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CORTISONE AND A.C.T.H. IN TREATMENT OF NON-RHEUMATIC CONDITIONS

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Since cortisone and A.C.T.H. were made available in this country in 1951, 78 patients have been treated with these drugs at the General Infirmary at Leeds. In no case has the decision to start the treatment rested on conditions other than therapeutic indication, so that our experience, though fairly broadly based, has been gained more from individual needs than from research interest.

In non-rheumatic conditions the results obtained seem valuable enough to allow of an interim report on our conclusions. Patients in this group have been submitted to treatment not only where it was felt that cortisone or A.C.T.H. offered the best hope of improvement, but also in an attempt to elucidate their various and varying effects in disease processes. Due weight has been afforded these aims in the allocation of cortisone or A.C.T.H. for individual patient treatment, applications for the drugs being submitted to the cortisone committee at the infirmary, one of us (S. J. H.) acting as secretary to this panel.

This report summarizes the results and experience gained in the non-rheumatic diseases. Fourteen patients have been observed with disorders of the blood and blood-forming organs; 16 patients have been treated for disease or dysfunction of the endocrine glands; and in a third, miscellaneous, group the effect of treatment has been studied in two patients with cirrhosis and portal hypertension, in two patients presenting a nephrotic syndrome, and in nine patients suffering from asthma.

No attempt has been made to review the literature, since this is thought to fall outside the scope and intention of a report which deals, in the main, with the routine treatment of problems common to a general teaching hospital.

DISEASES OF THE BLOOD

Acute Acquired Haemolytic Anaemia

Four children, whose ages ranged from 6 months to 8 years, were admitted to hospital during a period of 16 days in March, 1952, suffering from acute acquired haemolytic anaemia. Because of the poor response of three of them to blood transfusions a trial was given to the use of A.C.T.H., and the results have been reported elsewhere in greater detail (Rose and Nabarro, 1953).

Clinical Presentation.—All described a short febrile illness characterized by lethargy, irritability, increasing pallor, breathlessness, and haemoglobinuria; two showed moderate icterus, one of these also demonstrating enlargement of the spleen, liver, and lymph nodes. They were acutely ill, and in no case were any specific aetiological factors evident.

Haematology.—The findings in the peripheral blood were of a severe haemolytic process without evidence of leukaemia. The sternal marrow in the two patients on whom this examination was performed showed only normoblastic hyperplasia. The direct Race-Coombs test was positive on admission in two patients and eventually positive in three.

Treatment.—Three of the children required the protection of A.C.T.H. or cortisone. The fourth responded to a single blood transfusion given on the seventh day after admission, and she remained in good health despite persisting hepato-splenomegaly. Of the three treated with hormones, a girl aged 3 who had relapsed rapidly after each of three transfusions responded to a course of A.C.T.H. given over a period of five weeks, begun at an initial dosage of 50 mg. daily intramuscularly and gradually reduced after three weeks. A second child, a boy aged 8, was given A.C.T.H. because of severe relapse after several transfusions. He responded well to a dosage of 100 mg. daily continued for two weeks, gradually reduced in a "steppage" procedure in the next three weeks, but he relapsed when A.C.T.H. was discontinued. After further transfusion, splenectomy was performed without apparent effect. A second course of A.C.T.H. (100-75 mg. daily) was given, to which he again responded. In the seventeenth week after admission cortisone was substituted for A.C.T.H. A final attempt at drug withdrawal resulted in brisk haemolysis and he still required 75 mg. of cortisone daily, nearly 60 weeks after the beginning of his illness and the start of treatment. His general health remained excellent, though "mooning" of the face was clearly evident. In this case the direct Race-Coombs test, previously positive, became negative during the thirteenth week of treatment whilst he was receiving A.C.T.H., though later it reverted with cortisone.

The third patient to come under treatment, a female child of 6 months, was given A.C.T.H. after a preliminary trial of transfusion. Relapse followed withdrawal



of the drug, which had been given at a dosage of 25 mg. daily, and splenectomy was undertaken during a second course of A.C.T.H. Relapse again occurred when the drug was discontinued. A third course of A.C.T.H., later changed to cortisone, was continued in gradually diminishing dosage for a further period of 14 weeks, and no ill effects have attended its final withdrawal, 28 weeks after the onset. The direct Race-Coombs test, positive at the outset, is now only weakly so.

Comment.—In this small group, one child responded after one transfusion, and another after transfusion and A.C.T.H. The other two were given intensive hormone therapy, and both were submitted to splenectomy. The relatively large requirements of A.C.T.H. made it difficult to achieve haematological response and clinical control without the production of side-effects. Undue gain in weight, mooning of the face, and glycosuria were recorded, but without biochemical or electrocardiographic evidence of electrolyte disturbance. Splenectomy proved of little benefit in the two children who relapsed after withdrawal of the drug, the operation being undertaken because of the large requirements of A.C.T.H. and the long duration of the illness. Of these two children, one appeared to recover after splenectomy performed under the protection of a second course of A.C.T.H., but relapsed on withdrawal of the drug, subsequently responding to intramuscular cortisone. The other child was operated on during a relapse, but failed to improve, the haemolytic process being ultimately controlled with cortisone. Rose and Nabarro conclude that the underlying abnormal antibody reaction can be controlled by sufficiently large doses of hormone, yet cortisone and A.C.T.H. cannot be said to displace transfusion and splenectomy in the treatment of the individual patient, both remaining as important therapeutic adjuvants.

Aplastic and Hypoplastic Anaemia

Two patients with marrow aplasia have received A.C.T.H. A man aged 27 with Hodgkin's disease, confirmed by gland biopsy, was given a long period of treatment with oral nitrogen mustard (R48), for the supply of which we are indebted to Professor Haddow. After nine months a persistent anaemia required frequent correction by blood transfusion. It seemed likely that treatment had conditioned marrow aplasia, for the anaemia was associated with thrombocytopenia and profound neutropenia. Marrow puncture gave no diagnostic information. Accordingly a trial of A.C.T.H. was made: the dosage was 100 mg. daily, reduced after eight days to 75 mg. daily. The drug was continued for 20 days (total 1.7 g.). The blood count at the start of treatment showed: Hb, 72%; W.B.C., 900 per c.mm. (60% neutrophils); and platelets, 40,000 per c.mm. No improvement occurred in the peripheral blood as a result of treatment. In the ensuing months the interval between transfusions has lengthened and the white-cell and platelet count has gradually returned to normal.

A retired policeman aged 64 had been anaemic for three years. Marrow examination at the onset in 1949 demonstrated notable reduction in the formation of erythrocytes, though the marrow was not aplastic. The diagnosis of hypersplenism was considered, but splenectomy in 1950 failed to establish a clinical cure, and since operation he had been kept alive by blood transfusions. A course of A.C.T.H., 100 mg. daily for eight days, was without effect on the anaemia and no reticulocytosis was observed. No decrease in the frequency of subsequent transfusions followed this course of treatment, which was held responsible for the recognition, three months later, of diabetes mellitus, requiring insulin. He died six months later at home, and no post-mortem examination was possible.

Comment.—In the first patient the restoration of a normal blood count was seemingly uninfluenced by A.C.T.H., the subsequent haematological improvement being more in keeping with the experience of Matthews (1950) though occurring rather less promptly, which probably reflected on the large amount of R48 previously given. In the year of observation following the course of A.C.T.H. there has been no progression of the Hodgkin's disease, which appears entirely quiescent. In the case of idiopathic aplastic anaemia A.C.T.H. had no effect on the blood condition, diabetes mellitus developing three months later as a complication of treatment.

Agranulocytosis

A patient with agranulocytosis consequent on thiouracil treatment of thyrotoxicosis was admitted as an emergency. A blood count showed 1,200 leucocytes per c.mm., with 4% neutrophils; and marrow examination demonstrated severe hypoplasia of the myeloid series. A.C.T.H., 25 mg. six-hourly, produced prompt symptomatic and haematological improvement, with myeloid hyperplasia evident at a second marrow examination on the fourth day of treatment, the peripheral blood at this time showing 70% of polymorphs in a total white-cell count of 2,900 per c.mm. Restoration to normality was complete by the seventh day, and there seemed little doubt that A.C.T.H. was the agent responsible for the swift reversal of this profound neutropenia.

A housewife aged 57 had been found to be granulocytopenic two years previously. Apart from a course of sulphonamides, given prior to recognition of the condition, no cause was evident. Treatment with haematins had been without effect and she was subject to recurrent coliform urinary infections. The total white-cell count averaged 2,000 per c.mm., with neutrophils 10-20%. Marrow examination demonstrated a failure of maturation of the cells of the myeloid series in a quiescent marrow. Seven intravenous infusions of A.C.T.H., each of 20 mg. in 1 litre of normal saline, were given on alternate days without significant change in the peripheral white-cell count, and a seven-day course of A.C.T.H. by intramuscular injection (total 900 mg.) was similarly ineffective. Her progress has been followed for 18 months. Her health remains good, though still liable to interruption by urinary tract infection, and on one occasion by a large gluteal abscess of spontaneous origin from which *Bact. coli* was cultured. The added complication of a mild diabetes mellitus, recognized six months after the course of A.C.T.H., has been well controlled by dietary restriction of carbohydrates.

The third patient in this group, a man aged 51, first came under treatment for a left-upper-lobe pneumonia which gradually resolved with antibiotic therapy. Granulocytopenia was observed at this time, the bone marrow showing granulocytopenia to be arrested at the stage of transition from myeloblasts to myelocytes, the more mature forms showing heavy toxic stippling. The erythroid elements were hyperplastic in response to a moderately severe anaemia. The anaemia was corrected by blood transfusion, and the patient returned to work. His condition slowly deteriorated, with irregular pyrexia and progressive fall in the neutrophils to 7% of a leucocyte count of 2,400 per c.mm. A.C.T.H., 100 mg. daily for 16 days, caused some improvement, the white-cell count after treatment being 3,300 per c.mm., with 64% neutrophils. The diagnosis in this case remained obscure, the haematological findings being compatible with a chronic agranulocytosis or progressive marrow aplasia. Further investigation was prevented by the development of psychotic traits, the patient taking his own discharge and dying a month later at home. The possibility of tuberculosis was suggested by a chest x-ray examination within a month of death, which showed a diffuse mottling throughout the lung fields.

Comment.—Of three patients with agranulocytosis, an excellent response to A.C.T.H. occurred in the one in whom thiouracil was the agent responsible for the acute development of serious neutropenia. A.C.T.H. was entirely

without effect in a second case of agranulocytosis of idiopathic origin and two years' duration, and led to the later development of diabetes. In a third patient, A.C.T.H. produced a temporary improvement in the white-cell count where the cause of the granulocytopenia remained obscure.

Thrombocytopenic Purpura

Cortisone has been used in two cases. A man aged 65, with a lifelong bleeding tendency and several previous admissions for thrombocytopenia, was readmitted because of persistent epistaxis, with a platelet count of 100,000 per c.mm. and a bleeding-time of 12 minutes. Cortisone, 100 mg. daily intramuscularly, was given for five days without significant haematological response, though the bleeding stopped on the second day of treatment.

The second patient, a woman aged 39, developed thrombocytopenic purpura after a course of sodium aurothiomalate

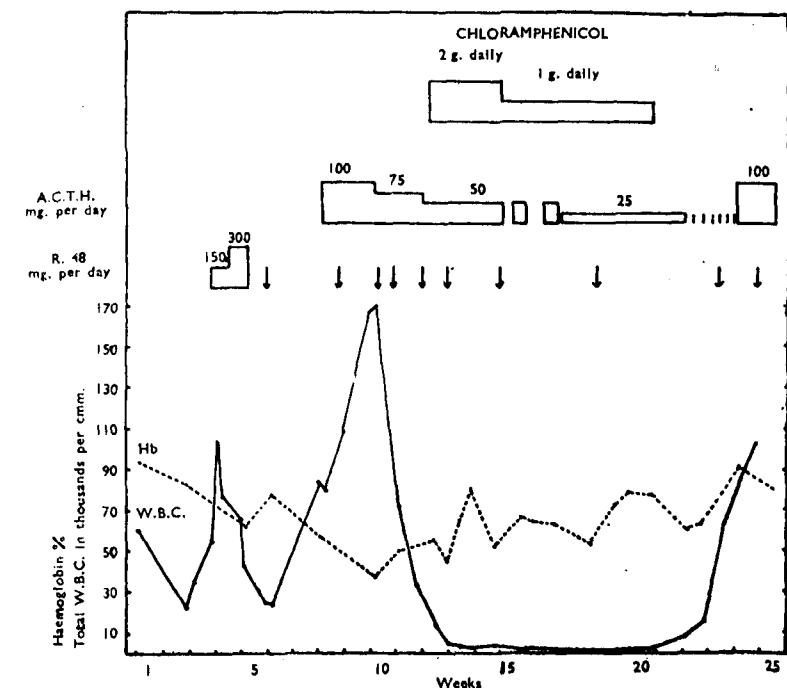


FIG. 1.—Effect of A.C.T.H. in a patient with subacute myelogenous leukaemia. Arrows indicate blood transfusions.

given for disseminated lupus erythematosus. The platelet count averaged 80,000 per c.mm., sternal marrow biopsy showing no evidence of aplasia or leukaemia, the megakaryocytes being normal in number and form. The spleen was not palpable. Splenectomy was done without persisting effect on the platelet count and bleeding continued, requiring frequent transfusion. Treatment with A.C.T.H., 100 mg. daily for three days followed by 50 mg. daily for two weeks, coincided with clinical improvement, and bleeding ceased shortly after the drug was discontinued, the platelet count showing little significant change. Since this time two further episodes of bleeding and purpura have necessitated her readmission, but her general condition has steadily improved and she is now well. The lupus erythematosus is quiescent.

Comment.—In both patients clinical improvement coincided with the administration of cortisone or A.C.T.H., unaccompanied by significant haematological response.

Leukaemia

Three patients with leukaemia have been treated with A.C.T.H. The first of these, a woman aged 42, presented in an acute termination of a myeloid leukaemia with the unusual feature of extensive glandular enlargement. Three weeks previously she had completed a course of deep x-ray therapy. Blood examination showed 51% neutrophils, 22% metamyelocytes, and 27% myelocytes in a total white-cell count of 48,000 per c.mm. A.C.T.H. was given at a dosage of 100 mg. daily for seven days, without clinical improvement or haematological response, the peripheral blood demonstrating an increasing number of less-differentiated cells in a higher total count. Her death from cerebral haemorrhage followed shortly on the withdrawal of A.C.T.H.

Our second patient, a man aged 30, had subacute myeloid leukaemia and the clinical appearance of so-called "pseudo-

scurvy." A course of R48 was discontinued on the development of skin purpura and A.C.T.H. introduced in an attempt to influence the extreme dysphagia occasioned by infiltration and oedema of the oropharynx. Symptomatic relief was rapid and striking, regression of swelling and clearing of ulceration from the mouth being associated with control of fever and a sensation of well-being that bordered on the euphoric. The total white-cell count initially increased, but later it progressively and rapidly declined to leucopenic levels, averaging 1,500-2,500 per c.mm., with neutrophils about 40-60% and lymphocytes 60-40%; immature white cells disappeared from the peripheral blood (Fig. 1). The dosage of A.C.T.H. was gradually reduced, but attempts to discontinue it entirely were met by a prompt return of fever with local and general deterioration. It appeared probable that A.C.T.H. was the agent responsible for the temporary control of the leukaemic process, though the concomitant employment of chloramphenicol may well

have contributed to marrow depression—an effect reported in this country by Hawkins and Lederer (1952) and by Wolman (1952). In the fifteenth week of treatment with A.C.T.H., and some nine days after chloramphenicol had been discontinued, the peripheral blood demonstrated a return of leukaemic features, with the re-appearance of primitive white cells. Thereafter deterioration was rapid, jaundice preceding death.

The third patient, a boy aged 16 with acute myeloid leukaemia, received five daily transfusions each of 25 mg. of A.C.T.H. in 1 litre of normal saline. The total white-cell count fell from 140,000 to 13,000 per c.mm. in this period, but the proportion of primitive cells remained unchanged. The later administration of folic acid antagonists clouded estimation of the therapeutic effect, but no remission followed, and the boy has since died.

Comment.—We have had no experience of the effect of cortisone and A.C.T.H. in the acute leukaemias of childhood, in which favourable results have been reported. In this small group of older patients with myeloid leukaemias the discouraging response to treatment has been in keeping with that generally recorded.

ENDOCRINE DISEASES

Exophthalmic Ophthalmoplegia

Our original report (Chandler and Hartfall, 1952) concerned the treatment with cortisone and A.C.T.H. of five patients (Cases 1-5) with this condition. Since then four more patients have been treated, without dietary regulation of sodium.

Case 6.—A woman aged 70 developed thyrotoxicosis in January, 1951. Treatment with thiouracil led to general improvement, but proptosis and chemosis became more pronounced, though unaccompanied by ophthalmoplegia. She was admitted in March, 1952, and given A.C.T.H., 100 mg. daily for 21 days, without change in the ocular condi-

tion, either subjective or objective. Her thyrotoxicosis showed no signs of settling and she was given a treatment dose of 1³¹ in June, 1952. Control of thyrotoxicosis has been associated with a slow improvement in the eye signs.

Case 7.—A woman aged 25 underwent partial thyroidectomy for primary thyrotoxicosis in April, 1951. There was some post-operative increase in exophthalmos, and on admission in May, 1952, the exophthalmometer readings were R. 23 mm., L. 22½ mm. Gross nystagmus, hysterical in pattern, prevented measurement of duction movements. There was no diplopia. She gave the impression of considerable anxiety without evidence of thyrotoxicosis (B.M.R. +20%). Treatment with cortisone by mouth, 25 mg. six-hourly, was started on May 30 and continued to June 19. There was some slight subjective improvement and a minimal decrease in proptosis (R. 21 mm., L. 22½ mm. on June 19). The dosage was reduced to 50 mg. daily on July 2 and then to 25 mg. daily on July 7, and was finally discontinued after another three weeks. No further change was observed, the readings of exophthalmos in November being R. 21 mm. and L. 22 mm. The patient claims continued symptomatic relief.

Case 8.—This patient was a woman aged 50. The onset of bilateral proptosis four years previously antedated by nearly two years the clinical recognition of thyrotoxicosis. Thiouracil treatment was instituted in January, 1951, but was discontinued after five months because of leucopenia. Since this date there has been little change, either in thyroid status or in the severity of the eye signs. In August exophthalmos measured R. 22½ mm. and L. 23½ mm. There was no oedema either of lids or of conjunctivae, and the ocular movements were full. The patient was euthyroid as judged by B.M.R. and radio-iodine studies. A course of cortisone, 100 mg. daily by mouth to a total of 2 g., was entirely without effect on the eye signs, and a subsequent trial of A.C.T.H. was likewise ineffective.

Case 9.—A man aged 54 was admitted on October 19, 1952, with a short history of progressive exophthalmos, first noted in the left eye four months previously. Diplopia was experienced on upward movement, and, concomitantly with the ocular disturbance, increasing irritability and weight loss suggested a mild thyrotoxicosis, confirmed by B.M.R. (+40%) and radio-iodine studies. Examination revealed rigid proptosis (R. 24 mm., L. 27 mm.), with chemosis and conjunctival prolapse. There was gross limitation of upward movement in both eyes with paresis of left inferior oblique and left superior rectus. A course of A.C.T.H. to a total of 2 g. (100 mg. daily for 20 days) was undertaken. During the period of observation and treatment the ophthalmoplegia and area of diplopia increased, later measurement of proptosis showing R. 26 mm. and L. 28 mm.—a small deterioration.

Comment

In summary, six patients showed no improvement, yet three responded well and one dramatically. This conflict of response is reflected in the publications of other investigators, some of whom (Lederer and Hambresin, 1950; Cole, 1951) reported conspicuously favourable results.

The reasons for this remarkable disparity are not immediately obvious, though some preliminary and necessarily tentative conclusions appear to be justified.

1. Our best results were obtained with A.C.T.H. in patients whose exophthalmos was of recent origin or had suddenly and rapidly progressed. It is possible that the greater effectiveness of A.C.T.H. may be the result of the stimulation of mineral corticoid secretion and consequent local withdrawal of fluid from the orbital tissues (Campbell, 1952). Such an effect could be expected in exophthalmos of recent development only before fibrotic changes have occurred in the ocular muscles and tissues. We have previously had experience of the ability of these steroid hormones to promote a saline diuresis in certain oedematous states (notably the nephrotic syndrome), and our original investigation was framed so as to relate the sodium balance of patients with exophthalmos to the effect of treatment.

2. Those patients in whom exophthalmos and thyrotoxicosis co-exist form a group of particular therapeutic difficulty. Though a

treatment dose of 1³¹ may prove a less drastic insult to the thyroid-pituitary relationship than partial thyroidectomy, yet in our series the control of thyrotoxicosis was the most notable feature of the treatment of two patients (Cases 1 and 5) in whom this coexisted with exophthalmos and ophthalmoplegia. This suppressive effect of the adrenal steroid hormones on thyroid function is in accord with the experience of Hill *et al.* (1950), who obtained good results in three out of six patients with uncomplicated Graves's disease. However, two patients in our series (Cases 6 and 9) showing the combination of thyrotoxicosis and exophthalmic ophthalmoplegia obtained no benefit from A.C.T.H.

3. Our experience with cortisone in patients showing exophthalmos unaccompanied by ocular muscle weakness has been entirely disappointing (Cases 6, 7, and 8), and no benefit from treatment has been observed. These patients showed only an overfilling of the orbit, presumably the effect of excess of fat.

4. Another consideration, that of dietary restriction of sodium which was enforced in our original series (Cases 2-5), cannot be discounted as a factor responsible for clinical improvement, bearing in mind the belief that oedema of the orbital tissues plays a part, at least, in the production of exophthalmos.

Simmonds's Disease

A.C.T.H. has been used in the treatment of three women with panhypopituitarism. On inquiry all gave histories typical of this disorder, dating their illness to a previous childbirth which had been attended by severe post-partum haemorrhage, following which lactation had never been established and the periods had failed to return. They had lost in energy, appetite, and variably in weight, one patient in particular presenting the picture of pituitary cachexia originally described by Simmonds (1914). Her slow deterioration over the years had been interrupted by infrequent attacks of drowsiness and coma. One such attack was observed in hospital, the patient lapsing into semi-coma with markedly cold extremities, immersion in a hot bath producing a striking but temporary improvement.

Clinical examination showed, in each, the changes of severe pituitary insufficiency. One patient was notable for the absence of mental change, preserving a bright though facile cheerfulness, in striking contrast to her physical enfeeblement. Of the others, one was deaf and apathetic, the other confused and hallucinated. The details of investigation before and during treatment are recorded in the accompanying Table. The Thorn test was normal in all, and hypoglycaemic unresponsiveness was observed in the two patients (Cases 2 and 3) in whom this investigation was made.

Treatment was by A.C.T.H. alone, and led to an improvement which was considerable in all, and dramatic in one (Case 2). It was appreciated by the patients, who without exception spoke of a feeling of strength and health, which had been absent for many years. The mental condition returned to normal in the two patients (Cases 1 and 2) in whom the symptoms of confusion and hallucination had predominated. Increase in appetite was universal, though gain in weight was not remarkable, averaging 8 lb. (3.6 kg.). All mentioned their new-found freedom from cold.

Concomitant anaemia, of normochromic type, which existed in Cases 1 and 3, did not respond to A.C.T.H., either alone or in combination with haematinics, and blood transfusion was required in Case 3 to correct the deterioration in this respect, the Hb having fallen to 49%.

Urinary excretion of 17-ketosteroids increased in all patients, particularly during the early weeks of treatment, but this was not maintained and perhaps was related to the reduction in dose of A.C.T.H. Examination of the fluid balance was remarkable for the demonstration, prior to the inception of A.C.T.H. therapy, of the small intake of water on which these patients were able to exist, the 24-hour urinary volume averaging 400-600 ml. The low level of sodium, which was a feature of the plasma chemistry of Cases 1 and 2, returned to normal and remained so under the influence of A.C.T.H. Serial E.C.G. recordings showed a parallel improvement. These patients have now returned home. Their maintenance requirements are being met by a single weekly injection of "acthar gel" 40 mg., on which

Effect of A.C.T.H. in Three Patients with Simmonds's Disease

Case	Age	Duration of History	Days from Start of A.C.T.H.	Hb %	B.M.R.	Blood Cholesterol (mg./100 ml.)	Blood		17-Ks in mg./24 Hours	Fasting Blood Sugar (mg./100 ml.)	A.C.T.H. Dosage	Response
							Na	K				
1	63	25 yrs.	0 7 20 25	84 67	-28%	268 140	280 345 333	19.6 17.1 17.8	0.8 5.0 1.9	60 80	25 mg. I.M. b.d. 25 " " " " 25 " " daily 25 " " alt. days	Excellent. Discharged home on 25th day of treatment. Maintenance requirements, acthar gel 40 units weekly
2	58	32 yrs.	0 25 47 160	91 90	-50%	240 180 250	270 325 330	15.7 18.8 18	2.3 4.0 2.1	80 130	25 " b.d. 25 " daily 25 " alt. days 25 " " "	Excellent. Severely confused and hallucinated on admission. Mental condition now normal. Returned home on 51st day of treatment and is managing all household duties. Continuing as an out-patient on acthar gel 40 units weekly
3	42	18 yrs.	0 18	64 49	-7%	130	332 315	21.5 16.5	1.2 3.1	70	25 " q.d.s. 25 " b.d.	Good. Previously bed-ridden is now taking an active part in her household duties. On acthar gel 40 units weekly as an out-patient

17-Ks = Urinary 17-ketosteroid excretion.

improvement has been steadily sustained: all are leading active useful lives, managing their homes in a way previously impossible of fulfilment.

No toxic effects have been observed in this series, the appearance of oedema of feet and legs during the initial period of treatment responding to moderate salt restriction and the later reduction in A.C.T.H. dosage.

Comment.—The effect of A.C.T.H. in severe pituitary insufficiency has been studied in three patients, with a benefit from treatment so remarkable as to leave no room for doubt. In one patient (Case 2), almost moribund on admission, the effect was life-saving. They are now restored to useful domestic activity, though the glandular deficiency is such that continued maintenance treatment seems necessary.

Adrenal Hyperplasia

Cortisone has been given to four patients. Two were young women showing the syndrome of adrenal virilism, and two were children presenting as pseudo-hermaphrodites.

Adrenal Virilism

A woman aged 22 had noted rapid gain in weight and irregular menstruation for six months. Examination revealed moderate hirsutism, mooning of the face, and gross acne of the chest and back. The blood pressure was normal. The urinary excretion of 17-ketosteroids varied between 28 and 34 mg. per 24 hours, and the test for dehydroisoandrosterone was negative. Perirenal air insufflation and aortograms were thought to exclude an adrenal tumour. Total right adrenalectomy was without benefit or appreciable effect on 17-ketosteroid excretion. Two months later, left hemi-adrenalectomy was carried out under the protection of cortisone, 200 mg. being given on the day before operation, the drug being carried into the immediate post-operative period in gradually diminishing dosage. There resulted a very definite improvement in hirsuties, and the urinary excretion of 17-ketosteroids declined to an average of 6 mg. per 24 hours. Within two months, however, symptoms returned in their old severity, 17-ketosteroid excretion increasing to 15 mg. per 24 hours, and a third operation of left subtotal adrenalectomy was undertaken, the adrenal remnant being some one and half times the size of the normal gland. Five-sixths of this was removed, again under the cover of cortisone, which was given at a dosage of 50 mg. daily for two days before and for seven days after operation. The adrenal tissue removed at these successive procedures showed no histological abnormality. The further progress of this patient has been reasonably satisfactory, though a tendency to hirsutism remains.

The second patient, a woman aged 25, had been raised as a boy until the age of 9, when a large clitoris was removed. The mother noted hirsuties at this time. Menstruation later occurred only under the influence of oestrogens. She presented with typical virilism, a strong beard requiring shaving twice daily. There was no evidence in

the skin or face of basophilism, and the B.P. was 190/120. Urinary excretion of 17-ketosteroids was 26.5 mg. per 24 hours. An aortogram demonstrated enlargement of both adrenal glands without evidence of tumour. Excretion of 17-ketosteroids increased to a maximum of 108 mg. per 24 hours during a period of in-patient observation. Total right adrenalectomy was followed by a course of cortisone, 50 mg. daily for 34 days, during which 17-ketosteroid excretion fell to normal, the hirsuties greatly improving. Left subtotal adrenalectomy was done five months later under the protection of a second course of cortisone, but within two months of this operation a mild Addisonian syndrome developed, with weakness, vomiting, and pigmentation. She improved with deoxycortone acetate and salt therapy, cortisone being withheld as her condition suggested functional activity of the adrenal remnant. The histological appearances were those of simple cortical hyperplasia.

Comment.—Surgical removal of hyperplastic adrenal tissue and cortisone therapy have effected a small improvement in two patients with virilism; in neither did the results appear commensurate with the risks involved, though the time of observation had admittedly been short.

Pseudo-hermaphroditism

An infant of 3 weeks presented with persistent vomiting and perineal hypospadias. The diagnosis of female pseudo-hermaphroditism was confirmed by a raised urinary 17-ketosteroid excretion of 8.2 mg. per 24 hours (normal less than 1 mg.) and the infant's inability to retain salt. Despite vomiting, the urinary excretion of salt averaged 2 g. daily on an intake of less than 0.5 g. a day. The blood sodium was 228 mg. per 100 ml., chloride 430 mg. per 100 ml., and potassium 25 mg. per 100 ml. The infant was given extra saline equivalent to 2-3 g. of salt a day, with cortisone 5 mg. intramuscularly daily. The 24-hour excretion of 17-ketosteroids fell rapidly to an average of 1-1.5 mg., but the child remained ill and miserable, passing loose offensive stools; analysis of a 24-hour specimen showing 47% of total fatty matter with trypsin present down to a dilution of 1:100. A loose cough was uninfluenced by a course of aureomycin. After four weeks, deoxycortone acetate, 2 mg. daily, was introduced and cortisone continued at a dosage of 5 mg. intramuscularly twice weekly, with some clinical improvement and restoration of the blood sodium and chloride levels to normal. The improvement was short-lived, the child dying from bronchopneumonia in the eighteenth week. At necropsy the suprarenal glands were greatly enlarged (each weighing 10.4 g.) and showed a pale hyperplastic cortex. Histological examination revealed fibrocystic disease of the pancreas.

The second patient, first seen aged 3 years 3 months, had hitherto been reared as a boy. He was of slender build with girlish facies, showing a perineal hypospadias flanked on either side by gonadal sacs containing no testes. Over these sacs and the top of the phallus there was a quantity of black hair, suggesting a masculinizing process in a female.

This was confirmed by hormone estimations on the urine: 17-ketosteroids, 16.6 mg. per 24 hours; dehydroisoandrosterone, negative; follicle-stimulating hormone, 17 units. These results suggested bilateral diffuse hypertrophy of the adrenal cortex, though the amount of follicle-stimulating hormone, not usually present at this age, raised the possibility of primary pituitary dysfunction. The patient's bone age was between 5 and 6 years. Laparotomy a year later demonstrated female internal organs, biopsy from the right ovary showing normal ovarian tissue.

Cortisone therapy was started in July, 1952, the child being then almost 5 years old. The dosage was 50 mg. daily for three weeks, reduced to 25 mg. daily for a further four weeks, thereafter continued at 75 mg. and 100 mg. twice weekly. The 24-hour excretion of 17-ketosteroids, which had averaged 18-19 mg. per 24 hours prior to cortisone therapy, was controlled in the succeeding months at 4-6 mg. per 24 hours. Little objective change has so far occurred, but the child is well and happy, conforming easily to feminine outlook.

MISCELLANEOUS CONDITIONS

Cirrhosis with Portal Hypertension

Our experience of the treatment of this syndrome with A.C.T.H. has been limited to two patients in whom hepatic fibrosis had occasioned portal hypertension with frequent episodes of gastro-intestinal bleeding. Previous reports (Bongiovanni and Eisenmenger, 1951) of the effect of A.C.T.H. in cirrhotic subjects have stressed the risk to those patients whose liver function is seriously impaired. In others, certain benefit seems to have attended treatment, though evidence of the specific nature of the response is lacking.

A man aged 35 developed cirrhosis consequent on homologous serum jaundice. Three attacks of haematemesis at six-monthly intervals brought him under our observation, when, in addition to the finding of splenomegaly, extensive oesophageal varices were visible on barium examination and confirmed at oesophagoscopy. Measurement of oesophageal varix pressure (Mr. Allison) showed an excess over systemic venous pressure of 140 mm. H₂O. A course of A.C.T.H. was given over 39 days of study (total 2.5 g.). Day-to-day variation in dosage was determined by the patient's response, particularly in relation to fluid and salt retention and also by the levels of blood sugar. Fluid retention was easily induced—far more readily than has been our experience in other conditions with similar dosage.

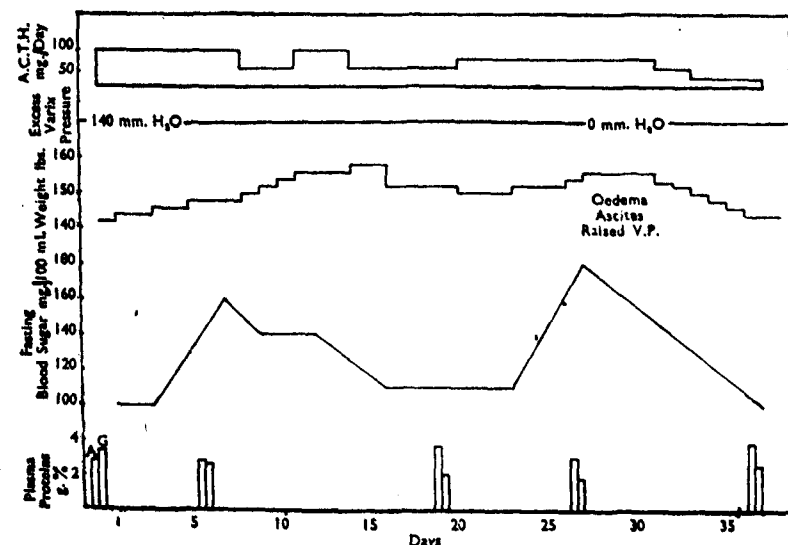


FIG. 2.—Effect of A.C.T.H. on a patient with hepatic cirrhosis and portal hypertension. Note initial rapid increase in weight, with equalization of portal and systemic venous pressures at a time of maximum fluid retention, and improvement in the levels and ratio of plasma proteins.

The details of treatment and investigation are shown in Fig. 2. Serial estimations of plasma chemistry showed a progressive and sustained improvement in liver function with final return to normality. Direct measurement of portal hypertension gave equivocal results. By the fifth week of treatment the pressures in the portal and systemic systems were equal, but this second measurement coincided in time with the period of maximum fluid retention and systemic venous pressure was notably raised. Six months later, measurement showed that the difference in pressure between the two systems was as before treatment. Treatment occasioned some improvement in general health, and in the eight months since A.C.T.H. was discontinued the improvement, both clinical and biochemical, has persisted without recurrence of bleeding.

A man aged 36 had survived numerous attacks of haematemesis and melaena as well as the operations of splenectomy and oesophageal devascularization, both without benefit. This patient suffered a recurrence of bleeding whilst under treatment, and has recently reported a further attack of melaena. A.C.T.H. has contributed nothing to this man's rehabilitation.

Comment.—This small experience suggests that A.C.T.H. has no certain place in the present admittedly unsatisfactory attack on the problem of portal hypertension, though it may remain a valuable therapeutic adjuvant in the treatment of cirrhosis.

Nephrotic Syndrome

We have had experience of the paradoxical diuretic power of these drugs in two patients whose presentation conformed to that described by Ellis (1942) as type II nephritis.

A woman aged 48 developed the characteristic triad of oedema, albuminuria, and hypoproteinaemia following on the employment of sodium aurothiomalate for a polyarthritis of rheumatoid type. Yet the time interval of nearly 12 months was such that the aetiological role of gold was of questionable significance. This patient received cortisone at a dosage of 100 mg. intramuscularly daily for six weeks (total 4.3 g.) and by the fourth week of treatment had lost 20 lb. (9.1 kg.) and was clear of oedema. Proteinuria declined from 7.8 g. per litre to an average of 1.2 g. per litre, yet no change in the level and ratio of plasma proteins accompanied this clinical improvement. She slowly relapsed after cortisone had been discontinued, oedema reaccumulating, uninfluenced by a 10-day course of A.C.T.H. (1.1 g.) and a final short course of cortisone, though she never became so waterlogged as on admission. Renal function was unchanged as judged by clearance tests, and the patient was normotensive throughout.

Our second patient, a girl of 15 years, came under observation in March, 1951, when for two months she had noticed swelling of the feet and legs, unaccompanied by haematuria. She was found to have gross albuminuria and a B.P. of 180/120. Since this time, oedema had fluctuated but never remitted. Renal function was adequate: the plasma chemistry demonstrated reversal of the albumin/globulin ratio. In March, 1952, no improvement having followed the adoption of orthodox dietary measures, A.C.T.H. was started at a dosage of 25 mg. intramuscularly six-hourly and continued for 17 days (total 1.7 g.), the patient being placed on a diet providing a constant daily intake of sodium. During the administration of A.C.T.H. she gained weight steadily, oedema sensibly increasing in a period of negative sodium balance (Fig. 3). Cessation of A.C.T.H. was followed by a profound saline diuresis over 10 days, when the patient lost 15 lb. (6.8 kg.) in weight, oedema clearing entirely. Albuminuria

diminished slightly and the level of blood cholesterol fell from 350 to 170 mg. per 100 ml. This patient's progress has been observed for 12 months, and neither increase in weight nor return of oedema has occurred. Hypertension remains unaltered, and renal function is adequate. No significant change was noted in the level of plasma proteins during the time of in-patient observation, but in the succeeding months the trend of the plasma chemistry has shown an encouraging progress to normality.

Comment.—Two patients with a nephrotic syndrome have been treated with cortisone and A.C.T.H. The first patient went into remission whilst under treatment with cortisone, decrease in albuminuria and diuresis occurring simultaneously. Partial relapse followed the withdrawal of cortisone. In a second patient, treated with A.C.T.H., the diuresis was observed immediately after withdrawal of the drug and continued for 10 days. In this case the remission induced by treatment has lasted for 12 months. It seems clear from these observations that A.C.T.H. and cortisone are capable of exerting profound effects on electrolyte metabolism. More doubtful, however, is the possibility that the underlying disease process has been radically altered. This favourable response to cortisone and A.C.T.H. compares with other clinical reports of the effect of induced malaria (Gairdner, 1952), and the natural remissions sometimes observed following measles, for these may well represent the common results of adrenal activation by stress. Whatever the precise mechanism, these effects of the adrenal steroids in nephrotic disease provide interesting problems in fundamental physiology.

Asthma

The dramatic relief afforded to patients with bronchial asthma, and particularly those in status asthmaticus, by cortisone and A.C.T.H. is generally known. We have had the opportunity of observing their effects in nine patients, all of them subjects of severe chronic asthma, for whom emergency hospital admission had been requested after the usual remedies had failed.

Three women in their fifties obtained rapid relief from a single intravenous infusion of normal saline to which 20 mg. of A.C.T.H. had been added. These drips were allowed to run for 12 hours, when symptomatic benefit was such that treatment could confidently be continued by more orthodox means.

A woman aged 45, admitted desperately ill in intractable status asthmaticus, did not respond to A.C.T.H. by intravenous infusion and died on the second day. Post-mortem examination demonstrated almost solid plugging of the air passages by thick mucoid material, a mechanical obstruction to respiration which only bronchoscopic aspiration might have relieved.

Two patients have been treated with cortisone by inhalation, 5 mg. of the standard preparation being made up into 2 ml. with normal saline and administered at two-hourly intervals. The response of both lacked the dramatic quality attending the use of intravenous A.C.T.H., but was judged by the patients themselves to provide more rapid and lasting improvement than they had obtained in previous attacks of similar severity.

Two patients have received cortisone by intramuscular injection. A housewife aged 59 derived no benefit from 100 mg. of drug given daily for five days. The other, a woman of 25 in status asthmaticus, made an excellent response to 50 mg. given thrice weekly for five doses, treatment being continued at 50 mg. twice weekly for a further fortnight. The remission in this patient lasted until her return home one week later.

Though not directly touching on the therapy of the asthmatic attack, cortisone has been used in a case of allergic asthma in which orthodox desensitization had been abandoned because of the production of severe asthma. It was found possible to complete desensitization under the protection of cortisone, 25 mg. twice weekly, and since its completion the patient, a man aged 40, has remained free of attacks.

Comment.—We have confirmed the beneficial effects of cortisone and A.C.T.H. in seven of nine patients with severe bronchial asthma. The intravenous infusion of A.C.T.H. in normal saline seems to offer the best prospect of rapid symptomatic relief, and, together with the topical administration of cortisone by inhalation, allows of considerable economy in prescribing. The remissions induced by these forms of treatment average one to two months, probably differing little from the duration of freedom afforded by the more usual forms of treatment.

Summary

The effect of cortisone and A.C.T.H. in non-rheumatic diseases has been studied in 43 patients.

Fourteen patients with disorders of the blood have been observed. A favourable response occurred in three children with acute acquired haemolytic anaemia, and in thrombocytopenic purpura apparent clinical benefit resulted in the two patients treated. No effects were produced in aplastic anaemia, though one patient with acute agranulocytosis from thiouracil made a good response. The effect of A.C.T.H. in leukaemia was at best temporary. This small experience suggests that, apart from acquired haemolytic anaemia and some cases of purpura, cortisone and A.C.T.H. have little place in the treatment of blood disorders.

Sixteen patients with disorders of endocrine function have been studied. Of nine patients with exophthalmic ophthalmoplegia, only three responded well, the best results being obtained with A.C.T.H. in those examples of recent onset or rapid progression. Three patients with Simmonds's disease have made a dramatic and sustained improvement on A.C.T.H. Two patients showing the virilizing effects of adrenal hyperplasia have been

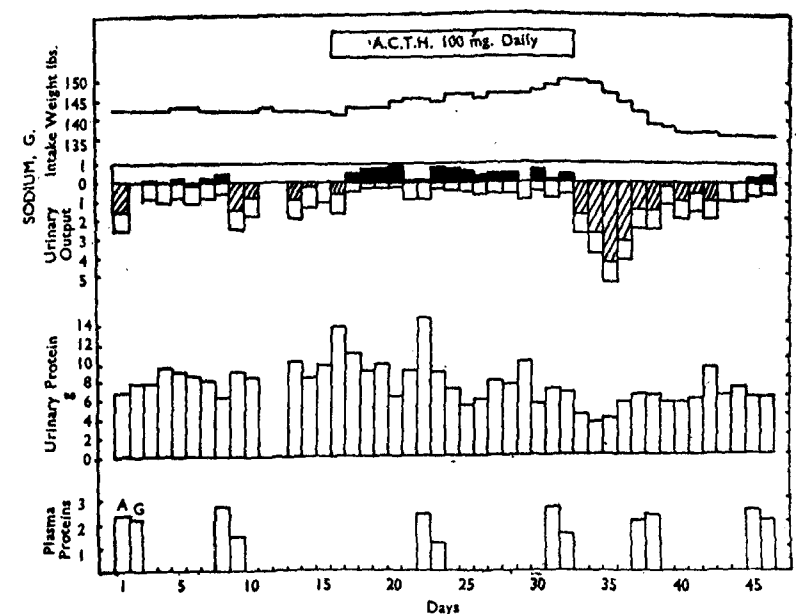


FIG. 3.—Effect of A.C.T.H. in a patient with nephrotic syndrome. Black areas, positive sodium balance; hatched areas, negative sodium balance. Note rapid loss of weight and saline diuresis when A.C.T.H. was discontinued. The levels and ratio of plasma proteins show no persisting improvement.

treated by adrenalectomy and cortisone: in neither did the results obtained appear to justify the risks involved. 17-ketosteroid excretion was controlled in two pseudo-hermaphrodites by the use of cortisone.

The beneficial effect of cortisone and A.C.T.H. in asthma has been confirmed. The use of A.C.T.H. by intravenous drip and of cortisone by inhalation usually brought prompt improvement and was an important economy in prescribing. In two patients with nephrosis a considerable diuresis attended treatment, and in one of them the remission obtained has lasted more than a year. There is no evidence that A.C.T.H. influences portal hypertension accompanying cirrhosis, though apparent clinical benefit occurred in one patient.

We are grateful to the physicians and surgeons of the General Infirmary at Leeds and the Hospital Cortisone Committee, who have allowed us to publish details of patients under their care. We are indebted to the Medical Research Council for the cortisone used in the treatment of exophthalmic ophthalmoplegia and to Armour Laboratories for a supply of acthar gel.

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DEVELOPMENTAL DYSARTHRIA

BY

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In 1950 we advocated a simple classification of speech disorders in childhood (Miller and Morley, 1950). This had grown naturally from our work and was conceived within the framework of accepted neurological terminology. The five broad categories of deafness, defective articulation or dysarthria, retarded development of language or dysphasia, dyslalia, and stammering, with their main subdivisions, are presented again, as follows:

Disorders from Deafness

1. Congenital nerve deafness:
 - (a) Severe for all frequencies.
 - (b) Partial, or high-frequency deafness.
2. Acquired nerve deafness.

Dysarthria

1. Due to local anatomical lesions of the speech organs.
2. Dysarthria with neurological signs of cerebral disease or maldevelopment.
3. Dysarthria unassociated with abnormal neurological signs elsewhere.

Dysphasia

1. Mainly expressive dysphasia.
2. Mainly receptive dysphasia:
 - (a) Dyslexia.
 - (b) ? Congenital auditory imperception.
3. Delayed development of speech or global dysphasia.

Dyslalia

Transient defects of consonant substitution and omission.
Stammering.

Continuing experience has confirmed the value of this classification in assessing the prognosis and designing the treatment of the individual child. In the past two years we have given particular attention to the problem of dysarthria, which is, to us, slow and clumsy articulation arising from dysfunction of the muscles used in speech. The association with cerebral palsy in all its forms is well known. A group of children, however, presented with dysarthria as the only disorder without detectable neurological abnormality in any other part of the body. It is this isolated form of dysarthria which is the subject of this paper. The literature on the subject is scanty, but suggests that the condition is uncommon. As we have studied 18 affected children over a period of four years we realize that it occurs more often than we suspected, and should be more widely recognized. We shall first describe four children whose cases illustrate the clinical patterns we have seen, and then consider the nature of the condition and its differentiation from other forms of defective articulation.

Clinical Patterns in Developmental Dysarthria

Case 1: Dysarthria with Clumsy Movements of Lips, Tongue, and Palate.—This boy is now 7 years 9 months old. He is the second child in the family, was born before the arrival of the nurse, and weighed 12 lb. 10 oz. (5.7 kg.). He breathed and cried immediately after birth, was successfully breast-fed for seven months, and was walking on his first birthday. Words were first used between 12 and 18 months and sentences from 2 years onwards. On his first visit at the age of 5 his mother complained that "he dribbled when he was excited, sucked instead of chewing his food, and could not talk properly." Though rather nervous, he co-operated well and his I.Q. on the Drever Collins scale was 111. No abnormality could be found in the nervous system except that speech was slow and clumsy, the tongue bunched and writhed on lateral movement, and the palate moved to the right. During speech the lips, tongue, and soft palate moved in an awkward and uncoordinated fashion. Two years after the beginning of treatment he could repeat all consonant sounds except "s," and speech was intelligible when spoken slowly, though some final consonants were still omitted. Although it may be some years before he speaks easily, and still longer before speech is satisfactory under stress, it seems likely that this boy will eventually achieve normal speech.

Case 2: Dysarthria with Clumsy Movement of the Soft Palate.—This 15-year-old girl is the second of four children. There is a history of language delay in her father until the age of 7 and of an unspecified speech difficulty in a cousin persisting into adult life. She was born normally and weighed 11 lb. 4 oz. (5.1 kg.). Her mother does not remember the child's early years very clearly, but she did not take the breast or bottle well and was slow in gaining weight. She was walking just before her first birthday. She was almost completely silent until 2, and then words came slowly. When first seen at 11 years she was a pleasant sensible girl with no evident disease of the nervous system apart from a tight soft palate which bunched up in the centre but did not contract at the sides. There was no sign of a submucous cleft. Speech was nasal in character. Consonants were weak or were omitted, and attempts to co-ordinate the use of vowels and consonants produced a

severe dysphonia. She ceased to attend for treatment, and four years later there had been little improvement in articulation. At 15 her reading age was 12 years 8 months and the palatal movements were unchanged. During a further course of treatment a transient dysphonia recurred, but four months later she had made considerable progress, and speech was normal except for an occasional audible nasopharyngeal leak, due to incoordination, when hurried. Her I.Q. on the Wechsler-Bellevue scale was 96, and her school report speaks of a "co-operative well-behaved girl, who, without outstanding qualities, had reached a fairly good standard of general attainment."

Case 3: Dysarthria with Clumsy Movements of the Tongue.—This boy, now aged 6 years 9 months, is a second child. Birth was normal and he weighed 10 lb. (4.5 kg.). There was no difficulty with feeding or swallowing, and he walked at the age of 14 months. His father had had a speech difficulty which persisted into school life. This boy began to use words at a year, and sentences followed very soon after. When first seen at the age of 5½ he was a well-developed boy of high intelligence, with an I.Q. by the Alexander performance test of 150. The nervous system was normal apart from a thick and clumsy tongue with poor lateral movement. Speech, however, was unintelligible. Sixteen months later speech was much improved, especially in formal rhymes and repetition, but was still clumsy when he attempted spontaneous conversation. The abnormal appearance and behaviour of the tongue was unchanged. We have regarded this boy as a case of dysarthria uncomplicated by dysphasia, in whom treatment has been facilitated by high intelligence.

Case 4: Dysarthria Without Apparent Clumsiness of Lips, Tongue, or Palate.—This boy is now 9 years old. The fourth child, he was born prematurely and weighed only 3 lb. (1.36 kg.). His behaviour during the first few weeks is not fully known, but at one stage "he was not expected to live." He did not dribble excessively and there was no apparent difficulty in swallowing. He was walking at the age of 15 months, and has always been a good runner. He did not begin to use words in any quantity until 2. When first seen at 6 he was a friendly active boy with no abnormality in the nervous system apart from defective speech. This was fluent, but intelligible only to his parents. The tongue, lips, and palate were normal in appearance and movement. Although at first he was thought to be an example of simple dyslalia, the failure to respond quickly to treatment suggested a more complex disorder of speech. He had difficulty in imitating and using consonant sounds, and was helped considerably by watching the therapist's articulation. When imitation of consonants was possible in isolation and in single words, he had exceptional difficulty in incorporating consonants correctly in speech. Two and a half years later his articulation was still defective, and, with increasing awareness of this, he had become more cautious, often repeating words silently before speaking. His I.Q. on the Wechsler-Bellevue scale was 113.

General Features of Developmental Dysarthria

Of the 18 children with this condition 12 were boys and 6 were girls. They have been observed for periods varying from 1 to 6 years, and their present ages range from 6 to 17. They come from all social classes and cover the full range of normal intelligence. The four children described earlier in this paper illustrate the clinical variations we have seen, and we shall now comment briefly on some common or frequently associated features.

Family Tendency.—There was an impressive history of speech defect in parents, siblings, or close relations in 10 of our families. Although we were unable to interview all the affected members personally, it was clear from the accounts given by the parents that the difficulty had been considerable and had continued in some instances into adult life.

Birth Injury.—In only three cases was birth injury suspected from the history, and in none was the evidence convincing. That this is unlikely to play an important part is borne out by the position of the affected children in the family. Only one was first-born, eleven were second, and six were third or later births.

Prematurity.—One of the 18 children was born prematurely—an incidence of prematurity similar to that for Newcastle-upon-Tyne in recent years (F. J. W. Miller, 1948).

Emotional Disturbance.—The majority of these children developed normally and happily in spite of their handicap. In two there were intermittent emotional difficulties which were not apparently related to their speech, while in a third, growing awareness of his defective articulation produced a reticence and hesitation which was absent in the earlier years. We have no grounds for believing that psychogenic factors play any important part in this group of disorders.

Appearance and Movements of the Lips, Tongue, and Palate.—Abnormal appearance and abnormal voluntary movements of the lips, tongue, or palate were present in 12 of the 18 children, and were the only abnormal physical signs apart from defective speech. The tongue is often thick and firm, with slow clumsy movements from side to side and difficulty or inability in pointing or turning it upwards over the lip. The upper lip also may give the impression of being tight and inflexible during speech, and the soft palate may show poor voluntary movement or fail to produce effective closure of the nasopharynx.

In the remaining six children, otherwise clinically similar, movements of the lips, tongue, and palate appeared normal on voluntary movements carried out at the examiner's request, but clumsy and awkward when the children attempted the more complex and rapid movements of articulation. We have regarded such cases as possible examples of "dyspraxic dysarthria" or "articulatory dyspraxia."

Associated Disorders of Language.—In nine of the children there was also delay in the development of language. The extent of this difficulty varied considerably. In one child the delayed appearance of words was followed by a limited vocabulary, dyslexia, and dysgraphia throughout school life. In three others, although there was no delay in starting to talk, dyslexia was still present at 9 and 12 years of age. In the remaining five children, words and sentences appeared later than the normal time, but three of these had a generous vocabulary by the age of 6. Dysphasia is a common associate of dysarthria in evident cerebral palsy: if these cases of isolated dysarthria are, as we believe, due to a structural brain defect, the frequency of associated dysphasia is not surprising.

Prognosis.—The less severely affected child, particularly when endowed with high intelligence, can make good progress and achieve almost normal speech by the age of 7 or soon after. The commoner experience is for progress in developmental dysarthria, even with faithful treatment, to be slow, and for the defect to reappear whenever there is emotional stress or excitement. In some children traces of the defect will linger on into the late teens, and in one family not included in the present account four members are still unintelligible at the ages of 54, 61, 69, and 72 years.

Aetiology

There are many features which suggest that these cases are developmental in origin, and we are certain that they are structurally and not psychogenically determined. The family history of speech disorders, the frequency of abnormal movements of the lips, tongue, and palate, the close similarity of these isolated dysarthrias to the dysarthria of cerebral palsy, and the steady but slow improvement in response to time and training are factors which speak strongly in favour of an organic basis.

The natural history of this condition is that of a defect of maturation. The disability shows neither the intermittency and tendency to recurrence of the emotionally determined speech difficulty such as stammering nor the rapid response to treatment with which we are familiar in those cases of temporary consonant substitution to which we have limited our use of the term "dyslalia." In our view the lesion in developmental dysarthria is analogous to that of spastic diplegia in nature if not in situation. The site of the lesion is problematical. It is certainly suprabulbar, and would seem to depend on a focal cerebral dysgenesis essentially similar to but more limited in extent than that with which we are familiar in spastic diplegia. It is for these reasons that we have adopted the term "developmental dysarthria," first suggested to us by Dr. C. Worster Drought (personal communication, 1952), to describe these cases and as the title of the present paper.

Diagnosis

Developmental dysarthria must be separated on the one hand from the dysarthria of cerebral palsy, and on the other from severe dyslalia. Where the dysarthria is part of a persisting minimal spastic diplegia recognition requires nothing more than careful physical examination. The differentiation of developmental dysarthria from the group of articulatory defects for which we reserve the term "dyslalia" is, however, not always easy and may be impossible without testing the response to treatment; but in most instances the distinction can be made on the basis of a careful history and examination.

In developmental dysarthria speech is slow and clumsy and, in severe examples, punctuated by explosive words and phrases. The child is unable to imitate speech quickly and easily, and the chief defect of pronunciation is omission with or without substitution of consonants. Many such children show the characteristic appearances and defective movements of tongue and palate already described and identical with those seen in cerebral palsy. In some children, however, the movements are apparently normal except when the muscles are used in articulation. The specific clumsiness evident under such circumstances appears to depend on a disturbance of function, an articulatory dyspraxia, arising at a higher level of the nervous system than is involved in cases where neuromuscular function is visibly abnormal. In a considerable proportion of dysarthric children there is also a history of slow development of language and a poor vocabulary with persisting difficulty in reading.

In the child with severe dyslalia, on the other hand, language develops at the normal time and speech is fluent even if unintelligible. There is no abnormality in the movements of the lips, tongue, or palate, and the defect of pronunciation is largely one of multiple consonant substitutions. The most striking difference between the two conditions lies in the response to treatment. Whereas in dysarthria recovery is slow, in dyslalia normal speech should be reached within three to twelve months from the start of consistent treatment. That these two broad groups of articulatory defects exist is obvious in everyday experience, and, whereas developmental dysarthria is structurally determined, dyslalia would appear to be a functional disorder of speech which responds quickly to guidance and treatment.

Summary

Within the general context of dysarthria in childhood we wish to draw attention to a group of children in whom dysarthria is unassociated with any neuromuscular abnormality elsewhere. The clinical features suggest that this is a structurally determined condition, for which the term "developmental dysarthria" would be fitting.

We have seen a smaller number of children also covered by this term in whom we suspect that the defect is essentially an articulatory dyspraxia.

The condition may or may not be associated with delayed development of language and difficulty in reading.

The outlook varies with the severity of the defect and the intelligence of the child: response to consistent treatment is usually slow, and occasionally the difficulty persists into adult life.

We value the opportunity which our colleagues have given us to study these children, and would like to express our thanks to Sir James Spence for his encouragement and advice. We are also grateful to Mr. R. F. Garside, of the department of psychological medicine, who assessed the children's mental development.

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ESTIMATION OF INTRINSIC FACTOR OF CASTLE BY USE OF RADIOACTIVE VITAMIN B₁₂

BY

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Pernicious anaemia is attributed to the failure of absorption of vitamin B₁₂ in the absence of the secretion by the stomach of the substance known as intrinsic factor (Castle, 1951). The preparation of pure vitamin B₁₂ labelled with radioactive cobalt (Co⁶⁰) (Chaiet, Rosenblum, and Woodbury, 1950) presented a method of assessing the absorption of orally administered vitamin B₁₂ and thus of detecting intrinsic factor activity. Heine and his colleagues (1952) estimated the radioactivity appearing in the faeces after an oral dose of 0.5 µg. of radioactive vitamin B₁₂. They found that between 72 and 96% of the radioactivity in this test dose was recovered from the faeces of four patients with pernicious anaemia unless a source of intrinsic factor was given simultaneously, when the recovery was less than 30%. In two normal subjects on three occasions they recovered no radioactivity, but on one occasion in one subject, when he was convalescing from pneumonia, 42% was recovered. A. D. Welch (1952, personal communication) indicated the difficulties encountered in these early experiments owing to the low specific activity (60 µc./mg.) of the radioactive vitamin B₁₂ used.

Using radioactive vitamin B₁₂ of higher specific activity (245 µc./mg.), Meyer (1953) recovered from the faeces between 89 and 99% of a 1-µg. test dose in four patients with pernicious anaemia and between 15 and 59% in seven control subjects. Significant reduction in the recovery of radioactivity, however, did not occur consistently when a source of intrinsic factor was given with the radioactive vitamin B₁₂.

The preparation by Lester Smith (1952) of radioactive vitamin B₁₂ of high specific activity (420 µc./mg.) has enabled us to extend these experiments.

*In receipt of a British Council Scholarship.

Method

Vitamin B₁₂ labelled with radioactive cobalt (Co⁶⁰) was given to a group of control patients with normal haematological findings and to patients with pernicious anaemia, and the radioactivity appearing in the faeces was measured.

A standard dose of 0.5 µg. of radioactive vitamin B₁₂ containing approximately 0.2 µc. of radioactivity was given by mouth in about 100 ml. of water. No food was allowed after 10 p.m. on the previous evening and for two hours before the dose was given; apart from this the patient took a normal diet. The stools were passed direct into glass containers and were collected until at least one contained less than 1% of the radioactivity of the test dose. No aperients were allowed for 24 hours before or after the test dose. Repeated tests were made on most of the patients in order to diminish the possibility of error due to incomplete collection of the stools. If this was suspected the test was discounted.

Each stool specimen was transferred quantitatively to a domestic electric mixer with enough water to allow the faeces to be blended to a uniform homogeneous suspension, which was then transferred quantitatively to a beaker and weighed. After further mixing an aliquot was transferred to a stoppered glass bottle and set aside for estimation of the contained radioactivity.

The radioactivity of the specimens was estimated by means of a scintillation counter comprising a crystal of sodium iodide 2½ in. (6.3 cm.) in diameter and a photomultiplier and scaling unit supplied by A.E.R.E., Harwell. Each specimen was weighed out into a 30 by 50 mm. glass weighing bottle,

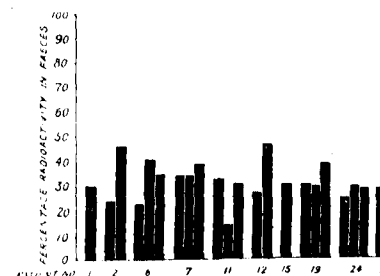


FIG. 1.—Recovery of radioactivity from faeces after an oral dose of 0.5 µg. of radioactive vitamin B₁₂ in 10 control patients.

TABLE I.—Radioactivity in Faeces After Oral Dose (0.5 µg.) of Radioactive Vitamin B₁₂ in 10 Control Subjects

Patient	Age	Sex	Diagnosis	Date	Total Radioactivity in Faeces as Percentage of Dose
1	46	F	Benign hypertension	4/11/52	30
2	64	M	Duodenal ulcer	18/11/52	24
				7/4/53	45
				13/4/53	60*
6	57	F	Fractured neck of femur	7/1/53	22
				16/1/53	40
				23/1/53	34
7	65	F	Fractured neck of femur	7/1/53	34
			Hypochromic anaemia	16/1/53	34
			Mild senile parkinsonism	23/1/53	38
11	78	F	Fractured neck of femur	6/2/53	32
			Mild cerebral arteriosclerosis	16/2/53	14
				27/2/53	30
12	82	F	Fractured neck of femur	6/2/53	26
			Osteoarthritis of hips	10/3/53	45
15	65	F	Peripheral neuritis	3/3/53	30
19	45	M	Duodenal ulcer	28/2/53	30
				9/3/53	29
				16/3/53	37
24	50	F	Benign hypertension	21/3/53	25
				31/3/53	29
				8/4/53	28
29	56	M	Gastric ulcer	14/4/53	28
				20/4/53	30

* See text.

which was stood on a thin brass tray over the crystal. The tray had raised edges, which ensured that each bottle was held in the same place.

Counting was carried out with a photomultiplier voltage of 2 kV and a discriminator bias of 12 volts. Under these conditions background counts of between 120 and 160 a minute were obtained, the efficiency of the counter for Co⁶⁰ being approximately 8%. It was found that the empty weighing-bottles gave counts of 10 to 30 a minute above background, and so each bottle was first counted empty to obtain the true background.

Then 50 g. of each of the faecal suspensions was weighed out in duplicate and the radioactivity counted. Since the specific gravity of the stools is approximately one, differences in volume were negligible. The counts obtained with the specimens were compared with that of 50 ml. of a standard solution containing one-tenth of a test dose. Each specimen was counted in duplicate for five minutes and an average taken of the two results. If, however, these differed by more than 2% (when expressed as a percentage of the total dose administered) further aliquots were counted.

Results

Normals

Radioactive vitamin B₁₂ was given to 10 patients who were in hospital for various complaints but who were considered to be haematologically normal, except for patient No. 7, who had a moderate hypochromic anaemia (haemoglobin 9.8 g.%) following the nailing of a fractured femoral neck and who was receiving ferrous sulphate. These patients were mostly in the same age group as our patients with pernicious anaemia. Their diagnoses and the results obtained with radioactive vitamin B₁₂ are shown in Table I and Fig. 1.

These results show that in the normal patient between 20 and 40% of the radioactivity in a test dose of 0.5 µg. of radioactive vitamin B₁₂ usually appears in the faeces. In the third test on patient No. 2 the recovery was 60%. He was at the time suffering from an upper respiratory infection. Recoveries of between 45 and 60% have also been

TABLE II.—Radioactivity in Faeces After Oral Dose (0.5 µg.) of Radioactive Vitamin B₁₂ in 13 Patients with Pernicious Anaemia

Patient	Age	Sex	Duration of Disease	Date	Total Radioactivity in Faeces as Percentage of Dose
4	62	F	2 years	29/11/52	90
				30/12/52	95
				12/1/53	91
	55	F	19 "	31/12/52	87
				13/1/53	86
				16/2/53	90
8	66	M	27 "	10/1/53	92
				21/1/53	91
				6/2/53	99
13	69	M	2½ "	7/2/53	92
				16/5/53	76
16	80	F	21 "	17/2/53	95
				9/3/53	91
20	67	F	3 months	6/3/53	84
				12/3/53	79
21	72	F	19 years	10/3/53	86
				1/4/53	98
22	76	M	17 "	17/3/53	85
				31/3/53	79
				7/4/53	81
23	61	M	2 "	20/3/53	81
				7/4/53	79
28	70	M	3 "	10/4/53	79
				4/5/53	99
				11/5/53	101
30	74	F	1 year	28/4/53	95
				27/5/53	91
31	73	F	12 years	8/5/53	90
32	60	M	19 "	26/4/53	90

obtained in four other patients during the course of infections. It seems that infections interfere with the test, and we have therefore excluded from the figures the results of the third test on No. 2.

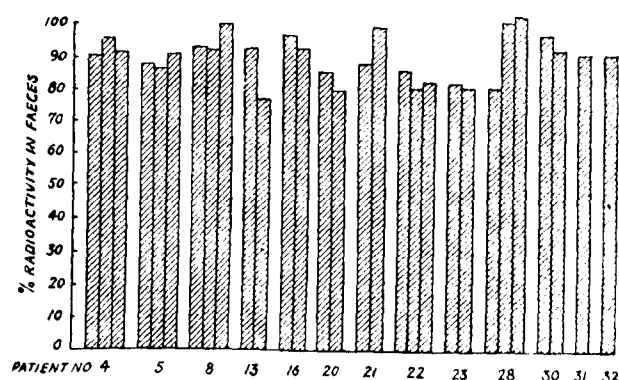


FIG. 2.—Recovery of radioactivity from faeces after an oral dose of 0.5 μ g. of radioactive vitamin B₁₂ in 13 patients with pernicious anaemia.

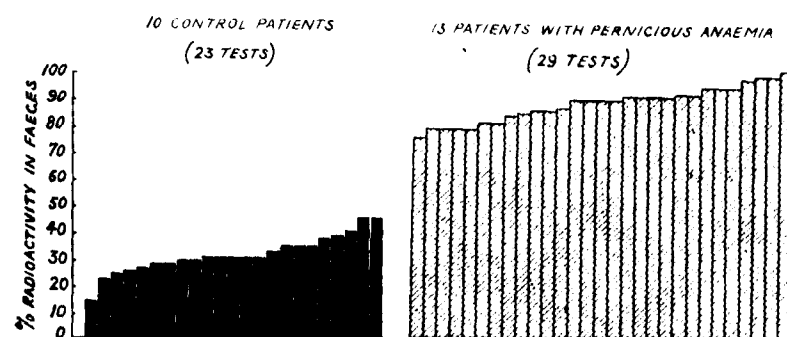


FIG. 3.—Comparison of recoveries of radioactivity from faeces after oral doses of 0.5 μ g. of radioactive vitamin B₁₂ in 10 control patients and 13 patients with pernicious anaemia.

TABLE III.—Effect on the Recovery of Radioactivity from the Faeces of Giving a Source of Intrinsic Factor with an Oral Dose of Radioactive Vitamin B₁₂ in Eight Patients with Pernicious Anaemia

Patient	Date	Material Given	Total Radioactivity in Faeces as Percentage of Dose of B ₁₂ Given
20	6/3/53	0.5 μ g. B ₁₂	84
	12/3/53	"	79
	18/3/53	" and 100 ml. human gastric juice (Pool A)	34
	24/3/53	" " " "	32
22	17/3/53	" " " (Pool B)	85
	24/3/53	" " " "	59
	31/3/53	" " " "	79
	7/4/53	" " " (Pool C)	81
23	14/4/53	" " " "	54
	20/3/53	" " " (Pool B)	81
	27/3/53	" " " "	57
	7/4/53	" " " (Pool C)	79
13	14/4/53	" " " "	52
	7/2/53	" and 100 ml. gastric mucosal extract (T2)	92
	14/2/53	" " " (T4)	53
	21/2/53	" " " "	43
21	16/5/53	" " " "	76
	10/3/53	" " " (T7)	86
	10/4/53	" " " "	44
	1/5/53	" " " "	98
30	28/4/53	" and 10 mg. "fraction B"	95
	18/5/53	" " " "	60
	27/5/53	" " " "	91
31	8/5/53	" " " "	90
	15/5/53	" " " "	49
32	26/4/53	" " " "	90
	27/5/53	" " " "	66

Pernicious Anaemia

Radioactive vitamin B₁₂ was given to 13 patients who had had classical pernicious anaemia for various periods. All except patients Nos. 4 and 20 were in good remission under treatment with vitamin B₁₂ ("cytamen"). Nos. 4 and 20 have both responded excellently to injections of vitamin B₁₂ started after their first test with radioactive vitamin B₁₂ had been completed.

The results obtained are shown in Table II and Fig. 2. In these patients between 76 and 101% of the radioactivity in the test dose was recovered from the faeces. Fig. 3 summarizes the results obtained in the normal patients and those with pernicious anaemia.

It might be argued that the apparent failure of absorption of the radioactive vitamin B₁₂ in these treated patients with pernicious anaemia was due to their tissues being saturated with vitamin B₁₂. The test was therefore repeated, giving a source of intrinsic factor together with the vitamin B₁₂. Patients Nos. 20, 22, and 23 received radioactive vitamin B₁₂ mixed with 100 ml. of pooled neutralized normal human gastric juice. Nos. 13 and 21 received as their source of intrinsic factor watery extracts of gastric mucosa. Nos. 30, 31, and 32 were given radioactive vitamin B₁₂ with 10 mg. of an ammonium-sulphate-precipitated fraction of hog stomach mucosa ("fraction B") prepared by the method of Prusoff *et al.* (1950).

The results of these experiments are shown in Table III and Fig. 4. It will be seen that the amount of radioactivity recovered from the faeces was diminished whenever a source of intrinsic factor was given, although it seems that the various preparations differed in potency.

Discussion

Our results confirm those of Heinle and his colleagues (1952) in that we find that there is a gross difference between the percentage of radioactivity of 0.5 μ g. of labelled

vitamin B₁₂ recovered from the faeces in normal subjects and in patients with pernicious anaemia. However, the addition of preparations containing intrinsic factor to the test dose reduced the faecal recovery of radioactivity considerably less than in their experiments. This difference is probably in part due to the greater accuracy resulting from the use of radioactive vitamin B₁₂ of higher specific activity, and in part to variations in potency of the sources of intrinsic factor.

It is interesting that even the normal subjects in our series did not absorb completely this small amount of vitamin B₁₂. It must be emphasized that it is the Co⁶⁰ which is being estimated, and that this is not necessarily still in a molecule

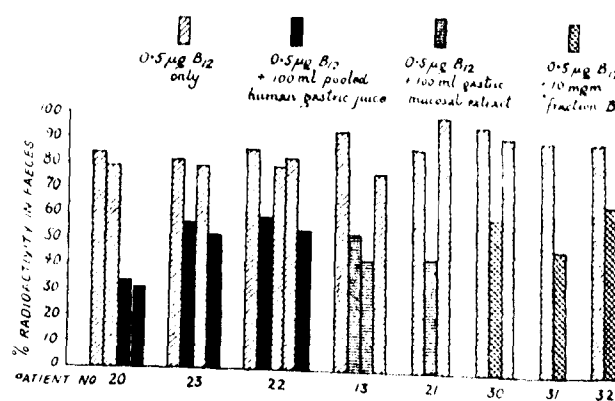


FIG. 4.—Effect on recovery of radioactivity from faeces of giving a source of intrinsic factor with an oral dose of 0.5 μ g. of radioactive vitamin B₁₂ in eight patients with pernicious anaemia.

of vitamin B₁₂. Moreover, if some vitamin B₁₂ is destroyed in the gastro-intestinal tract with the liberation of free ions of cobalt, it is possible that some of the latter might be absorbed as such.

Some of our patients with pernicious anaemia seem to have absorbed a fraction of the radioactive vitamin B₁₂, and this may indicate, as Goldhamer (1936) first suggested, that some patients with pernicious anaemia secrete traces of intrinsic factor. The significance of our figures depends chiefly on the accuracy of the stool collections. Experience in this department with radioactive iron (Fe⁵⁹), which was given by mouth and recovered from the red blood corpuscles and from the faeces, supports the view that incompleteness of stool collection is unlikely to account for all the radioactivity which was not recovered.

It appears that this technique offers a simple measure of intrinsic factor activity in the patient, and that it may also be used to assay preparations for their content of intrinsic factor. It has many advantages over the clinical assay, which requires patients with pernicious anaemia in relapse, but it has the disadvantage that it is an indirect test which depends on the absorptive power of the gastro-intestinal tract at the time at which the test dose is given. Preliminary evidence of the effect of infections suggests that the absorption of vitamin B₁₂ is easily interfered with in the normal subject. Further investigation of this point is in progress.

Summary

The absorption of vitamin B₁₂ has been assessed by measuring the radioactivity in the faeces after an oral dose of 0.5 μ g. of vitamin B₁₂ labelled with Co⁶⁰.

In 10 patients with normal haematological findings a mean of 31.0% (standard deviation, 6.9%) of the radioactivity in the test dose was recovered from the faeces. In 13 patients with pernicious anaemia a mean of 88.7% (standard deviation, 6.8%) was recovered.

Sources of intrinsic factor given with radioactive vitamin B₁₂ to patients with pernicious anaemia reduced greatly the percentage of the test dose recovered.

It is a pleasure to express our thanks to Professor L. J. Witts for allowing us to study patients under his care and for his constant help and encouragement; Dr. L. Z. Cosin for allowing us to study patients under his care in the Cowley Road Hospital; Dr. Lester Smith, of Glaxo, Ltd., for supplies of radioactive vitamin B₁₂; Dr. Arnold Welch for the "fraction B"; Dr. W. B. Taylor for the gastric mucosal extracts; Mr. Ray Oliver for advice and assistance in the radioactivity measurements; Dr. John Badenoch for help and advice; and Miss Barbara Hunt for technical assistance. This work was in part supported by a grant to Professor L. J. Witts from the Medical Research Council.

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The World Health Organization has recently issued the report of the discussion at the third European Seminar for Sanitary Engineers which was held in London from October 27 to November 1, 1952. The book is entitled *Design and Operation of Septic Tanks*, and among topics discussed are the treatment of small sewage plants, the design of small sewage works, and comparative studies of septic tanks. It is published in the Monograph Series (No. 18), price 7s. 6d., and is obtainable through H.M. Stationery Office, London, or direct from the Sales Section, Palais des Nations, Geneva.

RESEARCHES IN AETIOLOGY OF NON-SPECIFIC URETHRITIS*

BY

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General Observations

Non-specific urethritis (N.S.U.) is one of the most perplexing conditions encountered in the British venereal diseases clinic to-day. When complicated by Reiter's syndrome its disabling powers are considerable. In the clinics of England and Wales in 1951 there were 10,794 cases of non-specific urethritis, as compared with 14,975 male cases of gonorrhoea.

Although the condition is usually acquired venereally in the male, it is possible that the female may on occasion be infected non-venereally, which would explain the slight non-venereal bias. Thus in 100 cases of gonorrhoea the last sexual risk had been a casual exposure in 60%, whereas in 100 cases of non-specific urethritis the comparable figure was only 40%. Also, of 640 subjects of non-specific urethritis studied 35.3% were married, whereas of 603 male subjects of gonorrhoea only 25% were married. Persons suffering from non-specific urethritis were of slightly older age groups than those with gonorrhoea, and more likely to be in a "white collar" occupation—both observations perhaps being reflections of the marital status.

Some observers (for example, Coutts of Chile) have suggested that the practice of oral and/or anal coitus may frequently be responsible for the transmission of non-specific urethritis. This would not appear to be the case in Great Britain, for such practices were admitted by only 6% of 50 patients with non-specific urethritis so questioned, as against 9% of 100 other patients attending the venereal diseases clinic during the same period.

The incubation period of non-specific urethritis is often longer than that of gonorrhoea. Of two groups, each of 150 cases, 52% of patients with non-specific urethritis had incubation periods of over seven days, as compared with only 32% (in itself a high figure) in the case of patients with gonorrhoea.

Ignoring established rare causes, the following have variously been regarded as possibly responsible for the bulk of cases: (1) bacteria; (2) pleuropneumonia-like organisms; (3) trichomonads; (4) spirochaetes; and (5) a virus. This study was limited mainly to a consideration of bacterial and viral causes.

Bacterial Urethritis

It has for some time been fashionable to divide non-specific urethritis into bacterial and abacterial urethritis, depending on whether bacteria are seen in the urethral smears. Some 301 urethral cultures were made at King Edward VII Hospital, Windsor (pathologist, E. Sayle), on consecutive patients with non-specific urethritis, before and after treatment with the orally administered antibiotics, and on controls. As a result it is considered that "bacterial urethritis" is not a common entity and that the bacteria found are usually commensals (Table I).

*Being a summary of the report presented to the British Medical Association at the conclusion of the term of office as Insole Research Scholar.

TABLE I.—*Urethral Cultures*

Organisms	Controls (105 Cultures)		Non-specific Urethritis Cases			
			Before Treatment (81 Cultures)		After Treatment (69 Cultures)	
	No.	%	No.	%	No.	%
<i>S. albus</i> ..	72	68.6	66	81.4	55	79.7
<i>Bact. coli</i> ..	22	21.0	16	19.7	9	13.0
Diphtheroids ..	19	18.1	26	32.1	27	39.1
Saprophytes ..	8	7.6	4	4.9	9	13.0
<i>S. aureus</i> ..	4	3.8	1	1.2	—	—
Monilia ..	3	2.8	1	1.2	1	1.4
<i>B. proteus</i> ..	—	—	—	—	1	1.4
Enterococci ..	—	—	2	2.5	—	—
Streptococci ..	—	—	1	1.2	2	2.9
Sterile ..	2	1.9	1	1.2	3	4.3

Viral Urethritis

Attempts were made, by different means, to ascertain whether there was any cross-reaction in the skin or blood of patients with non-specific urethritis to antigens of various viruses of the psittacosis/lymphogranuloma venereum/trachoma group. A study was also made of Giemsa-stained urethral scrapings, and animal and egg studies were undertaken.

Skin Tests

In all, some 234 tests were performed—175 for lymphogranuloma venereum, 28 for psittacosis, and 31 for cat-scratch fever. Omitting the later tests, the results of the first tests are shown in Table II.

TABLE II.—*Skin Tests*

	Tested	Negative	Doubtful	Positive	% Positive
Lymphogranuloma venereum (1):					
N.S.U. cases ..	84	63	10	11	13.1
Controls ..	62	53	6	3	4.8
Psittacosis (2):					
N.S.U. cases ..	17	15	2	—	—
Controls ..	11	11	—	—	—
Cat-scratch fever (3):					
N.S.U. cases ..	16	12	2	2	12.5
Controls ..	12	12	—	—	—

Antigens kindly supplied by: (1) E. R. Squibb and Sons, International Corporation, New York ("lygranum") and Virus Reference Laboratory, Colindale; (2) Virus Reference Laboratory, Colindale (courtesy of Dr. A. D. Macrae); and (3) Professor P. Mollaret, Hôpital St. Bernard, Paris, and Virus Reference Laboratory, Colindale (courtesy of Dr. H. J. Bensted).

Thus the skin tests for psittacosis gave negative results. In the series tested, however, some positive readings were obtained with cat-scratch antigen in patients with non-specific urethritis, but not in controls. Also a somewhat higher incidence of positive readings to the skin test for lymphogranuloma venereum was noted in patients with non-specific urethritis than in controls. This aspect of the problem, therefore, would merit further attention.

Serum Tests

A total of 412 complement-fixation tests for lymphogranuloma venereum (L.G.V.), on sera from 275 persons, were made by Dr. A. D. Macrae, of the Virus Reference Laboratory, Colindale. A further 323 complement-fixation tests for enzootic abortion in ewes (E.A.E.), on sera from 250 persons, were performed by Dr. J. T. Stamp, of the Edinburgh and East Scotland College of Agriculture, Edinburgh. The latter veterinary disease is considered to be caused by a virus of the lymphogranuloma venereum/psittacosis/trachoma group.

The results of these tests are being recorded fully elsewhere, but are summarized in Table III.

In view of these findings and the results of serial tests performed on some cases, it was not thought that there was any relationship between the results of either test with non-

TABLE III.—*Serum Tests (First Tests Only)*

	Tested	Negative	Doubtful	Positive	% Positive
Lymphogranuloma venereum:					
N.S.U. cases ..	141	122	13	6	4.3
Controls ..	132	120	9	3	2.3
Enzootic abortion in ewes:					
N.S.U. cases ..	123	113	6	4	3.2
Controls ..	127	118	4	5	3.9

TABLE IV.—*Comparison of L.G.V. and E.A.E. Tests*

Titres	1/10 or Below	1/20	1/4 or Over	Total L.A.E. Tests
1/4 or below ..	218	15	—	233
1/8 ..	1	10	8	19
1/16 or over ..	1	3	7	11
Total L.G.V. tests	220	28	15	263

specific urethritis sera. There was, however, close agreement between the results of the two tests on 263 parallel specimens of sera (Table IV).

Giemsa-stained Urethral Scrapings

As the so-called virus of non-specific urethritis has not yet been successfully passaged in animals or eggs, the evidence for or against its existence has had to depend upon the presence or absence of inclusion bodies in Giemsa-stained urethral scrapings.

Some 1,463 Giemsa-stained urethral scrapings, taken from patients with non-specific urethritis, their female consorts, or from controls, were examined at the laboratories of the School of Pharmacy, London, under the supervision of Dr. G. M. Findlay until his death in March, 1952, his technician being Miss E. M. Howard. Through the courtesy of Professor G. A. H. Buttle, Miss Howard's services were made available after that date so that the work could be completed.

In order to determine the significance, or otherwise, of the various bodies seen, in due course the findings were classified as blue or red "colonies" (being granular bodies varying from 1.6 μ in diameter) and blue or red granules. The incidence of these various bodies in urethral scrapings was compared in male patients with non-specific urethritis before treatment, after successful treatment with one of the orally administered antibiotics, and after unsuccessful treatment (Table V).

TABLE V.—*Incidence of Various Bodies in Giemsa-stained Urethral Scrapings from Male Patients with Non-specific Urethritis*

	Before Treatment (206 Cases)		After Successful Treatment (182 Scrapings)		After Unsuccessful Treatment (103 Scrapings)	
	No.	%	No.	%	No.	%
Blue colonies ..	71	34.5	18	9.9	23	22.3
Red ..	17	8.3	15	8.2	6	5.8
Blue granules ..	36	17.5	15	8.2	17	16.5
Red ..	38	18.4	42	23.1	24	23.3
Nil ..	78	37.9	115	63.2	50	48.5

The fact that the incidence of red colonies and red granules was unaffected by treatment, successful or unsuccessful, appeared at once to exclude these as possessing no significance. On the other hand, the incidence of both the blue colonies and blue granules fell markedly after successful treatment with the orally administered antibiotics, but remained high when the treatment was unsuccessful. Moreover, at the time of actual re-treatment given to 42 cases the incidence of blue colonies was 30.9% and of blue granules 23.8%.

Summary and Conclusions

When compared with gonorrhoea, non-specific urethritis was apparently more frequently contracted from regular consorts, indicating a possible non-venereal bias in its aetiology.

In the urethritis group more patients were married, they tended to be older in age, and they were more likely to have achieved "white-collar" status than those of the gonorrhoea group.

There was no evidence to suggest that the practice of buccal or anal coitus was commonly responsible for the transmission of non-specific urethritis.

The disease tended to have a longer incubation period than gonorrhoea.

A study of 301 urethral cultures taken from patients with non-specific urethritis before and after treatment, and from controls, suggested that the so-called "bacterial urethritis" was uncommon.

The results of 412 complement-fixation tests for lymphogranuloma venereum and 323 complement-fixation tests for enzootic abortion in ewes showed nothing distinctive between sera from patients with non-specific urethritis and from controls.

A study of 234 skin tests for lymphogranuloma venereum, psittacosis, and cat-scratch fever, on the other hand, showed more positive readings in non-specific urethritis cases than in controls, and this aspect of the problem therefore merits further attention.

From the examination of 1,463 Giemsa-stained urethral scrapings it was considered that the bodies seen were products of inflammation and unconnected with the virus of non-specific urethritis. Thus, if inclusion bodies sometimes seen in these scrapings are responsible for the isolated case, the causative organism cannot be seen in the majority.

Attempts to passage the virus into the lungs of mice (1,735 mice being used in these experiments), mouse-brains, guinea-pigs, and into the conjunctiva, knee-joint, and urethra of baboons were also unsuccessful.

The "virus" of non-specific urethritis has not been isolated, and remains to be discovered.

A group of 80 controls was also studied. These consisted of 12 specimens of non-urethral pus, urethral scrapings from 18 normal males, from 13 patients attending the clinic on account of fear of venereal disease, from 17 patients with syphilis, and from 20 patients with non-syphilitic genital lesions (for example, warts, genital herpes, etc.). In only two (2.5%) were blue colonies, and in only one (1.25%) were blue granules discovered. Up to this point, therefore, the material showed promise so far as correlation between the blue colonies and blue granules and the activity of non-specific urethritis was concerned.

However, it was appreciated that the control scrapings so far studied were in the main taken from dry urethrae, whereas those from non-specific urethritis cases were from wet urethrae. A further control series, this time of 108 cases of gonorrhoea treated at varying periods of time previously with penicillin, was therefore taken. In these, 15 (13.9%) showed blue granules and, as this incidence was almost as high as in the untreated non-specific urethritis cases, these, too, had to be discounted. The incidence of blue colonies, however, was 14.8%, still very substantially below the 34.5% found in the patients with untreated non-specific urethritis.

But when the gonorrhoea cases were arranged according to the length of time which had elapsed from the giving of the penicillin until the taking of the scraping it was noted that at one to three days after injection the incidence of blue colonies was 21.7%. This figure was not far removed from the 27.6% incidence of these bodies two to seven days after the beginning of the treatment of non-specific urethritis with one of the orally administered antibiotics (Table VI).

TABLE VI.—*Incidence of Blue Colonies in Gonorrhoea Cases*

Time Since Treatment	Cases	Blue Colonies	%
Untreated ..	23	2	8.7
1-3 days ..	46	10	21.7
4-7 ..	24	4	16.6
Over 7 days ..	15	—	—
Total ..	108	16	14.8

It would seem that the blue colonies were but products of inflammation, since in both gonorrhoea and non-specific urethritis their incidence decreased as the urethra became drier. That they were seen relatively seldom in the discharges of untreated gonorrhoea was probably connected with the essentially high leucocytic and low epithelial count of the specimens at this stage. It was therefore regretfully concluded that none of the bodies studied in this investigation were involved in the causation of non-specific urethritis.

[A consideration of smears from female cases is omitted from this summary and will appear in the paper being prepared with Miss E. M. Howard.]

Animal Experiments

Attempts to transmit the virus of non-specific urethritis into baboons, guinea-pigs, mice, and eggs were made in the laboratories of the School of Pharmacy.

A sustained attempt to passage the virus into the lungs of mice was a failure. The haemorrhagic lesions which were seen in a number of the 1,735 mice used in these experiments proved not to be related to the disease. Limited attempts at intracerebral inoculation into mice, subcutaneous inoculation into guinea-pigs, and conjunctival instillation, urethral inoculations, and inoculation into the knee-joints of baboons, likewise failed to give any clear-cut evidence of transmission. Attempts to transmit the virus in the chorio-allantoic membranes of eggs also failed: these latter experiments, which involved about 100 eggs, were confused by the presence of other bodies which bore a resemblance to those seen in the urethral scrapings of patients suffering from non-specific urethritis.

The World Health Organization has recently published in pamphlet form a survey of modern legislation relating to nursing. The aim of the survey, it is stated, was to examine the extent to which legislation has established a system of control over the organization and practice of nursing and to indicate the new problems caused by the introduction of the auxiliary and specialized nurse. The survey reviews the laws of 22 countries. It notes the dichotomy of nursing laws: on the one hand, permissive laws which do not restrict the practice of nursing, but which give official recognition in the form of legislation to trained nurses, and thereby differentiate the qualified from the unqualified; and, on the other hand, mandatory laws which safeguard the health of the community by prohibiting the unqualified from practising, and which consequently need to define nursing. There is a general lack of precision in the definition of nursing functions, and the survey remarks that nursing, unlike midwifery and dentistry, defies precise legal definition, and consequently the professional nurse is not always provided with sufficient protection in the exercise of her calling. In recent years the shortage of nurses has become acute all over the world, and is mirrored to-day in the increasing number of laws being enacted in relation to auxiliary nursing staff and male nurses.

A SURVEY OF PATIENTS IN TWELVE MENTAL DEFICIENCY INSTITUTIONS

BY

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During the months of November and December, 1951, and January and February, 1952, we carried out a survey of a 5% sample of patients in mental deficiency institutions in the counties of London, Kent, and Surrey. The survey was concerned primarily with factual information relevant to the patients' occupational potentialities and behaviour, but, in addition, opinions on conduct were obtained. Some of the questions relating to conduct were included at the suggestion of Dr. R. F. Tredgold, regional psychiatrist to the South-East Metropolitan Region, to whom a preliminary draft of the proposed investigation was shown. A clinical classification of the patients, following A. F. Tredgold's (1947) system, which was obtained from medical officers at the time of the investigation will be discussed elsewhere.

A list of questions asked is given in summary form in the Appendix. By no means all the information obtained has been summarized in this paper, and anyone interested in other aspects of the survey is invited to get in touch with us.

Population and Sample

The population from which the 5% sample was drawn consisted of patients in all hospitals in the counties of Kent, London, and Surrey which had been classified by the Board of Control (1946) as certified institutions or institutions approved under Section 37 of the Mental Deficiency Acts. Approximately 100 patients housed in five approved homes in Surrey and Kent were excluded from the survey. The survey covered all other institutions in the selected area.

The size of the sample by hospitals is given in Table I. The population from which the sample was drawn consisted of approximately 11,850 patients, nearly one-quarter of the total number of institutional defectives in England and Wales. It should be noted that only patients certified under the Mental Deficiency Laws were included. In the case of Leavesden Hospital, for example, approximately one-third of the patients were either senile or for other reasons not certified under the Mental Deficiency Acts.

TABLE I.—Hospitals and Institutions Visited, with Size of Sample, by Sex

Hospital	Male	Female	Total
Botleys Park	43	37	80
Darenth Park	61	40	101
Farmfield	12	—	12
Fountain Hospital	15	17	32
Leavesden Hospital	33	40	73
Leybourne Grange Colony	28	35	63
Leytonstone House Hospital	1	17	18
Major Hospital	36	39	75
Princes Christian's Farm Colony	4	6	10
Royal Earlswood Institution	19	11	30
St. Lawrence's Hospital	49	42	91
St. Teresa's Home	—	7	7
Total	301	291	592

Method

The physician or lay superintendent of each hospital was written to for permission to undertake the survey. They

were told the purpose of the investigation and a copy of the questions to be asked was sent to them. Permission was obtained in all cases—indeed, the assistance given us at all hospitals was most generous. In each hospital the sample was selected by drawing every twentieth name from a nominal role of patients on the books, listed alphabetically, the first name to be selected being determined by lot from the first twenty names in the book. Case records and orders were examined. Additional information was obtained by questioning senior members of the nursing staff. The clinical classification was obtained subsequently from the medical staff. Patients between 16 and 29 years of age who were classified as feeble-minded and were not on licence or on leave were tested by the investigators on the progressive matrices test, in groups, but without a time limit. Between one and three days were spent at each hospital. The coded information was punched on Hollerith cards and machine-sorted.

Distribution of Patients by Sex, Age, and Grade

The distribution of patients by age, sex, and grade is given in Table II—43 (8%) were admitted under Sections 8 or 9 of the Mental Deficiency Acts, and 435 under Section 6, or other section. The data in Table II have been arranged so that the number of adults and children appear separately.

Children formed 12.33% of the patients, the majority of them being of low grade. (The Report of the Ministry of Health for the year 1949 gives the proportion of children in institutions in England and Wales as 12%, which agrees with the figure obtained in the survey.) There were 43% more males than females among the children. In Table III

TABLE II.—Distribution of Patients by Sex, Age, and Grade

Age	Male				Female				Totals			
	0	1	2	T	0	1	2	T	0	1	2	T
0-4	2	4	0	6	1	4	0	5	3	8	0	11
5-9	5	12	3	20	5	6	2	13	10	18	5	33
10-14	4	6	3	13	2	5	2	9	6	11	5	22
15	0	3	1	4	1	2	0	3	1	5	1	7
Total (children)	11	25	7	43	9	17	4	30	20	42	11	73
16-19	1	12	17	30	1	9	13	23	2	21	30	53
20-29	3	33	42	78	4	27	30	61	7	60	72	139
30-39	2	24	37	63	2	17	39	58	4	41	76	121
40-49	1	15	38	54	0	26	41	67	1	41	79	121
50+	0	13	20	33	1	29	22	52	1	42	42	85
Total (adults)	7	97	154	258	8	108	145	261	15	205	299	519
Total	18	122	161	301	17	125	149	291	35	247	310	592

0—Idiot. 1—Imbecile. 2—Feeble-minded person. T—Total. Age is given as from last birthday. The number of patients aged 15 years is given separately in order that the number of children (aged 0-15) and of adults (age 16+) can be calculated.

TABLE III.—Percentage of All Adult Patients (519) by Age and Grade

Age	Grade			Total
	0	1	2	
16-29	2	15	20	37
30-39	1	8	15	24
40-49	—	8	15	23
50+	—	8	8	16
Total	3	39	58	100

is given the percentage of adult patients by grade and age. The most recent report by the hospital authorities to the Board of Control was consulted in order to determine the grade of each patient.

Of the adults, 58% were classified as feeble-minded. Most of these were under 50 years of age.

Distribution of Patients by Type of Nursing Needed and Behaviour

There were 26 male patients and 28 female patients on resident licence from the institutions (8.6% of male patients and 9.6% of females). In addition 21 patients (16 males and 5 females) were on daily licence. The distribution of patients by sex, grade, and type of nursing needed is shown in Table IV.

TABLE IV.—Number of Patients by Grade and Type of Nursing Needed (on Day of Survey)

	Grade			Total
	0	1	2	
Chronic sick	1	9	11	21
Temporarily in hospital	0	3	4	7
Cot and chair cases	12	10	3	25
Low-grade ambulant	13	74	14	101
Open wards	0	75	154	229
Locked wards ("special supervision")	8	72	62	142
Hostel	0	0	6	6
On leave	0	0	1	1
Abandoned	0	0	6	6
Resident licence	1	4	49	54
Total	35	247	310	592

Supplementary questions added something to the picture so far as behaviour was concerned. Thus only one male and one female patient had attempted suicide during the previous year; 12 (2%) had been charged with stealing; 55 (9%) had had one or more clashes with staff or patients serious enough to be recorded in case notes; 18 (3%) had absconded. Ten (3.8%) of the female patients had been pregnant or had had V.D. at some time in their lives, and 16 (5.8%) of the male patients had histories of homosexuality, indecent assault, or indecent exposure. Some of the incidents listed as indecent assault in case papers or orders were of a trivial character and had occurred many years previously. Seventy-seven patients (13%) were doubly incontinent, and 27 (5%) enuretic; 68 patients (11.5%) suffered from epilepsy, 17 being severe cases (suffering grand mal attacks once a fortnight or more), 14 moderate, and 37 mild. Numerous other patients were recorded on case sheets as being epileptic, but had had no attacks during the last year or, in some cases, at any time during their stay in hospital.

There were marked differences in the proportion of patients in different hospitals who were in locked wards. No doubt the type of patient was in part responsible for this, but hospital policies appeared also to differ. Of the 538 resident patients, 75 (13%) left the hospital grounds once or more on day parole during the month preceding the date of the survey (29 females, 46 males). During the previous year 76 male patients and 47 female patients (25% and 16% respectively) went on leave. Over two-thirds of these patients were on leave for less than three weeks.

Rewards to Patients

The "wages," or rewards, given to patients varied somewhat from hospital to hospital. For low-grade patients rewards consisted of sweets or cigarettes. High-grade patients

TABLE V.—Cash Value of Rewards of Pocket Money Paid During Week of Survey to Patients Resident in Hospital

Value in Shillings	No. of Patients	Per Cent. of Total
1 or less	225	42
2	77	14
3	91	17
4	54	10
5	34	6
6-10	34	6
11-15	5	1
16+	10	2
Not ascertained	8	2
Total	538*	100

Total amount disbursed to 530 patients, £70 18s. 6d. * Total excludes 54 patients on resident licence.

usually had rewards paid partly in kind, partly in cash. The figures given in Table V refer to the cash value of the rewards, whether or not the patients received money, tokens to be exchanged at the canteen, or actual goods.

For patients not on either daily or resident licence the rewards represented total earnings. Those on licence, however, earned wages which were often in excess of the amount of pocket money allowed them. (Additional amounts, when deductions have been made for board and lodgings, are credited to patients' accounts.) Hospital policies differed in the extent to which they allowed patients on licence control over their own affairs, and wages earned by patients on licence, as well as the amount of money or goods they were given to spend or use during the week of the survey, also varied greatly. Those employed in factories and as labourers earned higher wages than those engaged in domestic service. Table VI gives the length of time patients had been on licence.

TABLE VI.—Duration of Licence of 54 Patients out of Hospital at Time of Survey

Period on Licence	Daily Licence			Resident Licence		
	Male	Female	Total	Male	Female	Total
Less than 3 months	1	0	1	5	2	7
3-6 months	1	0	1	4	5	9
6-12 months	0	0	0	4	5	9
1-2 years	4	0	4	6	8	14
2-5 years	6	0	6	5	5	10
More than 5 years	1	1	2	2	3	5
No information	3	4	7	0	0	0
Total	16	5	21	26	28	54

Occupations of Patients

The numbers of patients employed on different types of jobs both inside and outside the hospitals are given in Table VII. About 40% of those on licence were employed in domestic service of one sort or another. Only one hospital

TABLE VII.—Occupation of Patients During Week of Survey

Type of Occupation	Patients Working in Hospital				On Licence		
	Grade			Total	Daily	Resident	Total
	0	1	2				
Farm or garden	0	9	19	28	6	2	8
Domestic service in hospital	0	8	27	35	0	6	6
Other domestic work (private, hotel, or kitchen)	0	0	3	3	5	22	27
Labouring	0	6	4	10	5	4	9
Factory or laundry	0	8	11	19	2	6	8
Messenger or van boy, shop assistant	0	0	7	7	3	2	5
School or occupation centre	4	19	10	33	0	1	1
Occupational therapy	0	19	20	39	0	0	0
Ward work	0	57	54	111	0	0	0
Hospital workshop	0	16	51	67	0	0	0
No information	0	0	9	9	0	6	6
Unemployable	30	101	25	156	0	5	5
Total	34	243	240	517	21	54	75

made a practice of sending defectives to factory work. Surprisingly few patients were employed on farms or gardens—possibly the sample of defectives on licence was too small to enable us to generalize about the kind of jobs done by patients on licence.

Intelligence of Patients Classified as Feeble-minded

As mentioned above, patients between 16 and 30 years of age who were resident in hospital and available at the time of the inquiry, and who were classified as feeble-minded, were given the group matrices test, using an untimed procedure. The distribution of raw scores is given in Table VIII. The numbers are small—25 males and 24

TABLE VIII.—Distribution of Matrices Raw Scores* for Sample of 49 Patients Tested

Raw Score*	Males	Females
0-9	2	1
10-19	9	11
20-29	5	6
30-39	8	4
40+	1	2
Total	25	24
X	23.9	21.4
S	10.4	10.0

* For subjects between 20 and 30 years of age a raw score of 23 points is approximately equal to an I.Q. of 74 on a test whose mean is 100; S.D. = 16 points. For an unselected adult population 20-30 years of age the mean raw score on this test = 44 points; S.D. = 10 points.

females—and little reliance could be placed on the findings in the absence of other data. However, the results for male patients agree very closely with those obtained from testing 360 patients at Darenth Park, Harpersbury, and the Manor Hospitals (Tizard and O'Connor, 1952). There is thus a considerable amount of evidence to support the conclusion, at least so far as male patients are concerned, that the mean I.Q. on this test of young adult patients classified as feeble-minded is about 74 or 75 points. The mean for females may be somewhat lower. As has been shown elsewhere (Tizard, 1950) norms for the progressive matrices test agree closely with those obtained from other tests more commonly used with defectives. Hence, if these findings are valid over the country as a whole, more than half of the adults classified as feeble-minded in mental deficiency institutions have I.Q.s of over 70 points.

Summary

A survey, based on case records, was made of a 5% sample of nearly 12,000 patients in twelve mental deficiency hospitals in the Home Counties, representing nearly one-quarter of the total number of mental defectives in institutions in England and Wales.

Over half the patients were found to have been classified as feeble-minded. Less than 5% were idiots and just over 40% imbeciles.

Intelligence quotients, measured by the progressive matrices test, in those feeble-minded patients between 16 and 29 years of age who were available, indicated, in conformity with a previous finding, that the average intelligence quotient of young adult feeble-minded defectives in hospitals near London is above 70.

Half the patients did not need special nursing or supervision; a further 24%, while needing no special nursing, were thought to be in need of close supervision.

One patient in eight was on daily licence or resident licence. Only one hospital sent patients out to factory work. Rewards to patients averaged between 2s. and 3s. for the week of the survey, 56% of the sample receiving less than 2s. and 13% more than 5s.

General behaviour of the resident patients was apparently good. Sexual perversion, pregnancy, or venereal disease was recorded in approximately 5%. Three per cent. of the patients in the sample had absconded at least once during the preceding twelve months.

Our thanks are due to the hospital authorities of the 12 hospitals and institutions visited for their kindness in allowing us to carry out the survey, and for their great assistance to us, usually at considerable inconvenience to themselves. Dr. J. M. Crawford, Dr. L. T. Hilliard, Dr. J. K. Collier Laing, Dr. Vera Norris, and Dr. R. F. Tredgold gave advice on questions to be included and treatment of results. We are indebted to Mr. J. G. F. Singleton for carrying out the Hollerith work.

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APPENDIX

Survey of Patients in Institutions in London, Kent, and Surrey. Information Obtained

- Hospital.
- Sex of patients.
- Number.
- Date of order.
- Years in present hospital.
- Section of the Act under which certified.
- Age in years last birthday.
- Grade (taken from last report to Board of Control).
- Last I.Q. on case paper.
- Test used to obtain last I.Q.
- Type of nursing needed as in Table IV of text.
- Occupation.
- Pocket money during previous week.
- Paroles during previous month.
- Number of visits per year.
- Whether or not relatives were living.
- Days' leave during past year.
- Number of times absconded during past year.
- Attempts at suicide during past year.
- Times caught stealing during past year.
- Clashes with patients or staff during past year.
- Homosexual behaviour—any history of.
- Indecent assault—any history of.
- V.D. or pregnancy—any history of.
- Behaviour with patients—rating.
- Behaviour with staff—rating.
- Epilepsy recorded as in text.
- Incontinence.
- Whether or not on daily licence at any time.
- Type of work done.
- Reason for failure in past, if any.
- Resident licence.
- To whom licensed.
- Type of work.
- Failure?
- Duration of licence.
- Wages on licence.
- Matrices raw score.
- Clinical classification.

Professor D. R. MacCalman, Nuffield Professor of Psychiatry at Leeds, was the chairman of a World Health Organization expert committee which has recently considered the mental health aspects of adoption. In its report (*Technical Report Series No. 70, 1953*) the committee stresses that the well-being of the child is the real aim of adoption. The family composed of father, mother, and children constitutes the normal and enduring background for a child's education, and the object of adoption is to create a relationship between adopted child and adopting parents which will resemble this as closely as possible. The child must feel certain that those around him are well disposed towards him so that without too much anxiety or sense of guilt he may be able to give expression to the complicated and often hostile feelings aroused in him by the frustrating realities of ordinary life. In former times, according to the report, the adopting family was judged merely from a standpoint of material welfare, but now there is a tendency to pay far more attention to the capacity of the adoptive family and parents to meet the child's other needs. Parents who think they could find satisfaction only in a very gifted child should be dissuaded from adopting young infants; adoptive parents must be ready to run the same risks as other parents. Other advice included in the report is that the child should be adopted at a very early age; the earlier the child knows about his adoption the better; and it is wrong to adopt a child in order to patch up an unsatisfactory marriage.

URINARY EXCRETION OF ACID PHOSPHATASE

BY

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Marked elevation of serum acid phosphatase due to carcinoma of the prostate is often associated with evidence of impaired renal function, thus suggesting the possibility that the kidneys may excrete this substance, and that serum levels represent the balance between the rate of production and that of excretion of acid phosphatase (Daniel, 1952). It has long been known that urine is rich in acid phosphatase (Demuth, 1925), and Scott and Huggins (1942) have shown that, although most of this is added direct in the form of prostatic secretion, part is excreted by the kidneys.

The investigation reported here was undertaken with the object of discovering whether carcinoma of the prostate produced a change in the rate of urinary excretion of the prostatic (formol-stable) acid phosphatase, but the results show that there is no such change even when the serum formol-stable acid phosphatase is raised

and the kidney function normal. A series of estimations was also carried out on female patients with carcinoma of the breast.

Materials and Methods

All estimations carried out were of the prostatic formol-stable acid phosphatase (Abul-Fadi and King, 1948), but for convenience' sake they will be referred to as "acid phosphatase" throughout this paper.

The total daily excretion of urinary acid phosphatase was estimated on one or more occasions on four healthy young adult males, ten patients with benign prostatic hypertrophy, seven patients with carcinoma of the prostate, nine healthy women, and 13 women with carcinoma of the breast, of whom five had bone metastases.

Males who could micturate normally were instructed to void in three parts, and the volume and acid phosphatase content of each specimen were measured separately after each micturition performed during the 24-hour test period. It was assumed that the acid phosphatase in the mid-stream specimen had been excreted by the kidneys, and that the larger amounts found in the first and last parts were derived partly from kidney excretion and partly from prostatic secretion. Patients with catheter bladder drainage passed their urine into bedside bottles, and the volume and acid phosphatase content of this were measured for 24-hour periods. It was assumed that there was no regurgitation of prostatic secretion into the bladder and that all the urinary acid phosphatase was excreted by the

TABLE I.—Daily Excretion of Urinary Acid Phosphatase

Name	Age	Method of Collection of Urine	Total Excretion of Urinary Acid Phosphatase (Units/24 hrs.)	Renal Excretion of Acid Phosphatase (Units/24 hrs.)	Prostatic Excretion of Acid Phosphatase (Units/24 hrs.)	Serum Acid Phosphatase (Units/100 ml.)	Renal Clearance of Acid Phosphatase (Ml. Plasma Cleared/Min.)	Renal Function	Clinical Features
A. Apparently Healthy Men (4)									
D. A. L. . .	35	In 3 parts	{ 1,876 1,534 1,583	1,567 1,220 953	309 304 630	1.2 1.1 1.0	58 48 41	Normal	
W. I. S. . .	30	" " "	—	503	—	0.8	41	"	
J. A. D. . .	24	" " "	—	1,605	—	1.0	108	"	
F. R. A. . .	34	" " "	864	598	266	2.1	12.2	"	
Average:	31		1,462	1,074	377	1.2	53		
B. Patients with Benign Prostatic Hypertrophy (10)									
R. I. C. . .	72	Suprapubic catheter	—	66	—	2.0	2.3	Normal	Small fibrous prostate
M. A. R. . .	65	"	—	251	—	1.5	7.0	"	"
T. I. S. . .	82	"	—	198	—	2.6	9.1	"	"
D. E. N. . .	68	"	—	84	—	1.6	3.6	"	"
D. A. C. . .	70	"	—	254	—	1.5	7.0	"	"
S. W. A. . .	65	"	—	378	—	0.9	28.0	"	"
M. A. D. . .	74	"	—	272	—	1.1	—	"	"
V. E. N. . .	77	"	—	400	—	1.2	—	"	"
P. O. L. . .	70	In 3 parts	234	212	22	2.0	—	"	"
P. V. C. . .	72	" " "	290	222	68	0.4	8.4	"	"
Average:	71		262	234	45	1.5	9.3	"	
C. Patients with Carcinoma of Prostate (7)									
T. E. R. . .	72	Suprapubic catheter	{ — — —	96 80 39	— — —	6.5 10.8 14.6	0.2 0.4 0.2	Normal	Histological diagnosis
H. O. B. . .	90	"	{ — — —	290 360 41	— — —	144 144 40	0.14 0.17 —	"	Before stilboestrol therapy
R. E. D. . .	56	"	{ — — —	254 87 72	— — —	2.5 10.7 73.0	7.0 — —	Poor	After stilboestrol therapy Blood urea 60
V. E. S. . .	76	"	—	72	—	10.7	—	Very poor	" " 100
I. O. O. . .	73	In 3 parts	82	49	33	1.2	0.06	Poor	" " 80
L. O. T. . .	62	"	158	158	—	2.5	2.9	Normal	Clinical diagnosis
B. U. M. . .	80	Suprapubic catheter	—	12	—	2.1	0.39	Very poor	Total prostatectomy for carcinoma On stilboestrol therapy Blood urea 40
Average:				128		37.5	1.3		

kidneys. The healthy women were instructed to measure the volume of urine passed at each micturition during the test period, and to save a part of each specimen for acid phosphatase estimation. In the case of the other women, complete 24-hour collections of urine were estimated.

Estimation of Urinary Acid Phosphatase

Twenty ml. of each sample of urine was dialysed overnight in parchment shells against cold running tap-water, the volume measured after dialysis, and any change accounted for in the final calculation. The dialysed urine was diluted, usually four times, and the enzyme content estimated by a slightly modified King-Armstrong method. 0.5 ml. of urine was added to a substrate buffer mixture consisting of 1 ml. of 0.02 M disodium phenyl phosphate, 2 ml. sodium citrate/citric acid buffer, pH 4.9, and 1 ml. 5% neutral formalin, and incubated at 37° C. After one hour 1.5 ml. of dilute (1 in 3) Folin and Ciocalteu reagent and 3 ml. of 15% sodium carbonate were added, and after further incubation for 15 minutes at 37° C. the colour was measured in a photoelectric colorimeter with an Ilford 608 red light filter (cf. Delory and Hetherington, 1952).

Results

Four apparently healthy males whose ages ranged from 24 to 35 years excreted in the urines a daily average of 1,462 units of acid phosphatase. Of this amount 1,074 units were calculated, on the basis of mid-stream determination, to have been excreted by the kidneys and the remaining 377 units to have been added in the form of prostatic secretion. The average serum acid phosphatase of this group was 1.2 King-Armstrong units per 100 ml., and the renal clearance of acid phosphatase, as calculated from the formula $\frac{UV}{P}$, was 53 ml. of plasma cleared of phosphatase per minute (Table I, A).

Comparison of the acid phosphatase content of the urines collected in three parts shows that the lowest values were constantly found in the mid-stream specimens (Table II).

TABLE II.—Acid Phosphatase Content of Urine Collected in Three Parts (Units/100 ml.)

First Part	Mid-stream Part	Final Part
149	117	720
238	134	790
260	165	630
105	91	98
127	86	127
44	25	410
9	3	13
25	14	810
99	45	770
65	32	128
41	22	620
83	38	138
Average 104	65	438

and that the last part often contained much more acid phosphatase than either the first or the mid-stream specimen. Urine was withdrawn from the bladder of three of the first group of subjects by means of urethral catheters, and the rate of renal excretion of acid phosphatase found to vary from 0.35 to 2.25 units per minute, as compared with 0.38 to 2.4 units per minute as calculated from mid-stream specimens.

Ten patients with benign prostatic hypertrophy, whose ages ranged from 65 to 85 years, excreted a daily average of 262 units of acid phosphatase from their kidneys. Two of the ten were able to collect their urines by the three-part method, and it was found that their prostates excreted an average of 45 units of acid phosphatase each day (Table I, B). The average serum acid phosphatase of the group was 1.5 units per 100 ml., and the average renal clearance of acid phosphatase 9.3 ml. per minute. Each of the ten patients had normal renal function as shown by blood urea

estimations and intravenous pyelography, and in all of them the nature of the prostatic lesion was confirmed histologically.

Seven patients with carcinoma of the prostate, whose ages ranged from 56 to 90 years, excreted a daily average of 128 units of acid phosphatase from their kidneys (Table I, C). Only one of them could collect his urine by the three-part method, and it was found that his prostate excreted 33 units of acid phosphatase a day into the urethra. The average serum acid phosphatase of this group was 37.5 units per 100 ml., and the mean renal clearance of acid phosphatase 1.3 ml. per minute. The diagnosis of carcinoma of the prostate was based on histological findings in five of the patients and on firm clinical or serological grounds in the other two. Four of the patients had poor renal function as shown by raised blood urea, and their excretion of urinary acid phosphatase averaged 85 units a day as compared with 212 units a day for the three patients who had carcinoma of the prostate and normal renal function. The renal function of two of the patients deteriorated during the course of the investigation, and this deterioration was accompanied by a decrease in the excretion of urinary acid phosphatase. In one (Table I, C; R. E. D.), the serum acid phosphatase increased as the excretion of urinary acid phosphatase decreased; and in the other (Table I, C; H. O. B.) the serum acid phosphatase decreased, probably owing to the regular administration of stilboestrol.

Nine apparently healthy women, whose ages ranged from 23 to 60 years, excreted a daily average of 217 units of urinary acid phosphatase (Table III). Age, within the above limits, did not appear to have any significant effect on the rate of excretion of urinary acid phosphatase. The women with carcinoma of the breast excreted a daily average of 132 units of acid phosphatase (Table III). This was less than that excreted by healthy women. On the other hand, the women who had carcinoma of the breast and bone metastases excreted a daily average of 227 units of acid phosphatase, practically the same as in healthy women. A summary of these results is given in Table IV.

TABLE III

Initials	Age	Urinary Acid Phosphatase (Units/24 hrs.)	Serum Acid Phosphatase (Units/100 ml.)	Renal Clearance of Acid Phosphatase $\frac{UV}{P}$ (ml. Plasma Cleared/Min.)
Women with Breast Carcinoma				
A. H.	45	93		
B. P.	30	85		
L. D.	44	102	1.4	5
D. J.	56	162	1.4	8.1
P. G.	51	118	2.7	3.0
B. L.	77	147	1.8	5.7
E. F.	48	91	1.6	4.0
N. S.	63	257	3.1	5.75
Average:		112	2.0	5.1
Breast Carcinoma with Secondaries in Bone				
P. T.	59	207	2.0	7.2
C. L.	53	131	2.6	3.5
M. R.	51	101	4.5	1.55
E. H.	57	230		
		235		
W. H.	54	474	1.0	33
Average:		227	2.5	11.6
Healthy Women (9)				
P. E. G.	23	205		
		206		
R. M. H.	31	208		
		260		
J. E. F.	30	296		
		292		
		344		
J. A. L.	22	127		
H. A. W.	32	128		
A. R. D.	23	418		
H. A. R.	60	137		
S. T. E.	35	93	0.5	22.5
S. T. S.	60	165	1.0	11.3
		164		
Average:		217	0.75	16.9

TABLE IV.—Summary of Urine and Serum Acid Phosphatase Results

	Total Excretion of Urinary Acid Phosphatase (Units/24 hrs.)	Renal Excretion of Acid Phosphatase (Units/24 hrs.)	Prostatic Excretion of Acid Phosphatase (Units/24 hrs.)	Serum Acid Phosphatase (Units/100 ml.)	Renal Clearance of Acid Phosphatase $\frac{UV}{P}$ (ml. Plasma Cleared/Min.)
Apparently healthy men, 24-35 yrs.	1,462	1,074	377	1.2	53
Patients with benign prostatic hypertrophy	262	234	45	1.5	9.3
Patients with carcinoma of prostate		128		37.5	1.3
4 with impaired renal function		85			
3 with normal renal function		212			
Apparently healthy women 23-60 yrs.	217	217		0.75	16.9
Women with breast carcinoma	132	132		2.0	5.1
Women with breast carcinoma and bone secondaries	227	227		2.5	11.6

Variation in the Rate of Excretion of Urinary Acid Phosphatase

During the tests on normal men and women a note was kept of the time of each micturition, and the urine of patients with catheter drainage was in many instances collected at six-hourly intervals. Information thus gained shows that the concentration of acid phosphatase excreted by the kidneys was inversely related to the rate of urine formation, and that the rate of excretion of acid phosphatase appears to be independent of the rate of formation of urine.

A slight diurnal variation in the excretion of urinary acid phosphatase was found in all subjects, but this variation did not appear to be cyclical, and in women could not be related to the menstrual cycle.

Discussion

Healthy young adults excrete a considerable amount of acid phosphatase in their urines, and of this between one-third and one-fifth can be attributed to the direct addition of prostatic secretion to the urinary stream. Comparison of the acid phosphatase content of the urines collected in three parts (Table II) suggests that the first part of micturition washes out the prostatic secretion that has accumulated in the urethra, and that straining or some other factor associated with the completion of micturition produces an immediate discharge of more prostatic secretion. The volume of prostatic secretion required to produce these effects is probably small, as the seminal plasma is rich in phosphatase—for example, that of one of the subjects contained 6,000 units of acid phosphatase per ml. The assumption that mid-stream urine is reasonably free of prostatic secretion is supported by the close correspondence between the acid phosphatase content of catheter and mid-stream specimens, although the occasional occurrence of unusually high acid phosphatase levels in mid-stream urine (Table II) can probably be attributed to the added prostatic secretion.

Men in the sixth decade and over, with benign prostatic hypertrophy, excrete approximately one-sixth the urinary acid phosphatase of younger men, and this diminution applies to both the renal and the prostatic excretion of acid phosphatase. The output of acid phosphatase in the urine of old men corresponds closely to that of women aged 20 to 60 years.

Men suffering from carcinoma of the prostate excrete slightly less urinary acid phosphatase than men of a similar age suffering from benign prostatic hypertrophy; and the difference is most pronounced when renal function is poor. There is no evidence that the excretion of urinary acid phosphatase is related in any way to serum acid phosphatase

levels, and it can be concluded that the acid phosphatase put into the serum by carcinoma of the prostate is not eliminated in an active way by the kidneys.

Women suffering from carcinoma of the breast do not appear to excrete an increased amount of acid phosphatase in their urine, even though the plasma level is increased. In the cases of breast carcinoma without bone metastases the average daily excretion is lower than that in healthy women, or women with breast cancer with bone metastases.

No cause has been found for the slight diurnal variation of urinary acid phosphatase observed in all subjects or for the more marked variation in the rate of excretion that takes place throughout the day. The fact that the distribution of the rates of excretion of acid phosphatase by the kidneys of individuals fits the curve of general probability suggests that the rate is determined by many small factors operating at random and that there is no important underlying cause for the change. Calculation of the rate of renal clearance of acid phosphatase does not throw any additional light on the material studied, and merely emphasizes the inability of diseased kidneys to excrete acid phosphatase. The fact that women as well as men excreted a considerable amount of formol-stable acid phosphatase in their urine (217 units per day) shows that there must be some source of such phosphatase other than the prostate.

Summary

The rate of excretion of urinary acid phosphatase has been studied in four healthy young adult males, ten patients with benign prostatic hypertrophy, seven patients with carcinoma of the prostate, nine healthy women, and 13 women with carcinoma of the breast. Young men excrete up to six times more urinary acid phosphatase than elderly men or women of various ages. In both carcinoma of the prostate and carcinoma of the breast there was a decrease in the excretion of urinary acid phosphatase, in spite of a raised serum acid phosphatase.

This work was done in co-operation with the Institute of Urology, and we are grateful to the Institute for supplying part of the clinical material.

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The findings of a special survey undertaken after four and a half years' experience of the workings of the National Health Service are included in the annual report for 1952 of the London County Medical Officer and School Medical Officer, Dr. J. A. Scott. These include general comments on administration, co-ordination, and co-operation with other services and separate comments on the individual services. The report also includes a detailed statistical account of the "smog" catastrophe of 1952, which in the space of a week contributed to the year's total death rate an extra 0.5 per thousand population. Further statistics show that cancer is the second leading cause of death among Londoners at 2.30 per thousand and that its incidence is increasing slightly, while cardiac diseases are the first. It is reported that there is a continuing drop in the number of children under 5 years who are being immunized against diphtheria, the total percentage now being only 50. The demands on the Council's Ambulance Service were very great, as were those on the District Nursing Associations, each nurse in the service paying on an average fourteen visits a day. The report also includes a detailed account of the School Health Service. The report is published by the London County Council, and may be purchased (price 2s. 6d., by post 2s. 10d.) from the Information Bureau at County Hall, or from Staples Press, Ltd., Mandeville Place, London, W.1, or direct from any bookseller.

type and distribution of the calcification, there was evidence in 10 cases of only one area of undoubted calcification in the lung fields, and in four of an area of calcification in the lung fields with concomitant calcification at the hilum. In one case there was evidence of calcification at the hilum only; another case showed evidence of three foci in the lung fields with a calcified area at the hilum. In no case was generalized miliary calcification observed in the lung fields.

Correlation of Histoplasmin and Tuberculin Sensitivity with Radiological Findings

Correlation between calcification observed in the x-ray picture and the histoplasmin and tuberculin tests both of prisoners and of miners are shown in the Table. It also

Correlation of Histoplasmin and Tuberculin Sensitivity with Pulmonary Calcification (X-ray Film)

	No. X-rayed	With Calcification		Without Calcification	
		No.	%	No.	%
Miners					
T+ H-	50	5	10.0	45	90.0
T+ H+	11	4	(36.4)	7	(63.6)
T- Hmin.	4	0	—	4	(100)
T- H-	1	0	—	1	(100)
Total	66	9	13.6	57	86.4
Prisoners					
T+ H-	24	1	4.2	23	95.8
T+ H+	9	3	(33.3)	6	(66.7)
T- Hmin.	8	1	(12.5)	7	(87.5)
T- H-	18	0	—	18	100
T+ H+	3	1	(33.3)	2	(66.7)
T- Hmin.	2	1	(50.0)	1	(50.0)
Total	64	7	10.9	57	(89.1)
Miners and Prisoners					
T+ H-	74	6	8.1	68	91.9
T+ H+	20	7	35.0	13	65.0
T- Hmin.	12	1	(8.3)	11	(91.7)
T- H-	19	0	—	19	100
T+ H+	3	1	(33.3)	2	(66.7)
T- Hmin.	2	1	(50.0)	1	(50.0)
Total	130	16	12.3	114	87.7

Hmin.—An induration of under 5 mm. occurring after 72 hours from the time of the histoplasmin test.
T+—An induration of 5 mm. or over occurring after 72 hours from the time of the tuberculin test.
H+—An induration of 5 mm. or over occurring after 72 hours from the time of the histoplasmin test.

shows the final analysis in respect of all persons whose x-ray films were examined. The incidence of calcification amongst the tuberculin-positive and histoplasmin-positive group of subjects was four times that of the tuberculin-positive but histoplasmin-negative group. The same trend can be seen in the case of both miners and prisoners. If the tuberculin-negative subjects are considered the same tendency is observed—that is, a greater percentage of the histoplasmin-positive reactors show radiological evidence of calcification. This is proved by the fact that none of the 19 tuberculin-negative and histoplasmin-negative subjects showed calcification, whereas one of the three tuberculin-negative but histoplasmin-positive subjects did.

It is of interest to note that of the 47 prisoners who were known to have been Mantoux-negative at some time within a period of 14 months of the histoplasmin test three showed calcification at the time of performance of the latter. One of these was completely negative to the histoplasmin test, and his serial x-ray films showed a calcification developing in a primary tuberculous lesion contracted a year before the histoplasmin test. One of the other two subjects showing calcification gave a positive histoplasmin reaction, and the other showed a minimal induration of 3 mm. to this test.

It is not possible to make a comparison of the incidence of calcification observed in prisoners and miners in view of the selection that took place among the miners.

Minimal Histoplasmin Reactions and Calcification.—The significance of a small reaction of under 5 mm. to the histoplasmin test is not known. It may indicate a past infection of histoplasmosis, or it may represent a weak cross-reaction to other fungal antigens. The Table shows that the number of persons having minimal reactions and whose x-ray films were available is very small, but it seems that the incidence of calcification among such people (14.2%) is not as high as among the histoplasmin-positive subjects (34.8%), and only slightly higher than that observed in those 51 unselected histoplasmin-negative miners (9.8%).

Discussion

During the past six to seven years much work has been performed with histoplasmin in various parts of the world, but there have been no recorded investigations on this subject in East Africa. The finding of an overall sensitivity rate of 8.5% among adult male Africans in Kenya suggests that histoplasmosis is endemic in at least parts of Kenya. A certain amount of caution in interpretation, however, is necessary, since it is known that weak reactions to the histoplasmin test may represent cross-reactions to other related fungi, particularly *C. immitis*. For instance, it is believed that such is the interpretation of the rather weak histoplasmin reactions observed in California, a known endemic centre of coccidioidomycosis. This explanation may be applicable to Kenya, particularly in the case of those showing small indurations, and it will be necessary to clear up this point by performing sensitivity tests with coccidioidin and histoplasmin at the same time. Induration to a greater extent than 5 mm. to the histoplasmin test may be caused after infection by other related fungi, but in the present series reactions up to 18 mm. were observed 72 hours after the histoplasmin test, and this should provide fairly sound evidence that the response obtained is specific to histoplasmin. It may, however, be that, apart from histoplasmosis, coccidioidomycosis, or indeed other similar fungal infections, is endemic in Kenya. No cases of histoplasmosis or coccidioidomycosis have yet been recorded in Kenya, but the knowledge that at any rate cases of histoplasmosis are to be expected should cause more interest in the subject and a greater search for cases.

It is difficult to explain the high sensitivity rate found among miners as compared with that of prisoners, and until further tests both with histoplasmin and with coccidioidin are performed speculation would be highly theoretical. The sensitivity rate of 14.6% found among miners is the highest rate so far recorded in Africa.

It is known that false-positive histoplasmin reactions have been caused by contamination of the histoplasmin solution or the syringes or needles with tuberculin, but it has been shown among the miners that it is very unlikely that such reactions due to tuberculin have presented as positive tests to histoplasmin. It is even more unlikely that false reactions due to tuberculin occurred when testing the prisoners, as in these subjects the chances of cross-contamination during testing were eliminated by omitting the simultaneous test with tuberculin.

The radiological appearances of healed lesions resulting from histoplasmosis usually mimic those due to healed tuberculosis (Riddell, 1951). Zwerling and Palmer (1946) stated that the appearance of massive bilateral calcification is in most instances due to histoplasmosis. In only one case in the present series was evidence of bilateral calcification found in the lung fields, and this case had a positive histoplasmin reaction. In all other cases the calcification observed was either a single focus or a dual focus similar to that seen in a healed primary complex. The picture of generalized miliary calcification which is described as occurring in histoplasmosis was not seen.

It was also found that approximately one-third of those persons reacting to histoplasmin had radiological evidence of calcification; this should be compared with about 13% of all tuberculin-positive cases that showed calcification. It

should again be emphasized in this connexion that in assessing evidence of calcification in the x-ray films the interpreters had no knowledge of the individual histoplasmin or tuberculin tests. These findings, although based on relatively small numbers, compare closely with those found by Goddard *et al.* among a large series of student nurses in the United States. In the latter investigation it was found that approximately one-third of the nurses reacting to histoplasmin, or to histoplasmin and tuberculin, had pulmonary calcification, whereas approximately 10% reacting only to tuberculin showed evidence of calcification.

Radiological evidence of pulmonary calcification amongst the natives of Kenya is not therefore necessarily indicative of healed tuberculosis; the evidence indicates that it may be due to a past infection of histoplasmosis. It may also be said that radiological evidence of persistent pulmonary infiltrations, as distinct from calcification, may be due to infection by *H. capsulatum*, as Furcolow *et al.* (1947) have indicated that such infiltrations in children are much more often associated with histoplasmin than with tuberculin sensitivity.

Summary

Intradermal sensitivity tests performed on 768 adult African males show an overall sensitivity rate of 8.5% to 1:100 histoplasmin. A further 4.3% of the subjects showed minimal indurations of under 5 mm. to the histoplasmin test.

It is highly unlikely that these reactions are due to contamination of the histoplasmin solution with tuberculin, but it is possible that some of the smaller reactions are due to cross-reactions with other antigenically related fungi.

X-ray films of 130 of the subjects were examined for calcification under controlled conditions. Calcification was observed in 12.3% of the films.

In the tuberculin-positive subjects the incidence of radiological evidence of calcification among histoplasmin reactors was four times the incidence observed amongst the histoplasmin non-reactors. The same tendency can be seen in the tuberculin-negative group of subjects.

Those with minimal reactions to the histoplasmin test did not show the incidence of calcification that was observed in the histoplasmin-positive group and showed only a slightly higher incidence than that of the histoplasmin-negative group.

The appearance of calcification in an x-ray film of a Kenya African does not necessarily indicate a past tuberculous infection, as it may be due to a past infection with *H. capsulatum*. The diagnosis of histoplasmosis should be considered in the face of a negative tuberculin test associated with a persistent pulmonary infiltration.

I thank Dr. W. S. Haynes for help in interpreting the radiographs and Professor John Crofton for reading the draft and making most helpful suggestions. I also thank Dr. R. W. Riddell for supplying the bulk of the histoplasmin, and Dr. G. C. Dockeray for the remainder. Finally, acknowledgments are due to the Director of Medical Services and the Labour Commissioner, Kenya Colony, for permission to publish this paper.

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A CASE OF PULMONARY HAMARTOMA

BY

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The term "hamartoma"—from a Greek word meaning "to err"—was coined by Albrecht (1904), who defined it as "a tumour-like malformation in which in truth one can demonstrate only an abnormal mixture of the normal developmental components of the organ in which they occur, whether it be with regard to the quantity, to the arrangement, or to the degree of development, or in all three respects." He actually used this term for cavernous malformations of the spleen and liver, and also for the fibromata of the medullary substance of the kidney. Both Goldworthy (1934) and Jaeger (1934) used the word for a similar malformation occurring in relation to bronchi. More than 125 cases have been described up to date.

The tumour varies enormously in size. Usually a globular, solid, firm growth of the diameter of a two-shilling piece, it is of greyish-white colour and has a rough nodular surface. Commonly there is round it a capsule consisting of very loose areolar tissue. Microscopically it has a characteristic picture. The predominant tissue is cartilaginous, and may show calcification or even ossification at times. Such islets of cartilage are separated by varying amounts of mesodermal and epithelial tissues, which include fibrous and adipose tissues, epithelial clefts giving at times the appearance of a gland (the epithelium may be cuboidal, columnar, or transitional), smooth muscle fibres, and blood vessels. Essentially these tumours are benign, although very rarely they may undergo malignant transformation. The case reported by Simon and Ballon (1947) did show malignant changes.

Hamartomas can occur in any part of the lung, more commonly, it is said, in the lower lobes. Most of them are peripheral and subpleural, but a few are hilar in relation to the main bronchi. They are supposed to be more common in males than in females in the ratio of 3 to 1, and can occur at any age. Jones (1949) described one in a newborn baby. However, the majority of them are seen in the middle-age groups of 35 to 50 years, perhaps because of their asymptomatic course. Clinically most of the patients are symptomless and the lesion is usually detected on routine chest radiography. When subpleural there is often pleuritic pain. When the lesion is situated at the hilum symptoms of dyspnoea due to bronchial obstruction and of cough with sputum and fever due to infection behind this obstruction may occur.

Pre-operative diagnosis is rarely possible. A rounded shadow in a chest radiograph with well-defined margins, surrounded by normal-looking lung tissue and some scattered calcium in the shadow, when seen in an asymptomatic person strongly suggest the possibility of a hamartoma. No other investigation is helpful except rarely in the hilar variety, when a bronchoscopic biopsy may prove to be diagnostic. Diagnosis is usually arrived at by thoracotomy, when the tumour alone may be removed or, if necessary, with a part of the lung as well.

Case Report

A man aged 53 first had pains in the left lower chest and upper abdomen in 1949. These were sharp and stabbing in character, and very variable in duration. Thorough investi-

gation showed nothing abnormal. In 1950 a chest radiograph showed a prominent left hilar shadow and thickened pleura at the left base. In January, 1952, these changes were well marked (Figs. 1 and 2), and he was referred to the Brompton Hospital.

In February, when first seen at Brompton, he still complained of these pains in the left lower chest and upper abdomen, and of cough with 2 to 4 oz. (57 to 85 ml.) of purulent sputum daily, loss of weight, and hoarseness of voice of about six months' duration. He was admitted under the care of Sir Geoffrey Marshall on April 7 for further investigation. On examination he was seen to be a man of average physique with a moderate degree of finger-

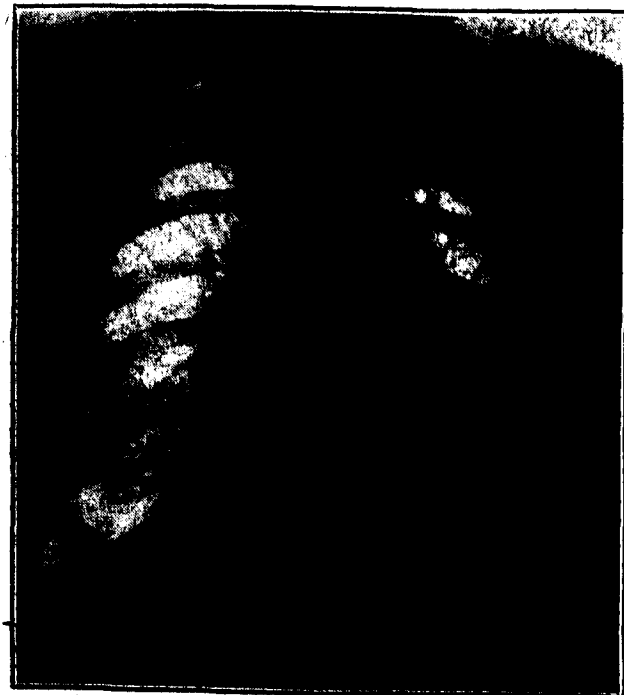


FIG. 1.—Chest radiograph showing well-marked changes.

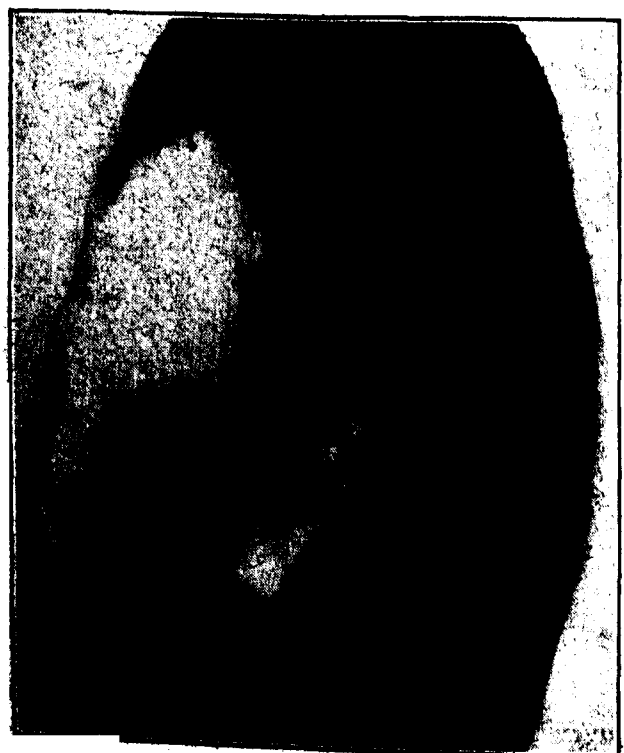


FIG. 2.—Lateral view.

clubbing. He had a swinging temperature rising to 101° F. (38.3° C.). A small firm lymph node was palpable above the left clavicle. On the chest a big transverse scar was seen, extending from the mid-clavicular line in the fourth left interspace across the axillary region to the inferior angle of the left scapula on the back. That was the result of drainage of an empyema at the age of 5. He also had physical signs of collapse of the left lower lobe. A provisional clinical diagnosis of bronchial carcinoma was made. The cough, with sputum and rise of temperature, was attributed to infection in the collapsed lobe.

A report by Dr. J. W. Clegg on a bronchial biopsy specimen taken on July 8 stated: "The biopsy is a small bronchial papilloma covered by epithelium showing a transitional metaplasia. Below the epithelium there are a mass of fatty tissue and a few atypical mucin-secreting glands. The appearances strongly suggest a benign hamartoma of the bronchus."

A left lower lobectomy was performed by Sir Clement Price Thomas on July 18. The specimens removed at the operation showed the following features, as reported by Dr. J. W. Clegg: "Two operation specimens were received—a lower lobe and a segment of bronchus 3 cm. long dilated by an endobronchial polypoid tumour measuring 2.5 cm. in diameter. This tumour was found to consist chiefly of fat, but there were also areas of cartilage and small numbers of mucin-secreting glands present (Fig. 3). The surface of the tumour was covered by a transitional type of epithelium. These are the classical features of an endobronchial hamartoma. . . ."

The patient was discharged for convalescence on August 9.

Comment

When this growth occurs in the cancer age group it is almost impossible to distinguish it clinically from bronchial carcinoma, and the diagnosis is usually post-operative. This case, however, illustrates the possibility of arriving at a correct pre-operative diagnosis. Even when, as in this case, the growth is within reach of the bronchoscope it may be difficult to obtain a satisfactory bronchoscopic biopsy. The difficulty may be due to the nature of the tissues in the growth—namely, the adipose and cartilage tissues, on which the biopsy forceps slips off easily.

I am grateful to Sir Geoffrey Marshall for encouragement and most valuable guidance during the preparation of this case record, and to Dr. J. W. Clegg, pathologist to the Brompton Hospital, for the detailed report on the bronchoscopic biopsy and the operation specimens. I wish to thank Sir Clement Price Thomas for permission to report this case, Dr. J. G. Scadding for offering me the help of the Photographic Department of the Institute of the Diseases of the Chest, and Mr. D. F. Kemp for the photographs.

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EOSINOPHILS IN THE SPUTUM

BY

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The presence of eosinophil leucocytes in the sputum has been traditionally associated with bronchial asthma. Early writers regarded this finding as diagnostic (Bezançon and Israël de Jong, 1912; Barth, 1921), but nowadays it has a wider significance, being found in chronic bronchitis, whooping-cough, carcinoma of the lung, etc. (Unger, 1945). The sputum eosinophilia of asthmatics was in some measure accounted for when Marchand (1915) found, in necropsies on asthmatic patients, extensive infiltration of the respiratory mucosa by eosinophil leucocytes. This is now an accepted pathological finding, as is also the infiltration by eosinophils of the nasal mucosa and sinus epithelium in other allergic states (Cooke, 1947; Baxter and Rose, 1953). Of the eosinophils in the respiratory mucosa, some were mononuclear cells, and there were many surrounding granules of an eosinophilic character; this appearance led Bezançon and Bernard (1930), Cooke (1932), and others to deduce that the eosinophils had been formed locally in response to an antigen-antibody reaction—the accepted mechanism of allergic bronchial asthma. Earlier, however, Huber and Koessler (1922) had recognized these mononuclear cells and scattered granules as stages in the degeneration of the eosinophil and had maintained the identity of the eosinophil in the lungs with the eosinophil circulating in the blood. Several attempts have been made to relate, numerically, the eosinophils in the blood with those in tissues and fluid discharges, but without much success (Cooke, 1932; Knott and Pearson, 1934; Cowie and Jimenez, 1936).

Eosinophilic infiltration of the pulmonary tissues was recently described in guinea-pigs which had developed eosinophilia following injections of toxic materials (Vaughn, 1953). In these experiments it was found that the eosinophils first increased in the circulating blood, then appeared in the lungs, and finally were found within the respiratory passages. From the chronological sequence it was suggested that the eosinophil leucocyte, formed in the bone marrow, proceeds by way of the blood stream to the lungs, migrates into the pulmonary tissues, whence it passes into the bronchioles and bronchi, and so is discharged from the body.

While working among the natives of Sukumaland, in Tanganyika, it was noticed that many specimens of sputum contained eosinophil leucocytes. The relationship which this finding might bear to the high incidence in the local population of parasitic disease, and, of course, to the eosinophilia of the blood so often an accompaniment to it, was considered and an attempt made to assess this relationship. Consequently the simultaneous examination of blood and sputa from a group of the local African natives was undertaken.

Methods and Results

African natives attending the out-patient department of Mwanza Hospital comprised the test group. These patients were not selected in any way except that in view of the

difficulty of obtaining specimens of sputum from young children such cases were omitted. There were only 10 cases of clinically apparent respiratory disorder in the whole series.

Patients were invited to expectorate into a Petri dish and smears were made of suitable specimens. Those specimens which consisted only of saliva were rejected and the patient was encouraged to try again. The smears were fixed, while still wet, in Schaudinn's fluid and were subsequently stained by haematoxylin and eosin, two such smears from each patient being examined. Differential leucocyte counts were found to be unsatisfactory owing to the uneven, often focal, distribution of the eosinophils. It was felt that a general impression of the contents of the smears as a whole would be of more value, and thus the smears have been reported as containing no eosinophils, scanty eosinophils, small numbers, or moderate to large numbers of eosinophils. Eosinophil counts of the peripheral blood were carried out by the method of Thorn *et al.* (1948).

In all, 205 Africans were examined in this way, and by a simple coding procedure examinations of the blood and sputum were made in complete independence.

In the Table the frequency and density of eosinophils in the sputum are shown in the various groups of Africans examined, the patients being arranged according to the level of eosinophils in the peripheral blood.

Occurrence and Intensity of Sputum Eosinophilia in 205 Africans with Various Levels of Eosinophil Leucocytes in the Peripheral Blood

Eosinophils in Sputum	Eosinophils in Peripheral Blood		
	0-500/c.mm.	501-1,000/c.mm.	Over 1,000/c.mm.
None	40	14	6
Scanty	18	21	3
Small No.	12	28	26
Moderate to large No.	3	12	22
No. of patients	73	75	57

Discussion

Of the patients examined, nearly two-thirds had an eosinophilia of 500 or more eosinophil leucocytes per c.mm. of blood, and the general pattern seems to be that as the degree of eosinophilia increases so does the frequency and density of the eosinophilia of the sputum. About one-fourth of the cases, however, do not follow this trend, some eosinophilic patients showing no sputum eosinophilia and some non-eosinophilic patients having numerous eosinophils in the sputum. To assess the importance of these dissenting results, attention must first be drawn to the technical inaccuracies in estimating the frequency of eosinophils in the smears. Also, in the animal experiments quoted above, eosinophilia of the blood was not synchronous with the appearance of these cells in the bronchioles, there being a time lag of some hours. This time lag was also evident as the eosinophilia subsided. This asynchronism has been observed in asthmatics. Tuft (1949) remarks that eosinophils in the sputum "are especially abundant towards the end of the attack." Generally, however, the trend of the present findings does support the view that eosinophils appear in the sputum, and of course in the tissues of the lungs, as late stages in the course of an eosinophilia.

The failure of former workers to establish such a correlation probably lies in their having investigated cases of allergy, the antigenic stimulus of which may not have been enough to produce an eosinophilia of sufficient intensity or duration to permit the relationship to be observed. In the present study the eosinophilia in almost all cases was a response to parasitic infestation, and it is among such cases that some of the highest eosinophil counts have been encountered (Wintrobe, 1951). In one of the cases included here there was a peak eosinophil count of 18,800 cells per c.mm., and the eosinophilia persisted for 10 days.

In a highly parasitized community such as that here examined, the frequency of eosinophilia, including pulmonary eosinophilia as revealed by the sputum, is not a new finding, for there have been many reports associating eosinophilic infiltration of the lungs with parasitic disease (Söderling, 1939; Wintrobe, 1951). The infiltration syndrome (Loeffler, 1932) should thus be expected in any condition in which there is a substantial increase in the number of circulating eosinophil leucocytes for any length of time—for example, periarthritis nodosa (Middleton and Carter, cited by Tisell, 1941).

As evidence accumulates there seems to be less doubt that the state of eosinophilia, of whatever primary aetiology, embodies an increase in the number of eosinophil leucocytes circulating in the blood, their subsequent migration (? selective segregation) into the tissues of the lungs, and their eventual discharge into the respiratory passages and so out of the body.

Summary

Simultaneous examination of blood and sputum for eosinophils was made in 205 African natives in an area where the incidence of parasitic infestation is high.

The results obtained suggest that there is some association between eosinophilia of the blood and that of the sputum.

This association is discussed in relation to the reports of pulmonary eosinophilic infiltration complicating parasitic disease.

It is suggested that eosinophilia of the sputum and its preceding eosinophilic infiltration of the lungs are integral parts of a general eosinophilia, and that the demonstration of eosinophils in sputum indicates that an eosinophilia is or has recently been in progress.

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The annual report of the National Institute for the Blind draws attention to the manifold activities now being undertaken by that organization. Of particular interest is the development of the new solid-dot Braille, which composes dots of plastic ink on paper instead of impressing them, and which will make possible the much cheaper production of books, periodicals, music, etc., for the blind. Moon type is a useful complement to Braille, especially for those who become blind in old age. It was developed by Dr. William Moon (1818-94), who lost the sight of one eye at the age of 4, following an attack of scarlet fever, and became totally blind at the age of 22. Although Moon literature is costly to produce, the Institute has continued to supply it. Nearly 50,000 volumes of literature and 2,000 volumes of music were among the year's output of the Institute during the year. The physiotherapy school continues to make its useful contribution to medicine; an arrangement made with the Whittington Hospital, Highgate, has enabled skilled physiotherapy students of the Institute to give 4,000 treatments a month to out-patients. The Institute has begun a new policy whereby its members may obtain Braille watches, clocks, literature, and other goods at greatly reduced cost.

Medical Memoranda

Prevention of Post-operative Backache in Women

Some women suffer from low backache following prolonged abdominal or vaginal operations. The pains are sometimes so excruciating after awakening from the anaesthetic (and commonly during the first post-operative day) that only morphine brings relief. Some of these patients say that they suffered more from the backache than from the effects of actual operation, and this backache may persist for months after the operation.

This kind of backache is due to the forcible flattening of the lumbar spine curvature while the deeply anaesthetized patient is stretched out on a flat operating table. During vaginal operations in the extreme lithotomy position this flattening of the curvature is aggravated by extreme flexion of the thighs. The pains are caused partly by pulling on the interlumbar and sacro-lumbar ligaments, which sometimes leads to slight dislocation of the intervertebral joints.

In other patients, predisposed to degenerative changes in the intervertebral disks, the widening of the lumbar bodies by the forcible flattening of the curvature leads to some protrusion of a disk or disks, with resultant pressure on the dura mater, causing pains similar to those of the common disk lesions. Cyriax calls this kind of pain "dural pains." Deep anaesthesia leads to relaxing of the lumbar muscles, which facilitates the flattening of the curvature. Since the introduction of the relaxing curare preparations the evidence tends to suggest that this kind of backache has become commoner.

In women operated on in the lithotomy position another factor may add to this flattening of the lumbar curvature. If, after the operation, the legs are not put gently into the normal position, but instead one leg is first stretched while the other is still fixed to the stirrup, undue force is applied to the sacro-iliac joints, causing strain to the ligaments and resulting in mild dislocation of these joints.

The flattening is still further increased by the routine nursing with pillows arranged in such a way that the lumbar region remains unsupported. Nurses have for years been trained to adjust the pillows in this manner; four to six pillows are usually placed under the shoulders and back to keep the patient in a propped-up position, but no attention is paid to the fact that the lumbar region is left entirely unsupported. One can push a hand underneath, as if in a tunnel. Consequently the already flattened curvature resulting from lying on the operating table is still unsupported, and so the back pains are increased.

A fourth contributory factor is a mattress which is too soft in texture; this gives too easily, causing dents and so contributes to the flattening.

Two types of women are prone to such post-operative backache—the very stout and the asthenic flabby type. In the former the lumbar muscles are permanently strained in balancing the heavy abdominal weight. These women always have an increase of the lumbar curvature, and during the operation the already overtired lumbar muscles readily give way. The second type have muscles and ligaments constitutionally weak. The intervertebral ligaments are very loose and the spine curvature relaxes easily.

These unpleasant backaches can be prevented by a very simple procedure: (1) During the operation a cushion, not too soft, should always be placed under the lumbar curvature to prevent flattening of that part of the spine. (2) When the patient is changed from the lithotomy to the normal position both legs should be stretched gently at the same time. (3) Nurses should be taught never to allow the lumbar region to be unsupported while the patient is lying on her back, and especially during the first few days after the operation. An ordinary and not too soft pillow

should always support the lumbar region and should be rearranged several times during the day; and the mattress should not be too soft.

Should backache occur in spite of these precautions, a tight strapping of the lumbo-sacral region usually gives relief in a short time.

It is extraordinary, however, how difficult it has proved to get these simple precautionary measures introduced and carried out by nursing staff. Doubtless this is due to the rigid routine instruction during training; and to get nurses to alter this routine may prove extremely difficult, as I have found. Nevertheless when they have put these measures into practice great suffering has been spared to these patients and their convalescence has been made much easier and swifter.

E. SCHLEYER-SAUNDERS, M.D., F.I.C.S.

Investigations on Long-acting Corticotrophin

Corticotrophin remains in the body for only a short time after administration. Sayers *et al.* (1949) found, in two normal persons, the highest blood concentration at the conclusion of intravenous infusions for a half and one hour respectively, whereas three hours after starting the infusions the corticotrophin level had fallen to the control value.

While the decrease in number of eosinophil leucocytes is accepted as a standard for increased activity of the adrenal glands, it is known that the number of eosinophil

leucocytes in the blood does not decrease after a single intravenous injection of corticotrophin (Renold *et al.*, 1952). One intramuscular injection daily, given on three consecutive days, does not stimulate the adrenal cortex as measured by the excretion of 17-ketosteroids in the urine (Querido *et al.*, 1951). The daily therapeutic dose of corticotrophin must therefore be subdivided. This is inconvenient for the patient as well as for the nursing personnel, and consequently a search has been made for an A.C.T.H. preparation which will be effective when injected only once daily. The preparations described below seem to meet these requirements.

Methods.—Using the method described by Goslings *et al.* (1953), we gave six 3½-I.U. doses of the Organon preparation C/41 daily to two male patients suffering from rheumatoid arthritis. The results were compared with those from one 21-I.U. dose of the Organon long-acting (CLA) preparation of the same batch. In the intervals the patients were given dummy injections. The 17-ketosteroids excreted in the urine in 24 hours were assayed according to the method of Kassenaar *et al.* (1950). Eosinophil leucocyte readings were taken every morning at the same time, before breakfast and previous to the first injection, and the cells were stained according to the method of Zollikofer (1901).

Results.—The eosinophil leucocytes showed a distinct decrease during injection of the normal preparation (C), and also during that of the long-acting preparation (CLA) (Figs. 1 and 2). Both C and CLA had a marked effect on the excretion of 17-ketosteroids in the 24-hour urine. In Case 1 (Fig. 1) these values were of the same order of magnitude; in Case 2 (Fig. 2) the excretion was about 80% more during the CLA-period than during the period in which the normal preparation was given.

DISCUSSION

From the criteria of Goslings *et al.* (1953) it may be concluded that CLA has a satisfactory action. This is in accordance with the clinical results obtained by us, and by others (Solem and Holterman, 1952) with zinc-protamine preparations. It is not intended to discuss the validity or otherwise of the Sayers test for corticotrophic preparations. It is important, however, to remember that this test requires intravenous injections, and that only the immediate effect is measured. The long-acting preparations do not lend themselves to intravenous injection, and their effect is spread out over a longer period. It does not seem correct, therefore, to express the strength of a CLA preparation in Sayers units of the basic material from which these preparations are made. Furthermore, it is possible that in preparing CLA some change in the activity occurs.

In order to obtain reliable data on long-acting preparations for clinical use it seems necessary to compare these preparations with ordinary preparations of the same batch, based on the excretion of 17-ketosteroids in the urine in men.

This work was aided by grants from the National Health Council and Messrs. Organon.

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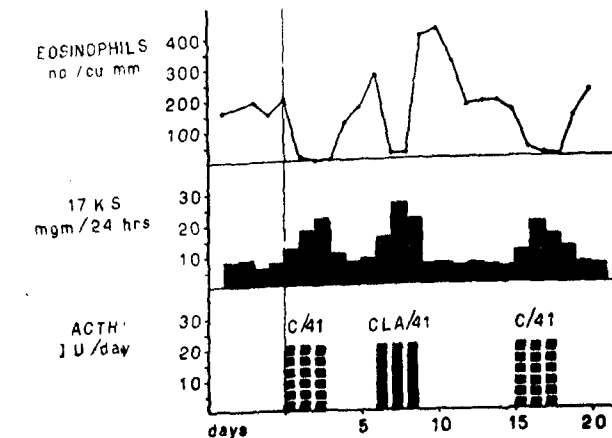


Fig. 1.—Case 1. The effect of six 3½-I.U. doses of corticotrophin a day compared with that of one dose of 21 I.U. of long-acting corticotrophin of the same batch.

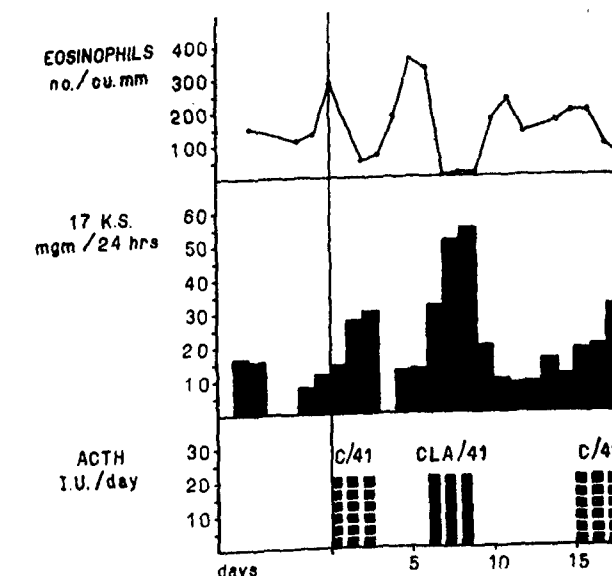


Fig. 2.—Case 2. The effect of six 3½-I.U. doses of corticotrophin a day compared with that of one dose of 21 I.U. of long-acting corticotrophin of the same batch.

Reviews

ANOXIA OF THE NEWBORN

Anoxia of the New-Born Infant. Consulting Editors: Dr. K. W. Cross (U.K.), Dr. M. Lelong (France), Dr. C. A. Smith (U.S.A.). Editors for the Council: J. F. Delafreschaye and T. E. Oppe. A Symposium organized by the Council for International Organizations of Medical Sciences. (Pp. 230; illustrated. 27s. 6d.) Oxford: Blackwell Scientific Publications. 1953.

When 17 outstanding authorities combine to discuss their subject informally among themselves their confabulations should make informative reading. This monograph is certainly informative; it is also stimulating and provocative. When obstetricians and paediatricians agree about the care of the newborn, and when, joined by pathologists, anatomists, physiologists, and chemists, they can meet together daily for five days "in a tranquil setting," then indeed are the lions lying down with the lambs.

Anoxia, a term which has now superseded the old "white" and "blue asphyxia"—and very properly so—is the subject of many theories but, in its essentials—prevention, early diagnosis, and treatment—of but few facts. In this symposium the theories are discussed and many are discredited, a number of new facts are brought forward, and alternative theories are proposed in the light of the authors' own research. Such vexed questions as the aetiology of hyaline membrane, the significance of foetal haemoglobin, and the value of combining carbon dioxide with oxygen in treating anoxia are fully considered. Dr. Lind (Stockholm) presents results of angiocardigraphic studies on foetuses and newborn infants, offers an explanation of the effect of anoxia on the functional closure of various foetal blood channels, and confirms the value of gastro-intestinal oxygen therapy.

There are five main sections which follow an introduction by Dr. Lelong (Paris). Each section ends with an account of the discussion engendered by the papers. The first is devoted to clinical aspects, with particular reference to the early diagnosis of foetal anoxia (Dr. Mayer, Paris), the mechanism, prevention, and treatment of anoxia (Dr. Gibberd), and the treatment of respiratory difficulties in premature infants (Dr. Rossier, Paris); the second to pathological findings—a symposium by Dr. Lelong, Dr. Clement Smith, Dr. Agnes Macgregor, and Dr. Ahvenainen (Helsinki); the third and fourth to biological and physiopathological considerations respectively; and the fifth to the place of oxygen in the therapy of premature infants and the treatment of atelectasis. In the final section some of the general conclusions are worthy of note, particularly in relation to anaerobic metabolism, arterial oxygen saturation, and oxygen therapy. It is stressed that the aim of resuscitation in anoxia is to oxygenate the medulla rather than to try to cause total expansion of the lung. Any mechanical device for resuscitation should be safe, simple, and readily applied without complicated apparatus or special skill.

Here indeed is a mental feast for all paediatricians, a book of value to all research workers in the field of neonatal physiology and pathology. It is well produced, with an extensive bibliography and excellent photomicrographs, graphs, and angiographs.

WILFRID GAISFORD.

PNEUMOCONIOSIS ABSTRACTS

Pneumoconiosis Abstracts. Volume I. Reprinted from the *Bulletin of Hygiene*, 1926-1938. (Pp. 347; illustrated. 63s.) London: Sir Isaac Pitman and Sons. 1953.

This book is the first of two volumes in which will be collected all the abstracts relating to pneumoconiosis which were published in the *Bulletin of Hygiene* from 1926 until the end of 1950. The present volume contains those abstracts

published from 1926 to 1938. Dr. E. I. Middleton, who has been responsible for the selection of relevant abstracts and for the preparation of the index, has adopted a broad definition of pneumoconiosis to cover all forms of pulmonary reaction to inhaled dust, without any reference to effect on function, and has taken the word "dust" to include fume in the solid state. The abstracts therefore cover a wide field of interest. They are grouped in sections, whose headings indicate their scope. After a general section on industrial hygiene and the relation of occupational dusts to respiratory disease in general, there are sections on silicosis, asbestosis, pneumoconiosis of coal workers, pneumoconiosis caused by other inorganic dusts and by dusts of vegetable origin, and on respiratory disease caused by fumes. These are followed by a section on methods of dust suppression and of protection of the worker against dust. The next two sections are on the periodical reports of various official bodies relating to pneumoconiosis and on pneumoconiosis legislation. Finally, there are a number of book reviews.

The value of such a compilation depends in great measure upon the accuracy and completeness of the index. In this volume the index covers 21 pages in double column, and has obviously been prepared with scrupulous care; a few random tests of it have proved entirely satisfactory. This volume, together with its companion, is likely to prove indispensable to everyone interested in the problems of industrial pulmonary disease.

J. G. SCADDING.

MEDICAL EDUCATION IN THE U.S.A.

Medical Schools in the United States at Mid-Century. By John E. Detrick, M.D., and Robert C. Berson, M.D. (Pp. 380; £1 16s.) London: McGraw-Hill Book Company. 1953.

Medical schools are an expression of the life of a nation, and therefore reflect its social, economic, and political forces; but the response of medical schools to changes in these forces is not instantaneous, and periods of confusion and stocktaking precede readjustment. In the United States medical schools have been evolving continuously for the past two centuries, the tempo varying with events, and there is no sign of finality. That the second world war has created immense problems is evident from this book, which will take its place in the series of classic reports initiated by Abraham Flexner in 1910.

The authors worked for the "Survey of Medical Education," whose committee includes some of America's leading medical educationists. The book is wider in scope than its title suggests, being in fact a comprehensive review of medical education, both undergraduate and postgraduate; the schools themselves are simply the focal point. As Alan Valentine says in his foreword, the book is the first thorough self-evaluation of American medical schools for many years. The materials were collected by questionnaires and visits to a large and representative proportion of the schools, with the full co-operation of deans, staff, and students. The result is much more readable than might have been expected. The book is concise, well-written, and trenchant, each section having a good summary and a list of recommendations appended; and the occasional platitudes may well bring home important truths to some readers for the first time.

The functions of a medical school are distinguished as education, research, and "service." Finance and administration are discussed at length, the topics including the cost of educating a medical student, the relation between medical school and hospital, the organization of departments in medical schools, medical libraries, teaching staff, and the selection of students. The rest of the book is on the theory and practice of the education of students and doctors, and there are interesting appendices, especially one on what students think.

While many of the problems discussed are peculiar to the United States, arising from a political and financial situation very different from ours, some are met with

everywhere. Among those of interest to us are the problems of medical libraries, the overloaded curriculum, encroachment on the student's leisure and vacations, out-patient teaching, domiciliary teaching, and the functions of housemen. British medical teachers and deans would find this record of American experience directly relevant to their own problems. If any British students read it, they will learn that talking to the blackboard and mumbling into one's beard are not peculiar to British teachers, and that British and American students are alike in desiring closer association with the staff.

RAYMOND WHITEHEAD.

PRACTICAL PRESCRIBING

Practical Prescribing: An Introductory Guide for Medical Students. By Alastair G. Macgregor, M.D., B.Sc., M.R.C.P.(Lond.), F.R.F.P.S., and Trevor W. G. Kinnear, M.B.E., M.B., Ch.B., M.R.C.P.(Ed.), M.R.C.P.(Lond.). Foreword by Professor J. H. Gaddum, F.R.S. (Pp. 88. 6s.) Edinburgh and London: E. and S. Livingstone. 1953.

This manual is an introductory guide for medical students. The authors therefore give the bare essentials about dosage, prescription writing, prescribing within the terms of the National Health Service, the law and drugs, and methods of administration of drugs. They make no attempt to present prescribing as an art. Further, we are told that "Signetur" in the form of "Sig." is the only permissible Latin word to appear on a prescription, just as B is the only permissible symbol. We have as an example of a typical prescription "B Ferrous sulphate tablets (B.P.)" with the usual directions in English. So be it! We must move with the times even though we may sigh nostalgically for our basis, adjuvant, corrective, and excipient compounded with a fine knowledge of incompatibility and rendered more efficacious by indecipherable dog Latin. There are surely two strong reasons against the jettisoning of Latin: first, speed is gained by using truncated Latin terms; secondly, such a prescription can be understood and thus dispensed over the greater part of the globe.

On page 37 we read that "the danger of diamorphine addiction is so great that this otherwise useful drug has been omitted from the latest edition of the B.P., 1953." This regrettable and ridiculous action might well have been accorded a paragraph of criticism, otherwise the student may conclude that it meets with general approbation. On the same page it is stated that Indian hemp has no legitimate medicinal use, yet as a euphoriant it is the only drug extensively used in the treatment of the anxious patient with duodenal ulcer.

The authors have presented their subject with praiseworthy clarity.

A. H. DOUTHWAITE.

PSYCHO-ANALYTIC PAPERS

Primary Love and Psycho-Analytic Technique. By Michael Balint, M.D., Ph.D., M.Sc., L.R.C.P., L.R.C.S. International Psycho-Analytical Library. No. 44. (Pp. 288. £1 10s.) London: The Hogarth Press. 1952.

Dr. Balint, one of the most distinguished of Ferenczi's pupils in this country, has taken after his master in three main respects—his interest in psychological parallels to the laws of biogenetics, his theoretical and practical concern with the development of libido-theory, and his tendency to speculative handling of psycho-analytical problems, in particular the rationale of psycho-analytical therapy. The present volume consists of papers delivered between 1930 and 1952 and includes discussion of such subjects as pre-genital organizations, primary love, genital love, love and hate, transference and counter-transference, therapeutic aims and techniques, and the termination of analysis. These subjects the author deals with in an easy speculative manner, the effect of which naturally depends on the degree to which the reader is ready to accept the interpretations so disarmingly presented.

On the matter of biological parallels it cannot be forgotten, however, that psychologists can quote biological and anthropological scripture for their own purposes. And when one examines closely the clinical observations on which Dr. Balint's theories are founded one is occasionally disconcerted to find such statements as "coitus . . . begins as an altruistic act," which is either an instinctual truism, a verbal misunderstanding, or a clinical understatement. Even his technical aphorisms are sometimes naive—as where he says that a priori there is no reason why patients should not be able to produce their symptoms at will after treatment "now that they have become fully conscious of their individual mechanisms of production." Similarly his favourite thesis that in a satisfactorily terminated analysis the patient makes a "new beginning" free from anxiety is either a restatement of the obvious or a professional idealization of the analytical process.

Dr. Balint's most important service is the emphasis he lays on early loving object-relations. Whether or not one agrees with his concept of "primary love" (primitive archaic object-relation), he is undoubtedly correct in his criticisms of some modern tendencies of psycho-analysis whereby constitutional sadistic and masochistic tendencies are unduly stressed.

EDWARD GLOVER.

TEN TEACHERS

Diseases of Women. By Ten Teachers, under the direction of F. W. Roques, M.D., M.Chir., F.R.C.S., F.R.C.O.G. Ninth edition. (Pp. 480; illustrated. 28s.) London: Edward Arnold and Co. 1953.

The production of the new edition of this well-known 34-years-old textbook is under the direction of F. W. Roques, assisted by J. Beattie and J. Wrigley as co-editors. Nearly all the London teaching schools are represented in the list of contributors, which now includes S. Clayton, C. Gwillim, and T. Lewis in the places of F. Cook, Sir William Gilliat, and C. White. The principle of collective responsibility, which has the doubtful merits of eliminating heresy and ensuring that nothing is said which would not bear repetition before the most narrow-minded examiner, has the known disadvantage of resulting in an insipid milk-and-water concoction which hardly dares to express a definite opinion. This disadvantage is now recognized, and a serious attempt has been made to allow each contributor sufficient rope to give the book more courage and character, and to inspire the reader with more confidence. The attempt is by no means unsuccessful. Moreover, attention is paid to the changing outlook on the requirements of the undergraduate in that the section on operative treatment is shortened and simplified, while more emphasis is placed on medical gynaecology. The chapter on neurasthenia and neurosis in relation to pelvic disorders deserves special mention. The illustrations are reasonable in number and generally adequate though individually varying in quality.

The student may wish for more on some of the common practical problems such as vaginal discharges and pruritus vulvae, but it is difficult to see how it could be supplied without increasing the size and price of the book—which would be a pity. As it is, the editors and contributors are to be congratulated on the way in which they have moulded advances in knowledge and modern trends in thought around the age-old essentials of gynaecology, and have still managed to keep it within small compass. For this as well as for other reasons it will undoubtedly find favour among large numbers of present-day students, as did its predecessors with previous generations.

T. N. A. JEFFCOATE.

Therapie der Kinderkrankheiten by Professor J. Siegl (Vienna: Wilhelm Maudrich, 1953. M. 32) is a product of the Vienna school of paediatrics and is volume five of a series on paediatric subjects. After an account of feeding normal infants, it goes on to discuss the treatment of diseases of the newborn, and then other disorders of childhood. An appendix lists certain drugs and prescriptions, and discusses dosage.

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CORTISONE AND BLOOD DISEASES

During the last three years A.C.T.H. and cortisone have been increasingly used in the treatment of blood diseases. Since quite large numbers of patients have now been treated,¹⁻³ it should be possible to form some sort of judgment on the value of these drugs. Only in acquired haemolytic anaemia of the auto-antibody type and in idiopathic thrombocytopenic purpura have favourable responses been obtained with any regularity. In other types of haemolytic anaemia, in agranulocytosis, chronic leukaemia, myelosclerosis, reticuloses, and in aplastic anaemia the drugs have given far less benefit, a favourable response being a rare and unpredictable event. The acute leukaemias occupy an intermediate position, for some cases in childhood will respond, even dramatically.

Before the physician undertakes the treatment of blood diseases with these drugs he should have gained experience of their general metabolic effects, for they may have to be given for long periods in large doses—for example, in adults up to 300 mg. a day of cortisone or 200 mg. a day of A.C.T.H. or its equivalent as A.C.T.H. gel in divided intramuscular doses. Most patients with acquired haemolytic anaemia of the auto-antibody type, whether "idiopathic" or secondary to some other disorder, respond favourably to treatment; some may obtain complete clinical and haematological remission. A.C.T.H. or cortisone therapy should therefore be the treatment of choice for acquired haemolytic anaemia, and splenectomy, which results in clinical cure in not more than 50% of cases,⁴ should be kept in reserve. If a patient responds to hormone therapy, it seems reasonable to reduce the dosage to the minimum amount that will prevent his haemoglobin level from falling below 11 g. per 100 ml. (74%). It is doubtful if it is worth trying to obtain normal haemoglobin levels by increasing the dosage to perhaps dangerous levels, for there is no evidence that A.C.T.H. or cortisone can cure the patient's disease. The aim should be to control the rate of haemolysis

in the hope that spontaneous cure will take place. In some cases treatment may have to be prolonged. In our opening pages this week Drs. G. M. Aber and G. N. Chandler and Professor S. J. Hartfall describe the follow-up of a child whose earlier history had been reported by Rose and Nabarro⁵; this patient (who had undergone splenectomy) still needed 75 mg. of cortisone a day 60 weeks after the beginning of therapy for the control of haemolysis.

The place of splenectomy in the treatment of acquired haemolytic anaemia needs to be reconsidered in the light of the favourable results of hormone therapy. Unfortunately there does not seem to be any way of telling beforehand which patients will do well after the operation; in particular, a favourable response to A.C.T.H. or cortisone does not necessarily mean that splenectomy will be successful, nor is the converse true. It is probably wise to postpone splenectomy either until it is clear that the patient will not respond to A.C.T.H. or cortisone in large doses and that his illness shows no signs of abating, or until it is clear that large doses of the hormones are required to control the patient's anaemia and that after months of treatment there are still no signs of a remission. In the latter circumstances, even if clinical cure does not result from operation, it may be possible to keep the patient well on smaller doses of A.C.T.H. and cortisone than previously.

As to idiopathic thrombocytopenic purpura, the situation is analogous to that of acquired haemolytic anaemia; most of the patients are benefited by hormone therapy whether the platelet counts rise or not. In acute cases cortisone or A.C.T.H. should be the treatment of choice, but when the disease is running a chronic course splenectomy will probably have to be undertaken sooner or later. The place of A.C.T.H. and cortisone in the treatment of acute leukaemia is more controversial. It seems that a favourable response may be expected only in acute or subacute lymphatic leukaemia affecting children or adolescents. In adults the chances of a remission are remote, and in children acute and subacute myeloid forms usually fail to react. According to Dameshek⁶ the best results are obtained if A.C.T.H. and small doses of aminopterin are given together. Unfortunately, even if remissions occur, they are always temporary, relapse inevitably taking place sooner or later. Most commonly the remissions last a few weeks; they seldom last more than four months. This raises the question whether treatment is worth while; on this crucial point opinions naturally differ. The simplest solution is to give children and adolescents suffering from acute leukaemia the benefit of A.C.T.H. or cortisone treatment. Unlike

treatment with anti-folic-acid drugs⁷ the consequences of overdosage are not serious and distressing; and, if remission follows, the parents of the patient may find that the respite has given them time to adjust themselves to a tragic situation.

TOO MANY DOCTORS?

The beginning of a new year is apt to prompt speculation on the future, and some thought is needed on what should be done about the ever-growing numbers of the medical profession in Britain. Against the hosts of applicants besieging their deans, the medical schools erect some sort of a barrier, with the result that during the last six years the annual entry of students to the medical schools of the United Kingdom and Eire has been between 2,500 and 2,700. The effect of this on the *Medical Register*, after some names have been removed by death and other causes and a few others added, has been to increase the total of registered medical practitioners by about 1,000 a year over the same period. Doctors seeking permanent positions are finding it more difficult than formerly to get the jobs they want, and the deans of the medical schools have a responsibility in relating supply to demand which they are at present compelled to exercise without sufficient knowledge of the country's needs. While the *Register* is likely to show at least the present rate of annual increase for the next five or six years, by virtue of the numbers of students now in training, the question whether these increments should be allowed to continue, and for how long, is surely an urgent one.

A fair approximation to the number of medical practitioners of all kinds in England and Wales and in Scotland may be obtained from the *Medical Directory*. This shows that in 1953 there was in England and Wales one doctor to every 900 persons and in Scotland one to every 600. These figures are of residents in the countries concerned, and do not attribute to Scotland those many doctors who qualify there but practise elsewhere. Some doctors whose names appear in the *Directory* have retired, and some whose names are not listed in it are yet in practice; the difference between these two numbers is unknown, but it is unlikely to be a large source of error in the final figures. In 1939, according to the same source, there were 37,429 doctors in England and Wales, while in 1952 there were 50,574. This is an increase of about 13,000, or 35%. In Scotland, the numbers rose over the same years from 6,091 to 9,096, an increase of about 3,000, or 50%. The *Medical*

Register tells much the same tale: between 1939 and 1952 the numbers for England, Wales, and Scotland rose from 63,360 to 83,914, an increase of about 20,000, or 33%. If this expansion continues, it will soon be impossible for some medical men to find work in Britain, and the scope for practice abroad is now much less than it was.

A year ago the Council of the B.M.A. accepted a suggestion made by the chairman of the General Medical Services Committee that the Committee should look into this question of supply and demand. A subcommittee was appointed, and it reported to the G.M.S. Committee on December 17.¹ Acknowledging that the task is complex and that national policy must be determined by the country's need for medical men and women, the G.M.S. Committee is recommending the B.M.A. Council to invite the Ministry of Health to co-operate in the setting up of a working party. The task of this new committee would be "to examine on a long-term basis and with the widest possible terms of reference the future number of medical practitioners likely to be required in all branches of the profession and to relate these needs to the intake of students to the teaching schools."

Some much-needed information could be gathered from such an inquiry, though there are two hazards to be avoided. The first is too great a preoccupation with details. Any attempt to lay down precisely how many doctors should fill any particular branch of the profession must be put out of court, for it is impossible to impose on the whole of medicine the sort of staff establishment that suits Government services. The expansion of medical knowledge in the past two or three decades has been reflected in a greatly altered distribution of medical men between the various branches of the profession, and such natural flexibility of response must be preserved. The second danger is delay. The numbers of doctors are increasing so rapidly that, apart from the obvious risks of overcrowding to the profession itself, doubts must arise whether the country ought to be spending its resources on training so many students—not in some years' time but this year and next. Even now deans of medical schools might well warn prospective students that competition for the more attractive posts is much keener than formerly—no bad thing—and also that to find any opening at all may be a competitive affair by the time they have qualified in six years' time. If the last six years may be taken as a guide to the next six years, and medical and general populations of England and Wales² estimated accordingly, the student starting his course this year and qualifying in 1960 will find only 800 people per doctor instead of the present 900.

¹ Dameshek, W., *British Medical Journal*, 1952, 2, 612.
² Medical Research Council Haematology Panel's First Report, *ibid.*, 1952, 2, 1261.
³ Medical Research Council Haematology Panel's Second Report, *ibid.*, 1953, 2, 1400.
⁴ Welch, C. S., and Dameshek, W., *New Engl. J. Med.*, 1950, 242, 601.
⁵ Rose, H. S., and Nabarro, S. N., *Arch. Dis. Childh.*, 1953, 28, 87.
⁶ *British Medical Journal*, 1953, 2, 825.
⁷ Dacie, J. V., *et al.*, *ibid.*, 1950, 1, 1447.

¹ See Supplement, p. 2.
² External Migration. Studies on Medical and Population Subjects, No. 6. General Register Office. H.M.S.O. 1953.

RETICULOENDOTHELIOSIS IN CHILDREN

The main, and often the only, justification for reporting a single case of an undiagnosed or hitherto undescribed condition is that similar cases may be recorded over the years. Eventually a clinical picture emerges sufficiently well defined to merit a name—usually eponymous, but this may be an advantage when aetiology or pathology is obscure. The syndrome associated with the names of Hand, Schüller, and Christian was evolved from descriptive case reports over a quarter of a century, starting in Philadelphia in 1893 with Hand's original description,¹ being embellished by Schüller's cases in Germany reported in 1915,² and returning to America for Christian's major contribution in 1919.³ At first thought to be localized to the skull and characterized by the triad of proptosis, diabetes insipidus, and radiological changes in the cranium, it is now appreciated that the condition is often more generalized and that the spleen, liver, lymph nodes, skin, lungs, and other parts of the skeleton may be implicated. The disease usually starts during the first decade of life and runs a variable course; but it has been described in adults, with a more favourable prognosis and with spontaneous regression and disappearance of the easily seen bone changes. The characteristic histological finding is localized areas of macrophage infiltration containing multinucleated giant cells loaded with cholesterol. Hence the condition has been termed lipophagic granulomatosis and, because of the associated xanthomata in the skin, was at one time classified with the xanthomatoses.

More recently another syndrome, associated with the names of Letterer⁴ and Siwe,⁵ has been recognized. This condition is characterized by a sudden widespread overgrowth of reticuloendothelial cells in the lymph nodes, spleen, liver, and marrow. The histological picture differs from that in the Hand-Schüller-Christian syndrome, the lesions being more diffuse and both giant cells and lipid scanty. Clinically the Letterer-Siwe syndrome is an acute fulminating illness of infants with fever, necrotic lesions of the mouth and pharynx, otitis, cutaneous haemorrhages, and a rapidly progressive anaemia. The picture is reminiscent of an acute leukaemia, but because of the septicaemia-like course it has been called acute infectious reticulosis, although there is little to indicate an infective aetiology. Some patients show features of both syndromes, with fever, lymphadenopathy, petechiae, anaemia, hepatosplenomegaly, and arthritis, and patients with the Hand-Schüller-Christian syndrome may present in the terminal stages with all the features of the Letterer-Siwe syndrome.

Yet more recently a third condition called eosinophilic granuloma of bone has been described.^{6,7} This usually occurs in late childhood or early adolescence, and is characterized by tumour-like destructive swellings of

bone, often single but sometimes multiple. A low-grade pyrexia and leucocytosis may be associated. The histological evidence suggests that these three conditions are variants of a single disease entity—rapidly fatal in infancy (Letterer-Siwe disease), chronic but liable to acute exacerbations in early childhood (Hand-Schüller-Christian syndrome), and fairly benign in later childhood and early adolescence (eosinophilic granuloma).⁸

The effect of treatment is difficult to assess because of the variable course of the disease. Eosinophilic granuloma and, in its more benign form, Hand-Schüller-Christian syndrome show improvement with x-ray therapy. In the more acute type blood transfusions, x rays, nitrogen mustard, and antifolic acid drugs have been used with more limited success. The Letterer-Siwe syndrome is usually rapidly fatal, although Aranson⁹ reports recovery in one infant after treatment with streptomycin. More recently Bass and her colleagues¹⁰ have described the response of five cases to cortisone and A.C.T.H. One infant with the Letterer-Siwe syndrome showed no improvement, but in four children with the Hand-Schüller-Christian syndrome there was regression of the splenic and lymph-node enlargement, remission of fever, and great improvement in their general condition. In one child whose state was similar to that seen in Letterer-Siwe syndrome A.C.T.H. proved life-saving. This type of response is seen in other conditions, such as acute lymphatic leukaemia, after cortisone or A.C.T.H. therapy, but is unfortunately short-lived. Similarly in the Hand-Schüller-Christian syndrome the improvement was only temporary in one case and the child eventually died. In the others hormonal treatment seemed to tide the children over an acute phase and allowed them to live long enough for a spontaneous remission to be manifest.

POST-OPERATIVE CHOLECYSTITIS

The surgeon often alleges most uncharitably that the worst place for a patient to have his peptic ulcer perforate is in the hospital ward of his physician colleague. However, he is not above criticism himself in overlooking the incidental surgical catastrophes which may infrequently occur in the immediate post-operative period. Of the hazards of the acute peptic ulcer, bleeding or perforating, he is well aware, and acute appendicitis may be obvious enough not to pass for long unrecognized. But there is one post-operative abdominal emergency of which he is likely to be unmindful namely, acute cholecystitis. There is nothing unusual in the clinical features of the disease to mislead him: the site and character of the pain and tenderness follow the usual pattern: it is only the timing which is so unexpected. Subhepatic abscess, subdiaphragmatic pleurisy, or a blown duodenal stump are diagnoses which may first present themselves, but this complication is by no means peculiar to abdominal surgery. In only six of Glenn's seventeen cases of this complication did the cholecystitis follow intraperitoneal operations,¹ and in three of the

six recorded by Sparkman² the abdominal parietes were not involved. A more recent communication³ has listed seventeen cases collected over a period of rather more than twenty years from the records of the hospital of the University of Pennsylvania. There were three deaths in this series and in each of them the diagnosis was established only at necropsy. Perforation of the gall-bladder occurred in four patients.

Perhaps during the period of anaesthesia and of the fast that usually follows the bile becomes stagnant and viscid. When later the gall-bladder is vigorously stimulated in response to the taking of food, obstruction and inflammation ensue, especially in the presence of stones. Certainly in a significantly high proportion of cases the first symptoms occur within 48 hours of the resumption of feeding. There can be no easy way of anticipating this complication. Even the palpation at laparotomy of what seems to be a normal gall-bladder is no guarantee against its later acute inflammation. But clearly surgeons should remember acute cholecystitis as an uncommon, though none the less serious, complication following operations for completely unrelated disease.

DIVERSITY IN DEVELOPMENT

In the half-century that has passed since the discovery of Mendel's work, Mendelian inheritance has been demonstrated so abundantly in living organisms that the chromosomes within the cell nucleus are apt to be regarded as the sole means of inheritance. Yet it has long been known that the chloroplasts of green plants are always derived from pre-existing plastids, and consequently their inheritance does not follow the Mendelian laws. In most flowering plants they are handed down to the next generation only from the female parent. More recently a few instances of such extra-nuclear inheritance have been found in micro-organisms. These are favourable subjects for genetic study, and, as Boris Ephrussi has shown,⁴ two distinct types of cytoplasmic inheritance are now known.

In one type—for example, the plastids of green plants and the "killer" character of *Paramecium*—the characters in question are determined by autonomous particles in the cell cytoplasm, which are irreplaceable if lost; and specific genes in the nucleus are required for the reproduction or for the physiological activity of the cytoplasmic particles. In the second type of cytoplasmic inheritance, shown by antigens in *Paramecium*, the characters in question depend on the action of nuclear genes, whose manifestation is controlled by the cytoplasm, which is itself influenced by the external environment. In other words, a cytoplasmic character permits the expression of one particular gene out of a number present. There is no evidence that in this type of cytoplasmic inheritance discrete extranuclear particles are involved, and it seems more probable that, under the influence of different environmental conditions, such as different temperatures, alternative but interacting reaction chains within the cell give rise to alternative stable cytoplasmic states.

These phenomena are interesting in themselves, but they take on a greater significance when compared with the process of differentiation into organs and tissues that is seen during the development of a living organism. Ever since the establishment of the chromosome theory it has been apparent that differentiation must originate in the cytoplasm. In no other way can differences between different cell-lineages arise, since mitosis distributes an identical set of genes to every cell. However, although genetically alike, the nuclei of different tissues may be functionally different. Indeed, it was long ago suggested that development consists in the orderly activation of different sets of genes in different cell-lineages. This is a remarkable parallel with the inheritance of antigenic types in *Paramecium*, where different cytoplasmic conditions call forth the activity of different nuclear genes. But, even if this is the mechanism of differentiation, there still remains the fundamental question of what initiates the cytoplasmic diversity during development. It is in the attempt to answer this question that profound differences of opinion exist at the present time.

Most geneticists favour the idea that the initial cytoplasmic diversity results from environmental stimuli external to the cell. The cytoplasmic diversity is thought to be similar in origin to the antigenic diversity brought about in *Paramecium* by the action of nuclear genes whose manifestation is controlled by the cytoplasm, this in turn being influenced by external stimuli. This hypothesis enables all cytoplasmic diversity (apart from structures known to be autonomous, such as the plastids) to be attributed to the functioning of different nuclear genes in different environments. But Ephrussi expresses a view which is revolutionary to most geneticists. He suggests that the initial cytoplasmic asymmetry of the egg cell reflects an underlying fundamental asymmetry at the molecular level. Furthermore, he thinks that this is inherent in the cytoplasm in the same way as the autonomous particles responsible for the "killer" character in *Paramecium*. Indeed, he goes so far as to suggest that the most fundamental characters of living organisms are inherited in the cytoplasm, and that the nucleus is concerned chiefly with the more superficial differences between individuals. Ephrussi's book is clearly written and he develops his ideas with great skill. Its appearance is salutary and it will give cause for thought on one of the most fundamental problems of biology.

THE FEEBLE-MINDED

The total number of mental defectives now under institutional care in England and Wales stands at 56,629. This figure includes 5,100 on licence, but excludes 2,385 in accommodation not vested in the Minister.¹ The number of patients awaiting admission in 1952 was estimated at 9,000, and of these 3,527 were considered to be urgent cases. Out of the latter figure some two-thirds were described as "low-grade children." Mental defectives occupy quite a large proportion of the total hospital beds in the country, and the long waiting-list is a serious

¹ *Nucleo-cytoplasmic Relations in Micro-organisms*. Oxford, 1953.

¹ Report of the Ministry of Health for 1952. Part I.

¹ *Trans. path. Soc. Philadelphia*, 1893, 10, 282.
² *Fortschr. Röntgenstr.*, 1915, 23, 12.
³ *Contributions to Medical and Biological Research*. New York, 1919.
⁴ *Frankfurt Z. Path.*, 1924, 30, 377.
⁵ *Z. Kinderheilk.*, 1933, 55, 212.
⁶ Otani, S., and Ehrlich, J. C., *Amer. J. Path.*, 1940, 16, 479.
⁷ Liechtenstein, L., and Jaffe, H. L., *Ibid.*, 1940, 16, 395.
⁸ Mallory, T. B., *New Engl. J. Med.*, 1942, 227, 955.
⁹ *Lancet*, 1951, 1, 889.
¹⁰ *Amer. J. Dis. Child.*, 1953, 88, 393.

¹ *Ann. Surg.*, 1947, 126, 411.
² *Ibid.*, 1952, 135, 863.
³ Schwegman, C. W., and DeMuth, W. E., *Surg. Gynec. Obstet.*, 1953, 97, 167.

problem; indeed, it has been referred to by the Minister as "problem No. 1." For the many medical officers of health and others concerned with making the best use of the beds available it will be some consolation to know that the first new hospital to be built in this country since the war is to be devoted to mental defect. On the other hand, it should be noted that 1,921 existing beds are out of use principally owing to shortage of nurses. In the present difficult circumstances the lack of adequate statistical information about the mental deficiency service is unfortunate, the previous reports of the Board of Control being now replaced, so far as mental deficiency is concerned, by a few lonely paragraphs in the general report from the Ministry of Health. The survey by Drs. N. O'Connor and J. Tizard published elsewhere in this issue is therefore welcome. It provides, together with the other information available, a basis for taking stock of the problem of the institutional defective. It also poses the questions whether we are making the best possible use of the existing hospital facilities, and whether enough thought has been given to the possibility of returning some of the long-stay cases to the community.

To those familiar with the problem it will not come as a surprise to learn that over half the patients in mental deficiency hospitals are classed as feeble-minded or that the average intelligence quotient in young adults confined in these institutions is above 70. The reason usually advanced for the continued detention of these patients is that they constitute a "social problem" group. In fact the survey suggests that social problem cases make up only a small proportion of the total. The spread of the intelligence and character of these individuals who have been classed as mentally defective overlaps very widely with that of the general population. Is the fact that a small proportion of patients certified as mentally defective are "difficult" an adequate reason for detaining for an indefinite period others who might become so? Unfortunately the survey does not provide information about the proportion of the total effort devoted to the care of the mental defective which is spent directly on social rehabilitation, though the figures of patients on licence have an indirect bearing on this. A survey devoted purely to this aspect of the problem would be certain to yield valuable results. Meantime it is already apparent from this survey and from previous work reported by the authors that a high proportion of patients in mental deficiency institutions are potentially employable in building, in factories, or in agriculture. A good case has now been made out for the employment of additional experienced social workers or rehabilitation officers in the mental deficiency hospitals specifically for the purpose of placing these patients in suitable employment.

HEALTH HAZARDS IN THE CHROMATE INDUSTRY

Chrome ulceration of the skin or of the nasal mucous membrane has for many years presented a serious industrial problem in every country where chromates are made or used. One of the earliest reports of skin lesions in the form of large penetrating ulcers of the

hands came from Scotland in 1827, and in 1902 the discovery in England by Sir Thomas Legge of a high incidence of perforated nasal septa among workers in a plant producing bichromate led to the setting up of a special code of regulations for the industry. Conjunctivitis, congestion of the throat, bronchitis, and acute toxic symptoms related to the digestive organs and the kidneys have also been noted as specific effects of exposure to chromates, but it is only rather recently that they have been indicated as a probable cause of lung cancer. The first report came from Germany in 1932 and was soon followed by many more, though neither the complete diagnosis of the neoplasm nor its connexion with chromate exposure was always indisputable.

The steadily growing suspicion of a carcinogenic hazard led the representatives of the chromate industry to request the Public Health Service of the U.S.A. to undertake an extensive inquiry into the problem, and the results have now been published.¹ The extent of the problem there can be judged from a comparison of the incidence of lung cancer in chromate workers with that in the general population, as exemplified in an x-ray survey of over 500,000 persons in Boston in 1949-50. This showed an incidence in the 897 chromate workers 32 times that of the Boston population at the age of 60-69 years, and 325 times as great at 40-49 years.

In Great Britain the problem of chrome ulceration has been met by statutory control, including periodical medical examination of workers in nearly all branches of the chromate industry. Most of the cases notified now are associated with chrome plating; the notifications from chrome tanning, dyeing, and finishing, for which Welfare Orders were made in 1918, have amounted to only two in the past five years. In 1951 there was an increase in all cases of chrome ulceration over those notified in 1950; this was largely accounted for by 80 cases occurring in the manufacture of bichromates.

There is certainly no such prevalence of lung cancer here as that indicated in the U.S.A. investigation. An inquiry in 1951 among 724 workers in the chromate-producing industry of Great Britain revealed only one case, a figure too small for a definite conclusion. It was then pointed out that the British process differs from that of both Germany and the U.S.A. in that the residue from the leaching tanks is not, in Great Britain, dried and crushed and used as a filler but is discarded in a moist condition and carried to dumps outside the factory. The residue, when crushed and recirculated, as is the practice in Germany and America, contains certain acid-soluble, water-insoluble chromium compounds, to which suspicion is directed in the U.S.A. report, though whether they are directly carcinogenic could not be established. The report recommends further research on the effects of all chromium compounds and, in the meantime, periodic x-ray examinations of all workers in the chromate producing industry.

¹ *Health of Workers in Chromate Producing Industry*, Federal Security Agency, Public Health Service, 1953.

CLINICAL PATHOLOGY IN GENERAL PRACTICE BLOOD GROUPING

BY

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Persons whose blood group needs to be known for medical reasons fall into three classes: blood donors, blood transfusion recipients, and pregnant women.

Blood donors are almost exclusively grouped by the National Blood Transfusion Service. Relatively small numbers are grouped by the Greater London Red Cross Blood Transfusion Service and by individual hospitals. It practically never happens that a donor has to be grouped or a sample taken for grouping other than at a large transfusion centre of some sort.

Apart from the most severe obstetrical haemorrhages, and uncontrollable haemorrhages due to accidental trauma, transfusions are never carried out away from hospitals. Such obstetrical and traumatic cases will, in general, be transfused with group O, Rh-negative blood by "flying squads" without preliminary grouping. Hence blood grouping of recipients is always carried out in hospitals or is done for them by the laboratories of the National Blood Transfusion Service. The same applies to the direct matching between the blood of donors and recipients.

The blood grouping of pregnant women is carried out for antenatal clinics by hospital laboratories or by the National Blood Transfusion Service, and the necessary samples are taken at the clinics. When a pregnant woman is not attending a clinic, her own doctor should arrange for the performance of the necessary tests either at the local hospital laboratory (as for other pathological tests) or at the Regional Blood Transfusion Centre. Local arrangements vary, but information about them can be obtained from the regional transfusion director or from the medical officer of health.

Collection of Specimens

For the tests a sample of blood of at least 5 ml., and preferably 10 ml., should be taken with a dry sterile syringe into a dry sterile tube. This relatively large volume is needed in order to supply enough serum for antibody tests. If the necessary syringe and tube are not available it is best to use a Behring venule* prepared without anticoagulant or preservative. It is perhaps worth repeating that to release the vacuum in a venule the needle should be bent further away from the axis of the tube, not brought into line with it. The alternative of a syringe kept in alcohol carries the well-known risk of transmitting homologous serum jaundice, but if it is used it should be rinsed several times in sterile physiological saline.

If a woman is found to have an abnormal antibody in her serum it may be necessary to test specimens from her husband and in some cases from their children. The specimen from the husband should consist of 2 to 5 ml. of whole clotted blood. Specimens from children may have to be obtained by pricking the heel, ear-lobe, or finger with a triangular needle. At least 10 drops of blood should be taken into a small dry sterile tube; some laboratories may, however, ask for such specimens to be taken into 3.2% sodium citrate or other anticoagulant.

Where there is a possibility of haemolytic disease of the newborn, it is necessary to carry out blood grouping and

*See the article by Dr. Martin Hynes on "Dispatch of Specimens," published on October 17, p. 876.

other tests on the blood of newborn infants. For certain of the tests (especially the haemoglobin estimation) a cord-blood sample is essential. As soon as the cord is cut and tied, 5 ml. of blood is taken with a dry syringe (or venule) from the maternal end of the cord and put into a tube containing dry oxalate or heparin. It is important to use a dry tube so as to obtain an accurate result in the important haemoglobin determination. A separate specimen without anticoagulant is needed for serological tests. Capillary blood from the infant is useless for haemoglobin tests if they are to be of prognostic value in haemolytic disease of the newborn. The blood should be taken by piercing the umbilical vein in the tied cord as though it was a subcutaneous vein. Any attempt to obtain blood from the open cut end of the cord is apt to lead to contamination with Wharton's jelly or even with maternal blood.

The ABO Blood Groups

The only tests which are performed on all (or nearly all) blood samples are those for the ABO groups and for the Rh factor or factors.

The ABO groups depend upon the existence on the red-cell surface of two substances or antigens known as A and B. Chemically they are very closely similar polysaccharides of high molecular weight, and the only clearly defined difference between them is that shown in agglutination reactions of the kind described below. All human red cells are classified into four groups—A, B, O, and AB—according to the presence on them of either, neither, or both of these antigens. These are detected by tests carried out with certain human sera containing antibodies in solution. When red cells carrying the antigen A are mixed with a serum containing anti-A, the surface properties of the red cell are altered in such a way that the cells stick to one another or agglutinate into large clumps. Cells carrying the antigen B react similarly with a serum containing anti-B. The antibodies in question are present in normal human sera: each serum contains all those antibodies which will not agglutinate the red cells present in the same blood. Thus anti-A testing serum is derived from group B blood, and anti-B serum from group A blood. The above facts are summarized in the Table.

Name of Blood Group	Antigens on Red Cell	Red Cell Reaction with Anti-A	Red Cell Reaction with Anti-B	Antibodies in Serum
O	—	—	—	Anti-A and Anti-B
A	A	+	—	Anti-B
B	B	—	+	Anti-A
AB	A and B	+	+	—

When any blood is tested it is necessary not only to examine the red cells by means of standardized anti-A and anti-B sera but also to test for the presence of anti-A or anti-B antibodies in the serum by the use of red cells known to be of groups A and B. Tests are in general carried out by mixing small quantities of the appropriate sera and red-cell suspensions in glass tubes. The mixtures are kept at room temperature for two hours before being examined microscopically. A working description of the technique of blood grouping is beyond the scope of this article and is given in the *Medical Research Council War Memorandum No. 9*.

In deciding what blood is suitable for a given recipient, the principal consideration is the absence of reaction between

the red cells of the donor and the serum of the recipient. Since high titres of antibody in the serum of the donor may also on rare occasions cause trouble, it is desirable always to give a recipient blood of his own group. In an emergency, however, group O blood can without great danger be given to anyone.

The Rh Factor

Every person, whatever his or her ABO blood group, is either Rh-positive or Rh-negative—that is, the red cells either contain or do not contain an antigen known as the Rh factor, or, more precisely, as the D antigen. The corresponding antibody, anti-Rh or anti-D, is not normally present in the serum of D-negative persons, but such a person, if transfused with D-positive blood or, in the case of a woman, if she bears a D-positive child, may become immunized by the D factor, so that an anti-D antibody develops in the serum. A subsequent transfusion of D-positive blood will then give rise to haemolysis and to a severe reaction. About 50% of D-negative persons receiving a single transfusion or course of transfusions of D-positive blood will become immunized. Of D-negative women who bear D-positive children, about 1 in 20 becomes immunized. It is thus important that D-negative persons, especially women, should, if transfused, receive only D-negative blood. The serum of D-negative persons who have been immunized to the D antigen will, under suitable conditions, cause *in vitro* agglutination of D-positive red cells. Such pathological sera are used in Rh blood-grouping of transfusion donors and recipients.

It is desirable also that the blood of all pregnant women be tested for Rh as well as for ABO. Two objects are in view: one is to be ready to transfuse should there be severe haemorrhage at the time of parturition; the other is so as to recognize the presence of immunization and so to be prepared for the birth of an infant with haemolytic disease. Every woman who is D-negative should therefore have her serum tested for the presence of anti-D.

Rh-testing procedures are complicated by the fact that the Rh factor is a complex entity, though most of its details have very little direct bearing on clinical medicine. Whatever other antigens may be or may become involved in the situation, however, all transfusion recipients who are negative for the D antigen, and likewise all pregnant women who are D-negative, are liable to develop anti-D. Thus a test of the red cells of all such persons should be made with anti-D serum: for nearly all purposes this single test is the only one that need be performed on the red cells.

The tests on donors are less simple and the extra tests mainly concern two other antigens of the Rh complex, known as C and E. Most D-positive bloods contain either or both of these antigens as well as D, and D-negative persons who develop anti-D are liable to make anti-C or anti-E as well. The transfusion of blood from a donor who is D-negative but C-positive or E-positive will of course be dangerous to such a recipient. Thus it is necessary after selecting D-negative donors with an anti-D serum to eliminate the relatively rare ones who have the C or the E antigen, by further testing with anti-C and anti-E sera. There is another antigen which may give rise to difficulties in the testing of donors, recipients, and mothers. It is known as D^a, and persons who have it are liable to appear D-positive when tested with some sera and D-negative with others. When the possibility of its presence is realized this is easily confirmed or disproved. Persons who are D^a-positive may be treated for clinical purposes as D-positive.

Tests for Rh antibodies in sera are carried out by means of red cells of known Rh groups. The sera of persons who are to be transfused may contain any of the antibodies already mentioned (anti-A, -B, -C, -D, -E), as well as other rarer ones which need not be described here. Even Rh-negative blood may react with some of these. It is therefore necessary before any transfusion to test the compatibility of the red cells of each donor with the serum of the recipient.

The methods of Rh testing and of direct matching are described in "The Rh Blood Groups and their Clinical Effects," by P. L. Mollison, A. E. Mourant, and R. R. Race (*Medical Research Council Memorandum No. 27*).

Planning of Blood Grouping

Only the principles and not the practice of blood grouping (including direct matching) are described in this article. It is of the utmost importance that it should be realized both by those who do blood grouping tests and by those who without adequate training may wish to do them, that, of all pathological tests, blood grouping carries the greatest responsibility: it is the one kind of test in which a single error may lead directly to the death of a patient. Thus no one who has not received a course of training in blood grouping should ever attempt to carry out such a test. Under emergency conditions, when the temptation to do the test will be the greatest, the danger of error will also be greatest. Rather should an irate pathologist be awakened from his bed and compelled to travel many miles to the hospital. Any doctor who is going to be completely isolated from laboratory facilities should obtain training in blood grouping just as he would in emergency surgery.

Instruction of house-officers and others in routine blood grouping and direct-matching techniques can be arranged through any regional transfusion director. While the house-officer untrained in blood grouping must never attempt to carry out the test, it is important that both he and his seniors should have an idea of what is involved in blood grouping and direct matching so that they can collaborate effectively with those who are doing the tests. It is agreed by most pathologists that adequate blood grouping and cross-matching tests require incubation for two hours. Hence, in the case of planned operations which may involve transfusion, a sample of the patient's blood should be sent to the laboratory well in advance of the operation, preferably some days before. Many laboratories have special arrangements for emergency grouping and direct matching by special methods which take about half an hour. Where such provision has been made emergencies are only very rarely so acute as to demand the transfusion of group O, Rh-negative blood into an ungrouped patient. Many so-called emergencies can be foreseen, and it must be realized that with emergency direct matching the possibilities of error, though slight, are appreciably greater than in normal tests.

In certain classes of surgery it is necessary that there should be available for each patient large quantities of blood which may or may not prove to be needed. In some cases the same bottles can be matched direct against the blood of several patients, but to save opening of bottles several times, and also possible confusion between the bottles intended for different patients, it is important that the routine of notification, sampling of patients' bloods, testing, and labelling of bottles should be carefully planned by consultation between the surgeon and the pathologist.

Interpretation of Rh Blood-group Tests

Cards bearing a statement of the ABO and Rh group are given to blood donors, to most pregnant women, and to a few transfused persons. On cards given to Rh-negative (D-negative) persons in the latter two classes there may also be a statement that the serum contains anti-Rh antibodies. A woman who knows that she is Rh-negative is likely to approach her doctor for information and advice about the possible effects on her children. If the husband or prospective husband is known to be Rh-negative as well, complete reassurance can be given. The shortage of testing sera is such that it is only in exceptional cases that a special test of the husband's blood can be justified for this purpose. In an Rh-negative woman who has never had a blood transfusion, the occurrence of clinical haemolytic disease of the newborn affecting a first pregnancy is practically non-existent, though slight immunization of the mother may occur. In the second pregnancies of Rh-negative women married to Rh-positive

husbands about 1 in 20 foetuses will suffer from haemolytic disease. The proportion of affected infants will increase somewhat with successive pregnancies. Once a woman has become immunized to the Rh factor all her subsequent Rh-positive children will suffer from haemolytic disease. If her husband is homozygous Rh-positive—that is, if he has received the Rh or D factor from both of his parents—then all the children will be Rh-positive (and therefore affected by the disease), whereas if the husband is heterozygous Rh-positive (having received the Rh or D factor from one parent only and the Rh-negative or d factor from the other parent) then any subsequent child has equal chances of being Rh-positive and affected or Rh-negative and healthy.

If any child of the couple is known to be Rh-negative this shows the husband to be heterozygous. Tests carried out on the husband's blood alone can never show with complete certainty whether he is homozygous or heterozygous, but they can do so with a high degree of probability. Where, therefore, an Rh-negative woman has become immunized to the Rh factor and there is a desire to increase the family, the Rh genotype of the husband should be determined. The necessary test requires the use of scarce and valuable kinds of antisera and can be carried out only at regional transfusion centres and a few other laboratories.

The above paragraphs have been written as though the Rh or D factor were the only one responsible for haemolytic disease of the newborn. In rare cases other Rh antigens, the A and B antigens, and antigens of other blood-group systems may be responsible. Where such cases are detected the medical officer in charge of the testing laboratory will readily give the necessary advice on such matters as prognosis for future pregnancies.

It is well known that Rh-negative persons should, in general, be transfused only with Rh-negative blood. If they have become immunized to the Rh factor by pregnancy or transfusion, any further transfusion of Rh-positive blood may be fatal. It is unnecessary to alarm such persons regarding their "condition," but they must be warned always to carry their blood-group cards and to proffer these when entering hospital for any reason.

Next article on Clinical Pathology.—"Investigation of Outbreaks of Infection," by Dr. R. E. O. Williams.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

OPHTHALMIC SURGERY IN INDIA SOME ENCOURAGING FEATURES*

BY

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A visit to India was organized in 1951 by Dr. R. U. Hingorani, an Indian ophthalmic surgeon practising in London. It was primarily a pleasure trip, a sight-seeing tour, but as the party was composed mainly of medical consultants and their wives, with a core of European ophthalmic surgeons, medical conditions aroused most interest, especially the efforts made to remove that great affliction of India, disease of the eye.

The amount of suffering in India is appalling, most of it preventable. This is not surprising, for there is a great shortage of trained medical personnel. A recent estimate states that there is only one trained doctor for

every 10,000 of the population, as against one for 900 in Great Britain. In addition, the doctors are poorly distributed, being congregated mostly in the towns. Facilities for the application of modern scientific medicine are lacking, and there still exists a good deal of native prejudice. Quacks abound. Some have a useful knowledge of Indian herbs and a skill in their application, passed on from father to son, but many indulge in superstitious practices concerned with the exorcizing of demons or the placating of evil spirits, practices which are often both crude and cruel. A man in any walk of life may pick up something about cataract extraction, set up in practice, and soon acquire a reputation as an eye specialist. Government intervention is not yet considered necessary, but it must come sooner or later.

Living Conditions

Poverty abounds. Most of our party had to revise their conception of the meaning of the word "poverty." In some of the refugee camps human beings were seen with scarcely a roof to cover their head. In the village huts we visited there was sometimes little else than some cooking utensils, a few fowls, and a receptacle to hold the family's supply of rice for the year.

With poverty go overcrowding and malnutrition. In the city of Bombay some 200,000 people sleep on the streets. This is partly a matter of choice owing to the heat, but is also partly due to the fact that many have little more than an accommodation address, a room which 20 or more people use to hold their worldly possessions while they eat and sleep on the streets.

Rice is the staple food; indeed, it is almost the only one, with resulting lack of balance in diet and deficiency disease. The fields given over to the cultivation of rice may provide excellent breeding grounds for mosquitoes and the spread of malaria.

A feature of Indian life that strikes the stranger forcibly is the lack of adequate attention to sanitation. Large cities like Calcutta still have open sewers in the streets, and cows are allowed to wander about unmolested even in the main thoroughfares. Some of the villages we visited were quite unprovided with streets, lighting, and sanitation, so that the spread of epidemics in the time of the monsoons can scarcely be avoided.

Finally, there is still to be found the secluded life of many women living in purdah. This system intensifies the lack of medical attention for women and children, and thus leads to needless suffering. A recent estimate gives the expectation of life for an Indian woman as 27 years as against 67 in Great Britain.

It is not my purpose to dwell on the lethargy, poverty, ignorance, and superstition of India. Rather do I wish to draw attention to some signs of an awakening to the need for action which is going on, particularly among Indian doctors. The Government also is becoming more alive to the need to do something to remove the great scourge of disease from India.

The most serious medical affliction is tuberculosis. Next comes eye disease; and here most authorities agree that at least 90% of it is preventable. I shall refer to one or two encouraging features in the ophthalmological field.

The Gandhi Eye Hospital

The Gandhi Eye Hospital is in Aligarh, a Moslem university town of 140,000 inhabitants, in the State of Uttar Pradesh (formerly United Provinces), 84 miles south-east of Delhi. The hospital has 100 beds, and plans to increase the number to 250. It began in 1928 as the private clinic

*A lecture delivered in the Department of Ophthalmology, University of Glasgow, on May 14, 1952.

of a public-spirited Indian, Dr. Mohanlal, who developed the work on a voluntary basis, and in 1941 handed over the assets to a public trust. Since then the hospital has been rebuilt, partly by voluntary subscription and partly by Government grant, and now stands on a new site covering 16 acres. With only 100 beds, extra accommodation has to be found sometimes for as many as 300 patients; and in winter some 500-600 patients may have to be provided for by means of extra tentage. Winter is the best time for cataract operation. In summer it is too hot, patients are restless, there is a constant battle against flies, and infection is more likely. In summer patients with diseases such as trachoma are more likely to find their way to the operating theatre. The hospital building is new and is provided with much up-to-date and expensive equipment. There are separate departments for refraction, radiotherapy, orthoptics and optical dispensing.

The staff consists of one chief medical officer, four ophthalmic surgeons, three assistant ophthalmic surgeons, two refractionists, one laboratory assistant, and several compounders, theatre assistants, and ward boys. Female nurses are conspicuous by their absence, for nursing is regarded as an unsuitable occupation for a girl of education or social standing.

The following figures show the yearly amount of work carried out:

New patients	..	..	20,000
Total patients	..	..	80,000
Refractions	..	..	5,000
Operations	..	..	6,000

The patients bring their own food and linen, with some-one to look after them. Those who are too poor (10%) get free food. Private patients are provided for; these pay 100 rupees (£7 10s.) for treatment and lodging.

The cataract operations in the height of the season number 60 a day. One surgeon generally operates, with three or four tables. The usual mode of extraction is the intracapsular.

The hospital is intended to be the centre for postgraduate study and for research. The most significant feature of this hospital, however, is its interest in rural work and its use of the mobile eye hospital. To appreciate the significance of this it is necessary to know something about the district in which the hospital is situated.

Uttar Pradesh is one of the most important States of India. It is right at the heart of the country—Hindustan of the old Moslem chronologists. It includes important cities like Agra, Aligarh, Lucknow, Allahabad, and Benares. Together with Delhi on the west and Patna on the east, it represents the area of the dawn of Indian history. There Brahminism took form; Buddha was born, preached, and died; the Mogul Dynasty had its most brilliant period; the Indian Mutiny took place, with the establishment of British dominion; and there also New India has more recently taken shape. The State has an area of over 106,000 square miles and a population of some 60 millions.

Before 1930 the facilities for the treatment of eye disease in this Province were meagre indeed. Eye cases tended to find their way to the district general hospitals, the State being divided into 51 districts. There they were seen by the civil surgeon, and treatment was mostly operative. At Agra and Lucknow there were medical colleges, each with an eye department, and at Allahabad there was a hospital where a limited number of eye patients were treated. In addition, in winter a well-known Indian eye surgeon used to hold eye camps where mass surgery was done. The great majority of eye patients were at the mercy, however, of village quacks or couchers.

Around 1930 in Uttar Pradesh there developed two eye hospitals, one at Aligarh and the other in Khairabad. This latter hospital has also recently been rebuilt, and is now at Sitapur. Both these hospitals set out to do village work, and in 1949 the Government approved of a State-wide scheme with them as base hospitals.

In the area allotted to the Gandhi Eye Hospital it is intended that in, say, 15 years each district will have an eye clinic in charge of a properly trained eye specialist. Meantime, however, a short-term policy provides for four mobile eye hospitals. Each of these will have 100 beds, a field operation theatre, and accommodation in tents for staff and patients. Except in the hill areas, work will be done mainly in winter. The hospital will visit one district for six to eight weeks and remain in one centre for, say, 20 days. There will be a permanent staff, with visits from the surgeon of the Gandhi Eye Hospital, and use will be made of Government medical officers and local eye specialists.

The proposed personnel will still be woefully short for such a vast area, but the step taken is considerable and is in the right direction. It will help to break away from outmoded and pernicious eye camps, which, while popular with the people and the Government, have not been run on scientific lines. It will provide for the treatment of eye disease apart from cataract. It will educate the people regarding the prevention and control of eye disease, develop an eye consciousness in school health administration, and break down much prejudice against scientific treatment.

At present eye disease and consequent blindness in the countryside are said to be increasing day by day, so this scheme is a welcome effort to tackle an enormous and serious problem.

Experience in Bombay Province

A well-known Indian ophthalmic surgeon has classified his colleagues into three groups: (a) mass surgeons, (b) scientific surgeons, and (c) occasional surgeons. That classification implies that mass surgeons are not scientific surgeons, and the statement was no doubt true when it was written. In recent years, however, there has been a growing concern in the highest quarters about mass-operation camps, and steps are being taken in some parts to place these camps on an irreproachable basis.

In Bombay Province, for example, the surgeons have become concerned about the advent of outsiders with a medical training, but no training in ophthalmic surgery, who stay for three or four days and conduct a large number of operations for cataract. The cases are then left in the hands of compounders and much sepsis results. In spite of their shortcomings such camps are welcomed by the people, who are often satisfied if they can see even a little again.

The ophthalmic surgeons in Bombay approached the Government to see what could be done, and at once received the challenge, "What can you do to help?" The outcome was the establishment of two camps yearly by the surgeons themselves—one in April and one in October—alternating between the northern and southern parts of the province.

A school or military barracks provides a suitable building for the requirements of the camp. When we visited the province in November one such camp had just finished at Pandharpur, and for some details I am indebted to Dr. Pradhan, of Poona, who took part.

The staff of this camp consisted of two senior surgeons, two assistant surgeons, three postgraduate students, and two additional surgeons from the district. One of the senior surgeons of Bombay was in charge.

An attempt was made to get all patients examined first by local Government doctors so that undesirable cases could be weeded out. When the camp began all the staff devoted the whole of the first day to seeing out-patients. Those with less than a certain standard (6/60 Snellen) were generally admitted. On the second day one-half of the staff operated in the forenoon while the other half saw patients; in the afternoon the order was reversed. Operations went on for four days and then stopped.

The patients were given a careful examination, attention being paid to teeth, lacrimal ducts, blood pressure, and urine,

and the usual dark-room investigation was done. On admission the patient was given a brisk purge; until operation the eye was washed and penicillin drops, 2,500 units per ml., were instilled three times daily. 5 ml. of milk was injected intramuscularly—a non-specific protein therapy which increases leucocytosis. On the operating-table penicillin drops were instilled and 50,000 units injected subconjunctivally in 0.5 ml. of solution before or after the operation. Sulphadiazine tablets were also given for four days. Forty-eight hours after the operation the eye was dressed; if it was satisfactory the other eye was left uncovered. The dressing was repeated every second day and dark glasses were given on the eighth day. Intracapsular extraction was generally done for immature and hypermature cataract; for intermediate types the surgeon used his own discretion regarding the best method of procedure.

This project is financed by the Government. Glasses are supplied free, lodging is free, and the patient's rail fare is paid if necessary.

The following is a brief summary of the work done and the results achieved:

Total No. of out-patients	..	..	3,372
" " " in-patients	..	..	845
" " " operations	..	..	1,084
" " " cataract operations	..	..	676

Of the 676 cataract operations, only 40 showed any post-operative complication, and only four eyes were lost—one from sepsis and three from intraocular haemorrhage. Such results would adorn the records of ophthalmic surgery anywhere.

A High Standard

The ophthalmic surgery is of a very high standard in the leading eye hospitals. In Bombay I had more time to see the hospital work than elsewhere, but members of our party had an opportunity of seeing similar work in Calcutta and Patna; and, as is well known, Madras has been an important centre of ophthalmic surgery for many years. The standard of cataract work in the leading eye hospitals in Bombay is very high indeed, and the results of the keratoplasty work are most encouraging. In a land where corneal opacities are so numerous there must be great scope for grafting, and it will expand in the near future if grafting material becomes more readily available. In Bombay research is being pursued with considerable success.

Eye surgery would seem to be handicapped at present by lack of personnel and lack of finance—both dependent, no doubt, on the general economy of the country. Another difficulty, and one which should be easier to overcome, is the apparent scarcity of surgical instruments of high quality. It should not be impossible to produce one or more Indian firms capable of manufacturing and maintaining ophthalmic surgical instruments adequate in quantity and quality.

Finally, it was a pleasure to meet with so many Indian colleagues, to discuss their problems, and to appreciate their work. There is still much to be done, and signs are not wanting that the magnitude of the task is appreciated and that a bright future lies ahead.

PRESENTATION TO PROFESSOR CHARLES SINGER

Professor Charles Singer has for many years been the leading historian in this country both of medicine and its allied sciences and of technology. When, therefore, the project was mooted of presenting him with a volume composed of a series of special contributions written by his friends and admirers, it met with an enthusiastic response. The responsible and difficult task of collecting and editing the contributions was undertaken by Dr. Ashworth Underwood, and to him must also be given the credit for arranging the various essays into groups having a similar theme or dealing with a definite period. The 90 contributors represent many countries, and the work has been published by the

Oxford Press in two excellent volumes, and entitled *Medicine, Science, and History*. It was arranged that specially bound copies of the two volumes should be presented to Professor Singer at Fowey, which is fairly near his home, and on December 19 the presentation took place at the end of a luncheon which was given in his honour. Among those present were his talented wife, Mrs. Dorothea Singer, Professor Gordon Childe, Professor K. J. Franklin, Dr. F. A. Freeth, Mr. Affleck Greeves, Dr. C. T. Andrews, Mr. Douglas McKie, Dr. Ashworth Underwood, and Professor Singer's son and daughter. The occasion was to have been presided over by Sir Arthur MacNalty, but in his unavoidable absence Sir Zachary Cope deputized for him. A special menu card had been prepared which included a photograph of Professor Singer and also sketches of the four places



(George W. F. Ellis, Bodmin)

Professor Singer receiving the presentation volumes from Sir Zachary Cope.

with which he had been most closely associated, while the different items on the menu had been given names which recalled many of the subjects on which he had written with authority. Dr. Underwood read out many messages of congratulation sent by friends who had been unable to make the journey to Cornwall. In making the presentation to Professor Singer, the chairman said that it was a unique occasion. Never before had any celebrated medical historian received in person such a noteworthy testimony of the high regard in which he was held by his contemporaries. He recalled that they were both alumni of St. Mary's Hospital medical school and that they had been house officers in the hospital together. In handing to Professor Singer the sumptuous volumes, Sir Zachary remarked that they were accompanied by the great respect, admiration, and affection felt towards him, not only by the whole body of contributors, but by a much wider circle of admirers over the whole civilized world.

Professor Singer, who was much moved by the occasion, said that it was the happiest day in his life. He commented on the factors which enabled him to accomplish what he had done. First the influence of his home, for his father was a great scholar and an erudite man, and from his earliest years he had lived in an atmosphere of learning. Among colleagues who had helped him he specially mentioned the late Professor Arthur Platt. He finally paid a glowing and affectionate tribute to his wife, Mrs. Dorothea Singer, who was not only a distinguished scholar in her own right but had inspired and helped him to an incalculable degree. This unity of endeavour was signally shown in his closing sentence: "We thank you from the bottom of our hearts."

Tributes were afterwards paid to their honoured guest by others who were present. Professor Singer is 77 years old.

Nova et Vetera

BIBLIOGRAPHY OF HARVEY

A Bibliography of the Writings of Dr. William Harvey, 1573-1637. By Geoffrey Keynes, M.A., M.D., D.Litt., F.R.C.S., F.R.C.O.G. Second edition, revised. (Pp. 79; illustrated. £2 10s.) London: Cambridge University Press. 1953.

Within living memory the art of bibliography has been refined far beyond anything previously attained. Certainly its recent practice by those with the suitable cultural and intellectual attainments, and, above all, with that indefinable thing called "judgment," has produced results which would have astonished their predecessors. Exact modern bibliography often enables the student to penetrate beyond the printed page to the very mind of the author treated. Among exponents of this art, Mr. Geoffrey Keynes has long been held in honour for the light that he has thrown on the life and work of such figures as Jane Austen, Donne, Sir Thomas Browne, William Blake, Hazlitt, John Ray, and Isaac Walton. This accomplished man has also applied himself to the work of William Harvey, who is in some ways an ideal subject for bibliography, since not a few of the editions of his several works are so rare that the number of surviving copies is approximately known and each copy located.

In 1928 Mr. Keynes produced a bibliography of Harvey in a very limited edition. It has long been out of print and a desideratum of scholars. This second edition, the scheme of which is faultless, is in even more sumptuous form. It follows the general lines of the first, but includes different illustrations, previously unrecorded editions, and a certain number of new facts. Of these the most interesting concern the printing and printer of the *De motu cordis*. It has always been a puzzle why Harvey should not have issued his great work in London, where there were many excellent printers, but at Frankfort-on-Main, with a young and not very competent printer, William Fitzer. The matter has been elucidated by Dr. Ernst Weil, who published his findings in 1944. They are linked with the life of Dr. Robert Fludd (1574-1637), a most peculiar figure who combined some understanding of the "new philosophy"—which we call "science"—with the wildest mysticism. The late Dr. H. P. Bayon threw some light on the relations of Fludd and Harvey. Mr. Keynes thus summarizes these researches:

"It seems that Fludd from 1617 had his books published by Johann Theodor de Bry of Oppenheim, formerly of Frankfort. In 1619 the firm returned to Frankfort, and in 1626, when de Bry died, the business passed to Fitzer, who then took over the publication of books by Fludd. Harvey had many contacts with Fludd beginning in their student days at Padua in 1602, and is exceedingly likely to have been influenced by him in choosing Fitzer as his publisher. Fitzer's career from 1600 to his death in 1671 has been fully elucidated by Dr. Weil but does not further concern us here. The choice of Frankfort, however, was certainly unfortunate, since its distance from London made communication difficult, and it seems to be unlikely that Harvey ever saw any proof-sheets of his book. Had they come under his eye he would hardly, even in those days of bibliographical insensibility, have passed so many errors in so few pages. It is probable that when the first copies reached him he was displeased, and sent Fitzer a list of errata as soon as he was able. A minority of the surviving copies of the book contain an additional half-sheet of two leaves, the first of which carries a list of 126 corrections. Probably these leaves were added only to the remainder of the edition, after the greater part had been distributed—even so the *errata* list was not long enough; the Latin text edited by Mark Akenside for the College of Physicians in 1766 contains 246 emendations."

Anyone who has tried to read Harvey's handwriting will spare a sigh of sympathy for his printer. It is in the mode to ascribe many qualities to the great father of modern physiology, but the hero-worshipper who will credit him with a clear neat script has yet to emerge.

CHARLES SINGER.

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Whither Anaesthesia?

SIR, At the summer meeting of the Section of Anaesthetics of the British Medical Association at Cardiff the subject of the morning session was "A Return to Simplicity?" and I think that the general feeling was that this discussion was timely, if not overdue. Since that date the tendency has been to greater and greater complication.

From a perusal of papers published in the British and French medical journals and those read at the Royal Society of Medicine it would appear that one line of thought now runs as follows. The over-enthusiastic use of hypotensive techniques to provide a bloodless field for surgeons has forced into prominence accompanying dangers. In order to minimize these, it was suggested that hypothermia would reduce the basal metabolic rate, so that such blood supply as remained would afford adequate oxygenation of vital structures. Unfortunately, hypothermia induced by superficial cooling in patients who are sedated or lightly anaesthetized without complete relaxation results in a violent reaction, including shivering, etc., designed to keep the temperature up and to raise the B.M.R. In order to circumvent nature still further, it appears to be necessary to avoid surface cooling (in adults) and to effect the temperature drop by an extracorporeal arteriovenous shunt passed through a refrigerator. If this complicated technique is to be avoided an intravenous infusion of various "lytic cocktails" can be substituted. These may contain a great variety of drugs (some French workers use twelve), including at least two which have not yet been fully worked out as regards their pharmacological effects. It is hardly surprising that patients take a considerable time to recover from these varied assaults, and an impression is beginning to gain ground that pulmonary complications and paralytic ileus are more frequent than with orthodox techniques.

I would be the last to decry real research into anaesthetic methods capable of coping with, say, intracardiac surgery with a shut-off cardiac inflow, but these complicated techniques are being used on some patients undergoing routine surgery which can be dealt with by well-tried and simple methods. Surely the correct and scientific approach to any problem is to investigate it one step at a time. For example, if it is thought that intravenous chlorpromazine is likely to be a useful drug to diminish the B.M.R., to facilitate cooling, to potentiate anaesthetic drugs, or to minimize post-operative vomiting, then it (and it alone) could be added in a series of patients undergoing routine operations, all other anaesthetic and surgical factors being kept the same, so far as practicable, as with a previous controlled series. If significantly beneficial results follow, the optimum dosage could be worked out and the next step embarked upon. If, on the other hand, complications such as venous thrombosis were noted, they must either be overcome or the decision would have to be taken whether the advantages of the drug outweighed its disadvantages. As matters stand at present, groups of workers all over the country appear to be giving large numbers of drugs of diverse actions in various dosages, and in an infinite variety of permutations and combinations with such other procedures as induced hypothermia and hypotension. The results of small series of cases are then rapidly published in terms which are often obscure. For example, what are the definitions of ganglionic and neuroplegic drugs, and is artificial hibernation an accurate term when the differences between hibernating mammals and non-hibernators are considered? Is it any wonder that the student and, indeed, the experienced anaesthetist is becoming bewildered? I am, etc.,

London, N.6.

C. LANGTON HEWER.

Correspondence

Press Publicity

SIR,—What a silly and sanctimonious little piece was that contributed to your issue of December 19, 1953 (p. 1378), by Miss B. M. Willmott Dobbie. "Journalists, of course, have their living to earn." Surgeons, too, I fancy.

Of course, vulgar reporting of medical matters is to be deplored and is deplored by none more so than by responsible journalists. But part, at least, of the blame must be attributed to such superior persons as your correspondent who fail to co-operate in enabling journalists to present simply and factually the more remarkable achievements and advances in the art and science of medicine.—I am, etc.,

JOHN PRINCE.

London, E.C.4.

Intra-arterial Transfusion

SIR,—It appears to me that the success of intra-arterial transfusion depends upon what is called the hydrostatic paradox, which states that "any quantity of water however small may be made to counterbalance any weight however great." This is brought about by the fact that in a liquid great pressure is transmitted equally in all directions, and consequently the pressure on any given surface is proportional to the area of that surface. From this it follows that, if the pressure in a narrow artery is raised by the injection of fluid under pressure, the pressure in the wide aorta is in proportion to the differences of their sizes. This is considerable, even allowing for the loss of efficiency in the hydrostatic system occasioned by leakage into the arterial tree.

The repercussions of raising the intra-aortic pressure are manifold—perfusion of the coronary arteries, oxygenation of the tissues, take-up of blood from the venous bed, filling and emptying of the right heart, leading to increased efficiency of the cardiovascular system, etc.—and are amply illustrated in the reports of successful intra-arterial transfusion.

I submit, therefore, that, rather than continuous intra-arterial transfusion under pressure, it is more rational to apply intermittent intra-arterial injection until the take-up of blood from the venous bed is established in cases of shock, or from intravenous blood in cases of haemorrhage.—I am, etc.,

J. SHEGOG RUDELL.

Northampton.

SIR,—The observations made by Dr. J. A. G. Horton and his colleagues in their article "Intra-arterial Transfusion" (*Journal*, December 12, 1953, p. 1294) are very instructive.

May I point out in this context in favour of intra-arterial transfusion that the whole principle may be looked upon as a second cardiac system, operating outside the body, feeding the whole arterial system with oxygenated blood directly under pressure when it is utterly impoverished, and thus filling adequately the coronaries and increasing the vis-a-tergo, improving the capillary stasis. In addition, the greatest advantage of this route is that it excludes the pulmonary circuit, which is definitely a retarding factor in the effectiveness of a transfusion through the venous route before the blood reaches the left heart. Thus, the more the patient is shocked, more rational it will be to choose the arterial route for transfusion for its immediate dramatic effect.—I am, etc.,

R. CHAKRABARTY.

Braintree, Essex.

Polycythaemia Vera

SIR,—A patient may be said to have polycythaemia (rubra) if the red cell component of the blood of his whole body is decidedly in excess of the normal. But why should one call it polycythaemia vera (true polycythaemia) as if there were such a condition as false polycythaemia (pseudo-polycythaemia)? How can a polycythaemia be false, unless the patient or someone else has injected into his blood the stream a substance imitating haemoglobin? Of course, the term "polycythaemia vera" was intended to mark a distinction from secondary polycythaemias, reactionary results of high altitudes, or malformations or diseases of the heart or lungs. But all such secondary polycythaemias are as

real polycythaemias as so-called polycythaemia vera. Clearly, by the term "true polycythaemia" (polycythaemia vera) a condition of primary polycythaemia is meant—that is to say, polycythaemia of unknown origin, perhaps of neoplastic (or rather "neoplastic") nature, and not secondary to any known cause. In discussions on the subject I occasionally drew attention to this question, but mostly ignored it, in order not to turn an interesting discussion into one of nomenclature.

In nearly all genuine cases of primary polycythaemia there is an increase in the white cells at the very least in proportion to the increase in the red cells; this is a reason why the word "rubra" may be (as it usually is) omitted.—I am, etc.,

London, N.W.1.

F. PARKES WEBER.

Succinylcholine Chloride for Casualty Anaesthesia

SIR,—I should like to comment on Dr. V. P. Wordsworth's first point in your issue of November 28 (p. 1219). The lower end of the oesophagus is controlled not by an intrinsic but by an extrinsic sphincter mechanism which is composed of three elements, first, the pinch cock action of the right crus of the diaphragm which forms the margins of the oesophageal hiatus, secondly, the sharp backward angulation of the lower end of the oesophagus caused by the contraction of the crura, and, thirdly, the acute angle of entry of the oesophagus into the stomach at the cardia. As the crura contain striated muscle Dr. D. C. Adamson's observation in your issue of October 31 (p. 993) that the cardiac sphincter relaxes during oesophagoscopy when succinylcholine is given would appear to be a correct one and is due to the property of the drug in question.—I am, etc.,

Hull.

W. N. ROLLASON.

The Human Foot

SIR,—It was greatly encouraging to those whose approach to foot problems is not that of the surgeon to see two non-surgical papers on foot disabilities appear side by side in the *Journal* (October 3, pp. 745 and 749). The ensuing correspondence has shown how lively an interest is taken in this subject by readers whose thoughts are not bound by acceptance of clinical entities nor harnessed to therapeutic conditions that should be preventable. But, Sir, having read the two papers and studied the material they offer with some care, I venture to ask how far have we been enlightened? Was this type of study in fact calculated to enlighten at this stage? Do the kind of questions both papers put to themselves—at enormous cost of time and labour—tell us anything that we did not know before?

It would be possible to discuss some of the evidence presented—I refer particularly to Dr. Doris Craigmile's paper (p. 749)—in slightly less serious vein. Reading the mass of assembled figures, I longed for a Mr. Schwartz on Sunday to spill them, big and small, into the air like soap-bubbles, juggle with them or let them fall in cascades of glistening fragility, and then return us to the real problems—to what is in fact a major social problem of this day. Not, however, being a Mr. Schwartz, may I put my queries in the form of a few direct questions?

Did we or did we not already know that foot deformities show an undesirable prevalence in early life? Do we or do we not agree that they take an undesirable toll of the comfort and energies, not to say looks, of the community of most Western populations? Are they not in fact costly? Do we or do we not believe that they are not congenital and, since they are eventually disabling, that it is our duty as a profession to prevent them, when our knowledge is great enough? Do we or do we not accept that certain deformities—differing only in degree, not in kind—are more common in adolescent girls and women than in males of the same age? Did we have to be informed that in old age, in a period of major tissue change and degeneration, symptoms mount, and are likely to mount, in both sexes (pace Dr. Craigmile's old ladies, who lose their bunions at 60) and assume new shapes and guises as a greater fraction of the anatomic complex—osseous, ligamentous, nerve, muscular and vascular tissues—is involved?

None of these things, I submit, requires laborious exposition, or analysis, at this stage. The relation between height, weight, and alterations in foot size (D. Hewitt *et al.*, p. 745) is far better

tackled, I would suggest, by insisting on the need for foot measurements every time new shoes are bought (at any age) than by demonstrating what is rational and manifest. Educate the public and the public will, in general, respond.

We, on the contrary, should get on with the problem of the proper protection of the child from early youth into the more mature periods of life, in which new and un-understood factors are unlikely to erupt unbidden, but in which old stresses will begin to show cumulative effects until eventually, in old age, the declension of the entire being causes a calling-in of mortgages, an auditing of all the outstanding accounts of preceding years, that may transmute the clinical characters of what started as a local traumatic lesion. In general, foot deformities are traumatic lesions. Let us deal with the trauma.

If the two studies have provided no major enlightenment, do any points emerge on which further questions arise? I found the following: (a) Some negative evidence in the matter of heel heights and disability—a point still fully open to discussion. (b) Some negative evidence on the inadmissibility of varus metatarsus I as a factor contributing to deformity, the chief point being its apparent tendency to "recede," in both sexes, between the ages of 5 and 15 years. Was this information confirmed by x-ray examination? (c) A failure to observe annual, as opposed to month by month, fluctuations of growth in the feet of the two sexes that might have contributed positive evidence of the effects of specific periods of growth: in particular, a failure to check the effects, if any, of the peculiar spurt of growth manifested by children's feet in the sixth year of life. (d) Some negative evidence, worth clarifying further, on the effects of specific periods of growth on foot deformity—i.e., the considerable increase in cramping of the toes observed by Dr. Craigmille in girls coincidentally with the "third springing-up period" (11-12 years) which comes two years earlier in girls than in boys. (e) A considerably higher rate of valgus ankles in boys than in girls, declining steadily in boys during the school-age period. Could this derive from the later ossification of the secondary epiphyses of the os calcis in boys—at 8 years as opposed to 6 in girls? Does this symptom, very prevalent in both sexes in pre-school life, hinge partly on the presence or absence of the tubercles, of which the posterior medial is the largest, that develop on the lower surface of the os calcis, enabling it to maintain its even keel? How far is the whole symptom of valgus ankles in early youth linked, *inter alia*, with the practice of having a flat, upper heel surface in the shoe, which does not correspond with the inclined plane of the lower surface of the os calcis, minus its tubercles? (f) Some very interesting observations on pes cavus in males at all ages. Has this symptom (I use the word advisedly) ever been related to nervous tensions? Has anyone ever examined statistically the frequency of pes cavus in mental patients of both sexes?

Some bubbles after all sustained their flight! But I revert to my thesis that the work of the future lies with the feet of the children, and with a study of physiology rather than pathology.—I am, etc.,

MARGARET EMSLIE.

London, W.1.

REFERENCE

¹ Harris, H. A. (1947). In *Child Health and Development*, edited by R. W. B. Ellis. Churchill, London.

SIR.—For many years I have been conducting experiments on wear and shrinkage of men's socks, as it had become apparent that many minor disorders of the forefoot were directly attributable to the compression of the toes by hosiery. Among the types tested were the oily woollen fishing socks which are readily available in towns on the West Coast of Scotland, and, although these socks were satisfactory from the aspect of wear and minimum shrinkage, they are rough in texture and quite unsuitable for town wear, although they are remarkably satisfactory for long-distance driving provided there is adequate room in the shoes to accommodate their bulk.

The most unsatisfactory types under test were all-wool hand-knitted socks, which show quite remarkable shrinkages (up to 30%) although they are washed with great care, while the manufactured socks stamped "guaranteed unshrinkable" give some loss of length and girth. Wool and rayon, and wool and nylon reinforced, socks had little or no advantage over the pure wool or wool and cotton mixtures; cotton socks rapidly became harsh and uncomfortable in wear.

On May 13, 1952, I purchased three pairs of 100% spun nylon socks, and one pair was retained as a control while

the other two pairs were worn on alternate days until the end of June, 1953. Each sock was worn and washed 200 times and each was subjected at various times to soaking or boiling in 20% "lysol," 5% "dettol," as well as soaking and boiling in almost every available proprietary washing powder and detergent. The texture of the material has remained very good for 18 months; there has been no breakdown in texture, no holes have appeared, and the length and girth of the test socks still remain identical with the unwashed control socks.

I was surprised to find that the socks were as cool as the same weight of cashmere sock in the summer, and at least as warm as the same weight of woollen socks in the winter, and I was not conscious of cold feet even while driving an unheated 1939-model car. A very notable feature was the quite extraordinary amount of dust or grime in the washing water at each washing. It appears that dirt is much more easily removed from nylon material than from wool, and I feel that these socks would be useful for patients suffering from hyperhidrosis and bromidrosis in particular, and from other skin conditions where cleanliness of the skin of the feet is essential. Several of the commercial washing powders will remove ointment bases from the nylon.

Subsequent tests have shown that daily washing of the socks gives the most satisfactory results, as three, four, or five intervals produce a temporary hardening of the foot of the sock, something like the hardness found in cotton material. As I give quite a number of talks on "foot care" to women's institutes each year I have been a little amused to discover that none of the members (among whom there are many ardent knitters) has been able to identify the spun nylon socks, and these women, who are usually knowledgeable about materials, were surprised to find that the socks were not pure wool.—I am, etc.,

London, S.W.1

C. F. KEMP

Hypothermia

SIR. Your leading article on hypothermia (*Journal*, December 5, p. 1256) interested me considerably, for, as I pointed out some years ago,¹ and probably many others have realized it too, there are many points in common between the action of cold and morphine. Both reduce the body temperature, both depress respiration, and, especially, both reduce the demands of the tissues for oxygen—that is, slow metabolism. Morphine, of course, has also marked effects on the central nervous system, but these are, on the whole, entirely beneficial in anaesthesia. It would seem right therefore to point out that in giving morphine before anaesthesia we are, in some degree, actually achieving some of the advantages claimed for hypothermia. The problem is, How far can we go and what can be done to prevent the obvious possible dangers of increasing the dose of morphine?

In the article quoted I mentioned the case of a missionary in India who had tried to put a woman in the bush out of her misery by giving her an overdose of morphine, only to be greeted by her some years later as the man who had saved her life. I recall, too, a girl who was apparently dying of general peritonitis after an operation (this was in 1915) to whom the house-surgeon, confusing liquor morph. with the injectio morph., gave ten times the dose he had intended. He spent a most uncomfortable weekend while the girl slept solidly, but on the Monday his chief was surprised to find her so much better and she eventually recovered. No doubt many other stories of the life-saving power of morphine might be cited, and no less of unexpected fatalities.

If morphine is to be used for these often unconsidered effects I think we must realize certain things. First of all, its benefit is often mainly due to the fact that it diminishes the tissue demands for oxygen, and if after giving it we persist in trying to maintain the body temperature by hot-water bottles, etc., we are inevitably increasing these demands and so undoing the benefit we may otherwise obtain. It is, indeed, questionable how right we are physiologically in trying to keep up the temperature of a patient during operation if he has had morphine previously. It might be safer to let the temperature drop a little, for the traditional prevention of shock after an anaesthetic by keeping the patient warm was established, as I know, before premedication was at all common. Furthermore, later studies—long after my day—of

electrolyte balance, etc., after operation have shown what a baneful effect fluid loss has; and maybe our present technique is unconsciously increasing this.

The next thing is that morphine undoubtedly depresses respiration. Now Barcroft's work,² to which I referred in a letter recently (*Journal*, August 29, p. 510), showed that in the foetus (and the same probably holds throughout life) asphyxia progressively alters the source of the respiratory rhythm from the respiratory centre itself to lower and lower portions of the C.N.S., and that these respond, not to oxygen lack, but to external or internal stimuli. He pointed out that one of these stimuli is certainly muscle tone, and with the increasing use of muscle relaxants it is clear that this source of respiratory stimulus is diminished or abolished. It is therefore of the utmost importance that any patient who has had morphine should be ensured of an abundant supply of oxygen if normal respiration is to be maintained.

The last point I make is that we have now at hand many agents which can, in case of need, counteract some of the dangers of morphine therapy. As you pointed out in an annotation (*Journal*, August 8, p. 329), the newly introduced N-allyl normorphine has in some unknown way the power of rapidly counteracting the depressive effect of morphine on the respiratory centre. Chilling is not, of itself, a cause of infection, for infecting organisms all multiply very much faster at higher temperatures, but penicillin (and possibly other antibiotics) should prevent chest complications, for the shallow respiration of morphine narcosis is not, *per se*, a cause of congestion or atelectasis; in fact cardiac action, and so the circulation, is probably relatively improved rather than diminished by morphine.

This last statement is, I think, substantiated by the life-saving properties of morphine in cases of coronary thrombosis—not that I am here belittling in any way the effect of the anticoagulants. The question does arise, however, whether when we have given morphine to such cases we do the best for them by keeping them warm, or whether they would not really have a better chance of recovery if we allowed their temperatures to fall to, say, 96° or even 95° F. (35.6° or 35° C.), as in fact it naturally does unless we take measures to prevent it. Admittedly all these points are hypothetical, and perhaps highly controversial, but I think they do arise and that modern treatment might possibly be improved if they were answered, or at least were present in the minds of those who undertake to teach it.—I am, etc.,

Winsted, Cheshire.

W. N. LEAK.

REFERENCES

- ¹ *Practitioner*, 1945, 155, 171.
- ² *British Medical Journal*, 1939, 2, 986.
- ³ *Researches on Pre-natal Life*, 1946. Blackwell, Oxford.

Infected Urine

SIR.—The article by Mr. Cuthbert Dukes (*Journal*, December 5, p. 1262) on infected urine in the series "Clinical Pathology in General Practice" has been greatly appreciated, but it is felt that it is concerned more with the examination of urine in the laboratory rather than in the surgery or even the clinical sideroom. It is regretted that Mr. Dukes did not deal more fully with the examination of the urine for pus. Usually this is the first, and perhaps the only, test that needs to be done by the general practitioner when faced with a suspected case of renal tract infection. For this purpose, as Mr. Dukes mentions, microscopy is essential, and it is agreed that "the simplest and quickest" way of doing this is by examining a measured quantity of urine, using a counting chamber (an ordinary blood counting chamber may be used if a Fuchs-Rosenthal is not available). Not only is the counting chamber method to be recommended because it is easy to do, but it is also much more useful than the microscopic field counts method, for it avoids its ambiguity and detects small but significant quantities of pus that otherwise would be missed. The interpretation of microscope field counts of pus cells can be very confusing, as the range of normal excretion cannot be determined precisely since the method is so inaccurate and the quantities of urine examined are variable. On the other hand, Mr. Dukes himself has ascertained the limits of normal excretion of pus cells measured in a counting chamber for uncentrifuged urines from adults,¹ and I wish he had emphasized the value of this method.

Recently observations have also been made on children of all ages² using the counting chamber method. Briefly, it appears that in males and catheter specimens from females urines usually contain less than 50 cells per c.mm., between 50 and 100 cells is suspicious, and over 100 abnormal. In females contamination may occur, but over 500 cells per c.mm. indicates probable infection.

Finally, Mr. Dukes has not mentioned the need for repeated urine examination in a suspected case of renal tract infection. Both pyuria and bacilluria may be intermittent. The diagnosis of renal tract infection cannot be ruled out on the evidence of a single specimen of urine which is normal.—I am, etc.,

Durham.

J. M. STANSFELD.

REFERENCES

- ¹ *Proc. roy. Soc. Med.*, 1928, 21, 1179.
- ² Stansfeld, J. M., and Webb, J. K. G. (1953). *Arch. Dis. Childh.*, 28, 386.

Unwrapping the "Journal"

SIR.—May I recommend to the attention of your correspondents the following method of resection of the wrapper of the *British Medical Journal*?

An ordinary dinner knife is required. With its aid the free ends of the leaves of the *Journal* are located at one end of the package, and the knife is gently inserted so that it lies between the leaves, with its sharp edge pressing against the wrapper. The knife is then pushed, with a saw-like motion, to the other end of the package, cutting the wrapper as it moves. By this method the *Journal* can be shelled out, like a sebaceous cyst, with minimal laceration both of the operator and of the pages. We in this college would not recommend the attempt without the use of what Dr. Lyndhurst Duke (*Journal*, December 12, p. 1326) describes as a special implement, any more than we would recommend an appendicectomy performed with the bare hands.—I am, etc.,

London Hospital Medical College.

STEPHEN BUTTERWORTH.

A Cosmetic Amputation

SIR.—When those who are amongst the acknowledged leaders of our profession express opinions, these opinions are likely to have a wide hearing. It is therefore unfortunate that opinions which may be controversial should be expressed as *ex cathedra*, as they may then be accorded full and indeed overriding authority. It is particularly unfortunate when the vexed questions which arise in assessment of disability for the purposes of insurance are made the subject of opinions expressed in this way. For these reasons I consider Sir Heneage Ogilvie's letter (*Journal*, December 12, 1953, p. 1322) to be regrettable.

My experience of amputation of the index finger or of the little finger is that many patients are more comfortable and are less functionally disabled if the distal part of the metacarpal is removed. It is not my experience that the movement of the adjoining finger is limited if the amputation is performed in this manner, nor that the occurrence of painful neuromata is more common if the associated metacarpal is removed; indeed, I think it is less so. It is a fact that, if the metacarpal is removed, the scar of amputation can be placed dorsally where it is free from the impacts which fall on the palm or upon the terminal projecting stump which must result from disarticulation of the finger without removal of the metacarpal. The only patients who are adversely affected by lack of breadth of the palm are those engaged in the gripping of heavy objects with large handles such as picks, shovels or heavy hammers, and not all of them are. Those who are working with machinery commonly find the metacarpal stump a considerable nuisance, and indeed often return asking to have it trimmed.

I propose to continue to remove the index finger with the removal of the associated distal part of the metacarpal in most patients requiring this amputation.—I am, etc.,

Edinburgh.

IAN LAWSON DICK.

Chronic Gastric Ulcer

SIR,—Your statement in your leading article (*Journal*, October 17, p. 871) that "in ordinary clinical practice the combination of careful radiology, aided when necessary by gastroscopy, can safely distinguish between them [benign gastric ulcer and early, ulcerating gastric cancer]" is a most remarkable one, and seems to me to require examination and comment.

The phrase "in ordinary clinical practice" is not clear to me. Do you mean by "ordinary" a practice in which the bulk of the patients are just average, run-of-the-mill citizens—perhaps with their medical fees prepaid through taxes—or a general practice, as distinct from one limited to gastro-enteric diseases? The inference that you are referring to some sort of *milieu* in which no very great degree of exactness of diagnosis need be aimed at seems virtually inescapable to me. I trust I have not understood you correctly.

I do not understand, certainly, your implication that the comparative unlikelihood of malignant degeneration in a benign gastric ulcer (which is admitted by most workers, I am sure) contravenes in any way the belief of "many workers in the U.S.A." that "a gastric ulcer carries a 10% chance of malignancy." The word "But," initiating this sentence, seems quite gratuitous. The only thing wrong with your statement about the American workers is that the figure given is too low. Lampert, Waugh, and Dockerty¹ found 13% of 550 radiologically and clinically benign gastric ulcers to be malignant histologically. Allen² found 14% to be malignant under the microscope. Smith and Jordan³ at the Lahey Clinic found 21% of apparently benign gastric ulcers were actually early gastric cancer. Banks and Zetzel⁴ found that 8 of 48 cases of chronic and apparently benign gastric ulcer died of carcinoma.

I know of no radiologist, nor any gastroscopist, who believes he can say with assurance of any ulcerating gastric lesion that it is definitely not a carcinoma. As long as any such statement has to be prefaced with "probably," the decision should be left to the pathologist—quite apart from the fact that about one out of four victims of truly benign gastric ulcer receives any lasting benefit from medical treatment.—I am, etc.,

Hawaii.

HARRY L. ARNOLD, jun.

REFERENCES

- ¹ *Surg. Gynec. Obstet.*, 1950, 91, 673.
- ² *Surgery*, 1945, 17, 750.
- ³ *Gastroenterology*, 1948, 11, 575.
- ⁴ *New Engl. J. Med.*, 1953, 248, 1008.

* We meant by the words "in ordinary clinical practice" to indicate general or special practice in places where diagnostic facilities are available in hospital or clinic.—ED., B.M.J.

Hexamethonium in Acute Pancreatitis

SIR,—In view of the interest aroused in the article by Mr. Russell Davis, Mr. F. T. Moore, and Mr. D. Wynn-Williams (*Journal*, December 5, p. 1251), it may be valuable to record our experiences in this subject. In 1949 we concluded that if hexamethonium would abolish the secretion of hydrochloric acid and inhibit gastric motility for three or four hours it would also serve to diminish or even abolish the production of secretin by the duodenal mucosa. If this proved to be the case, it should then be of value in pancreatitis purely from the point of view of resting the gland. With this in mind, we tried to assess its activity in normal individuals. A Rehfuess tube was passed into the second part of the duodenum under the x-ray screen, 100 ml. of 50% glucose was given by mouth, and suction applied for 4 hours. The following day the experiment was repeated with 100 mg. of hexamethonium given intramuscularly at the same time. The pancreatic juice was measured and its tryptic activity and pH were assessed by Dr. MacGowan. The amount of trypsin was considerably reduced in five cases and was

unchanged in one. The changes in pH were not significant, but in all except one case the volume of the pancreatic juice secreted during the four hours was markedly diminished. This crude experiment suggested that hexamethonium exerted an effect on the pancreas, either by the suppression of secretin or possibly by its autonomic ganglionic blocking activity on the pancreas itself.

Between October, 1949, and February, 1952, with the help of our colleagues in the clinical area, we were able to observe and treat 24 cases of acute pancreatitis. (We took as our criteria a serum amylase above 250 units, associated with severe upper abdominal pain of fairly sudden onset, with vomiting. Actually many cases had a serum amylase above a thousand.) Eighteen of the 24 cases were treated with hexamethonium. In all but five cases there was relief of pain, relief of vomiting, and steady clinical improvement under a dose of 25 mg. four-hourly. Three cases died; two of them after 24 hours with an acute haemorrhagic pancreatitis. The other one died on the third day from coronary thrombosis. Hexamethonium had given complete symptomatic relief. In three cases there was no apparent relief of pain but they nevertheless recovered. One case had no relief from his pain, but there was immediate benefit from intramuscular methantheline ("banthine"). In four cases the blood pressure was so low on admission that it was not deemed advisable to give hexamethonium. Three of these cases recovered.

It was apparent from this that, although hexamethonium gave relief from pain, its side-effects, and especially that of further lowering the blood pressure in an already grave condition, did not make it an ideal drug in this disease. We were of the opinion that methantheline or propantheline bromide ("probanthine"), or even atropine, pushed to its limits, give equal relief without the dangerous lowering of blood pressure. We therefore abandoned its use as a routine measure.

It seems to us that the response to hexamethonium in pancreatitis cannot be held to indicate that thrombosis, embolism, or infarction is a primary aetiological factor. We cannot believe that a further lowering of blood pressure of 10 to 20 mm. Hg is likely to benefit thrombosis or infarction. It is more likely that improvement is due to diminished formation of secretin.

Finally, if laparotomy for this condition is recommended in order to assess the degree of destruction of the gland, then the mortality will steadily rise. In our view, the correct treatment according to our present knowledge (or ignorance) of the aetiology consists mainly in very careful gastric aspiration to prevent acid passing into the duodenum together with a full dose of methantheline or atropine, and supportive therapy. Hexamethonium should only be given initially where the blood pressure is not seriously lowered and continued only where dangerous hypopiesis does not develop. We cannot believe that laparotomy could affect the outcome otherwise than adversely. We are, etc.,

Bristol

W. M. CAPPER
FRANK I. TOVEY

Appendix in the Hernial Sac

SIR,—In view of the recent correspondence on inflamed appendices in hernial sacs, it may be of interest to record a case in an obturator hernia which came under my care in Italy during the war.

The patient was in the W.R.N.S., in the early 20s, and complained of moderately severe right-sided lower abdominal pain. On vaginal examination a hard, tender mass could be felt over the right obturator foramen. In view of this, some displacement of the uterus, and a positive Howship-Romberg sign, a provisional diagnosis of obturator hernia was made. At operation the fimbriated end of the right Fallopian tube and about 1 in. (2.5 cm.) of the appendix were found to be adherent in the sac and inflamed, the right ovary lying over and blocking the foramen. The tube and appendix were reduced and separated and the appendix removed, but not the Fallopian tube, and the sac repaired. Convalescence was uninterrupted.

I reported this case to the North of England Obstetrical and Gynaecological Society, and fuller notes can be found in the proceedings for 1946.—I am, etc.,

Manchester.

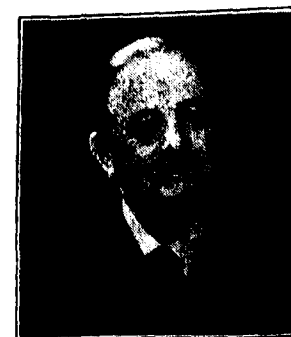
DUDLEY RACKER

Obituary

THOMAS COCHRANE, M.B., C.M.

Dr. Thomas Cochrane, who died suddenly at Pinner, Middlesex, on December 7, 1953, at the age of 87, graduated in medicine at Glasgow University in 1896. He then went for a short time to do pioneer medical mission work in Mongolia, and in 1901 he was asked to go to Peking to reorganize medical work in that city, where everything had been destroyed during the Boxer troubles of 1900. He was soon asked to fill important posts. For example, he was known to be interested in bacteriological and public health work, and during an outbreak of cholera he inaugurated and conducted the first official public health campaign in China for the Chinese Government, with the support of Prince Su and Sir Robert Hart. He was appointed medical officer to the Imperial

Maritime Customs and adviser to the Chinese Government. He was acting medical officer for some time to the British Legation at Peking and did medical work in most of the legations in the capital besides attending the highest officials in the empire and the court of Peking.



But Cochrane's greatest contribution to China was in connexion with education. He helped to form and was for a time president of the North China Educational Union, out of which grew the present large university scheme in Peking. He founded and was the first principal of the Peking Union Medical College, which in his hands became the most efficient medical college in China and was taken as the model for government institutions. This college has now become one of the great medical colleges of the world and has made contributions of world-wide value—for example, in the discovery of ephedrine and in other directions. He was appointed one of the trustees of this institution on the Rockefeller Board in New York. He was the first foreigner in China to petition the throne in the interests of scientific medical education, and he received the first and only gift ever made by the throne to a foreigner for educational purposes. The large sum of money he received from the Empress Dowager was followed by a grant of land from the Emperor. A committee was formed, composed of the Emperor, a grand councillor, the president of the Board of Finance, and Sir Ernest Satow, the British Minister: the Chinese members of this committee intimated to all the provincial governors the contribution made by the Empress Dowager, and her example was quickly followed. When the college was built a high commissioner was appointed by the throne to declare it open, which he did in the presence of the most brilliant international assembly that China had ever seen, including princes, dukes, grand councillors, presidents of government departments, and representatives of all the foreign powers. The board of education gave the college the unique privilege of recognition, and the government made annual grants towards the current expenses of the institution. Dr. Cochrane

made other contributions to China through his literary activities, which included *Lectures on Osteology* (in Chinese), a translation of Heath's *Practical Anatomy* into Chinese, *A Survey of China*, and *A Survey of Medical Education in China*.

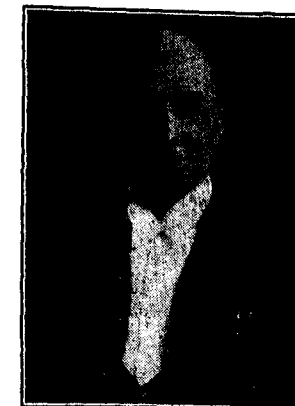
In 1915 Dr. Cochrane returned to England, where his influence and statesmanship in missionary matters were at once in evidence. He and the late Mr. S. J. W. Clark, influenced very largely by the writings of the Rev. Roland Allan, founded the Survey Application Trust, the object of which was to encourage indigenous principles in missionary planning and to emphasize priorities. The trust sponsored the World Dominion movement which has had a profound influence in missionary strategy. He was editor of *World Dominion* (an international review of Christian progress) since its inception in 1923. In 1931 he founded the movement of World Evangelists, of which he was president. He was a recognized authority on religious, social, educational, and medical mission situations throughout the world and the author of many published surveys.

Dr. Cochrane married in 1896, and his wife shared all his early adventures before the Boxer rising in China. His first wife died in 1930; he married again in 1935 and is survived by his widow and three sons, all of whom are in the medical profession.

CYRIL HORSFORD, M.D., F.R.C.S.

Mr. Cyril Horsford, one of the older generation of laryngologists—probably even better known among singers and actors than in his own profession—died in London after a short illness on December 16, 1953, at the age of 77. It was as a consultant particularly helpful in the ailments of the throat and problems of the voice of singers and actors that Cyril Horsford made his reputation, and at the height of his career he was one of the best-known laryngologists in London. He was himself an accomplished musician, and during the opera seasons at Covent Garden his house was a rendezvous of foreign operatic stars, whose carefree and uninhibited singing in Horsford's friendly salon was wont to enliven the early hours of the morning in Harley Street. Many famous singers have expressed their gratitude in no uncertain terms for Horsford's timely help.

Born at St. Kitts, in the West Indies, on January 25, 1876, Cyril Arthur Bennett Horsford was the son of the Hon. S. L. Horsford and was educated at Bedford Modern School and at Edinburgh University. He graduated M.B., Ch.B. in 1898 and proceeded to the M.D., with honours, in 1902, becoming a Fellow of the Royal College of Surgeons of England in the following year. He was appointed a clinical assistant at the Throat Hospital, Golden Square, in 1902, and from 1905 to 1913 he was registrar at the Central London Throat Hospital. Subsequently he received appointments as honorary laryngologist to the Princess Beatrice Hospital, Kensington, and as surgeon in charge of the



[Hay Wrightson, London]

throat and ear department of the St. Pancras Dispensary. During the war of 1914-18 he served for a time in the R.A.M.C. as an aural specialist with the rank of captain. For many years he was honorary laryngologist to the Royal College of Music, the Royal Choral Society, and the Royal Society of Musicians, and was a popular lecturer to non-medical audiences on such subjects as the anatomy and physiology of the larynx.

Cyril Horsford's contributions to medical literature were comparatively few, but they were all helpful and practical. In discussions at meetings of the section of laryngology of the Royal Society of Medicine he was an occasional but always pungent contributor; and he was a loyal and regular attendee at the dinners of the Edinburgh University Club in London, of which he was one of the oldest members. He married Miss Edith Louise Sayers, adopted daughter of the late Miss Lascelles-Jones, and had a son and a daughter, with whom he led a most happy and devoted family life.—R. S. S.

ADAM BARR, M.B., F.R.F.P.S., F.R.C.O.G.

Dr. Adam Barr, senior obstetrician and gynaecologist at Stobhill Hospital, Glasgow, died suddenly on December 11, 1953, while on his way home from hospital. He was 60 years of age.

Adam Barr was born on May 29, 1893, at Rutherglen, a royal burgh on the outskirts of Glasgow, and there he spent the early years of his life. He graduated M.B., Ch.B. at Glasgow University in 1921, his medical course having been interrupted by a period of service as a combatant in the first world war. After graduation he held several house appointments and then spent five years in general practice. But he had always been much interested in obstetrics, and as soon as the opportunity offered joined the staff of the Royal Maternity and Women's Hospital and the Royal Samaritan Hospital in Glasgow. In 1929 he was given charge of the obstetrical and gynaecological units of the Eastern District, Western District, and Stobhill Hospitals, and, while holding these appointments, acted for a time as professor of midwifery in the Anderson College of Medicine. He relinquished this post to become senior assistant to Professor S. J. Cameron at the university and at the Western Infirmary. He was elected F.R.F.P.S. in 1926 and two years later he took the diploma of L.M. of the Royal College of Physicians of Ireland. In 1940 he became a Fellow—he was a founder member—of the Royal College of Obstetricians and Gynaecologists.

More recently he retired from private practice and from his other hospital appointments and devoted himself entirely to his work as senior obstetrician and gynaecologist at Stobhill Hospital. Under his supervision the obstetrical and gynaecological unit there developed into a department of over 200 beds. The university, recognizing its importance, appointed Dr. Barr an honorary lecturer in clinical obstetrics and gynaecology and arranged that he should undertake the teaching of a considerable number of the university students. He also acted as examiner to the university, to the Central Midwives Board, and to other institutions, including the Royal Faculty of Physicians and Surgeons of Glasgow.

Dr. Barr excelled as a clinician, a teacher, and a consultant. As a teacher, he never forgot that the majority of his students would enter general practice, and he made it his business to fit them for their task. His own early

experience and his gift of stating the essentials in plain terms enabled him to do this with outstanding success. For the same reason no postgraduate course was complete without his lecture on midwifery in general practice. He acquired a very large private practice, which with his hospital work kept him so busy that he had little time for research, even if his interests had leaned in that direction. But his main concern was with the purely practical aspects of his specialty, and his published work deals exclusively with practical matters. Perhaps his most outstanding contribution was the development (in conjunction with Dr. Andrew Tindal) of the Barr-Tindal apparatus for the self-administration of gas and oxygen. Other pieces of work included an investigation into the value of serum in the treatment of puerperal sepsis, and the use of "prontosil" in cases of renal infection.

Outside medicine his main pleasures were a love of the countryside and a keen interest in the Church. He was a devout churchman and took an active share in the services and in the social work of the congregation to which he was attached. He was particularly fond of the old Scottish psalm tunes, and when unable through pressure of work to attend a service he used to play over to himself the records of the old psalm tunes as sung by the Glasgow Orpheus Choir. Dr. Barr is survived by his wife, who is also a doctor, and by his only child (a daughter), who is a second-year medical student; to them, and to his other relatives, we extend our deep sympathy.—J. H.

WILFRED SHAW, M.D., F.R.C.S., F.R.C.O.G.

C. R. M. writes: As a house-surgeon many years ago of the late Wilfred Shaw, whose obituary was printed in the *Journal* of December 19, 1953 (p. 1380), I should like to pay a humble tribute to a great man. Although he will always be remembered for his work in science—especially on ovarian tumours—I shall always think of him as a superb clinician, operator, and teacher. He must occasionally, like all of us, have made clinical mistakes, and yet I cannot recollect an occasion when this occurred. The search for truth was the objective from which he never deviated. Ready at all times to consider the opinions of others, he was equally stubborn in defending his own unorthodox views, if he was sure that he was right. His genius for sifting the mass of material in the modern medical press was remarkable, and a day or two spent with him in the operating theatre, out-patients, or on a ward round were worth any postgraduate course or conference.

To his old students, or for that matter any visitor, he was an inspiration and ever ready to help, advise, or listen. I was privileged to see the proofs of his *Operative Gynaecology*, fortunately completed. This magnum opus, not yet published, will undoubtedly be the brightest star among his other well-known publications. The loss of this remarkable man at such an early age is indeed a severe one to British obstetrics and gynaecology.

The Services

Brigadier A. Sachs, C.B.E., Q.H.P., late R.A.M.C., has been appointed D.D.M.S., and has been granted the temporary rank of Major-General.

Captains R. P. Hickey and D. R. Patchett, R.A.M.C., have been awarded the Military Cross in recognition of gallant and distinguished services in Korea.

Surgeon Captain A. A. Pomfret, O.B.E., R.N., has been appointed Honorary Surgeon to the Queen in succession to Surgeon Captain M. Brown, R.N., who has been placed on the Retired List.

Medico-Legal

BELL'S PALSY IN DRAUGHTY OFFICE

A South-western Electricity Board temporary clerk, Mr. N. L. Andrews, aged 53, of Minehead, Somerset, unsuccessfully brought an action for damages against the Board before Mr. Justice Parker at Devon Assizes recently on the grounds that when employed in the Board's office between December, 1951, and March, 1952, he had to sit in draughts which caused him to suffer from Bell's palsy, with a result that he was now prevented from doing any sustained work. His case was that for the rest of his life he would suffer a considerable degree of disability, and the disease was one which could be caused by exposure to draughts.

Since Mr. Andrews had contracted the disease the Board had fitted draught-excluding devices to the windows and doors of the premises.

Dr. P. B. Stirling Cooper, of Minehead, said he believed that Mr. Andrews's complaint was caused by a draught on the side of his face.

Dr. T. Rowland Hill, consultant in neurology, said the form of palsy from which Mr. Andrews suffered was nearly always caused by a draught striking the face. He thought Mr. Andrews was truthful when he said that he could not work for any longer than half an hour without getting a splitting headache. There had been a nervous reaction in Mr. Andrews, although in about 18 months the patient might be able to do a full day's work again.

The defendants contended that, if the plaintiff was right, even people who had got influenza might be taking out writs against the transport authorities for allowing draughts in trains and buses. An employer was bound to take reasonable precautions for the safety of his employees, but precautions against draughts fell into the category of welfare and not safety. It was not certain that Bell's palsy was caused by draughts. From clinical experience it was thought that was probable, but it had not been established.

Judgment

Giving judgment, Mr. Justice Parker said that on March 30, 1952, Mr. Andrews woke up with his jaw distorted, his left eye closed, and the whole of the left side of his face paralysed. The complaint was correctly diagnosed as Bell's palsy.

It was the plaintiff's case that the disease was caused by the negligence of his employers. A plan showed the office in which Mr. Andrews worked for the Board to be a passage in which Mr. Andrews had said that the office was very draughty room. Witnesses had said that the office was very draughty and cold with badly fitting doors, and people who walked through left the doors open. But there had been a good deal of exaggeration in the evidence given on the part of the plaintiff, and he was satisfied that the office was no more draughty than any other office, subject of course to its being a passage room.

The latest theory was that certain people were predisposed to Bell's palsy. On the balance of probabilities he was satisfied that in the Board's office the conditions did predispose that disease in a man already predisposed towards it in the sense that he already had a virus infection of a nerve. There was no question of the employers' having the slightest knowledge or suspicion that the plaintiff was so predisposed to that disease. Eliminating that, one asked oneself what steps a reasonable and prudent employer should take in regard to his office staff in conditions such as those in that case. Conditions in the Board's office were quite comparable with those existing in other offices and were not such as the employers ought reasonably to have foreseen injury to health, although they might well recognize that there was discomfort, as opposed to danger to health. The defendants in that case had not been guilty of any breach of duty and the claim therefore failed.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on October 31 the following medical degrees were conferred:

D.M.—R. G. White, E. O. Field, E. C. Hoff.

The Board of the Faculty of Medicine has awarded medical scholarships to Roland David Stedeford (Worcester College) and Ortwin Answald Alwin Bock (University of Pretoria).

UNIVERSITY OF CAMBRIDGE

In Congregation on November 14 the degree of M.A. was conferred on F. W. Campbell, Ph.D., M.B., Ch.B., University Lecturer in the Department of Physiology, and the degrees of M.B., B.Chir. on R. J. Hutchinson (by proxy).

The following degrees were conferred on October 31:

M.D.—D. H. M. Woollam, T. M. Robinson, R. B. Welbourn. M.A.—C. W. McE. Pratt, M.B., Ch.B., University Demonstrator in Anatomy.

M.B., B.Chir.—Mrs. Stella M. E. Ambache (by proxy).

UNIVERSITY OF ABERDEEN

The following medical degrees were conferred on October 28:

Ch.M.—G. E. Mavor.

M.B., Ch.B.—Frances Allan, J. G. Barnett, G. R. Buchan, Vera C. Coutts, B. B. Dale, N. L. Edmond, J. D. Garden, W. Geddes, J. D. Johnston, D. Macintosh, J. McNab, C. O. Macrae, A. N. Milne, V. J. Murphy, G. G. Rennie, T. F. Rennie, N. F. Stewart, J. V. Watt, Isobel M. Wood.

UNIVERSITY OF LONDON

The Court of the University has re-elected Sir Archibald Gray as deputy chairman, and Dr. C. F. Harris has been elected chairman of the Academic Council.

Dr. P. W. Rowland has been reappointed representative of the University on the governing body of the Colchester Royal Grammar School.

Mr. J. H. Daggart has been recognized as a teacher of ophthalmology of the University at the Institute of Ophthalmology.

The Laura de Saliceto Studentship has been awarded to Dr. H. J. G. Bloom for a period of two years in the first instance from October, 1953; the A. H. Bygott Scholarship, tenable for one year, to Dr. T. A. Plumley; a University Studentship in Anatomy to A. W. Rogers (London Hospital Medical College); and a University Studentship in Physiology to J. J. Misiewicz (St. Bartholomew's Hospital Medical College).

The title of Reader in Entomology, as applied to Hygiene, in the University has been conferred on J. R. Busvine, Ph.D., D.Sc., in respect of the post held by him at the London School of Hygiene and Tropical Medicine.

The following degrees were awarded by the Vice-Chancellor on behalf of the Senate on September 30:

M.D. (INTERNAL).—Helen Ingleby.

M.S. (INTERNAL).—F. B. Cockett.

UNIVERSITY OF WALES

The following candidates at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

TUBERCULOUS DISEASES DIPLOMA.—T. B. Master, J. Morgan, C. Michie, B. Sinha.

UNIVERSITY OF LEEDS

Dr. D. G. F. Harriman has been appointed Lecturer in Neuro-pathology in the Department of Pathology.

UNIVERSITY OF SHEFFIELD

The following appointments are announced: Dr. Alison Chapman, Whole-time Assistant Medical Officer to the Student Health Service; Dr. T. Smith, Part-time Lecturer and Clinical Teacher in Obstetrics and Gynaecology; Dr. D. H. Blakey, Part-time Honorary Tutor in Obstetrics and Gynaecology; Dr. R. S. Weetch, Part-time Honorary Lecturer in Therapeutics.

Dr. M. G. Philpott has resigned his appointment as Tutor in Child Health.

The John Stokes Medical Research Fellowship has been awarded to Mr. R. Whittam.

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
‡ Includes puerperal pyrexia.

DEATHS

Benton.—On December 15, 1953, at 228, Old Shoreham Road, Hove, Sussex, Austin Lewis Benton, M.B., B.S.
Crofton.—On December 11, 1953, at Hertford, Herts, John Hutchinson Crofton, M.B., B.Ch.
Dobbin.—On December 15, 1953, Dorothy Isabel Dobbin, M.D., D.P.P.

fluid must be used. The veins that are being injected are very thin-walled and are often covered by a very thin layer of epithelium. For these reasons, even with the most careful intravenous technique, it is possible that the overlying epithelium may not be strong enough to withstand even a mild inflammatory reaction following the injection of a minute dose of sclerosant.

Is Bell's Palsy Infectious?

Q.—I have encountered three cases of facial palsy in rapid succession in my practice. Is this just a coincidence, or is the condition infectious?

A.—The aetiology of the common facial palsy (Bell's palsy) is not known for certain, but many people consider it is probably infective in nature. Small groups of cases occurring together in a locality are not rare.

Home Electrolysis

Q.—Home electrolysis outfits for the removal of superfluous hair are now on the market. Are these suitable to recommend to patients for use in their own homes?

A.—The chief danger with electrolysis is over-treatment. In most cases the current needs to be passed for only a few seconds, and if the needle is held in place with the current passing for too long there results an excessive area of necrosis leading to a slough, perhaps a millimeter or so in diameter. This can only result in a scar. It does not seem very likely that a patient treating herself will cause this kind of damage provided that she is sensible and properly advised by her doctor. Infection is never likely to be a serious problem provided elementary precautions of cleanliness are taken; in any case this risk seems no more likely in the home than in a beauty parlour.

It is not, of course, every person who will be able to acquire the manual dexterity for carrying out this rather delicate operation; the seven-day free trial period should be sufficient to enable a patient to decide about this. Self-treatment of hairs on the front and central part of the face is easy for the patient herself; at the side of the cheeks not so easy; and under the chin, where superfluous hair is often present, a very difficult task.

Prickly Heat

Q.—What is the aetiology of prickly heat? What are the main diagnostic features distinguishing it from other skin rashes? What is the most successful treatment?

A.—Prickly heat is generally held to be caused by blockage of sweat ducts by keratinous plugs. Sweat is thus held back in the glands and is responsible for the papular rash. Prolonged sweating with maceration of the cells in the horny layer of the skin is the commonest precursor, but injury caused by ultra-violet light, application of chemicals, or adhesive plaster may act in a similar way. The relationship of sodium to the aetiology of the condition remains rather in doubt.

The diagnostic features are the appearance of the rash after a period of at least several days' exposure to high environmental temperature, especially if the atmosphere be humid. The body flexures, chest, back, shoulders, and abdomen are the commonest sites affected, and the rash is almost invariably symmetrical. Seborrhoeic dermatitis may sometimes be simulated, but the history and aggravation of symptoms while sweating are distinctive features of prickly heat, while there are no macular or plaque-like lesions such as are common in seborrhoeic dermatitis. In miliarial rashes caused by various local applications the distinguishing characteristics are the more limited distribution and history of exposure to the agent concerned.

Innumerable powders and lotions are recommended for the treatment of the condition, their very multiplicity being testimony of their ineffectiveness, while some of them may lead to a complicating dermatitis medicamentosa. Measures

taken to keep cool and to avoid sweating alone are likely to be effective—that is, the use of fans, light loosely fitting clothing, and the avoidance of excessive exercise, particularly during the warmer parts of the day.

Incest: Marriage to a Sister-in-Law

Q.—(a) With what relatives is it incestuous to cohabit? (b) Does the law allow marriage between a divorced man and his former sister-in-law?

A.—(a) Under the Punishment of Incest Act, 1908, Section 1 (i), a male person who has carnal knowledge of a female who is to his knowledge his granddaughter, daughter, sister, or mother, is guilty of a misdemeanour. Under Section 4 a female of or above the age of 16 who permits a person who is to her knowledge her grandfather, father, brother, or son to have carnal knowledge of her is guilty of a misdemeanour.

(b) The Deceased Wife's Sisters' Marriage Act, 1907, permits the marriage, in so far as it is a civil contract, of a man with his deceased wife's sister. It is unlawful for a man to marry the sister or half-sister of his divorced wife or of his wife by whom he has been divorced during the lifetime of the wife, or the divorced wife of his brother or half-brother, or the wife of his brother or half-brother who has divorced his brother during the lifetime of the brother or half-brother.

Parotid Enlargement in Primitive Peoples

Q.—Is there any explanation of the bilateral chronic enlargement of the parotid glands found in primitive peoples in various parts of the world? Here in Borneo it occurs not uncommonly in the Murut tribes; it arises in childhood and is definitely not due merely to an increase in adipose tissue. Mumps is not uncommon among these tribes: could that be the cause?

A.—Enlargement of the parotid glands has latterly been recognized as one of the results of protein deficiency, and it is unlikely that mumps is responsible in the cases in question. Other organs developmentally similar to the parotids, such as the salivary and lacrimal glands and the pancreas, may also be damaged. In malignant malnutrition, kwashiorkor, and allied syndromes parotitis is not uncommon.

Glycerin in Obesity

Q. Can glycerin be used as a sweetening agent in the treatment of obesity?

A. Glycerin is largely converted to glucose in the body. There would therefore seem to be no theoretical basis for its use in obesity.

"Any Questions?" Book. The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 9 1954

SPONTANEOUS HYPERINSULINISM DUE TO ISLET-CELL ADENOMA

BY

K. O. BLACK, M.D., F.R.C.P.

R. S. CORBETT, M.Chir., F.R.C.S.

J. P. HOSFORD, M.S., F.R.C.S. AND

J. W. ALDREN TURNER, D.M., F.R.C.P.

(From the Departments of Medicine, Surgery, and Neurology, St. Bartholomew's Hospital, London)

Spontaneous hyperinsulinism resulting from a tumour of the islets of Langerhans is not a common condition, and the diagnosis is easily overlooked. Failure in the diagnosis usually results in the early death of the patient, while diagnosis followed by operative removal of the tumour cures the majority of patients.

Nicholls (1902) first described an adenoma of the islet cells of the pancreas, but this was an incidental finding at necropsy and no clinical details of the case were recorded. Following the discovery of insulin, Harris (1924) suggested that symptoms might be caused by excess secretion of the hormone, and the first demonstration of an insulin-secreting tumour was by Wilder *et al.* (1927); they explored the pancreas of a doctor, aged 40, who had suffered from attacks of spontaneous hypoglycaemia for eighteen months, and found a carcinoma in the tail of the pancreas with metastases in the liver. The cells of the carcinoma bore a striking resemblance to islet cells, and insulin was extracted from one of the liver metastases.

The first successful operative removal of an insulin-secreting tumour was by Roscoe Graham in 1929 (Howland *et al.*, 1929), who found a small tumour in the body of the pancreas of a woman of 52 who had a seven-years history of attacks of spontaneous hypoglycaemia. The tumour was composed of islet cells, and as it lacked a capsule it was thought possibly to be a carcinoma, but no metastases were found. This lack of a capsule has been a feature of a number of islet-cell tumours subsequently studied, and is not now regarded as an indication of malignancy. Another successful operation was performed at about the same time, for Harvey Cushing (1930), in his Lister Lectures on neurohypophysial mechanisms, mentioned that a small islet-cell adenoma which had caused recurrent attacks of hypoglycaemia had recently been removed in his clinic. Since then the condition has attracted much attention in the United States, no fewer than 38 cases being reported from the Mayo Clinic in twenty years (Lopez-Kruger and Dockerty, 1947), while reviews have been published on both medical (Crain and Thorn, 1949) and surgical aspects of the problem (Howard *et al.*, 1950).

In Great Britain the number of reported cases is comparatively small. Apart from Nicholls's early pathological observation, the first report is that of Barnard (1932), who found an islet-cell adenoma at the

post-mortem examination of a patient in whom the diagnosis had been suspected clinically but who had declined further investigation or operation; post-mortem reports have also been published by Cairns and Tanner (1933), Lawrence *et al.* (1942), Webster and Blades (1952), and Cunningham *et al.* (1952). The first successful operative removal of an adenoma in Great Britain seems to be that reported by Fraser *et al.* (1938), and nine other reports of single cases successfully treated by operation have subsequently been published (Rudd and Walton, 1941-2; Rayner and Rogerson, 1943; Haines, 1946; Dickie, 1946; Holmes *et al.*, 1946; Bishton and Malins, 1947; Murray, 1949; Wood, 1951; Smith and Cochran, 1952); and Cohen (1950) has recorded two cases. There has also been a single report of an islet-cell carcinoma with liver metastases (Brearley and Laws, 1950), and one case in which attacks of spontaneous hypoglycaemia were thought to be caused by diffuse hyperplasia of the islet cells without tumour formation (Graham and Oakley, 1950). Richardson and Russell (1952) have reported five cases from the London Hospital; operation was carried out in three of these; in two an islet-cell adenoma was removed with complete relief of symptoms, while in the third patient the tumour was a carcinoma with a metastasis in the liver.

We have had under our care in St. Bartholomew's Hospital in the course of four years three patients with attacks of spontaneous hyperinsulinism, in each of which an islet-cell adenoma has been removed, with a successful result.

Case 1

A male Post Office counter-hand aged 27 was admitted to hospital on August 16, 1947, complaining of fits. The history, obtained from the patient and his wife, started in February, 1946. He then began to have attacks of sweating, trembling, and a feeling of unusual hunger. These occurred in bed in the morning or just before the midday meal. The symptoms were relieved by taking food and usually did not last more than about 10 minutes. At first they occurred infrequently, with symptomless intervals of as long as two or three months, but they grew more frequent, and by October, 1946, were occurring at the rate of one a week. By January, 1947, the attacks had become more severe. They began to occur when he was asleep, and his wife was unable to rouse him. Once he was incontinent, and on another occasion he bit his tongue. Attacks during the day started with blurring of vision, a feeling of dizziness, and

some slurring of speech and general bewilderment. Apart from these attacks she had been normal in every way, and had no memory of the attacks.

The patient was a dissimilar twin, and the past history was uneventful except for two minor head injuries due to falls from a horse. There was no family history of epilepsy.

When examined on admission to St. Bartholomew's she was normal mentally, and there were no abnormal signs in the nervous or other systems. Blood pressure was 160/95, and the urine contained neither sugar nor albumin.

As hyperinsulinism seemed the probable diagnosis the crucial test was to induce an attack by fasting: accordingly she had no food on November 4 from 9 a.m. onwards; by 10 a.m. on November 5, after a 25-hours fast, she was drowsy and confused, could give no history, appeared vacant and flushed, and her speech was slurred. She was not, however, sweating noticeably. The pupils were widely dilated but reacted normally to light, and both plantar responses were extensor. At this time the blood sugar was 45 mg. per 100 ml. She was given 50 g. of glucose by mouth and within 20 minutes was fully awake and alert; she seemed normal mentally, her pupils were considerably smaller, and the plantar responses were flexor.

A sugar-tolerance test was carried out after this fast, with the following result. Fasting, 45 mg. per 100 ml. After 50 g. glucose by mouth: 1 hour, 190 mg.; 2 hours, 130 mg.; 3 hours, 89 mg.; 4 hours, 54 mg.; 5 hours, 48 mg.; 6 hours, 46 mg. A barium meal showed no deformity in the duodenum.

An E.E.G. on November 8 (in fasting state—blood sugar 45 mg. per 100 ml.) showed unstable alpha rhythm of very irregular amplitude, with spread into the frontal areas. Excessive generalized slow waves were present in all areas. Overbreathing slowed the alpha rhythm and greatly increased the slower frequencies, which often became paroxysmal and of increased amplitude. After 22 ml. of 33.3% glucose intravenously there was a marked reduction in the slow frequencies, and the alpha rhythm became more steady in amplitude and was reasonably stable.

On November 16 the pancreas was explored by R. S. C. A more extensive search had to be made which involved not only the mobilization of the head of the pancreas, as in Case 2, but also an incision of the peritoneum along the inferior border of the pancreas after entering the lesser sac. It was only after turning up this lower edge of the gland that the tumour was seen embedded in the posterior surface of the tail, lying just above the splenic vein. An enucleo-resection was carried out with preservation of the splenic vein. The space left was obliterated with interrupted sutures of catgut as in Case 2 and the pancreas replaced. The wound was closed without drainage. This was an error in technique, for in three weeks a left subphrenic abscess formed in the lesser sac. This was drained through a left lateral incision and the fluid contents showed large quantities of diastase. Following this, recovery was uneventful, and the patient was discharged six weeks later.

Pathological Report (Professor Blacklock).—"The tumour measures 2.5 cm. in its greatest diameter and is 0.5 cm. thick. It is well encapsulated, fragments of the pancreas being still adherent to the capsule. The tumour is rather plum-coloured on the surface, though on section there are paler fleshy areas in it. The tumour weighs 1.85 g. Microscopically the growth consists of masses of small cells resembling the cells of the islet tissue of the pancreas. The tumour is fairly well encapsulated and is a typical islet-cell tumour."

There were no hypoglycaemic attacks after the removal of the islet-cell adenoma, and a glucose-tolerance curve on January 14, 1952, gave a fasting level of 86 mg. per 100 ml., rising to 115 mg. per 100 ml. after 50 g. of glucose and falling to 74 mg. per 100 ml. two hours later.

When seen in May and in November, 1952, she was very well, had had no further hypoglycaemic attacks, and had returned to her work as a groom.

Discussion

Symptoms

The important feature in the early stages, and often throughout the whole course of the illness, is paroxysmal attacks, of which two main types occur. The less serious type was well illustrated by the early attacks in Case 1, and is thought to be due to excess liberation of adrenaline in response to a rapid fall in the blood-sugar level. These attacks consist in sweating, trembling, general weakness, and nervousness, and often palpitations and precordial discomfort without impairment of consciousness. The more serious type of attack is due to a disturbance of cerebral function, resulting from the low blood sugar, and these attacks vary greatly in type, not only from patient to patient but in different attacks in the same patient. They may consist of short confusional episodes often associated with automatic behaviour, major epileptic attacks with convulsions, periods of stupor in which bilateral extensor plantar responses may be found, or prolonged coma with, in a severe attack such as occurred in Case 2, signs of decerebrate rigidity. Cerebral attacks were the presenting symptom in Cases 2 and 3, while in Case 1 they began a few months after the onset of attacks, due to excess adrenaline secretion. Attacks of either type tend to occur some hours after a meal and are not uncommon early in the morning, as was well illustrated in Case 3, in which the two severe attacks occurred before breakfast. In general, attacks occur with gradually increasing frequency and severity, though periods of complete freedom may occur as in Case 2, in which after an extremely severe and prolonged attack there was a period of freedom lasting three months.

If the condition is not treated, more permanent changes may develop: in particular there may be a change in personality, with intellectual deterioration and emotional changes. Case 2 presented a curious mental state with poor memory, affective lability, apathy, and a general lack of co-operation, all of which features improved after the removal of the islet-cell adenoma, and within a few weeks of operation her parents thought that her mental condition had returned to normal, and shortly afterwards she resumed her work as a schoolteacher. Comparable mental changes occurred in the patient from the Maudsley Hospital reported by Fraser *et al.* (1938).

Transient focal neurological disturbances such as hemiparesis or aphasia may occur during the attacks of hyperinsulinism, and, more rarely, permanent neurological changes may develop: Case 2 had a complete left hemiplegia following a prolonged hypoglycaemic attack, and, though gradual improvement took place over the course of months, she still had a mild residual hemiparesis; a similar occurrence has been recorded by Crain and Thorn (1949). These rare permanent neurological sequelae are presumably due to actual death of nerve cells resulting from prolonged hypoglycaemia.

Lawrence *et al.* (1942) have studied the cerebral changes in six fatal cases of hypoglycaemia—three diabetics suffering from insulin overdosage, two patients dying during insulin treatment for schizophrenia, and one islet-cell adenoma unsuspected during life—and they found similar changes in all six patients. There was widespread degeneration and necrosis of nerve cells with microglial and macroglial proliferation, the most severe changes being in the cerebral cortex, the caudate nucleus, and putamen, with only slight changes in the cerebellum and brain stem. These changes are very similar to those found in cerebral anoxia and are thought to be due to failure of the normal oxidative processes in the cells from lack of glucose. Although these pathological changes are probably the basis for permanent neurological sequelae, it is difficult to understand why a hemiplegia should occur: one would expect that both hemispheres would be equally affected by prolonged hypoglycaemia, with a resulting double hemiplegia rather than a unilateral hemiplegia, and it is possible that vascular factors are also important.

Lower motor-neurone lesions may also occur as a result of hypoglycaemia and confuse the diagnosis. Silfverskiöld (1946) described two patients with islet-cell adenomas: one developed gross wasting and weakness of the hand muscles, without fibrillation, and weakness of both ankles following a prolonged hypoglycaemic attack; and the other had a bilateral flaccid foot-drop in similar circumstances. Lidz and others (1949) removed an islet-cell adenoma from a patient with severe mental changes, cerebellar ataxia, and extensive muscle-wasting in both legs, without fibrillation: after operation the mental condition and ataxia improved while the muscle-wasting remained unaltered. Tom and Richardson (1951) showed that the cause of a lower motor-neurone lesion of this type was destruction of spinal anterior horn cells occurring during prolonged hypoglycaemia in a patient in whom an islet-cell tumour was found at post-mortem examination. In their case the diagnosis had not been made during life, largely because of the confusing feature of severe localized muscle atrophy in the legs.

Diagnosis

Whipple (1938, 1944) has suggested three criteria for the diagnosis of functioning islet-cell tumours: (1) attacks of nervous or gastro-intestinal disturbance occurring in the fasting state; (2) during the attacks hypoglycaemia with a blood sugar below 50 mg. per 100 ml.; and (3) relief of symptoms immediately by the ingestion of glucose. Whipple's triad is of great value in attacks deliberately induced by a period of fasting as a diagnostic measure, but there may be deviations from it in the attacks which occur spontaneously. In some patients the time relationship of attacks to fasting is by no means obvious, as attacks may occur three hours or so after a meal without any sensation of hunger. More confusing is the fact that the blood sugar may have risen above 50 mg. per 100 ml. while the patient is still unconscious: this was illustrated in Case 3, whose blood sugar was 60 mg. per 100 ml. when she was stuporous and had bilateral extensor plantar responses. Prompt recovery from the attack is usual when glucose is given either by mouth or intravenously, but if the hypoglycaemia has been severe and prolonged this rapid recovery may not occur. Case 3 had been comatose for about 24 hours when she was admitted to St. Bartholomew's and her blood sugar was 55 mg. per 100 ml., but, in spite of intravenous glucose and a gastric drip containing glucose, her recovery was very slow, and it was at least 48 hours before she became conscious.

The most useful confirmatory test is to fast the patient for 12 to 24 hours: if an attack occurs the blood sugar must be estimated and then the effects of oral or intravenous glucose observed. Under these controlled circumstances Whipple's three criteria hold good in the majority of cases. In each of our three patients attacks occurred after 14 hours, and in Case 3 after 24 hours; in each case blood sugars below 50 mg. per 100 ml. were recorded and the attack was rapidly stopped by administration of glucose. We have used this fasting test in a number of other patients whose histories suggested the possibility of hyperinsulinism, most of whom were in fact suffering from epilepsy or hysteria, without an attack being induced and without the blood sugar falling to below 80 mg. per 100 ml.

Differential Diagnosis

Spontaneous hypoglycaemia is known to occur in a variety of conditions. These include organic hyperinsulinism, liver disease, functional hypoglycaemia, certain diseases of the endocrine glands, and a miscellaneous group of which starvation and severe renal glycosuria are examples. None, however, is so likely to enter into the differential diagnosis of islet-cell tumour. Hypoglycaemic crises are not a feature of anorexia nervosa, and hypoglycaemic symptoms are absent or unobtrusive. Addison's disease and Simmonds's disease will be recognized by their other clinical manifestations. In practice, then, the problem which confronts the clinician is to distinguish between liver disease, functional hypoglycaemia, and a tumour of the islets of Langerhans.

No difficulty arises with the hypoglycaemia of severe damage to the liver parenchyma with jaundice, but hypoglycaemia occasionally results from minor degrees of liver damage. Conn and others (1938) reported six cases of hypoglycaemia due to an ascending infection of the biliary tract. One of his patients, a man aged 47, had repeated hypoglycaemic crises ending in unconsciousness. These always occurred between 3 and 7 a.m. A biopsy taken at operation showed cholangitis with early biliary cirrhosis. The gall-bladder contained stones and pus, and its removal was followed by complete disappearance of hypoglycaemic attacks. Whipple's triad may fail to distinguish between organic hyperinsulinism and hepatic hypoglycaemia. It is therefore advisable to include radiological examination of the biliary tract and tests of the liver function in the investigation of patients with spontaneous hypoglycaemia.

Difficulty is likely to arise in differentiating organic hyperinsulinism in its early stages from functional hypoglycaemia, which is by far the commonest of all the causes of spontaneous hypoglycaemia. The distinction is an important one, because the treatment of the former is surgical whereas in the latter medical treatment is effective and surgery is to be avoided. It can usually be made with reasonable certainty on clinical grounds. Functional hypoglycaemia is of the stimulative type: the blood sugar is normal even after prolonged fasting, and hypoglycaemic attacks do not occur during the night or before breakfast. They are confined to the daytime and occur two to four hours after meals. The clinical course of organic hyperinsulinism is progressive, the hypoglycaemic crises becoming increasingly severe and frequent, whereas functional hypoglycaemia is not progressive. Undoubtedly the crucial test is the fasting test, which leads to hypoglycaemic symptoms in organic hyperinsulinism but not in functional hypoglycaemia. The glucose-tolerance test is less reliable. The fasting blood sugar is normal in functional hypoglycaemia and the blood sugar falls to subnormal levels two to four hours after the administration of glucose. A sharp rise to 200 mg. per 100 ml. or more immediately after the glucose is characteristic of the hypoglycaemia which sometimes follows operations on the stomach.

Glucose-Tolerance Tests

Glucose-tolerance tests are of less value in the diagnosis of islet-cell tumours than is a fasting test. Very varied results have been recorded in the literature (Crain and Thorn, 1949), but this may be partly due to the fact that they have been carried out under varying conditions of diet. Duncan (1947) has suggested that a standard diet containing 350 g. of carbohydrate in 24 hours should be given for the three days before a six-hour glucose-tolerance test. Under these conditions a patient with a functioning islet-cell tumour usually has a subnormal fasting blood sugar; the highest peak rarely exceeds 120 mg. per 100 ml. and the level falls to subnormal values within two hours, and these low values continue during the third to sixth hours. In our first case a standard diet was given before the glucose-tolerance test: the blood sugar rose to a peak of 125 mg. per 100 ml. and subnormal levels were not reached until the fourth hour. In the other two cases a standard diet was not given, and in fact the tolerance curve in Case 3 was carried out after a 24-hour fast. In this patient the blood-sugar level rose to 190 mg. per 100 ml. at the first hour and did not fall to a subnormal level (54 mg. per 100 ml.) till the fourth hour. In Case 2 glucose-tolerance tests were carried out on two occasions with a seven-months interval between them: the first curve was practically within normal limits except that after three hours the level was 69 mg. per 100 ml. and remained in the sixties at the fourth and fifth hours; the second test fulfilled all Duncan's criteria.

Electroencephalography

It is recognized that marked E.E.G. changes occur during hypoglycaemia: Hofer *et al.* (1946) studied 11 of Whipple's patients who had functioning islet-cell tumours. The most typical abnormality was high-voltage slow activity occurring

in synchronous bursts all over the head, with considerable improvement in the record after intravenous glucose. He found no clear-cut correlation between the degree of E.E.G. abnormality and the blood-sugar level in the five patients in whom this was studied. In our second patient the E.E.G. was recorded at intervals from the fourteenth to eighteenth hours of a fast, with blood-sugar estimations. The findings of high-voltage slow activity agreed with those of Hoefler *et al.*, and, although from the sixteenth to twentieth hours the blood sugar was rising slowly, there was no progressive improvement in the E.E.G. record or in the clinical state till intravenous glucose was administered, when both the E.E.G. and the clinical condition rapidly returned to normal. In Case 3 when the blood sugar was 45 mg. per 100 ml. the E.E.G. showed generalized slow waves which were greatly increased by overbreathing, and considerable improvement occurred in the record following intravenous glucose. The E.E.G. does not afford any great help in the diagnosis of these patients, but it is perhaps worth stressing that diffuse abnormality in an E.E.G. record of a patient in stupor or coma does not necessarily indicate a primarily intracranial cause for the coma, as both the coma and the abnormal E.E.G. may be the result of disordered brain metabolism from conditions such as hypoglycaemia.

Treatment

The treatment of hyperinsulinism due to an islet-cell adenoma is by surgical removal of the tumour when possible. Once other causes of hypoglycaemia have been excluded and the diagnosis of organic hyperinsulinism has been made, the pancreas should be explored without delay because of the possibility of malignancy, the risk of permanent damage to the central nervous system, and increasing obesity. An intravenous infusion of 5 or 10% glucose solution is set up beforehand and continued throughout the operation. Transient hyperglycaemia may follow operation: it occurred in Case 1 and was easily controlled by soluble insulin, given twice daily.

Medical treatment is notoriously unsuccessful but may be the last resort if operation is refused or if there is a malignant growth with metastases. A predominantly protein-and-fat diet with little carbohydrate, though useful in functional hypoglycaemia, will not prevent the occurrence of severe hypoglycaemic attacks from an islet-cell tumour. A large carbohydrate intake and frequent meals are necessary to prevent attacks. Attempts to destroy the beta cells by alloxan have not been encouraging, and severe toxic effects may result. Extracts of adrenal cortex and of the anterior pituitary have proved disappointing. Growth hormone was tried in Case 1: it produced some elevation of the blood-sugar level, but not enough to be of practical value. It is possible that a combination of adrenocorticotrophin and growth hormone may prove to be more effective.

Surgical Treatment

In all three cases there was a solitary tumour, removal of which brought complete relief of symptoms. A right paramedian incision was used in two cases and a transverse incision in the third, a very adequate exposure of the whole pancreas being obtained in each case.

If the tumour is not seen or felt on any part of the anterior surface of the pancreas, a thorough search must be carried out. The posterior surface of the head is examined by dividing the peritoneum on its lateral side of the duodenum, mobilizing the second part of the duodenum. In Cases 1 and 2 the tumour was felt in this position and was exposed in this way: enucleation was effected after incising the pancreatic tissue over it. An enlarged lymph node was found lying adjacent to the common bile duct in Case 2. The undersurface of the body and tail are examined by making an incision along the inferior border of the pancreas, after entering the lesser sac. In Case 3 the tumour was found on the posterior surface of the tail.

The tumours were enucleated from the pancreas and the cavity obliterated with catgut sutures. It is not to be put a

drain down to the area through a stab incision in the right or left loin, to prevent a collection of blood and ferment and to avoid abscess formation. If a pancreatic fistula forms, as in Case 1, it will close spontaneously and the surrounding skin can be prevented from becoming sore by applying suction. In Case 3 the leak produced a subphrenic abscess as a result of not draining.

From the cases reported it seems that these tumours are small (1-2 cm.), red or purple in colour, and firm in consistency compared with ordinary pancreatic tissue. They are often buried in the gland and can occur anywhere from the head to the tail. In Case 1 the search was given up at the first operation and in Case 3 it was almost given up. A lymph node may be mistaken for the tumour on palpation, but the appearance (Case 2) is quite different. No sign of malignancy was found, which from reports is a rare occurrence.

Summary

Three cases of spontaneous hyperinsulinism due to an islet-cell adenoma are described. The removal of the adenoma in each case resulted in relief of symptoms, whereas a resection of three-quarters of the pancreas in one patient had caused only temporary improvement.

The symptomatology is discussed, and it is stressed that permanent neurological damage may occur in a prolonged hypoglycaemic attack.

The crucial diagnostic test is a period of fasting of up to 24 hours. In attacks produced in this way Whipple's diagnostic triad is fulfilled, which is not invariably true in spontaneous attacks.

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Four field medicines issued to British troops during the Crimean War have been added to the Pharmaceutical Society's historical museum. The bottles, labelled "The British Pharmacy, Smyrna," contain powdered rhubarb, milk of sulphur and cream of tartar, calcined magnesias (for indigestion), and ipecacuanha wine (for coughs).

INVASION OF INTERNAL MAMMARY LYMPH NODES IN CARCINOMA OF THE BREAST

BY

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For the past 150 years isolated observers have been calling attention to the internal mammary lymph chain and its importance in the spread of carcinoma of the breast. No great notice has been taken of their words because they have not provided convincing proof. In 1946 it occurred to us that quantitative microscopical proof of the role of the internal mammary chain in malignant disease of the breast could be obtained by biopsy during the course of a radical mastectomy. The surprising results of this simple procedure have from time to time been published (Handley and Thackray, 1947, 1949; Handley, 1950, 1952). It is intended now to bring this published information up to date and to try to discern whither the facts are leading in the realm of treatment.

Anatomy of the Internal Mammary Lymphatic Chain

The internal mammary lymph nodes receive lymph chiefly from the medial side of the breast and from the region of the nipple, but there is considerable overlap in the territories drained by them and by the axillary system. Afferent lymphatics from the breast reach the chain by perforating the intercostal muscles, for the most part where the anterior perforating arteries emerge. The nodes themselves lie posterior to the intercostal muscles, and Stibbe's (1918) diagrams (Figs. 1 and 2) show their general arrangement. They are inconstant both in position and in number, and there exist many very tiny nodes which are recognizable only by the microscope. The chain begins in the sixth intercostal space, where it receives lymph from the diaphragm and liver, and it ends, again inconstantly, in a node which lies behind the sternal head of the sterno-mastoid muscle and which discharges direct into the great veins. Nodes most often occur in the second, first, and third spaces in that order of frequency, and it is to nodes in these spaces that lymph from the breast is mostly discharged.

Technique of Internal Mammary Biopsy

To remove a node for purposes of biopsy is a finicking procedure, but by no means difficult. A 1-in. (2.5-cm.) incision in the intercostal muscles, running from the edge of the sternum, midway between and parallel with the costal cartilages, will reveal extrapleural fat, imbedded in which are the lymph nodes of the chain and the internal mammary vessels; the latter usually lie about $\frac{1}{4}$ in. (6 mm.) clear of the sternum. To detach lymph nodes requires a nice touch with two pairs of dissecting forceps, particularly as the nodes are often minute; any fatty tissue removed from a plane deep to the intercostal muscles should be sectioned as it often

contains a microscopic node. The only peril attending the procedure is laceration of the internal mammary artery, but this accident should be easy to avoid, and has not occurred in the series described here. Tears of the pleura are of no great consequence if they are recognized, and this accident has occurred to us on five occasions without untoward post-operative sequels.

Material

The series on which internal mammary biopsy has been carried out consists of 150 cases. It is as continuous as it has been possible to make it. All patients being treated for the first time by surgery have been subjected to the biopsy. Second primary tumours occurring in the opposite breast, tumours in men, and tumours treated first by radiotherapy have been excluded. Of the 150 patients, 139 have been judged, on clinical grounds, to be operable; in 11 the biopsy was exploratory in

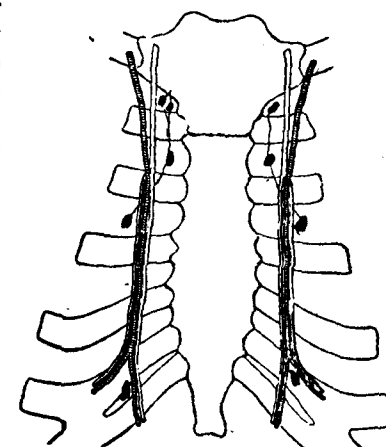


FIG. 1.—The internal mammary blood vessels and chain of lymph nodes seen from within the thorax. (After Stibbe.)

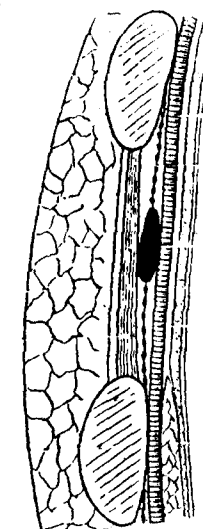


FIG. 2.—Sagittal section of the chest wall showing the pectoralis major to the left, two costal cartilages cut across, and an internal mammary lymph node lying behind the intercostal muscles. (After Stibbe.)

patients who were judged inoperable. During the time in which these numbers have been accumulating, approximately 45 additional cases have been seen in which, for one reason or another, but chiefly because of advanced spread, surgery as a primary measure has not been undertaken and no biopsy has been done; it is reasonable to suppose that, had they been included, the overall percentage of invasion of the internal mammary chain would have been higher. An analysis by quadrant, and by the numbers in which axillary metastases were found, does not differ greatly in its distribution from the large published series—for example, Truscott (1947)—and it may therefore be taken that our series is representative in these respects. One of us (R.S.H.) has done all the biopsies and the great bulk of the accompanying surgery. The latter, in the 139 operable cases, has consisted of 117 radical mastectomies, 3 Margottini operations, 3 Urban operations (see below), and 16 extended simple mastectomies. All diagnoses are based on histological evidence, with the exception of the state of the axillary nodes in one of the clinically operable cases and in 8 of the 11 inoperable cases. All these unproved axillary nodes have been reckoned as invaded. In the earlier cases only the second intercostal space was explored.

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SPINAL EPIDURAL ABSCESS

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Infection of the spinal epidural fatty areolar tissue by pyogenic organisms is generally regarded as a rare condition. Although a well-recognized clinical entity, it has received little attention in British medical literature. In contrast, that of the United States contains a number of excellent reviews of the subject, notably by Dandy (1926), Gasul and Jaffe (1935), Browder and Meyers (1937, 1941), Rankin and Flothow (1946), Huesner (1948).

In 1926 Dandy found only 25 cases in the literature. Rankin and Flothow were able to review 225 cases in 1946, and two years later Huesner reported a further 20 cases.

This communication is based upon a series of 25 cases of spinal epidural suppuration, 19 of which have been treated in the department of surgical neurology, Edinburgh Royal Infirmary, between 1933 and 1952, and 6 in the Bristol Neurosurgical centre during the past four years. In Bristol during the same period there were 21 cases of spinal tumour, 10 of which were meningioma or neurinoma. This is too small a series from which to draw deductions, but it does at any rate suggest that spinal epidural abscess is proportionally a not infrequent cause of interference with spinal cord function.

Since a presentation of the entire series would be too lengthy, the following case histories have been selected to illustrate various features of the illness.

Case 1

This case indicates the usual course of events in the acute metastatic type of infection before penicillin was available.

A youth aged 18 had malaise and fever a few hours after the extraction of an infected tooth. This was followed by an increasing low lumbar backache and pain at the back of both thighs. His temperature was 102.6° F. (39.2° C.). Acute tenderness over L 4 spinous process and severe back pain were aggravated by any movement. The abnormal neurological findings were hyperreflexia in the lower limbs, bilateral extensor plantar responses, and hyperaesthesia of the buttocks and thighs posteriorly.

The lower three lumbar laminae were removed, disclosing a localized extradural abscess containing staphylococcal pus. Pus was tracking outwards along the fourth and fifth lumbar roots. The wound was only partially closed, the central portion being left open to provide free drainage. Fever and toxæmia continued, and cerebrospinal fluid (C.S.F.) escaped from the wound. The patient died 27 days after operation.

At necropsy pus was found to have extended between the necks of the right eleventh and twelfth ribs and into the psoas sheath. A sloughing patch was found on the dura opposite the abscess and there was a generalized purulent meningitis.

Case 2

This case illustrates, in contrast, the satisfactory result obtainable by early surgical intervention and the use of antibiotics.

A healthy girl of 9 years complained of pain in the back, of fairly sudden onset. Next day the pain extended into the

left thigh. Later she became delirious and was admitted to hospital with a provisional diagnosis of tuberculous meningitis. She was found to have some weakness of the left hip flexors and a depressed left knee-jerk. The left plantar response was equivocal. Lumbar puncture yielded thick staphylococcal pus from the epidural space.

Laminectomy of the second and third lumbar vertebrae was performed, and pus was found both within and external to the vertebral canal. The wound was closed in layers with indwelling tubes for instillation of penicillin into the epidural space in doses of 20,000 units twice daily for eight days. Intramuscular penicillin, 500,000 units twice daily, was continued for two weeks. The wound healed, and the patient left hospital cured, 18 days after her admission. At a re-examination eight months after operation the only residual abnormality was very slight weakness of eversion at the left ankle.

Case 3

The disastrous results of delaying operation, despite the elimination of infection by antibiotics, are indicated in this case.

A man aged 64 gave a history of septic arthritis of the knee four years prior to his recent illness; this was followed two years later by osteomyelitis of the tibia. His spinal malady began with lumbo-dorsal backache and girdle pains round his left flank and across his abdomen. Eleven days later he developed a complete flaccid paraplegia within the space of 24 hours. He also had retention of urine.

He was retained for eight days in another hospital, where a suprapubic cystostomy was done. When he was referred to the neurosurgical department three weeks after the onset of his illness he presented a complete paralysis of the lower limbs and a sensory level on the trunk at the T 10 segmental level. The x-ray film showed poor definition of the left pedicle of the tenth dorsal vertebra.

A laminectomy of the eighth to the eleventh thoracic vertebrae was performed, exposing red adherent granulation tissue on the surface of the dura and a few millilitres of pale yellow pus from which a penicillin-sensitive staphylococcus was cultured. The wound was closed with indwelling catheters down which penicillin (20,000 units twice daily for five days) was instilled. Systemic penicillin and sulphonamide therapy was given.

The wound healed by first intention, but though post-operative lumbar puncture demonstrated a complete absence of a spinal subarachnoid block there was no improvement in the neurological state.

Case 4

Occasionally, as in this case, the abscess is very extensive and may indeed involve the entire length of the vertebral canal. Despite this a most satisfactory result may be obtained.

A healthy child aged 2 years had a trivial fall. The next day she complained of pain in her right lower limb and of headache. She was unable to walk. A week later she developed fever and signs suggestive of meningitis. Purulent fluid was obtained on lumbar puncture. The lumbar puncture was repeated next day, and on this occasion frank pus, yielding a mixed growth of *Staph. aureus* and *Str. faecalis* was obtained.

Examination revealed weakness and some extensor rigidity of the lower limbs with extensor plantar responses; sensory testing, though inaccurate in such a young patient, seemed to show a depression of pain sensation up to the level of the iliac crests. Despite the clinical evidence of meningitis, the cisternal C.S.F. contained only 10 polymorphonuclear leucocytes per ml.

An exploration of the fenestration type was done between the laminae at L 1 2 and L 3 4 on the right side, and at L 2 3 on the left. Pus under slight pressure was released. A catheter was passed upwards extradurally through the entire length of the spinal canal, and a smaller tube down

into the sacral region. Further pus was released by saline irrigation. The wound was closed with these tubes *in situ*. Penicillin was instilled down the tubes in doses of 30,000 units, at first four-hourly and later 12-hourly.

Pyrexia subsided, and within nine days active movements of the lower limbs were noted. Two months later recovery was complete.

Case 5

This case presents an entirely different clinical pattern, and illustrates not only the prolonged course which may be followed in some instances but also the fluctuation in neurological signs and difficulty in diagnosis.

A girl aged 16, whose previous health had been good apart from a crop of boils, developed pain in the left lumbar region after playing games and doing gymnastics. The pain persisted and was aggravated by movement. Two weeks later she developed tingling and numbness in the lower limbs, followed by difficulty in walking, and increasing weakness progressing to complete paraplegia. There was impairment of sensation below the umbilicus, and retention of urine. A lumbar puncture yielded C.S.F. "under decreased tension," but unfortunately no record is available of the response to jugular compression, and the protein content was not estimated.

After about three months some spontaneous return of motor power began, and continued during the next three years. Lumbar puncture was repeated eight and a half months after the beginning of her illness and then showed no block and a protein of 30 mg. per 100 ml. of C.S.F. A diagnosis of "transverse myelitis" was made. Although she remained spastic and ataxic she was able to walk and had adequate bladder control.

Twelve years after the original onset of her illness she again suffered mid-abdominal girdle pains, and 20 days later developed complete numbness and rigidity of the lower limbs and retention of urine. This increase in neurological disability took place over a period of two days. Examination showed a complete flaccid paraplegia, sensory loss below T 11, and a complete spinal subarachnoid block. By myelography the block was localized at the level of the twelfth thoracic body.

Laminectomy T 7 to T 12 was performed, exposing dura covered with granulation tissue containing pockets of pus from which a penicillin-sensitive *Staph. aureus* was cultured. Normal dura was exposed above and below. The wound was closed with indwelling catheters, and treatment by local instillation of penicillin and streptomycin and systemic administration of the same antibiotics was undertaken.

During the past seven months there has been minimal return of motor and sensory functions in the lower limbs, but she remains virtually paraplegic, and no substantial improvement is anticipated.

In retrospect there seems little doubt that this patient suffered an acute attack of epidural inflammation with cord involvement at the beginning of her illness. This subsided spontaneously, perhaps aided by sulphonamide therapy, leaving a persisting low-grade infection which flared up again 12 years later without any known precipitating cause. Similar cases of prolonged duration with fluctuations in neurological disability have been recorded in the literature.

Case 6

This case of vertebral osteomyelitis was complicated by epidural suppuration.

A man aged 22 had an amputation through the left thigh for purulent arthritis of the knee and osteomyelitis of the femur. Shortly afterwards he experienced pain in the back of his neck, and noted some weakness of his right lower limb. The weakness improved for a time with massage, but four and a half months later the neck pain increased and he developed paralysis of his lower limb, partial loss of sensation below the lower cervical dermatomes, and incontinence of urine and faeces.

The neurological findings tended to be somewhat variable but on the whole progressive. X-ray films of the cervical spine showed evidence of chronic osteitis in the form of gross erosion and new bone formation in relation to the lower three cervical vertebral bodies. A marked increase in the thickness of the prevertebral soft tissues was also apparent. Lumbar puncture demonstrated a complete subarachnoid fluid block.

On exploration a chronic extradural abscess cavity with a smooth granulating wall was found. The prevertebral swelling was also explored and a small quantity of turbid fluid evacuated.

Despite drainage, the subarachnoid block remained unrelieved, and the patient died about one month after operation. Antibiotics were not available at this time. Shortly before death he developed a suprapatellar bursitis from which *Staph. albus* was cultured. It therefore seems that he continued to have a persistent pyæmia.

Case 7

The course of the illness in the more chronic type of case is illustrated by the following history.

A 45-year-old man gave a seven-months history, beginning with pain below the right scapula which radiated to the lower chest and abdomen. Three months later he sustained a heavy blow on the left lumbar region and buttock, and about a month after this experienced mid-abdominal girdle pains and an electric-shock sensation in his legs. Two weeks later, gradually increasing weakness and sensory depression in the lower limbs began. There were no sphincter or constitutional disturbances.

On examination he showed a moderate paraparesis and impairment of sensation below the eighth thoracic segment. There was no spinal tenderness. Myelography demonstrated a block at the level of the seventh thoracic vertebral body, and on exploration at this level the dura was found covered with vascular granulation tissue containing minute pockets of pus from which a hæmolytic streptococcus was cultured. The wound was closed with indwelling catheters and treatment with repeated local instillation of penicillin instituted.

Gradual improvement in neurological function followed, and recovery was complete in eight months.

Case 8

This case is an example of the rare type of infection giving rise to a true chronic granuloma.

A man aged 36 gave a history of typhoid fever complicated by erysipelas. Since that time, for five years, he had suffered from pains in the right hypochondrium which were attributed to indigestion.

For five months he had had girdle pains at about the ninth thoracic segmental level, worse on the right side. For six weeks he had experienced pain in the back of the right knee, and tingling paraesthesiae radiating from the right side of his body down to the right knee on coughing. Two days after the onset of these pains, weakness of both lower limbs, starting on the right, began and progressed over the next four days.

Examination showed a fit-looking man with a flaccid paraplegia and sensory "level" $\frac{1}{2}$ in. (1.3 cm.) below the xiphisternum. Myelography demonstrated a gradually tapering obstruction in the upper thoracic region, and at laminectomy a very vascular granuloma was exposed; this was densely adherent to the dura, and in order to relieve pressure on the cord the dura was carefully incised at the upper limit of the mass, the arachnoid being kept intact; the incision was then carried longitudinally throughout the length of the granuloma, allowing the arachnoid to bulge through. C.S.F. was seen to pass caudally beyond the obstruction.

Histologically the granuloma consisted of chronic inflammatory tissue containing aggregations of lymphocytes, and on culture yielded a Gram-negative non-motile non-lactose-fermenting bacillus which was not definitely identified.

After transitory improvement his condition deteriorated, and lumbar puncture demonstrated a subarachnoid fluid block. Re-exploration was therefore undertaken some three weeks after the first operation. The incision through the granulation tissue was found to have refilled with the same dense inflammatory mass. This was again split longitudinally and partially excised in order to free the cord, which was found to be greatly constricted at the level of the fifth thoracic lamina. There was only minimal return of motor power, and the patient died two and a half months later. Before death, *Bact. coli* and streptococci were cultured from an effusion in the knee-joint, and the blood culture yielded *Bact. coli*.

While the granuloma in this case was never definitely proved to be due to infection with an enteric type of organism, the evidence suggests that this may have been so.

Judging from the experience in this case, simple division of the constricting granuloma would appear to be insufficient to provide lasting relief of cord compression, and it seems necessary to perform at any rate a fairly generous excision of the inflammatory tissue. Even so, nutrition of the cord may perhaps be too grossly impaired by this stage for useful recovery to ensue.

Cases 9 and 10

These are examples of cases in which infection was due to direct implantation of organisms.

Case 9.—A 39-year-old man had a lumbar puncture while under investigation for headache. Some hours later he complained of pain in the back and right thigh, and two days after this he developed pyrexia with shivering which persisted despite penicillin therapy. He was acutely tender over the lower lumbar spinous processes. Epidural suppuration was suspected and exploration performed; no pus or granulation tissue was found, but a swab taken from the extradural fat showed very large numbers of polymorphonuclear leucocytes in the smear. The wound broke down and yielded thin pus, from which no organism could be cultured. Recovery was eventually complete.

Case 10.—A soldier sustained a through-and-through thoraco-abdominal wound, with the exit wound in the left buttock. The missile traversed gut, which was repaired. The patient showed a severe lesion of the cauda equina, which failed to improve. Six months after injury the cauda equina was explored and the nerve roots were freed from scar tissue. Chronic inflammatory granulation tissue was found in the epidural space. The wound was closed with tubes for instillation of penicillin. Some improvement in neurological function followed, though he remained virtually paralysed below the knees.

Aetiology and Pathology

With rare exceptions the *Staph. aureus*, usually coagulase-positive, is the causative organism. It reaches the epidural space either by the blood stream or by local extension of infection.

Haematogenous infections are derived most commonly from septic skin and subcutaneous lesions such as boils and pimples, but respiratory and urinary tract infections are among the many other possible sources of organisms.

TABLE I.—Summary of Findings

Source of Infection *	No.	%
Cutaneous or subcutaneous suppuration	8	32
Other distant foci of suppuration	3	12
Respiratory infection	3	12
Direct implantation	4	16
? Typhoid	1	4
Not known	6	24
Total	25	100
Trauma (direct and indirect) a probable aetiological factor	9	36
Operative, radiological, or post-mortem evidence of vertebral bone or joint infection	7	28

Trauma to the spine seems to play a definite precipitating part in a number of instances, perhaps by producing a haematoma in which organisms may readily multiply.

Direct infections arise most commonly as a complication of vertebral osteomyelitis. Spread from a neighbouring suppurative lesion such as retropharyngeal abscess, probably by means of a spreading thrombophlebitis, also occurs. Direct implantation of organisms by wounds or a contaminated lumbar puncture needle is an obvious possibility. The relevant findings in the present series are summarized in Table I.

Pathological Anatomy

Although any level, and occasionally the entire length, of the vertebral canal may be involved, most cases of blood-borne infection are located in the upper and mid-thoracic region. This predilection is believed to depend on the anatomical distribution of the epidural tissue, which is of greatest thickness between the fourth and eighth thoracic vertebrae and again below the second lumbar vertebra, at which level a few cases occur. Anteriorly the theca is in contact with the posterior common ligament, and since the epidural areolar tissue is restricted to its dorsal and lateral aspects the infective lesion is similarly situated. In the present series 12 cases occurred in the thoracic and five in the lumbo-sacral region. The cervical region was involved in three cases, and the whole canal in one.

In the rare *anteriorly placed abscesses*, which occur in association with vertebral osteomyelitis, longitudinal spread is limited by adherence of the dura, but for the same reason penetration of the theca may occur, leading to a suppurative meningitis or myelitis.

In *posterior abscesses* there is much less resistance to axial spread, and pus and granulation tissue may extend widely along the spinal canal; usually, however, the extent is limited to a few vertebral segments. Cohen (1938) drew attention to the possibility of the formation of gravitational abscesses in the lumbo-sacral region from a primary focus at a higher level. In these common cases the dura forms a resistant barrier to the spread of infection, so that, although a C.S.F. pleocytosis of a few hundred cells is commonly found, a purulent meningitis is uncommon.

Not infrequently pus tracks outwards into the extra-vertebral tissue planes.

Local Pathological Process

The inflammatory reaction varies from an acute fulminating infection, with severe constitutional disturbance, to a chronic condition extending over months or even years; it probably begins as a septic thrombophlebitis initiated by a coagulase-positive organism. In most cases vascular granulation tissue containing pockets of pus of very variable size is found. In more chronic cases there is a dense adherent granuloma, often closely resembling neoplastic tissue. These chronic granulomata are much less common than the acute and subacute varieties of infection.

Despite the resistance of the dural barrier, disastrous pathological changes soon occur in the *spinal cord*; these consist of liquefaction and vacuolation in the cord substance, and microscopically of all stages of degenerative change up to death and disappearance of nerve cells and disintegration of fibre tracts. It is generally believed that these changes are caused by thrombosis or stasis in blood vessels supplying or draining the cord, a view which is supported by the rapidity with which signs of cord damage progress.

In the adult, between four and ten arteries entering the cord on each side constitute the main vascular supply to their own and neighbouring segments, by way of longitudinally disposed anastomotic vessels. The venous drainage follows a somewhat similar pattern. Stasis or thrombosis in one of these important vessels is likely to produce widespread changes, which develop early in the course of the infection and progress rapidly to a stage of irreversible damage.

Clinical Features and Diagnosis

Acute and Subacute

In most cases the illness follows a fairly constant pattern of development, and the following stages may be recognized (Rankin and Flothow, 1946; Huesner, 1948): (1) the stage of spinal ache; (2) the stage of root pains; (3) the stage of impairment of cord function, leading to sphincter disturbances, and early motor and sensory loss; and (4) the stage of complete paralysis. An antecedent history of infection, frequently of a minor cutaneous nature, is often obtainable, but this is by no means invariable.

The time relations between the several stages varies. Transition from stage 3 to 4 is usually rapid, however, and may occupy only a few hours. This fact is insufficiently recognized.

The onset is often fairly rapid, and accompanied by malaise and fever. The blood shows a polymorphonuclear leucocytosis, and a positive blood culture is often obtainable.

The *back pain* occurs at the level of infection; it is often agonizing, and increased by movement, especially flexion as opposed to extension (Stammers, 1938).

Tenderness on spinal percussion or pressure at the appropriate level is a most important localizing sign. There may be local swelling or redness of the skin.

Root pains, sometimes accompanied by paraesthesiae, make their appearance within a few days, or, in some cases, less than 24 hours.

Headache is common, and neck rigidity and a positive Kernig's sign are often found.

In subacute cases, and those secondary to vertebral osteomyelitis, the period of spinal ache may be more prolonged and of less severity, and the onset of root pains may be delayed for a week or two.

Careful neurological examination at this early stage will often reveal reflex changes indicative of early pyramidal tract involvement. *Lumbar manometry* shows absent or sluggish response on jugular compression, indicating a spinal subarachnoid fluid block. The C.S.F. shows an increase in protein which is of greater degree in more chronic cases, and a pleocytosis of up to perhaps 200 cells, mostly lymphocytes. This investigation is of great importance in establishing the differential diagnosis from such non-surgical conditions as transverse myelitis, and should not be omitted. It must of course be performed with care, advancing the needle a millimetre or so at a time, and aspirating frequently lest a lumbar abscess be present. With reasonable caution there is little risk of carrying infection into the theca.

The development of stage 3, with obvious signs of impaired cord function, occurs usually within a few days of the development of root pains. Retention of urine is often an early symptom. Pain tends to diminish with development of sensory loss.

The transition to stage 4, with complete motor and sensory loss below the level of the lesion, often occurs with disastrous rapidity. In seven cases in the present series, 24 hours or less elapsed between the appearance of the first neurological abnormality and the development of stage 4.

In the *chronic type of infection* the course is much more prolonged, extending over months or even years; the signs of cord dysfunction may fluctuate, sometimes undergoing spontaneous remission. The constitutional phenomena of infection are absent, and the pattern of the illness closely resembles that of extramedullary spinal tumour.

The most important factor in the diagnosis of spinal epidural abscess is awareness of its possibility. The urgency and potential gravity of these cases must be more widely recognized.

No fewer than 12 cases in the present series had a virtually complete paraplegia when presented to the surgeons. It cannot be too strongly emphasized that, once signs of inter-

ference with cord function begin to appear, the situation is one of extreme urgency and every hour of delay diminishes the chances of recovery.

Myelography may be required to establish the precise level of the lesion when the local and neurological evidence is equivocal in this respect.

Radiographs of the spine are not often helpful, since the infection in most cases is too recent to have caused visible changes in the bones.

Treatment

Once the diagnosis is established, exploration is urgently indicated. The objects of operation are (1) to release pus, and decompress the theca and its contents; and (2) to provide means for repeated local application of antibacterial substances by means of thin indwelling tubes. In the first instance a limited opening into the vertebral canal should be made by removal of ligamentum flavum and portions of adjacent laminae at one or more levels. If pus in quantity is found, this will often suffice to allow insertion of thin rubber catheters to the extremities of the abscess cavity, for repeated aspiration of pus and instillation of antibiotics.

Where the lesion consists largely of granulation tissue containing small pockets of pus, a complete laminectomy should be performed throughout the length of the infected area. If the granulation tissue is thick and dense, excision by careful sharp dissection is indicated, in order to obviate subsequent stricture of the theca by scar tissue.

In children, in whom preservation of the laminae is of importance in order to avoid the later development of a kyphosis, the laminae may be elevated in a continuous string, preserving the ligaments, so that they may be replaced at the conclusion.

The catheters are brought out through stab incisions adjacent to the main wound. In the great majority of cases primary healing can be achieved, with appropriate antibiotic therapy vigorously applied locally and systemically. An early report on the culture and sensitivity of the organism is essential. It must be emphasized that antibiotics are in no sense regarded as a substitute for early and adequate surgical intervention.

Results

The prognosis with regard to survival has undergone a dramatic change since the introduction of the sulphonamide drugs and antibiotics. Previously a fatal outcome was the rule in all acute and subacute cases not treated surgically, and also in a large number of those subjected to operation (Campbell, 1937). In Huesner's series, before 1939 there were eight acute cases with three deaths: in a group of ten similar cases after 1939 there was only one death.

The prognosis for recovery of cord function bears a close relationship to the severity of neurological deficit at the time of operation. We have been unable to establish any clear correlation between the duration of paralysis and the degree of recovery. Our impression is that once conduction in the cord becomes severely compromised it is already too late to achieve any substantial degree of recovery in most cases. This does not imply, however, that the severely paralysed case should be regarded with any less urgency, since a number of remarkable recoveries have been recorded.

The results in the present series are given in Table II.

In Table III the severity of neurological impairment at the time of operation and the subsequent degree of functional recovery in the survivors are presented.

TABLE II.—Results

Category	No.	Died	Survived		
			Full Recovery	Partial Recovery	No Recovery
Acute	13	4	4	3	2
Subacute	7	3	—	2	2
Chronic	5	2	1	1	1
Total	25	9	5	6	5

TABLE III

Degree of Neurological Deficit Before Operation	No.	Degree of Recovery		
		None	Partial	Complete
None or slight	4	—	—	4
Moderate	4	—	2	—
Complete or very severe	7	4	3	—

One case in which disability was mainly due to severe trauma of the cauda has been excluded.

Summary

The results in 25 cases of spinal epidural suppuration, with illustrative case histories, are presented. The importance of recognition of the urgency and potential gravity of these cases is emphasized.

The survey indicates that, with early recognition and treatment prior to the onset of gross neurological abnormalities, satisfactory recovery can be anticipated in most cases; while delay until signs of severe cord damage become apparent usually results in permanent, crippling disability.

The most important factor in early diagnosis is an awareness of the possibility of the condition, and an appreciation of the rapidity with which the pathological process advances to an irreversible state.

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LOW GAMETOCYTE THRESHOLDS OF INFECTION OF ANOPHELES WITH PLASMODIUM FALCIPARUM A SIGNIFICANT FACTOR IN MALARIA EPIDEMIOLOGY

BY

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Malariaologists have long been familiar with the inconsistencies experienced when trying to infect anopheles with malaria parasites by feeding them on patients showing falciparum gametocytes—crescents—in the blood. Those subjects with the heaviest infections have not necessarily been the most infectious—in fact, they have sometimes proved completely non-infective. Many of these discrepancies have been attributed to the great disparity in the sex ratio of the crescents, to the possibility that the gametocytes are not "ripe," and so on. Up till a few years ago, however, it was fairly generally assumed that, as the number of crescents in the blood decreased, a point was eventually reached when low density alone became a limiting factor, the subject becoming non-infective at a time when crescents could still be detected in the blood film without too much difficulty (Boyd, 1949). Those ideas seem to have been so firmly implanted that carriers with very scanty

crescent infections were almost automatically rejected as a possible means of infecting anopheles in the laboratory or in the field.

Martin Young and his colleagues (1948), working with a negro population in South Carolina, showed, however, that those ideas would have to be revised considerably. They were able to infect 10 lots of *Anopheles quadrimaculatus* (nearly half of the total infective lots) at a time when falciparum gametocyte counts were less than 5 per c.mm. Of these, five cases had fewer than one gametocyte per c.mm.; and finally a few mosquitoes became infected at a time when parasites were too scanty to be detected in the ordinary microscopical examination.

Similar observations, although on a much smaller scale, were made with *Anopheles albimanus* and a negro population in Jamaica during 1950 (Muirhead-Thomson and Mercier, 1952). These observations made a particularly deep impression on us, as at that time we were unaware of the findings in South Carolina. After feeding a batch of *A. albimanus* on a 3-year-old subject who had previously been a good carrier and infecter, routine examination of the thick film taken at the time of feeding failed to reveal a single crescent, and it was dismissed as negative. The mosquito batch was kept as a matter of curiosity, and one-third of them (12 out of 37) eventually developed gland infections. Later, another subject was found to be infective at a time when only a single crescent was present in over 200 thick-film fields—0.12 crescents per 1,000 leucocytes, or less than 1 per c.mm.

Present Investigation

In the Gold Coast recently this work has been continued more intensively, using laboratory-bred *Anopheles gambiae* and working in an area west of Accra where malaria is hyperendemic. In order to find out the crescent carriers and to determine the gametocyte rate of the village population that is, the proportion showing falciparum gametocytes in first examination—thick blood films were examined rather more thoroughly than usual, no slide being dismissed as negative until at least 200, and usually more, oil-immersion fields had been examined. The gametocyte rate—or rather crescent rate—of the population examined is shown in Table I.

TABLE I.—Incidence of *P. falciparum* Gametocytes in African Population, Weijsa, Gold Coast, 1952

Age Group (Years)	No. Examined	No. with Crescents	% Positive (Gametocyte Rate)
0-1	52	21	40.4
2-4	62	16	25.8
5-9	148	22	14.8
10-14	78	9	11.5
15 and over	151	9	5.9

Although the gametocyte rates are rather higher than usual, the general trend is similar to that found by other workers in West Africa (Barber and Olinger, 1931; Young and Johnson, 1949; Bruce-Chwatt, 1951), the higher age groups, 15 years and over, having low gametocyte rates as well as low gametocyte densities. Heavy gametocyte infections were comparatively rare, only 1 out of 491 people examined showing over 200 crescents per c.mm. Shute and Maryon (1951), in a thin-film survey in Lagos, had the same experience, only 2 out of 800 children showing 200 or more crescents per c.mm. Higher figures have been recorded elsewhere (Barber and Olinger, 1931; Robertson, 1945; Bruce-Chwatt, 1951), but they are evidently exceptional.

The actual infectiousness of as many of these crescent carriers as possible was tested by feeding batches of 40-50 laboratory-bred *A. gambiae* on them, blood films being taken at the time of feeding. The mosquitoes were dissected four to seven days after feeding, when falciparum oocysts with their characteristic pigment (Shute and Maryon, 1952) could best be detected in the mosquito stomach. In a few of the more heavily infected batches some of the mosquitoes were kept until salivary gland infections developed.

In all, 73 batches of *A. gambiae* were fed on 32 crescent carriers of all ages from 4 months upward. Of these, 24 batches became infected from 14 carriers.

In previous work in West Africa the lowest thresholds of infection were recorded by Robertson (1945), who found four infections at thresholds below 3 crescents per 1,000 leucocytes; in one batch 1 out of 13 *A. gambiae* being infected cytes; when the crescent density was 0.7 per 1,000 leucocytes—that is, less than 5 per c.mm.

In the present investigation, of the total number of batches infected, nearly half (46%) were recorded at crescent densities below 3 per 1,000 leucocytes. On six occasions—that is, 25% of total infected batches—the crescent density at the time of feeding was below 1 per 1,000 leucocytes (Table II).

TABLE II.—Particulars of Mosquito Infections Obtained at Falciparum Gametocyte Thresholds Below 1 Crescent per 1,000 Leucocytes

Age and Sex of Subjects	Crescents per 1,000 Leucocytes	Mosquitoes Dissected	Positive		Mean No. Oocysts per Positive Stomach
			No.	%	
F, 2½ years	0.52	13	3	23	1.7
F, 5 "	0.20	21	2	9	1.5
M, 5½ "	0.27	20	1	5	3.0
F, 9 "	0.26	12	1	8	1.0
F, 9 "	0.10	10	1	10	1.0
M, 10 "	0.16	18	1	6	1.0

The two lowest figures recorded correspond to a density at or below one crescent per c.mm., the first crescent being found only after examination of 300-400 oil-immersion thick-film fields. Those slides would normally have been dismissed as negative for crescents, and it was only the knowledge that the subjects were actually infective to mosquitoes which made the search so prolonged and persistent.

From Table II it will be seen that of the total number of mosquitoes feeding on those subjects with low crescent counts the proportion infected is usually about 10% or less, and that the intensity of infection is also low—from 1-3 oocysts in each positive stomach. These figures will be seen in their right perspective if we compare them with what happens with the most infectious subjects found in this African village survey. In the four most efficient infectors found—whose crescent densities covered a wide range from 1.2 to 24.0 crescents per 1,000 leucocytes (roughly 8 to 150 per c.mm.)—it will be seen from Table III that the number of oocysts per positive stomach remains fairly low.

Of the 87 positive mosquito stomachs in this series, 76 (89%) had fewer than 10 oocysts per stomach, and only 4

TABLE III.—Record of Experimental Feeds on Four Most Infectious Crescent Carriers in Gold Coast Village Survey

Age and Sex of Subjects	No. of Mosquito Batches Fed	Range of Crescent Density during Most Infective Periods (per 1,000 Leucocytes)	Total <i>A. gambiae</i> Dissected	No. with Oocysts	Intensity of Infection. Oocysts per Positive Stomach		
					Max.	Min.	Mean
M, 2 yrs.	1	6.0	18	7	26	1	9.1
M, 3 "	3	1.2-4.1	50	23	28	1	5.7
M, 5 "	7	7.9-24.0	107	39	28	1	5.0
F, 9 "	5	1.7-8.2	97	18	10	1	3.4
			272	87			

(5%) had more than 20. Higher oocyst densities have been recorded elsewhere (Barber and Olinger, 1931; Robertson, 1945), but our own experience is that they are unusual, particularly after a single infective feed.

In comparing the infectiousness of these village subjects showing the lowest crescent densities (Table II) with the infectiousness of the most efficient carriers found in the survey (Table III), we can say roughly that while the best infectors will infect about 30-40% of the mosquitoes feeding on them, and produce on the average about 5 oocysts per stomach, the carriers with the lowest threshold may infect up to 10% of the mosquitoes, and produce about 1-2 oocysts per stomach. The low-threshold carriers are therefore relatively much more infective than we would imagine from their very low gametocyte densities. There is some evidence to show that such a carrier may retain a very scanty crescent infection and at the same time remain infective for long periods.

In discussing these very low gametocyte densities it must be pointed out that, as many of the figures have to be based on the finding of only one or two crescents in several hundred thick-film fields, they may possibly give a misleading idea of the true density not only in the blood film itself but also in the mosquitoes' blood meal. In fact, our findings would be altogether easier to understand if we assumed that at these low densities the distribution of crescents throughout the blood stream is very uneven.

In contrast to these low-threshold, or "cryptic," infectors, our routine tests revealed several striking examples of subjects being non-infective at a time when crescents were abundant in the blood. The most outstanding examples are shown in Table IV.

TABLE IV.—Particulars of Non-infective Feeds at Gametocyte Densities Greater than 3 per 1,000 Leucocytes

Age and Sex of Subjects	Crescents per 1,000 Leucocytes	No. of <i>A. gambiae</i> Found Non-infective
F, 4 months	3.3	22
F, 6 "	4.8	16
M, 2 years	7.7	13
F, 3 "	2.8	15
F, 7 "	3.9	17
F, 7 "	3.1	19

In our investigation in Jamaica (Muirhead-Thomson and Mercier, 1952), the subject with the heaviest infection remained non-infective for several weeks, while Martin Young and his colleagues (1948) report a similar failure with the two patients showing the highest gametocyte count. In this connexion it is interesting to note that in the Gold Coast village survey the highest proportion of non-infective carriers occurred in infants—0-1 year age group—only 2 out of 13 crescent carriers proving infective to mosquitoes. Whether this figure is really representative of that group or whether it is just a sampling error is obviously a point which will require further investigation.

Discussion

The first conclusion from all these findings is that the presence or apparent absence of falciparum gametocytes in routine blood-film examination may really give a very misleading idea of the infective status of the subject. Until further improvements in technique occur, actual infectiousness can be determined accurately only by test feeds with anopheles. In fact, one might go so far as to say that in trying to determine the proportion of malaria infectors in the African or native village community a more accurate picture might be obtained if test feeds were carried out on a large scale, at random, quite irrespective of the blood picture. Obviously, too, in implicating cryptic infectors, the larger the batch of mosquitoes used in the test the better. Even with batches of 40-50 anopheles one might still miss the occasional carrier who infects only 2 to 3% of the mosquitoes feeding on him. How fruitful a line of inquiry this random testing

might be already indicated by the first tentative tests in the Gold Coast. Out of 28 adults, two young men aged about 20-25 proved infective. In view of the low gametocyte rate of this group, and the low gametocyte densities encountered under hyperendemic conditions, adults have usually been regarded as of negligible importance as a source of malaria infection. As crescent infections may occur at all ages, including the very oldest inhabitants in the community, the usual blood picture may be giving quite an erroneous impression of the infective status of this group.

The possible role of these cryptic infectors as reservoirs of malaria has also to be considered in the light of recent observations on the distribution of anopheles bites and feeds among different human age groups. With both *A. albimanus* in Jamaica (supported by observations on *A. aquasalis* and *A. bellator* in Trinidad) (Muirhead-Thomson, 1951) and *A. gambiae* in West Africa (Thomas, 1951) it has been shown that in general there is a tendency for mosquitoes to obtain the bulk of their blood meals from older children and adults rather than from infants and toddlers. From this it would appear that an adult with a cryptic infection might be a much more important reservoir of malaria than an equally infective baby, the low infectivity being counterbalanced in nature by the greater number of mosquitoes feeding on the adult.

In trying to understand the conditions leading up to malaria epidemics, or even to seasonal waves of malaria, malariologists have long been influenced by the changing gametocyte rate of the human population as found in routine blood-film examination. It is possible that the difficulties they have encountered in trying to explain the discrepancy between low gametocyte rates and densities in the human population on the one hand, and rapidly increasing infection rates among the anopheline mosquitoes on the other hand, might be due to a much higher proportion of the population actually being infective to mosquitoes for the reasons described above.

Frohne *et al.* (1950), for example, have shown in an area in South Carolina that, despite a remarkable reduction in the parasite rate of the negro population in the proportion of 318 to 1 between 1945 and 1948, infections in wild-caught anopheles still persisted. One of the explanations suggested by these workers was that a higher proportion of the human population is infective to anopheles than is indicated by the monthly parasitaemia rates. They were dealing with a strain of *P. falciparum* which had already been shown by Young and his colleagues to be capable of infecting *A. quadrimaculatus* at extremely low gametocyte densities.

Finally, it is interesting to note that these extremely low gametocyte thresholds of infection have been encountered in three different parts of the world, using three different species of anopheles, and probably as many different strains of *P. falciparum*. One feature common to all three investigations is that the human population experimented with has been negro or of negro origin. It might be worth considering how far these results could be influenced by racial characteristics.

Summary

Observations in Gold Coast villages where malaria is hyperendemic have confirmed previous findings in Jamaica, and by American workers in South Carolina, that some carriers can infect anopheles with *P. falciparum* at a time when the density of gametocytes in the blood is so low that they may be detected only with difficulty in routine blood-film examination.

In the Gold Coast experiments these cryptic carriers formed a significant proportion—roughly one-quarter of all infective carriers. This finding, together with the fact that many good crescent carriers are non-infective to mosquitoes, suggests that the blood-film examination may prove a very deceptive guide to the real malaria infectors in the African or native village community.

The implications of these findings are discussed in the light of recent work on the uneven distribution of anopheles bites and feeds among different human age groups.

The work briefly described above forms the first phase of a research scheme carried out under the control of the Colonial Office and the Colonial Medical Research Committee. It is hoped that a more detailed report will be produced at a later date.

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RHEUMATIC HEART DISEASE COMPLICATING PREGNANCY

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Improvements in antenatal and intranatal care over the past 50 years have resulted in a great reduction in the maternal mortality rate. Advances in particular fields have altered the relative importance of many complications, because some which were formerly of the utmost gravity are now more amenable to treatment. The change is exemplified by an analysis of 328 maternal deaths occurring in 128,474 deliveries in the three Dublin maternity hospitals during the decade 1940-50 (O'Driscoll and Quinn, 1951), the chief causes of which were:

Eclampsia	41
Sepsis (usually complicated)	42
Rheumatic heart disease	35
Accidental haemorrhage	32
Post-partum haemorrhage	25
Ruptured uterus	21
Placenta praevia	17
Non-convulsive toxæmias	15

These figures demonstrate the importance of rheumatic heart disease as a factor in maternal mortality. No reference is made to other forms of heart disease complicating pregnancy, as few cases were seen and none was fatal.

To evaluate the problem of rheumatic heart disease in pregnancy a clinical survey was begun by us in the National Maternity Hospital on January 1, 1948, and, for the purpose of this communication, was concluded on January 1, 1952. During these years 250 pregnancies in 175 patients with rheumatic heart disease were studied. The patients were graded according to the recommenda-

tion of the New York Heart Association. The diagnosis, which was in all cases confirmed after pregnancy, was a clinical one, although electrocardiographic and x-ray examinations were routine. Every patient who survived was seen in 1953, so that the follow-up time varied from four years to a minimum of one year.

The average parity of these women was 4. This compares with the figure of 3.3 for all married women in Ireland. In 1,532 years of married life these women had 704 pregnancies—that is, a pregnancy every two years. Of these 704 pregnancies none was artificially terminated and only 29 failed to reach viability.

It is apparent that the number of children borne by these women was related only to their natural fertility. The series is drawn from a population which does not practise contraception, therapeutic abortion, or sterilization. The communication presents the result of uninhibited child-bearing in patients with rheumatic heart disease. Most papers on this subject are open to the criticism that indirect case selection results from these practices.

At the end of the survey 11 women had died. Five died later than one year after confinement (13, 18, 24, 36, and 36 months), and so their deaths are not thought to have been related to pregnancy. Six died during pregnancy or within one year of confinement; these deaths are considered to have been related to pregnancy. They represent a maternal mortality of 3.5%. The number of babies who left hospital alive was 229. The uncorrected foetal loss was 6.4%.

Analysis of 175 Patients

An unequivocal rheumatic history was given by 111 patients, or 63%. A strong family history was obtained in a further six cases. The incidence of the various valvular lesions was as follows:

Lesion	No. of Cases
Mitral stenosis	151
Mitral stenosis and aortic regurgitation	23
Aortic regurgitation	1

Because of the recognized difficulty in diagnosing pure mitral regurgitation (Brigden and Leatham, 1953), 10 patients with harsh mitral systolic murmurs and a personal history of rheumatic disease are grouped under the heading "mitral stenosis." In these cases the predominant defect would appear to be an incompetence of the valve. The importance of history-taking and of careful auscultation at the mitral area is illustrated by these figures.

It has often been said that the heart condition deteriorates with increasing parity. Table I confirms this, but the last column reminds us that increasing parity coincides with increasing age. This may be the relevant factor.

TABLE I

Parity	No. of Cases	Grades III and IV		Average Age
		No.	%	
1	46	15	32.6	28.5
2 to 4	83	30	36.1	33.2
5+	46	21	45.7	38.5

TABLE II

Age	No. of Cases	Grades III and IV	
		No.	%
Under 26	18	8	44.4
26 to 30	39	11	28.2
31 to 35	48	17	35.4
Over 35	70	30	42.9

Table II shows the relative incidence of severe cases in the various age groups. With the striking exception of the youngest group, the number of severe cases increased with age. We formed the opinion that recurrences of acute rheumatism may explain the disproportionately high number in the youngest group. We believe that this constitutes a real danger to young mothers. Further reference is made to this matter.

In 17 of the 29 patients seen in acute congestive heart failure there were, apart from pregnancy, the following important relevant factors:

Auricular fibrillation	4
Auricular fibrillation and acute respiratory infection	2
Acute respiratory infection	4
Acute respiratory infection and hypochromic anaemia; Hb 32%	1
Acute pyelitis and hypochromic anaemia; Hb 23%	1
Subacute bacterial endocarditis	2
Acute rheumatism	2
Pre-eclampsia; B.P. 170/110; oedema	1

Auricular fibrillation is the most important single factor in precipitating heart failure. Its presence indicates widespread damage to the myocardium. Four additional women with auricular fibrillation were not in failure. Intercurrent infection, particularly of the respiratory tract, anaemia, hypertension, and fluid imbalance are other notable causes of cardiac decompensation during pregnancy. Active rheumatic and bacterial endocarditis caused heart failure in four of the patients in this survey.

It is of interest to note the stage at which failure occurred in these 29 patients. In two it appeared in the first trimester, in seven in the second, and in 14 between the 28th and 36th weeks, but in no instance between the 36th week and the onset of labour. Five failed during labour and one during the puerperium. This experience substantiates the opinion that the strain imposed on the heart by pregnancy steadily increases to the period between the 28th and 36th weeks, and sharply decreases in the last month. It follows that induction of labour is basically an unsound procedure in the treatment of heart disease. The comparatively small number that failed during labour indicates that, given proper management, the danger of labour has been exaggerated. The fact that only one woman failed in the puerperium lends no support to the frequent reiteration that this is a time of particular risk.

Method of Delivery

Labour was induced in three women for pre-eclampsia and in no instance for heart disease. The methods used for delivery in the 250 pregnancies were as follows:

Caesarean section	7
Forceps or breech extraction	47
Laparotomy (see maternal deaths)	1 (twins)
Died undelivered	2
Spontaneous delivery	184 (5 twins)
Evacuation of incomplete abortion	4
Complete abortion	5

The incidence of caesarean section was 3%, whilst in the whole hospital service it was 1.5%. This discrepancy arose as the result of cases operated on more than once before coming under our care.

Only one caesarean section was performed for heart disease. It was in the early stages of the survey. The patient was subsequently delivered vaginally of her second baby. This illustrates the attitude towards abdominal delivery prompted by the intervening cases. The operation was performed in error resulting from inexperience of this condition. We now believe that rheumatic heart disease is never an indication for section.

Caesarean section was performed once for central placenta praevia, once for severe pre-eclampsia at 30 weeks' gestation and once for absolute disproportion. From fear of rupture of the uterus three operations were carried out on women who had undergone section at least twice previously for heart disease. The cardiac condition did not influence the decision in any of the foregoing six cases.

Six women who had undergone section previously for heart disease were delivered by the natural passages. The assisted vaginal delivery rate of 20% was twice the rate for all the hospital deliveries. The timely but not routine forceps or breech extraction is favoured. Local analgesia, supplemented when necessary by intravenous thiopentone, was used in all operative deliveries.

Maternal Deaths

Six women died during pregnancy or within one year after. A brief description of each follows:

Case 1.—Primigravida aged 25. Emergency admission at 31 weeks' gestation with subacute bacterial endocarditis complicated by embolic hemiplegia. Labour began spontaneously one week later and was terminated by breech extraction. The endocarditis did not respond to treatment, and the patient died 10 weeks after delivery from congestive heart failure. The baby survived.

Case 2.—Primigravida aged 28. Emergency admission at 30 weeks' gestation, moribund from congestive heart failure (grade IV). She was not in labour and died undelivered 12 hours after admission. This patient had mitral stenosis and aortic incompetence. She had been having frequent attacks of haemoptysis for three months before admission and had been partially incapacitated by her heart for several years.

Case 3.—Primigravida aged 24. Emergency admission at 16 weeks' gestation, moribund from congestive heart failure (grade IV). She was not in labour, and died one hour after admission. She had mitral stenosis and aortic regurgitation. No antecedent history was available.

Case 4.—Primigravida aged 23. Emergency admission at 30 weeks' gestation with cardiac decompensation (grade IV). There was considerable enlargement of the heart, tachycardia, and extrasystoles. She had aortic regurgitation and mitral stenosis. Her condition improved considerably in hospital, but frequent bouts of tachycardia were accompanied by relapse into failure. A diagnosis of active rheumatic carditis was made; she had an easy labour at term, ending in low forceps delivery. The baby survived, but the mother died six weeks later from congestive heart failure.

Case 5.—Gravida 2 aged 27. Emergency admission at 32 weeks' gestation with cardiac decompensation of moderate degree (grade III) due to acute bronchitis. She responded well to treatment, ceasing to be a cause of anxiety until three weeks before term. She then developed pneumococcal pneumonia involving the right upper lobe. This caused acute cardiac distress and a fulminating bacterial toxæmia which precipitated the onset of labour 17 hours later. Despite an easy rapid labour lasting six hours, she died five hours after spontaneous delivery in congestive failure; the baby was stillborn.

Case 6.—Gravida 10 aged 39. Emergency admission at 30 weeks with unexplained pyrexia and a twin pregnancy. Her last delivery had been by classical caesarean section for placenta praevia outside our service. On admission her general condition was poor, temperature 100° F. (37.8° C.), pulse 128, haemoglobin 23%, blood pressure 160/90, albumin, a trace; she had mitral stenosis, with considerable enlargement of the heart, and was in congestive heart failure. Subacute bacterial endocarditis was diagnosed, and she was treated with fair response. Her general condition deteriorated again at 34 weeks, and on further investigation it was clear that her symptoms were due to quiet rupture of the uterus. At laparotomy two macerated foetuses and their placentae were in the abdominal cavity, which was heavily infected. A loop of small gut was torn where it adhered to the uterus. Subtotal hysterectomy and bowel resection were performed. The patient died 24 hours later.

All six who died were unbooked patients; not one had received antenatal care at the hospital before admission to the wards in heart failure. There was a 20% fatality rate in unbooked patients. No booked patient died. This emphasizes the importance of routine examination of the heart of every midwifery patient. It also emphasizes the importance of efficient antenatal care. It has been our experience with emergency admissions that frequently neither the patient nor her doctor knew that heart disease existed until symptoms of heart failure appeared. The explanation is that many practitioners do not examine the heart of a pregnant woman because they are unaware of the frequency and gravity of heart disease. This fact demands the attention of all engaged in teaching obstetrics.

A striking feature of the fatal cases was the preponderance of the young and the primigravidae. The only exception was Case 6, who would probably have survived if her uterus had not ruptured. Was it because these women were young or because they were primigravidae that they died? Or were these matters merely of coincidence? Three of these fatal cases had aortic incompetence.

Case 1 died from subacute bacterial endocarditis 10 weeks after an easy delivery. It may be assumed that neither age nor parity was of importance here. Case 5 died in congestive failure precipitated by lobar pneumonia and aggravated by the untimely onset of labour, albeit rapid and easy. This death was not influenced by age or parity. Case 4, a primigravida aged 23, died six weeks after a normal delivery. She was under our care long enough for us to be satisfied that the deterioration of her heart was due to active rheumatic carditis. This was related to her age. Case 3 died from congestive failure at 16 weeks' gestation. She was 24 years old, and we suggest that her youth exposed her to a recrudescence of acute rheumatism. Her parity was hardly an important factor. Case 2 died similarly, in congestive failure at 30 weeks' gestation. That she was a primigravida was not likely to have been of importance, because she was not in labour. A rheumatic recurrence is offered to explain this fatality in a woman of 28 years.

It is our opinion that age and parity were matters of simple coincidence in Cases 1, 5, and 6, and that age rather than parity was an important factor in Cases 2, 3, and 4. The young mother who is by coincidence usually a primigravida is prone to reactivation of her disease, and we agree with others that this is of the greatest importance in determining a fatal issue (McKeown, 1948, 1950; Kennedy, 1950; Castleden *et al.*, 1951).

Paradoxically, most of the deaths occurred in the groups which contained the smallest number of severe cases, that is, in the younger women and women of low parity. Although most of the patients in failure were older and of high parity, only one of these died, and she as the result of a ruptured uterus. None of the women with fibrillation died. The inference is that the heart damaged by rheumatic disease is not likely to result in death if proper care be given, unless the mother's youth exposes her to the risk of reactivation of the disease.

The five women who died more than a year after delivery were all amongst the older age groups (33, 35, 37, 37, and 48 years), and all died from heart failure. They had reached the end phase of their disease. The fact that they survived their latest pregnancy by more than a year suggests that pregnancy did not contribute to these deaths.

Contraception, Therapeutic Abortion, and Sterilization

Contraception, therapeutic abortion, and sterilization are not practised in this city. There were 229 healthy surviving children born to these 175 women in the four-year period. It is of interest to consider the effect that the absence of these practices had on the maternal survival rate.

Women with heart disease are commonly advised to have only two children, and to ensure this the patient is often sterilized after the second delivery. Had this procedure been adopted in our series many operations would have been done, as a result of which one woman would have been saved from death due to rupture of the scar of a classical section carried out for placenta praevia.

All six women who died were seen too late in pregnancy or too advanced in heart failure for therapeutic abortion to be performed. Since no woman who received antenatal care at the hospital was lost, one might be justified in assuming that proper antenatal care would have been more likely to save them than therapeutic abortion.

It is unlikely that the practice of contraception would have affected the mortality from heart disease, since four

women died on their first pregnancy, and the only one who died later than the second pregnancy did not die from heart disease.

Had sterilization, abortion, and contraception been considered in the management of these cases they would have been applied to those who survived and not to those who died.

The dangers of these procedures have never been systematically presented. The indications, ages, parity, and maternal mortality figures in a series of cases treated by these methods would render an assessment of their advantages, or otherwise, possible. Until such figures appear it seems that good antenatal care can be expected to serve a mother better than either therapeutic abortion or sterilization.

Outcome of 250 Pregnancies

Of the 250 pregnancies observed, six were twin pregnancies. The outcome may be summarized as follows:

Surviving infants	229
Stillbirths	10
Neonatal deaths	6
Abortions and miscarriages	9
Died undelivered	2

Estimating the percentage of stillbirths and neonatal deaths on the number of infants delivered (245) who weighed more than 2 lb. 12 oz. (1.25 kg.), we obtain the figures of 4% and 2.4%, respectively. The corresponding figures for all deliveries in the hospital over the same period were 3.8% and 2.4%.

Two of the stillbirths were examples of hydrops foetalis; rupture of a classical section scar in a case of twin pregnancy caused the death of two infants; two infants died as the result of extensive placental infarcts due to pre-eclampsia (one of these mothers suffered from diabetes); eclampsia (one of these mothers suffered from diabetes); and a central placenta praevia caused another stillbirth; and one was a macerated twin, its fellow surviving. In none of these eight cases did the maternal heart condition affect the foetal loss. In the other two cases of stillbirth the mothers were suffering from cardiac decompensation, but it is likely that the stillbirths would have otherwise resulted: the one mother suffered from primary uterine inertia, and the foetal heart ceased after labour had lasted 80 hours; the other was suffering from an overwhelming toxæmia due to acute lobar pneumonia.

Not one of the six neonatal deaths was related to maternal heart disease. Two resulted from congenital malformations, one was caused by pneumococcal meningitis, and one by laceration of the tentorium cerebelli. One baby was found to have atelectasis following prolapse of the cord, and another suffering from laryngismus died suddenly when 6 days old. Each case was examined at necropsy.

The nine abortions or miscarriages give the surprisingly low incidence of 3.6%. The incidence of abortions and miscarriages in the hospital over the same period was 7.5%. As many women do not attend in early pregnancy and abort outside hospital, these figures may not be reliable. But the figure for the heart cases seems to be confirmed by the fact that these women had borne, in all, 704 pregnancies, including those under consideration, and only 29 (4%) had terminated before the period of viability. It can be confidently stated that none of the nine abortions or miscarriages were caused by rheumatic heart disease.

In the case of the two women who died before delivery the foetal loss can clearly be attributed to the heart condition.

Since rheumatic carditis did not affect the survival of more than four conceptions in 256 it seems fair to assume that the prospects of a healthy child in a woman who suffers from this disease is virtually the same as in one who does not. In assessing these figures it must be remembered that therapeutic abortion was not performed, so that 89.5% of all conceptions seen at the hospital resulted in surviving children.

Conclusion

As already stated, the cases recorded in this paper were totally unselected; contraception, termination, and sterilization were never practised. Furthermore, the patients were mainly drawn from the under-privileged groups, with poor home conditions and no home help, who are fertile to a degree which workers in other countries rarely see.

Diagnosis is the first and clearly the most important aspect of the problem of rheumatic heart disease in pregnancy. That it is simple is illustrated by the preponderance of mitral stenosis and the frequency of a rheumatic history. The functional systolic murmur so common in pregnancy may lead to the suspicion of disease more often than it exists, but failure to recognize existing disease is a more serious error. In the present series all of the fatalities occurred in cases which were not diagnosed until failure was established.

Rest is the natural sequel to diagnosis. Cases without significant limitation of cardiac reserve are allowed to go home. They are advised specific rest hours, which are systematically increased until they are admitted to hospital two weeks before term. Patients with limitation of cardiac reserve are admitted to hospital without delay and are not discharged until after delivery. The importance attached to rest is signified by the total of 5,250 days which the women in the present series spent in the antenatal wards of the hospital—that is, an average of 21 days before each delivery.

Digitalization, diuresis, venesection, etc., are adopted as in the standard management of heart disease. Valvotomy is now an additional weapon.

Heart disease is not regarded as an indication for induction of premature labour or for caesarean section. Forceps extraction is often employed to abbreviate the second stage of labour. Post-partum haemorrhage is never encouraged or permitted to continue, venesection being a much safer method of reducing the circulatory volume when necessary.

Summary

The case histories of 175 women in 250 pregnancies over a period of four years are analysed.

Rheumatic heart disease is a common complication in pregnancy (1.7%).

The diagnosis is a simple clinical one.

Early diagnosis is imperative if fatalities are to be avoided.

There was no maternal death in 220 booked cases.

It is considered that there is no place for therapeutic abortion or sterilization.

This survey was begun during the Mastership of Dr. A. W. Spain. We are grateful to him for his interest and stimulating advice.

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A revised edition of *Social Work* is now available in the "Careers for Men and Women" series issued by the Ministry of Labour and National Service (H.M.S.O., price 1s. 6d.). Information is given on the scope of each career, the pre-entry qualifications needed, the amount, cost, and type of training required, and the professional opportunities available after qualification. Among the careers described in the booklet are almoner, psychiatric social worker, mental health officer, moral welfare worker, home teacher of the blind, and family case worker. This is a useful booklet for anyone likely to be asked for advice in the choice of a career closely related to medicine.

As has been stressed by Cicely Williams (1953) and Chambers (1953), a diagnosis of vomiting sickness is often loosely used in Jamaica to cover various undiagnosed illnesses in which vomiting or sudden death has occurred. Nevertheless, after taking this into account, there remains a definite group of typical cases showing a characteristic clinical picture.

Aetiology

The precise aetiology of the vomiting sickness of Jamaica is still very much in doubt and cannot be discussed here fully. The various hypotheses have been considered by Hill (1952). Meningitis, encephalitis, cerebral malaria, and other acute cerebral inflammatory diseases can be excluded both clinically and by post-mortem evidence. The present consensus of opinion is that the syndrome is due to the effect of an unknown poison, or possibly one of several poisons, upon subjects who are usually rather poorly nourished, especially children. Metallic poisons, botulism, "barracuda poisoning" (from fresh but diseased fish), and the staphylococcal toxin have all been suggested on occasion with no real evidence; while ill-prepared bitter cassava or unripe yams—both of which contain cyanogenic glucosides—are sometimes alleged to be responsible, although again there seems to be little proof.

The ackee (*Blighia sapida*), which is widely grown and eaten throughout Jamaica, has been shown to contain a toxic saponin when immature (Evans and Arnold, 1938). Scott (1916), in his investigation of this subject, concluded that all cases were due to the eating of unripe ackees, and he was of the opinion that the disease should be called "ackee poisoning." However, as Cicely Williams (1953, personal communication) notes: "In spite of the evidence produced by former workers that the ackee was responsible, it is difficult to reconcile this with the fact that most Jamaicans are eating ackees regularly. They eat them in large quantities. Some people eat them raw or eat the fruit before the 'pod' is opened. They even drink the 'pot-water' after boiling the ackees, without disaster in the majority of cases." Nevertheless, most observers feel that the unripe ackee should still be suspect. Finally, it may be noted that herbal infusions of "bush tea," which are universally used as beverages and medicinally, are made from a very wide variety of plants which may conceivably be sometimes misused, with toxic results.

An unusual feature of the syndrome of vomiting sickness is that it has not been described elsewhere in the world, even in the other Caribbean territories.

Actual field investigations of cases of vomiting sickness are usually inconclusive, owing to the difficulty of obtaining accurate medical histories and because of the large number of potentially poisonous plants—including the ackee tree—to be found in the bush around the average Jamaican peasant's home. The dietetic history of children under these circumstances is even more difficult to assess, as, although the family's diet may be known, during the "hungry months" ill-fed children may scavenge in the bush and experiment with wild berries, fruits, and plants.

During the first three months of 1953 a number of cases of vomiting sickness were admitted to hospital here showing a vivid and pathogenic clinical picture associated with severe hypoglycaemia. Clinical details of these cases are in the process of publication (Stuart, Jelliffe, and Hill), as is a discussion of the pathology (Hill and Bras). The following is the description of a case seen more recently.

Case Report

A 6-year-old Jamaican boy of African extraction had been quite well until 4 p.m. on the day before admission, when he had vomited once, bringing up a small quantity of undigested food. There was no abdominal pain or diarrhoea. Following this the child had appeared to be quite well and went to bed normally at 9 p.m. He passed urine during the night at 1 a.m. and 6 a.m., and on each occasion he was seen by his father, who thought he appeared to be quite well. At 7 a.m. the father called the child for his morning "bush tea," but could not wake him. The father thought the boy was in a deep sleep, but on trying to rouse him 15 minutes later the child was found to be unconscious, with his legs in rigid extension, arms tightly flexed on his

chest, hands clenched, and jaw locked. This stiffness seemed to wax and wane, lasting about 10 minutes with longer intervals between.

The rest of the family, consisting of the father and a 3-year-old sister, were in no way affected, although they had all eaten the same meals together. The patient had eaten no ackees or other possibly toxic substances during the preceding 36 hours, so far as the father was aware, although there were plenty of ackee trees and other bushes around the house.

The patient arrived in the ward at 2 p.m., when he was found to be deeply comatose with stertorous respiration. He was afebrile, with a pulse of 120 and a blood pressure of 110/60. There were no signs of meningeal irritation. The eyes tended to rove about, with a transient squint. The fundi and pupils were normal. The limbs were flaccid at the first examination and all tendon reflexes were diminished. Painful stimuli produced no response, while the abdominal and plantar reflexes were absent. The child was well hydrated and moderately nourished, with only minor stigmata of malnutrition, in particular slight angular stomatitis and cheilosis. The liver was just palpable.

During the first three-quarters of an hour after admission there were repeated attacks of stiffening of the limbs, each lasting about one to two minutes, accompanied by a rigor like shaking. During these bouts the limbs became hyper-tonic with greatly increased reflexes.

In view of experience gained with previous cases, a diagnosis of acute toxic hypoglycaemia due to vomiting sickness was made.

Investigations.—Investigations carried out immediately on admission showed: (1) Blood count: haemoglobin, 11.6 g. per 100 ml.; red cells, 3,500,000 per c.mm.; white cells, 17,000 per c.mm. (metamyelocytes 0.5%, neutrophils 85%, lymphocytes 14.5%); E.S.R., 6 mm. per hour; haematocrit, 32%; M.C.V., 91.4 μ^3 ; M.C.H.C., 36.3%; M.C.H., 31.1 μg . (2) Liver-function tests: bilirubin (total), 0.6 mg. per 100 ml.; cephalin-cholesterol flocculation test, negative; gamma-globulin (Kunkel), 5.8 units; thymol flocculation, negative; thymol turbidity, 1.2 units; serum proteins, total 7.4 g.% (albumin 4.9 g., globulin 2.5 g.); cholinesterase

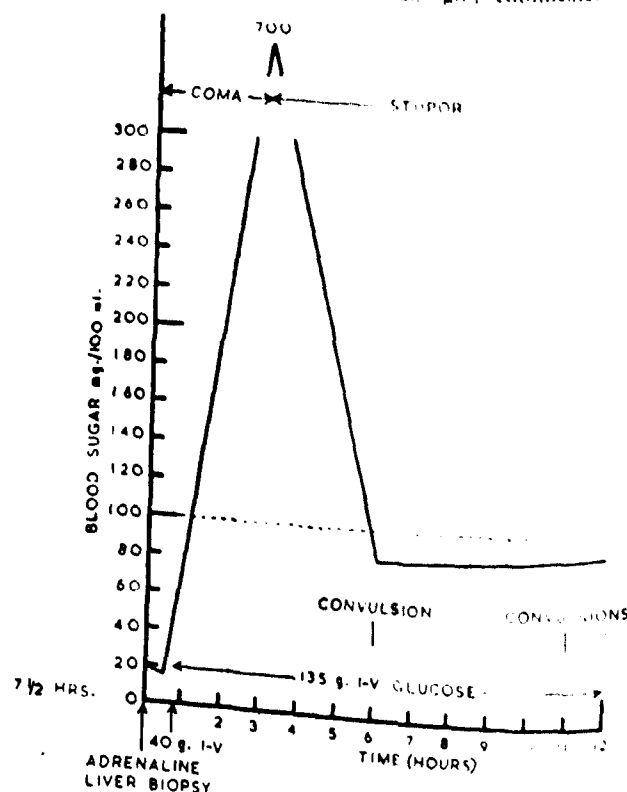


Chart of the case.

(Michel), 0.7 unit. (3) Blood urea, 45 mg. per 100 ml. (4) Serum calcium, 11 mg. per 100 ml. (5) Carbon dioxide combining power, 40 volumes per 100 ml. (6) E.C.G., normal. (7) Blood sugar, 19 mg. per 100 ml. (8) Liver biopsy (immediate): almost complete absence of liver glycogen (0.7%).

Progress in hospital is summarized in the accompanying graph. Adrenaline, 5 minims (0.3 ml.), was given subcutaneously on admission and the blood sugar was estimated after 15 minutes. This showed no real change (18 mg. per 100 ml.). Treatment was then begun with an injection of 40 g. of glucose intravenously, in a 50% solution, followed by a continuous intravenous drip of 9.5% glucose solution. By 4.25 p.m. the blood sugar had risen to 700 mg. per 100 ml. and was associated with a marked glycosuria. No dramatic clinical effect was produced, although the coma appeared to be definitely lighter during the afternoon and evening. The blood sugar had fallen to 84 mg. per 100 ml. by 8.30 p.m., and thereafter remained between 80 and 100 mg. The child continued in a stuporose condition, and during the night he had two generalized tonic-clonic convulsions. Next day a further fit occurred at 5 a.m., following which the child died, the respiration stopping while the heart continued to beat for 15 minutes afterwards.

Post-mortem examination was mainly negative save for lymphoid hyperplasia in the mesentery and ileum, together with fatty change in the liver.

Discussion

The very low blood sugar and almost absent liver glycogen found in this case have also been noted in other examples of vomiting sickness investigated during the acute phase of the illness. Full clinical and pathological details are to be published elsewhere, but results from five cases, including the present one, are summarized in the Table. The rapid

Details of Five Children Admitted with Acute Toxic Hypoglycaemia in the Vomiting Sickness of Jamaica

Case No.	Age in Years	Sex	Mental Condition on Admission	Blood Sugar (on Admission) (mg. per 100 ml.)	Known Length of Coma (Hours) before Treatment	Response to Large Doses I.V. Glucose
1	6	M	Drowsy	6	—	Rapid recovery
2	5	F	Comatose	3	—	Slow recovery (32 hours)
3	8	F	Drowsy—Comatose (fluctuant)	5	4	Rapid recovery
4	4	F	Comatose	15	11	Slight improvement. Died
5*	6	M	"	19	7½	" "

* Present case.

onset, with or without vomiting, of various grades of cerebral depression varying from drowsiness to stupor to coma—have been observed. Some early mild cases have responded dramatically and immediately to large doses of intravenous glucose, while others have recovered after some hours of treatment.

The present case can be regarded as a fulminant example of so-called vomiting sickness—coma coming on in only one hour, if the father's story is to be believed, while vomiting was virtually absent. Clinical response to a large dose of intravenous glucose was very slight, possibly because of the relatively long period—seven and a half hours—elapsing between the onset of coma and the beginning of treatment. The prognosis in these cases seems directly related to this interval, possibly because irreversible changes can be produced if hypoglycaemia is prolonged.

The toxin responsible for this dramatic clinical syndrome is unknown, but is very probably an accidentally ingested poison, possibly from some wild plant used in one of the "bush teas." The biochemical mechanism producing the hypoglycaemia is also as yet undetermined, but it seems likely that some form of enzyme blockage may be produced,

possibly in the enzyme systems responsible for hepatic gluconeogenesis. Whatever this may be, it is temporary and potentially reversible, as if recovery occurs, either spontaneously or following intravenous glucose, it is complete.

While hypoglycaemia is the most striking biochemical finding, there may be other upsets of blood chemistry as yet undiscovered. However, the presence of very low blood sugars in these cases does offer a possible immediate line of therapy, and it seems logical that cases of vomiting sickness should now be treated as medical emergencies with intravenous injections of concentrated glucose solution as soon as possible after the onset of symptoms.

Our thanks are due to Dr. G. Bras for carrying out the necropsy, and to Dr. S. J. Patrick for analysing the liver for glycogen.

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CONGENITAL ABSENCE OF BOTH KIDNEYS

A REPORT OF FOUR CASES

BY

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Agenesis of both kidneys is a rare condition, only 171 cases having been reported since 1663. The four cases occurring at the West Middlesex Hospital described by us bring the total to 175.

The largest number reported was 20 by Potter (1946a, 1946b). These she found in a series of 5,000 necropsies on fetuses and newborn infants, and she estimated the incidence to be 0.3 per 1,000 births. At the West Middlesex Hospital the incidence was four cases amongst 9,940 deliveries (that is, 0.4 per 1,000 births).

The absence of both kidneys is usually accompanied by other gross or multiple deformities (Hinman, 1940). The sex incidence is predominantly male. Bilateral agenesis is compatible with intrauterine life, and does not appear to affect the quantity of liquor amnii. Survival after birth is short; the average duration of life in Potter's cases was 1½ hours. One case is reported to have lived for as long as 21 days, and another for 11 days.

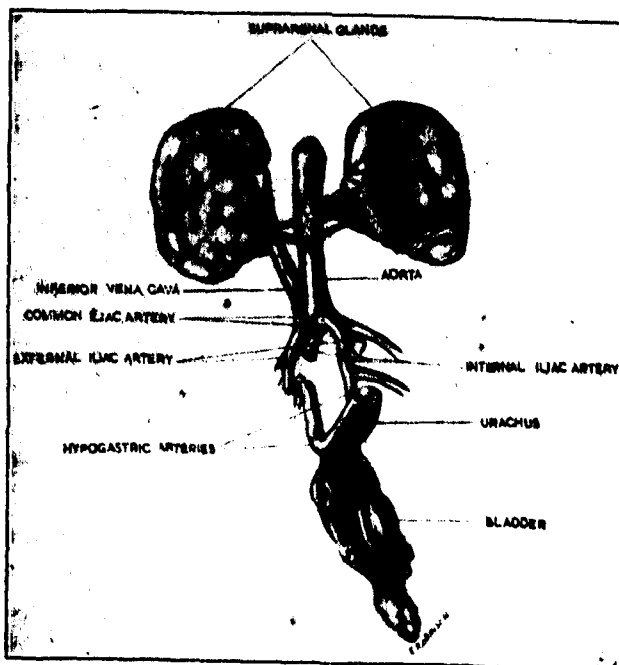
Case 1

The mother, aged 40 years, had four previous normal pregnancies. The last child, aged 6 years, had an undescended right testicle. The other children, one boy and two girls, were normal and healthy. There was no history of congenital deformity in either the mother's or the father's family.

The early antenatal period appeared normal, although the mother later admitted that six weeks after the last menstrual period she had taken about 2.3 g. (35 gr.) of a quinine salt in one day, followed by 85 ml. (3 fl. oz.) of an ergot mixture and two tablets of an unknown substance.

At the 35th week she was admitted to hospital with antepartum haemorrhage due to placenta praevia. The foetus presented by the breech, and the foetal heart was strong and regular. Two weeks later a lower-segment caesarean section became necessary because of severe haemorrhage. The placenta was lying centrally in the lower uterine segment, and it was noted that the liquor amnii was normal in amount.

The child, a boy weighing 2,920 g. (6 lb. 7 oz.), showed a lax skin, generalized cyanosis, and hypotonia. The skull was scaphoid, with a tense anterior fontanelle and an occipito-frontal circumference of 37 cm. (14½ in.). A misshapen left pinna was noted. No abnormality was detected in the cardiovascular, alimentary, or central nervous systems. Rapid grunting respirations, with marked intercostal and subcostal recession and scattered crepitations, persisted throughout life, which lasted 20 hours and 40 minutes.



A dissection from the anterior aspect. The kidneys and renal arteries are absent. Discoid suprarenals are shown.

Necropsy revealed no abnormalities in the brain, thyroid, thymus, heart, spleen, liver, pancreas, and gastro-intestinal tract. A haemorrhagic consolidation was present in the posterior aspects of both lungs, and aeration was present in their anterior margins.

The adrenals were discoid, and measured 4.5 cm. by 3 cm. (see Diagram). There was complete absence of both kidneys, renal arteries, and ureters. A small prostate and bladder

were present. Complete descent of the testes had taken place. The penile urethra was patent in the terminal 0.5 cm. A microscopical search for renal tissue failed to reveal its presence.

Cases 2-4

Three other cases of anephrogenesis were discovered in the records of the West Middlesex Hospital. In Tables I, II, and III the details available are summarized and are compared with those of the case described above.

TABLE I.—Summary of Pregnancies

Case	Age		Month of Conception	Parity	Abnormality of Pregnancy	Maternal Health	Amount of Liquor
	Mother	Father					
1	40	46	February	4	1 Breech 2 Placenta praevia	Good	Normal
2	18	21	August	0	Mild toxæmia	Good	No record
3	45	?	September	5	None	Mitral and pulmonary systolic murmurs	Very little
4	25	52	February	0	Mild toxæmia	Diffuse enlargement of thyroid for many years	No record

TABLE II.—Summary of the Infant Data Prior to Death

Case	Duration of Pregnancy in Weeks	Birth Weight	Sex	Weight of Placenta	Duration of Life
1	36	6 lb. 7 oz. (2,920 g.)	M	1 lb. 1 oz. (548 g.)	20 hr. 40 min.
2	34	3 lb. 13 oz. (1,730 g.)	F	12½ oz. (354 g.)	7 hr. 20 min.
3	34	4 lb. 14 oz. (2,210 g.)	M	No record	28 hr. 30 min.
4	40	5 lb. 12 oz. (2,608 g.)	M	9 oz. (255 g.)	Stillborn

Aetiology

The present knowledge of the aetiology of congenital abnormalities is reviewed fully by Warkany (1947) and Fraser and Fainstat (1951). The two main groups are: (1) genetic and (2) environmental. The latter includes nutritional deficiencies and chemical, physical, endocrine, infectious, and mechanical agents. The timing of the environmental disturbance has been shown experimentally by Ingalls *et al.* (1950) to be important in deciding the site and nature of a congenital defect. These factors are applicable to congenital deformities of the renal tract.

Arey's (1946) calendar of human development shows that by the fourth week of embryonic life the pronephros has

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Discussion

It is suggested that Case 1 is an example of congenital abnormality caused by disturbed environment. Six weeks after her last menstrual period, in a regular cycle of 6/27, the mother swallowed 2.3 g. (35 gr.) of a quinine salt within 24 hours, and later 85 ml. (3 fl. oz.) of an ergot mixture and two tablets of an unknown substance. The probable age of the embryo at this time—4 to 6 weeks—covered the important developmental periods of the mesonephric duct, cloaca and ureteric bud.

Quinine salts are known to be protoplasmic poisons with a specific nephrotoxic action. They are readily absorbed into the blood stream, and Dilling and Gemmell (1929) showed that quinine crosses the placental barrier at term. Huggett and Hammond (1952) state that placental permeability of different agents varies according to the stage of development. We have been unable to trace experimental proof that quinine reaches the human ovum from the maternal blood in the first few weeks of pregnancy. However, we submit that it is not unreasonable to regard the quinine as the agent responsible for the agenesis of the kidneys in Case 1. Our assumption is that the drug acted direct on the rapidly differentiating renal tissue.

The deformity of the left pinna is interesting. Potter noted certain facial characteristics, which included large low-lying ears with cartilaginous dysplasia. In a six-weeks embryo the external ear is beginning development around the first branchial cleft. Therefore it may be supposed that the disordered differentiation of the tissues at this time was the result of an insult, the timing of which coincided with the quinine administration.

One weakness in our hypothesis is the fact that quinine and other drugs are often taken as abortifacient measures during the early weeks of pregnancy and yet bilateral anephrogenesis is rare. There are three points to make in reply. First, the drug must be taken at the correct time in the development of the renal tract; the margin of error in time allowance is probably very small. Secondly, it is necessary to assess the incidence of anephrogenesis in the embryos and fetuses of abortions. Thirdly, the dosage and concentration of the drug must be sufficiently great.

Summary

Four cases of congenital absence of both kidneys are reported. One of these cases is described in detail.

The aetiology of the condition is discussed. The fourth to sixth weeks of embryonic life are the "critical period" during which development of the kidneys is taking place, and is the time when noxious environmental factors could exert their most damaging effects.

Quinine, taken by the mother of one case in a large dose six weeks after her last menstrual period, is suggested as a possible cause of the renal agenesis.

We wish to thank Dr. M. Dynski-Klein, Mr. D. M. Stern, and Miss I. M. Titcomb for allowing us to report these cases under their care and for access to their records; Dr. A. C. Counsell for his careful pathological examinations; and Miss S. Robinson for the drawing.

USE OF UNSATURATED FATTY ACIDS IN THE ECZEMAS OF CHILDHOOD

BY

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Burr and Burr (1929, 1930) and Burr *et al.* (1932) showed that the total exclusion of fats from the diet of young rats produced a deficiency disease with caudal necrosis, red and somewhat swollen feet, and scaliness in the hair of the back. At the same time the growth of the animals was arrested and there was much loss of weight. This condition was not improved by adding non-saponifiable fats to the diet, but was cured by the unsaturated fatty acids (U.F.A.s), particularly linoleic and linolenic acids.

This work stimulated Hansen (1933), who first made the suggestion that U.F.A.s might be useful in treating infantile eczema. He demonstrated that there was a diminution of these acids in the serum of eczematous children, and he claimed that the addition of U.F.A.s to their diet caused a clinical improvement which was associated with a rise in the iodine number, an index of the non-saturated fatty acids in the serum. Shortly afterwards Cornbleet (1935) reported good results in a series of 85 cases of eczema which had been treated with fresh lard by mouth, but there seems to be no reference to any control in his investigation. Taub and Zakon (1935) found no benefit in eight cases of atopic eczema (Besnier's prurigo, disseminated neurodermatitis) which they treated with linseed oil by mouth, and also pointed out that the use of linseed or cottonseed oil might be dangerous, as the patient could be sensitive to these sources of U.F.A.s. Ginsberg and Bernstein (1937) found satisfactory improvement in three adults in a group of 11 with atopic dermatitis and in four out of six children. They also pointed out, however, that two children receiving the same local treatment and no added U.F.A.s improved in the same time. Finnerud, Kesler, and Weise (1941), using fresh lard in older children and adults, had a satisfactory response in about half their cases. Hansen, Knott, *et al.* (1947) reported on the study of 225 cases of eczema, of whom 123 were under the age of 2 years, 67 were from 2 to 15, and 35 were 16 and over. During these trials they used many forms of local treatment, including boric acid, zinc paste, sulphur, resorcinol, and occasionally coal-tar. Their results were poor in only 37 of the 148 cases treated with supplementary fatty acids, while 18 of the 48 controls were unsatisfactory in the same

TABLE III.—Clinical and Pathological Findings

Case:	1	2	3	4
Head	Scaphoid skull; misshapen left ear	Asymmetrical	Considerable head moulding; bilateral accessory auditory auricles	Dolichocephaly; cranial bones friable and thickened
Respiratory system	Cyanosis; congenital atelectasis	Cyanosis; congenital atelectasis	Cyanosis; congenital atelectasis	Bilateral pulmonary hypoplasia
Cardiovascular system	No abnormality	No abnormality	No abnormality	Patent interventricular septum
Alimentary system	No abnormality	No abnormality	Intestinal adhesions; ectopic caecum	"Hour-glass" constriction of stomach
Locomotor system	No abnormality	Limited flexion and abduction of both hips; hypermobility of right knee	No abnormality	Deformed hands and feet; limbs splinted against trunk
Urogenital system	Absence of both kidneys and ureters; rudimentary bladder	Absence of both kidneys and ureters; failure of fusion of Müllerian ducts; bladder elongated	Absence of both kidneys and ureters; small bladder	Absence of both kidneys and ureters; bladder present

period. They also demonstrated that the iodine number is reduced in many cases of eczema and returns to normal on satisfactory treatment.

More recently European workers have stepped into this field with investigations and reports on lines similar to those of the earlier American articles. As early as 1942 Justin-Besançon and Laroche criticized those who saw fit to call linoleic acid "vitamin F," and also pointed out that the administration of U.F.A.s gave very divergent results and that "the conclusion that certain authors wish to draw seems insecurely based." Azerad and Grupper (1949a) summed up their experience and claimed that lard by mouth was giving extremely encouraging results, but later (1949b) they reported better results with purified linoleic acid. In 58 breast-fed infants, 18 children, and 24 adults whom they treated they obtained 52 excellent or good results, and only 17 were mediocre or negligible. It must be pointed out that the linoleic acid was only a supplementary form of treatment, and as local treatment they used "nothing except a paste or ointment of 10% tar," which they deliberately chose in view of the excellent action of tar on vesicular and weeping eczema. Touraine (1949) quotes Püttilä (1948), who found an improvement in infantile eczema treated with vitamin B₆; and Charpy (1948) combined this with the U.F.A.s and claimed there was a synergistic effect, but Hansen was unable to confirm this. Touraine also quotes Vachon (1948) as having tried the application of 3% linoleic acid in an ointment base, which was found to irritate, and he used a 1% ointment in resistant cases but said it should be employed with care. Alechinsky (1950) claimed six complete cures in 11 cases, while Dubois (1950), summing up the Continental view, pointed out that local treatment, preferably tar, was indispensable and claimed that irritation ceased in four to seven days and exudation dried in two to four days. More recently Finzi (1951) and Carletti and Scalapogna (1952) claimed good results, but in an apparently uncontrolled series of cases.

The unsatisfactory state of these claims and the associated recent publicity in this country of the use of unsaturated fatty acids, particularly linoleic and linolenic acids in liquid, ointment, and capsule form, suggested that an investigation of their effectiveness should be undertaken.

The following investigations were therefore carried out at a hospital mainly for the long-term treatment of children with severe and chronic dermatoses.

Local Application and Oral Administration of U.F.A.s

For the first investigation 27 cases of infantile and atopic eczema were used. The ages ranged from 18 months to 15 years, and so far as was possible the cases were paired in age and type of skin lesion. The babies with infantile eczema had usually been in hospital only a short time, while most of the older children had spent a considerable period in hospital. As a result of this long-term treatment any improvement which might have been attributed to the child's change of environment on admission to hospital was, in the main, avoided.

Each child was seen at the start of the trial and assessed, and after that, without the investigator's knowledge of which children were being treated, 15 children were given a daily application of an ointment with the following formula:

Linoleic acid	..	..	..	1.7%
Linolenic acid	..	..	..	0.8%
Hydrous ointment	..	..	to	100%

and orally a capsule a day:

Linoleic acid	..	..	..	0.27 g.
Linolenic acid	..	..	..	0.13 g.
Arachis oil	..	..	to	0.5 g.

The other 12 children continued the routine treatment of the hospital, usually zinc ointment with boric acid and various strengths of tar. An independent dermatologist (Dr. G. B. Dowling) also saw the patients regularly, and if the child's condition deteriorated enough to warrant a change

of treatment the case was automatically graded as 2. Each child was seen and assessed weekly, and at the end of seven weeks the progress was marked in the following way:

Improvement amounting almost to cure	..	..	..	..	..	+2
Overall improvement	..	..	..	..	..	+1
Approximately the same as at the start	..	..	..	..	..	0
Overall deterioration	..	..	..	..	..	-1
Failure, needing change of treatment	..	..	..	..	..	-2

It was not until all these cases were marked that the investigator knew which patients were being treated with the U.F.A.s. In that way any bias for or against the treatment was avoided.

The results (Table I) showed no evidence that the treatment with local and oral unsaturated fatty acids was a satisfactory substitute for the normal routine. The possibility

TABLE I

	12	11	0	1	2	Total
Cases on local and oral U.F.A.s	1	0	1	8	5	15
Cases on usual treatment	1	5	2	1	1	12

that the ointment itself might irritate was considered, but the fact that one child steadily improved while on the treatment disproved this. Later, at the end of the series, patch tests with the ointment were made in cases that had failed, but no evidence of sensitivity to the ointment was found. It was thought that this group of cases showed striking evidence against the further continuation of the trial, but in order to assess whether oral U.F.A.s in addition to the routine hospital treatment was of benefit a further investigation was made.

Oral U.F.A.s as an Adjuvant to Therapy

This group consisted of 36 cases of infantile eczema and atopic eczema, 20 of whom took a capsule of linoleic and linolenic acid daily for approximately four months. The actual time that patients were treated varied from nine to seventeen weeks. Several of the children were discharged from hospital in this time and they were automatically marked +2. Again any child whose treatment was altered because of manifest deterioration was graded 2.

TABLE II

	12	11	0	1	2	Total
Routine treatment plus oral U.F.A.	..	..	..	..	..	..
Routine treatment	7	8	1	2	0	20
	8	3	1	1	1	16

Taking into consideration the slightly smaller group of controls, it is not considered that this investigation produced any evidence that oral U.F.A.s have value as an adjunct to local treatment of infantile or atopic eczema.

Discussion

The diminution of the iodine number showing the reduction of U.F.A.s in the serum of children with eczema caused Hansen to start this long and contradictory series of investigations. The conception that a reduction in the U.F.A.s of the serum is aetiological connected with infantile eczema was doubted by Faber and Roberts (1933), who found that in eczema the cholesterol was slightly higher, the total fatty acid and the total lipid content considerably higher, and an iodine number only moderately lower than in normal controls. They did not find a degree of unsaturation as high as Hansen did, and expressed a belief that the findings were secondary rather than causative. This suggestion would seem to receive support from Hansen's own work, which shows there is a rise in the iodine number in children satisfactorily treated for eczema with nothing but local applications of tar (Hansen, 1933; Hansen, Knott, *et al.*, 1947).

The emphasis placed by nearly all authors who claim benefit from the use of these fatty acids on the fact that

local treatment is a prime necessity, and the apparent lack of any great interest in a controlled series, suggest that the benefits claimed may be due to the usual treatment, with perhaps a dash of enthusiasm.

The investigations reported here, in which all personal bias and normally varying factors were removed so far as was possible, have failed to substantiate the claims that the so-called "vitamin F" has any value in the treatment of atopic and infantile eczema. The findings of Vachon seem to be borne out, in that the ointment almost invariably irritated the eczematous skin.

Summary

A brief summary of the literature on the use of unsaturated fatty acids in the treatment of infantile and atopic eczema is followed by the details of a recent investigation.

The combined use of linoleic and linolenic acid ointment and capsules and the use of the capsules as an adjuvant to routine treatment were in no way preferable to the established methods of treatment.

My thanks are due to Dr. G. B. Dowling for allowing me to see and investigate his cases, and to the matron and nursing staff of the Goldie Leigh Hospital for their willing co-operation.

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Medical Memoranda

Total Gastrectomy for Haematemesis

The object of this report is to point out the necessity for total gastrectomy in certain rare cases of haematemesis and to stress the value of oesophagoscopy in diagnosing the source of the haemorrhage.

Obvious bleeding occurs in some 20% of all peptic ulcers, and these form about 85% of all cases of haematemesis and melaena. The total mortality rate in the peptic ulcer group is roughly 8%, but in patients under 45 it is 2%. Death more often takes place from irreversible changes following prolonged anaemia than from acute anaemia, as necropsy nearly always shows the vessel occluded by clot. Hence the sheet anchor of treatment is blood transfusion, not only to prevent anaemia but also to enable the patient to withstand further haemorrhage by keeping the haemoglobin level about 80%. If this rule is followed the so-called critical periods on the third day or at any other time cease to exist, and surgery is indicated when replacement does not control the loss or if the loss continues or recurs for several days.

HAEMORRHAGE FROM FUNDUS OF STOMACH AND LOWER OESOPHAGUS

The importance of haemorrhage from the fundus of the stomach was first impressed upon me by a patient, known to be suffering from a chronic gastric ulcer for some years.

who was admitted with severe haematemesis which did not respond satisfactorily to transfusion. A partial gastrectomy was successful, but the specimen showed that the bleeding was not from the known chronic ulcer but from a small acute ulcer high up the lesser curvature which had been included in the resected area by luck, not judgment. This acute ulcer was not palpable to the gloved finger, and I doubt if it would have been noticed on gastrotomy, which in other cases has proved to be of no value.

Further, the importance to the differential diagnosis of the site of the haemorrhage was brought home by another man, known to have a chronic gastric ulcer, who was admitted with severe haematemesis not controlled by transfusion. At partial gastrectomy cirrhosis of the liver was noted. He died five days later from continued bleeding from oesophageal varices. No evidence of haemorrhage from the ulcer was found. This error might have been prevented by an oesophagoscopy examination, in which it is simple to distinguish a normal oesophagus, a normal oesophagus with regurgitated blood in it, bleeding oesophageal varices, or a stomach distended by gastric haemorrhage. In fact, since then it has saved me from making the same mistake again.

Those who are not trained in the use of the common instruments for the visualization of their patients' orifices will find no difficulty in passing an appropriate-sized oesophagoscope if they will first pass a stomach tube, aspirate, and then pass the endoscope alongside it before its removal.

Treatment.—This must be governed by the general principles already mentioned. When surgery is indicated for gastric haemorrhage from acute ulceration it is no use temporizing by doing a gastro-enterostomy (as in my house-surgeon days) or a partial gastrectomy or ligation of gastric vessels (as is often done now). I know of deaths from continuing haemorrhage after these procedures have been carried out by competent surgeons and also of recovery when nothing has been done. Acute fundic ulceration is probably as common as is acute ulceration in any other part of the stomach, and unless at laparotomy the surgeon can determine the site of bleeding he is faced with only two logical procedures: nothing or total gastrectomy. The following case histories illustrate the problem.

CASE I

An engineer aged 58 collapsed at work on March 16, 1952, and was admitted to Lodge Moor Hospital the next day as a case of "influenzal pneumonia." No cause for his collapse was found on admission, but 48 hours later he had a severe haematemesis. Blood transfusion was at once started, and he was transferred later in the day (March 19) to the City General Hospital. His pulse was 130 and blood pressure 105/60, and he was pale, cold, and clammy. Further transfusion was given, with improvement.

On March 21 he had further haematemesis and melaena in spite of a total of 8 pints (4.5 litres) of blood, so I was asked to see him with a view to surgery. His pulse was 84, blood pressure 85/55, Hb 8.8 g. (60%). He gave a history of several weeks of epigastric discomfort after food lasting an hour or so, and then complete freedom for several days before the next recurrence. I felt that the diagnosis of a chronic ulcer or carcinoma was very unlikely and suggested further conservative treatment.

However, on March 26 his condition deteriorated in spite of a total of 21 pints (11.9 litres) of blood, and laparotomy was advised.

First Operation.—On March 26, under intratracheal gas and oxygen, thiopentone, and D-tubocurarine chloride, a left upper paramedian incision was made. External exploration of the stomach and duodenum showed no lesion or evidence of scarring from an old lesion. The intestines were full of blood. The anterior stomach wall was incised from the lesser to the greater curvature roughly at its mid-point and the contents were aspirated. No fresh blood was present, but some adherent clot at the fundus was found. Nothing abnormal was seen or palpated though ungloved hands were used. The lower oesophagus also felt normal. The problem was total gastrectomy or nothing, and I chose the latter

course in the hope that the gastric haemorrhage, which was presumed to have come from the fundus, where adherent clot was found, would not recur.

The patient's condition improved for several days, though intermittent melaena occurred. On April 1 I passed an oesophagoscope into the stomach and found no evidence of bleeding or lesion in the oesophagus, but there was old clot in the stomach. Shortly after this he started to bleed severely, and as the consulting haematologist again found no evidence of blood dyscrasia I decided to do a total gastrectomy.

Second Operation.—On April 1, under a similar anaesthetic, the old incision was opened up and extended. There was a good deal of mild peritonitis due to the previous gastrotomy. Total gastrectomy was performed and a retrocolic jejunal loop was anastomosed to the oesophagus without entero-anastomosis (operative time two hours).

Recovery was uneventful and the patient was discharged on April 26 on an unrestricted diet. He had received 524 pints (29.8 litres) of blood from March 19 to April 2. He was readmitted on February 3, 1953, with acute intestinal obstruction for which section of a solitary cord adhesion from the mesentery to the posterior abdominal wall was done. In June he was at work again, the blood counts, etc., being satisfactory.

Specimen.—The stomach showed about a dozen small erosions, three or four being in the pyloric region and the rest on the posterior wall of that part opposite to and above the oesophageal opening. The haemorrhage had occurred from the largest of these fundic lesions, which measured about 1 cm. in length and 2-3 mm. in width.

CASE 2

A crane-driver aged 48 was admitted to the City General Hospital on June 27, 1952, with severe haematemesis. His history was as follows: 1930, onset of symptoms of duodenal ulcer; 1941, pyloric obstruction—gastro-jejunostomy; 1947, severe haematemesis—14 pints (8 litres) blood transfused; 1950, further haematemesis—3½ pints (2 litres) blood transfused; 1951, high partial gastrectomy for two anastomotic ulcers. I first saw him at 9 p.m., after he had vomited 38 oz. (1 litre) of blood. His condition was improving under transfusion. The Hb was 62.5%, but, as it fell to 55% in the next twelve hours in spite of drip transfusion, I decided to operate without further delay though the rate of transfusion was increased.

Operation.—On March 28, under gas and oxygen, thiopentone, and D-tubocurarine anaesthesia, oesophagoscopy was carried out. The oesophagus was normal, but there was blood in the stomach. A left postero-lateral thoracotomy was done with resection of the eighth rib. Total gastrectomy was performed with considerable difficulty in 3 hours 10 minutes. Unfortunately, the patient died some 30 hours later, but the cause of the haemorrhage was acute ulceration of the fundus of the stomach.

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Two Cases of Ovarian Cyst in Childhood

The deceptive presentation of these cases—one as retention of urine and the other as appendicitis—is of clinical interest.

CASE 1

In October, 1950, a girl aged 3½ was admitted to hospital with acute retention of urine. A week previously she had had a sore throat and diarrhoea with much mucus in the stools; this cleared up after three days, but two days later she began to have frequency, and micturition was apparently difficult and painful. The urinary symptoms increased in severity and culminated in acute retention.

On examination of the abdomen a smooth rounded cystic swelling was found rising out of the pelvis half-way up to the umbilicus. This was taken to be the distended bladder. The external urethral orifice appeared normal, there was no fever or any evidence of a neurological lesion, and an x-ray film

of the abdomen and pelvis showed nothing abnormal. With difficulty a catheter was passed and only a few millilitres of normal urine was obtained.

Under a general anaesthetic the cystic swelling previously described, which had been mistaken for the urinary bladder, became disimpacted from the pelvis, and at a subsequent laparotomy was shown to be a large multilocular teratoma of the left ovary, measuring 11 by 6.5 cm. It was removed without difficulty.

The mechanism of the production of urinary retention was possibly the same as that which occurs in retroflexion of the gravid uterus, whereby the urethra is compressed and elongated. The bladder, normally an abdominal viscus in young children, is easily displaced and compressed anteriorly by the impacted ovarian cyst. Disimpaction under anaesthesia allowed the bladder to empty easily and no further dysuria was experienced. Urinary disturbances occur not uncommonly in cases of ovarian cyst in children, but the occurrence of acute retention seems to be quite rare.

CASE 2

In June, 1951, a girl of 4 years 9 months was admitted to hospital with abdominal pain and vomiting. She had had three attacks of constipation and abdominal pain lasting two to three days in the past nine months. The present attack began three days before admission, with vomiting and lower abdominal pain. She had been constipated for three days and had been irritable and had a poor appetite. There were no urinary symptoms.

On examination she was seen to be flushed, with mild pyrexia and tachycardia. There was a tender rounded swelling arising out of the pelvis and extending 2 in. (5 cm.) above the symphysis pubis; slight muscular guarding was present over it. Rectal examination revealed a tender swelling palpable through the anterior wall of the rectum. A catheter was passed readily and 2 oz. (57 ml.) of urine was withdrawn. A diagnosis of pelvic abscess or cyst was made. Under general anaesthesia the swelling emerged from the pelvis and was freely mobile in the abdomen; it was evidently a cyst. The subsequent laparotomy revealed a right-sided unilocular ovarian cyst which had undergone torsion twice in a clockwise direction. It was removed. The left tube, the ovary, and the uterus were normal. Convalescence was uneventful, and the patient was discharged on the eighth day. (On section a simple ovarian cyst with haemorrhage into the ovary was reported.)

COMMENT

Study of reported cases shows that simple or multilocular cysts of the ovary account for one quarter to one third of all ovarian neoplasms in girls under 15 years, while granulosa-cell tumours produce symptoms of precocious puberty, and teratomas can sometimes be recognized by x-ray examination; ovarian cysts may remain unrecognized for a long time. Lower abdominal pain, distension, constipation, and frequency may occur. Torsion leading to acute symptoms may be the first indication of the presence of an ovarian cyst, and differential diagnosis from acute appendicitis may be very difficult; in fact, many series of reported cases show that this is the commonest pre-operative diagnosis, particularly as most cysts are on the right side. Steel (1931) reported 25 cases of twisted ovarian cysts diagnosed pre-operatively as appendicitis.

The most useful procedure to help in diagnosis is probably rectal examination, this fact being emphasized in many reports; it was of great assistance in these cases.

We are indebted to the late Mr. J. O. D. Wade, Professor A. G. Watkins, and Mr. R. J. Williams for permission to publish these cases.

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Reviews

CLINICAL GENETICS

Clinical Genetics. Edited by Professor Arnold Sorsby. 31 Contributors. (Pp. 580+23; 311 illustrations. 90s.) London: Butterworth and Co. 1953.

The plan of this book is both novel and excellent. No space is wasted in providing what must perforce be, within any reasonable limits of length, an inadequate account of the principles of general and human genetics. It is assumed that the reader is already familiar with these, and so the first quarter of the book comprises just what such a reader would probably like to turn to next—namely, a series of more advanced essays on subjects of interest and importance relevant to the medical field. The twelve essays are very good indeed, and it may be invidious to single out particular chapters for special note; but, taking that risk, we might mention Neel on the detection of carriers of inherited disease, Mather on polygenic inheritance, Koller on cytogenetics, and Catcheside on chemical genetics; they have written the kind of contribution which is possible only when the author is discussing a subject of which he is master and when he has taken pains to make the presentation as concise and as clear as is reasonably possible.

The rest of the book is called clinical and covers the genetics of the various systems and specialisms. The whole field is covered, but naturally within the space of a single volume there must be compression, whether by omission of less important topics, or even more by rather brief summaries of what is known about some inherited conditions. Editorial difficulties must have been considerable, and there is indeed some lack of balance in the result. It is reasonable enough to compress the chapter on ophthalmology in view of Sorsby's own recent book, and a similar shortening is understandable with mental deficiency, for which subject Penrose's *Biology of Mental Defect* is available, and again in dermatology, where Cockayne's *tour de force*, although twenty years old, is still invaluable. But why should 26 pages be devoted to the alimentary system, with only six conditions to describe, and no more than 23 to the host of neurological disorders, for which there is no genetic textbook? Incidentally, both are excellent chapters, but, whereas Carter is able to marshal the evidence at leisure, Pratt has to discuss some conditions in briefest summary and omit a number altogether.

The one real failure of the book is in the bibliographies. To anyone specially interested in a particular condition the most that a single volume can provide, and what indeed this volume usually does provide, is a relatively brief, accurate, and up-to-date summing-up. The essential accompaniment is a carefully selected bibliography which will guide the inquirer to the key references. The bibliographies of this book are most uneven. Some are excellent, with the more important references specially indicated, but many are impossibly brief. Sometimes papers are quoted in the text to which there are no references in the bibliographies. Sometimes references are given to papers which are not discussed. Some authors quote the titles of the papers while others do not. It is a pity that the usefulness to the research worker of so excellent an undertaking should have been diminished by neglect of such an important point.

Once again the gremlins have been busy over genetic linkage. There is a reference to two conditions being possibly linked because they tend to occur together, an unfortunate lapse in a book in which a special chapter is devoted to the subject. The best human example for demonstrating the workings of genetic linkage is haemophilia and colour-blindness, and the reader is duly shown in Fig. 206 a pedigree in which the two genes are in repulsion, that is, in opposite chromosomes, followed by a pedigree in which they are in coupling. Then comes Fig. 207, stated to show an example of crossing-over. But, alas, it shows

nothing of the kind, for Riddell's original pedigree has been wrongly reproduced.

The book is beautifully illustrated and produced and should prove of great value to a variety of readers. But the second edition should be considerably more valuable, for then, it may be hoped, balance will be improved, errors removed, and, above all, adequate bibliographies provided.

J. A. FRASER ROBERTS.

CELL STRUCTURE AND FUNCTION

Histology. By Professor Arthur W. Ham, M.B., F.R.S.C. Second edition. (Pp. 846; 518 figure numbers, including 7 plates in colour. 80s.) J. B. Lippincott Company. 1953.
An Introduction to Functional Histology. By Geoffrey Bourne, D.Sc., D.Phil. (Pp. 188. 98 illustrations. 21s.) London: J. and A. Churchill, Ltd. 1953.

These two books have, as a common objective, the correlation of the dull subject matter of purely descriptive histology with cell, tissue, and organ function. They are primarily designed for the use of undergraduates. Both are written in clear, vivid, and unambiguous language, easily understandable by the average student, and in spite of its complexities both authors have tackled their problem with commendable success.

This is the second edition of Professor Ham's book, which is a full and comprehensive treatise on microscopic anatomy, greatly simplified by the generous use of excellent photomicrographs and clear diagrams. The bare facts of normal structure are skilfully blended with those of biochemistry, physiology, and the principles of pathology. Both structural and functional sides are up to date, and the author includes much new knowledge on such subjects as cytoplasmic nucleic acid, chromosomal structure, the function of mitochondria, submicroscopic particulates, and electron microscopy.

Professor Ham, who was a pathologist before he became a histologist, has taken every opportunity to introduce enough histopathology to help the student in correlating normal structure with common pathological processes. An outstanding chapter on the normal structure of bone, for instance, is followed by an account of fracture healing and the fate of a bone graft; an account of tissue fluid, by a discussion on oedema; the structure and functions of the skin, by a simple account of burns and skin grafting; and those readers remembering the author's many contributions to cancer research will welcome several reliable and stimulating accounts of the general characteristics of the malignant cell included in the chapters on cytology.

Dr. Bourne's slim volume must in these days of rapid biological progress be regarded as an essential companion to any purely descriptive treatise on normal histology. To the best of the reviewer's knowledge this is the only book suitable for undergraduate readers which has seriously attempted and brilliantly succeeded in bringing together the results of recent cytological research and blending them with modern physiology. A chapter on histochemical technique, with special reference to the identification of cell and tissue enzymes, will prove of immense value to students who are seriously attracted to the subject and wish to satisfy themselves of the reality of modern intracellular enzymology. We confidently predict that the author's refreshing approach will strongly appeal to all students of general biology.

GEOFFREY HADFIELD.

MANUAL OF PSYCHOLOGICAL MEDICINE

Manual of Psychological Medicine for Practitioners and Students. By A. F. Tredgold, M.D., F.R.C.P., F.R.C.S., and R. F. Tredgold, M.A., D.M., D.P.H. Third edition. (Pp. 328. £1 5s.) London: Baillière, Tindall and Cox. 1953.

Relatively few recent textbooks of psychiatry are free from some sort of aetiological bias, and most of those from the U.S.A. can be labelled as belonging to one school of thought or another. A thoroughly orthodox British descriptive psychiatry is therefore much needed. The third edition of "Tredgold" covers an even wider field than its

predecessors and it has been brought up to date so far as facts are concerned. The attitude to mental maladjustment lacks the therapeutic optimism of the present generation, and, while rejecting as false the gods of psycho-analysis, the authors have tried to do without any very consistent theme at all. The result is a competent compilation in which the different clinical entities are described in detail according to their importance in practice. This will meet the immediate needs of the student and the practitioner, but does not give him much chance to build up a frame of reference into which facts from other sources can later be fitted. This is especially true of the discussion of treatment, where enough is usually given to satisfy an examiner who does not inquire too closely, but it is not the sort of information which helps to avoid pitfalls in treating a patient.

On the other hand, the description of types of neurotic maladjustment which actually come to the consulting-room are most realistic, especially when the minor degrees of instability, psychopathy, and inadequacy are under consideration. Terms such as neurasthenia and eccentric paranoia are made to justify themselves; the section on malingering contains a wealth of experience; while the section on war neuroses extracts in a few pages the more important lessons of the recent conflict.

It is to be recommended as a thoroughly safe textbook.

ALEXANDER KENNEDY.

THE ELDERLY SICK

The Nursing of the Elderly Sick: A Practical Handbook of Geriatric Nursing. By T. N. Rudd, M.D., M.R.C.P. (Pp. 108. 8s. 6d.) London: Faber and Faber, 1953.

This is not a mere textbook of nursing for the elderly; it is far more than that. The writer has a humane and eminently sane approach to a problem which is steadily growing as the expectation of life increases. He appreciates the fact that the first essential to success in this field is to understand the working of the elderly mind, to enter into its fear of being useless or unwanted, to understand that horror of crippling is far greater than the dread of death.

It is interesting to read that only half of the old for whom hospital treatment is sought require medical or nursing treatment which could not be provided at home. The difficulty is to secure adequate supervision at home now that whole families go out to work. In the more leisurely days, before emancipation of women, it was the lot of the unmarried daughters to tend their aged and sick parents. This abominable servitude has fortunately been swept away by economic necessity; something better must be found to replace it. Homes for the aged are a crying need. The author stresses the fact that senile dementia is more likely to be the result of environment than of organic disease: loneliness and boredom are the evil influences.

The sections on incontinence, nutrition, bed sores, and diet are highly practical, and should be of great help to doctors and nurses in caring for the sick of all ages.

A. H. DOUTHETT.

MEDICAL MYCOLOGY

Atlas of Medical Mycology. By Emma Sadler Moss, M.D., and Albert Louis McQuown, M.D. (Pp. 246; 248 illustrations. £3 1s. 6d.) London: Baillière, Tindall and Cox, 1953.

This atlas is based on wide practical experience of mycotic infections in New Orleans. Its aim is to facilitate the identification of pathogenic fungi and the histological diagnosis of the diseases they produce. The authors present about 250 photographs in the style of the introductory manual of medical mycology by Lewis and Hopper. But they discuss the subject more uniformly and without the same emphasis on skin and dermatophyte infections.

The descriptive text is a concise and practical elementary summary representing generally accepted present-day teaching. A chapter on immunology is inadequate, and the use of the term "vaccine" for skin-testing antigen is likely

to cause confusion. The debatable nature of pulmonary moniliasis might perhaps have been considered, and the importance of *Aspergillus fumigatus* might have been mentioned under the pathogenic aspergilli. There are some inconsistencies in the use of capitals for specific names of fungi, and the choice of chromomycosis in preference to the more generally accepted name, chromoblastomycosis, is unusual. In discussing technical methods it is clear that the authors are impressed by the results of primary isolation of pathogenic fungi on Littman's bile-salt crystal-violet streptomycin medium. Consequently it is given considerable prominence among media more generally used. This recommendation merits attention and confirmation. The appearance of cultures under ultra-violet light is described in greater detail than is warranted for normal routine diagnosis.

It is unfortunate that the quality and usefulness of the illustrations vary widely. Many of those depicting cultures serve no useful diagnostic purpose and scales are applied without care. The detail demanded from a number of photographs has not been realized, and microscopical fields of fungous cultures could have been chosen with more discrimination. There is a brief and unusually varied bibliography, but no reference is given to it in the text.

R. W. RIDDELL

FOOD HYGIENE

Food Poisoning and Food Hygiene. By Betty C. Hobbs, B.Sc., Ph.D., Dip.Bact. (Pp. 174; 44 figures. 14s.) London: Edward Arnold and Co., 1953.

Food-poisoning has reached alarming proportions in recent years. One of the major causes is the increasing tendency to take meals in canteens and restaurants, where methods of preparing and serving food by mass production provide the mechanism for extensive outbreaks if technique is faulty. The danger to health is incalculable; the effect on human endeavour can be chaotic. An outbreak of dysentery in a hospital upsets routine, restricts admissions, and slows the tempo of the institution; the introduction and spread of infection in day and residential nurseries occur frequently, impairing their usefulness and on occasion dictating their closure for a time; widespread food-poisoning in a works canteen cripples production, with consequent loss of wages and profits. Too little attention has been paid to this serious problem of public health and national economy.

Dr. Hobbs has used her opportunities and experience as director of the food hygiene laboratory of the Central Public Health Laboratory to great advantage. She presents the facts of food-poisoning and the remedies of food hygiene simply and authoritatively. She demonstrates disturbingly the high rate of increase of infection over a period of years, although it is but right to point out that the high efficiency of the Public Health Laboratory Service is undoubtedly one cause of higher figures in that ascertainment is much improved.

But Horace's Homer nodded, and here the statement on the cover that "the number of notified outbreaks of food poisoning during the last ten years has increased at almost exactly the same rate as the number of catering establishments" must be challenged. The increase is quite definite, but the rate of increase is not nearly the same. Furthermore, a graph which appears at first sight to support the statement is found to be of unsound construction in that the vertical scale is not consistent, and the graph is therefore fallacious. There are several minor blemishes; for example, a Lancashire firm cannot properly be called a Midland firm. Descriptions of examples of outbreaks are exceedingly well done; the numerous photographs are good and in themselves instructive; opinion is sound and well balanced. There is no better book than this on food control, and the few errors but enhance by contrast the general high standard of writing and production. But, example being more efficacious than precept, I can best commend this book by obtaining a copy for myself—and this I have done.

C. METCALFE BROWN.

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CEREBRAL ARTERIOGRAPHY

Moniz, by performing the first successful carotid arteriogram in 1927, made possible the accurate diagnosis and surgical treatment of certain of the cerebral vascular disorders. His discovery also provided a new method of localizing, and in some cases of identifying, intracranial expanding lesions and a means of studying the cerebral circulation. After careful animal experiments he and his colleague Lima used a 70% solution of strontium bromide as contrast medium, radiographs being exposed as it passed through the cerebral vessels. This substance was soon found to be unsuitable, but with a 25% solution of sodium iodide satisfactory arteriograms were obtained, the medium being injected into the exposed common carotid artery. Sodium iodide was used until 1931, by which time over three hundred arteriograms had been performed and a considerable experience of the normal and abnormal cerebral vascular tree obtained. A 25% colloidal suspension of thorium dioxide (thorotrast) was then substituted as contrast medium, and it proved to be safer than sodium iodide although theoretically dangerous in view of its radioactivity and retention in the liver.

An important development was the introduction of percutaneous puncture of the carotid artery. But this method was of limited use with thorotrast as the contrast medium, for it is irritant if injected outside the vessel. Diodone was first used by Gross in 1939, but its use did not become extensive until Engeset perfected the percutaneous method of injection in 1944. The radiological and operative technique was further developed by Lindgren, and cerebral arteriography is now established as a routine procedure, practised and accepted in all neurological centres. Moniz in 1933 had also started performing vertebral arteriograms in order to demonstrate vessels of the posterior fossa and the posterior cerebral arteries. Four methods of vertebral arteriography are now in use. The percutaneous methods include puncture of the artery in its canal in the cervical spine, and punc-

ture between the arch of the atlas and the occipital bone. The open methods entail exposure of the vessel close to its origin from the subclavian artery or the passage of a catheter up the radial artery.

The indications and scope of cerebral arteriography were fully described by Bull in 1949.¹ Its greatest value is in demonstrating the source of subarachnoid or intracerebral haemorrhage. Congenital aneurysms of the cerebral vessels are the commonest cause of subarachnoid haemorrhage, and cerebral arteriography has made possible the surgical treatment of these lesions, which offers good prospects of cure.² Early cerebral arteriography is therefore indicated so that the aneurysm may be identified and treatment started. The examination, if performed soon after a haemorrhage, does not seem to increase the risk of further bleeding. Multiple radiographic projections may be necessary to demonstrate the smaller aneurysms, and if bilateral carotid arteriography fails to show an aneurysm vertebral arteriography should follow. Cerebral angiomas (arteriovenous malformations) may present with subarachnoid haemorrhage, epilepsy, hemiparesis, or headache, and many can be removed. Mackenzie, analysing the clinical findings in 50 proved cases of cerebral angioma, found haemorrhage to be the presenting incident in 15.³ Intracerebral haematomata, whether or not associated with aneurysms or arteriovenous malformations, may respond to treatment by evacuation, and arteriography will often show their position.

The localization of cerebral tumours depends on their proximity to the large cerebral vessels, whose displacement and distortion may be identified, or on the demonstration of pathological vessels, whose character will often suggest the nature of the lesion. In particular an exact diagnosis may often be made of meningioma, malignant glioma, or metastases. It was at one time thought that the deep tumours of the cerebral hemisphere could be localized only if abnormal vessels were shown, but now that the normal radiological anatomy of the deep veins is well recognized their displacement may indicate the site of a tumour.⁴ Carotid arteriography is indicated only if the side in which the expanding lesion lies is clear clinically or from skull radiographs. If the side cannot be determined, pneumography is the examination of choice, but has the disadvantage over arteriography that surgery is more likely to be required immediately. Vertebral arteriography is indicated only for vascular lesions of the basilar system and for expanding lesions in the distribution of the posterior cerebral artery. With the exception of haemangioblastomata, particularly when they are multiple, it is of limited value for the localization of

¹ Proc. roy. Soc. Med., 1949, 42, 880.
² Norlén, G., and Oliverson, H., J. Neurosurg., 1953, 10, 404.
³ Bradt, 1953, 76, 184.
⁴ Krusenbühl, H., and Richter, H., Die Zerebrale Angiographie. Stuttgart: Georg Thieme Verlag, 1952.
⁵ Broman, T., and Olsson, O., Acta radiol. (Stockh.), 1948, 30, 326, and 1949, 31, 321.
⁶ Lin, P., et al., J. Neurosurg., 1953, 10, 367.

posterior fossa tumours, and ventriculography is nearly always the method of choice.

Complications of the procedure result from errors of technique or from the effect of the contrast medium on the cerebral vessels. Errors of technique may cause cerebral embolism or the formation of a haematoma at the puncture site. Diodone has been shown by Broman and Olsson to alter the blood-brain barrier, and this effect varies directly with the strength of the solution and the time of application.⁵ It is this effect on the blood brain barrier (or vascular spasm, which probably causes the transient hemipareses) which may complicate arteriography. This complication is more frequent in patients with severe cerebral arteriosclerosis or hypertension, and the examination may be contraindicated for them. Patients with large tumours and high intracranial pressure occasionally become unconscious after arteriography. This is probably due to oedema of the tumour and surrounding brain causing a tentorial pressure cone. In these cases arteriography may be as dangerous as ventriculography. Where clinical and radiological evidence suggests the presence of a large benign tumour, such as a meningioma, arteriography should be performed only when there are facilities for immediate craniotomy if it should be necessary.

The fact that the contrast medium is responsible for most complications points to the need for continuous search for a non-toxic water-soluble substance. "Urokon" sodium 30% (an organic iodine compound) has been claimed to be safer than diodone and is less disturbing subjectively, but in 1 of 100 patients Chamberlain reported complications.⁶ Recent advances in radiographic technique include simultaneous radiography in two planes; this facilitates examination with a smaller volume of contrast medium. Rapid serial radiography has proved to be of value in the study of the normal and abnormal cerebral circulation and in the demonstration of pathological vessels.

Cerebral arteriography has now a secure place in the diagnosis of neurological diseases, particularly the vascular disorders. It has to some extent replaced pneumography in the localization of intracranial expanding lesions, but these examinations are nevertheless complementary, the choice depending on the nature of the suspected lesion and personal preference of the clinician or radiologist. With the advance of radiographic techniques, it can be confidently predicted that the finer details of the cerebral blood vessels will be demonstrated in the living, for at present only relatively large vessels and lesions can be shown.

CORONARY DISEASE AND WORK

Since the publication of the Registrar-General's analysis¹ of occupational mortality for the years 1930-2 it has been known that mortality from coronary heart disease is considerably higher among the professional classes than among unskilled workers. This observation is all the more striking because experience of most other diseases, including most other forms of heart disease, suggests that where incidence is related to social and economic circumstances it is usually highest in the poorest classes. The striking exception of coronary disease has inevitably provoked discussion of aetiology: and emotional stress,^{2,3} diet,⁴ and the sedentary nature of work⁴ have all been suggested as contributing agents.

In a recent report⁵ Dr. J. N. Morris and his colleagues have added the useful observation that there are differences in the experience of coronary disease between workers in occupations usually regarded as belonging to the same social class. They have examined sickness and mortality records of drivers, conductors, and guards aged 35-64 employed by the London Transport, and, interpreting the first absence from work because of coronary heart disease as the first clinical episode, they have shown that about one-fifth of the cases first present as angina pectoris, about half as coronary thrombosis which is not rapidly fatal, and between one-quarter and one-third as coronary thrombosis which results in death within three days. After a detailed comparison of the morbidity and mortality experience of conductors with that of drivers, they conclude that conductors have less coronary disease, and that their disease appears at a later age and follows a more benign course. In discussing these results Morris and his colleagues consider, as it seems right to do, the possibility of both constitutional and environmental differences between persons in the two occupations. They are particularly attracted, however, by the possibility that lack of physical activity is a contributing factor in aetiology, a suggestion made by Stocks⁶ and supported by a comparison of the mortality experience of clerical workers and mineworkers.⁷ Morris and his colleagues have examined this possibility more closely, and have assembled an impressive body of evidence consistent with the view that mortality from coronary heart disease is inversely related to the amount of physical effort which the occupa-

¹ Registrar-General for England and Wales, *Decennial Supplement 1931, Part IIA, Occupational Mortality*, London, 1938.
² Ryle, J. A., and Russell, W. T., *Brit. Heart J.*, 1949, 11, 170.
³ Stewart, I. McD. G., *Lancet*, 1950, 2, 867.
⁴ Stocks, P., *ibid.*, 1951, 1, 351.
⁵ Morris, J. N., *et al.*, *ibid.*, 1953, 2, 1053 and 1111.
⁶ Logan, W. P. D., *ibid.*, 1952, 1, 758.
⁷ Morris, J. N., *et al.*, *British Medical Journal*, 1952, 1, 501.

tion requires. It is clear that physical activity is not the only important factor in the aetiology of coronary heart disease; it cannot, for example, explain the higher incidence in general practitioners than in consultants.⁷ There is indeed every reason to suppose that, as in most other diseases, both genetic and environmental agents are at work, and it is most unlikely that the environmental component can be attributed to a single agent. Nevertheless the relationship between physical activity and experience of coronary disease seems firmly established, and any acceptable discussion of aetiology must take account of it.

These findings in coronary heart disease, like some others related to the aetiology of common diseases, raise an important issue. The environmental changes which have contributed so much to the decline of mortality since the early years of the nineteenth century were brought about by public authorities, and depended for their effectiveness hardly at all upon the co-operation of the individual. But many of the aetiological agents now under consideration are of quite a different character: what to eat, whether to smoke, and how much to exercise are intensely personal questions which cannot be decided solely by Acts of Parliament, and responsibility for answering them must inevitably rest to a large extent with the individual. At present the task of establishing the significance of food, smoking, and exercise in aetiology is sufficiently exacting, and the investigator should not be deterred by the practical implications of positive findings. But it is as well to recognize that when positive findings are forthcoming they suggest no easy remedy, but on the contrary raise issues, personal as well as public, for which the experience of nineteenth-century public health has hardly prepared us.

HEART DISEASE AND PREGNANCY

The management of the pregnant woman with heart disease calls for a high standard of judgment, skill, and watchfulness on the part of the attendants. The close co-operation which should obtain between obstetricians and physicians is exemplified by a joint report at p. 70 of this issue of the *Journal* on 250 pregnancies in 175 women with rheumatic heart disease seen at the National Maternity Hospital, Dublin, during the four years 1948-51. The authors say that these cases are drawn from a population which does not practise contraception, therapeutic abortion, or sterilization, and they argue that a true picture of the natural course of rheumatic heart disease in relation to pregnancy is obtained. The follow-up of the cases was unfortunately limited to a maximum of four years, but many valuable lessons are to be learnt, or rather learnt afresh, from this review.

The assessment of the probable risk of pregnancy in these women is best based, as Professor Bramwell pointed out in this *Journal* last year,¹ on the woman's exercise tolerance before pregnancy, but often the patient is not seen until the cardiac efficiency is already influenced by the pregnancy. The previous obstetric history, age, social surroundings, and personal temperament and wishes of the patient have all to be taken into account in giving guidance and hazarding a prognosis. But the immediate prognosis is governed above all by the quality of antenatal care, and MacRae's² recent description of the details of careful attention which enabled him to report 228 consecutive cases without maternal death in pregnancy or labour is worthy of close study. The heart condition can be expected to deteriorate with increasing parity, probably because of the coincident increasing age; but the severer degrees of disability occur disproportionately often in younger women, probably because of the greater chance in them of recrudescence of acute rheumatism. Auricular fibrillation, respiratory infection, and anaemia are important factors in precipitating heart failure during pregnancy. The maximum strain on the heart is between the 28th and 36th weeks; it might be profitable therefore to admit these women to hospital for rest at this time rather than for the customary two or three weeks before term. Only exceptionally does cardiac failure begin in the last month of pregnancy, and the induction of premature labour during that time is therefore irrational. In cases of mitral stenosis, valvotomy during pregnancy is likely to be increasingly performed, for in some of them it will avert the need to consider therapeutic abortion; the operation may also be preferred when severer degrees of disability show little improvement with medical treatment, or when acute pulmonary oedema has occurred or is threatened. In the management of labour the salient points are the avoidance of caesarean section except for purely obstetric indications, the use of morphine and pethidine for analgesia, supplemented later if necessary by gas and air or gas and oxygen, the shortening of the second stage by the judicious use of forceps under local analgesia, and the avoidance of post-partum haemorrhage. The lying-in period should be extended to at least three weeks, and the woman should then be referred to a heart clinic for further help and supervision, for the obstetrician is dealing with merely one episode in her life.

In the Dublin series, 11 of the 175 women died during the short time of follow-up, 5 of them more than one year after confinement. The conclusion is drawn that these five deaths were not related to pregnancy, but it seems likely that the extra burden, not of the pregnancy itself but of looking after another baby, especially in poor surroundings, materially shortened the mother's life. Of the 6 women who died during pregnancy or within one year of delivery 5 were under 30 years of age, and all were unbooked patients who were admitted as emergency cases and in poor condition. It is discouraging to read that in some cases seen neither the patient nor her doctor was aware that heart disease

¹ Bramwell, C., *British Medical Journal*, 1953, 1, 897.

² MacRae, D. J., *J. Obstet. Gynaec. Brit. Emp.*, 1953, 60, 650.

existed until complications ensued. Heart disease has become one of the commonest causes of maternal mortality, and early diagnosis and scrupulous antenatal care are imperative if fatalities are to be avoided.

MEASUREMENT OF SICKNESS

While the collection of mortality statistics could hardly be made more complete in Britain except in small particulars, the collection of morbidity statistics, other than those of notifiable infectious diseases, is slight in comparison. Malignant disease was early singled out for special study of morbidity, at first by the Radium Commission in 1930, and in recent years the net has been cast increasingly widely by the General Register Office.¹ A few weeks ago a useful study of general practitioners' records by Logan² was discussed in these columns,³ and now a further contribution to this difficult field of inquiry comes from the General Register Office.⁴ It gives information, first, on general morbidity obtained by the Survey of Sickness, secondly on admissions to and discharges from mental hospitals, and thirdly on cancer registration. The last section includes a table showing for twenty-one cancer sites and fourteen regions of England and Wales an analysis of the time intervals from the earliest symptom or sign of cancer to the date of registration or treatment. While no very precise significance can be attributed to these intervals for reasons given by the Registrar-General, they may prove to be of particular interest for comparison with figures obtained in subsequent years (these refer to 1947-8), but even these may provoke thought. For instance, by means of some simple calculations a comparison may be made for the different geographical areas between the proportion of cases with intervals of less than 24 months and the proportion with intervals of 24 months and over. For all the centres and hospitals 16.5% of the cases had intervals of 24 months and over. In the metropolitan area 15% had intervals of 24 months and over, and there was no difference between the teaching and non-teaching hospitals there. Newcastle and Liverpool also had 15%, and Leeds and Birmingham 16%. Sheffield, East Anglia, Oxford, and the South-west followed with 18%, and Manchester with 19%. Finally came Wales with 28%. The number of cases is rather small in Wales and its relative position should be accepted with reserve, but the figures do suggest the need for some special inquiry there if only to ascertain their significance more clearly. Similar comparisons may be made of these intervals between the different cancer sites, but they must at present be even more hazardous if only because of the different rates at which cancers can grow at different sites.

The figures for the mentally sick refer only to those treated in Health Service hospitals; the numbers treated in private institutions, psychiatric clinics, and prisons are unknown. At the end of 1949 there were in mental hospitals 3.4 per 1,000 civilian population, and 68% of

direct admissions were first admissions. The rate of admissions increases as age advances: for men aged 65 and over the rate was 673 per 100,000 population in the age group, compared with 300 for all men, and for women aged 65 and over it was 968, compared with 368 for all women. Like the cancer statistics those for mental illness will gain in significance as the years pass and more figures become available for comparison. This volume is the first on morbidity statistics to be added to the Registrar-General's annual review. It is a break with a 125-years-old tradition that is both welcome and worth repeating.

EXCHANGE OF PRACTICES

During the last four years the Medical Practices Advisory Bureau of the B.M.A. has made over 2,000 introductions with a view to exchange of practices, but fewer than 20 doctors have been able to conclude satisfactory arrangements. It is not difficult to find reasons for this discouraging result. A recent survey by the Bureau suggests that the majority are wanting the same thing—a more desirable area without too great a drop in income. Certainly the inducement of a bigger income is insufficient to attract doctors to industrial areas. Many will only consider an exchange if certain limiting conditions are fulfilled, and are apparently prepared to wait indefinitely in the hope of finding just what they need. At the end of last October, according to the survey, there were at least 70 doctors anxious to exchange practices. Experience shows that many of the secondary difficulties which must inevitably accompany negotiations, such as exchange of houses, the presence or lack of social amenities or of educational facilities, are not insuperable.

The preliminary steps towards exchange are necessarily confidential, and in order to give publicity to the opportunities which are available, together with details sufficient to invite inquiry, while concealing any information by which the doctor or practice could be identified, we publish in the advertisement columns of this issue (p. 24) a list comprising 70 practices offered for exchange. Introductions and advice on procedure can be obtained by application to the Medical Director of the Medical Practices Advisory Bureau. It is impossible to say whether regular publication of a comprehensive list of practices for exchange will increase the exchanges effected, but this tentative experiment of advertising a large number together will at least give a clearer picture of the possibilities of the scheme and of the available facilities.

A TREATMENT FOR ECZEMA

In making therapeutic trials investigators have often had difficulty in discounting the human factor. If the new treatment gives apparent initial success the enthusiasm of the physician is apt to give rise to the over-optimistic reports which are all too familiar and which have in many cases hampered the progress of medicine, caused much waste of time and money, and added false hopes and disappointment to the patient's burden. Thus it is that exaggerated claims for new remedies are prolific, and the disillusioning process lags too far behind. The investigation conducted by Dr. J. H. S. Pettit into

linoleic and linolenic acids in the treatment of eczema (page 79) is a happy exception. Since the first reports of this treatment—most of them, as Dr. Pettit points out, conducted without controls—the treatment has been recommended in advertisements and elsewhere for various types of eczema and for a variety of other dermatoses. As a result these preparations have no doubt been used extensively both in general practice and in hospital. A glance at Dr. Pettit's tables will illustrate the variable course of eczema under different treatments, and it is easy to see how a wrong judgment can be formed if only a few cases are treated. To add to the illusion most doctors, quite naturally, tend to remember with joy the one or two apparent cures and to forget the half-dozen cases in which nothing happened.

Clinical experience grows slowly, and it may be that further experience will eventually attach a somewhat greater value to these fatty acids than this report suggests. But it is probable that the general consensus of dermatological opinion has, by a slow accumulation of clinical impressions and by more limited trials, already reached substantially the same conclusions for which Dr. Pettit now provides statistical support. Indeed, this probably applies not only to atopic eczema but to the various other dermatoses for which this type of treatment has been enthusiastically recommended.

CHLORPROMAZINE FOR HYPOTHERMIA

In a recent annotation¹ entitled "A New Drug" we observed that clinical findings were published before the results of a pharmacological investigation of the drug in question ("4560 R.P.," now known as chlorpromazine or "largactil"), and mentioned the need for research on some aspects of the drug's action. In commenting thus we failed to do justice to the work of Courvoisier and her colleagues² at the Rhône-Poulenc laboratories. Their paper was published in January, 1953, after the appearance of the report by Laborit, Huguenard, and Aulluaume,³ to which we have already referred.¹ Courvoisier's work showed, among other things, that chlorpromazine inhibited the effect of vagal stimulation but did not appreciably diminish the action of acetylcholine. For this reason chlorpromazine was described as a ganglion-blocking agent, although no evidence was given of any action on sympathetic ganglia. Much prominence has been given to this feature of its action, and a ganglion-blocking effect has been held to explain the fall of body temperature which it causes. Both Dundee and his colleagues⁴ and Smith and Fairer⁵ in their recent papers on hypothermia in this *Journal* appear to subscribe to this view. It is, of course, true that the sympathetic fibres to the skin cause vasoconstriction in response to cold, but it has long been known

that the most important organs concerned in heat production are the skeletal muscles. Their innervation is not through the autonomic system, but through the voluntary system, and therefore the suppression of shivering by curare or other substances such as chlorpromazine has nothing to do with autonomic or ganglion blockade.

As to the question of how chlorpromazine, or a mixture of it with pethidine and promethazine, causes a fall of body temperature, one possibility is that it exerts a central action and abolishes the reflex impulses to the skeletal muscles in the same way as does any form of deep anaesthesia. There is also the possibility that it acts directly on the muscles themselves, depressing their metabolism. Evidence against this second view is given by Peruzzo and Forni,⁶ who have determined the effect of chlorpromazine on the oxygen consumption of tissue slices from liver, kidney, and brain. They found that the oxygen consumption of slices of the cerebral cortex of the rat was greatly diminished, but that that of slices of liver and kidney was unaffected. These results strongly suggest that the effect of chlorpromazine is central.

There is, however, nothing new in the finding that substances of this kind will reduce body temperature. Quinine has perhaps the oldest claim to this action, and more recently⁷ it has been shown that pethidine, procaine, diphenhydramine, and quinidine have it too. In our correspondence columns last week (p. 42) Dr. C. Langton Hower gave some timely advice to anaesthetists who are thinking of using chlorpromazine. Until careful quantitative comparisons in further animal experiments have established that chlorpromazine is definitely superior to other drugs, it would seem wise to use more familiar tools, such as pethidine, in the trial of methods of anaesthesia devised to make surgery safer for the poor-risk patient.

HOSPITALS AND THE PUBLIC

About a year ago a report of the Central Health Services Council entitled "The Reception and Welfare of In-patients in Hospitals" was sent out to hospital management committees. Commenting on this we remarked that "lack of information probably causes patients and their relatives more worry than anything else," and we mentioned some of the ways by which the bewilderment and apprehensiveness of the ordinary patient could be relieved.¹ The Portsmouth Group Hospital Management Committee has recently adopted a series of recommendations put forward by the secretary of the group with a view to improving relationships with the public. One of the dangers of a nationalized service is that hospitals should come to be impersonally regarded as a special type of workshop, with problems little different from those of an industrial concern. The burden of the Portsmouth report is that a hospital must exert itself to keep the good will of the public, and that efforts made in this direction will be well

¹ *British Medical Journal*, 1953, 2, 1149.

² *Arch. int. pharmacodyn.*, 1953, 92, 305.

³ *Presse méd.*, 1952, 60, 206.

⁴ *British Medical Journal*, 1953, 2, 1237, 1244.

⁵ *Ibid.*, 1953, 2, 1247.

⁶ *Presse méd.*, 1953, 61, 1463.

⁷ *Dutta, Brit. J. Pharmacol.*, 1948, 3, 246.

¹ *British Medical Journal*, 1953, 1, 264.

² *Ibid.*, 1953, 2, 683.

¹ Stocks, P., *Cancer Registration in England and Wales, Studies on Medical and Population Subjects*, No. 3. H.M.S.O., 1950.
² *General Practitioners' Records, Studies on Medical and Population Subjects*, No. 7. H.M.S.O., 1953.
³ *British Medical Journal*, 1953, 2, 1038.
⁴ *Registrar-General's Statistical Review of England and Wales for year 1949: Supplement on General Morbidity, Cancer and Mental Health*. H.M.S.O., 7s. 6d.

repaid. In particular there is still room for much improvement in the reception of patients and their relatives. Out-patient departments should be brightened, and when patients have to be kept waiting for a long time someone in authority—perhaps the sister in charge of the department—should give them a full explanation of the reason for delay. All complaints, even the unjustified ones, should be sympathetically listened to and answered, so that no patient or relative has any reason to retain a sense of grievance. At Portsmouth they rightly attach great importance to the handling of telephone calls: well-trained, efficient, and helpful telephone operators can do much for the reputation of a hospital.

It has been estimated that in the Portsmouth area one person in every eight comes into some contact with local hospitals every year, and the management committee is one of the largest employers in the neighbourhood. Thus the hospital touches the lives of a large proportion of the population. Where an active "league of friends" has developed round a particular hospital so has the association of the hospital with the neighbouring community become more firmly established. It is good to learn that the Portsmouth Group Hospital Management Committee has agreed that "if the hospitals are to provide the best service, the closest co-operation and confidence of the family doctor must be enlisted." The Hadfield report² has given emphasis to the valuable suggestion that local doctors might be asked for their views on some of the difficulties which arise in the relationship between hospitals and general practitioners. Portsmouth is not the only hospital group to take action on the Central Health Services Council report, but there is still much to be done before the common complaint, "They never tell me anything," is no longer heard.

FLEXIBLE ENDOSCOPES

An idea that may revolutionize the design of endoscopes was last week the subject of a communication from H. H. Hopkins and N. S. Kafany,¹ of the Imperial College of Science and Technology, London. They describe how light may be transmitted through a bundle of glass fibres even when the bundle is curved quite sharply through an angle of 90 degrees. The simplicity of this system of transmitting light images, over that of the existing gastroscopes for instance, which have up to 50 lenses, may add great reduction in manufacturing costs to increased flexibility in performance. With a bundle 4 in. (10 cm.) long made by these workers a bending radius of less than 2 in. (5 cm.) was achieved "without any deterioration in the image quality," and the theoretically expected resolving power of 100 lines to the inch (40 to the cm.) with the fibres used is reported to have been easily obtained. Similar experiments in Holland carried out by A. C. S. van Heel are reported in the same issue. He was led to them by a consideration of the eye structure of some insects.

¹ *Nature (Lond.)*, 1954, 173, 39.

THE NEW YEAR HONOURS

The list of New Year Honours (see p. 95) contains, as is usual, the names of medical men and women who have achieved eminence in their profession at home, in the Services, and in many Commonwealth and Colonial countries. At the top of the list comes Lord Webb-Johnson, who is promoted to Knight Grand Cross of the Royal Victorian Order. Among the new medical knights comes Professor E. C. Dodds, F.R.S., director of the Courtauld Institute of Biochemistry at the Middlesex Hospital. He was appointed professor of biochemistry in the University of London in 1925 while still in his twenties. Professor Dodds is known all over the medical world for his investigation of the chemical and physiological properties of internal secretions, and for work which led, about fifteen years ago, to the synthesis of stilboestrol. His colleagues, here and elsewhere, will be delighted that the Queen has been pleased to honour him. The dental as well as the medical profession will be gratified by the knighthood awarded to Mr. E. W. Fish, chairman of the Dental Board of the United Kingdom. Mr. Fish, who has been dental surgeon to St. Mary's Hospital and the Royal Dental Hospital, has a distinguished record as a teacher and as an investigator of dental and oral disease. In 1952 he was president of the eleventh International Dental Congress in London. The honour of knighthood has also been awarded to Dr. F. T. Rees, who has recently retired from the post of Director-General of Medical Services, Ministry of Pensions (which is now merged with the Ministry of National Insurance). Dr. Rees joined the staff of the Ministry in 1919, and thus was closely concerned with the pensions work which followed the two great wars. Australia will soon be much in the news, and it is fitting that two Australian medical men complete the list of new knights. Dr. B. H. Swift, gynaecological and obstetric surgeon in Adelaide, has many friends in this country. A graduate of Cambridge University, he is a Fellow of the Royal College of Obstetricians and Gynaecologists, and vice-chairman of the Australian Council of the College. A few years ago he was president of the South Australian Branch of the B.M.A. Dr. H. W. Wunderly, who was elected F.R.C.P. last year, is a specialist in diseases of the lungs. Before his appointment in 1947 as Director of Tuberculosis in the Department of Health at Canberra he was a physician in Adelaide.

Some well-known names are in the list of those awarded the C.B.E., but there will be particular pleasure that a medical woman in Australia, Dr. Kate I. Campbell, is thus honoured: she is a paediatrician in Melbourne. Dr. G. A. Clark, Principal Medical Officer at the Ministry of Health, and formerly dean of the faculty of medicine and professor of physiology at Sheffield University, receives the C.B.; and Dr. H. W. Mulligan, director, West African Institute for Trypanosomiasis Research, and Dr. W. G. Wickremesinghe, who has been Acting Director of Ceylon's Health Services, receive the C.M.G.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

INVESTIGATION OF OUTBREAKS OF INFECTION

BY

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No short article can adequately cover the whole of the investigation of epidemics of communicable disease, so a number of restrictions have to be introduced. I shall deal only with diseases that occur in Britain, and largely with diseases for which the laboratory can, in the present state of knowledge, give practical help. Moreover, since it is with the investigation of localized outbreaks of communicable disease rather than with widespread epidemics that the general practitioner is likely to be concerned, the discussion is similarly restricted.

It is convenient to recognize three sorts of outbreak: one in which a number of cases occur as nearly as may be simultaneously; one in which infection appears to be spreading through the community; and one in which the so-called "dropping" cases of a disease occur at intervals. None of these histories is pathognomonic of any particular method of spread, but the explosive outbreak is often due to massive contamination of a common foodstuff, and the dropping-case type of outbreak is commonly due to a chronic carrier of the infective microbe. These two sorts of outbreak are also those in which the general practitioner may be in the best position to assist—the explosive outbreak because he is the first on the spot and therefore best placed to secure material for laboratory investigation; the dropping-case outbreak because he alone may be in a position to recognize its occurrence and envisage the common contacts of the patients.

In the investigation of a suspected outbreak of infection there are several steps. The first is the establishment of a precise diagnosis in the suspected cases, and the second is the taking of a careful history of the patients and of the outbreak. In some cases these two steps—diagnosis and history taking—indicate so closely the source of infection that for practical purposes further investigation is superfluous. More often, however, the third step is an attempt to trace the source from which the latest batch of patients became infected. At the same time an attempt is made to discover other victims of the infection who have as yet shown no signs of the disease; sometimes it is also possible to determine the susceptibility of contacts to the disease. Lastly, it may be necessary to try to find out how the infection was spread—by direct contact or by indirect methods such as food, drink, air, or fomites.

Diagnosis and History

An accurate diagnosis and an accurate history for the individual patients are the first requirements. In many cases the "diagnosis" may be the name of a well-recognized disease. In others, however, it may be a syndrome, observed to occur in epidemic fashion, but not yet widely recognized. In the latter group accurate definition of the syndrome is most important.

The history needs to include the dates of onset of the disease in each individual patient; details of his activities at the times when, judged from the ordinary incubation period of the disease, he must have been infected; and

details of his activities immediately before he fell ill, when he was probably already infective.

In addition to the history of the illness in individuals, we need to construct a history of the incident as a whole, and this has to take account of the persons who were not ill as well as those who were. It is important, especially in outbreaks that may be food-borne, to assess the number of persons exposed to infection, and in all kinds of epidemic a comparison of the attack rates in various groups of the population—different classes in a school, different ages, the two sexes, the various wards in a hospital—may often give a strong lead to the subsequent bacteriological investigations.

In some instances diagnosis and history may be all that is possible, for want of methods for cultivating the responsible microbes or other means of laboratory confirmation. Even so, it may be possible to infer the way in which the disease is spread and methods for its prevention.

However, there are numerous occasions when laboratory help is indispensable to the proper investigation and control of the epidemic. Laboratory help comes first in helping to establish the diagnosis of the disease, and at this stage it has two functions. The first is to put a precise name to the patient's illness—to convert the label of "P.U.O." to the diagnosis of typhoid fever, to distinguish the streptococcal from the non-streptococcal sore throat, to recognize the true virus influenza among the host of "flus." These distinctions can often, with experience, be made on clinical grounds alone, especially in the face of a general epidemic, but the laboratory should be able to make the distinction with more certainty and in the atypical cases. For this to be most useful the laboratory must be prepared to issue, and the practitioner to accept, preliminary reports which may be subject to some revision when the tests are complete.

The second function of the laboratory is the "type identification" of the infecting organism. In many cases the members of a species of pathogenic bacteria or viruses can be classified into a number of types which are stable under natural conditions. Then, if two patients are found to be infected with one species of microbe but of two different types, we can conclude that they became infected from different sources and are not part of one epidemic. If both are infected with one type they may well have acquired the infection from a common source, but the

TABLE 1.—Microbes that Cause Epidemics and Can be Classified Into Types

Microbe	Disease	Typing Method Employed on Microbe
<i>Salmonella typhi</i>	Enteric fever	Bacteriophage
<i>Salmonella paratyphi</i>	"	"
Other <i>Salmonella</i> species	Food-poisoning	Serology
<i>Escherichia (Bacterium) coli</i>	Some gastro-enteritis in infants	"
<i>Shigella</i> species	Dysentery	"
<i>Streptococcus pyogenes</i> (Lancefield's group A haemolytic streptococci)	Scarlet fever, sore throat, puerperal sepsis, etc.	"
<i>Staphylococcus aureus</i>	Food-poisoning, sepsis, etc.	Bacteriophage
<i>Streptococcus pneumoniae</i> (pneumococcus)	Lobar pneumonia	Serology
<i>Corynebacterium diphtheriae</i>	Diphtheria	Morphology, culture, serology, and physiology
Influenza virus	Epidemic influenza	Serology

degree of certainty that can be put on this conclusion depends on the frequency with which the various types occur in the population.

Of the microbes that cause epidemics, those for which type identification is possible are listed in Table I, but a warning may be added here. The techniques of type identification are commonly difficult and the materials needed are usually available in only a few specialized laboratories. This means that there may be a few days' delay before the results of the tests can be given to the practitioner or medical officer of health. It also means that requests for type identification ought to be restricted to investigations where enough material has been collected to make the results useful.

Search for Source of Infection

The diagnosis and the history should indicate what sort of outbreak is occurring, and what investigations are needed to trace its source, to prevent further cases in the immediate future, and to prevent the occurrence of further outbreaks.

In outbreaks apparently due to infection of a common foodstuff an attempt is first made to demonstrate bacterial contamination of the food remnants, and then a search is made for carriers among the persons who had handled the food. In outbreaks consisting in dropping cases of bacterial infection a search may be made for chronic carriers among contacts and perhaps also for intermittent contamination of food. When there is evidence that a disease is spreading from case to case through a community we are concerned to discover those remaining susceptible to infection and also the potential dispersers of infection; in some examples of this type it may be possible to control the outbreak by isolating all infected persons, but often specific protection of the remaining susceptible persons may offer more hope of success.

Laboratory assistance in the investigation of the source of outbreaks is thus most often required in a search for healthy carriers and for other animate or inanimate sources of the causal organism.

Truly chronic healthy carriers are particularly important in the propagation of typhoid fever, and they also play a part in the spread of streptococcal and staphylococcal infections. In food-poisoning due to salmonellae, and in dysentery, chronic carriers are unimportant, but patients recovering from the disease may continue to excrete the organisms and infect others.

In attempting to pin responsibility for an epidemic on a carrier discovered during investigations made after cases have occurred, it may be difficult to be certain that the carrier was not really a victim rather than the cause of the outbreak, but in either case he may still be a cause of further spread if opportunities occur.

In surveys for possible dangerous carriers it is most important, though often difficult, to examine everyone who may have been concerned. The kitchen staff may include a number of part-time members who are often understandably reluctant to submit to examination; repeated inquiry may be needed to establish the full complement.

The specimens to be obtained from suspected carriers in investigations of some of the more important infections are given in Table II. In the enteric fevers especially, the carrier state may sometimes be recognized by finding a

TABLE II.—Specimens Required from Suspected Carriers

Disease	Specimens
Enteric fever	Faeces and urine Serum for detection of raised antibody titre in chronic carriers or convalescents
Salmonella food-poisoning	Faeces
Dysentery	
Staphylococcal infections and food-poisoning	Swabs from nose and throat, from skin of hands, and from any active or healing septic lesion
Streptococcal infections ..	Swabs from nose and throat and any septic lesion
Diphtheria	Swabs from nose and throat (or wound)

raised serum antibody titre (Widal reaction, typhoid Vi antibody titration), but the interpretation of these tests is often confused by antibodies resulting from earlier prophylactic inoculations. A raised titre of typhoid Vi antibody, however, is found only in persons who are still carrying the living organisms.

A raised antibody titre to the streptococcal toxin, streptolysin O, would similarly indicate recent infection with haemolytic streptococci, but this test is not widely used in a search for streptococcal carriers, partly because elevation of the titre is not invariable even with severe streptococcal infections, and partly because streptococcal infections are so common that only a method giving retrospective type-specific diagnosis would be useful. No such test has yet reached the stage of practical application. Other diseases in which antibody titration may be helpful include influenza, psittacosis, Q fever, undulant fever, and Weil's disease.

Relative Dangers of Carriers

With the intestinal infections, all carriers are commonly regarded as potentially dangerous. On the other hand, healthy persons who yield only small numbers of haemolytic streptococci, even of the pathogenic group A, are of little danger to their fellows, and there is good evidence that heavy nasal carriers are the persons particularly apt to spread the infection.

The hope animating any search for carriers among the contacts of the patients in an outbreak is that we may find a single person infected with the microbe causing the outbreak, and that he or she had the opportunity to spread the disease. Sometimes this hope is realized, and removal or neutralization of the carrier may, provided all the victims are accounted for and prevented from further dispersal, end the epidemic. Often, however, several carriers are found; one of these may perhaps be the source and the others victims—a distinction that may sometimes be possible from the history of the outbreak.

The presence of numerous carriers may also indicate that the microbe has already spread widely through the population, and may indeed have already infected many or all of those susceptible. In some circumstances this may indicate that the epidemic is burning itself out; in others, such as a hospital ward, it may show that the only ways of preventing further infection are by specific protection of the remaining susceptible patients or by closing the pathways along which infection is transmitted, including the isolation of infected persons.

Specific protection may be by the use of general chemoprophylaxis or, in diphtheria and smallpox particularly, by immunization. With diphtheria, indeed, it is also possible to distinguish the susceptible persons from the immune persons by means of the Schick test.

Animal Reservoirs

In considering the source of some epidemics, animals have to be considered. The *Salmonella* organisms responsible for food-poisoning may be pathogens or harmless commensals of domestic animals—the risk from infected duck eggs is so well known now that an infected patient who has had a duck egg within the past few days is often hardly questioned further. Epidemics of psittacosis arise from contact with sick birds, not only parrots; epidemics of bovine tuberculosis and Q fever start with infection derived from cattle or, in the latter case, other animals; and infection in Weil's disease is derived from rats.

Method of Spread of Infection

Inseparable from the investigation of the source of the epidemic—using "source" for the person or animal in whom the microbe was previously living—is the investigation of the way in which the organism was spread. We can distinguish spread by food and drink, by direct or indirect contact, by the air, and by insect vectors. With the possible exception of flies, spread by insects is so rare in this country

that it is not considered here. The distinction between these methods usually has to be made from the history of the outbreak and from comparison of attack rates on different groups of people who had various degrees of association with one another, or were exposed to various possible sources of infection.

Food-borne outbreaks are commonly, though not always, abrupt in onset; accurate history-taking often leads to a clear indication of the source of the infection. The enteric diseases and food-poisoning are always spread by infected or toxic food, and in the investigation of such outbreaks collection of samples of foodstuffs is important; these should be sent to the laboratory immediately, because, if kept, the pathogenic organisms may be overgrown by saprophytes. With diseases like typhoid fever, however, which have an incubation period of 10 days, it is quite likely that contamination of food or water with the typhoid bacillus has ceased by the time that investigations are begun. Some help may still be given by laboratory investigations, which may reveal, for example, faecal contamination of water supplies, faulty food-handling habits, or inadequate heat treatment of milk or ice-cream, and so indicate methods for the prevention of further outbreaks.

In both "dropping-case" and "spreading" outbreaks in hospitals hopes of prevention lie in investigation and the closing of the routes of infection, especially by improvements in the aseptic routine. For this it is often necessary to spend a great deal of time in the affected department, quietly observing the routine as it is followed; it will often be found to differ from that prescribed by authority.

In investigating outbreaks in hospitals and schools it is often possible to obtain evidence of widespread dissemination of the epidemic microbe on bed-clothes, in floor dust, on surfaces, and in the air; and bacteriological investigations of fomites may suggest the route of transmission. It is well to remember, however, that the finding of, for instance, large numbers of streptococci in the floor dust of a school suffering an epidemic of scarlet fever does not necessarily imply that the victims were infected by dust-borne streptococci; it may be that the streptococci in the dust are no more than a by-product of dispersal from carrier to new host by much more direct means.

In one special case the method of transmission of infection may be discovered, but not the person from which the infection is derived. This is the syringe-transmission of infective hepatitis: the causative virus may be carried in the blood of apparently healthy persons and be transferred to others by inadequately sterilized hypodermic syringes or needles; the infecting dose of virus is so small that it may be contained in an almost imperceptible amount of blood.

Conclusion

Clearly, methods for the investigation of all epidemics cannot be prescribed in a short article; all that can be done is to indicate some of the broad lines of approach, and the part that the laboratory can play in the investigations. The medical officer of health, on the epidemiological side, and the laboratory, on the microbiological side, can give guidance to the practitioner on the specimens that should be examined and the investigations that may profitably be made in any particular outbreak. The part played by the Public Health Laboratory Service, which was constituted to give assistance in the investigation of epidemics, was described by Dr. M. T. Parker in a previous article in this series (October 10, 1953, p. 823).

The investigation of outbreaks of infection has often consisted solely in the analysis of numbers of cases and of attack rates on the various sex and age groups of a population that are readily accessible in the, often inadequate, written records. Analyses of attack rates are essential, but to show their real value they have to be done in the first few hours of the investigation, for their first purpose should be to guide the field and laboratory investigations. The source of any but the simplest of epidemics can rarely be found unless the investigations are started as soon as there is

reasonable suspicion of the existence of an epidemic, and it will certainly not be found without a concerted clinical and laboratory investigation on the spot. With information gained from such full investigations, retrospective analysis may be expected to indicate the way in which further outbreaks may be prevented.

Next article on Clinical Pathology.—"Examination of Faeces for Infection and Infestation," by Dr. K. B. Rogers.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

MEDICAL AND SOCIAL PROBLEMS OF THE AFRICAN IN INDUSTRY

BY

J. H. JACKSON, M.B., B.S.

The industrial and mining development of the greater part of the African continent is still in its infancy. Full development will result in its attaining a position of great economic and strategic importance in the world, but cannot be carried out without native African labour. The future prosperity of Africa rests upon this, unless some equally suitable type of labour can be found. No true thought or consideration has been given to this fact by those in whose hands the existing development of the continent up to the present has lain. This seems to have been due to ignorance of the economic and social hazards of a policy of *laissez faire*, combined with the fact that labour supply has exceeded demand and the sources have been primitive peoples with a high reproductive rate whose mental horizons and economic needs were until recently of the lowest possible order.

Social Conditions

To-day in a large part of the African continent the industrial and mining development which has taken place has created terrible social conditions associated with poverty, malnutrition, disease, and crime. The terrifying proportions of these social evils appal the mind when viewed in the nakedness of their true facts. The social burden of the corrective measures necessary to deal with the situation now in existence is likely to be extremely heavy if the measures required are to prove effective. Indications are that such measures are beyond the means of the community as at present constituted. The social unrest which must inevitably spring from the continued existence of these conditions is likely to lead to economic and political disaster.

Whether sufficient knowledge or foresight could have been expected from those responsible for the creation of the present conditions one cannot say. Nevertheless I am of the opinion that a repetition of the mistakes elsewhere can be avoided by a knowledge of those of the past. It is the intention of this paper to discuss the medical and social impact of certain procedures which have been adopted to obtain native industrial labour, and the ultimate effect which they are likely to have if imposed upon primitive native peoples. It is based upon five years of general practice in an area where some of the conditions described exist. If it prevents similar conditions arising during the future development of the relatively untouched African territories then its purpose will have been well served.

Migratory Labour

In a large part of Southern Africa a system of migratory labour for the mines, industry, sugar plantations, etc., has been in existence from the outset. It will serve no purpose here to describe and discuss the factors which have resulted in the creation of native reserves where a large proportion of the population is crowded, where the land is eroded and exhausted, and, with present methods of cultivation, incapable of supporting agriculturally the population on it, and where no industries whatsoever exist capable of contributing to the local economy. Suffice it to say that they exist to-day in their stark reality. From these reserves 30 to 40% of the able-bodied males go annually to work elsewhere, leaving their women to till the land. These men depart for a period of six to nine months, sometimes for one to two years, to labour for the means necessary to give them and their distant families the barest of livings. No modern nation, even in the face of the direct military necessity, could maintain such numbers in the field. Certainly it would not be willing to maintain such a force outside its borders in peacetime. The social, medical, economic, and moral results of this migratory labour are catastrophic, and the system cannot be condemned too strongly.

The incidence of venereal disease is high amongst Africans in those areas where European civilization and industry have become firmly established. The published figures are in fact staggering when compared with those from other areas. It is undoubted that the introduction, spread, and high incidence of syphilis amongst the native peoples of Southern Africa is directly related to contact with the European and his industry, served by migratory labour. Apparent also is the lack of attention paid to the warnings of those medical men whose writings provide the evidence of this (Kark, 1949; Sax, 1952). The excellent survey of the social pathology of syphilis in Africans by Kark (1949) presents the facts admirably. To combat the amount of venereal disease now in existence in certain areas demands an extensive organization of social, medical, and educational workers. Moreover, the essential features of migratory labour among backward peoples are such as to prevent any effective control by such measures. Effective legislative measures to prevent the spread of disease can be placed on the statutes, and exist, but to put such measures into effect would result in social, economic, and legal chaos.

Malnutrition

The increasing dependence of the native in the reserves upon migratory labour, his ignorance of proper farming methods, and its sequelae—neglect, overstocking, and soil erosion and exhaustion—combined with a natural increase in population, have produced an intense and increasing problem of malnutrition. Unless checked this of itself is likely to have far-reaching effects, and it is already taking its toll. The selective action of malnutrition on the native female of the reserves has been noted (Jackson, 1952). That a process of racial degeneration due to malnutrition may be taking place can be supported by reasoning alone, and has been suspected (Gillman and Gillman, 1951; Jackson, 1952; Jones, 1952). Two processes are probably involved.

(a) The fertilized ovum is to some extent independent of the mother, even while *in utero*, and makes every effort to satisfy its own biological demands for development and growth. The high incidence of miscarriage and premature birth among malnourished African women is known (Gillman and Gillman, 1951; Ross, 1952). That the high abortion rate can be solely attributed to venereal disease is doubtful. It is conceivable and highly probable that the genetically larger foetus with a greater biological demand will be unable to satisfy its needs from a malnourished mother and consequently will undergo foetal death and be lost through abortion. This process, if operative, is likely to be highly selective under intensive malnutrition and will be a potent factor in racial degeneration.

(b) The summation from generation to generation of the environmental influence of diet in man where there is a long

gestational period must also play a part in general somatic deterioration. It must be remembered that the predominant part played by carbohydrate, and particularly by maize in certain areas, is conducive to degenerative changes in the mother and possibly in her infant.

Malnutrition in the native results in a high incidence of preventable disease. This includes premature ageing, tuberculosis, skin infections, general inefficiency, and backwardness. The most important single factor contributing to the high incidence of tuberculosis in the African is malnutrition. The incidence of tuberculosis in the native of Southern Africa is the highest in the world. In areas where maize is the staple article of diet insanity is a sequel to the malnutrition, and the insidious mental degeneration consequent upon such a diet must contribute to general mental backwardness of the people.

It has often been said that African labour is not cheap. This statement is true because the labour is inefficient and there is a high wastage, but it needs qualifying by an assessment of the medical and social handicaps which contribute to the inefficiency. Too much has been expected of the African. One is surprised, taking all circumstances into consideration, that he has accomplished, and continues to accomplish, as much as he does to-day.

Detribalization

There is growing up in Southern Africa a class of men often referred to as detribalized natives. They are most numerous in the towns, but their counterparts are beginning to appear in the reserves. The term is used frequently with an implication of regret and depreciation, as though they were social misfits. This is strange. In actual fact they are the natural products of civilization and industrialization and will appear wherever the natives are employed by industry. Upon them will turn the fate of Africa. The tragedy of Southern Africa to-day is that the logistics of their advent played no part in the development of the country. There is to-day an amorphous mass of human material living without tradition, social structure, or allegiance in slum conditions exhibiting the worst forms of human degradation, poverty, malnutrition, and disease. These masses have grown up around all the large European residential and industrial centres. There was no planning, and the problem is practically out of control. From these areas have radiated social diseases which have contaminated the most distant tribes (Kark, 1949; Sax, 1952).

The detribalized natives are in an unenviable and tragic position, for no place was made for them, and their natural heritage has been denied them. No attempt has been made to guarantee them a social structure and a feeling of belonging to a society within the natural order of their existence. As a group they are without a name or a home.

A Problem for the Future

From the foregoing and from the literature quoted an investigator will obtain the impression, and rightly so, that the progress of civilization in Africa has resulted, so far, in a progressive burden of social maladjustment, disease, poverty, and malnutrition for the African people. One might say that if the African is suspicious of the intentions of European civilization he is, judging by the results, justified from a medical point of view.

In any discussion of social medical problems, particularly concerning a continent of multiracial and multitribal inhabitants, it is difficult to avoid confusing politics and preventive medicine. I doubt, in actual fact, whether they can be dissociated, unless the discussion of the problems outlined be regarded as education of the races involved on the nature of the prospects before them. One thing is certain that for the safety and economic prosperity of the African continent capital and labour from all races must combine to produce harmony and to avoid the potential dangers which lie ahead. For those territories which are yet undeveloped, planning will ensure a stability and prosperity which will exceed anything yet accomplished in the continent. The

prosperity of any section accomplished at the expense of the legitimate human needs of another, at the expense of the soil, or of any other resource, is exploitation and will finally result in chaos. There may or may not be a remedy. The economic drain of preventable disease, both social and secondary to ignorance, poverty, and malnutrition, will, unless checked, prove a burden eventually on any society. In a multiracial interdependent society its results in one section are likely to be disastrous for all. It is apparent from the literature quoted that members of the medical profession are concerned about the medical prospects in Africa. To adopt the attitude that everything will come right in the end in areas where such conditions exist is an admission of defeat. In areas where it does not exist but may arise such an approach would be tantamount to negligence.

The future of Africa is the heritage and the responsibility of all races within its bounds. The problems are theirs.

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MEDICAL NEW YEAR HONOURS

The names of the following members of the medical profession were included in the New Year Honours List published in the *London Gazette* on January 1.

G.C.V.O.

LORD WEBB-JOHNSON, K.C.V.O., C.B.E., D.S.O., T.D., M.B., Ch.B., F.R.C.S. President of the Royal College of Surgeons of England, 1941-9.

Knighthood

EDWARD CHARLES DODDS, M.V.O., M.D., Ph.D., D.Sc., F.R.C.P., F.R.S. Courtauld Professor of Biochemistry, University of London.

ERIC WILFRED FISH, C.B.E., M.D., D.Sc., F.D.S. Chairman of the Dental Board of the United Kingdom since 1944.

FREDERICK TAVINOR REES, C.B.E., M.C., T.D., M.R.C.S., L.R.C.P. Lately Director-General of Medical Services, Ministry of Pensions.

BRIAN HERBERT SWIFT, M.C., M.D., F.R.C.S.Ed., F.R.A.C.S., F.R.C.O.G. In recognition of his valuable services to public hospitals and to the University of Adelaide.

HARRY WYATT WUNDERLY, M.D., F.R.C.P., F.R.A.C.P. Director of Tuberculosis, Commonwealth Department of Health, Canberra.

C.B. (Military Division)

EDWARD PHILIP NAGLE CREAGH, M.B., B.Ch., M.R.C.P. Major-General, late R.A.M.C. Honorary Physician to the Queen.

VYVYAN STEWART EWING, C.B.E., M.B., Ch.B. Air Vice-Marshal, R.A.F.

WILLIAM RALSTON DUNCAN HAMILTON, O.B.E., M.D. Major-General, late R.A.M.C. Honorary Physician to the Queen.

ROBERT WALSH MUSSEN, C.B.E., M.D., F.R.C.P. Surgeon Rear-Admiral.

C.B. (Civil Division)

GEORGE ALBERT CLARK, V.R.D., M.D. Principal Medical Officer, Ministry of Health.

C.M.G.

HUGH WADDELL MULLIGAN, M.D. Colonel, late R.A.M.C. Director, West African Institute for Trypanosomiasis Research, Colonial Research Service.

WALTER GERALD WICKREMESINGHE, O.B.E., M.R.C.S., L.R.C.P. Lately Acting Director of Health Services, Ceylon.

C.V.O.

WILFRID PERCY HENRY SHELDON, M.D., F.R.C.P.
WILLIAM ELTON TUCKER, M.B.E., T.D., M.B., B.Chir., F.R.C.S.

C.B.E. (Military Division)

CHRISTOPHER CROWLEY, M.B., B.Ch., D.P.H. Group Captain, R.A.F.

ROBERT JAMES ROSIE, M.B., Ch.B. Brigadier, late R.A.M.C. Honorary Physician to the Queen.

ERIC THOMAS SUTHERLAND RUDD, M.B., B.Ch., F.R.C.S.Ed. Surgeon Captain, R.N.

CAMPION AUBREY RUMBALL, O.B.E., F.R.C.P., D.T.M.&H., D.P.M., L.D.S. Air Commodore, R.A.F. Honorary Physician to the Queen.

C.B.E. (Civil Division)

CYRIL JOHN AUSTIN, O.B.E., M.B., Ch.B. Lately Medical Superintendent, Leprosy Hospital, Makogai, Fiji.

KATE ISABEL CAMPBELL, M.D. For services to medical science in Australia.

WILLIAM GEORGE CLARK, M.B., Ch.B., F.R.C.P.Ed., D.P.H. Lately Medical Officer of Health, Edinburgh.

JAMES THOMAS CURRAN, M.B., Ch.B. Group Physician Superintendent, Lennox Castle and associated institutions, Lennoxtown, Stirlingshire.

THOMAS HALL JAMES DOUGLAS, F.R.F.P.S., Hon. F.D.S. Chief Dental Officer, Department of Health for Scotland.

THOMAS FERGUSON, M.D., D.Sc., F.R.C.P.Ed., F.R.F.P.S., D.P.H. Professor of Public Health, University of Glasgow.

CHARLES MONTAGUE FLETCHER, M.D., F.R.C.P. Physician and Senior Lecturer, Postgraduate Medical School of London.

MUSTAFAH BIN OSMAN, M.B. State Medical and Health Officer, Kedah, Federation of Malaya.

O.B.E. (Military Division)

JOHN MORLEY HOLFORD, M.B., B.Chir., M.R.C.P. Surgeon Commander, R.N.

EUSTACE ALWYNNE ROWLANDS, V.R.D., M.B., B.S., F.R.C.S., F.R.A.C.S. Surgeon Commander, Royal Australian Naval Reserve.

DAVID WRIGHT, D.S.O., M.B., Ch.B., F.R.C.S.Ed., Lieutenant-Colonel, R.A.M.C. In recognition of non-operational services in Japan in connexion with operations in Korea.

O.B.E. (Civil Division)

WILLIAM ARTHUR ANDERSON, M.B., Ch.B., J.P., of Queens-town, New Zealand. For services to the community.

GEOFFREY OSBORN BARBER, M.B., B.Chir. Lecturer in General Practice, St. Mary's Hospital Medical School.

LOUIS GERARD BLAZÉ, L.R.C.P.&S.Ed. Lately Acting Deputy Director of Health (Medical Services), Ceylon.

REGINALD MURRAY DUNSTONE, M.B., Ch.B., J.P. For public and social welfare services in the Commonwealth of Australia.

MACORMACK CHARLES FARRELL EASMON, M.D. Senior Medical Officer, Sierra Leone.

DENNIS HERBERT GEFFEN, M.D., D.P.H. Medical Officer of Health, St. Pancras and Hampstead.

JOHN THOMSON GUNTHER, M.B., B.S. Director of the Department of Public Health of the Territory of Papua and New Guinea.

GOPAL HARIDAS, M.D., M.R.C.P. For services to the St. John Ambulance Brigade and movement in Singapore.

SAMUEL HORTON OLUWOLÉ JONES, M.B., Ch.B., D.T.M.&H. Colonial Medical Service. Director of Medical Services, Gambia.

JOHN WILSON McCAGIE, L.R.C.P.&S.Ed., L.D.S. Lately Senior Medical Officer, Ministry of Pensions.

VATAPAKAT RAMANMENON NARAYANA MENON, M.B., B.S. Medical Officer, Dindings, Federation of Malaya.

The Reverend Sister MARGARET MARY NOLAN, M.Ch., M.A.O., F.R.C.S.I., F.R.C.O.G., D.T.M.&H., D.P.H. For medical and missionary work in Nigeria.

BERTIE SOUTAR SIMPSON, M.B., Ch.B., F.R.C.S.Ed., J.P. Consultant Surgeon for the County of Sutherland.

JAMES ANDERSON SMILEY, M.D., D.I.H. Factory doctor for East Belfast. Special Lecturer in Occupational Health and Lecturer in Forensic Medicine, Queen's University, Belfast.

HENRY GEORGE TRIAY, M.D., D.C.H. For medical services in Gibraltar.

HUBERT CAREY TROWELL, M.D., F.R.C.P. Colonial Medical Service Specialist (Physician), Uganda.

WILLIAM HENDERSON WATSON, M.D. Medical Officer in Charge, Mental Hospital, Nyasaland.

M.B.E. (Military Division)

ANTHONY ST. CLAIR REX DE COSTA, M.B., B.S. Captain, Ceylon Volunteer Force.

CHRISTOPHER BERKELEY WYNN-PARRY, B.M., B.Ch., D.Phys.Med. Acting Squadron Leader, R.A.F.

M.B.E. (Civil Division)

RATU JIONE ANTONIO RABICI DOVI, M.B., Ch.B. Medical Officer, British Solomon Islands Protectorate.

VISHNUPRASAD BALKRISHNA PANDIT, L.C.P.S. Senior Sub-Assistant Surgeon, Uganda.

ETHEL JOYCE SAWARD, M.R.C.S., L.R.C.P. For medical services in Jamaica.

CHARLOTTE ANNIE STUART, M.B., B.Ch., D.T.M.&H. Principal Medical Officer, Church Missionary Society Hospital, Cairo.

RAPHAEL LAWRENCE TIRUCHELVAM, M.R.C.S., L.R.C.P., D.T.M.&H., D.P.H. Acting Director of Social Services, Ceylon.

ARTHUR STANLEY WINT, M.B., B.S. For services to sport in Jamaica.

Kenneth Mellanby, Sc.D., who was appointed O.B.E. in 1945, has been promoted to Commander of the Order of the British Empire in the New Year Honours List. He has recently relinquished the post of Principal of University College, Ibadan, Nigeria, to which he was appointed in 1947.

Nova et Vetera

BATTLE OF EPONYMY

Eponymous structures in anatomy may sometimes give trouble. For on occasion the structure may be named after a person who does not deserve such a chance to immortality, or the structure as originally described is quite different from the current view. The common description of Hesselbach's triangle is a triangle delimited by the inguinal ligament below, medially by the lateral edge of the rectus abdominis muscle, and laterally by the fold of peritoneum raised by the inferior epigastric artery. Such a triangle is described in the first edition of Jones Quain's *Elements of Descriptive and Practical Anatomy*, London, 1828, immediately after mentioning Hesselbach's name with regard to hernia externa or indirect inguinal hernia.

In fact, however, Franz Caspar Hesselbach (1759-1816), professor of surgery at Würzburg, in his *Anatomisch-Chirurgische Abhandlung über den Ursprung der Leistenbrüche*, Würzburg, 1806, and more clearly in 1814,¹ originally described the triangle differently. His definition, which is clarified in the plates, was a triangle bounded below by the horizontal ramus of the pubic bone, medially by the lateral edge of the rectus abdominis muscle, and laterally by the femoral vein and inferior epigastric artery. He distinguished external and internal (direct) inguinal herniae and femoral herniae, and described the abnormal obturator artery. Hesselbach pointed out that the two lower corners of the triangle he described were important, and gave his reasons. The medial corner, between the margin of the rectus abdominis and the pubis, where the abdominal wall is weakened by the superficial inguinal ring, is the site of origin of a direct inguinal hernia. The lateral corner, between the pubic ramus and the femoral vein, is the site of the neck of a femoral hernia. In view of this precise statement it is strange how the modern view of the triangle arose and how early the change was made.

Hesselbach is usually given the distinction of having been the first to define the difference between indirect and direct inguinal herniae, but Astley Cooper² in 1804, and two years earlier than Hesselbach's book, quoted the London surgeon, Henry Cline (1750-1827) as having made the observation in his surgical lectures at St. Thomas's and Guy's Hospitals in 1777. A search through five manuscripts of students' notes of Cline's lectures, one dated 1785 and another 1791, at the Royal College of Surgeons has confirmed this. Astley Cooper also confirmed the observation from his own experiences.

¹Neueste anatomisch-pathologische Untersuchungen über den Ursprung und das Fortschreiten der Leisten- und Schenkelbrüche, Würzburg, 1814.

²The Anatomy and Surgical Treatment of Inguinal and Convental Hernia, London, 1804.

In the 1806 book Hesselbach mentions another name for the inguinal ligament—the ligament of Fallopius. Joseph Hyrtl (1810-94), professor of anatomy at Vienna, in his *Onomologia Anatomica*, Vienna, 1880, has a comment on this. "I do not understand why the structure, which was known by Vesalius (Book 2, chapter 31, of the *Fabrica*, 1543) and excellently described by Fallopius (an Italian anatomist, 1523-63) in his *Observationes Anatomicae*, Venice, 1561, between the iliac spine and the symphysis pubis is called 'ligamentum Poupartii.' François Poupart (a French surgeon, 1661-1709) had the temerity or ignorance to describe this ligament as something new, thus earning the gratitude of his compatriots." However, 90 years earlier, a Frenchman, Antoine Portal (1742-1832), who on the title page of his *Histoire de l'Anatomie et de la Chirurgie*, Paris, 1770, is described as "lecteur du Roi, Professeur de Médecine au Collège Royal de France, Professeur d'Anatomie de Monseigneur le Dauphin, de l'Académie Royale des Sciences, etc., etc." had already written in favour of Fallopius's name for this ligament: "C'est ce ligament que l'ignorance a fait attribuer à Poupart, qui a vécu cent ans après: quelle erreur! quelle faute d'histoire! des Anatomistes modernes, fameux d'ailleurs, sont cependant sujets à de pareilles méprises." Despite this, for many years it has been Poupart who has usually won what might be called this international battle of eponymy.

My thanks are due to Professor J. D. Boyd and Mr. W. Le Fanu, Librarian at the Royal College of Surgeons, for their help.

MILK KEYNES.

Preparations and Appliances

AN IMPROVED UNDINE

Mr. L. G. SCOLAR, of London, W.1, writes: The sterilization of a glass undine has always been a source of annoyance to sisters and nurses, largely because it is such a difficult thing to grasp with forceps. If held by the spout it usually breaks, and if the inlet is grasped the nurse has her fingers scalded by the boiling water, which runs down the forceps as she inverts the undine. The photograph shows an undine which Messrs. Clement Clarke, of Wigmore Street, London, W.1, have made for me. The chief feature is a bridge or handle between the spout and the inlet. By this it can be held with forceps, picked out of a boiling sterilizer, and inverted. It is of uniform size, and contains 5 fl. oz. (140 ml.). There is a wide base to give it stability, and the inlet points outwards rather than upwards so as to minimize the collection of dust. Being made of "pyrex" glass, it is stronger and has greater thermal resistance than those made of ordinary glass.



Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Radiology and Lumbar Disks

SIR.—The review in your leading article (*Journal*, December 19, 1953, p. 1363) entitled "Radiology and Lumbar Disks" gives an excellent picture of current attitudes towards the diagnosis of this fashionable complaint. In the same issue under "The Doctors' Diseases" (p. 1372) you report Mr. E. A. J. Heath as saying that in the experience of an insurance company the diagnosis of prolapsed disk was on the increase. He further stated that the condition showed a considerable augmentation of the period of disability when compared with that due to lumbago, sciatica, and sacro-iliac strain in 1937. I could therefore have wished your survey might have extended to assess the results of treatment based on the newer aetiology.

Most clinicians, especially those whose experience stretches back 30 or 40 years, would agree that, up to date, the human race has not benefited as much as might have been hoped from the demonstration of the mechanical cause of several conditions previously incorrectly labelled. I can say that among the Metropolitan Police the period of disability or incapacity from complaints diagnosed or suspected as being due to prolapsed disk conforms to the figures given by Mr. Heath.

If these statements are accepted, they appear to offer a challenge to our current methods of managing the condition. The answers will no doubt vary. I agree that now that the first enthusiasm for operation has passed the selection of cases which justify surgery is slowly finding its level. In the less severe examples without gross neurological signs two factors may be responsible for causing unnecessarily prolonged disability. The first is premature diagnosis. Many practitioners are all too ready to attribute "lumbago" or "fibrositis" of the buttock to prolapsed disk and to inform the patient of this possibility. A hospital assignment is the natural sequence. Often enough I am faced with a policeman who appears to be fit for duty after an attack of lumbago: in accordance with his sensibility to a diagnosis which suggests that there is something radically wrong with his spine he may or may not agree. Frequently, however, he says: "Oh, I have an appointment next week to have an x-ray and see a specialist," and, not unreasonably, he thinks he should remain on the sick list. The second factor is the commonly prescribed system of treatment for fairly severe cases. I am inclined to think that prolonged partial immobilization in plaster followed by the provision of a restrictive belt is a too frequent routine. It seems that limited rest, traction, and exercise to restore muscle tone and function are not as generally employed as they might be.

Whatever value may be attached to my suggestions I would submit that we should recognize that, though the aetiology of sciatica and the like may be established, the resultant form of treatment has, up to date, been productive of as much, if not more, harm than good to the community.

I am, etc.,

Faversham, Kent.

MAX PAGE.

SIR.—May I be permitted to comment on your leading article, "Radiology and Lumbar Disks" (*Journal*, December 19, 1953, p. 1363)? After careful study I found it difficult to decide whether it contained a plea for the more extensive use of myelography, and concluded that this was probably the case. It seemed to be based upon the need to exclude—or reveal—the presence of a tumour in patients suspected of suffering from a protruded lumbar disk. The incidence of tumours misdiagnosed as protruded disk, according to the quoted figures, was 4.3% at the Lahey Clinic and about 8% at the Mayo Clinic. But these cases

were nevertheless dealt with by operation—presumably satisfactorily. Would the writer recommend myelography in every case of suspected lumbar disk protrusion in order to demonstrate pre-operatively tumours in those patients ultimately brought to operation? If that be the case, since the writer makes the statement (and many would agree with it) that "four out of five cases get better when treated conservatively," myelography would be carried out for a condition which occurs in probably not more than 1% of the cases. The statement is made that there is a prejudice against myelography in many centres in Britain, especially amongst orthopaedic surgeons. This is a most fortunate "prejudice" and the use of this word perhaps implies the writer's leaning towards this procedure. He states later that at most neurological centres myelography is held to be an essential investigation; I can hardly credit this, and wonder on what experience he bases such an opinion. And essential in which cases?

Finally, he quotes Barr that catastrophes can only be avoided by routine myelography. Is this closing remark a recommendation? If so, it needs critical examination. What are the catastrophes to be avoided? Those which arise from a lack of careful assessment of the history (so often neglected) and physical signs? A routine investigation—in all patients complaining of posterior crural pain, or of those coming to operation with a carefully considered diagnosis? It would be a retrograde step if, after "twenty years" of experience, those who treated patients were to employ as a routine a procedure which (with present contrast media) is not without danger, is not entirely reliable for the diagnosis of lumbar disk protrusion, and is usually redundant. One had hoped that in this country medicine had now achieved a more critical outlook. Myelography is a valuable method of investigating the spinal canal, and it may be helpful in the investigation of a small proportion of cases of suspected lumbar disk protrusion. The quickest way of bringing it into disrepute is to use it as a routine procedure.—I am, etc.,

London, E.1.

D. W. C. NORTHFIELD.

SIR.—Your leading article on radiology and lumbar disks (*Journal*, December 19, 1953, p. 1363) leads me to believe that nobody in Britain has yet seen fit to put on trial the methods described by Hasner, Schalmitzek, and Snorrason.¹ These gentlemen, working at the State Hospital, Copenhagen, have evolved what they call a functional x-ray examination of the spine, and, as its name implies, the rationale is to examine the spine radiologically from a functional point of view—namely, in its main positions of flexion, extension, and lateral bending. In the first two positions the films are taken in the lateral view, whilst in the third position they are taken in the antero-posterior view.

When the normal spine bends in whatever direction, the vertebrae angulate on each other, the angles converging to the concavity of the spine. In cases of prolapsing or degenerating disk there is either parallelism of the vertebral bodies or paradoxical angulation—i.e., the angle formed between the two vertebrae converges to the convex side of the spine. In a series of 90 cases these workers were able to demonstrate 86 abnormal disks by their functional x-ray examination. Of 13 patients submitted to operation the functional x-ray findings were confirmed in 12, whereas straight x-ray only revealed 6 cases. In this same series of 13 cases, myelography failed to reveal one case which the functional x-ray discovered, and vice versa.

I would have thought that there was sufficient evidence of the merit of this method to warrant its being taken up in this country.—I am, etc.,

Salford, 7.

HYMAN DAVIES.

REFERENCE

¹Acta radiol. (Stockh.), 1952, 37, 141.

SIR.—In your leading article on radiology and lumbar disks (*Journal*, December 19, 1953, p. 1363) you state that an enormous "disk" literature has grown up in the past 20 years and that opinions still differ widely on diagnosis, treatment, and prognosis. However, there is one aspect of

this disorder on which there is complete agreement, that is the gross severity of sciatic pain. For this reason I would like to suggest a rapid method of treatment that requires no particular manipulative skill.

The problem of replacing a herniated disk, as I see it, is to reduce the intervertebral pressure below the level of that exerted by the tissues on the displaced disk. Intervertebral pressures are evidently at their lowest when there is full adaptation for muscular activity. The initial response to an effort stimulus is an extensor movement. This includes contraction of the erectors spinae muscles—bracing oneself for an effort, as it is usually known. The movement is a sustained contraction but is, none the less, a movement. The spinal column is thus extended and supported, and strain is distributed evenly along the whole column. On the other hand, intervertebral pressures are probably at their highest when the extensor muscles are relaxed. Anybody who has had the experience of heading a ball relaxed, or "flatfooted" as it is called, is unlikely to forget the jarring sensation along the spine and sacro-iliac joints. No such effects ensue when one "goes up" to the ball. With full extension the muscles take over the burden of the joints. For a like reason it is less fatiguing to walk for an hour than to stand still for a quarter of that time. When the extensors are relaxed the spine is flexed and the intervertebral pressure tends to be greater at the anterior aspect of the disk. Physical effort, such as lifting a weight, without the preliminary protective extensor contraction will increase the pressure on the anterior portion of the disk and retropulsion is liable to occur. In other words the immediate or precipitating cause of disk displacement is the failure of the patient to react in a normal way to an effort stimulus.

The treatment then is to restore the initial extensor response. The patient lying in the prone position is encouraged to extend the lower limbs and contract the plantar muscles. He is then asked to raise his head (without arm help) and at the same time to expire fully. Expiratory movement synchronizing with the initial extensor movement is the normal respiratory response to an effort stimulus. The diaphragm should be relaxed as much as possible. My manipulative reinforcement of these extensor efforts on the part of the patient is merely to raise the sciatic limb slightly at the knee and at the same time to apply moderate pressure of a few seconds' duration to the lumbo-sacral region. One such attempt at disk replacement is sufficient. I have had no failure in the few cases I have experimented on. In fact I believe it possible for a determined, fully co-operating patient to replace a disk without any manipulative help. The earlier the patient is treated the better and quicker the results.

This method of treatment can do little harm in the 5-8% of cases of sciatica due to tumours—usually of the benign type. As for the occasional tubercular cause, a careful history and clinical investigation should be of help. An additional safeguard in this type of case would be the failure of the patient to co-operate—the extensor response being rather feeble in tubercular subjects—in other words, no co-operation, no manipulation.—I am, etc.,

Callan, Co. Kilkenny.

WILLIAM HERON.

Ulcerative Colitis

SIR.—I was much interested in Mr. Stanley O. Aylett's article on the surgery of ulcerative colitis (*Journal*, December 19, 1953, p. 1348) and in the annotation on that subject in the same issue of the *Journal* (p. 1364). Ileostomy, of course, is a beastly operation and Mr. Aylett is to be congratulated on having devised a substitute for it. But what has happened to appendicostomy? Time was when I saw quite a number of cases of ulcerative colitis of all degrees of severity, and my experience was that an appendicostomy followed by lavage of the colon with saline was far the best treatment. The operation was usually done by Mr. Lockhart-Mummery, and many of the patients wore a tube for months or even years, washing out the colon as required and meanwhile carrying on their ordinary vocations in perfect comfort. I think the results were quite as good as those claimed by Mr. Aylett.

Why, then, has the operation fallen into disuse? It can hardly be, as apparently is the case with gastro-enterostomy, that the modern surgeon has lost the "know how" (to use a horrid Americanism) of it, for the technique is really quite simple. It is, perhaps, merely a case of going out of fashion, there being, as we all know, fashions in operations just as

there are in women's hats. Or has appendicostomy joined the ghostly company of "forgotten treatments" about which I have often thought a valuable essay might be written by someone willing to wade deep enough into the morass of old medical literature? Perhaps Mr. Aylett or some other active abdominal artificer will kindly enlighten me.

As to the statement in the annotation that "it is now widely recognized" that sufferers from ulcerative colitis "are people characterized by emotional immaturity, often having a pathological parental attachment," I can only say, "Dear, dear, who'd have thought it?" That such a distressing malady can induce mental disturbances is understandable, for has it not been said that nothing saps the morale of an army more than an epidemic of dysentery, but that a pathological parental attachment can cause, or even predispose to, ulcerative colitis demands more credulity than I, at least, possess. Is this not another example of the tendency in the modern concept of psychosomatic disease for the "psycho" element to steal the limelight from the somatic?—I am, etc.,

Stretley, Berks.

ROBERT HUTCHISON.

SIR.—The article on the conservative surgery of ulcerative colitis by Mr. Stanley O. Aylett (*Journal*, December 19, 1953, p. 1348) is of particular interest to me because I have been treating these cases by the method described by Devine since 1950. The results have also been completely satisfactory, with the one exception in which there was a pre-operative rectal stricture. This still needs regular dilatation and there has recently developed a superficial anal fistula.

In his original article, Devine maintained that stricture was not a contraindication because by this method (a spur crushing technique between low rectum and terminal ileum) the stricture could be eradicated by the fact that half its circumference would then consist of normal ileum. Mr. Aylett's point concerning future inflammatory troubles in this type of rectum is borne out by this case, who otherwise is a happy, healthy young woman soon to be married (a point considered in choosing her original surgical procedure). My other five cases, which were all cases referred by physicians because of chronicity, colonic stricture, pyoderma, and, in one case, multiple arthritis and profound toxæmia, are now all well with an average of two to three bowel movements per day and, when last examined, a healthy rectal mucosa.

I have found that, by leaving a long devitalized loop on the proximal ileum and using this to drain the ileal content via a Paul's tube, and by applying the spur crushing clamp through the open rectal stump and a small hole in the ileum just proximal to the gangrenous loop on the second post-operative day, the spur can be obliterated very early, even while the loop is still draining most of the ileal content clear of the abdominal skin. Aluminium paste, hexamethonium, and early closing of the open ileo-rectal stoma on the fourteenth post-operative day are all aids in getting an early rectal defaecation.

There is no doubt that by this technique and by using an extensive mobilization of the rectum a much more complete colectomy can be subsequently performed. One reads of criticisms of this method in which the critic describes "having to undo the ileo-sigmoid anastomosis" before establishing ileostomy. This declaration, I have always felt, reveals in part the cause of dissatisfaction which has resulted in criticism.—I am, etc.,

Great Yarmouth.

H. A. McDONALD.

REFERENCE

¹ *Postgrad. med. J.*, 1950, 26, 308.

Malaria in Ex-Servicemen

SIR.—Although Dr. C. F. J. Cropper's suggestion (*Journal*, December 5, 1953, p. 1269) for the standardization of the treatment of malaria may be acceptable to some, one rather fears that those doctors with experience of tropical diseases will question his inclusion of vomiting amongst the cardinal signs of this disease. The admitted difficulty in diagnosis surely arises from the fact that there is frequently no

cardinal sign. Otherwise how can one account for the amount of research on diagnosis which is still going on, and is still being published in the medical press of the world?

However, if we are to standardize treatment, let us also standardize the diagnosis without the awkward nautical feat of stressing cardinal points, while remembering—with vomiting—*inter alia* the work of Paladini¹ in diagnosis: "Malaria diagnosis by contraction of the muscles of the face during abdominal palpation."—I am, etc.,

Dublin

REFERENCE

¹ *Rass. Clin. Ter.*, 1929, 28, 168.

H. B. WRIGHT.

Infection and Poliomyelitis

SIR.—With reference to your leader (*Journal*, December 5, 1953, p. 1258) upon the above-mentioned subject, the evidence which you quote from American sources that the virus of poliomyelitis is spread by close contact, and that the path of its spread is narrow, has been shown by me to be true in this country.

An epidemic of acute poliomyelitis occurred in a rural area of Kesteven, Lincs, in 1950, and involved 99 confirmed cases with 13 deaths.^{1,2} It was shown that, whereas the spread of poliomyelitis had formerly been attributed to many causes—i.e., to droplet infection or to infected water and foods, milk, ice-cream, etc.; by public swimming baths; by flies; infected dust or dried excreta; by fingers and the communal use of articles recently contaminated by infectious secretions or excretions, or defective personal hygiene—this outbreak in Kesteven demonstrated beyond all doubt that the predominant method of spread of poliomyelitis is by personal contact via the respiratory route.

In all, 114 cases were notified (99 corrected) mostly in the third quarter of 1950. The epidemic originated in the village of Digby (population 1,134), in the rural district of East Kesteven, which had 16 cases. Eleven days after the onset, the disease spread to an adjoining village where 10 cases occurred. Three days later nine cases began to be notified in another village 1½ miles from Digby. In the second fortnight of the outbreak seven more villages were affected, all within four to five miles of Digby. In the third fortnight three other villages were involved, while in the fourth fortnight two more villages were attacked by the disease.

That poliomyelitis was spread in this outbreak by personal contact with infectious persons was proved by the transport of infection between villages over bus routes. All the confirmed cases were resident on organized bus routes, there being no other common mode of transport; some were known to have travelled by bus during the incubation period of the disease. Detailed inquiries showed that there were also links, direct and indirect contacts, between many of the cases, extending over a wide area. In a very high proportion of those affected with poliomyelitis, close personal contact with a declared case or infected household was established.

In the last paragraph of your leading article, in relation to the control of poliomyelitis, you state that quarantine of contacts is the obvious attack, but, if this is to be effective, contact with other people must cease. Doubt is expressed as to whether the movements of adults should be restricted compulsorily, if in fact this can be done at all. I agree that the movements of adult contacts may be difficult to control, especially in city life. Further, there are no restrictions in law upon the movements of such contacts. However, in an article in *The Medical Officer*³ I gave details of the comprehensive measures, including restrictions upon child and adult movement, which were adopted during the Kesteven epidemic. As a measure of their efficacy it is of interest to record the fact that this epidemic was confined to the rural district where it originated and did not spread to other parts of the county.

It is true that much can be done on a voluntary basis by supervision of contacts by trained staff, publicity, and informed public opinion to control this disease, as implied in your leading article. In particular, since close personal contact has been shown to be the predominant factor in the spread of this disease, the M.O.H. and his colleagues in general medical practice will in future be in a better position to give appropriate advice with regard to prevention. Moreover, valuable time may be saved to the M.O.H. in the early stages of an outbreak, as it may not be necessary, unless he has special reasons, for him to devote time to investigations, which are likely to prove futile, into the possibility of water, food, etc., having been the vectors of infection.

When a serious outbreak of poliomyelitis occurs, it is quickly brought to the notice of the public in the area

concerned that they are being attacked by a disease which paralyses or kills. In view of the great amount of press publicity, local and even national, which is given to this aspect, the active co-operation of adult contacts, as well as parents of child contacts, and the public at risk, is not difficult to secure with regard to all precautions which should be taken.—I am, etc.,

Sleaford, Lincs.

J. H. C. CLARKE.

REFERENCES

- ¹ *Annual Report of the M.O.H. County of Lincoln—Parts of Kesteven*, 1950, p. 7.
- ² *Med. Offr.*, 1951, 86, 167 and 171.
- ³ *Report of the Ministry of Health*, April 1, 1950, to December 31, 1951, p. 36. H.M.S.O., London.
- ⁴ *Lancet*, 1951, 2, 1129.
- ⁵ *County Councils Association Official Gazette*, 1952, November, p. 193.

A Cosmetic Amputation

SIR.—Sir Heneage Ogilvie (*Journal*, December 12, 1953, p. 1322), referring to the amputation of the index or little finger along with part of the metacarpal, rightly condemns this operation in the manual worker. Obviously, where breadth of hand is an important factor in a man's ability to grasp large objects, the loss of the metacarpal head reduces his working capacity. On the other hand, where a patient's employment calls for the minimum of disfigurement, the gradual tapering produced by the oblique section through the metacarpal is much less noticeable than the abrupt stump produced by disarticulation at the metacarpal phalangeal joint.

If the oblique section is carried out with good plastic surgical technique, there is no reason why the scar should limit the movements of the adjoining finger, or remain tender for an abnormal length of time. These faults suggest technical errors. If sufficient padding of subcutaneous fat and interosseous muscle is left to cover the cut surface of the metacarpal, and the scar is placed towards the dorsal surface, no limitation of movement should result. Neuromata rarely develop if the digital nerves are shortened and allowed to retract well into the soft tissues, where they will not be exposed to pressure or friction. Tenderness and retraction of the scar are complications which arise when the latter is placed too much toward the volar surface or has become adherent to the cut surface of the bone.

Our practice in every case is to discuss with the patient the relative merits of the two operations in relation to his or her work before coming to a decision on a matter of such importance.—I am, etc.,

Basingstoke.

C. R. MCCASH.

Distinguishing a Psychopath

SIR.—Dr. A. Shepherd invites criticism of my view of the psychopath in relation to mental disease (*Journal*, December 19, 1953, p. 1379). I would differ from him a little by dividing mentally ill patients into psychotics, neurotics, and psychopaths. (Any of these patients may belong to the mentally defective group mentioned by Dr. Shepherd.) I would qualify the general classification I have given by stating that the psychotics have a disturbance principally of knowing, the neurotics of emotion, and the psychopaths of action. This classification of the symptoms of the abnormal mind is in harmony with long and well established custom in the psychology of the normal mind, which regards cognition (knowing), affection (feeling), and conation (action) as different aspects of the same process.

Any given mental illness, therefore, may present as a disturbance of knowing, feeling, or action. Some, or even most, mentally ill patients show obvious disturbance of all these three aspects of the mind; but there are many who present an apparent predominance in one aspect, and of these it is of course the psychopaths who come into conflict with the law. The judge then wishes to know if the psychopath is mentally ill. By the classification I have given, the psychopath is mentally ill. But the law does not easily accept that view and often asks, in effect: "Is this psychopath also psychotic? Has he, apart from his disturbance of normal actions, also got disturbance of knowing such as

would be covered by the M'Naghten rules? If so he can surely be regarded as mentally ill, but otherwise should he not be punished?" Dr. Desmond Curran, giving evidence before Mr. Justice Hilbery (*Journal*, November 28, 1953, p. 1224), appeared to agree with this legal view, and affirmed that a psychopath "is distinct from a person suffering from a distinct disease of the mind."

The situation is, however, illogical if we accept that abnormal behaviour can derive from a mind functioning normally. The clinician, in his own province, should, I submit, accept that a psychopath is mentally ill, even though the evidence suggests that the actions of the patient are more disturbed than his thoughts or feelings. The clinician should also, of course, try to arrive at a diagnosis of the mental illness of the psychopath, as of the psychotic or neurotic. The psychopath, for instance, may be suffering from schizophrenia, or he may be an hysterical psychopath, an epileptic, a hypomaniac, or a case of paranoia. And an attempt should be made to give to each illness its appropriate treatment, even though the illness may be manifest more in action than in thought or feeling.

Nevertheless, when the psychopath comes into conflict with the law, the important question remains: "If abnormal behaviour is to be regarded as a form of mental illness, is the appropriate treatment punishment?" The answer in most cases would still appear to be, and perhaps always will be, "Yes." But it is to be earnestly hoped that treatment by punishment will not so often exclude other treatment of the ailing mind.—I am, etc.,

Leicester.

C. E. H. TURNER.

Glycosuria and Hyperglycaemia

SIR,—In the article on glycosuria and hyperglycaemia (*Journal*, December 19, 1953, p. 1367) the author advocates examination of two samples of urine, the second one one and a half hours after a carbohydrate meal, as a means of distinguishing between glycosuria and the presence of reducing substances other than glucose.

It has been standard practice in the R.A.F. since about 1940 to give 50 g. glucose immediately to any patient whose urine has shown reducing substances without ketones on routine examination. A further specimen of urine is tested one and a half hours later, and if the degree of reduction is not increased it is assumed that the reducing substance was not glucose.

This extension of the principle outlined by Professor Gray has practically eliminated the former common experience of glucose tolerance tests being inflicted on patients who prove to have no glycosuria.—I am, etc.,

Aylesbury.

W. P. STAMM.

Insulin Zinc Suspensions

SIR,—Dr. Ian Murray (*Journal*, December 19, 1953, p. 1377) writes that it seems desirable that both protamine zinc and globin insulins should be withdrawn and be superseded by zinc suspension insulins. But why?

The articles and letters which you have published show no real advantage in the suspension insulins, and surely it is unnecessary and wrong to plunge the diabetic community, not to mention the doctors and consultants who serve them, into the confusion of using one of seven different insulins, as Dr. R. D. Lawrence (*Journal*, November 28, 1953, p. 1215) pointed out. No doubt similar control can be obtained by both the suspension and protamine insulins, but it appears that, on the whole, more of the suspension insulins, sometimes much more, is needed. This will add to the expenses of the Health Service.—I am, etc.,

Hove.

G. M. WAUCHOPE.

The Pituitary and Graves's Disease

SIR,—In his paper on the clinical trial of methimazole in treatment of thyrotoxicosis (*Journal*, December 12, p. 1300) Dr. Lindsay A. G. Davidson makes the surprising dogmatic statement: "At the present time it is generally accepted that the thyroid gland in thyrotoxicosis is producing excess thyroxine in response to stimulation by excess pituitary

thyrotrophic hormone." In support of this he gives references to Samson Wright's *Applied Physiology*¹ and Means's *The Thyroid and its Diseases*.² In the interests of accuracy it is worth drawing attention to what these authorities actually said.

Samson Wright (p. 990) says: "The initiating factor which causes the thyroid to become overactive has not been identified, but emotional stress acting via the hypothalamus on the anterior pituitary may sometimes play a part." Also (p. 980): "It is believed by some that emotional tension causing hypothalamic overactivity leads to oversecretion of thyrotrophin and the development of Graves' disease."

Means (p. 293) states that: "The aetiology of Graves' disease is quite unknown, but one may be permitted to speculate about it." This he does (p. 553), but nowhere does he say what Dr. Davidson attributes to him.

Moreover, in an annotation of recent work entitled "Pituitary-Thyroid Relations in Graves's Disease,"³ the gist is that the results of several quoted authorities suggest that in Graves's disease the stimulus to the thyroid does not come from the pituitary. I am, etc.,

Cambridge.

LAURENCE MARTIN.

REFERENCES

- ¹ *Applied Physiology*, 1952. London.
- ² *The Thyroid and its Diseases*, 1948. Philadelphia.
- ³ *Lancet*, 1953, I, 431.

Sterilizing Ampoules

SIR,—In your issue of December 5, 1953 (p. 1269), a letter by Professor L. P. Garrod condemns the practice of "sterilizing" ampoules in disinfectant solutions. With this I am in entire agreement, particularly with regard to spinal anaesthesia. Not long ago, a new box of ephedrine was opened and an ampoule discovered with no fluid in it. The ephedrine was crystallized out on the inside of the glass. No crack or flaw was visible to the naked eye. If it is possible for this to occur, or for antiseptics to diffuse through a fault in the glass ampoule, then it is also possible for bacteria to gain entry. This may be serious enough when the contents of an ampoule are given parenterally, but it could be lethal intrathecally.

For some time past it has been my practice to wrap ampoules of cinchocaine ("nupercaine") in a swab and place it alongside the syringes and spinal needles. The whole is boiled in distilled water for half an hour, in a sterilizer kept solely for this purpose. Heavy cinchocaine, of course, is allowed to cool before injection, but light cinchocaine is left in the sterilizer so that it is at the right temperature when given. In the event of a faulty ampoule, the only disaster which can arise is the injection of sterile distilled water and the humiliation of a failed spinal. To date, no ampoules have been faulty, nor damaged by boiling, and the quality of the spinal anaesthesia has not been altered. There have been no post-spinal complications from boiled cinchocaine. I am, etc.,

Edgware.

D. RICKLESS.

Antibiotics in Bacteraemia

SIR,—There is a statement in Dr. M. Anthony Peyman's letter concerning antibiotics in bacteraemia (*Journal*, December 19, 1953, p. 1376) which I feel cannot go unchallenged. He says: "Thus it is perfectly possible for a patient to be cured of a bacterial infection by an antibiotic while *in vitro* tests demonstrate the organism to be insensitive to that antibiotic." While I agree that this may be true in some cases with regard to the tetracyclines aureomycin and terramycin, I have never known a case of bacterial infection with a proven penicillin-resistant or streptomycin-resistant organism be cured by these antibiotics; and I maintain that it is a waste of time and antibiotic to persist with treatment when laboratory tests show that an organism is resistant to either of these antibiotics. In general, the rule still holds that one should be guided by the laboratory tests in treating a case with antibiotics, keeping in mind that exceptions with regard to aureomycin and terramycin are possible.—I am, etc.,

Guildford.

A. LAWRENCE.

Medresco Hearing-aids

SIR,—I am sure none of your readers could have been misled by Mr. A. E. Stevens's use (*Journal*, December 19, 1953, p. 1376) of the results of our inquiry.¹ He says that "only 18% of the aids issued were ever taken to work," but he omits to point out that as many as 54% of the patients do not even take *themselves* to work. Only 46% of the patients are, of course, in employment and therefore in a position to take their aids to work. In fact the report said nothing about taking aids to work. It said: "Of the Medresco users who were workers 44% used their aids *when working*." Mr. Stevens's calculation of the 18% is an excellent example of the misuse of statistics.

To correct any false impression this may have given, another sentence might be quoted from the article: "With as many as 91% of the patients claiming to understand all or most of what is said when using the aid, it is scarcely surprising to find that the service has been enthusiastically received." Perhaps we should have added—"by the patients."—I am, etc.,

London, W.C.1.

P. G. GRAY.

REFERENCE

- ¹ *Lancet*, 1951, I, 1170.

Controlled Hypothermia

SIR,—I have read with great interest the two papers in the *Journal* of December 5, 1953 (pp. 1237 and 1244), on controlled hypothermia.

I think it is to be regretted that the term "cocktail" has been introduced into medical literature. Unfortunately the French have had the bad taste to make use of this expression and you may be sure that it will soon find its way into their popular press and will lend itself to cheap jokes and advertising for "cocktails" as an adjuvant in modern surgery.

British medical journals combine sobriety with humour of a subtler kind. The "cocktail" might well have been omitted from an interesting report on a new form of treatment.—I am, etc.,

Basel.

ERICH ZIMMERLI.

Appendix in the Hernial Sac

SIR,—Professor Lambert Rogers (*Journal*, December 12, 1953, p. 1324) draws attention to a recent article by P. G. Creese¹ in which Claudius Amyand, of St. George's Hospital, is given due, if belated, credit for the first appendicectomy, which he performed in 1735. Some months ago in searching the *Philosophical Transactions* for early accounts of the acute abdomen I chanced on Amyand's account "of an iliac passion occasioned by an appendix in the ilion."² This is a clear description of the necropsy of a boy of 10 who died of peritonitis following acute inflammation of the structure later to be known as Meckel's diverticulum. It is almost certainly the first account of disease of this vestigial structure. I was so struck by this report that I looked for other case records written by Amyand and was rewarded by the discovery of his report of the successful removal of the appendix from a terminal sac.³ Amyand has, therefore, two distinct claims to fame.

It is quite clear that in medical textbooks statements of alleged historical accuracy are copied without reference to originals. The much quoted case of Mestivier⁴ is an example of inaccurate quotation and is of little importance in the history of appendicitis. Mestivier described a patient who developed a large abscess in the right side of the abdomen. The abscess was opened and much pus was evacuated. The patient died and at necropsy the caecum was found to have necrotic patches ("parsemé d'escarres gangreneuses"). The appendix contained a corroded pin, but there is no mention of the appearance of the organ, of inflammation, or of perforation. Mestivier suggests that the pin by irritation may have caused the illness (. . . "que c'étoit-elle qui, irritant sans cesse les différentes tuniques qui entrent dans sa composition, y avoit déterminé tous les accidents de la maladie . . ."). This case is frequently quoted as the first in which operation was performed for appendicitis, as the first account of appendicular inflammation, or as the first

example of perforation due to a foreign body. It is read in the original it is, as I translate it, merely an entry about of a foreign body in the appendix.

It is surprising that the rediscovery of Claudius Amyand as the first appendicetomist should apparently have eluded the historians of St. George's Hospital and of British surgery. We must pay tribute to the searchers who found Dr. Creese and thank him for bringing to light this interesting and graphic item of surgical history.—I am, etc.,

Liverpool, 7.

JOHN A. SHEPHERD.

REFERENCES

- ¹ *Surg. Gynec. Obstet.*, 1953, 97, 643.
- ² *Philos. Trans.*, 1745, 43, 369.
- ³ *Ibid.*, 1735, 39, 329.
- ⁴ *J. Med. Chir. Pharm.*, 1759, 10, 441.

SIR,—Judgment, based on implication, is always tricky and often fallacious, as in Mr. Raymond Helsby's comments (*Journal*, December 26, 1953, p. 1434) on the details of a case of true strangulation of an appendix in a femoral sac which I gave in the *Journal* (November 28, 1953, p. 1216). The excision of the appendix from "below" was simply an *ad hoc* manoeuvre to deal with the particular set of circumstances presenting—with the appendix and cone of caecum temptingly displayed. The implication drawn about the habitual use of this method was quite erroneous, as witness the fact that in over 12 years of operating under a wide variety of circumstances I have used the low approach only four times, including the case in question. Perhaps, however, Mr. Helsby's object in writing was primarily to use the letter as a medium for advocating McEvedy's approach, of which he is clearly a devotee. I, also, am familiar with and appreciative of its merits. However, in operating upon strangulated femoral herniae I almost invariably use a crease incision over the inguinal ligament, then, as a first step, dissect the sac out from below for several reasons: (1) It allows safe evacuation of the toxic, infective, and frequently haemorrhagic fluid present in the sac, instead of draining it to the peritoneum. (2) It allows clearing of oedematous and adherent fat from the sac, rendering its reduction easy and neat. (3) It allows inspection of the contents providing useful information before reduction. (4) It allows a combination of manipulations from below and above (as the next step is exposure of the canal from above by the usual route through the floor of the inguinal canal) giving greater control over safe reduction.

It was in making this preliminary inspection from below that I decided, on finding both canal and herniated organ small, just to complete the operation from this angle. I omitted these details from the description of the case, as I was mainly interested in describing the pathology, which was not the usual inflamed appendix in a hernial sac, but a genuine strangulation of a loop of the organ.—I am, etc.,

Wolverhampton.

HENRY B. YOUNG.

Royal Medical Benevolent Fund Christmas Gifts

SIR,—It is a very great pleasure to report that the amount contributed to the Christmas Gifts Fund was most satisfactory and exceeded that of all previous years. It is impossible for me to thank the contributors personally for their generous response to my appeal, but through you, Sir, I should like to thank all your readers who have helped. I am especially grateful to the many B.M.A. Divisions and Branches, medical societies, and local medical committees who either forwarded donations from their own funds or arranged for collections to be made at an autumn meeting.

The many messages of good will sent with donations show how much this Christmas effort of the Royal Medical Benevolent Fund is approved of by the profession. It is hoped that as each Christmas comes round this work of kindness and good fellowship will be continued. I ask those who read the Christmas Appeals in future to bear in mind the intense pleasure and gratitude felt and expressed by those who benefit from the Appeal. I desire to express my own very sincere appreciation of the generosity which has been shown.—I am, etc.,

WEBB-JOHNSON,

London, S.W.15.

President, Royal Medical Benevolent Fund.

Obituary

WILFRED SHAW, M.D., F.R.C.S., F.R.C.O.G.

Dr. J. B. GURNEY SMITH writes: Wilfred Shaw, whose obituary was printed in the *Journal* of December 19, 1953 (p. 1380), was certainly one of the many original personalities who have graced the honorary staff of Bart's. He had a very concise mind, which was readily reflected both in his clinical lectures and on his ward rounds, which always drew large numbers of students. In the theatre he was always bold and fearless, especially if the operation was of a dramatic order such as removal of a large ovarian cyst or a caesarean section. One of his most striking attributes was a wonderful sense of humour, and many of his pungent quips are as fresh to-day as when they were first uttered. Life was never slow when he was about. He was a notable successor to a long line of eminent Bart's physician accoucheurs, comprising Matthews Duncan, Sir Francis Champneys, Herbert Williamson, and my own very revered and beloved chief, John D. Barris. His going creates a gap which it will be difficult to fill, and all Bart's men who knew him will feel that they have lost a real friend.

G. A. S. H. writes: Probably because of his pungent wit, behind which lay his inherent kindness, Wilfred Shaw proved himself a brilliant teacher to whom I turned repeatedly for fresh advice. Above all, he had that rare capacity for setting people at ease, and of encouraging their confidence within a few minutes—a fair tribute, I feel, to his character, as well as to his acknowledged supremacy in his own branch of medicine. I know that I was fortunate to be able to work under him.

Flying Officer A. L. C. DUNCAN was tragically killed on November 7, 1953, in a shooting incident at Buraimi in the Persian Gulf. He was a young man of exceptional promise in his profession and will be greatly missed. Alexander Leslie Cameron Duncan was born on June 6, 1928, and was educated at Jordanhill College School and at Glasgow University, where he graduated M.B., Ch.B. in January, 1952. In his student days he was a violinist in the university orchestra. After graduation he held house-surgeon and house-physician posts at Stonehouse Hospital, Lanarkshire, and Bridge of Earn Hospital, Perthshire, and was an outstandingly good resident. His capacity for work appeared unlimited, yet he could remain cheerful and unruffled under the most harassing conditions. He was kind and gentle towards his patients and their welfare was always his first consideration. He had intended to become a general practitioner, and with his enthusiasm for work and his qualities of sympathy and humanity he would undoubtedly have done a great deal of good in that role. In the Royal Air Force, which he entered last March for his period of National Service, he held several posts in the Canal Zone and latterly served with the Trucial Oman Services, setting up surgeries in the native villages and meeting and overcoming difficulties with his usual good humour and imperturbability. Although he was at Stonehouse Hospital for only six months, he is unlikely to be forgotten, and the deep sympathy of his ex-colleagues there is extended to his parents, brother, and sisters.—T. G. G.

The death of Dr. HUTCHISON BURT on December 1, 1953, at the age of 49 was a tragic loss to his family and to the specialty of psychiatry in the West Riding of Yorkshire, where he was medical superintendent of Stanley Royd

Hospital, Wakefield, and consultant psychiatrist to the Leeds Regional Hospital Board. A Scotsman, Hutchison Burt was born on January 8, 1904, and was educated at Ayr Academy and at Glasgow University, where he won many class honours and graduated M.B., Ch.B. in 1926 with distinction in forensic medicine. After three and a half years of wide experience in general practice in Ayrshire he took up psychiatry as assistant medical officer at Gilgall Hospital, under the late Dr. G. Douglas McRae. In 1933 he left Scotland for the industrial north of England to pursue his specialty at Wakefield Mental Hospital, where he worked until his untimely death, becoming senior assistant in 1938, deputy medical superintendent in 1947, and medical superintendent in 1949. He took the D.P.M. of Leeds University in 1934. One of his special interests was pathology, and he had published work on dysentery carriers.

The patients and staff of the hospital, the character of which he helped to shape, held him in high regard. He fostered the recreational interests of the nurses and was himself a notable cricketer in the hospital team. Since 1949 he had been honorary lecturer in psychiatry to Leeds University and was keenly interested in teaching. Shortly before his death he had begun to take an interest in the psychiatric training of the students at the School of Remedial Gymnasts at Pinderfields General Hospital. Because of the great dearth of psychiatric social workers, he, in collaboration with Professor C. Fraser Brockington, organized courses of study for unqualified mental health workers for the West Riding County Council. He was interested also in mental deficiency as a branch of psychological medicine, and many of those concerned with problems of mental defectives will miss his advice. In the region he worked assiduously to develop and extend the influence of the mental hospital into the community and helped to establish many out-patient clinics in the area as far apart as Doncaster, Leeds, and Pontefract. He never spared himself in the service of others, and although for many years in poor health he gave himself cheerfully to his patients. The peace of mind he must have brought to countless of the distressed is incalculable. He leaves a widow and two schoolboy sons.—P. F. F.

The death occurred on December 19, 1953, at his home near Sittingbourne, Kent, of Dr. S. W. INNES SMITH at the age of 56. A member of an old Scottish family, Stuart William Innes-Smith was born at Sheffield on July 4, 1897, the elder son of the late Dr. R. W. Innes-Smith, whom he succeeded as surgeon to many of the great steelworks in Sheffield. He also carried on the works' ambulance movement originated by his father. Shortly after leaving Epsom he joined the Army and served as a combatant in the first world war, being awarded the Military Medal for gallantry in action. After the war he studied medicine at Edinburgh and Sheffield Universities and qualified M.R.C.S., L.R.C.P. in 1925. He then went into practice in Sheffield until, shortly before the last war, he emigrated to a remote part of Southern Rhodesia, where he was medical officer in an area the size of Wales. He performed many operations in a tiny clinic with only a native orderly to assist him, and he also did much dental and forensic work. During the last war he held a commission in the R.A.F., and in 1948 he returned to England. He was disillusioned to find that at the age of 52 it was difficult to obtain an appointment under the National Health Service, so he became a ship surgeon and in the course of his duties accompanied troops to Korea. Latterly he travelled to and from New Zealand. He was a kindly, generous, and sympathetic man and will be mourned by many of the poorer people of Sheffield, whom he helped during the period of depression before the last war, and by countless patients and friends both in this country and abroad. Despite a long and serious illness, during which he never complained, he did not give up work until three weeks before his death.

Medico-Legal

DEATH NOT DUE TO SWAB

(FROM OUR MEDICO-LEGAL CORRESPONDENT)

On October 8, 1953, Mrs. Mary Petty, a married woman 38 years old with four children, died in the Bradford Royal Infirmary. At the inquest held by the Bradford city coroner, Mr. R. S. Bishop, the verdict was recorded that the cause of death was general peritonitis due to multiple perforations of the large bowel due to ulcerative colitis (natural causes).

At necropsy a surgical swab 17½ by 11½ in. (45 by 30 cm.) was found. Dr. J. Eastwood, who performed the necropsy, thought at the time that the swab was inside the intestine, but Professor C. J. Polson, of the Department of Forensic Medicine of Leeds University, after consultation with Dr. Eastwood, came to the conclusion that it had probably been lying in the abdominal cavity beside the intestine and closely applied to it by fibrinous adhesions. The strong probability, he considered, was that the swab had been introduced during the delivery of Mrs. Petty's fourth child by caesarean section in March, 1953. He thought it most unlikely that such a swab could have entered through the mouth, and that, if it had, symptoms of digestive disturbance could not have been delayed until the third week of July, 1953, the first time they had become apparent. There was ulceration of the lower part of the large bowel at the recto-sigmoid junction well below the position in which the swab was found, and there were natural changes found capable of causing intestinal obstruction. Where the swab was found there was no sign of obstruction. There was also ulceration and perforation of the colon at the recto-sigmoid junction. Professor Polson concluded that the presence of the swab did not cause the disease from which Mrs. Petty died, and had no effect in accelerating her death.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on November 21 the degree of D.M. was conferred on P. B. S. Fowler.

The Welsh Memorial Drawing Prize in Anatomy has been awarded to Richard Charles Cook, scholar of Merton College.

UNIVERSITY OF CAMBRIDGE

Dr. G. A. Gresham has been appointed a University Demonstrator in Pathology with tenure from October 1, 1953, for three years.

UNIVERSITY OF LONDON

The following have been nominated, appointed, or reappointed as representatives of the University on the governing bodies of the institutions indicated in parentheses: Dr. J. F. Smith (Guy's Hospital Medical School); Sir Francis Fraser (Board of Management of the London School of Hygiene and Tropical Medicine); Professor A. A. Moncrieff, Professor J. Z. Young, F.R.S., and Mr. R. C. Davenport (Court of Governors of the London School of Hygiene and Tropical Medicine).

The following have been recognized as teachers of the University in the subjects indicated in parentheses: St. Thomas's Hospital Medical School, Dr. H. E. de Wardener (Medicine); University College Hospital Medical School, Dr. B. G. B. Lucas (Anaesthetics); St. Mary's Hospital Medical School, Dr. M. W. L. Owen (Anaesthetics).

Probationary recognition as teachers of the University in the subjects indicated in parentheses for two years from November, 1953, has been granted to the following: University College Hospital Medical School, Dr. W. B. Balderston (Dental Surgery); St. Mary's Hospital Medical School, Dr. R. H. Heptinstall (Pathology).

The following candidates have been approved at the examination indicated:

THIRD M.B., B.S.—¹D. A. Alderson, ²C. J. Edmonds, ³C. J. Hayter, ⁴P. J. Huntingford, ⁵Gillian A. J. Lomax, ⁶D. J. Parry, ⁷A. C. Pollard, ⁸V. M. Rosenoer, ⁹F. T. Sai,

¹⁰Gisela S. Seligmann, ¹¹Elizabeth J. Steele, M. E. N. Anflogoff, P. D. Arnold, T. O. Atkinson, G. M. L. Baer, P. A. Barker, K. E. Barrett, Monica K. Barrett, A. A. Bartholomew, J. R. S. Barton, M. C. Batchelder, M. C. Bate, B. S. Beardsworth, A. O. C. Beattie, P. J. Bell, Ruth Bell, E. D. L. Bennett, G. H. Bevan, J. A. Bevan, F. A. F. Biddle, D. L. J. Bilbey, F. Bilbey, C. E. S. Bill, A. O. Billingham, C. Bishop, R. C. Blake, P. O. Bodley, Evelyn A. M. Boesen, D. F. Boomla, J. L. Bourdillon, C. C. Bratt, M. Bray, D. W. Breese, R. G. Brenchley, O. V. Briscoe, Nancy G. Brockbank, J. R. Brook, R. C. Brookes, N. C. Brooks, J. R. Brown, Hilary E. S. Budd, J. Bullen, W. Bust, Pamela M. Butcher, J. E. Cairns, N. V. S. Calderon, J. D. Campling, J. L. H. Capper, Y. M. Chaiken, D. R. Chambers, F. A. Chandra, P. S. N. Chappell, B. Cheng, G. J. R. Clarke, H. J. Clarke, T. A. P. Clarke, A. Clark-Jones, H. J. W. Cleve, W. E. Clifford-Jones, J. T. Coals, R. J. C. Cobbold, A. D. Cole, J. D. C. Cook, Barbara P. Coppen, R. McK. Corfield, J. Cottam, J. Crause, M. d'A. Crawford, D. J. Cripps, Elizabeth Cross, Margaret R. Cudkovic, W. E. N. Cummings, Joan M. Curtis, P. Cushman, H. F. Davies, Margaret B. Davies, W. F. T. Davies, José A. Day, J. Dobbing, J. R. Duke, R. A. S. Dunn, B. J. MacD. Duxbury, K. Dyson, A. W. T. Eade, H. B. Edghill, Mary T. Edmonds, J. D'A. Edwards, D' R. Elam, W. J. Elder, Joan Edean, M. Evans, Frances M. Fisher, Gillian France, R. C. Francis, P. J. Frost, A. J. Fry, D. R. Gander, R. C. Giles, B. Gillespie, J. H. Goode, G. T. Goodey, Elizabeth B. Grantham, A. N. Green, F. V. Griffiths, M. V. Gruchy, R. Haggatt, Mureen E. Hall, Dorothy J. Harden, Audrey Hardwick, D. Harris, R. W. Harris, W. C. Harris, J. A. Harrison, R. J. C. Hart, R. E. G. Harvey, Margaret A. Hatton, G. L. Haworth, Margaret M. Heley, M. D. Hickman, C. J. M. Hill, E. J. Hill, Rosemary A. Hill, P. O. Hirsch, C. F. Hoad, G. Y. P. Hobart, J. M. Hughes, A. G. Hughesdon, C. A. Hyde, R. K. Hyland, D. S. Iles, Eileen S. Jackson, H. G. Jenkins, Emily B. John, Anne F. Jones, J. J. Jones, R. F. N. Jones, A. R. Jordan, Sylvia J. Jordan, Brigid Keane, Sylvia J. Keet, D. B. Ker, M. Laurence, C. E. Lay, Pamela F. Lind-Smith, R. M. Liscoombe, A. V. Livingstone, H. M. Lloyd, Robina S. Lock, D. B. Longmore, R. L. J. Lovick, Ann H. Low, J. A. Lunn, T. M. McAneny, R. M. A. McClelland, I. R. McDonald, J. G. Macdonald, W. M. McIsaac, Chloe Majolier, T. S. Mangat, H. St. J. Mansbridge, Patricia S. Matthew, Bridget d'E. Matthews, O. V. Maxim, Jean E. Moffat, R. O. Mohabir, J. B. Montgomery, R. J. Morgan, S. D. Morgan, J. C. Muir, Ann G. Mullins, T. N. Munro, A. P. Murphy, D. S. Nachshen, D. Naidoo, B. E. H. Neal, R. H. Neeve, C. G. Nicholson, Sheila Nourse, M. R. Oates, A. B. Oliveira, R. G. Orr, Patricia O'Sullivan, H. R. Owadally, R. B. Pardoe, J. V. Parson, J. D. W. Peck, P. R. Penny, J. P. Perry, J. H. Peters, Elizabeth M. Phillips, L. A. Phillips, A. F. W. M. Pooler, Caroline R. F. Port, L. J. Posener, April G. L. Powlett, J. W. H. Pretty, J. F. Pritchard, I. E. Purkis, Margaret J. Purser, I. F. S. Rae, H. J. Rayner, B. E. L. C. Reedy, M. T. Richards, Priscilla A. Ridge, A. H. M. Rimmer, Sheila M. Ritchie, A. A. Roe, J. A. Roopchand, F. E. N. Roper, J. R. Samuel, J. W. Scopes, H. G. Scott, Jean E. Septon, Rita W. Shannon, D. E. Sharland, D. M. Shaw, F. E. Shaw, P. Sheldermine, D. C. Shields, Jean M. Shields, J. D. Shone, W. S. Sinton, S. Sivasithamparam, D. A. D. Slatery, G. F. Slocombe, Marguerite L. Sloper, P. C. Smart, C. G. L. Smith, E. B. O. Smith, J. Southgate, Ethel M. Spencer, G. R. Stevenson, A. P. O. Stewart, T. F. Stoye, R. J. Sturt, F. L. H. Sugden, R. L. G. Sutcliffe, N. D. V. Swallow, A. P. Tannen, W. H. H. Taylor, E. M. Thomas, G. E. Thomas, R. V. L. Thomas, S. G. Thompson, A. D. Tuddenham, F. B. Valentine-Hagart, Heather F. A. Vickery, R. MacD. Vining, T. Wade West, D. J. Waller, H. W. C. Ward, D. Wardale, I. C. Ware, A. M. Warrington, S. A. Watkins, D. S. Watson, H. P. Watson, R. Watts, E. L. Webb, G. F. K. Webb, J. W. S. Webb, Jean M. Weddell, Dorothy A. Westcott, J. A. Whillis, C. J. White, Dorothy J. Whitney, J. R. Wilde, D. Wilkinson, C. A. Williams, J. L. Wilson, A. S. Wint, Edna D. C. S. Wood, J. G. Wotherspoon, C. E. Wright, R. W. P. Yates, T. G. Young, W. O. C. Young.

¹With honours. ²Distinguished in pathology. ³Distinguished in medicine. ⁴Distinguished in applied pharmacology and therapeutics. ⁵Distinguished in surgery. ⁶Distinguished in obstetrics and gynaecology.

UNIVERSITY OF BIRMINGHAM

Dr. J. A. H. Waterhouse, Lecturer in Human Genetics, has been given the title of Reader in Medical Statistics.

Dr. P. L. Krohn has resigned his Readership in Endocrinology in order to accept a Nuffield Gerontological Research Fellowship, to date from October 1, 1953, in the Department of Anatomy.

Dr. W. D. Carruthers has provided funds to establish an annual prize in social medicine to the value of five guineas. The prize

is in memory of the late Dr. Bostock Hill, professor of hygiene and public health from 1893 to 1919.

The following appointments are announced: Dr. Douglas B. Brewer, Senior Lecturer in Pathology, Dr. R. Lannigan, Lecturer in Pathology, and Dr. E. A. Smith, Research Fellow in Social Medicine, all from October 1, 1953; Dr. E. J. Hamley, Lecturer in Physiology from December 1, 1953; Dr. E. A. Cooper, University Research Fellow in the Department of Medicine from October 16, 1953.

Dr. P. B. Marshall, Lecturer in Pharmacology, Dr. J. L. Stafford, Lecturer in Pathology, and Dr. K. White, Lecturer in Physiology, have resigned their appointments.

UNIVERSITY OF SHEFFIELD

The following appointments are announced: Dr. T. J. Rendle-Short, Full-time Lecturer in Child Health; Dr. K. S. Holt, Full-time Tutor in Child Health; and Dr. D. H. Anderson, Part-time Clinical Teacher in Chest Diseases.

Dr. Irving Gordon, of the New York State Department of Health, has been appointed Visiting Senior Lecturer in Bacteriology during his visit to the University during the present session.

Dr. J. Mackinnon has resigned his appointment as Research Assistant in the Department of Medicine.

At a degree Congregation held on December 15, 1953, the following degrees were conferred:

M.B., Ch.B.—S. H. Harrison, T. G. Kershaw, G. F. Mackenzie, G. F. C. Rosser, P. Sykes, Helen F. Taylor, P. Taylor, D. W. Warrell, Cynthia M. Worrall.

QUEEN'S UNIVERSITY, BELFAST

Dr. R. A. Womersley, M.R.C.P., has been appointed to a lectureship in medicine in the University.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on November 12, with Sir Reginald Watson-Jones, Vice-President, in the chair, Professor Lambert Rogers was appointed as the Bradshaw Lecturer and Professor F. Wood Jones as the Thomas Vicary Lecturer for 1954.

The death of Mr. R. H. Burne (Hunterian Trustee and past Physiological Curator) was reported and the Council unanimously adopted a resolution of condolence.

Professor F. C. Wilkinson was co-opted as the Member of the Council representing Dental Surgery in place of Sir William Kelsey Fry.

The Begley Prize was awarded to Margaret M. Heley (Royal Free).

Licences to practise were conferred upon the successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London (*Journal*, December 26, 1953, p. 1437) and to I. P. Vaughan.

Diplomas were granted, jointly with the Royal College of Physicians of London, in Medical Radio-Diagnosis, in Medical Radiotherapy, in Child Health, and in Ophthalmology, to the successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London (*Journal*, December 26, 1953, p. 1437).

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Faculty held on December 7, 1953, with the President, Dr. Andrew Allison, in the chair, the following were admitted Fellows of Faculty: *qua Physician*, Saw Mra Aung, H. W. Boyd, T. Cochrane, A. F. Toboku-Metzger; *qua Surgeon*, J. P. Fraser, S. R. Ganeshiya.

ROYAL COLLEGE OF SURGEONS IN IRELAND

On November 20 the Fellowship of the College was conferred on E. G. Leahy and A. McCalister.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

The following candidates were successful at the November examination for the Diploma in Psychological Medicine:

D.P.M.—Part I: M. J. Raymond, H. K. Rose, G. S. Stirling. Part II: J. D. C. Currie, R. S. Ferguson, T. E. Hall, I. E. J. McLauchlan, M. J. Raymond, A. Smellie, Elizabeth Shoenberg.

ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS

The following, having satisfied the Board of Censors in Australia, were admitted to the Membership of the College in October, 1953: J. Benecke, G. L. Bennett, J. W. Bennett, R. B. Blacket, W. H. Cary, G. W. Cooper, D. L. Hobson, K. S. Millingen, N. M. Newman, R. F. O'Shea, J. G. Richards, P. M. Robertson, L. C. A. Watson.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending December 19 (No. 50) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1953					1952				
	Eng & Wales	Land	Scot	N. Ire	Eire	Eng & Wales	Land	Scot	N. Ire	Eire
Diphtheria	16	1	5	0	2	23	3	7	1	1
Dysentery	503	95	156	3	1	328	10	75	2	2
Encephalitis, acute	3	0	0	0		10	1	0	0	
Enteric fever:										
Typhoid	1	0	1	0		1	0	1	0	6
Paratyphoid	4	0	0	0		4	12	(11)	0	0
Food-poisoning	141	10				74	11			1
Infective enteritis or diarrhoea under 2 years					14					13
Measles*	778	12	42	16	66	17,742	1404	241		27
Meningococcal infection	22	1	13	1	2	39	4	11	2	2
Ophthalmia neonatorum	30	2	6	0		32	1	7	0	
Pneumonia†	692	43	242	12		1,135	131	472	8	1
Poliomyelitis, acute:										
Paralytic	39	2		8	3	41	1		3	2
Non-paralytic	12	1				17	2			
Puerperal fever‡	259	47	10	0		233	35	16		1
Scarlet fever	1,284	61	202	30	46	2,229	131	302	34	70
Tuberculosis:										
Respiratory			142	22				133	22	5
Non-respiratory			24	4				24		
Whooping-cough	2,304	101	396	60	32	1,865	75	129	21	122

DEATHS In Great Towns	1953					1952				
	Eng & Wales	Land	Scot	N. Ire	Eire	Eng & Wales	Land	Scot	N. Ire	Eire
Diphtheria	0	0	0	0	0	1	0	0	0	0
Dysentery	0	0				1	0			
Encephalitis, acute			1					0		
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	7	1	0	1	1	10	2	3	1	0
Influenza	17	3	3	1	0	60	24	4	1	1
Measles	0	0	1	0		0	0	0	0	0
Meningococcal infection		0	1				1	2		
Pneumonia	226	28	21	10	6	597	168		8	16
Poliomyelitis, acute	6	1				4	1			0
Scarlet fever	0	0	0	0		0	0	0	0	0
Tuberculosis:										
Respiratory	88	14	17	6	6	259	77	31	3	7
Non-respiratory		1	1	0	0		5	1	0	2
Whooping-cough	2	0	0	0	0	6	0	0	0	0
Deaths 0-1 year	217	20	25	10	21	295	54	49	18	18
Deaths (excluding stillbirths)	5,072	725	559	106	184	9,452	2484	861	143	224
LIVE BIRTHS	6,680	996	783	212	352	7,157	1050	854	211	342
STILLBIRTHS	199	25	19			202	22	26		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Vital Statistics

England and Wales in 1952

Of the Regions and large conurbations Greater London had the lowest death rate in 1952 (10 per 1,000 population), in spite of its December fog, and the West Midlands conurbation (including Birmingham) came next with a rate of 10.2. At the other end of the scale were the West Yorkshire conurbation (including Leeds and Bradford) with a rate of 13.1, and North Wales with a rate of 12.8. The rate for the whole of England and Wales was 11.3. For infant mortality Greater London again had the lowest figure (22 deaths per 1,000 live births), while the Merseyside conurbation had the highest figure (35) followed by South Wales (34). The rate for the whole of England and Wales was 28.

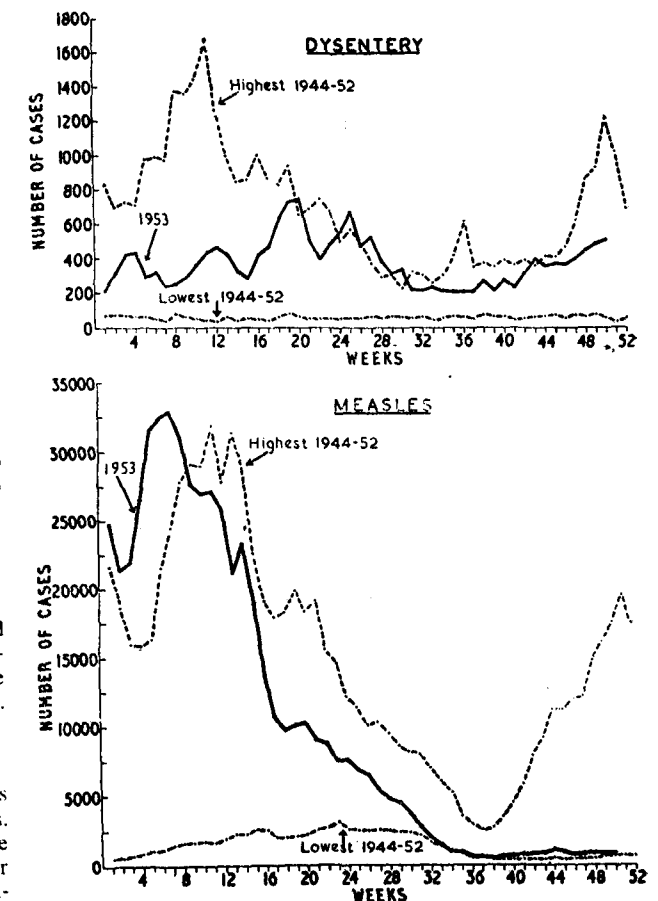
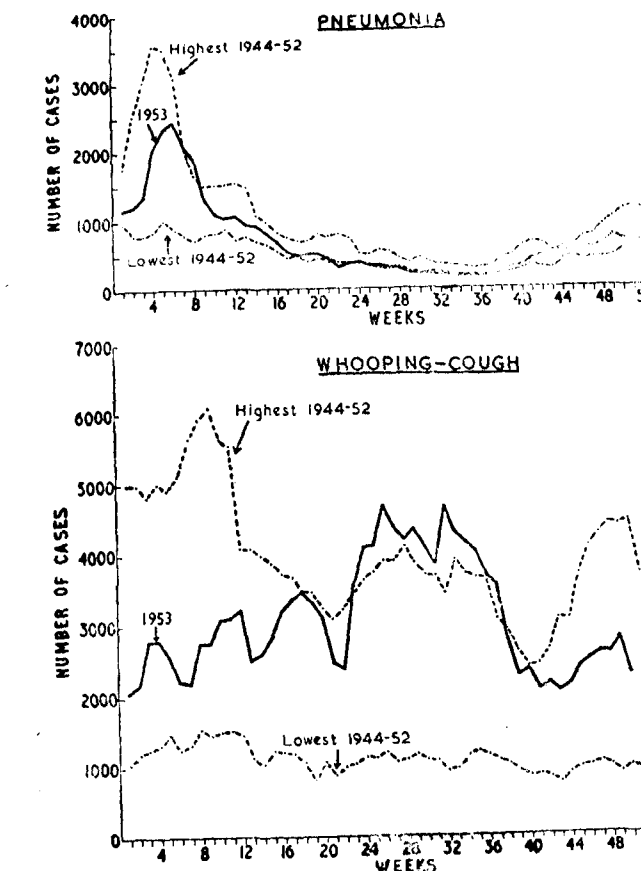
These figures are from the Registrar-General's *Statistical Review for the Year 1952, Tables, Part I, Medical* (H.M.S.O., 10s.), the first review for many years to appear within a year of the period to which it relates.

Week Ending December 26

The notifications of infectious diseases in England and Wales during the week included scarlet fever 949, whooping-cough 1,424, diphtheria 15, measles 611, dysentery 309, acute poliomyelitis 29, paratyphoid fever 1, and typhoid fever 0.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ----, the figures for 1953 thus —. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Infectious diseases were less prevalent in England and Wales during the week ending December 19. The falls in the number of notifications were 452 for whooping-cough, from 2,756 to 2,304, 162 for scarlet fever, from 1,446 to 1,284, and 105 for measles, from 883 to 778.

The largest declines in the incidence of whooping-cough were 113 in Lancashire, from 333 to 220, 53 in Glamorgan-shire, from 136 to 83, 44 in Staffordshire, from 138 to 94, and 35 in Norfolk, from 79 to 44. The only large fall in the local trends of scarlet fever was 52 in Lancashire, from 242 to 190. 16 cases of diphtheria were notified, being 5 fewer than in the preceding week. The chief features of the returns of diphtheria were falls in Staffordshire from 7 to 4 and in Lancashire from 4 to 1, and a rise in Durham from 2 to 5. The only fluctuations in the trends of measles of any size were falls of 37 in Staffordshire, from 119 to 82, and 30 in Cumberland, from 87 to 57.

51 cases of acute poliomyelitis were notified during the week. These were 7 fewer for paralytic and 1 fewer for non-paralytic cases than in the preceding week. The largest returns were Lancashire 8, Wiltshire 4, and Middlesex 4.

In contrast to the other infectious diseases the number of notifications of dysentery increased by 18, from 485 to 503. The largest centres of infection were London 95 (Islington 21, Lewisham 10, Wandsworth 9), Lancashire 71 (Bolton C.B. 31, Manchester C.B. 16), Yorkshire West Riding 47 (Bradford C.B. 24, Shipley U.D. 9), Surrey 39 (Egham U.D. 18, Frimley and Camberley U.D. 18), Essex 30 (Barking M.B. 17), Durham 30 (Lancaster R.D. 23), Norfolk 27 (Norwich C.B. 27), Leicestershire 25 (Leicester C.B. 23), and Middlesex 20.

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in November, 1953, was

124, compared with 124 in the previous month and 129 in November, 1952.

The number of cases of industrial diseases in the United Kingdom reported during November was as follows: lead poisoning, 4; other poisoning, 0; anthrax, 7; epitheliomatous ulceration, 8; and chrome ulceration, 15; total, 34. There were no deaths.—*Ministry of Labour Gazette*, December, 1953.

Medical News

Cataract and Glaucoma.—Professor Arnold Sorsby's report on "The Causes of Blindness in England, 1948-50" (H.M.S.O., 1953) and his more recent analysis in the Ministry of Health's report for 1952 have made it abundantly clear what a high place cataract and glaucoma now occupy in causing blindness in this country. In round figures 3,000 persons were placed on the Blind Register during the year 1951-2 because of cataract and 1,500 because of glaucoma. These two conditions account for over 40% of the new registrations in England and Wales. What is less well known and far more disturbing is that probably much of this blindness could have been prevented. According to a recent Ministry of Health circular to regional hospital boards and management committees, asking for an urgent review of the arrangements for the treatment of such cases, four out of every five patients with cataract placed on the Register in 1951-2 had received no treatment. At the lowest estimate, the circular puts the number of these "whose sight might well have been saved by surgical treatment" at 1,000. One reason for this state of affairs may have been the long waiting-list for ophthalmic beds. Although between 1950 and 1952 the number of ophthalmic hospital beds in England and Wales had risen from 3,975 to 4,391, the waiting-list during that time jumped from 6,000 to 31,000. With glaucomatous patients early diagnosis is recognized as being the prime need. To facilitate this the circular suggests the establishment of special glaucoma clinics in ophthalmological departments.

Fellowships in Clinical Research.—The Medical Research Council is inviting applications for a further series of Fellowships in Clinical Research, tenable at centres in the United Kingdom during the academic year 1954-5. These Fellowships are open to suitably qualified medical graduates who desire to prepare themselves for a career in clinical research. It is intended that each Fellow appointed under the scheme should be given an opportunity to study methods of research in the basic subject most relevant to his particular clinical interest. The awards will be made for a period of one year in the first instance and will be renewable annually in approved cases up to a maximum of three years in all. Stipend will be at the rate of £850 per annum, rising by annual increments of £75 to £1,000 per annum, with superannuation provision in addition. Candidates for these Fellowships, which are ordinarily restricted to British subjects resident in the United Kingdom, must be medically qualified and clinically experienced, and should preferably have worked for a period in a department in which clinical research was in progress. Applicants will be invited to submit their own proposals as to type and place of work, but the Council will be glad to advise successful candidates on the selection of suitable centres of study and to assist in placing them in departments or laboratories where the desired training and experience can be obtained. Applications must be sponsored in each case by the head of the appropriate department in the candidate's university or medical school, and an undertaking will be required that a suitable academic post in a clinical department will be available to the candidate in that institution on satisfactory completion of the period of study under the Fellowship. Forms of application for these Fellowships may be obtained from the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1, with whom applications should be lodged as soon as possible, and in any event not later than March 1.

Viomycin.—A limited supply of viomycin, a new antibiotic with properties similar to streptomycin, will shortly be available to N.H.S. hospitals through the usual antibiotic distribution centres. Viomycin was developed in the United States. Its main indication is for cases of tuberculosis where the bacilli are found to be drug-resistant or where the patient is intolerant of conventional chemotherapy. It is contraindicated if there is impairment of renal function or non-tuberculous renal disease. Like other drugs used in the treatment of tuberculosis, viomycin quite commonly provokes toxic reactions, though generally these are transient and reversible.

Dalby Memorial Prize. On the recommendation of the Council of the Section of Otolaryngology of the Royal Society of Medicine, the Society's Dalby Memorial Prize has been awarded to Mr. Terence E. Cawthorne for the best original work in otology during the previous five years.

Nuffield Dental Fellowships.—Details of the Nuffield Foundation's dental fellowships and scholarships are given in our advertisement pages this week at p. 49. One of the purposes of these fellowships is to enable selected graduates in medicine and science to receive training that will qualify them to undertake teaching and fundamental research on dental health and disease.

The "Half-Minute" Thermometer.—The British Standards Institution has rung the knell of the half-minute and the one-minute clinical thermometers. Because of the errors that may follow blind reliance on such timing instructions, a new Standard has been issued. Clinical thermometers will in future be marked "quick," "medium," or "stubby."

Sierra Leone Mission Hospital.—A gift of £40,000 by the former Lord Mayor of Newcastle, Alderman J. G. Nixon, to the Methodist Missionary Society has made possible the rebuilding of a 100-bedded mission hospital at Seghwema, Sierra Leone. Alderman Nixon recently went to West Africa to open the hospital.

COMING EVENTS

Mount Everest.—Mr. R. C. Evans and Dr. M. Ward will deliver a Hunterian Lecture on "The Ascent of Mount Everest: Medical Studies," on Wednesday, January 13, at 5.30 p.m., at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2.

NEW ISSUES

Abstracts of World Medicine.—The January issue (Vol. 15, No. 1), which is now available, contains abstracts of important papers on both medical and surgical subjects drawn from journals published in some 20 different countries and in all five continents. In addition to the various branches of clinical medicine and surgery, the subjects covered include pathology, bacteriology, pharmacology, and chemotherapy, and there are also sections dealing with medical genetics, public health, industrial medicine, anaesthetics, radiology, and the history of medicine. Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; a specimen will be sent free on request.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, January 11

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture demonstration by Dr. J. Stengel.
MEDICAL SOCIETY OF LONDON. 8.30 p.m., discussion: Physical Basis of Mental Illness, to be introduced by Dr. R. A. J. Asher and Dr. T. A. H. Munro.
ROYAL COLLEGE OF PHYSICIANS OF LONDON. 5 p.m., Watson Smith Lecture by Dr. J. T. Ingram: Significance and Management of Psoriasis.
ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: The Hypertensive Patient. Astigmatism. Bifocals.

Tuesday, January 12

CHLSEA CLINICAL SOCIETY.—At South Kensington Hotel, 7.30 p.m., dinner, followed by a discussion on Sleep, to be opened by Sir Francis Walsh, F.R.S., and Dr. Denis Williams.
ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., film: A Two Year Old Goes to Hospital. Discussion to be opened by Dr. H. M. S. Davidson.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. G. Cochrane: Leprosy.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Professor Donald Baird: Impact of Social Conditions on Labour.

Wednesday, January 13

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Histopathology of Fungal Infections.
MIDLAND MEDICAL SOCIETY.—At Selly Oak Hospital, Birmingham, 8.15 p.m., clinical meeting.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Hunterian Lecture by Mr. R. Charles Evans and Dr. Michael Ward: The Ascent of Mount Everest: Medical Studies.
ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Operations and their Indications (3).
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Finlayson Memorial Lecture by Professor L. J. Witts: Anaemia and the Alimentary Tract.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. D. F. O'Neill: Lecture-demonstration in Psychiatry.
SOCIETY FOR APPLIED BACTERIOLOGY.—At Institution of Civil Engineers, 10 a.m., business meeting, 2.15 p.m., joint meeting with Microbiology Group of Society of Chemical Industry. Symposium: Industrial Methods of Sterilization. Papers by Dr. M. Ingram, Mr. Osman Jones, Dr. R. Maxwell Savage, and Mr. G. Sykes.

Thursday, January 14

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Mr. R. W. Raven: Psychological Reaction to Surgical Disease.
BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Dr. J. Blair Hartley: Significance of Placental Calcification.
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. E. A. Carmichael: Hemispherectomy and Localization of Function.
INSTITUTE OF CHILD HEALTH.—5.30 p.m., Dr. H. N. Davy: Behaviour in Epilepsy.
INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—5 p.m., Professor F. C. Ormerod: Use of Antibiotics and Chemotherapy.
LIVERPOOL MEDICAL INSTITUTION.—3 p.m. and 8 p.m., Mr. Charles Evans: Everest, 1953.
LONDON UNIVERSITY.—At Middlesex Hospital Medical School, 5 p.m., special university lecture in Human Anatomy and Morphology by Professor J. Pasteels (Brussels): Present Views on Embryonal Induction.
ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Dr. W. C. Cockburn: Early Field Investigations of Typhoid Vaccines.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor R. Milnes Walker: Place of Venous Shunts in the Treatment of Portal Hypertension.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor L. J. Witts: Anaemia and the Alimentary Tract.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. J. H. Paterson.
SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At West Park Hospital, Epsom, 7.30 p.m., clinical meeting. Papers by Dr. J. Zelmanowits, Mr. M. Klein, Dr. O. F. Garai, and Dr. M. K. Beattie.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—Physiology Theatre, 4.45 p.m., Public Lecture by Professor Jean Brachet (Brussels): Role of Ribonucleic Acid in Morphogenesis.

Friday, January 15

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members.
FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 2.15 p.m., Radiodiagnosis Section Meeting. Dr. P. G. Keates: Physical, Physiological, and Hormonal Aspects of Hydronephrosis; Dr. C. J. Don: Bronchography in Pulmonary Tuberculosis.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. G. Cochrane: Leprosy.
ONIER CLUB OF LONDON.—At 11, Chandos Street, W., 7.45 p.m., Professor J. M. R. Cormack, M.A.: Black Magic (in honour of Sir James Frazer, January 1, 1854-1941). Discussion: Professor Raymond Firth, H.E. Mme. Subandrio, and Dr. Michael S. M. Fordham.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor R. Milnes Walker: Lesions of the Small Intestine.
ROYAL EYE HOSPITAL.—5 p.m., Miss M. Savory: Differential Diagnosis of Corneal Lesions.
ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Dissertation by Mr. K. Chapman: Toxaemia of Pregnancy.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, 5.30 p.m., Public Lecture by Professor Werner Koll (Göttingen): Experimental Studies on Analgesics—Tooth Stimulation and Other Methods.

Saturday, January 16

BIOCHEMICAL SOCIETY.—At Department of Chemical Pathology, Postgraduate Medical School of London, 11 a.m., 325th meeting. Scientific papers.
SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Farnborough Hospital, Kent, 10.30 for 11 a.m., extraordinary general meeting. Dr. D. G. Madigan will speak on his experiences in America.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Batten. On November 26, 1953, at Queen Charlotte's Hospital, London, W., to Mary, wife of Henry Batten, M.B., F.R.C.S., a daughter—Jane.
du Heaume.—On December 30, 1953, at Enfield, Middlesex, to May (formerly Giffin), wife of Brian du Heaume, M.B., B.S., D.Obst.R.C.O.G., a daughter—Susan.
Lewes.—On December 29, 1953, at Bedford General Hospital, to Daphne (formerly Wailes), wife of David Lewes, D.M., M.R.C.P., a fourth daughter—Christina.
McLaren. On December 19, 1953, to Patricia Annette, wife of William J. McLaren, F.R.C.S., of Tranquille, British Columbia, Canada, a third son—Niall Fullerton.
Vowles.—On December 16, 1953, at the Royal Infirmary, Cardiff, to Mary (formerly Knowles), M.B., Ch.B., D.C.H., and Keith D. J. Vowles, M.B., F.R.C.S., a brother for Robert—Andrew John.
Woodall.—On December 17, 1953, to Jennifer, wife of John Woodall, M.B., B.S., of The Lodge, Cray Hall, North Cray, Kent, a son—Christopher John.

DEATHS

Douglas. On December 10, 1953, at his home, 38, Prestbury Road, Cheltenham, Glos., Kenneth Harrington Douglas, M.R.C.S., L.R.C.P., formerly of 41, Prospect Hill, London, E., aged 80.
Ewen.—On December 15, 1953, Gerald Anglin Ewen, M.R.C.S., L.R.C.P., of Ryde House, Twickenham, Middlesex, aged 43.
Schaefer.—On December 14, 1953, in a nursing home, London, Hans H. Schaefer, L.R.C.P.&S.Ed., L.R.F.P.S., of 251, Hertford Road, Enfield Highway, Middlesex.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Coronary Disease and Dental Analgesics

Q.—Are local analgesics for dental operations contraindicated in those with coronary artery disease? Are any special precautions advised in such cases?

A.—There is no reason why the average patient with coronary artery disease should not have a local analgesic of this sort. Where there is a history of a recent heart attack it is perhaps better to avoid the adrenaline. In any case the concentration of adrenaline in the solution should not exceed 1 in 200,000. Solutions commonly supplied for dental use often have a higher concentration of adrenaline than this.

Blood Pyruvates

Q.—What is the value of a blood pyruvate estimation? What conclusions can be drawn if the level is raised, particularly in relation to peripheral neuritis?

A.—Pyruvic acid is formed as an intermediary in the oxidation of glucose by the tissues. Vitamin B₁ (thiamine) is required for its further oxidation, and if this vitamin is not available in adequate amounts pyruvate accumulates in the blood. The estimation of blood pyruvate levels is therefore of interest as a means of assisting in the diagnosis of vitamin B₁ deficiency states. In the more chronic and less severe forms of thiamine deficiency the fasting blood pyruvate level is usually within the normal range; raised levels can, however, be demonstrated in many such patients if a "loading" dose of glucose is first given.

It must be realized also that conditions other than a deficiency of this vitamin can also cause impaired pyruvate oxidation with a resulting rise in the blood pyruvate level. In a patient with peripheral neuritis a raised level cannot by itself therefore be taken to indicate thiamine deficiency, although it would support this diagnosis. If, however, parenteral treatment with thiamine for, say, two weeks results in a return to normal of a previously elevated level, it would seem likely that a deficiency of this vitamin had existed. As the clinical response of such patients is often slow, blood pyruvate estimations before and after thiamine therapy can often provide a more rapid and surer indication of response to this therapy.

Malaria Prophylaxis

Q.—What is the best malaria prophylactic for a European family visiting a malarious area? Please give details of dosage and frequency of administration, including any variations of these for infants and children. Are mosquito nets necessary if chemoprophylaxis is thorough?

A.—Proguanil is probably the best antimalarial for a European family visiting a malarious area. The drug is prepared in tablets containing 100 mg. or 25 mg. Where proguanil-resistant strains of *P. falciparum* have been demonstrated, chloroquine should be taken instead.

The dosage of proguanil for adults is 100 mg. daily. Exceptionally—for example, in a big individual—twice this dose may be needed. For children, the dosage from birth to the second birthday is 25 mg. daily, and from the second to fifth birthday 50 to 100 mg. daily. Prophylaxis should begin a fortnight before entering the malarious area and continue for one month after leaving the area.

Most people find it easier to form the habit of taking a drug daily than once or twice a week. If, however, the latter is desired, chloroquine is advised. The drug is usually

prepared in tablets containing 250 mg. of the diphosphate. The dosage of chloroquine diphosphate for adults is 500 mg. once weekly. For children: from birth to the third birthday, 62.5 mg. once weekly; from the third to the sixth birthday, 125 mg.; over 6 years, 250 mg.; and over 10 years, the adult dose.

Alternative antimalarials are mepacrine and pyrimethamine ("daraprim"). The adult dose of mepacrine is 100 mg. daily, started a fortnight before entering the malarious area and continued for a month afterwards. Mepacrine is not as convenient as proguanil for children. Birth to second birthday: total dosage of 50 to 75 mg. in divided daily doses. From second to sixth birthday: total weekly dosage of 100 to 200 mg. in divided daily doses. From sixth to tenth birthday: total weekly dosage of 200 to 300 mg. in divided daily doses. From tenth to fifteenth birthday: total weekly dosage of 300 to 400 mg. in divided daily doses. Over 15 years, adult dose. The adult dose of pyrimethamine is 25 mg. once weekly. Half this dose has been found successful in children.

All drugs should be taken at some meal during the day with a good draught of fluid. Absorption is not affected by moderate quantities of alcohol. After cessation of suppressive therapy with any of the above drugs attacks of falciparum malaria should not develop. Vivax malaria may, however, appear and require radical therapy.

Some form of mechanical protection against insects is always desirable, even when drug suppression is successful. There are many insect-borne diseases other than malaria.

Artificial Materials for Hernia Repair

Q.—What are the advantages and disadvantages of using materials such as nylon or wire for the repair of large hernias in place of fascia lata?

A.—Those surgeons who use nylon and wire for the repair of large hernias regard the ready availability of the materials as a chief advantage. It is, however, doubtful whether a lattice or filigree of any foreign material is really as effective as a barrier of the patient's own tissues. The questioner refers to the use of fascia lata, a method introduced by the late W. E. Gallie and satisfactory in his hands. Those surgeons who object to his method have two main criticisms: first, the extra time taken in removing the fascial strip and the added risks of sepsis; and, secondly, the tendency for the inguinal ligament to be damaged by the large fascial needle, especially in patients with friable tissues. An effective barrier of the patient's own tissues can, in most cases of inguinal hernia, be provided by a rectus sheath slide operation, and many believe that this offers the advantages of a fascial repair with none of its disadvantages.

Lattices of nylon and wire all tend to fragment after a variable period of time. If the lattice is made very close critics of the method will point to the tendency for the inguinal ligament to be frayed by frequent passage of the needle. On the other hand, if the lattice is of a wide mesh, the tissues can readily bulge through the suture material. The tendency for nylon knots to slip can be irritating, and this objection is not entirely rectified by the use of braided nylon. Stainless steel wire tends to become fragmented by movement and electrolysis in the tissues, and is less in vogue than it was a few years ago. Tantalum similarly fragments on movement. Filigrees of tantalum or stainless steel also break up and tend to separate from their attachments; recurrences are therefore sometimes seen at the edge of a filigree. Silver wire is rarely used to-day: it is subject to all the objections already mentioned, with the additional one of occasionally staining the overlying skin black owing to the deposition of silver sulphide. There is some evidence to suggest that wire filigrees are more useful for difficult umbilical and incisional hernias than they are for large inguinal hernias. The critical surgeon recognizes that there is very little valid statistical evidence about the recurrence rates following different types of repair. The collection of truly comparable cases is not easy, and some

of the methods used have not been tried for long enough to enable their true worth to be assessed. It is notable that much of the earlier enthusiasm for tantalum and stainless steel wire has died down owing to appreciation of the various difficulties already mentioned. The use of relatively rigid materials in the reinforcement of mobile structures introduces inevitable complications, and many surgeons (probably a growing number) are recognizing the virtues of repair with the patient's own tissues, provided this can be effected without tension. An understanding of the fundamentals of plastic surgery is certainly an advantage in planning the repair of large and difficult ruptures.

Nocturnal Priapism

Q. A healthy man of 56 complains that for over 20 years he has been troubled with a full penile erection every time he sleeps. It is not associated with erotic sensations or dreams of any kind. If he partially wakes, he is conscious of the condition and its discomfort, which does not alter unless he reaches a point of wakefulness that he describes as about half-way between sleep and full consciousness, when the erection immediately ceases. If he sleeps and wakes a number of times, the condition recurs each time. Is there any special significance in his complaint? I can find no cause.

A.—These cases of nocturnal priapism in an elderly or middle-aged man are exceedingly puzzling. In only a few cases does one find any physical explanation, such as an irritative lesion of the posterior urethra or an enlarged prostate. Sometimes, but not often, there is a psychological explanation, but as nothing has been said in this case to indicate that the patient is suffering from a thwarted sex life, I assume a psychological factor does not explain it.

To sum up, therefore, it is quite usual to find no explanation in these cases. They begin mysteriously and end mysteriously.

Nutrient Enemas

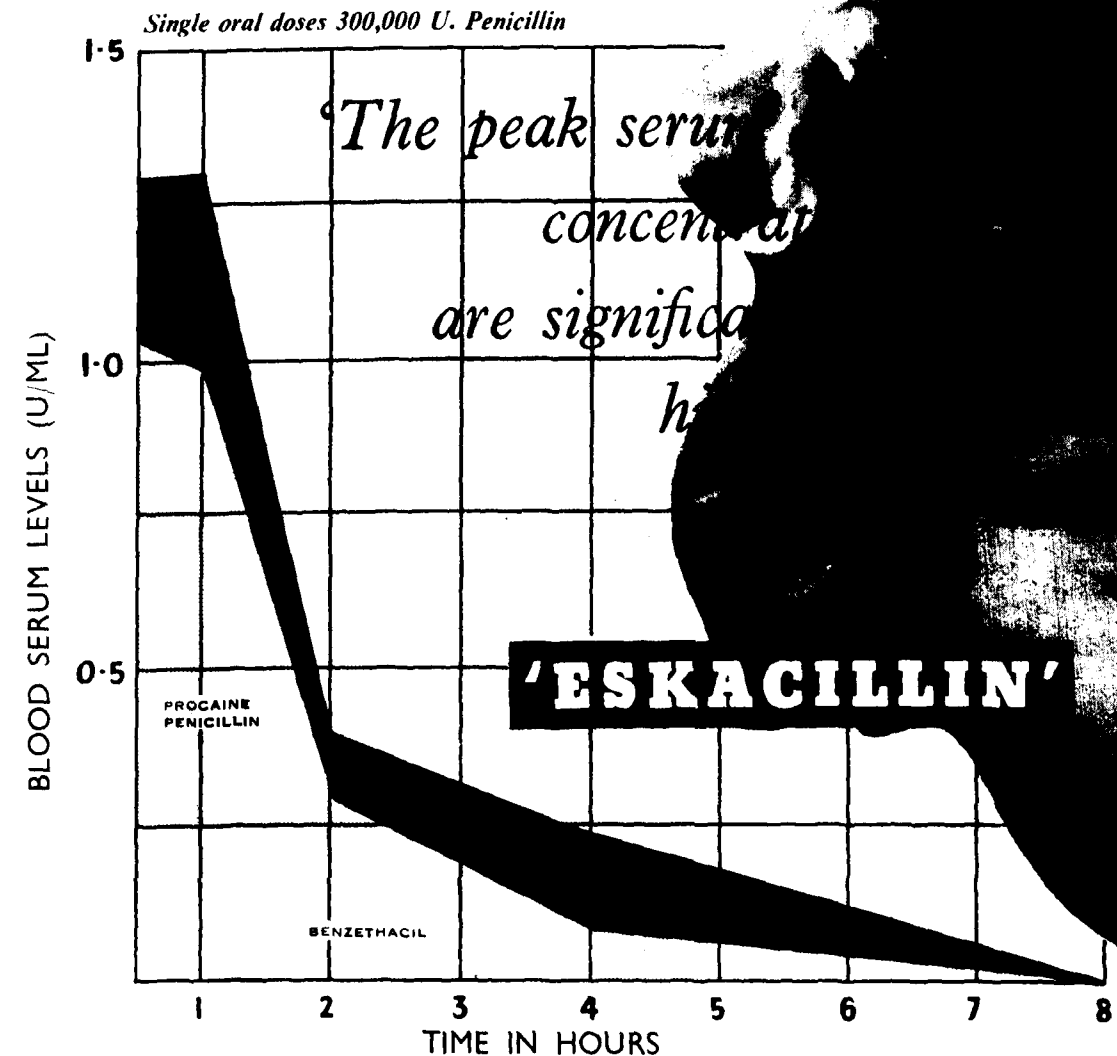
Q.—Are nutrient enemas e.g., 5% dextrose properly absorbed?

A. A solution of 5% dextrose is absorbed when given rectally. The colon, however, can absorb only 1 to 2 litres of fluid daily, so that a total of 75 g. (300 calories) glucose is the maximum that can be administered by this route. There can be few circumstances when it is not preferable to give glucose intravenously, as there is then no doubt about the degree and speed of its absorption. Proteins, peptides, and fats are not absorbed by the colon, and their administration by this route is not only useless but may be harmful, as the putrefactive bacteria break down those substances and form toxic products which may be absorbed.

Correction.—The authors of the article "Cortisone and A.C.T.H. in Treatment of Non-rheumatic Conditions" (*Journal*, January 2, p. 1) regret the omission of acknowledgments to Professor R. E. Tunbridge for access to the case records of two cases of Simmonds's disease and one of adrenal virilism.

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¹ *Antibiot. Chemother.* (1953), 3, 593-9.

² *J. Lab. clin. Med.* (1953), 42, 417-29

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BRITISH MEDICAL JOURNAL

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STUDIES OF A GENERAL PRACTICE (II)* THE DOCTOR'S JOB IN AN URBAN AREA

BY

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In the course of a study of the various methods which can be used to investigate general practice, the activities of a single National Health Service practice were followed for one year. This paper presents results selected from the study, to describe some of the more quantitative aspects of the doctor's job in connexion with his patients and their diseases.

Because the study had as its main purpose an assessment of the various methods which could be used, it was not thought necessary (nor was it a practical possibility) to try them out, to begin with, in more than one place. For this reason no attempt has been made to generalize from the results here presented, for they show only what went on in this one practice. They are put forward in much the same manner as a clinical case study is put forward, to suggest how one part of the doctor's job may be described and measured, and to illustrate some ways of thinking about what may be happening in an urban practice and in the medical care of some 3,000 ordinary people.

The Practice

During the year of the study (April, 1950, to March, 1951) the practice had an average population of 3,084 registered persons and was increasing slightly in size. Of these persons 72% consulted the doctor during the year. Working with the principal was a trainee assistant, and there was also available the occasional help of another practitioner, who lived on the outskirts of the practice and who undertook a few visits and surgeries by arrangement. A prefabricated building in the garden was used as a waiting-room and contained also an additional surgery for the trainee assistant and a small office for the part-time receptionist-secretary. The practice, which was situated in a North-west London borough, was highly concentrated, in that some 95% of registered individuals lived within a mile of the surgery, over which the principal was living. The area is mainly residential, but the terraced houses are interspersed with numerous small

factories and laundries. It is a relatively poor area where much of the housing is scheduled for demolition and an impressive rehousing programme has already started. During the period of study the practice probably had much the same age, sex, and occupational pattern as the immediate local population, but it was somewhat poorer than the borough as a whole.

Method of Study

The principal and his assistants became part-time members of the team which was conducting the study, and undertook to supply records of their work throughout the test year. The necessary recording took place in three stages.

(1) The age, sex, and social characteristics of the population were ascertained and recorded, and the existing records brought up to date. This was a considerable task, because it entailed many home visits and at least one letter to every registered person. It was made difficult also because, unknown to the executive council or to the doctor, the council's records contained the names of 15% more persons than were actually found to be present in the practice. The medical record envelopes in the surgery files exceeded the number of persons present by even more than this large amount of "official inflation," and contained about 19% more than the total, thus rendering useless nearly one M.R.E. in five.

(2) A simple basic form was completed by each doctor after every consultation. This form served to identify the patient and doctor concerned, the time and place of the consultation, whether in the patient's home or in the surgery, the diagnoses made, and the services rendered. In addition, every six weeks, for one week, members of the research team "sat in" on all consultations and recorded in greater detail what went on. The detail included records of telephone conversations, the writing of letters, preparation of lists of patients to be visited, and so on. The collection of these more intensive records gave a rest to the doctors and acted as a "control" as well as an amplification of the simpler records. As a result of this control it is estimated that

*The first paper, a description of method, was the subject of a discussion in the General Practice and Epidemiological Sections of the Royal Society of Medicine (Backett, Shaw, and Evans, 1953).

TABLE I.—Number of Consultations in Surgery and as Visits, Distinguishing Age and Sex of Patient and Percentage of Visits

Consultations	Age Group in Years								Total	
	0-14		15-44		45-64		65+		(All Ages)	
	M	F	M	F	M	F	M	F	M	F
In the surgery (a)	1,012	947	1,854	2,499	1,053	1,531	502	706	4,421	5,683
As visits (b)	877	1,073	474	605	563	569	463	967	2,377	3,214
Percentage of visits in total of (a) + (b)	46%	53%	20%	19%	35%	27%	48%	58%	35%	36%

This table excludes the 93 consultations which took place other than in the surgery or at visits. The grand total is, 15,695—that is, 15,788—93. The average population of the practice was 3,084. All tables and figures refer to the year April 1, 1950, to March 31, 1951, in a N.W. London practice.

over 99% of all consultations were recorded. The doctors were encouraged to make many notes, and, perhaps because the record card usually took less than one minute to complete and stated only the barest minimum, this was often done. These notes later proved particularly useful in sample studies, designed to test the value of various ways of classifying the material.

(3) All records of consultations were transcribed on to patient record cards, which thus came to contain the health histories of each registered individual in the practice during the year. All the items on these patient records were then classified and cards for machine tabulation were prepared.

The basic records were adequate to describe the work of the doctor in terms of the main services involved. Every six weeks there was far greater detail available from the intensive records mentioned above, and to fill out these two pictures sample studies of consultation timing, of the extent of the use of apparatus, elementary time and motion studies of the doctor's day, and a fuller inquiry into the health of a random sample of the families in the practice were undertaken. While results from these other studies are not included in this paper, it is recognized that without such additional material the job of the busy G.P. cannot adequately be described.

The Unit of Work

It is possible to relate the doctor's work, the type of disease, and the patient, through a series of simple codes if the consultation is taken as the basic unit of work. The term "consultation" includes all meetings between doctor and patient in which advice was given, whether such meetings were by chance or arrangement, and it also includes meetings between doctor and patient while the latter was in hospital, telephone inquiries, and the like. During the year of study 15,788 of these consultations took place. This number, with the services involved, letters, referrals, prescriptions, etc., represented 100% of the work of the doctors for the purposes of this part of the study. It is well recognized that this may be by no means all the work of the practice, but sample analyses of the more detailed records suggest that this way of organizing the material embraces almost all of the doctor's job that can easily be measured. Purposely omitted is the maintenance of equipment and the many other chores which, though playing some part in terms of both time and energy, are not specifically associated with the doctor's work with his patients. Also omitted are some of the "social-work" aspects of his job, which it is hoped to discuss elsewhere. Selected results from the analyses are presented below. They show where and when the consultations took place, with what groups of patients, and with what diseases and groups of diseases. Finally, some of the services which were rendered during consultations are mentioned, and two tables are presented which link the work done in the practice with groups of patients suffering from various types of disease.

Place and Time

Most of the 15,788 consultations took place during the normal working day, but 120 were made at night, between 8 p.m. and 8 a.m., the large majority before midnight. During so-called "off duty" periods at week-ends or during bank holidays 140 consultations took place.

The number of consultations which are held in the patient's home reflects several important aspects of the doctor's job. First, the apparent or real seriousness and urgency of the case may be reflected in this figure. Second, it may show how much time is available to the doctor and indicate how busy he is (distances from the surgery are hardly important in this closely knit practice). And, finally, it is reasonable to speculate—as McKinlay (1950) does in connexion with visits to the elderly—that the extent of intimate understanding of the family situation which comes from visits to the homes of his patients will be reflected in this figure. Thus the proportion of these visits in the whole of his work may help to illustrate, albeit crudely, the quality of his care.

In order to explore these ideas further, the proportion of all consultations which took place in the patient's home has been made the basis of a series of tabulations. It will be recognized at once that this proportion is of use only when comparing habits of work with populations roughly comparable for need and custom; and comparison, for example, of a middle-class and a working-class practice in this way might well be useless. In the practice under observation 36% of all consultations were made in the patient's home, a figure which is comparable to that given by Pemberton (1949). The distribution of this percentage for both sexes and at different ages (Table I) shows that a large proportion—some 50% of all the work involved in treating the children and the elderly—was carried out in the patient's home, compared with about 20% among the younger adults.

Work in Treating Different Groups of Patients

With the exception of a small number of persons (1.7%) for whom occupational data were not available, the age, sex, and social characteristics of every registered individual were known. These data were related to the number of consultations and to the "contents" of the consultations, such as the number of prescriptions, etc.

Fig. 1 shows the consultation rate for the year per 100 registered persons for each sex at different ages. It shows how the work of the doctor is related to the age of his patients and the excess of work (measured as consultations) with females over that with males. The excess in the consultation rate for children (aged 0-14) over that for young adults can be very largely explained, by a great excess amongst the very young children (aged 0-4), though this is not the complete explanation for the boys.

If the work of the practice is divided among those registered it gives an average of some five consultations per registered person in the year, a figure comparable to that found by McGregor (1950), and by Bradford Hill (1951) for 1938, and somewhat in excess of that found by Fry (1952). Since 28% of these registered persons were either not ill or not ill enough to consult the doctors during the year, the more realistic average is seven for each patient. Even such a

corrected average may be misleading and a more realistic picture of the use made of the doctors' services emerges only when the percentage of persons having various numbers of consultations is examined.

The percentage of all the males in the practice who had no contact with the doctors in the year is greater at each

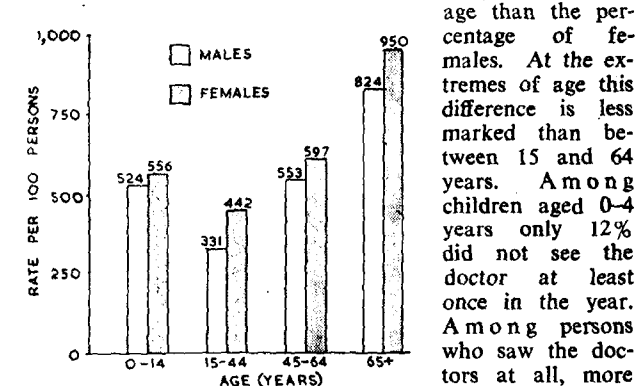


FIG. 1.—Consultation rate for the year per 100 persons registered. 3,084 persons and 15,788 consultations are represented.

age than the percentage of females. At the extremes of age this difference is less marked than between 15 and 64 years. Among children aged 0-4 years only 12% did not see the doctor at least once in the year. Among persons who saw the doctors at all, more consulted them on one occasion than on two, and more on two than on three, and so on (Fig. 2). In other words, the most frequently occurring number of consultations for any person was one, and the next most frequent two.

Fifty-six per cent. of males and 46% of females consulted the doctors on fewer than three occasions—that is, not at all, once, or twice—while in contrast 13% of males and 18% of females consulted on 10 or more occasions. Some patients, however, contributed proportionately much more than others to the work of the practice: of those aged 65 and over (rather under 10% of the practice), 25% of the males and 32% of the females saw their doctor on 10 or

TABLE II.—Percentage of Persons of Each Sex in Each Age Group Having Various Numbers of Consultations with the Doctor in the Year

Age Group	Percentage of Persons with Stated Number of Consultations							
	None		1-2		10-19		20 or More	
	M	F	M	F	M	F	M	F
0-14 years	24	20	19	16	13	18	4	2
15-44 "	35	25	28	26	6	11	1	2
45-64 "	36	27	22	19	10	15	6	6
65+ "	29	25	18	21	14	18	11	14
All ages	32	24	24	22	9	14	4	4

Only the extremes of the distribution are shown. Omitted from each age and sex group are those clustering round the mean, namely the percentage of persons who had between 3 and 9 consultations in the year.

Each figure is the percentage in the age group indicated of all persons of that sex. Table based upon the number of persons registered for at least the whole year—that is, 2,844 persons.

TABLE III.—Number of Consultations in the Year. Proportion of Persons and the Work Involved in Treating Them

No. of Consultations	Age Group in Years								All Ages	
	0-14		15-44		45-64		65+		(a) % of Persons	(b) % of Work Involved
	(a) % of Persons	(b) % of Work Involved	(a) % of Persons	(b) % of Work Involved	(a) % of Persons	(b) % of Work Involved	(a) % of Persons	(b) % of Work Involved		
None	22	0	30	0	31	0	27	0	28	0
1 or more	78	100	70	100	69	100	73	100	72	100
3 "	60	95	43	88	49	94	54	96	49	92
10 "	19	50	10	38	19	61	29	74	16	52
20 "	3	12	2	9	6	26	13	40	4	18

(a) Is the number of persons in the age group with the stated number of consultations in the year, expressed as a percentage of all the persons in the age group. (b) Is the work involved in treating the persons in (a) expressed as a percentage of all the work with the age group. (c) Cannot be precise because tabulation of the work involved with each separate number of consultations was prohibitive. The figures given are approximate. The figures are based upon information about persons registered for at least the whole year, or who died during the year—that is, 2,844 persons.

more occasions in the year. Moreover, nearly one in eight of these elderly people had 20 or more consultations.

Table III shows the approximate proportion of all the work of the practice which is involved with patients consulting various numbers of times. This idea is further illustrated in Fig. 3.

It will be seen that 12% of the work of the doctors among children, for example, was involved with that 3% of persons who had 20 or more consultations, which was four times the average number of contacts for that age group (5). Or again, while only one-fifth of the middle-aged men and

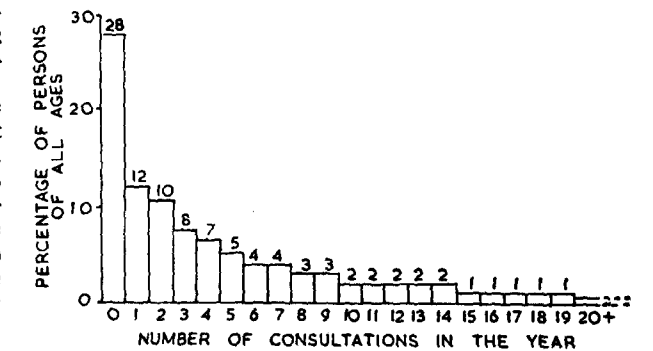


FIG. 2.—Percentage of persons having various numbers of consultations in the year. Note: (1) The chart is based upon the number of persons registered for at least the whole year—that is, upon 2,844 persons. (2) The percentages shown are "rounded off" to the nearest whole number. (3) 4% of the population had 20 or more consultations in the year.

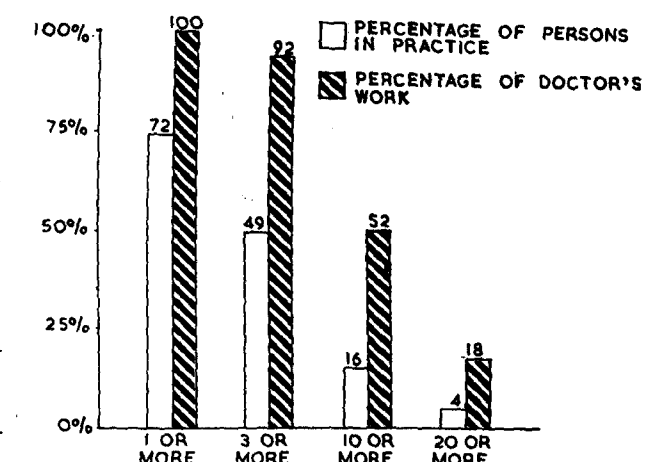


FIG. 3.—Number of consultations in the year. The proportion of persons and the work involved in treating them (summary of Table III). Note: (1) The columns show the relative proportion of persons and work for different numbers of consultations in the year. (2) The figures are for all ages together. (3) The figures are based upon information about persons registered for the whole year—that is, 2,844 persons.

women in the practice saw the doctor on 10 or more occasions during the year, three-fifths of all the work involved with this age group was concerned with this relatively small number of people (19% of people, 61% of work). Similarly, while 29% of the elderly saw the doctor on 10 or more occasions, these were responsible for 74% of the work with that age group. Taking the practice as a whole, half of all the work involved only that sixth of all the patients (some 500) who saw the doctors on 10 or more occasions, and 18% of all the work concerned only 4% of the patients (125) who consulted 20 times or more.

Work in Treating Different Types of Disease

Diagnoses were classified by a short list of 28 categories arranged to permit comparison with other lists in more general use. As an attempt to explore further the implications of the various diseases and to develop methods of study of their effects upon the individual and family, each diagnosis was also classified according to its *seriousness* and its *duration*. Serious diagnoses were of diseases in which there was evidence of a major threat to the life or livelihood of the patient or which required considerable readjustment in his life or that of his family. Each of these criteria was, of course, further defined operationally. Such conditions as pulmonary tuberculosis, cancer, established peptic ulcer, and pneumonia were always classified as serious. It was realized that a definition such as this, based in part on other than purely medical concepts of seriousness, might include many diagnoses which were not serious when judged from a pathological point of view. In practice this effect was found to be very small, for the large majority of serious conditions as defined reflected major organic disease.

Again, certain conditions were always regarded as chronic, and other conditions were placed in this category only when there was evidence of a duration of three months or more. Conditions which were chronic by definition included organic heart disease, bronchiectasis, varicose veins, and the like. All other conditions were classed as acute and were further divided into acute infective and acute non-infective conditions. From this classification it will be seen that each diagnosis made at a consultation, which was, of course, counted only once during the year, could be described in three ways: (1) as belonging to one of the 28 elements in the diagnosis code; (2) as being acute infective, acute non-infective, or chronic; and (3) as being either serious or not serious.

Where more than one diagnosis was made at a consultation it is not possible to say what fraction of the consultation was concerned with which diagnosis. It is therefore not possible to state with any precision what proportion of all the consultations in the year was concerned with any given diagnosis group. But the range or limits between which this proportion lies can be shown by dividing all consultations into (a) those in which the given diagnosis occurs on its own, and (b) those in which it occurs together with at least one other diagnosis: (a) is a minimum count of all the work concerned with the given diagnosis, and (a+b) a maximum count. Expressing (a) and (a+b) then as a percentage of all consultations gives a minimum and maximum to the percentage of work involved with the given diagnosis. For example, the common cold, when it occurred alone, was the diagnosis in 4% of all consultations. The proportion of consultations in which the common cold occurred either alone or with some other condition was 8.5%; the range was therefore between 4 and 8.5% of the total work for the year.

Diagnoses of interest in this respect are peptic ulcer and chronic or recurrent dyspepsia, which accounted for 1% of all diagnoses and involved between 1 and 4% of the work of the practice. Psychiatric diagnoses (5% of the total) often occurred with other diagnoses, and involved between 1 and 7% of the work, while cardiac and vascular conditions (excluding varicose veins) were 3% of all diagnoses and entailed between 2 and 10% of the work of the practice.

Skin disease was indicated in 11% of all diagnoses and involved between 6 and 12% of the work. Some 5% of diagnoses were of arthritis, fibrositis, rheumatism, etc., and these involved between 3 and 8% of the work of the practice. For acute respiratory infections, which were rather less than one-third of all diagnoses, it was only possible to state that they accounted for between 20 and 40% of the work of the practice. These wide limits are, of course, a measure of the frequency with which these infections occur together with some other condition.

When the work of the practice is classified by diagnoses in this way, there is a large measure of agreement between the proportion of all the diagnoses which fall into each group and the proportion of the work of the practice which was involved. The picture which this classification by itself gives of the work of the doctor is not a good one, and it is more likely to prove useful when there is added a qualitative description in terms of the seriousness and duration of the conditions which have been treated.

Fig. 4 shows the percentage of 15,788 consultations classified as work with diseases grouped as acute infective, acute non-infective, or chronic, and also the relative proportions of consultations and diagnoses. In 12% of consultations, diagnoses from more than one of these three groups were made—for example, an acute infective condition and a chronic condition at the same time. These consultations have been referred to as work with "mixed" conditions. No attempt has been made to break them down further, although it is recognized that fractions of such consultations "belong" to the main groups concerned.

It will be seen that the care of chronic disease, which formed less than 20% of the diagnoses made by the doctors in this practice, involved at least 30% of all their consultations and, because of the contribution of the work with "mixed" diagnoses, probably rather more. Almost half of all the diagnoses made were of acute infective conditions, and roughly the same proportion of all the work of the practice was involved in treating them. When diagnoses and work are classified by the seriousness of the condition the disproportion between the number of diagnoses and the amount of work is more striking.

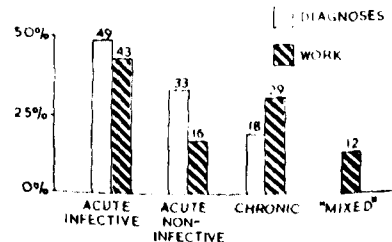


FIG. 4.—Percentage of diagnoses and consultations showing broadly the type and duration of the condition diagnosed. Note: (1) Each single diagnosis is classed as either acute infective, acute non-infective, or chronic. (2) There may be several diagnoses in any one consultation. Where several diagnoses are made and these come from more than one of the three broad groups seen above, the consultation is referred to as work with "mixed" diagnoses. 12% of all consultations fell into this category. (3) Because of this the percentage of consultations with acute infective, acute non-infective, and chronic conditions will be seen to represent an approximate and minimal figure. (4) The total of 6,122 diagnoses upon which this chart is based excludes 85 "diagnoses" in which there was no illness and prophylactic inoculation was involved. The 144 consultations which were concerned with these 85 "diagnoses" are also omitted.

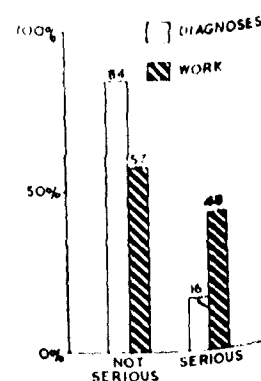


FIG. 5.—Percentage of diagnoses and consultations showing the seriousness of the condition diagnosed. Note: (1) Each diagnosis was classed as either serious or not serious. (2) Each consultation was classed as serious if one of the diagnoses made during it was serious. (3) Prophylaxis is omitted from the totals of "diagnoses" and consultations. The figure is based, therefore, upon 6,122 diagnoses and 15,644 consultations.

Fig. 5 shows this most important contrast. While only 16% of diagnoses were considered to be "serious," the work involved in dealing with them amounted to 43% of all the work of the practice for the whole year.

Services

The services which were rendered during a consultation have been analysed initially under the headings of examination, prescription, referral to hospital or some other agency, certificates of various types, and non-medical advice and help. Each of these groups of services has been examined in much greater detail for one week in every six, and full consideration of them in this practice must wait upon an analysis of this material. Preliminary review suggests that the findings in this study will not exceed greatly the figures reported by Fry (1952) and others. For example, at least one certificate was given for every 4.5 consultations, and only about half of these were National Insurance certificates. Referrals outside the practice were at the rate of rather over 35 for every 100 registered persons in the year, and most of these patients were referred only once. It is of interest to note that the referral rate at ages for each sex shows a maximum of 57 per 100 persons in elderly males, the comparable group of elderly females having only 38 referrals per 100 persons during the year.

During 10,889 out of 15,788 consultations, one, or more than one, prescription was made. This is equal to a prescription rate of about 7 for every 10 contacts with the doctor or at least five prescriptions for every person who consulted the doctors during the year, and rather under four for every person registered.

Prescription rates when analysed according to the seriousness and duration of the condition concerned go further to describe the prescribing habits in this practice. Prescriptions were given in 73% of "non-serious" consultations (based, of course, upon the "seriousness" of the diagnoses made during the consultation) and in only 65% of "serious" consultations. These differences in the amount of prescribing during serious and non-serious work were found whether the work was with diagnoses of acute infective, acute non-infective, or chronic conditions. Many of the serious acute non-infective conditions, such as injuries, will of course be referred to hospital or casualty clinic without need of a prescription, and this may explain the difference in this group. No such simple explanation is to hand for the larger amount of prescribing in the other less serious groups. It is possible that the difference here is due partly to hospital prescribing for those more seriously ill and partly to the longer duration of serious illnesses; the number of prescriptions in each episode of illness being more nearly constant.*

Work in Treating Groups of Patients with Various Diseases

The recording system which was used, and which has been briefly described above, allows not only the relating of the doctors' work to groups of patients and then to the groups of diseases, but the production of tables which show how much work was done with the different groups of patients when they were suffering from various types of disease. In this way it is possible to build up further the picture of the role of the G.P. in this "population." Table IV gives the proportion of persons, diagnoses, and consultations which occupied the doctors of this practice during the year, and shows that, of all patients, the young adult involved them in the smallest amount of work.

It will be seen that there were proportionately slightly more diagnoses made among the male children, but that this involved the doctor in much the same proportion of consultations as might be expected from the number of persons concerned (however, the large number of visits

*In order to examine this and kindred suggestions the material from the study is being analysed to show the number of episodes of illness as well as upon the basis of the consultation, diagnosis, etc.

TABLE IV.—Percentage of Persons, Diagnoses, and Consultations Showing for Each Sex the Proportions at Different Ages

	Age Group in Years								Total	
	0-14		15-44		45-64		65+		All Ages	
	M	F	M	F	M	F	M	F	M	F
Registered persons ..	24	23	48	44	20	22	8	11	100	100
Diagnoses ..	32	23	40	43	18	22	10	12	100	100
Consultations ..	28	23	34	35	24	23	14	19	100	100

3,084 persons are represented. This is the average population for the year. Prophylaxis is omitted from the totals of diagnoses and consultations. The table is based, therefore, upon 6,122 diagnoses and 15,644 consultations.

which were made to the homes of children must not be forgotten). At the other end of the age range, as might be expected, for the elderly, the number of diagnoses was not strikingly disproportionate, yet the work involved was in excess of that to be expected upon the basis of the numbers of persons of that age (and, again, the number of visits was disproportionately high).

As has been shown, there was more work in this practice with females than with males, and this was due to a greater use of the doctors' services by the women, as well as to the larger number of them who were registered (on the average each female consulting the doctor did so approximately once a year more often than each male). Comparison of the proportion of work with each sex that was involved in treating various types of illness shows a marked similarity throughout. In both males and females the milder acute infections occupied nearly one-third of the consultations (33% in males, 31% in females). The next largest group was the serious chronic conditions, which involved 25% of the doctors' work with males and 22% of the work with females. Serious acute infections involved roughly the same proportion of the work with males as with females (12% for males and 10% for females).

Such averages are of course subject to "great variation with age, and examination of the relative amount of work involved in treating different types of disease at various ages emphasizes this (Table V).

TABLE V.—Percentage of Consultations at Different Ages Showing Type and Seriousness of the Condition Concerned

Age of Patient (Years)	Seriousness	Type of Condition				Total
		Acute Infective	Acute Non-infective	Chronic	"Mixed"	
0-14	S	17	0	1	2	100
	NS	64	12	1	3	
15-44	S	7	3	18	6	100
	NS	32	21	6	7	
45-64	S	10	2	34	9	100
	NS	16	13	10	6	
65+	S	10	2	53	11	100
	NS	7	7	7	3	
All ages	S	11	2	23	7	100
	NS	32	14	6	5	

S = Serious. NS = Not serious. Prophylaxis is omitted. 15,644 consultations are represented.

The doctors spent proportionately more time on the treatment of the acute non-infectious conditions, such as injuries, in the younger adults than they did with any other age group, yet these young people caused them less work than patients of other ages. Again, the non-serious acute infections of children are seen to occupy nearly two-thirds of the doctors' consultations with that age group (64%)—twice the average for the whole practice. At the other end of the scale, over half the work with elderly folk (53%) was in treating serious chronic conditions—over twice the average for the practice.

Comment

Four much-discussed aspects of the work of the general practitioner have been measured and illustrated by examples from this particular practice. They are the concentration

of a large proportion of the work among a relatively small number of patients, the large amount of work with serious disease, the large amount with chronic disease, and the effect of the age of the patient upon the amount and type of work.

Concentration

The 16% of registered persons who were responsible for over half of the work of the doctors may be regarded, for this year at least, as the "hard core" of sick people in this practice. It might be thought that these people, who were more often and more seriously ill than the general run of patients, were a group of elderly and chronic sick for whom, perhaps, little could be done, yet over half of them were under 45 years of age and more than a quarter were children. The presence of this relatively large group of younger people, for whom treatment necessarily holds more hope, and the fact that they caused about one-quarter of all the work of the practice, draws attention to them as a body of patients of particular interest to the general practitioner. This group would be still more interesting if it could be shown that the same persons or the same families were identified in this way from year to year.

Another way to consider the preventive and therapeutic problems which were presented by this "hard core" is to approach it from the point of view of the number of persons involved—that is, in terms of the size of the problem for the G.P. If each person registered with the practice had been equally concerned in the doctor's work, it is unlikely that an intimate and personal knowledge of all the 3,084 would have been possible. However, only three-quarters of those registered caused any work at all, one-sixth were responsible for half of the work, and one-twenty-fifth (125 persons) for one-fifth of the work. In this there is a strong suggestion that the size of the doctor's list was, in this case, a poor indication of the number of persons among whom the bulk of the work was distributed. Moreover, since the 500 persons responsible for half the work had in fact an average of 16 consultations each, these general practitioners had a good opportunity of getting to know them and of practising good medicine with them.

Seriousness

The classification of a diagnosis as "serious" or "not serious" was carried out conservatively, and whenever there was doubt about the category in which to place it the diagnosis was classed as "not serious." The proportion of the total which was finally grouped as "serious" (16%) is not surprising, but the proportion of the work associated with these diagnoses (43% of the total) implies at least that in this case the general practitioners were themselves undertaking a substantial amount of serious work. If similar conditions were found to exist elsewhere it might become possible to refute the implication contained in such statements as "the general practitioner is a specialist in the trivial."

Chronic Disease

About one-third of all the work was with chronic disease. This type of work is often the least rewarding from the point of view of the doctor and the most difficult from the point of view of its attendant social problems, yet in the medical care of the chronic sick the G.P. and the family bear the major part of the responsibility. In this practice the doctors were often the only persons who were in a position to appreciate fully the needs of the family in which there was chronic illness and to co-ordinate the many services which were becoming available. Since the chronic disease burden of an ageing community is likely to increase (at any rate with the present lack of the means of prevention), these doctors must look forward to spending a very substantial part of their time and energy in the treatment of this type of illness.

Influence of Age of Patient

The most frequent users of the doctors' services were those over 65 years of age, with the young children and the middle-aged next, and the younger adults consulting least often.

The extent of this rather obvious effect of age is seen more clearly than in such generalizations, however, when the duration and seriousness of the work are examined. Thus two important trends with the age of patient were apparent in this practice. In work with children 64% was with non-serious acute infections, while in the elderly only 7% was classified in this way. Serious chronic illness, on the other hand, involved the doctors in only 1% of all work with children but in 53% of the work with those aged over 64. Thus between the extremes of age there was a proportionate difference of some nine times between the amounts of work involved in treating less serious short-term infections and of fifty times in treating serious chronic illness. These examples confirm in numerical terms how important the age composition of the patient population is to the practitioner. From the doctor's point of view the easiest patient on his list is obviously the younger adult, in the treatment of whom a relatively small amount of work is involved, and for whom, as has been shown in Table I, the smallest proportion of visits is undertaken. However, not only do patients of different ages need different amounts of medical care, but (and perhaps more important) the type of work which is involved in giving this care, and the kind of medical interest and satisfaction to be derived from it, differ greatly from age to age.

Summary

The work of a medium-sized practice in North-west London was studied for one year as part of an examination of the different methods which can be used in general practice research. Special records were kept by the doctors concerned and completed after each consultation, which thus became the basic and most easily counted unit of work. The number and "contents" (certificates, prescriptions, etc.) of such consultations were related to the age, sex, and social characteristics of the registered population, and to the diseases from which they suffered. These diseases were classified according to a list of 28 elements, and also as acute or chronic and serious or not serious according to defined criteria. Selected tables and figures are presented to illustrate how such material may be used to answer questions about the amount and type of work that is involved in running a practice of this size. No attempt is made to generalize from this study, but there is no reason to believe that the medical needs of the 3,000 registered persons differed greatly from those of the population of the rest of the borough.

The whole of the work of the practice, so far as this study was concerned, centred upon the 15,788 consultations which took place during the year. This is roughly the same as 100 consultations a week for every 1,000 registered persons. Half of this work was concentrated among 16% of the population (some 500 persons) who consulted the doctor on 10 or more occasions during the year. One-fifth of all the work was accounted for by 4% (some 125 persons) who consulted 20 or more times. Of all the diagnoses made during the year 16% were of serious disease, and the work involved in treating them amounted to 43% of the total work of the practice. Chronic disease caused 30% of the work, and acute infections accounted for another 43%. Much of this latter was in the treatment of acute respiratory infections. Over half of all the work with those aged over 64 was concerned with chronic serious disease, while less than 1% of the work with children was involved with this type of condition. Nearly two-thirds of the work with children was in treating the less serious acute infections, while only 7% of the work with the elderly was of this type.

Prescriptions were given during nearly 11,000 consultations—an average of at least five prescriptions for

every person consulting the doctor, or seven for every ten consultations. At least one certificate was given for every 4.5 consultations, and only about half of them were for official purposes. Referrals were at the rate of 35 per 100 persons in the year, and most of these patients were referred only once. The elderly male patients with a referral rate of 57 per 100 persons were referred most often.

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TRAINING GENERAL PRACTITIONERS IN PSYCHOTHERAPY

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Present Situation Regarding Psychotherapy in General Practice

It is generally agreed that at least one-quarter of the work of the general practitioner consists of psychotherapy pure and simple. Some investigators put the figure at 50%, or even higher; but, whatever the figure may be, the fact remains that the present medical training does not properly equip the practitioner for at least one-quarter of the work he will have to do.

Although the need for a better understanding of psychological problems and for more therapeutic skill is keenly felt by many practitioners, they are reluctant to accept professional responsibility in this direction. The most frequent reason advanced is that they have too much to do and it is quite impossible for them to sit down and talk with one patient for an hour at a time, week after week. Impressive as it sounds, this argument is not, in fact, firmly based. It is true that establishing and maintaining a proper therapeutic relation needs much more time than prescribing a bottle of medicine. In the long run, however, it can lead in many cases to a considerable saving of time both for the doctor and for his patient (and for the National Health Service). In the Appendix two cases are quoted to prove this point.

What actually happens at present in most of the so-called psychological cases of general practice is an almost mechanical prescribing of phenobarbitone if the patient is not depressed, and of some "tonic" if he is. If this fails, various specialists are consulted, usually resulting in "reassuring" reports that nothing organically wrong has been found. Eventually a psychiatrist is also consulted, often not so much as a

deliberate policy as *faute de mieux*. This situation, however, is created as much by the difficulties of the psychiatrist as by those confronting the general practitioner. It is common knowledge that the psychiatric services are pathetically unequal to the ever-increasing demand; they are flooded with patients, and consequently the psychiatrist must pick and choose. If a patient is picked he is put on the waiting-list, eventually taken on for treatment, and, more often than not, lost completely to the practitioner. If the patient is not picked the report sent to the doctor hardly ever helps him in his psychotherapeutic task except advising him to give sedatives or tonic.

Thrown back on his own resources, the doctor, often shamefacedly, prescribes some placebo or gives a "reassuring" pep talk. (It is a common joke to ask, "Reassuring—but to whom?") Then there are the advocates of common-sense psychology who advise the patient to have a holiday, to change his job, to pull himself together, to leave home, to get married, to have a child or not to have any more children but use some contraceptives, etc. None of these recommendations is necessarily wrong, but the fallacy behind them is the belief that an experienced doctor has acquired enough well-proved "common-sense" psychology to enable him to deal with the psychological problems of his patients. But minor surgery, for instance, does not mean that a doctor can pick up a well-proved carving-knife or a common-sense carpentry tool and perform minor operations. On the contrary, he has to observe very carefully the rules of antisepsis and asepsis, he must know in considerable detail the technique of local and general anaesthesia, and must have acquired reliable skill in using scalpel, forceps, and needle, the tools of the professional surgeon. Exactly the same is true of psychotherapy in general practice. The uses of empirical methods acquired from everyday life are as limited in professional psychotherapy as are carving-knife and screw-driver in surgery.

Experiences in Teaching Psychotherapy to General Practitioners

In the past twenty-five years or so, psychiatrists in many countries have run courses for general practitioners, courses which were often arranged because of the pressing and ever-increasing demand for them.

The results of these courses have been generally disappointing. This is a surprising outcome, for the general practitioner of some years' standing is a very good trainee. He has had time to assess the value and limitations of what he has learnt at his medical school and hospital, he has also had a fair amount of frustration and success in his practice, and he has seen enough of human suffering to make him sensitive. (Seen from this angle general practitioners are much better material for training in psychotherapy than young medical students.) The reason for the failure of these courses would appear to be that theoretical lectures, even when based on, or illustrated by, case histories or clinical demonstrations, hardly give more to the general practitioner than what he can get from reading books. Strongly influenced by the traditional medical training based on lectures and clinical demonstrations, both practitioners and psychiatrists forget, in a mutually attractive teacher-pupil relation, that psychotherapy means acquiring a new skill and not learning some more theories and facts. Nothing is easier or more satisfying for a psychiatrist than to take a patient's case and deliver a lecture about the theoretical implications, the unconscious dynamics, and the likely diagnosis of the patient. Moreover, such teaching is gratifying indeed to both. The

specialist can shine, and the practitioner feels enriched and reassured. But this gratifying collusion is disappointing in the long run because in reality it is too facile and does not give the means of effecting therapeutic changes.

Instead of allowing this teaching-being-taught atmosphere to develop, the aim of such a course should be to help the practitioner to acquire a new skill. This means a considerable, though limited, change in the personality of the doctor. The doctor has to discover in himself an ability to listen to things in his patients that are barely said, and, in consequence, he will start listening to the same kind of language in himself. This fairly difficult change of attitude is not needed if the doctor does not have to do the listening himself, but is taught and told what other people have found out about the "human mind"—namely, the theories of psychodynamics, of personality development, of transference patterns, and so on. In the same way as a new physical skill can be learnt only in the actual situation while dealing with the problems in it, so is it with the acquisition of a psychological skill. This is why concentrated full-time courses lasting for some weeks have proved to be of very limited value. The general practitioner must use his own current experience as a basis for learning the new skill. Past experiences are unsatisfactory for this purpose, since the memory of an emotional involvement is always less alive, less vivid, than the actual experience itself.

So far, so good; but the skill to be acquired involves understanding and guiding the development of the two-person (patient-doctor) relation, and the presence of a third person would fundamentally change this situation. This condition automatically excludes the presence of the tutor. Therefore the material on which the whole training has to be based is the doctor's report of what happened in the interview situation between him and his patient. This necessary condition implies a number of uncertainties. The doctor has not yet learnt what to look for and he is somewhat self-conscious and apprehensive because of his lack of skill and understanding; like everyone else, he too is apprehensive of criticism, and, consciously or unconsciously, tries to make his activities appear in the best light and to minimize his shortcomings and mistakes. On the other hand, in order to train him, his blind spots, shortcomings, and mistakes have to be brought out quite clearly and discussed as frankly as possible. It is difficult enough to do this in any sphere of physical activity which is near to the core of the personality—say, for instance, in dancing, social behaviour, or table manners—but it is still more difficult in the psychological sphere, where the whole personality is always involved. Moreover, any such personality change needs time, and it is impossible to hurry it. The only training which systematically caters for these difficulties is the psycho-analytic training, which provides for a personal analysis lasting for many years and amounting to several hundred hours.

Experience at the Tavistock Clinic, where courses in psychotherapy for general practitioners have been given for more than twenty years, has confirmed the limited value of "teaching" psychotherapy. Consequently in the last few years a new approach has been tried—namely, to shift the emphasis from "teaching" to training, using group methods to achieve to a certain extent, although admittedly not completely, the necessary changes in personal attitudes.

At first the aim was a very modest one, amounting only to the awakening of an awareness of psychological factors, enabling the practitioners to give a better and deeper assessment of their patients' problems and illnesses. According to the doctors' reports, the result has been a great saving of their time, much less need for complicated hospital examinations (hence a considerable saving for the National Health Service), and, last but not least, some help to the patients. Admittedly all this amounted only to something of a better diagnostic skill. But, having achieved a better diagnostic skill, the practitioners then wished to know how to treat the patients. This demand was not unexpected, as, with a greater awareness of the problems, the practitioners'

desire to do something to alleviate them was bound to follow. To answer this demand a two-year course in psychotherapy was organized. I now report briefly on the principles and methods used in this course. My main reason for doing so at this stage is that I believe similar courses may be contemplated elsewhere, and I felt that the approach developed may be of value to others and an exchange of ideas about the problems involved would improve the quality of the work.

Training in Psychotherapeutic Skill: (a) First Attempts

We started by advertising "introductory courses in psychotherapy for general practitioners" in the medical press, and every practitioner interested was admitted to one of the courses, each taking in, on an average, 8 to 12 doctors. Each course lasted for a term and consisted of weekly case conferences of two hours each. No systematic theory was given. The practitioners were asked from the start to describe any recent "psychological case" they had had to treat, and the discussion was kept so far as possible concrete—that is dealing with the individual problems of the patients in question. For some doctors this was enough; one or two dropped out during, and a few more at the end of, the first term. The remainder were the ones mentioned above who asked for more. To provide this further training, the weekly case conferences were continued, but each conference session was now followed by a tutorial meeting on the general outlines of psychodynamics, based mainly on psycho-analytic concepts. Both events took place on the same afternoon, and lasted from 2 to 5 or 5.30. This arrangement continued for two terms, and as the demand for still more training persisted it was decided to institute a two-year course.*

The method used in our training scheme was developed and tested to a fair degree jointly by Enid Balint and myself while training for the Family Discussion Bureau a group of social case-workers who were trying to help people with marital problems. The human problems facing these workers were roughly the same as, although in some relevant points simpler than, those of the general practitioners. Some of the similarities were the starting situation—namely, a patient in trouble coming for help and a professional offering understanding, the developing patient doctor or patient worker relation, especially the need for controlling the doctor's or worker's subjective involvement in this relation and so on. What was different was the usual presence of illness, often physical, in the doctor's material, and the all-important fact that the general practitioner cannot "pass the buck." Unlike general practitioners, social workers and, for that matter, specialists may say—and as is well known they often do say—this or that patient is not "my cup of tea"; "I am not interested in this kind of illness"; "I cannot find any justification for his complaints"; "the illness is so slight, or so severe, or so progressed, that it is a waste of my time to treat the man"; "give him some reassurance and ½ gr. phenobarbitone thrice daily and leave me alone"; etc. The general practitioner, come what may, must see his patient through, sometimes even to the bitter end; he cannot "refer him back" with an easy and empty cliché.

Before describing our scheme I wish to discuss at some length the implications for training of this factor, as its realization profoundly influenced our attitude.

(b) Practitioners and Their Relation to Specialists

The first of these implications is that the general practitioner must remain in his practice during his whole training. This rightly emphasizes the mutual roles of the psychiatrists on the one hand and the practitioners on the

*In fact, our total intake was 36 doctors. Of these, seven were left after their first and a further five after their second term, leaving 15 who are doing the present two-year course.

other. Both of them are doing their jobs, neither of them is so important that for his sake the other must make sacrifices; their jobs and their roles are those of peers. A further consequence is that the general practitioner remains in full and unrestricted control of his patients, he is the one who is running the show; the psychiatrist accepts the fact that his own role is that of an expert assistant, not that of a manager, and still less of a superior mentor or teacher.

Although this approach preserves, even enhances, the practitioner's dignity, it is only with great difficulty that it can be accepted by him. One reason is the burden of responsibility, sometimes really severe, that it involves. It is so much easier to farm out responsibility, to say, "I have asked all the important specialists and none of them could say anything of importance; I really need not be better than the bigwigs." No such escape is permitted in our course. Although the opinions of specialists are asked for and listened to, they are not accepted as final or binding; they are criticized for what they are worth, and then the doctor in charge is asked to decide what is to be done with the patient and to accept undivided and unmitigated responsibility for his decision. Often the decision influences the patient's whole future. This fact too must be borne in mind.

No wonder that the practitioners, as often as not, do not like to shoulder this heavy burden. What is more surprising is the willingness of the psychiatrists (in fact of all specialists) to enter into a collusion with the general practitioner in order that this responsibility may be dissipated, if I may say so, into thin air. The patient with psychological complications is often seen by several "eminent" people, each of whom gives his opinion about one or other part of the problem, but the final responsible decision is seldom explicitly stated even if it has to be taken. If possible no decision is taken; things are left hanging until fateful events supervene and make the decision anonymously, allowing everybody to feel that after all it was not his word that counted. On the other hand, if things turn out well everybody concerned may feel that his contribution was highly important, if not the decisive one.

One feature of our scheme was to unmask this anonymity by making the practitioner accept that he is and must remain in charge of his patient. If the doctor needed more help than the course could give him he was free to refer his patient to the clinic for consultation only. The patient was then tested by a psychologist and interviewed by a psychiatrist (usually the leader of the course), but only if the doctor was willing to continue the treatment. The results of the tests and of the psychiatric interview were then brought up in our conferences and mercilessly scrutinized. The final test of their value, which kept psychologist and psychiatrist equally on their toes, was the standard question of how much help in his further treatment of the patient did the doctor get from their reports.

This is a severe test indeed, as I can testify from first-hand experience. Neither I nor the psychologists who took part in this scheme found it easy to accept that some of our reports were merely nice phrases, repeating in a different form the facts known only too well to the doctor, and giving him hardly any help in his difficult task. This sobering realization of the shortcomings of our work is only one of the many lessons that general practitioners can teach us specialists.

The "collusion" and anonymity mentioned above is an excellent way out of this often very trying self-criticism. The specialist need not see the futility of his reports, and may rest perched on his "eminent" pedestal; the doctor may grumble and feel justified in his contemptuous opinion of the useless and pretentious specialist, and no one need do anything. Our scheme, by bringing face to face as equals specialists and practitioners, has made this escape impossible. Admittedly we, as everyone else, have had cases in which very little or nothing could be done; this fact then had to be accepted explicitly and in full and open responsibility.

I have already mentioned another kind of escape, the establishment of a teaching-being-taught atmosphere. This temptation, although very attractive to both practitioners and psychiatrists, should in most cases be resisted. When listening to a case an experienced psychiatrist can almost always without any great effort make a "clever" diagnosis and even foretell with reasonable accuracy what will happen in the doctor-patient relation for the next period. If he indulges in such a "conjuring trick" he severely interferes with the doctor-patient relation and inhibits the doctor's powers of observation and ease of handling the case. The doctor will then try either to confirm the psychiatrist's prophecy or to prove it to be incorrect, according to the actual relation between them. In any case the individual doctor and the group are deprived of the opportunity of finding out for themselves the advantages or disadvantages of one or the other ways of handling the problem.

(c) Present Training Scheme

The weekly case conferences are the mainstay of our scheme. About 10-12 are held in each of the three terms. To secure intensive participation and, on the other hand, to obtain varied enough material, we found it advisable to have groups of six to eight doctors. In addition to the conferences we offer to any doctor who asks for it individual supervision of his cases—that is, about an hour a week of "private" discussion. While the conferences are taken by the leader of the course, the individual supervision is provided—aided by some external help—by other clinic consultants. Psychotherapeutic technique is highly individual. In order to avoid the danger of muddling the practitioner by the often widely diverging views and approaches of the various consultants, the supervisors were asked to attend some of the case conferences before taking on any doctor for supervision. It was explicitly stated that they were not expected to subordinate their individual views to those of the course leader; on the contrary, they were asked to take part in the case discussions as frankly as they wanted. The reason for their attendance was that they should acquaint themselves with the atmosphere of the conferences, and, on the other hand, that the doctors should have the opportunity of finding out who they would like to supervise their cases. As these supervisions are expected to run on well-known lines, I wish to restrict my report to the psychodynamics of the case conferences.

I have already pointed out that we try to avoid so far as possible the ever-tempting teaching-being-taught atmosphere. Our aim is to help the doctors to become more sensitive to what is going on, consciously or unconsciously, in the patient's mind when doctor and patient are together. This kind of listening is very different from "history-taking," and here we encountered much difficulty when trying to free the doctors from the automatic use of this kind of approach. The main difference is that history-taking is concerned almost exclusively with objective events or with events that can easily be expressed in words—that is, events towards which both doctor and patient can adopt a detached "scientifically objective" attitude. The events that are our concern are highly subjective and personal, often hardly conscious or even wholly beyond conscious control; also, as often as not, there exists no unequivocal way of describing them in words. Nevertheless these events exist, and, moreover, they profoundly influence one's attitude to life in general and still more so to falling and being ill, accepting medical help, etc.

"Automatic Patterns"

It may safely be said that these events, happening all the time in everybody's mind, are only partly sensible adaptations to the ever-changing environment; to a large extent they are governed by almost automatic patterns originating mainly in childhood but influenced by emotional experiences in later life. The first task for our scheme was to awaken in the doctors an awareness of these automatic patterns, and then to enable them to study more and more in detail how these patterns influence the patient's attitude towards his

own illness, and on the other hand, how they colour or even determine his relations to any human being, and especially to his doctor.

Another factor affecting the patient's developing relation to his doctor is the doctor's response, which also is partly governed by automatic patterns. The interplay of these two sets of patterns, whether and how they "click" with each other, determines to a large extent the efficiency of any treatment. Its influence is less important in short-lived acute illnesses, but almost crucial in chronic ones. In order to achieve a better fit, and with more patients, the doctor must have a wide choice of responses, which means that he must become aware of his own automatic patterns and gradually acquire at least a modicum of freedom from them.

What is Needed

Intellectual teaching, however good and erudite, has hardly any effect on this process of liberation and general easing up. What is needed is an emotionally free and friendly atmosphere in which one can face the experience that quite often one's actual behaviour is entirely different from what has been intended and from what one has always believed it to be. The realization of this discrepancy between one's actual behaviour and one's intentions and beliefs is not an easy task. But if there is good cohesion between the doctors in the group, the mistakes, blind spots, and limitations of any individual member can be brought into the open and at least partially accepted by him. The group steadily develops a better understanding of its own problems, both collectively and individually. The individual can more easily face the realization of his mistakes when he feels that the group understands them and can identify with him in them, and when he can see that he is not the only one to make mistakes of this kind. Moreover, it takes only a very short time for the group to discover that the technique of each member, including the psychiatrist group leader, is an expression of his personality, and so, of course, are his habitual mistakes.

Admittedly crises occur from time to time, when one or other member finds it difficult to accept the full implications of some of his ways of handling his patients, or the realization of some facets of his personality that he had been only dimly aware of. These, however, can be borne, as they are also group events and do not solely concern the individual. It has been easy to describe this state of affairs, but it is rather difficult to explain its dynamism. So long as the mutual identifications of the members are fairly strong, any individual member can face strains because he feels accepted and supported by the group. His mistakes and failings, although humiliating, are not felt as singling him out as a useless member; quite on the contrary, he feels that he has helped the group to progress, using his failings as stepping-stones.* Crises may occur when there is some tension between one or the other member and the rest of the group which the leader has not detected soon enough (I would add that neither his role nor his psychiatric training confers on the group leader an absolute immunity against this hazard), and, instead of re-establishing good cohesion, his criticism may help to widen the gulf.

Signs of this isolation or tendency to isolation and the accompanying touchiness can be regarded as the equivalents of what psycho-analysis calls resistances. On the one hand, they are premonitory signs that some major personal attitude of the individual is being tackled in the group situation; on the other hand, by the way in which the isolation is achieved and maintained, they show what the problem is. In the same way the reaction of the integrated group towards such an attempt at isolation reveals the other side—that is, the counter-transferences of the group to the particular personality problem. The way in which a member isolates

himself, as well as the way in which the group deals with it, must be shown up. They represent very valuable material for studying interpersonal relations, and their full realization is a necessary condition to the re-establishment of a workable cohesion.

If such crises occur too often, or leave a bitter resentment behind, it is a sign that the pace of training has been too exacting and that the group has been made to work under considerable strain for some time. It is an equally ominous sign, however, if no crises occur at all; it means that the sensitivity and grasp of the group are not developing, the group and its leader are in real danger of degenerating into a mutual admiration society where everything is fine and we are nice, clever, and sensible people. It is a fact that acquiring psychotherapeutic skill is tantamount to discovering some hard and not very pleasant facts about one's own limitations. This unpleasant strain must be faced, and the group develops as long as it can face up to it, and stops developing as soon as it tries to avoid it. It is the task of the group leader to create an atmosphere in which each member (including the leader) will be able to bear the brunt when it is his turn to bear it.

It is a precondition of our technique to establish this kind of atmosphere in the group, and it is only in such an atmosphere that it is possible to achieve what we term "the courage of one's own stupidity." This means that the doctor feels free to be himself with his patient—that is, to use all his past experiences and present skills without much inhibition. At the same time he is prepared to face severe objections by the group and occasionally even very searching criticism of what we call his "stupidity." Although every report and case conference is definitely a strain and an effort, the result is almost always a widening of one's individual possibilities and a better grasp of the problems.

Importance of Timing

One of the most important factors in this kind of training is timing, which in the first approach means not to be in a hurry. It is better to allow the doctor to make his mistakes, perhaps even to encourage him in this, than to try to prevent them. This sounds rather foolhardy, but it is not; all our trainees have had considerable clinical experience, and this "sink or swim" policy was justifiable. Apart from not undermining the confidence and dignity of the doctor, it has the added advantage of providing ample material for discussion, since everybody was seeing patients all the time and was anxious to report his findings and discoveries, his successes and difficulties. As I have confessed, this policy may have been too much for some doctors, and we had a fair number of "casualties" who did not wish to continue.

If the timing is good enough, the doctor feels free to be himself and will have "the courage of his own stupidity." Gradually he becomes aware of the type of situation in which he is likely to lose his sensitivity and ease of response, or, in other words, to behave automatically. Meanwhile the reports of the other doctors have shown him what other ways might be adopted in similar situations. The discussion of the various individual ways, demonstrating their advantages and limitations, encourages him to experiment. (One practitioner announced the result of such an experiment thus: "I have done a real 'Smith' in this case—and it worked," meaning he had adopted the attitude he felt Smith usually adopted.) Every such experiment means a step towards greater freedom and better skill.

Attitude of the Group Leader

Perhaps the most important factor is the behaviour of the leader in the group. It is hardly an exaggeration to say that if he finds the right attitude he will teach more by his example than by everything else taken together. After all, the technique we advocate is based on exactly the same sort of listening that we expect the doctors to acquire. By allowing everybody to be themselves, to have their say in their own way and in their own time, by watching for proper cues—that is, speaking only when something is really ex-

pected from him and making his point in a form which, instead of prescribing the right way, opens up possibilities for the doctors to discover by themselves some right way of dealing with the patient's problems, the leader can demonstrate in the "here and now" situation what he wants to teach.

Obviously no one can live up to these exacting standards without some shortcomings. Fortunately there is no need for perfection. The group leader may make mistakes—in fact, he does quite often—without causing much harm if he can accept criticism on the same, or even somewhat sharper, terms as he expects his group to accept. This must be watched very carefully, and any hesitation by the group in exposing the leader's mistakes must be pointed out. Obviously this freedom cannot develop if the leader tries to hedge or to explain away his failings. It is a very wholesome sign if the group can run the leader down, even if they have some fun at his expense, if only they can do so without rejecting him or turning hostile to him. (Incidentally, this frank criticism is another way in which practitioners can teach us specialists.)

The Training Technique

One more word about the number of doctors who dropped out. The technique described here is still in its experimental stages—that is, it is crude and harsh. We are fully aware of this and we have decided to accept the risks involved. Our first consideration has been to develop a technique that is workable for a fair enough proportion of the doctors interested, in order to test out whether such a training technique is possible at all. The results of the two pilot projects—the Family Discussion Bureau scheme for social workers and the Tavistock Clinic scheme for general practitioners—are highly encouraging, although as yet not final. As soon as our technique is fairly securely settled, our next concern will be to examine our "casualties"—that is, the reasons why so many of our entrants have to leave us. It is true that psychotherapy in the same way as, for instance, surgery, is not within everybody's reach; nevertheless our "casualty rate" is too high. Conversely, this means that our training technique is, for the time being, inelastic and too exacting for a great number of practitioners.

There is, however, one very important difference between this kind of training and any other training in one or other of the many specialties in medicine. Any advance in therapy demands a new skill from the doctor, even if it amounts only to learning the correct ways of prescribing a new drug. In other words, mastering a new therapy means a change. But, whereas the changes required by new techniques in any of the other branches of medicine do not touch much upon the doctor's personality, the technique of psychotherapy involves the personality fairly deeply. From this angle the action of some doctors who dropped out is perhaps a sensible defence against an unauthorized violation of their private mental life, a defence that must be treated with respect. The diametrically opposite danger is that the group training may degenerate into therapy pure and simple. We are fully aware of this possible complication, which, in fact, is present in every form of psychiatric training, but as our scheme is a very young one we have not had to come up against it.

Summary

A training scheme in psychotherapy is described, in which the emphasis has been put on acquiring a personal skill instead of on teaching. The aim is to make the general practitioners aware of what their patient wants to convey to them, not so much by his words as by his whole behaviour, and of how their own general behaviour and actual responses influence what the patient can actually tell them. We have tried not to teach them what psycho-analytic or any other theory could say about the working of the human mind; instead we have

aimed at enabling them to be free enough to feel and understand what is going on between the patient and themselves in their surgery.

APPENDIX

It is generally recognized that it is rather difficult to describe in a condensed and concise form the subtle work of psychotherapy in any given case. That is the reason why only two case histories are given here as illustrations. The first describes the events and the consequences of what we called "the collusion of anonymity" between the general practitioner and his consultants. The second case tries to give an impression of the stage to which psychotherapeutic skill and understanding of our course have developed. When judging the case history, the reader must bear in mind that the work reported here was done in the third month of a course which is planned to last two years. Both case histories were compiled by the doctor treating the patients. Since, according to our idea, the doctor's personality plays also an important part in every therapy, I start each case with a short characterization of the doctor in charge.

Case 1

The doctor attending this case works in a partnership. His partner is a straightforward practitioner who wants to get on with the job. The reporter, however, is interested in the psychological implications of the illnesses and has a fair knowledge of the current psychiatric ideas. He reports:

"A married childless woman aged 32 has been on my partner's list since 1946. She complained then of epigastric and chest pains. In April, 1946, my partner sent her for investigation to an eminent physician, who reported: 'You will be glad to hear that this patient's chest x-ray film is quite normal. She seems very pleased at this, and I think most of her symptoms are functional, and I hope that the reassurance that I have given her may be of some help.' A short while after this the patient was unhappy about the condition of the chest, as the pain returned, and she was sent for x-ray examination to a chest clinic. The physician to the chest clinic reported in May, 1946: 'You will be pleased to learn that there is no evidence of pulmonary or pleural tuberculosis. I think the epigastric pain originates in the abdominal wall—that is, it is probably muscular or fibrous in origin. Massage might now be tried.' Massage was accordingly tried, but with little success.

"She was a frequent visitor to the surgery, and was seen by me first in October, 1946. I thought then that her symptoms might be due to 'chronic appendicitis.' I referred her to a gynaecologist first, who wrote in 1947: 'This lady is rather puzzling. She has been under Dr. L., who had her completely investigated and found nothing; I must admit I can find nothing abnormal, and from the gynaecological point of view I have drawn a blank. Whether in view of her constant pain in the right side and her chronic constipation there is the possibility of appendix trouble, it is difficult to say, but if you wish I will ask one of the surgeons, etc.' A surgeon was accordingly asked, and he said, in October, 1947: '... I have advised her to come into hospital for the removal of the appendix.' Appendicectomy was carried out in December, 1947. She came to see me practically every week with a variety of pains, sometimes in the right iliac fossa, sometimes in the back, and drove me frantic with seemingly irrelevant chatter and unwillingness to leave me during a busy surgery. I sent her to see a well-known orthopaedic surgeon on account of her persistent backache. He said in January, 1948: 'She has a supple back, although there is some slight tenderness in her lumbar muscles. I am arranging for her to have some treatment in the physiotherapy department.'

"She attended my surgery every week regularly, had still the same complaints as before, and began, to my puzzlement, to be rather aggressively flirtatious with me. I then told her one day, rather abruptly, that there was little more I could do for her and that it would be best if she went back to her job as a sales assistant and not come back to see me for some time. I did not see her again until 1950. She came then with her old complaints of pains again and in the attitude of a penitent child ('Didn't you miss me,' and 'I hope you won't be cross with me any more'). She still came every week, again became flirtatious and tried to put her foot on mine, and one day put her hand on mine. I

*In psychiatric terms, the depression caused by the realization of one's shortcomings must be fully accepted; identification with the common group ideal must remain, now as before, a desirable and attainable aim, but the group leader must watch very carefully when and how one or the other member is forced or allowed to slide into a paranoid position of the one who has been "singled out."

rebuked her, and she cried. She came back the following week and in subsequent weeks, receiving five to ten minutes' chat and a bottle of medicine on each occasion.

"Since then, owing to a greater awareness of personality disorders on my part, she has been given a one-hour interview in which, *inter alia*, she told of her childhood, of a father who was in the Navy and away from home most of the time, of a much-loved younger brother who died at the time of the onset of her symptoms, of her dyspareunia since the beginning of her marriage, and her complete inability to have sexual intercourse since her brother's death. Further investigations are in progress. Her attitude to me since that interview has much changed: there are no more efforts to flirt and there is an improvement in her symptoms. But it took four years to get that hour, and an appendicectomy. *Mea culpa!*"

Case 2

The doctor in charge of this case is a well-experienced and rather cautious general practitioner. Although he seemed to be sincerely interested in his patients' psychological problems he was careful, until coming to the course, not to get too much involved with them. He attended for three terms, hardly missed a conference, and, although following the discussions with great interest, even to quoting his own experiences, never tried any real psychotherapy with his patients. Then suddenly he decided to start with one case, and on the same day the case of which the following is his report occurred in his practice. It was this case which he started reporting with the phrase, "I did a real Smith—and it worked."

"The patient, a boiler coverer, aged 26, was a quiet, thin, pale, neat, inoffensive young fellow. Married three weeks before. Severe headaches. No relief in tab. codein. Pain 'behind eyes'; feels 'something wrong with brain.' Cannot go to sleep, and wife has to sit with him and hold his hand. Worries about 'floods.' For the last two months he could not go to the cinema; he gets lost in the film and suddenly 'comes to,' gets a 'crowded-in feeling,' feels panicky, screen seems to recede, and he has to rush out of the cinema. He also fears boilers now and is jumpy when working on them. He has always found it hard to make friends and is content to be by himself.

"No sex life before marriage. Satisfactory now for him, but wife has to be manually masturbated to achieve orgasm. ('I feel funny telling you that.') Feels content sitting in in-laws' house now, in spite of noise of numerous children, but is not so happy about going out. His wife has recently recovered from pulmonary tuberculosis and is at work again. The patient is very 'fussy'; does all the housework himself because he likes to do it, not of necessity. Gets a 'kick' out of giving his wife breakfast in bed.

"Family History.—Mother died when he was 3 years old, and he and his two elder brothers were sent to an orphanage, where he stayed until 14. Father had tabs and was blind. When the patient left the orphanage he became the maid-of-all-work at home. It was he who did the shopping and cooking and cleaning. He led his father about all the time, not his brothers. (This I remember very well, as I used to treat his father and knew the family set-up well.) His only hobby was motor-cycling, and he always took his father out on the motor-cycle. He thinks his father's blindness was due to war injuries and experiences. He himself often wondered what it was like to be blind, and often did a 'silly thing'—drove his motor-cycle blind to see what it felt like. His father's mother was blind (he was told) and she was also the youngest in her family.

"He dislikes his elder brother intensely and the dislike is reciprocated. This brother always acted the big boss: he expected to be waited on, 'took everything for granted,' and expected the patient to wait on him like a slave. The brother does not drink nor smoke, and is a highly critical sort of chap. He even supervised the patient's courtship, told him when he should get home at night, and strongly advised him against marriage. The brother's marriage broke up after three weeks and was 'annulled' (that was the word he had heard used.) The patient was afraid of him, but now they are not on speaking terms and pass each other in the street.

"Two weeks ago the patient was admitted to hospital for investigation because of the severity of the headaches. He was discharged after a few days, being told it was his 'nerves.'

"Hospital Notes (seen by me).—Came to hospital in taxi as he could not walk owing to severity of headaches. Admitted: ? sinusitis; ? migraine. Investigated, and no organic cause found. C.N.S. clear. Discharged. To be seen again next week. ? Psychiatrist."

"March 13, 1953.—He reported to me immediately after he left hospital, complaining that headaches were still persistent and

that he could not get to sleep. 'I don't know why I should be like this; after all, it is the first time in my life I have been free from financial worry—for example, paying off motor cycle and wife is over her I.B. and is working. Thus I can have little luxuries I could not afford before.'

"Immediate Interpretation After Taking History.* Assured not organic and nothing to do with father's blindness. 'You have always been pushed around since childhood and always in an inferior position. The Cinderella of the family. You had no right to be all right. You always had to carry a burden and had no right to affection (which you really craved). Now you are suddenly free of your tasks (through which you were playing out your inferior position) and you are immediately obsessed with guilt. So you have to atone with a symptom—the obvious one being headache behind eyes associating yourself with your father, to whom you were attached (and perhaps unconsciously resented). 'I thought of that myself.'

"March 16.—Saw the patient again. He said he felt 'marvellous.' No headaches; knows it is not organic now and understands symptoms are due to his previous life; sleeps through the night and goes off to sleep immediately; not frightened in a crowd, and is very grateful.

"May 7.—The patient has been back at work since March, is very happy with his wife, sleeps well, and has no complaints at all."

Postscript when reading the proofs. Report of the practitioner on October 22: "Man not seen for several months, only wife, who reported that he was fine. He occasionally gets headaches, which do not amount to anything, and he continues working. He is much easier to live with, and from the point of view of the wife he is a complete cure."

MYELOMATA OF BONE A REVIEW OF 25 CASES

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Myelomata are said to be the rarest form of bone tumour (Geschickter and Copeland, 1936; Cade *et al.*, 1947), yet of 25 cases here reported 24 have been treated in this hospital group over the past five years, and one of us (A. N.) has had nine under his care in the past two years. During this same five-year period 13 cases of osteogenic sarcomata of bone (including three cases arising in Paget's disease) have been treated in the Bradford Regional Radium Institute. Osteogenic sarcoma is given considerable prominence in medical textbooks, yet it is apparent that its incidence is less than that of myelomata of bone. We suspect the incidence of the latter is not so uncommon as is usually suggested, and believe that many cases are wrongly diagnosed as secondary carcinomata or never diagnosed. Four cases in this series were diagnosed only when the patient was admitted in extremis. One is apt to associate myelomata with the textbook picture of multiple discrete osteolytic lesions in the skull, clavicle, vertebrae, and ribs, but this is usually the terminal picture. Hence one finds that most cases have a history lasting one to two years before the diagnosis is made. Early diagnosis is difficult because the condition is often asymptomatic for a long period, while signs and bio-

*This interpretation was what the doctor described as: "I did a real Smith."

chemical changes are very variable and not all are present in an established case. We wish to emphasize that one or more negative investigations do not exclude the condition, and the whole gamut of confirmatory tests is required before we can be confident of its absence.

While textbook descriptions stress the multiplicity of the lesions, and this is no doubt the commonest type, solitary and diffuse forms of the condition are encountered. The tumours are soft, reddish purple in colour, and vascular, although central necrosis may be present in large tumours (Case 4). They consist of ovoid or pyriform cells with a nucleus which has a nucleolus and a typical "clock" or cartwheel appearance due to dense chromatin.

We find the disease to exist in three forms: (1) a solitary form in which a large tumour is present; (2) a diffuse form in which the lesions are small and cause a diffuse decalcification of the affected bone; and (3) a multiple form into which the others usually develop when the plasma cells are aggregated into discrete nodules forming localized osteolytic lesions.

Myelomata Initially Solitary

Willis (1941) enunciated the criteria which determine the diagnosis of solitary myeloma—histological diagnosis, radiographs of the entire skeleton at regular intervals, and the absence of Bence Jones proteose from the urine. Only 23 cases of proved solitary myeloma have been described (Lumb, 1952). Many described as such have subsequently become multiple. The solitary tumours are large and affect the long bones and spine (Chesterman, 1935; Willis, 1941) as opposed to the affection of the flat bones and ribs by the multiple form.

There is little doubt that many myelomata are solitary initially, but the picture of multiple myelomata usually develops. It is therefore probable that this form and those which appear to be initially multiple are a single pathological entity, the rate of metastasis being extremely rapid in the multiple form, which is the end-stage of the disease. Some pathologists, however, maintain that multiple myelomatosis is a multifocal systemic disease without metastasis (Lumb and Prosser, 1938) and that the solitary myeloma is a separate entity. This view is difficult to reconcile with our experience and the other recorded cases of solitary tumours which ultimately disseminate (Cutler, Busch, and Cantril, 1936).

Case 1.—In November, 1944, a man aged 36 fell on to his sacrum. In July, 1945, he developed severe pain in the lumbo-sacral region and both legs. X-ray examination revealed the presence of a multilocular cystic tumour involving the entire sacrum. The sacrum was expanded and the cortex eroded anteriorly. Trabeculation was present. Biopsy on July 21 showed typical plasmacytoma. The blood picture was normal. Deep x-ray therapy was given. He remained well and there were no deposits in the ribs until July, 1951. Sternal puncture then showed myelomatosis to be present. In August he was given a course of stilbamidine and deep x-ray therapy, which relieved his pain a little. The patient is still alive, but is confined to bed owing to his rapidly deteriorating condition. Comment: This tumour remained solitary for seven years, but ultimately the typical multiple form developed.

Case 2.—A woman aged 63 was first seen in 1947. She complained of pain in the right loin for two years and had

recently noticed a lump in this situation. An x-ray film showed rarefaction of the twelfth rib. Kahn test negative. Tumour excised—section showed a tumour of undifferentiated round cells and no definite pathological diagnosis made. Two years later she had a similar mass over the left sixth rib. Bence Jones protein absent from urine. Mass excised but no definite pathological diagnosis made. On March 30, 1950, a further mass was removed from a rib which proved on section to be a myeloma. The patient died one year later.

Case 3.—In May, 1948, a man aged 41 fell from a ladder and attended hospital. X-ray film revealed solitary cyst in the upper end of the femur. The other long bones, ribs, and skull were not examined radiologically. Biopsy revealed the presence of a plasmacytoma. Deep x-ray therapy was given. In August he was readmitted and died within twelve days. X-ray examination revealed punctate osteolytic lesions in ribs, skull, and pelvis. Urine: Bence Jones protein and albumin present. Blood: Hb, 55%; W.B.C., 6,000; moderate rouleaux formation; total protein, 12.8 g.% (albumin 3.0 g., globulin 9.8 g.); A/G ratio, 1:3.27. Necropsy confirmed the diagnosis of multiple myeloma.

Case 4.—This case represents the closest approach to the solitary plasmacytoma in this series. The patient, a man aged 28, was seen on February 21, 1952. The first symptom was pain below the knee, present for the previous nine weeks. It was worse when he walked. Examination revealed tenderness over the tibial condyle, no effusion in knee, and full knee movements. An x-ray film showed a



FIGS. 1 and 2.—Case 4. Myeloma of tibia.

multilocular cyst in the upper end of the tibia extending down the shaft, but not expanding the cortex. On later review two small translucent areas could be seen below the main cyst (Figs. 1 and 2). Films of the skull, ribs, and long bones showed no other tumour. Urine: Bence Jones protein absent. Biopsy: typical plasmacytoma—central necrosis of the tumour present at operation; Unna-Pappenheim staining showed typical plasma cells. Sternal puncture, normal. Blood: acid phosphatase, 1.3 units; alkaline phosphatase, 4.3 units; total plasma protein, 6.8 g.% (albumin 3.8 g., globulin 2.8 g.); A/G ratio, 1.5:1. An x-ray film four weeks later showed two small translucent areas in the skull. Deep x-ray therapy was given. The symptoms cleared and he walked without pain or limp. The tumour has not enlarged and no further changes have occurred in other bones. Plasma protein is still unchanged. Comment: This case would appear to resemble that described by Chesterman, but the two nodules in the skull suggest that multiple lesions will appear at some future date.

In the cases described above, Bence Jones protein was absent in two, and present in one when multiple lesions had appeared. It is probable that changes in plasma globulin and A/G ratio are late changes and present only when there are multiple deposits.

Multiple Myeloma

The established multiple myelomatosis may appear in circumscribed or diffuse forms, and again the latter may develop into the former. The picture of the circumscribed variety is that which we have been apt to assume from our textbooks as the only type, but the well-established picture of multiple osteolytic lesions in the skull, pelvis, scapulae, ribs, and other bones appears to be a late stage in the disease. Unfortunately diagnosis before this stage is reached is not always possible, as many diagnostic features may be absent; and, as there is often a paucity of symptoms, or none, its presence is often unsuspected. The presenting symptoms are variable, but localized pain, especially persistent backache, was a feature in many, and paraplegia was present in two of our cases. It is possible that the discrete punctate form is preceded by a diffuse form producing general decalcification. Then discrete nodules produce osteolytic areas.

Case 5.—Man aged 56. Presenting symptoms and signs: ascites and ulceration of mouth. Diagnosis: cardiac failure and thrombosis. Ultimately diagnosed as multiple myeloma. Died without treatment. Blood picture: Hb, 47%; E.S.R., 83 mm.; W.B.C., 8,600; marked rouleaux formation present. Sternal puncture, plasma-cell myelomatosis. Blood urea, 40 mg. per 100 ml. Total protein, 11.5 g. (albumin 1.9 g., globulin 9.6 g.); A/G ratio 1:5. X-ray films showed multiple punctate osteolytic areas in skull, ribs, and pelvis. Urine: Bence Jones protein absent.

Case 6.—Man aged 42. Presenting symptoms: proptosis and headaches. X-ray films revealed multiple punctate areas of erosion in the skull. No changes in ribs and other bones. Blood protein and A/G ratio unchanged initially, but after two months the total protein was raised and the A/G ratio became 1:3.8. Course of stilbamidine given. Died four months later. Note: Normal proteins initially.

Case 7.—Woman aged 64. Presenting symptoms: lassitude and dyspnoea for six weeks. Died within two weeks of attendance at hospital. Sternal puncture positive for myeloma. X-ray films showed punctate areas in ribs and skull. Plasma-protein estimations and presence or absence of Bence Jones protein not recorded.

Case 8.—Woman aged 58. Presenting symptoms: nausea and cough for six weeks. Died two weeks after hospital admission. X-ray films showed multiple punctate areas of erosion in ribs, skull, and pelvis. Blood picture: Hb, 80%; W.B.C., 10,000; urea, 120 mg. per 100 ml.; protein not estimated.

Case 9.—A man aged 53 had backache for four months and then developed weakness and paraesthesia in one leg after three months. Paraplegia developed and he was admitted. Examination showed paraplegia due to lesions at level of D8. X-ray films showed osteolytic lesions in ribs and skull, with compression of D7 vertebral body. Disk spaces intact. Blood: protein 7.4 g., A/G ratio normal; acid phosphatase 1.5 units. Urine: Bence Jones protein absent. Deep x-ray therapy and stilbamidine given. Readmitted eight months later; no change in paraplegia; deposits in shoulder girdle and cervical spine. Died 13 months after first attendance.

Case 10.—Man aged 58. December 8, 1950: presenting symptoms: cough for six weeks and tumour of angle of mandible extending to ramus. X-ray film showed obstruction of angle of mandible with erosion of ramus. December 14:—biopsy: typical plasma-cell myeloma. January 15, 1951: x-ray film showed erosion of first rib. February: course of deep x-ray therapy given—3,000 r to mandible and shoulders. May 9: x-ray films showed defect in upper end of femur; no destructive lesion in spine. Incontinence

of urine. Suprapubic cystotomy performed. Test for Bence Jones protein not performed. Further deep x-ray therapy and nitrogen mustard given without effect. Patient died on July 27, 1952.

Case 11.—Woman aged 64, referred from radiotherapy department May, 1949, with 2 osteoclastoma of sternum. Presenting symptoms: backache, pain in chest and arms for six months. X-ray film showed loculated tumour in manubrium sterni. No other radiographs of bones taken. Deep x-ray therapy given. In November, 1949, pain had been relieved but tumour unchanged. X-ray examination showed translucent areas in several ribs and right clavicle. Urine: Bence Jones proteose present. E.S.R., 47 mm. Total plasma protein, 6.6 g. (albumin 2.9 g., fibrinogen 0.17 g., globulin 2.9 g.); A/G ratio 1:1. Course of nitrogen mustard therapy given in January, 1950. In July, 1950, x-ray examination showed no further changes. Patient died September, 1951; own doctor stated cause to be "coronary thrombosis due to hyperpiesis."

Case 12.—Man aged 68. Presenting symptoms: breathlessness, diplopia, and numbness of face for three weeks. X-ray film of skull showed punctate areas typical of myelomatosis. No lesion in pelvis. Total protein, 7.5 g. (albumin 5.7 g., globulin 1.8 g.); A/G ratio, 3.1:1. Alkaline phosphatase, 4.4 units; acid phosphatase, 0.9 unit; blood urea, 210 mg. per 100 ml.; E.S.R., 13 mm.; W.B.C., 12,000; Hb, 90%. Urine: Bence Jones proteose absent. Sternal puncture: typical of myelomatosis. Died two weeks after initial observation.

Case 13.—Woman aged 47. Presenting symptoms: feeling of weakness for many years, backache for six months, exophthalmos. Blood: cholesterol, 250 mg. per 100 ml.; total protein 7.9 g. (albumin 6.2 g., globulin 1.7 g.); A/G ratio, 3.6:1; Hb, 90%. Sternal puncture: normal. Urine: Bence Jones proteose absent. X-ray film of skull: punctate areas typical of myelomatosis; no lesion in other bones.

Case 14.—Woman aged 64. May 12, 1952: presenting symptoms: pain in right lower ribs. Blood: Hb, 48%; R.B.C., 2,900,000; W.B.C., 4,400; total protein, 11.0 g. (albumin 5.1 g., globulin 5.5 g.); A/G ratio, 1:1. Urine: Bence Jones proteose present. X-ray films showed multiple destructive lesions in ribs and skull, with generalized decalcification. Stilbamidine and deep x-ray therapy given. Last seen July 30, 1953. Pain then considerably relieved.

Case 15.—Man aged 71. July 30, 1952: presenting symptoms: repeated epistaxis and melæna. X-ray films showed multiple small areas of translucence in skull, right humerus, and right femur. Blood: total protein, 7.95 g. (albumin 2.65 g., globulin 5.3 g.); A/G ratio, 1:2. Course of deep x-ray therapy given.

Case 16.—Woman aged 59. Presenting symptoms: low back pain for eighteen months, unrelieved by bed rest or plaster immobilization. X-ray films showed general decalcification of lumbar and dorsal spine and pelvis. Blood: total proteins, 8.0 g. (albumin 3.9 g., globulin 3.8 g.); A/G ratio, 1:1; calcium, 10 mg. per 100 ml.; phosphorus, 3.2 mg. per 100 ml.; Hb, 68%; W.B.C., 9,000. Some months later x-ray films showed typical punctate areas in ribs, pelvis, and skull. Sternal puncture: typical myelomatosis. Urine: Bence Jones proteose absent. Deep x-ray therapy relieved pain. Died three months after treatment. Comment: This case demonstrates the diffuse decalcification, followed by the appearance of the typical multiple osteolytic lesions.

Case 17.—Woman aged 60, seen in 1950. Presenting symptoms: pain in dorsal region for about three months. Had kyphosis and tenderness at D9-10. X-ray films showed collapse of D9; no lesions in ribs. Thought to have secondary carcinoma, but no primary lesion found. Six months later x-ray examination showed no further radiological changes; no lesions in ribs or humerus. Twelve months later, x-ray films showed punctate areas in dorsal and lumbar spine, skull, and long bones. Sternal puncture: typical myelomatosis. Urine: Bence Jones proteose

present. Blood: total protein, 6.0 g. (albumin 5.2 g., globulin 0.8 g.); A/G ratio 6.5:1. The patient is still alive. Has had a course of stilbamidine without demonstrable effect. No deep x-ray therapy given. Note normal serum proteins when all other typical changes were present.

Case 18.—Woman aged 56. Admitted February 18, 1953, with fractured shaft of right femur. There had been pain in the knee for the two previous months. X-ray films showed a fracture through a large cyst at junction of lower and middle thirds of femur. X-ray films of ribs, clavicle, scapula, and skull showed multiple osteolytic areas with no new bone formation. Uroselectan showed normal renal function. Urine: no Bence Jones proteose present on repeated testing. Blood: W.R. negative; blood urea, 27 mg. per 100 ml.; total protein, 5.7 g. (albumin 2.97 g., globulin 2.4 g.); A/G ratio, 1.2:1 (same when repeated after three weeks). E.S.R., 45 mm. per hour. R.B.C., 3,800,000; W.B.C., 10,000; Hb, 69%. Sternal puncture: positive for myelomatosis. Biopsy of nodule in left acromion process showed plasma-cell myeloma.

Case 19.—Woman aged 66. Admitted with history of increasing shortness of breath and weakness for a year. Doctor had noted that she was anaemic six months previously, and started some liver injections with no improvement. Three months previously she developed severe backache, which was aggravated by any attempt at movement, and was admitted in this condition. Had vague aching in most joints. No marked physical features. Bence Jones proteose—positive. Total serum protein, 7.2 g. (albumin 3.4 g., globulin 3.8 g.); A/G ratio, 1:1.1. Blood urea, 40 mg. per 100 ml. X-ray film showed no change in skull. Some compression of D5, 6, and 7, with decalcification. Generalized osteoporosis of dorsal and lumbar spine. Osteolytic areas in ribs and sternum. Sternal marrow puncture: 90% of cells were plasma cells. Blood count: Hb, 22%; leucocytes, 3,800.

Case 20.—Woman aged 69. Presenting symptoms: shortness of breath and feeling of tiredness for six months. Physical examination showed no definite features. X-ray films of skull, femora, and pelvis showed bone detail within normal limits. Old fracture of right clavicle and left eighth rib. Area of rarefaction in left clavicle. Sternal puncture: numerous lymphoid cells and abnormal early cells; ? localized deposit of leukaemia. Bence Jones proteose—negative; trace of albumin in urine. Blood: total plasma protein, 9.3 g. (albumin 1.3 g., globulin 7.7 g.); A/G ratio, 1:5.9; Hb, 48%; leucocytes, 7,300 (lymphocytes 2,701; polymorphs 2,236; myelocytes, 1,633). The patient died two months after admission. Necropsy: skull normal; sternum filled with whitish nodules; vertebrae contained similar white areas of marrow in lumbar region and upper end of femur. Sections taken showed myeloma, although cells resemble lymphocytes.

Case 21.—Woman aged 56. Presenting signs: pain in neck, radiating into occiput and to left shoulder and left clavicle. Developed stiff shoulder, which was treated and which has improved; but she still has some pain in the neck. Has noticed prominence of inner end of clavicle. X-ray film showed soap-bubble rarefaction of inner end of clavicle. Biopsy showed myeloma cells. Sternal puncture: myelomata; many atypical plasma cells. Bence Jones proteose—negative; trace of albumin in urine. Blood: total plasma protein, 10.1 g. (albumin 3.1 g., globulin 6.58 g.); A/G ratio, 1:2.1. X-ray film shows small area of rarefaction in the ribs. Skull: one area of rarefaction. Femur and lumbar spine: N.A.D. Dorsal spine: no areas of destruction.

Diffuse Type

Case 22. Woman aged 66. Presenting symptoms: pain in dorsal and lumbar regions for two years; increasing kyphosis for past six months; poor general condition, with

marked kyphosis. X-ray films showed general decalcification of dorsal spine. No destructive lesion in ribs or spine. Sternal puncture: positive for myelomatosis. Patient developed paraplegia within one month of examination and died.

Case 23.—Woman aged 68. Presenting symptoms: (1) dorsal pain for eighteen months, x-ray film one year previously showing osteoarthritic change, for which physiotherapy gave some relief; (2) increasing kyphosis over the past six months. X-ray films showed general decalcification and collapse of all dorsal vertebrae. No other destructive lesion in spine or ribs. Blood: total protein, 10.3 g. (albumin 3.8 g., globulin 5.88 g.); A/G ratio, 1:1.5; Hb, 48%; W.B.C., 3,000; calcium, 10.5 mg. per 100 ml.; phosphorus, 4.8 mg. per 100 ml.; alkaline phosphatase, 4.6 units. Sternal puncture: typical of myelomatosis. Urine: Bence Jones proteose absent initially, but present three weeks later. Stilbamidine therapy given. Died within two months of conclusion of course.

Case 24.—Woman aged 72. Presenting symptoms: exhaustion for two years; low back pain for nine months. X-ray film showed diffuse decalcification of dorsal and lumbar spine with collapse of D12. Disk spaces intact. Ribs decalcified, but no destructive lesion. Three months later, x-ray examination showed further collapse of D12 and fractures of ribs, but no changes in skull. Sternal puncture: typical myelomatosis picture. Blood: Hb, 55%; W.B.C., 4,000; blood urea, 72 mg. per 100 ml.; total protein, 12 g. (albumin 3.8 g., globulin 8.2 g.); A/G ratio, 1:2.36; E.S.R., 67 mm.; serum calcium, 13.8 mg. per 100 ml.; phosphorus, 3.5 mg. per 100 ml.; alkaline phosphatase, 10.4 units. Urine: albuminuria present; Bence Jones proteose absent. No treatment given. Diagnosis confirmed at necropsy.

Case 25.—Man aged 67. Presenting symptoms: low back pain for six weeks. Nothing abnormal on examination. X-ray film showed collapse of D11; chest and ribs, N.A.D. Blood: Hb, 83%; W.B.C., 4,100; E.S.R., 55 mm.; total protein, 7.8 g.; A/G ratio normal. Thought to be secondary carcinoma, but no primary neoplasm discovered. Deep x-ray therapy given, with relief of pain. X-ray examination two months later showed no further changes. Four months later patient developed severe pain and anaemia. Blood: Hb, 51%; W.B.C., 4,600; total protein, 10.6 g. (albumin 2.1 g., globulin 6.5 g.); A/G ratio, 1:3. X-ray films showed general demineralization of spine and ribs, but further collapse of D11, with collapse of L1 and 2. Sternal puncture: negative. Died two months later. Comment: Note the late appearance of serum protein changes.

Discussion

From a study of these cases we see that the large solitary myeloma occurs in the younger age group (average 40 years), but ultimate spread to the multiple form was experienced in all our cases. The diffuse form occurred in subjects over the age of 60 and proved to be the most difficult type to diagnose. The sex ratio in the solitary type was 3 males to 1 female, whilst in the multiple type the female sex predominated (11 females to 7 males). Of the discrete multiple type, two (Cases 16 and 17) were initially diffuse, and discrete punctate lesions developed after an interval, while simultaneous general decalcification was present in Case 14.

Local pain is the most common initial symptom, but pathological fracture and paraplegia are frequent presenting symptoms. The destruction of isolated vertebrae is apt to be confused with secondary carcinoma, and full investigation must be carried out in all cases. This should consist of: radiographic examination of the skull, ribs, and vertebrae; estimation of the total serum proteins and serum albumin and globulin; examination of the urine for Bence Jones proteose; and sternal marrow puncture.

The presence of Bence Jones proteose in the urine is a useful confirmatory test, but is often negative in the multiple cases, and its absence is of no significance in diagnosis. Further, it may be present rarely in other conditions—for example, secondary carcinoma of bone and myelogenous leukaemia.

In our series the test was positive in seven and negative in seven of the cases in which multiple lesions were present. It is negative while a myeloma remains solitary. This approximates to the figures given by Bayrd and Heck (1947), who found the test positive in 53% of the cases.

The serum-protein changes, when present, are diagnostic. There is usually a rise in the total serum protein, due to increase in the globulin fraction, leading to reversal of the albumin/globulin ratio. In the multiple cases in our series these changes were present in 13 and absent in 4, whilst they were not recorded in 4 cases. The change took place at a very late stage in Case 25. A normal serum-protein value does not exclude the diagnosis of myeloma, and the test has no prognostic value.

The blood picture varied extensively, but a severe reduction of the red-cell count was present only in the later stages of the disease in the multiple lesions, while little change in the white-cell count was experienced. A count within or near normal limits may be obtained in the presence of myelomata. A high E.S.R. was often recorded, and this may be associated with the increased serum globulin, as is the phenomenon of the increased rouleaux formation often seen in this disease. Sternal puncture was performed in 14 cases, with a positive diagnosis of myelomatosis in 12 of these.

In reaching a diagnosis we wish to emphasize the need for radiological examination of all bones and completion in all the tests discussed. Biopsy is usually required in the solitary type, as radiological differentiation from osteoclastoma is usually impossible. In lesions of the vertebrae we noted that decalcification followed by compression and destruction occurred, but the intervertebral disks were not affected. In this respect the condition resembles secondary carcinoma and differs from a tuberculous lesion. The frequency of backache as an initial symptom is noteworthy, and the condition should be borne in mind as the cause of such symptoms in the elderly, especially in the presence of osteoporosis and where the pain is unrelieved by rest or immobilization.

Treatment

The results of all forms of treatment make dismal and depressing reading, as these are of no avail in preventing the ultimate death of the patient. One wonders if the patients would not live equally long without treatment. Tennant (1945) described the case of a patient who was still alive five years after diagnosis and who had received no treatment. In our series one was still alive after the appearance of myeloma of the spine two years previously, although a course of stilbamidine had been given recently; while one was still alive seven years after deep x-ray treatment of an initially solitary tumour.

Of those initially solitary, in this series two were given deep x-ray therapy, one being still alive seven years after initial treatment, the other being still alive one year after treatment. One patient died without treatment, and the remaining case did not survive local excision.

It would seem that deep x-ray therapy is of no value in prolonging life in the multiple form, at least when administered when the full clinical picture is present. It is probable that this is the end-stage, and all treatment then will be of no avail. Deep x-ray therapy is of palliative value in relieving localized pain. Eight cases had such therapy alone, and seven survived an average of only nine months, the longest survival being two years. Three had deep x-ray therapy combined with stilbamidine, and died without the treatment having any appreciable effect on the course of the disease.

We have no proof of the value of stilbamidine in the treatment of myelomatosis. Three were treated with stilbamidine alone, and two died within two to four months of treatment. One was still alive six months after therapy. Nitrogen mustard administration also had no therapeutic value.

Consideration of this series of cases suggests that myelomata are not rare, but if the possibility of the presence of the condition is not realized diagnosis is belated. Early and full investigation should be made with this in mind. Full radiological investigation is also of value from the prognostic aspect, as cases in which the myeloma is initially solitary have a longer survival. Successful treatment of malignant disease requires early diagnosis, yet, with myelomata, we have tended to diagnose only the fully established condition. An analogous position would be where diagnosis of carcinoma or sarcoma is made only when metastases are present: when such a condition is reached treatment is of no avail. Hence we can expect little else if we wait until the similar dissemination has occurred with myelomata before we begin treatment.

We believe that the present textbook description of multiple myeloma is that of the end-stage of the disease and that it is analogous to the condition of general carcinomatosis. For efficient treatment we must diagnose the lesion at a much earlier stage. This problem still remains, but if we bear in mind that myeloma is a much more common condition than it was thought to be, we may be able to observe its early manifestations.

Summary

Twenty-five cases of myeloma of bone are reviewed to call attention to their frequency, as it is thought that they are not so rare as one is led to believe.

The difficulty of diagnosis of a disease which is often present in the absence of symptoms is discussed.

Treatment at present available has a questionable effect on the ultimate fate of the patient, but deep x-ray therapy has a definite place in the relief of pain and may prevent the onset of paraplegia when given to affected vertebrae. A case surviving seven years is recorded.

We are indebted to our staff colleagues at the Bradford Hospitals and to Dr. J. W. Hirst, of Huddersfield, for permission to review cases under their care.

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In his annual report for 1952 Dr. W. S. Walton, medical officer of health of Newcastle-upon-Tyne, describes the unsatisfactory housing conditions in that city. Though progress has been made in the building of new houses, "the city has a very long way to go before the living conditions of many of the inhabitants can be brought up to what might be termed ordinary reasonable English health standards of the mid-twentieth century." Out of every 100 households in the city 38 do not possess a separate bath, 18 are without separate water-closet, and 17 have no piped supply of water. About 18,800 of the 87,800 households in the city at the time of the 1951 census lived in one- or in two-roomed "dwellings." The index of persons per room—0.88 in Newcastle—is one of the highest for any area in England and Wales.

HAEMOPTYSIS, BRONCHIECTASIS, AND FOREIGN BODY IN LUNG

BY

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Parents and doctors are often amazed by the variety of objects, other than food, that children delight in placing in their mouths. Some of these are swallowed, but a few are inhaled, and the consequences are then usually dramatic. If not coughed up and out immediately, early bronchoscopy may be urgently necessary.

Occasionally, however, there is merely a short, easily forgotten episode of choking after such an inhalation. No more is thought of the incident until, maybe years later, the patient presents with symptoms and signs of segmental putrid bronchiectasis, in which the inhaled foreign body may be found. Jackson and Jackson (1950) mention 1,485 patients with bronchial foreign bodies; in 200 the diagnosis was overlooked for periods ranging from one month to forty years. Other and similar cases are reported by Leary (1950) and by Glennie, Dark, and Lindars (1952).

As foreign bodies are commonly inhaled by children, if a mother insists that her child has "swallowed something down the wrong way," or with something in its mouth has choked, gagged, or coughed, attention should be paid to the story and every practicable investigation be carried out to exclude the presence of a foreign body in the respiratory tract; laryngoscopy and bronchoscopy may be essential, as often there are no immediate radiological changes in the lungs. However, apart from possibly revealing the impacted material, radiology may help further in the diagnosis by showing an alteration in aeration of the affected lung. It is essential in this procedure to obtain, in addition to a lateral radiograph, a postero-anterior radiograph of the chest both in inspiration and in expiration (Asherson, 1940).

In the three patients whose clinical histories are given below, the foreign bodies were probably present for 12 months, 5 months, and 6 weeks respectively before being removed. All were composed of vegetable matter, and none could be seen radiologically. In the second patient, however, radiological evidence of obstructive emphysema was obvious, and in the third patient there was clinical and radiological evidence of pulmonary collapse. The first case was unusual in that the patient had recurrent severe haemoptyses—a departure from the typical clinical syndrome which merits special emphasis.

Case 1

On July 1, 1951, a boy aged 5 choked over a piece of "grass in seed." His mother tried to retrieve it by putting her finger down his throat, but, being unable to make him cough it up, assumed he had swallowed it. Five days later he complained of colicky central, and later right-sided, abdominal pain, loss of appetite, and constipation. He also had a painful cough and almost continual generalized chest pains.

On July 7 he was admitted to hospital. Examination then revealed a flushed ill-looking boy with a temperature of 102.4 F. (39.1° C.) and obvious respiratory distress. Respirations, at a rate of 30 a minute, were grunting and inverted,

his alae nasae were working and there was slight cyanosis of his lips. The chest showed diminished movement, and impaired percussion note and air entry on the right side, with a pleural rub and crepitations at the right base. The tongue was dry and furred, and oral fetor was present. There was some guarding and tenderness in the right upper abdomen. Throat and mouth swabs showed normal mixed flora. The Hb was 13.3 g. (90%); W.B.C. 23,500 per c.mm. (83% neutrophils). Degenerated pus cells and a few organisms were seen in the sputum. Culture yielded a moderate growth, chiefly *Streptococcus viridans*. Mantoux 1 in 1,000 was negative. An x-ray film of the chest showed pleural effusion at the right base with probably consolidation in the anterior segments of the right lower lobe.

As the boy was obviously ill on admission, he was placed in an oxygen tent and treated for supposed pneumonia with "sulphatriad" and penicillin. Chest radiographs taken two days after admission showed an abscess cavity with a fluid level in the right lower lobe and a right pleural effusion. As there was no apparent response to treatment after 48 hours, chloramphenicol was given, and 48 hours later, again because of lack of clinical response, it was replaced by aureomycin. This was continued for two weeks, sulphadiazine being given for the first six days of this course. He remained very unwell, with a high swinging temperature. Subsequent chest radiographs showed a second abscess cavity to have formed alongside the first, with accompanying consolidation of the right middle lobe and increase in size of the right pleural effusion. Pleural aspiration was attempted, but no pus was obtained. Because he was so ill treatment with chloramphenicol was repeated, but with no better result than before.

Eighteen days after admission he coughed up a little sticky yellow sputum for the first time and produced a larger quantity on subsequent days, from which a culture yielded a moderate mixed growth of *Str. viridans*, *Staphylococcus aureus*, and a scanty growth of *Candida*. His temperature soon settled, and with physiotherapy he became more active and his appetite improved. A chest radiograph showed some residual pleural thickening at the right base only. On September 11 he was discharged to convalescence. There he remained well until October 3, when he developed a loose cough and shortly afterwards had repeated small haemoptyses. There were clinical and radiological signs of partial collapse of the right lower lobe, so that on October 31 he was readmitted to hospital.

At this time he was afebrile, looked fairly well, and, apart from the above signs, the only new feature noticed since his previous admission was early finger- and toe-clubbing.

Bronchoscopy on November 2 showed that the whole tracheo-bronchial tree was hyperaemic, and a purulent discharge was observed coming from the right main bronchus. A bronchogram done on November 15 showed poor filling of some segments of the right lower lobe.

The boy had repeated and alarming haemoptyses, though remaining afebrile. On November 24 he coughed up about 6 oz. (170 ml.) of blood with a piece of tissue which was reported histologically to be "vegetable matter." There were no further symptoms until two weeks later, when he had a moderate pyrexia. A second bronchoscopy on January 4, 1952, under "cover" of aureomycin, showed no changes from those seen previously, and thereafter he was afebrile, fairly well, and, in fact, was discharged on January 22 to a convalescent home. After a short period he produced increasing amounts of pink-stained sputum which later became frankly blood-stained. On February 11 this amounted to about 4 oz. (114 ml.) in 12 hours. He was therefore again admitted to hospital, where he was found to be pale and slightly cyanosed, with a significantly greater degree of finger-clubbing, a mucopurulent nasal discharge, and clinical signs of collapse of the right lower lobe. Culture of his sputum yielded a profuse growth of "mixed organisms" sensitive to aureomycin only.

On February 14 the third bronchoscopy showed the right bronchial tree full of foul fetid pus. Further radiological

investigations, including tomograms, showed no more than collapse at the right base. Considerable difficulty was experienced in controlling secondary staphylococcal lung infection, but a further bronchoscopy on May 21 showed this was now much less, and despite general clearance of the exudate a foreign body was not found. Haemoptyses,

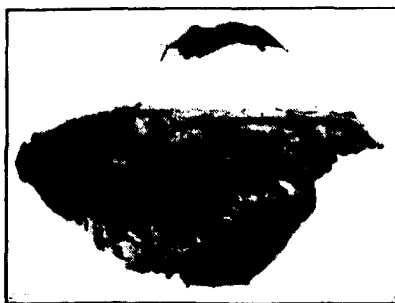


FIG. 1.—Case 1. Cavity in posterior basal segment of right lower lobe in which an ear of corn (inset) was found.

varying from 6 to 19 oz. (170 to 540 ml.) in 24 hours, continued, and on July 3 the right lower lobe was removed. On examination and dissection of the excised tissue it was noted that the lobe contained a cavity in the posterior basal segment which was in direct communication with a bronchus and might well have been a fusiform dilatation of a bronchus. It was filled with vegetable matter resembling an ear of wild barley (see Fig. 1).

Case 2

A female infant aged 18 months, the only child of healthy parents, had a cold in August, 1952, and a cough had since persisted for which her own doctor saw her in November. She was then febrile, and examination of the chest showed significantly diminished air entry over the left mid-zone posteriorly. Despite an inconclusive diagnosis she was treated with penicillin, and the temperature returned to normal. Subsequently, a radiograph of the chest was reported to show "epituberculosis of the left upper zone." At this stage she was referred to hospital.

Her listlessness had returned and her cough was more severe. Examination at this time, approximately five months after the onset of her cough, revealed a moderately well nourished but pale and somewhat wasted child in whom the only abnormal signs were confined to the respiratory system.

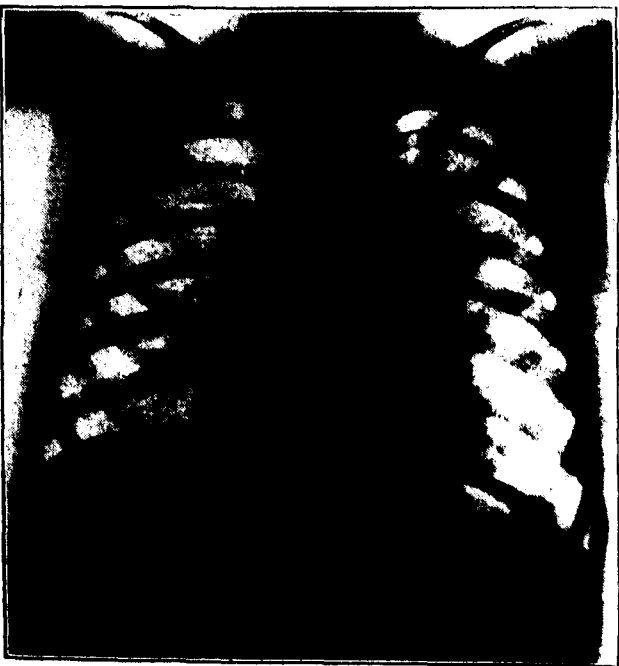


FIG. 2.—Case 2. Compensatory emphysema in left mid-zone of chest. (Foreign body found in left lower lobe bronchus.)

There was no finger-clubbing or evidence of mediastinal displacement. Movement and air entry were diminished on the left, but the percussion note was considered to be equal on the two sides of the chest and no adventitious sounds were detectable. Radiological examination showed collapse of the left upper lobe and part of the left lower lobe, and indicated also some compensatory emphysema of the remaining portion of the left lung (Fig. 2). The left hilar shadow was enlarged. It therefore seemed that there was obstruction to the left lower lobe bronchus, either the result of hilar adenitis due to tuberculosis or pertussis, or as the result of an inhaled foreign body. Tuberculosis was excluded by negative Mantoux tests. On direct questioning a "choking attack," was remembered by the mother and thought to have occurred with a sweet. This was thought to favour the presence of a foreign body, and the child was consequently admitted for bronchoscopy on December 26. The haemoglobin was 12.4 g. (84%) and the white-cell count 12,700 per c.mm. (neutrophils 9,600).

A bronchoscopy was performed on December 31. Vascular granulation tissue was seen in the left lower lobe bronchus, and below it a foreign body; this was removed and was subsequently shown to be a burr (fruit of *Agrimonia eupatoria*).

Subsequently, auscultation showed that air entry over the affected part of the chest had improved. There followed a short period during which signs of left lung collapse recurred, but with the aid of intramuscular penicillin and physiotherapy clinical and radiological recovery was complete. A bronchogram done later showed no abnormality.

Case 3

A boy aged 21 developed a cough at the beginning of January, 1953. As his six siblings were thought to have whooping-cough at the time, his cough was attributed to this infection. He developed signs of bronchitis, which resolved when treated with sulphadiazine. However, a week later his cough returned and signs of collapse of the right lower lobe were detected. Despite courses of chloramphenicol and penicillin, these signs persisted and he had a constant fever. He was therefore referred to hospital on February 12. He was afebrile and looked pale. Abnormal physical signs were confined to the respiratory system. Signs of collapse of the right lung base were found clinically and confirmed radiologically. After admission the Mantoux 1 in 10,000 and 1 in 1,000 was negative; the E.S.R., 44 mm. in 1 hour (Westergren); haemoglobin, 78% (11.6 g.); white cell count, 13,700 per c.mm. (neutrophils 6,800).

As the collapse of the right lower lobe was known to have been present for at least six weeks a bronchoscopy was performed on February 23. The right stem bronchus was obstructed by vascular granulation tissue, in the centre of which lay a friable white foreign body. This was removed in one large and several small pieces and appeared to be a nut. No gross damage to the wall of the bronchus could be seen. Re-expansion of the collapsed portion of lung was aided by physiotherapy, and three weeks later the collapsed lobe appeared clinically and radiologically to be fully aerated. On April 9 a bronchogram showed a mild degree of bronchiectasis of all the right middle and lower lobe bronchi. Physiotherapy was continued, and a bronchogram taken six months later showed the bronchial tree to have returned to normal.

Discussion

Ears of corn, grasses, and other vegetable matter may easily be inhaled; they may prove to be more dangerous than some inorganic or hard organic substances such as bone or teeth, particularly as vegetable matter may swell by imbibition and increasingly irritate the tracheo-bronchial mucosa. Often, in a matter of weeks or months, exuberant granulation tissue forms around such matter, and this reactionary mucosal swelling, when touched, bleeds easily, and

usually indicates the presence of a foreign body. This type of bronchial granulation tissue was seen in Case 1.

Inhaled material may travel far along the respiratory tract, and there are several reports of foreign bodies ultimately reaching the pleural cavity (Graham, 1929; Davidsohn, 1931) without the appearance of symptoms. Occasionally the inhaled foreign body has gradually penetrated the thoracic parietes and presented as a chest-wall swelling (Seydell, 1937; Sehring and Shaw, 1948) which might have the characters of a pointing empyema.

Mayo (1836) reported that "a boy, aged about 12, who was travelling in a carriage, happened to have an ear of rye in his mouth: the carriage being jolted, the ear of rye disappeared: it had dropped into the lungs, where it produced abscess." At necropsy the offending ear was found in an abscess involving the lungs and liver. Lung abscesses are, however, uncommon in children. Thus Brock (1952), in an analysis of 477 cases of lung abscess, found that only 15 (3.1%) occurred in children under 14 years of age, and none of these were considered to be due to foreign bodies. The same author quotes other workers for details of the incidence of lung abscess in children, with a variation from 2.6% to 18.3%. In a total of 2,250 lung abscesses reported in the American literature (Smith, 1934), of 59 abscesses in infants and children only 1 was recognizably due to an inhaled foreign body. Hence, on the evidence available, lung abscess would not appear to be a common sequel to the inhalation of a foreign body.

Owing to the anatomical distribution of the bronchial tree, foreign bodies are more common in the right than in the left lung and are particularly rare in the right middle lobe.

As stressed already, the symptoms may be delayed for a very variable period, possibly for weeks or even months. Cough is common and later becomes productive. Occasionally the sputum is blood-streaked, but frank and recurrent haemoptyses of several ounces at a time, such as occurred in Case 1, are distinctly unusual. A search of the literature has revealed only three other examples of haemoptysis occurring as the result of foreign bodies in the lungs. This is perhaps rather surprising considering how often the presence of a foreign body in a bronchus promotes the formation of vascular granulation tissue, which bleeds so easily when touched through a bronchoscope.

Flandin and Poumeau-Delille (1932) report the case of a patient aged 24 who was investigated for tuberculosis on account of recurrent haemoptyses. Eventually radiological examination revealed a needle in his lung. Linneweh (1935) reports a rather similar case. In 1918 a man aged 28 sustained a grenade splinter wound in his neck. Over the next 17 years he was investigated for recurrent haemoptyses and, finally, following a fatal haemorrhage, it was found that this splinter had travelled to the right main bronchus and had eventually penetrated a major blood vessel. Steiner (1947) reports a most extraordinary case of a patient who introduced a metal sound into the vagina in order to procure an abortion; this was lost and "forgotten about." Eventually the sound migrated to the left lung and caused severe haemoptysis. It was removed at operation, but the patient died one month later.

Despite three bronchoscopies the correct diagnosis in Case 1 was not made for a considerable time. This case was further misleading in that the patient appeared to recover for a time after coughing up the first foreign body; his relapse was due to a suspected second foreign body which could not be seen. It should be stressed, therefore, that, in a patient who may have inhaled a foreign body, full radiological investigation and expert bronchoscopy may be required, and even then the object may be beyond the range of view. If symptoms and signs persist after the removal of a foreign body the presence of a second one should be suspected. As bronchiectasis is sometimes a sequel to the inhalation of foreign material, a bronchogram should always be done once all such material has been removed. Case 3 exemplifies this.

Summary

The reports are presented of three children who inhaled foreign bodies. In the first, lung abscesses developed which were followed by severe and alarming recurrent haemoptyses. After 12 months' illness a lobectomy revealed an ear of corn in the removed lung. The other two patients had persistent coughs. In the second there were clinical signs of obstructive emphysema, and in the third signs of pulmonary collapse. After removal of a foreign body from the latter patient, bronchiectasis was found to be present.

The literature is reviewed and the following points are stressed: (1) The rarity of lung abscess in children even as a complication of inhaled foreign bodies. Chronic suppuration of unknown aetiology, occurring in the right lung especially, should, however, suggest the presence of a foreign body. (2) Haemoptysis is an uncommon complication of an inhaled foreign body. (3) The value of a complete radiological investigation and the importance of expert bronchoscopy in children alleged to have inhaled or choked over any object. (4) As bronchiectasis is often a sequel to the inhalation of a foreign body, bronchography is usually essential after the foreign body has been removed.

I wish to thank Professor A. V. Neale for continual encouragement and help in the preparation of this paper and for permission to publish details of Case 1. My thanks are also due to Dr. Beryl Corner for permission to publish details of Cases 2 and 3; to Mr. Ronald Belsey, who bronchoscoped the three patients and performed the lobectomy on the first, for his encouragement and permission to publish surgical details; to Dr. R. J. Sandry for the pathological report in Case 1; and to Miss Jean Sheach for x-ray films and reports. I am indebted to Dr. J. Apley for correcting the draft manuscript for me. The photographs were kindly supplied by the Bristol University department of clinical photography.

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The City Analyst of Birmingham, Mr. H. H. Bagnall, has been looking into the potency of the oral penicillin tablets sold in local pharmacies. During five months last year 82 samples were examined. Twelve samples had less than 80% of the prescribed potency. Of these, four contained less than 10% of the stated amount of penicillin, which Mr. Bagnall interprets by saying that "a patient stands a one in twenty chance of being supplied with tablets entirely devoid of any therapeutic value." The cause of the loss of potency appears to have been moisture admitted when the manufacturers' sealed containers were opened to dispense smaller numbers of the tablets. In his report (for the Third Quarter of 1953) Mr. Bagnall points out that this state of affairs is likely to be widespread in the country, but only in the largest centres is it possible for city analysts to undertake the research necessary to uncover it. As a solution, he suggests the establishment of about half a dozen regional laboratories to monitor the dispensing of the "wide range of new drugs listed in the *Pharmacopoeia* which have never yet come under the purview of the public analyst."

TUBERCLE BACILLI RESISTANT
TO ISONIAZIDVIRULENCE AND RESPONSE TO TREATMENT
WITH ISONIAZID IN GUINEA-PIGS

BY

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Barnett, Bushby, and Mitchison (1953a, 1953b) found among strains of tubercle bacilli an apparent relation between their degree of resistance to isoniazid and their virulence in guinea-pigs and mice. Strains with a high degree of resistance were of low virulence, whereas those with only a slight increase in resistance were fully virulent. However, only three out of the eight strains employed were recently isolated from human lesions. Furthermore, even with these three strains the virulence of sensitive cultures isolated from the same patients before treatment with isoniazid was not tested. To meet these objections the virulence of eight pairs of freshly isolated sensitive and resistant strains has been investigated in guinea-pigs. The response to treatment at a level comparable to that used in man was also found by treating half of the animals with 4 mg. of isoniazid per kg. per day, given by subcutaneous injection.

Methods

Strains.—The eight pairs of sensitive and resistant strains were obtained from the sputum of eight patients in the Medical Research Council (1952) trials of isoniazid. The sensitive strains, obtained before treatment with isoniazid, had been subcultured not more than three times over a period of up to six months before preparation of the inoculum. The resistant strains, obtained during or up to three months after treatment with isoniazid, were isolated on isoniazid-free Löwenstein slopes and were then subcultured twice on slopes containing isoniazid in concentrations shown in Table II. In this way admixture of organisms with a lower degree of resistance was eliminated.

The inoculum for infecting the guinea-pigs was obtained by suspending the growth from 12- to 17-day-old Löwenstein cultures in Tween-albumin medium. Quantitative sensitivity tests on Löwenstein medium and viable counts on oleic-acid-albumin agar were set up from all the suspensions as described by Barnett *et al.* (1953b).

Guinea-pig Experiments.—An injection of 0.1 mg. (moist weight) of each strain was given into the right thigh of six guinea-pigs. One subgroup of three of these animals received no treatment and the other three were given 2 mg. of isoniazid per kg. subcutaneously at both 10 a.m. and 5 p.m. daily, except on Saturdays, when only one dose was given, and on Sundays, when none was given. Treatment was begun immediately after infection and was continued till the animals either died or were killed. Pairs of guinea-pigs, consisting of one treated and one untreated animal, were killed after 6, 10, and 14 weeks. If any animal died spontaneously, none was killed in that subgroup at the next appointed time. At the necropsy a histological examination was made of the spleen, liver, and lungs of all animals in which there was little or no macroscopic tuberculosis, and of some of the remaining animals with visible disease. The degree of tuberculosis was scored out of a possible total of 100 as described by Barnett *et al.* (1953b). Portions of the spleens from animals infected with the resistant strains and from treated animals infected with the sensitive strains were cul-

*In receipt of a grant from the Medical Research Council.

tured on Löwenstein slopes, and a sensitivity test to isoniazid was carried out by the Medical Research Council (1953) method on any growth of tubercle bacilli that appeared. Serum isoniazid concentrations were estimated by Dr. S. W. A. Kuper, of the Brompton Hospital, using the method of Cuthbertson, Ireland, Woolf, and Kuper (1954).

Results

Sensitive Strains. All the untreated guinea-pigs infected with the sensitive strains developed widespread tuberculosis, which was often fatal within nine weeks, as shown in Table I. The average score for the amount of tuberculosis

TABLE I. Results in Guinea-pigs Infected with Eight Sensitive Strains

Strain	Viable Units Injected Oleic-acid-albumin agar	Untreated Guinea-pigs Dying from Tuberculosis		Average Amount of Tuberculosis out of 100	
		No. out of 3	Days till Death	Untreated	Treated
O.T.	2.4 × 10 ⁶	2	57, 62	71	0
McF	4.3 × 10 ⁶	1	39, 46, 57	81	13
L	4.2 × 10 ⁶	2	55, 60	89	13
McK	2.7 × 10 ⁵	0		60	0
H	7.9 × 10 ⁶	1	86	51	13
Ri	6.6 × 10 ⁶	2	49, 49	65	27
Ru	4.9 × 10 ⁶	1	50	79	0
Fy	3.8 × 10 ⁶	2	60, 62	76	27

varied from 53 to 89. Among the guinea pigs infected with the sensitive strains and treated with isoniazid there were 18 out of 24 with no macroscopic or histological evidence of tuberculosis. In the remaining six animals there was some tuberculous involvement at the site of inoculation or in the inguinal glands. The average scores, shown in Table I, varied from 0 to 3.1. These findings demonstrate the protective ability of isoniazid in the dosage used.

Resistant Strains. The results of the quantitative sensitivity tests on all eight of the resistant strains, together with one typical sensitive strain, are shown in Table II. The amount of tuberculosis in the guinea-pigs infected with the resistant strains is shown in Table III. In animals with

TABLE II. Results of the Quantitative Sensitivity Tests.
Log₁₀ Viable Units Per mg. of Bacilli

Strain	Isoniazid Concentration μ g./ml.							
	0	0.2	1	5	10	50	200	500
O.T. sensitive	7.3	2.2	—	—	—	—	—	—
O.T. resistant	2.2	7.2	—	—	—	—	—	—
McF	7.1	7.1	—	—	—	—	—	—
L	7.6	7.1	7.1	—	—	—	—	—
McK	5.9	5.9	7.6	—	—	—	—	—
H	6.9	6.9	5.5	3.8	1.2	—	—	—
Ri	6.0	7.0	6.9	6.9	6.9	3.1	—	—
Ru	7.2	7.2	7.0	7.0	7.0	3.6	—	—
Fy	7.4	7.4	7.2	7.2	7.2	6.6	3.2	—

TABLE III. Results in Guinea-pigs Infected with Eight Resistant Strains

Strain	Minimal Inhibitory Concentration of Isoniazid (μ g./ml.)	Isoniazid Concentration during Sub-culture (μ g./ml.)	Viable Units Injected Oleic-acid-albumin agar	Average Amount of Tuberculosis out of 100	
				Untreated	Treated
O.T.	1	0.2	5.1 × 10 ⁶	78*	30
McF	5	0.2	6.8 × 10 ⁶	58	64†
L	5	0.2	7.7 × 10 ⁶	22	30
McK	5	0.2	3.3 × 10 ⁵	11	14
H	50	10	5.0 × 10 ⁶	13	22
Ri	50	10	4.8 × 10 ⁶	11	12
Ru	200	50	3.7 × 10 ⁵	10	6
Fy	500	50	2.5 × 10 ⁶	15	20

* Two animals died from tuberculosis on the 64th and 77th days.
† One animal died from tuberculosis on the 83rd day.

scores of up to 20 there was a caseous abscess at the site of inoculation and a variable amount of caseation in the draining lymph nodes. The liver, spleen, and lungs, though macroscopically normal, often contained small tubercles or collections of histiocytes and lymphocytes. A score of 20 to 50 indicated macroscopic disease in the spleen, liver, and lungs, though less than would be found in animals infected with a fully virulent strain. Widespread generalized tuberculosis was present in animals with a score of over 50.

Virulence and Degree of Resistance.—As can be seen from Table III, an increase of resistance to isoniazid was associated with a decrease in the virulence of the strains. The scores of the amount of tuberculosis in untreated animals ranged from 78, caused by the strain with the lowest degree of resistance, to 10 to 15 caused by the four strains with the highest degrees of resistance. This relation can best be shown by including with the present results those obtained by Barnett *et al.* (1953a, 1953b), using other resistant strains, and also the results on a further two highly resistant strains (Table IV). One of these was obtained

TABLE IV.—Relation Between the Virulence and the Degree of Isoniazid Resistance of 17 Strains of Tubercle Bacilli

Virulence	Degree of Isoniazid Resistance			
	Growth on 0.2 μ g./ml. Not on 1	Growth on 1 μ g./ml. Not on 5	Growth on 10 μ g./ml. Not on 50	Growth on 50 μ g./ml.
High or just subnormal	3	2	0	0
Intermediate	0	1	1	0
Low	0	1	2	7*

* Three of these strains were variants of the laboratory strain H37Rv.

from a patient under treatment with isoniazid and the other was a resistant variant of the H37Rv strain obtained from Professor R. Knox, of Guy's Hospital, and used by Goulding and Robson (1952). Both were injected into two untreated guinea-pigs, which were killed after 10 weeks. In spite of differences in the time between infection and killing, all these strains could be classified into three categories of virulence: high or just subnormal (scores of above 50), intermediate (scores from 20 to 50), and low (scores below 20). A well-marked correlation between the degree of resistance to isoniazid and loss of virulence is shown.

Stimulation of Virulence by Treatment.—The individual scores of guinea-pigs infected with the six strains of the present series which were of relatively low virulence are shown in Table V. In untreated animals the disease tended

TABLE V.—Amount of Tuberculosis in Guinea-pigs Infected with Six Resistant Strains of Low Virulence

Strains	Amount of Tuberculosis out of 100							
	Untreated Animals Killed at				Treated Animals Killed at			
	6 Weeks	10 Weeks	14 Weeks	Average	6 Weeks	10 Weeks	14 Weeks	Average
McK	12	10	10	11	16	17	10	14
Ri	16	10	8	11	17	11	8	12
Ru	12	10	8	10	10	0	8	6
L	33	17	16	22	15	17	59	30
H	18	10	12	13	31	15	20	22
Fy	18	15	13	15	20	12	29	20
Average	18	12	11		18	12	22	

+ : Macroscopic tuberculosis in spleen, liver, or lungs.

± : Histological but not macroscopic tuberculosis in spleen, liver, or lungs.

— : Normal spleen, liver, and lungs.

to heal, as demonstrated by the fall in the average scores and the decrease in the proportion of animals showing lesions in the spleen, liver, or lungs during the period from 6 to 14 weeks after infection. The average scores of treated guinea-pigs killed at 6 and 10 weeks were the same as those of similar untreated animals. However, among animals

killed at 14 weeks the score in those that were treated was 22, whereas in those that were not treated it was 11. This higher average in the treated animals was due to those infected with strains L, H, and Fy. It can be seen that these three strains were slightly more virulent in the untreated animals than were the remaining strains. Thus there is a suggestion that, among resistant strains of low virulence those which were the more virulent appeared to have had their virulence increased by treatment with isoniazid between the 10th and 14th weeks after infection.

Response to Treatment.—Treatment with isoniazid afforded partial protection to the animals infected with strain O.T., which grew on 0.2 μ g. per ml. but not on 1 μ g. per ml.; their score was 30 (Table III). The scores in the treated animals infected with three strains, McK, L, and McK, capable of growth on 1 μ g. per ml. but not on 5 μ g. per ml., were in each case higher than in the untreated animals. Whether or not the strain can grow on 1 μ g. per ml. therefore seems to determine whether the infection will respond *in vivo* to treatment at 4 mg. per kg. per day.

Viable Counts.—Barnett *et al.* (1953b) found that two highly resistant strains gave much lower viable counts on oleic-acid-albumin agar than on Löwenstein medium. These differences were thought to be due to abnormal nutritional requirements of the strains. In the present investigation (Tables II and III) the counts on oleic-acid-albumin agar were equal to or slightly greater than the counts on Löwenstein medium except with the resistant strain Ru, which yielded counts of 3.7×10^6 and 1.5×10^7 respectively per mg. of bacilli.

Spleen Cultures.—Out of 21 spleens from treated guinea-pigs infected with sensitive strains, 2 yielded growth of tubercle bacilli. One of these strains was sensitive to isoniazid. The other grew on 0.2 μ g. per ml. but was inhibited by 1 μ g. per ml. None of the 19 cultures recovered from animals infected with the resistant strains showed any alteration in the degree of resistance from the strain injected.

Serum Isoniazid Concentrations.—The serum isoniazid concentration of guinea-pigs injected with doses of 2 mg. per kg. are shown in Table VI. For comparison mean

TABLE VI.—Serum Isoniazid Concentrations in Patients and Guinea-pigs

Time After Dose	Average Serum Isoniazid, μ g./ml.		
	Patients; Oral		Guinea-pigs; Subcutaneous
	1.4-2.6 mg./kg.	2 mg./kg.	10 mg./kg.
1 hour	0.9	2.3	9.9
2 hours	1.2	1.7	5.4
4-17 "	0.8	0.7	—
No. of patients or animals on which each average based	10	3	2

values for isoniazid concentrations, performed by the same method, in sera from 16 patients receiving 1.4 to 2.6 mg. per kg. by mouth were taken from the figures of Cuthbertson *et al.* (1954). If allowance is made for differences in the speed of absorption due to the different routes of administration it will be seen that the values obtained in man and in guinea-pigs were very similar. The serum concentrations in guinea-pigs injected with doses of 10 mg. per kg. were substantially higher.

Discussion

The low virulence to guinea-pigs of strains of tubercle bacilli resistant to isoniazid has also been reported by Barry, Conalty, and Gaffney (1953), although they did not state the degree of resistance of their strains isolated from patients. Since these strains also lack virulence in mice

(Barnett *et al.*, 1953b) and in rabbits (Domagk, quoted by Klee, 1953) it would seem probable that they would be of low virulence in man. However, patients in the Medical Research Council (1952) trials who developed resistant strains (growth on Löwenstein slopes containing 1 µg. of isoniazid per ml.) benefited less from treatment with isoniazid than did those whose strains remained sensitive.

There seem to be three possible explanations for the apparent contradiction. In the first place, even the most highly resistant strains set up large abscesses at the site of inoculation and usually minimal regressive lesions in the spleen, liver, or lungs. Thus these strains are not completely avirulent. Secondly, when strains from patients appear highly resistant in sensitivity tests there may be bacilli with a lower degree of resistance, and therefore higher virulence, in areas of the lungs containing progressive tuberculous lesions. Thirdly, the virulence of resistant strains may be increased by treatment with isoniazid; this may have occurred in the guinea-pigs infected with strains L, H, and Fy, although the numbers of animals were too small to allow a firm conclusion. It has also been reported in mice in three out of four experiments (Barnett *et al.*, 1953b).

Strains growing on Löwenstein slopes containing 1 µg. of isoniazid per ml. did not respond to 4 mg. per kg. per day. The serum isoniazid concentrations of guinea-pigs receiving this dose were similar to those of patients on the same dosage, used in the Medical Research Council (1952) trials. Thus it is reasonable to assume that such strains would also not respond to treatment with isoniazid when present in human lesions. Unfortunately some of the strains growing on 1 µg. per ml. but not on 5 µg. per ml. were still of fairly high virulence (Table IV). An increase in the dosage of isoniazid would be unlikely to inhibit these strains in patients, since they did not respond to a treatment level of 20 mg. per kg. per day in guinea-pigs (Barnett *et al.*, 1953b).

Strains growing on 0.2 µg. per ml. but not on 1 µg. per ml. have been classified as of doubtful resistance in the Medical Research Council (1953) trials. There is justification for this classification, since on 4 mg. of isoniazid per kg. per day such a strain partially responded to treatment, and on 20 mg. per kg. per day there was almost complete response (Barnett *et al.*, 1953a).

Summary

In a study of eight pairs of strains of tubercle bacilli sensitive and resistant to isoniazid it was found that the higher the degree of resistance the lower was the virulence in guinea-pigs. Treatment with isoniazid in a dose comparable to that used in man protected animals infected with sensitive strains, and partially protected animals infected with a resistant strain growing on 0.2 µg. per ml. but not on 1 µg. per ml. It did not protect animals infected with resistant strains growing on 1 µg. per ml., and may, indeed, have increased the virulence of some of these strains.

I am greatly indebted to Dr. D. F. Barrowcliff, Group Pathological Laboratory, Warwick; Dr. M. Laidlaw, Robroyston Hospital, Glasgow; Dr. P. H. Martin, Public Health Laboratory, Ipswich; and Mr. G. Usher, Clare Hall Hospital, South Mimms, for supplying strains of tubercle bacilli used in this investigation. Miss M. Monk provided valuable technical assistance. The isoniazid was provided as "nydradiz" by Messrs. E. R. Squibb, London.

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BACTERICIDAL ACTIVITY OF STREPTOMYCIN AND ISONIAZID AGAINST TUBERCLE BACILLI

BY

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Garrod (1950) concluded that streptomycin, in concentrations attainable therapeutically in the body, was rapidly bactericidal to cultures of *Mycobacterium tuberculosis* growing in Tween albumin liquid medium. The speed of killings became more rapid with increasing concentrations of streptomycin. More recently, Mackaness and Smith (1953) have described the bactericidal action of streptomycin, isoniazid, and a combination of these two drugs on similar cultures.

The purpose of the present investigation was to investigate the action of streptomycin and isoniazid, both alone and in combination, on Tween albumin cultures of tubercle bacilli. An attempt was made to use concentrations of these drugs comparable to those found in treated patients.

Methods

Screw capped bottles containing 20 ml. of the H37Rv strain of *Mycobacterium tuberculosis* grown for nine days in modified Dubos and Davis Tween albumin medium (Medical Research Council, 1948) were centrifuged for 10 minutes at 1,000 r.p.m. to remove the larger aggregates of bacilli. The supernatant fluid was removed, and stained films from it showed that 80% of the organisms were single or in pairs.

A volume of 0.5 ml. of this supernatant was added to 4.5 ml. of Tween albumin medium containing various concentrations of streptomycin, isoniazid, or a combination of both drugs in screw capped bottles. A control bottle containing no drug was included in each experiment. The bottles were incubated at 37° C. in a hot air room. At intervals, 0.5-ml. samples were removed from these bottles for viable counts on oleic acid albumin agar plates, using a calibrated dropping pipette and loop as described by Mitchison (1953). The diluent employed was Tween albumin medium. The plates were sealed with wax coated "cellophane" tape and were incubated for four weeks at 37° C. The numbers of colonies were then counted with a plate microscope.

Where the presence of resistant organisms was suspected sensitivity tests to streptomycin and isoniazid were carried out by the Medical Research Council (1953b) methods. In one experiment the cultures which appeared to contain dead organisms were injected into guinea-pigs. These were killed after 10 weeks and examined for macroscopic evidence of tuberculosis.

Results

Streptomycin.—The bactericidal action of streptomycin alone in concentrations of 2, 20, and 200 units per ml. is shown in Fig. 1. The number of viable units, that is, discrete organisms or clumps developing into single colonies in the cultures was diminished by a thousandfold after contact with two units per ml. for seven days, 20 units for three days, and 200 units for one day. Thus the higher the concentration of streptomycin the more rapid was the

bactericidal activity. The viable count on the culture containing 2 units per ml. began to increase after the 10th day. Streptomycin-sensitivity tests carried out on subcultures from two colonies obtained on the plates inoculated

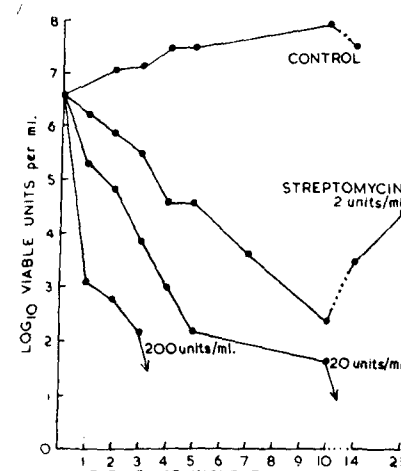


FIG. 1.—The bactericidal action of streptomycin.

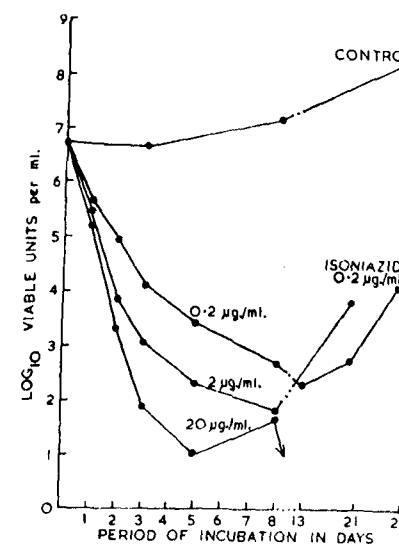


FIG. 2.—The bactericidal action of isoniazid.

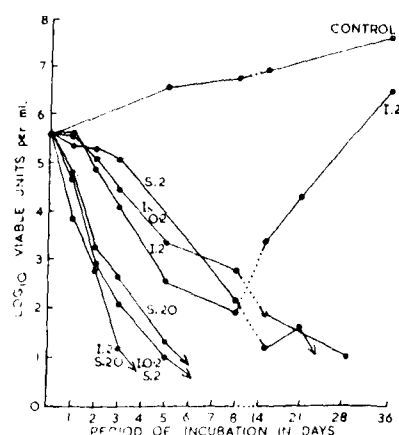


FIG. 3.—The bactericidal action of streptomycin and isoniazid alone and in combination. S.2=Streptomycin 2 units per ml. S.20=Streptomycin 20 units per ml. I.0.2=Isoniazid 0.2 µg. per ml. I.2=Isoniazid 2 µg. per ml. I.0.2, S.2=Isoniazid 0.2 µg. plus streptomycin 2 units per ml. I.2, S.20=Isoniazid 2 µg. plus streptomycin 20 units per ml.

after 21 days showed a fourfold increase in resistance. Viable counts on the cultures containing 20 and 200 units per ml., when sampled on the 15th and the 4th days respectively, yielded no growth; neither did subsequent samples of these cultures.

Isoniazid.—The bactericidal action of isoniazid alone in concentrations of 0.2, 2, and 20 µg. per ml. is shown in Fig. 2. The number of viable units in the cultures was diminished by a thousandfold after contact with 0.2 µg. per ml. for five days, 2 µg. per ml. for two and a half days, and 20 µg. per ml. for two days. Thus, although the speed of the bactericidal action was slightly increased by higher concentrations of isoniazid, this effect was less marked than with streptomycin. It should be noted that there was about a tenfold decrease in the viable counts during the first 24 hours with all three concentrations of isoniazid. The viable count on the culture containing 0.2 µg. per ml. began to increase after the 13th day. Subculture on to Löwenstein slopes containing isoniazid concentrations showed that the organisms present were resistant, being capable of growth on 0.2 µg. per ml. In

a similar manner a resistant strain capable of growth on 50 µg. per ml. was obtained from the culture containing 2 µg. per ml. Viable counts on the culture containing 20 µg. per ml. yielded no growth on the 13th, 21st, and 27th days.

Streptomycin Plus Isoniazid.—The bactericidal actions of streptomycin alone in concentrations of 2 and 20 units per ml., of isoniazid alone in concentrations of 0.2 and 2 µg. per ml., and of both drugs in combinations of these concentrations were tested simultaneously. The results are shown in Fig. 3. The bactericidal activity of isoniazid in concentrations of 0.2 and 2 µg. per ml. was about the same as that of 2 units of streptomycin per ml., but the activity of 20 units of streptomycin per ml. was distinctly greater. However, the combination of 0.2 µg. of isoniazid and 2 units of streptomycin per ml. was much more active than either alone, and was equal to or slightly greater than the activity of 20 units of streptomycin per ml. The combination of 2 µg. of isoniazid and 20 units of streptomycin per ml. was even more active, though the increase in bactericidal activity of this combination as the concentrations of the drugs were increased tenfold was less marked than with streptomycin alone.

Isoniazid-resistant strains capable of growth on Löwenstein slopes containing 50 µg. of isoniazid per ml. were eventually obtained from the cultures containing 0.2 and 2 µg. of isoniazid per ml. alone. The remaining cultures failed to yield growth in their viable counts and guinea-pigs injected with them failed to develop tuberculosis.

Discussion

The streptomycin concentration of 20 units per ml. and the isoniazid concentration of 2 µg. per ml. are both about equal to maximum serum levels (Medical Research Council, 1948; Elmendorf *et al.*, 1952), and the two lower concentrations of 2 units of streptomycin per ml. and of 0.2 µg. of isoniazid per ml. are both four to eight times the maximal concentration that inhibits the growth of sensitive tubercle bacilli (Medical Research Council, 1948; Mitchison, 1952). Thus the concentrations that we have used can be regarded as equivalent for both drugs, and are about equal to maximal and minimal therapeutic serum levels.

At the maximal serum concentrations streptomycin was more rapidly bactericidal than isoniazid, though at the minimal levels there was little difference in their activity. The concentration of both drugs in tuberculous lesions would be less than the peak serum level, so that here the activity of both drugs would probably be nearly the same.

As shown in Fig. 2, and in two further unpublished experiments, isoniazid appeared to have caused a marked fall in the viable counts after 24 hours' contact. A similar fall in Fig. 3 was not shown, probably because the count at 0 days was unsatisfactory, being done on only one plate. Mackaness and Smith (1953) found a delay of 48 hours before the onset of any marked fall in their viable counts. The difference might be due either to the presence of smaller bacillary aggregates in our suspensions or to the organisms being in a different growth phase.

There was an increase in bactericidal activity as isoniazid concentration was increased, as shown in Figs. 2 and 3 and also found in a third unpublished experiment. We cannot account for this difference between our results and those of Mackaness and Smith, who found that the bactericidal effect of isoniazid was independent of the drug concentration. The increase in activity with increasing drug concentration was, however, more marked when streptomycin was used. One would therefore expect an increase in therapeutic dosage of streptomycin to be more beneficial to patients than a similar increase of dosage of isoniazid.

As shown in Fig. 3, the bactericidal activity of a combination of streptomycin and isoniazid at minimal therapeutic concentrations was as great as the activity of the maximal concentration of streptomycin alone, and the activity of maximal concentrations of both drugs together was greater than that of either alone. Thus one would expect treatment

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of patients with a combination of streptomycin and isoniazid to be more effective than treatment with either drug alone, even in the early stages, when development of resistant strains of tubercle bacilli would probably not have occurred.

When either streptomycin or isoniazid alone was added to our cultures, in most experiments resistant strains eventually replaced the sensitive bacilli which had been killed. When the two drugs were added together resistant strains did not emerge. These results are analogous to the observation that a combination of streptomycin and isoniazid prevents or delays the development of resistant strains in pulmonary tuberculosis (Medical Research Council, 1953a).

Summary

At concentrations four to eight times those necessary to inhibit growth of tubercle bacilli the bactericidal activities of streptomycin and isoniazid were the same. At concentrations ten times higher, corresponding to maximal serum levels, the activity of streptomycin was greater than that of isoniazid. The activity of the combination of both drugs was higher than that of either alone, and prevented the growth of resistant strains of tubercle bacilli.

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PROGNOSIS OF DEPRESSION TREATED BY ELECTRIC CONVULSION THERAPY

BY

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Electric convulsion therapy (E.C.T.) is now widely used in psychiatric practice, and its efficiency, especially in the treatment of depressive states, would seem to be beyond dispute. It is certainly the commonest method of treatment employed by the in-patient psychiatric unit.

In England and Wales approximately 60,000 people are admitted to mental hospitals annually, and probably at least one-third have E.C.T. at some time during their stay; nor does this figure take into account the number who receive it as out-patients or in private practice.

It is therefore a matter of some importance that the long-term results of this treatment should be critically assessed. The present paper describes the position at the end of three years of a series of cases of depression treated in a mental hospital, the majority of which received E.C.T., and the effects of that treatment are evaluated.

Material and Method

The patients studied consisted of 114 "typical" cases of a series of 130, the clinical features of which have already been published (Jarvie, 1950). They represented the routine admissions to the Cheadle Royal Hospital of people suffering from depression who came under my care from May, 1947, to April, 1949. Of the 130 cases, 16 were regarded as "atypical" in that they showed unusual, bizarre, or

schizophrenic features, and the diagnosis of "depressive state" would probably not have been accepted in their case by many psychiatrists. The results in this atypical group will be published elsewhere, as they are of more specialized interest.

The 114 cases were an entirely heterogeneous group of consecutive admissions and included cases which could have been placed in most of the recognized clinical subgroups: manic-depressive, involutional, anxiety-depressive, reactive. Their ages ranged from 21 to 78, but the majority (74) at the time of admission were 50 years of age or older. They included cases having both recurrent and first attacks. The age and sex distribution is shown in Table I. In view

TABLE I. Age and Sex Distribution of Cases Studied

Group	No. of Cases	Sex		Age Group											
		M	F	20-29	30-39	40-49	50-59	60-69	70-79	Totals	Recovered	Improved	Dead	Relapsed	Unstable
No E.C.T.	17	9	8	2	7	2	4	7	2						
E.C.T.	71	28	43	2	7	16	23	21	2						
Improved	26	12	14	2	6	5	7	6	2						
Totals	114	49	65	4	13	23	34	34	6						

of the difficulty that exists, except in extreme cases, of making a rigid differentiation of clinical types, it was felt it would be of little value to attempt an analysis of the effects of E.C.T. on different subgroups. Consequently the results presented here are those of the whole series without reference to diagnostic grouping.

The method of inquiry was as follows. On the third anniversary of the patient's discharge from hospital a questionnaire was sent to the nearest relative and to the patient's doctor. The information asked for was the same in both cases, except that the doctor was asked to give the certified cause if death had occurred. The purpose of the double questionnaire was to obtain a cross check on the information received. From the results obtained in this way any further sources of information were followed up—for example, by inquiry to hospitals or consultants who had been concerned with the patient. The case-notes of the parent hospital also form a source of information when, as in many cases, the patients had returned for further in-patient or out-patient treatment.

Results

Of the 114 cases, 97 received a course of E.C.T., after which 71 (73%) were discharged recovered and 26 (27%) were discharged improved. The number of convulsions administered and the duration of stay in hospital (in weeks) are shown in Table II. The remaining 17 patients either did

TABLE II. Number of Convulsions and Duration of Stay in Hospital of Cases Receiving E.C.T.

Group	No. of Convulsions			Stay in Hospital (Weeks)		
	Min	Max	Median	Min	Max	Median
Recovered	2	14	7.5	2	21	7
Improved	6	21	7.5	1	17	8

not receive E.C.T. or received such small amounts that it was regarded as not affecting the course of the illness. This last group is considered first.

Cases Not Receiving E.C.T.

In seven cases treatment with E.C.T. was withheld for physical reasons, all cardiovascular: atheroma, congestive cardiac failure, aortic aneurysm, aortic stenosis, cardiac syncope, and hypertension. In one other case the treatment was stopped after four convulsions, as the patient developed Stokes-Adams attacks during its administration. At the end of three years six of these eight patients were dead—

four from natural causes and two from suicide; one was a patient in another mental hospital, and one was well so far as the psychiatric illness was concerned.

Of the nine remaining cases which did not receive E.C.T. the following was the position at the end of three years: no information, 3; still in hospital, 1; completely well, 3; fairly well, 2.

E.C.T.—Cases Discharged Recovered

At the end of three years the position with regard to the 71 cases which received E.C.T. and were discharged recovered was as follows:

No adequate information	7 (10%)
Dead	5 (7%)
Well—Completely	25 (35%)
Fairly*	9 (13%)
Relapsed	25 (35%)
34 (48%)	

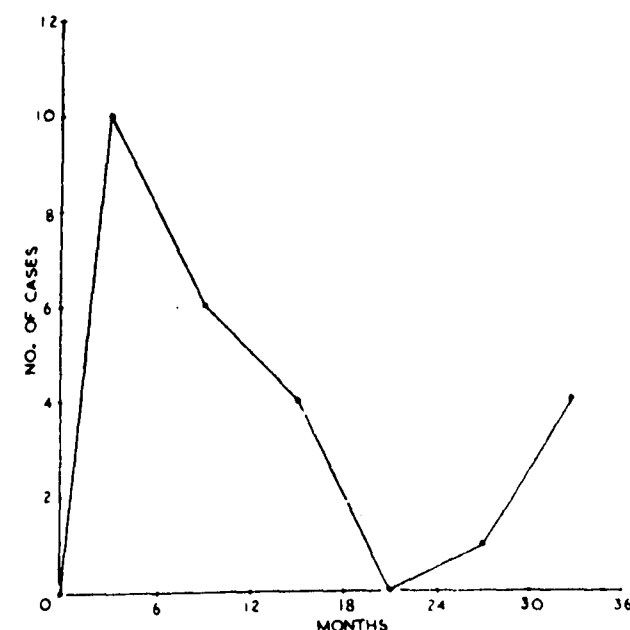
*Nine cases were regarded only as fairly well for the following reasons: (a) still on sedatives, 2; (b) failed to return to work, 1; (c) evidence of unstable episodes of short duration, usually of depression and/or elation, 6.

Of the five deaths, four were due to coronary artery thrombosis and one to lobar pneumonia.

Cases Relapsing

The interval (in months) between discharge and recurrence of symptoms is shown in the Chart. It is interesting to note that the relapses reached a peak within the first six months, then became less frequent, so that between 18 and 24 months none was recorded. From then onward the incidence of relapses began to rise again. This suggests that cases relapsing within 18 months of discharge are mainly true "relapses" of cases apparently well but really inadequately treated, while those whose symptoms recur later are having further genuine attacks.

Seven cases were still well after a further single course of treatment, in six consisting of more E.C.T. and in one



Interval between discharge from hospital and recurrence of symptoms in 25 cases which relapsed after being discharged recovered.

of symptomatic treatment with sedatives and euphoriant drugs. In all seven cases the recurrence of symptoms occurred within a year of discharge.

Four cases had broken down again just at the end of the three-year period and were under treatment in hospital at the time of inquiry.

One patient had been admitted to another hospital, where she still remains. In her case the symptoms recurred six weeks after discharge from the Cheadle Royal Hospital.

Of the remaining 13 cases, 12 had required further in-patient or out-patient supervision on two occasions: four of them had received one further course of E.C.T., and the remainder two further courses. Subsequently two of these cases had the operation of prefrontal leucotomy. Only one of these 12 cases was regarded as being well at the time of inquiry. The remaining patient had been readmitted to hospital on seven occasions within the three-year period and had received seven courses of E.C.T., consisting of a total of 39 convulsions.

E.C.T.—Cases Discharged Improved

Twenty-six cases were discharged only improved after what was regarded at the time as an adequate course of E.C.T. At the end of three years the position with regard to this group was as follows:

No adequate information	7 (27%)
Dead	2 (7.7%)
Well without further treatment	1
Well after relapse treated with E.C.T.	3
Still not symptom-free:	
In same condition as on discharge; no relapse, no more E.C.T.	6
Still unwell after relapse treated with E.C.T.	4
Prefrontal leucotomy	3
10 (38.4%)	
3 (11.6%)	

Of the two deaths, one was due to carcinoma of the colon and the other to a glioblastoma.

Physical Sequelae

Apart from the deaths and the one patient who developed epilepsy, organic sequelae which could even be remotely ascribed to the treatment were surprisingly few.

In this series the treatment had in every case been given unmodified—that is to say, without the aid of muscle relaxants or anaesthetics. In only one case was a definite fracture encountered during the administration of the treatment. This was in a lady of 65 who fractured her right humerus. Since then she has developed a painful swelling of both hands, presumably arthritic, although she had not been troubled with this before. It is of course difficult to decide how much these changes are due to the effects of the fracture or E.C.T. and how much to the natural processes of ageing.

Two patients complained of pain in the back which seemed to be genuinely organic in origin. Although minor degrees of compression fracture of the mid-dorsal vertebrae may have been missed, it is again difficult to decide without fuller investigation whether these complaints were not based on natural changes unconnected with the treatment.

Although not specifically asked for in the questionnaires, no complaints of persisting amnesia or other intellectual defect were recorded. Most of the patients in this series came from the Registrar-General's social classes I and II, and many have returned to work of considerable responsibility which they have carried on effectively and efficiently.

The deaths require some comment. Four of the seven were due to coronary artery thrombosis. Again it is difficult to implicate the treatment as an aetiological factor in precipitating death in these cases. One patient was known to have a pre-existing heart lesion, while the other three died at intervals of 3, 16, and 24 months after treatment. They were aged respectively 42, 61, and 66 at the time of death. It is not surprising that cases of unsuspected cardiovascular anomaly pass unnoticed in patients of the older age groups.

As has already been stated, the actual administration of E.C.T. in the crude and unmodified form gave rise to anxiety in only one case—namely, that of the lady in whom it was stopped because of the development of Stokes-Adams attacks during it. Even she managed to survive for two years after its administration.

The patient who developed a glioblastoma complained of symptoms two and a half years after discharge and died nine months later. The tumour, of considerable size, was found at necropsy in the temporal lobe.

One patient developed epilepsy. On discharge she was known to have received the largest number of convulsions—

a total of 60. Her case was complicated by the fact that a few weeks before her initial treatment with E.C.T. she appeared to be recovering from some infection involving the nervous system, as the following case history shows. There was no family history of epilepsy in her case.

A woman of 27 was admitted to the Chaddle Royal Hospital in November, 1942, suffering from melancholic stupor. She remained a patient until the early part of 1944. During this time she received 54 convulsions. Two months before admission she was reported to have had "catarrhal jaundice," and on admission she had nystagmus and bilateral extensor plantar responses. A lumbar puncture produced a clear fluid with 64 cells per c.mm., lymphocytes predominating, and a raised protein. Blood and C.S.F. Wassermann reactions were negative. Six months later the C.S.F. was normal, and when she was examined on readmission in 1947 there were no persisting neurological signs. A further course of six convulsions was given, and 21 months later she had her first grand mal attack.

Discussion

This study confirms the value of E.C.T. as a therapeutic agent in the treatment of depression.

It has to be remembered that most of the cases in this series were severely ill, otherwise mental hospital treatment would not have been regarded as necessary. Many on admission to hospital were calculated suicidal risks, and several had made an active attempt at suicide before admission. In the 71 cases discharged recovered after a course of E.C.T., 15 (21%) had made such an attempt, while in the 26 cases discharged improved 9 (34.6%) had done so. Only two attempts at suicide, both unsuccessful, were reported in the available follow-up material of these 97 cases.

On the grounds of suicidal risk alone, therefore, treatment with E.C.T. can be said to have returned many socially useful people to a happy and effective life much more quickly than would have been the case if a natural remission had been awaited. Nevertheless, the limitations of the treatment must be recognized. In the first place, although the number of cases of depression which make a good initial response to E.C.T. is high (73%), every case does not respond completely, although on the whole nearly all of them show sufficient response to be regarded as improved. Secondly, a high proportion (35%) of cases discharged recovered relapse within the relatively short period of three years. Many of these cases are true "relapses" in that they represent the recurrence of symptoms in an attack which has been inadequately treated and in which superficial improvement has been regarded as recovery. Several of these cases respond to a further single period of supervision (on the average, of 10 weeks' duration) and an additional course of E.C.T. (on the average, eight more convulsions).

In any unselected group of depressions treated with E.C.T. there will be a hard core of cases in which the administration of this form of treatment will be of only limited value. These cases will consist of two main groups—those which fail to produce more than a minimal response to E.C.T., although apparently adequately treated, and those which seem to respond to E.C.T. but which relapse after a short time and continue to relapse at intervals, in spite of further courses of E.C.T. Thus one woman in the series had received a total of 39 further treatments and had been readmitted to hospital on seven occasions during the three-year period. In the 10 years which had passed since her first attack she had a total of 11 admissions to hospital and was known to have had 65 convulsions.

In chronic relapsing cases of this nature, with decreasing intervals of well-being, it is obvious that the continued administration of E.C.T. can hardly be justified. In such cases cerebral surgery must be seriously considered as an alternative form of treatment, and the good but limited response to E.C.T. which these cases show gives the measure of probable success. The reasons why a number of cases of depression should make only a limited initial response to E.C.T., so that they can be regarded as having improved rather than recovered, are obscure and probably complex. While a few of the 26 cases discharged improved were probably inadequately treated, reasons other than this must be adduced to explain the failure of response in the

remainder. From the study of this group there was some evidence that many were people of poor personality caught up in serious personal difficulties.

In spite of the fact that the mode of action of E.C.T. is apparently physiological, it is important that we should not get too far away from the concept of depression as a dynamically orientated illness.

The assessment of any form of treatment must be made against the background of the natural history of the illness. It should therefore be remembered that depression is a self-limiting disease, and patients often come for treatment when the brunt of the illness is over. Nevertheless, the response of most cases of depression to E.C.T. is rapid and effective and can be observed after the first few convulsions.

On the whole, E.C.T. is an effective form of treatment for the majority of cases of depression uncomplicated by serious physical disease, although its limitations in 30-40% of cases should be recognized. Physically, it is fairly innocuous, and apart from traumatic events in the course of its administration and the occasional disturbing cardiac episode, it is very safe. These events should be materially reduced by the administration of the treatment in the modified form. The only serious complication would appear to be epilepsy, and this cannot be a common one. It does not occur unless large numbers of convulsions are administered (Sundqvist, 1951). On the whole, for this and other reasons, the continued administration of E.C.T. as a therapeutic agent in any one case over a long period of time is undesirable.

Summary

The results of a three-year follow-up study of 114 cases of depression treated in a mental hospital are reported.

Ninety-seven cases were given E.C.T., and the immediate and remote results of this treatment are analysed.

It is concluded that E.C.T. is an effective form of treatment in most cases of depression, but its limitations in some 30-40% of cases should be recognized.

Physically, it is an innocuous form of treatment, but one serious complication reported is epilepsy.

I am indebted to Dr. J. A. C. Roy for enabling this study to be made. I am grateful to Miss Joan Williams, medical records secretary at Chaddle Royal Hospital, for her willing co-operation in issuing questionnaires and collecting information, and to Dr. W. Ritchie Russell for much helpful criticism in the presentation of this material.

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New regulations made under the National Insurance (Industrial Injuries) Acts by the Minister of Pensions and National Insurance extend the insurance cover against pneumoconiosis. The regulations, which came into operation on January 11, give effect to recommendations made by the Industrial Injuries Advisory Council in their report on pneumoconiosis (Cmd. 8866). Up till now benefit for pneumoconiosis has been available only to persons who since July 5, 1948, have worked in occupations which have been scheduled because they are known to be capable of giving rise to the disease. Under the new regulations benefit is also available to persons who have never worked in a scheduled occupation but who are suffering from pneumoconiosis due to the nature of their work since July 5, 1948, in some other dusty occupation. Before being referred to the pneumoconiosis medical panels, claimants from unscheduled occupations will be required to provide a medical certificate or similar evidence to show that there is a reasonable cause for suspecting they are suffering from pneumoconiosis. Those who are totally disabled by pneumoconiosis but whose period of exposure ended before July 5, 1948, may be entitled to an allowance under the Pneumoconiosis and Byssinosis Benefit Scheme, 1952.

MUCOCELE OF THE APPENDIX

BY

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Mucocele of the appendix is an uncommon condition. Woodruff and McDonald (1940) reported its incidence as 0.3% of appendicectomies in the Mayo Clinic over a period of 24 years. The disease was described by Rokitsky in 1842 and by Virchow in 1863. Werth in 1884 first described pseudomyxoma peritonei associated with cystadenoma of the ovary, and in 1901 Fraenkel recorded the same condition in a case of appendix mucocele.

Case 1

A man aged 76 was admitted to hospital in October, 1952, complaining that for 24 hours the rupture in his right groin had been painful and irreducible and that he had been vomiting. There were the typical signs of a strangulated right inguinal hernia, but rectal examination revealed the presence of a large firm swelling in the rectovesical pouch. At operation the hernial sac was found to contain strangulated but viable small intestine. The bowel was reduced and the abdomen explored by a finger inserted through the neck of the sac. A firm smooth mass, which was palpable, extended from the right iliac fossa into the pelvis. The peritoneal cavity was opened through a transverse incision above the inguinal canal, disclosing the mass, which proved to be a large mucocele of the appendix. It was delivered with some difficulty, as it was adherent to its surroundings, and was removed. The hernia was repaired and the incision closed. On subsequent questioning the patient denied any history of previous abdominal pain or dyspepsia. He collapsed and died suddenly of a coronary thrombosis on the fourth day after operation.

The appendix (see illustration) measured 6½ in. (15.8 cm.) in length and 7½ in. (19 cm.) in its greatest circumference. It contained a colourless jelly-like substance, and the lumen



Photograph of the appendix in Case 1.

was completely occluded at the base by a short fibrous stricture. Histological examination showed that the wall was only 1/16 in. (1.6 mm.) thick. The serous coat was normal, but the muscle was entirely replaced by hyaline connective tissue with many cholesterol clefts. The lining epithelium consisted of a single layer of tall columnar cells secreting mucus.

Case 2

A woman aged 38 was admitted to hospital in June, 1951, with a history of central abdominal pain and vomiting of four days' duration and more recent pain in the right iliac fossa. The temperature was 100.2° F. (37.9° C.) and the pulse rate 90 a minute. There were tenderness and muscle guarding in the right iliac fossa and hypogastrium; rectal examination revealed tenderness of the pelvic peritoneum but no palpable tumour. The pre-operative diagnosis was appendicitis with perforation and peritonitis. At operation thin pus was found in the peritoneal cavity. The appendix was much enlarged and was surrounded by mucoid material,

which was also present in the pelvis. The left ovary contained a small cyst. Appendicectomy was performed and the abdomen drained. Recovery was uneventful. Section of the specimen showed that a pre-existing mucocele of the appendix had become acutely inflamed and had ruptured.

In September, 1952, 15 months after appendicectomy, the patient was readmitted complaining of swelling of the abdomen which had been progressing for nine months. On examination there was a central cystic tumour in the hypogastrium extending from the pubis to the umbilicus. Pelvic examination revealed that the uterus was of normal size; the large cyst was palpable through the left anterior fornix, and a smaller cyst was found in the right appendage. At operation the peritoneal cavity contained large quantities of mucoid substance which was exuding from a perforation of a multilocular cyst of the left ovary. The right ovary contained an endometrial cyst. Bilateral salpingo-oophorectomy was carried out. Histological examination showed that the large ovarian cyst was a pseudomucinous cystadenoma. Subsequently radiotherapy was applied to the abdomen.

Discussion

The essential factors in the development of appendix mucocele are obstruction of the lumen and sterility of its contents. In most cases the obstructing agent is a fibrous stricture at the base of the appendix which completely occludes the lumen and is the result of former appendicitis. On occasion the lumen is narrowed but not totally obliterated, since a mucocele may fill with barium in the course of an opaque-meal examination (Vorhaus, 1930). Wilson (1950) estimated the degree of occlusion necessary for the formation of appendiceal diverticula and found that an internal circumference of 4 mm. was the critical level at which obstruction and retention of secretions occurred. Wangenstein *et al.* (1937) recorded a resistance to the flow into the caecum of fluids injected into an appendicostomy and suggested the possibility of functional obstruction due to a sphincter mechanism at the appendix base. Carcinoid tumour (Topping, 1937), carcinoma of the caecum (Muir, 1931), and endometriosis (Shemilt, 1949) are rare causes of the condition.

The appendix contains a jelly-like material, pseudomucin, which is a glucoprotein distinguishable from mucin by reduction tests and by staining with mucicarmine. Its presence may be due to abnormal secretion by the mucosa or, since all gradations of staining and reduction reactions occur, the change from mucin to pseudomucin may be a gradual extracellular one. The content of a mucocele is usually sterile on culture. Wells (1936) produced the condition in rabbits by ligation of the appendix base, leaving the blood supply intact. In the experiments of Cheng (1949) and Grodinsky and Rubnitz (1941), however, simple ligation resulted in acute appendicitis, and development of mucocele required preliminary sterilization of the lumen by irrigation with saline, penicillin, or sulphaguanidine solutions. In long-standing cases the pseudomucin becomes inspissated, and calcification may lead to the formation of a large appendiceal calculus (Bunch, 1945).

In experimental mucoceles the muscular coat is hypertrophied in the early stages, but in the fully developed condition the muscle is thin and almost, or entirely, replaced by fibrous tissue, which may become hyalinized and eventually calcified. Diverticulum formation is common and is probably an early occurrence, as Wilson (1950) has shown that an actively contractile muscularis is essential to raise the intra-appendicular pressure and that passive distension of the appendix is ineffective.

Pseudomyxoma peritonei, which also follows rupture of a pseudomucinous cyst of the ovary, is the most important complication of appendix mucocele and is characterized by the presence of masses of colloid in the peritoneal cavity either lying free or enclosed in membranous adhesions. This material is identical with the contents of the mucocele and may be localized to the region of the appendix or widespread. The initial cause of the condition is perfora-

tion of the appendix, usually through a diverticulum, but the large quantities of pseudomucin which may be found have led to speculation concerning its origin. There are three possibilities.

1. The serosal cells may be stimulated by the presence of colloid to secrete an identical substance. This seems unlikely. Trotter (1910) stated that the peritoneal lining cells could assume columnar forms but believed that their reaction was of the nature of a foreign-body peritonitis and limited to the formation of enclosing adhesions.

2. The peritoneal pseudomucin may result from its continued discharge from a perforation of the mucocoele, but if this were so the complication would be halted by removal of the appendix. It may, however, recur after appendicectomy and eventually lead to the death of the patient.

3. The most probable explanation, in both appendiceal and ovarian types, is that mucus-secreting cells escape into the peritoneal cavity and, becoming implanted there, continue to secrete. Such cellular elements are difficult to find histologically in the peritoneal colloid, but the hypothesis is supported by the experiments of Grodinsky and Rubnitz (1941), who injected the contents of mucocoeles into the peritoneal cavities of other animals and produced progressive pseudomyxoma peritonei, while if the contents were first passed through a Seitz filter to remove the cells the condition did not develop.

Woodruff and McDonald (1940), in a study of 146 cases, divided appendix mucocoele into two groups. In the first the mucosa consists of a single layer of columnar cells. Rupture of such a mucocoele leads to a localized type of pseudomyxoma peritonei which does not recur after appendicectomy. In the second, smaller group the mucosa is hyperplastic owing to the presence of papillae covered with large columnar cells containing hyperchromatic nuclei. This is regarded as a grade 1 adenocarcinoma, and perforation causes dissemination of malignant cells and a diffuse, progressive peritoneal lesion.

Pseudomyxoma peritonei of appendiceal or ovarian origin differs, therefore, only in degree of malignancy from the coelomic spread of colloid carcinoma of the alimentary tract.

The occurrence of mucocoele of the appendix and pseudomucinous ovarian cyst in the same individual has been recorded many times. Bailey (1916) and Ries (1924) described cases with both lesions present simultaneously and discharging colloid into the peritoneal cavity. In Eden's (1912) patient an appendix mucocoele was found two years after operation for a ruptured pseudomucinous cyst. The double condition is usually complicated by pseudomyxoma peritonei, and it is likely that one lesion results from transcoelomic implantation of mucus-secreting cells released by perforation of the other, although the reason for selective involvement of these viscera alone is not clear. Willis (1952) considers that the probable sequence is rupture of a primary ovarian cyst which causes colloid and cellular spread in the subserous tissues and thus involves the appendix leading to mucocoele. In Case 2, however, the perforated appendix preceded the large ovarian cyst, although a small cyst was noted at the first operation. Hentz (1932) recorded a case with both lesions but without peritoneal colloid, and suggested that cells passed from the ovary to the appendix by lymphatic channels.

Other complications of appendix mucocoele are acute inflammation (Case 2), intussusception (Ward-McQuaid, 1949), volvulus (Jones and Carmody, 1936), and occurrence in a hernial sac (Juvara and Borcescu, 1948).

The clinical features of uncomplicated mucocoele are vague and symptoms are often absent. There may be a history of recurring pain in the right iliac fossa and a mass may be palpable in the abdomen or the pelvis. Radiology may show calcification of the appendix wall or of its contents, or a soft-tissue shadow displacing the caecum or producing a filling defect may be visible with an opaque meal. Rarely does the mucocoele fill with barium.

The treatment is appendicectomy; in the female, especially when the mucocoele is perforated, the ovaries are examined for concomitant pseudomucinous cyst. Occasionally the dense adhesions of the appendix necessitate resec-

tion of bowel for its removal. When the complication of pseudomyxoma peritonei is present the myxomatous material is removed so far as possible, and post-operative radiotherapy to the abdomen is carried out in an attempt to destroy the disseminated mucus-secreting cells. Drainage of the peritoneal cavity is avoided because of the tendency to secondary infection. A more accurate prognosis may be given in such cases if the appendix mucosa is examined for the presence or absence of papillomatous formations.

Summary

Two cases of mucocoele of the appendix are described, one of them associated with pseudomyxoma peritonei and with pseudomucinous cyst of the ovary. The pathogenesis, complications, and clinical features of the condition are discussed.

I am grateful to Mr. W. M. Beattie and Mr. C. H. Walsh for permission to record Case 2; to Dr. J. Carr Brundret for the histological reports; and to Mr. J. Cosbie Ross for advice in the preparation of this paper. I have to thank the central photographic department of the University of Liverpool for the photograph.

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A CASE OF ULCERATING HODGKIN'S DISEASE

BY

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The ulcerative form of Hodgkin's disease is so rare and so difficult to diagnose that the following case is worthy of record.

Case Report

A woman aged 44 was admitted to St. Luke's Hospital, Bradford, in July, 1948, complaining of a painful swelling on the anterior chest wall, over her sternum, of twelve months' duration. The swelling had gradually become larger, recently fluctuant, and had been aspirated two weeks before admission. She also complained of painful stiffness of the neck for about three years, and aching of both arms for twelve months. The spleen was not palpable and no glands were enlarged. The E.S.R. was 18 mm. in one hour; haemoglobin, 85%; W.B.C., 16,000 per cmm. (polymorphs 83%, lymphocytes 12%, monocytes 5%); platelets normal. The Wassermann reaction and Kahn test were negative on two occasions. X-ray examination showed erosion of the left sternoclavicular joint and adjacent sternum, with no new bone formation.

The fluctuant swelling was incised, pus and necrotic bone were curetted out, and the wound was closed. The wound healed by first intention. The pus obtained was sterile on culture and no organisms were found in the smear. A provisional diagnosis of a tuberculous lesion was made, and the patient was discharged home four weeks later, to await a bed at a sanatorium.

In March, 1949, she was readmitted from the sanatorium with the abscess from the sternum increasing in size and pointing in two places. Incision with curettage was performed, a large quantity of necrotic debris being evacuated. The appearance favoured the diagnosis of gumma, despite the negative Wassermann reaction and Kahn test. Examination of the pus again showed no tubercle bacilli or other organisms, and section of the curettings of the ulcer wall revealed necrotic tissue. A consultant venereologist diagnosed the ulcer as gummatous in nature despite the absence of other signs of syphilis. He gave a course of bismuth, penicillin, arsenicals, and iodides with no response. She was discharged home in April, and kept under out-patient surveillance.

In July she was readmitted as an emergency case following haemorrhage from the abscess, the cavity being packed to control it. Repeated examination of the pus showed no evidence of tubercle bacilli or actinomycosis. Guinea-pig inoculation was negative. No glands were palpable elsewhere in the body.

In August the swelling over the sternum had developed into a large ulcer, approximately 1 in. (2.5 cm.) in depth and 5 in. (12.5 cm.) in diameter, with an elevated edge and an uneven floor covered with necrotic granulations. A biopsy of the edge of the ulcer was taken, and the section report was as follows: "The histological picture is that of a chronic granulomatous lesion probably tuberculous in origin. The caseous material consists of degenerate cells with mucus and a few pus cells. No tubercle bacilli or other organism seen." The lesion was still thought to be tuberculous in nature.

Until June, 1951, progress was uneventful and the ulcer showed no change. She was then readmitted again for treatment of further haemorrhage from the ulcer. A recent swelling was found to be present below the right clavicle and a few discrete glands were palpable in the neck. This was the first appearance of glandular enlargement. No other glands were palpable and the spleen was not enlarged. A biopsy of one of the cervical glands was carried out, the pathological report on the gland being as follows: "Histological section shows marked fibrosis and complete loss of architecture. There is a proliferation of reticulum cells with several multinucleated cells and many eosinophils. The findings are in keeping with Hodgkin's disease."

In July an abscess was forming over the inner end of the right clavicle (see illustration). The patient was seen by Dr. Chester-Williams and transferred to the Radium Institute for a course of deep x-ray therapy.

In September the course had been completed and she showed a remarkable change; she had gained over 56 lb.



Showing the ulcer over the sternum, with an abscess forming over the right clavicle.

(25.4 kg.) in weight, but her pain was still troublesome. The ulcer had shrunk considerably in size, and in October this improvement had been maintained. X-ray examination of the cervical and dorsal spine showed no abnormality, but both clavicles showed absorption at their medial ends. The mediastinum was within normal limits, but the anterior ends of both first ribs were absorbed and showed no evidence of regeneration. Three months later the ulcer had practically healed.

In April, 1952, there was considerable local improvement, but she had severe pain over the fourth dorsal spine. Some supraclavicular infiltration was present, and her general condition was failing.

In October she had a painful swelling in both posterior triangles of her neck. The lower edge of the ulcer was extending, with a painful swelling over the lower end of the sternum. In November she had further subcutaneous swelling on the right chest wall and some loss of power in the right arm, with considerable induration in the supraclavicular regions.

In April, 1953, she attended for her eighth course of deep x-ray therapy. The ulcer had broken down again and was 1½ by 2½ in. (3.8 by 6.4 cm.) in size. There was a large soft swelling to the right of the ulcer and two smaller swellings on the left side and over the lower end of the sternum. Her general condition was deteriorating, and in the past year she had lost 35 lb. (15.9 kg.) in weight.

Discussion

The first observation of an ulcerative lesion in Hodgkin's disease was reported by Grosz (1906), and in the following 21 years only 26 cases had been recorded. Price (1946) states: "The skin is only rarely involved; and when it is, or when, with equal rarity, the nodes undergo caseation or suppuration, this is due to the secondary infection by pyogenic organisms or by tubercle."

The difficulty of diagnosis is emphasized by a perusal of various case reports (Alderson, 1917; Cole, 1917; Kierland and Montgomery, 1941). Goldman (1940), in an analysis of 212 cases of Hodgkin's disease, did not mention the presence of ulcerating lesions. Seneor and Caro (1937) comment that ulceration occurs in three different ways: (1) Ulceration of limited extent developing in a number of small nodules in the skin. (2) Extensive ulceration developing in the skin by extension from underlying involvement of lymph nodes, bones, and other tissues. The case recorded seems to be from this group. (3) Extensive ulceration developing in large infiltrations appearing in the skin without involvement of the underlying structures.

The ulcer may appear before obvious glandular involvement elsewhere, as in the case now recorded, and may cause considerable confusion in differential diagnosis. The differential diagnosis is between gumma, epithelioma, sarcoma, tuberculosis, and mycosis fungoides. The typical ulcerative lesion of Hodgkin's disease has sharply defined rounded borders, but may be irregular, serpiginous, or linear. The edge is elevated and the margins are undermined or sharply punched out to resemble a gumma. Usually, as in this case, the ulcer is deep, with an uneven floor, covered with abundant purulent necrotic material or granulation tissue which bleeds freely when touched. Pain is variable, but in this case was severe. Affection of the neck, thorax, and axillary regions is most common, but the condition can be widespread.

The diagnosis is usually made by biopsy, but the case described illustrates that this is not infallible, and is dependent on demonstration of the characteristic Dorothy Reed or Sternberg cell.

Radiotherapy, as in this case, makes the ulcer melt away (Moriame, 1949), but recurrence is usual.

Summary

A case of the rare ulcerative type of Hodgkin's disease is described, illustrating the extreme difficulty experienced in diagnosing this atypical form of the disease.

My thanks are due to Mr. A. Naylor for his encouragement and advice, and to Dr. F. E. Chester-Williams for permission to record this case.

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Medical Memorandum

Renal Complications after Using Sulpenin

Combinations of penicillin and sulphonamides have been in clinical use for more than a year. No serious toxic effects have been reported, and the manufacturers know of only a few mild reactions occurring in a small number of instances. The following case report seems to be the first example of a serious toxic effect following the use of "sulpenin."

CASE REPORT

A married woman aged 73 was admitted to hospital on March 7, 1953, with the following history. In the previous ten days she had had "influenza," and mild bronchopneumonia, for which her doctor had prescribed sulpenin, the total amount given before admission being 28 tablets (14 g. sulphonamide). Twenty-four hours before admission she had suddenly developed epigastric pain, which had increased in intensity. It "spread through to the back," but did not radiate to the shoulders. The character of the pain was described as severe, with exacerbations. She had never had anything like this previously. Several times in the previous 24 hours she had vomited a small amount of mucoid fluid. Throughout this period she noticed a diminution in the quantity of urine passed, and what was voided was bloody (she admitted that she had not been drinking very much for the past two days). She had been constipated for five days. In 1916 laparotomy and appendectomy had been performed, and in 1917 gastric ulcer had been diagnosed radiologically.

On examination she had the appearance of an ill, moderately dehydrated old lady. The tongue was dry and brown. The neck and chest, cardiovascular system, and central nervous system were all normal. Her blood pressure was 160/90 mm. Hg, pulse rate 80, temperature 99° F. (37.2° C.), and respirations 22. In the abdomen there was an upper right paramedian healed scar. Muscular movements were diminished, tenderness was acute in the epigastric area, but not in either loin, bowel sounds were diminished, no mass or abnormal viscus was palpated, and no fluid was detected. Rectal examination was normal. A straight x-ray film of the abdomen did not show air under the diaphragm or any intestinal abnormality. A diagnosis of anuria due to sulphonamide intoxication was made.

On March 8 the cystoscopy findings were: residual urine in the bladder 3½ oz. (100 ml.); some trigonitis; right ureteric orifice oedematous and blocked with bloody material, no efflux being present; left ureteric orifice oedematous without efflux. Attempted catheterization of the right ureter failed. There was a block 1.5 cm. from the vesical opening. A left ureteric catheter passed easily and was left *in situ*.

An indwelling gastric tube was left *in situ* for 24 hours, but yielded practically no material on aspiration. She was given oral fluids, 1 oz. (28 ml.) hourly for 12 hours, after which time the amount was doubled each 12 hours; 500 ml. of M/6 sodium lactate was administered intravenously. After the cystoscopy no urine was passed for 17 hours, at which time spontaneous diuresis took place. (The left ureteric catheter was left *in situ* for 72 hours, but no urine drained through it.) In the next 24 hours she passed 35 oz. (1 litre) of urine. She was discharged on March 13.

Investigations. March 7: microscopy of urine removed from bladder on cystoscopy revealed it to be acid in reaction, with a microscopic haematuria. No sulphonamide crystals were seen. March 9: urine turbid, red-brown, pH 6.2; deposit abundant red blood cells, with no excess of leucocytes and no crystals seen; alkaline reserve, 40.4 vols. CO₂%. March 11: urine deep red, pH 5.6; still large numbers of red blood cells. On March 13 the report was similar. Intravenous pyelography showed good function on both sides, with normal renal outlines. The concentration of dye excreted was better on the left than on the right.

COMMENT

The simultaneous administration of two antibacterial agents is now an accepted principle of therapeutics. The drugs employed are many, proceeding from mixtures of synthetic agents, such as sulphonamides, to mixtures of sulphonamides with various antibiotics. Sulpenin is one of these; each tablet contains penicillin, 100,000 units, sulphadiazine, 0.25 g., and sulphamerazine, 0.25 g. The dose administered for infection of average severity is two tablets every four hours.

Garrod (1953) outlined the principles and the problems of this kind of therapy. He gives the following indications for its use: prevention of acquired resistance, achievement of synergism, prevention of toxic effects, mixed and double infections, and, rarely, the urgent undiagnosed case. The main difficulty is to avoid the production of resistant strains of infecting organism, but penicillin sulphonamide mixtures tend to do this much less often than do other combinations.

This case emphasizes the fact that combinations of antibacterial agents do not abolish the capacity of the individual drugs to produce their specific toxic actions on the host. It seems likely that sulphadiazine was probably the responsible fraction, as its solubility in urine of pH 6.5 is less than half that of a comparable dose of sulphamerazine at that pH. Recent work has cast some doubt on the routine use of sulphonamide mixtures alone. Weinstein and Murphy (1952) state "that combinations of sulphonamides may have little clinical usefulness in many instances, since they are often not as effective as the single agents which compose them." This raises the question of what sulphonamide is best combined with penicillin. Of the sulphonamide preparations now available, sulphasomidine (6-*p*-aminobenzene sulphonamido)-2:4-dimethylpyrimidine), the isomer of sulphadimidine, would seem to be worth combining with penicillin. It has a greater solubility in acid urine than any other sulphonamide, the degree of acetylation is only 10-15%, the blood level remains consistently high, and side effects are slight.

The clinical picture was not entirely typical in that no signs or symptoms referable to the loins were obtainable: a superficial examination suggested the presence of an intra-abdominal condition. A careful history provided the answer.

In the treatment carried out along standard lines it is significant to note that return of renal function occurred first on the non-catheterized side. Although the condition was what is often classified as an obstructive type of anuria, spontaneous diuresis occurred within 24 hours. The left ureteric catheter, *in situ* for 72 hours, did not drain urine in that period. It is possible that traumatic oedema of the ureteric mucosa, already partly damaged by a saturated solution of sulphonamide, was the cause of this depression of function. This experience would tend to support the view of those who recommend, after an initial cystoscopy, the application of the principles of the Bull regime to cases of sulphonamide anuria.

This case was under the care of Mr. Cameron MacLeod, to whom I am indebted for permission to publish.

J. G. CALLANAN, F.R.C.S.

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Reviews

SURGERY IN WARTIME

Surgery: History of the Second World War. Edited by Sir Zachary Cope, B.A., M.D., M.S., F.R.C.S. United Kingdom Medical Series, compiled under the direction of an Inter-Services Editorial Board. Editor-in-Chief: Sir Arthur S. MacNalty, K.C.B., M.D., F.R.C.P., F.R.C.S. who has written the Foreword for this volume. (Pp. 772; illustrated. 80s.) London: Her Majesty's Stationery Office. 1953.

This volume must surely be one of the greatest records of all time of the art of healing. It is far more than a mere record of surgical skill. It is the story of how a whole nation came to the help of those who had risked their lives in its service, of medical skill without parallel, devoted to those whose courage has never been surpassed. A fortunate combination of circumstances, rapid transport, blood transfusion, penicillin, gave the surgeon opportunities he never before possessed, but without the willing co-operation of the whole nation the amazing results he obtained could never have been achieved.

The volume opens with an admirable review by Ogilvie of the novel problems of the war and of the novel means by which they were overcome, and this is followed by a chapter on the general treatment of war wounds, dealing especially with the difficult conditions imposed. Lionel Whitby contributes a chapter on blood transfusion, in which he rightly claims that in no previous war has there ever been such a system, where blood was collected from thousands of healthy donors, kept in store, processed, and dispatched all over the world wherever it might be needed. And never before has there been produced such a balance sheet as he here presents of the origin, destination, and achievement of pints of blood from more than 750,000 donors. Largely to those donors did our wounded owe the 80 to 90% chance of life which they enjoyed.

In a great book the greatest chapter of all is that on abdominal injuries. It could have been written only by Gordon-Taylor. The width of outlook, the grasp of detail, the clarity with which he paints a most complex scene, demanded a depth of experience and a breadth of travel, and perhaps a classical background, which no one else possesses. He traces the story from the early days when morphine was the only resource to the splendid achievement of later years, when among over 5,000 abdominal casualties in the B.L.A., from June, 1944, to the armistice, recovery was obtained in 70%. It was not the achievement of any individual or of any one group, but of team work to which there is no parallel, covering transport, surgical technique, anaesthesia, chemotherapy, nursing, evacuation, and rehabilitation. From the purely surgical standpoint the chapter is packed with information of vital importance to all who have to deal with abdominal injuries of any kind, many indeed of the cases arising in air raids in this country.

The chapter on the treatment of burns by Zachary Cope and Morley is of high value and may well be accepted as expressing standard practice for years to come. It is very naturally followed by a discussion by Harold Gillies and his colleagues on plastic surgery and the organization of plastic units. The article by Kelsey Fry on maxillo-facial injuries gives a wonderful demonstration of what can be done in conditions which not long ago would have been regarded with utter despair.

We have been able to touch upon only a few of the highlights in a book whose every page is full of interest. It deserves the close study of every surgeon in the country, and perhaps especially of those of the younger generation, that they may realize how difficulties which appear insuperable may be overcome by determination and co-operation. And in the last chapter of all, where Julian Taylor tells of how he and his colleagues carried on their work in the Japanese prison camp of Singapore, they may learn something of the great ideals which have inspired our profession since the days of Hippocrates.

HENRY SOUTTAR.

CHEMICAL PATHOLOGY

Clinical Chemical Pathology. By Professor C. H. Gray, D.Sc., M.D., M.R.C.P., M.R.C.S., F.R.I.C. (Pp. 138, 10s. 6d.) London: Edward Arnold and Co. 1953.

This is the best book I have met on chemical pathology for students. It is neither a mere collection of diagnostic tips and laboratory techniques nor a treatise in which a student cannot see the wood for the trees. The range covered is rather limited—renal function, acid-base balance, fluid balance (two chapters), liver function, blood sugar, calcification, digestion and absorption of fat, the chemical pathology of the alimentary tract, endocrine disease, and miscellanea.

The first four chapters are particularly good. The chapter on blood sugar is the least satisfactory; Professor Gray may be prudent in avoiding discussion of the fundamental nature of diabetes, but surely it is not wise to recommend Soskin and Levene for further reading without some antidote. The laboratory techniques given are not more than are needed by students who do not propose to take up laboratory work. A table of normal values of blood constituents is given.

J. R. MARRACK.

CLINICAL ALLERGY

Clinical Allergy. By French K. Hansel, M.D., M.S. (Pp. 1,005; 86 illustrations and 3 colour plates. £6 10s.) London: Henry Kimpton. 1953.

This massive volume is presented as a complete text on the subject of general allergy and has been expanded from the author's previous work on allergy of the nose and paranasal sinuses published in 1936. Some eleven chapters are largely devoted to this subject, three to hay-fever, two to bronchial asthma, and five to allergy in children. The chapter on antihistamines is rather disappointing, and of its 16 pages almost half are occupied with the effect of antihistamines on the common cold. The chapter on A.C.T.H. and cortisone gives an adequate review of the subject.

No obvious omissions were found, and the text fulfils its aim of completeness. Unfortunately, a number of methods of treatment are stressed and recommended to which few, if any, allergists in Britain would subscribe and which are not considered normal practice in other countries. Thus, the author recommends small desensitizing doses rather than the usual progressive dosage found best in hay-fever in most hands. Perhaps that is why he finds (p. 516) that "treatment has not modified . . . the skin reactions." In Britain we expect the skin reactions to be greatly diminished or to disappear after adequate specific high-dosage therapy. The author also recommends sublingual antigen therapy and lauds the non-specific use of staphylococcus toxoid in urticaria, angioneurotic oedema, and eczema. In the presence of these unorthodox recommendations, the book may be considered an excellent reference volume for the expert rather than a text for the beginner in allergy. The general format and printing are superb and no typographical errors were observed. The bibliography and index are satisfactory features of the book.

C. J. C. BRITTON.

ELEMENTARY HISTOLOGY

Elementary Pathological Histology. By W. G. Barnard, F.R.C.P. 3rd edition. (Pp. 77. 185 illustrations, including 8 in colour. 17s. 6d.) London: H. K. Lewis and Co. Ltd. 1953.

This is the third edition of Professor Barnard's book, which was designed to help students during their first course in elementary pathological histology by providing them with a strictly limited number of large photomicrographs of good quality illustrating the processes of inflammation, degeneration, and tumour formation. This subject is taught just before or early in the student's clinical training, when he needs assistance in forming a clear and permanent visual memory of a few basic pathological lesions, which he should

then be encouraged to look for as he becomes more experienced. By this means he trains himself to deduce from a complex histological picture the fundamental process responsible for it. During this period it is remarkably easy to produce irreparable confusion in the student's mind by a surfeit of illustrations. Professor Barnard's careful selection and rigid censorship have skilfully avoided this pitfall: each of his 185 illustrations justifies its inclusion, and we can safely recommend this book to students about to embark on a subject which rather too often becomes more difficult for them than it should be.

This edition is enlivened by the inclusion of some illustrations in colour. The textual alterations are few, and the short pithy descriptions are eminently suitable for what is, after all, no more than a good laboratory companion, to be used while sections are being examined under the microscope.

GEOFFREY HADFIELD.

MANUAL OF OBSTETRICS

Eden and Holland's Manual of Obstetrics. By Alan Brews, M.D., M.S., M.R.C.P., F.R.C.S., F.R.C.O.G. 10th edition. (Pp. 812; 57 plates, 12 in colour, and 378 illustrations. 52s. 6d.) London: J. and A. Churchill, 1953.

Should an undergraduate textbook provide for the bright student at the top of the class or the dullard at the bottom? Should it give only the bare essentials of a subject—enough merely to provide the average reader with a reasonable expectation of a pass in the qualifying examination, or should it aim at satisfying as well as whetting the appetite of the most intelligent and diligent of students, stimulating them to further endeavour and opening up for them new fields of thought? A wide outlook on education surely demands the latter approach. It brings material as well as spiritual benefit in that the resulting book caters not only for the surmounting of the immediate hurdle of "finals," but remains a companion and a source of reference for the years to come.

Eden and Holland's Manual of Obstetrics has always taken the large view, and in consequence has long been recognized as one of the finest textbooks on obstetrics published in this or in any other country. It is renowned not only for its subject-matter but for its style and prose, and this again can have nothing but a favourable impact on the student with a receptive mind. The confidence of the author in the reader is shown not only by the text but by the suggestions for further reading which appear at the end of each chapter.

This edition, like its immediate predecessor, is written by Mr. Alan Brews and has entailed a good deal of modification. Clear photographs and radiographs now take the place of several of the diagrams of earlier editions. Despite thorough revision the author has succeeded in retaining the original style and flavour, and this is no mean achievement.

The undergraduate looking for a sound, attractive, and complete textbook rather than a cram précis could not find a better, and after he has qualified it will be a standby in his practice and in his pursuit of higher diplomas in obstetrics.

T. N. A. JEFFCOATE.

DIABETIC NEUROPATHIES

The Diabetic Neuropathies. By Joseph I. Goodman, M.D., S. Baumof, M.D., L. Frankel, M.D., L. J. Marcus, M.D., and S. Wassermann, M.D. (Pp. 138. £1 15s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications, 1953.

This is a very good book, and, although there are bits and pieces on the subject in many large books on diabetes, it is the only book I know whose authors have put the whole subject together in a competent way. The reading behind the book has been wide and the bibliography ranges through a hundred years since the relations between diabetes and its neuropathic complications were first mentioned.

The authors emphasize the early peripheral nature of this type of complication and give a clear account of how it can creep upwards, if untreated, to the more central nervous system, with protean manifestations such as impotence, apart from malnutrition; the tabetic-like bladder; chronic relapsing diarrhoea; neuritis of the nerves in the eye, with resulting diplopia, and even retrobulbar neuritis. Mention of the rare involvement of almost any one or two peripheral nerves round the chest and the abdomen or even the phrenic seems to be omitted.

The early attack—perhaps the first manifestation of this neuropathy—on the autonomic nervous system has been pointed out. It would appear that the non-medullated nerve fibres suffer first, and their unprotected axis cylinders are the earliest to suffer degeneration. This has been shown by biopsy material by Martin since this book was written. It is tragic to realize, in the rapid progression of medical discovery, that not even this nor any book is quite up to date. However, it is really excellent and should be read by all neurologists and, shall I say, diabetologists.

R. D. LAWRENCE.

CLINICAL CARDIOLOGY

Clinical Cardiology. Edited by Franklin C. Massey, A.B., M.D. (Pp. 1,100; 250 illustrations. £5 2s. 6d.) London: Baillière, Tindall and Cox, 1953.

The reader of this book cannot help wondering whether the subject of cardiology has really become so large and diffuse that it requires the minds of 33 collaborators to produce a book upon it. It is almost inevitable that there will be repetition and overlapping. This will then lead to a disintegration of the subject, and consequently its complication instead of simplification. It is indeed a pity that the razor of William of Occam had not been used here, and the multiplication of authors and opinions beyond necessity avoided. There has, however, been a sound attempt at a fairly uniform use of technical terms, so "atrial" fibrillation and flutter it is throughout. Each chapter starts with a sort of "Who's Who," so that age, birthplace, and various particulars about its author are set out. The description of the anatomy of the heart in the first chapter is well done; in the chapter on physiology "circus movement" is accepted without comment, but not so in the chapter on arrhythmias. Here, unfortunately, the discussion of diagnosis and treatment and much other information on this subject lack orderly presentation, and the reader is left in some confusion, though the line illustrations are clear and economical. The chapter on physical diagnosis is unsatisfactory. The description of signs is weak and in places hardly accurate.

There is a chapter on the radiology of the heart. This subject should surely be joined with the various matters it helps to elucidate. The sketches are poor, artistically and practically. The surgery of the heart similarly stands alone as a chapter, instead of being discussed where this method of treatment is appropriate. The key to the study of congenital lesions is so short that it is doubtful if it opens any door of knowledge. In the description of angina pectoris on page 622 there is a piece of Latin which would have made Heberden shudder. But this is really a good chapter; unfortunately it lacks the all-important cardiograms, and for them one must turn to the chapter on electrocardiography. The chapter on arteriosclerosis needs a clear basis of pathological classification, but there is much interesting material on atheroma and some good photomicrographs. Most of the chapters give a fairly full list of references from the American literature. The paper and print are excellent, and most of the illustrations are good. The index is full. There is a vast amount of information in this book, but it suffers from having too many authors, and consequently is rather dull to read, for it lacks the individual touch and any sort of soul or personality.

TERENCE EAST.

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THE PRESS AND THE PROFESSION

Professor Ian Aird's letter to this week's *Journal* (p. 153) draws attention to a matter of much concern both to the medical profession and to journalists—the publication in the lay press of intimate details of medical or surgical treatment which traditionally should be the concern of two parties only—the patient and his relatives and those who look after the patient. This traditional reticence, which is primarily in the interests of the patient, has never been strictly observed. For example, the illness of a public figure is rightly held to be a matter of public concern, and his medical attendants will often issue bulletins giving details of the illness and of the treatment administered. In the case of a crowned head this has indeed come to be looked on as a public duty. The editor of a newspaper may, too, consider that his obligations to his readers extend beyond this and through his special correspondents pursue inquiries of his own. *The Times*, for instance, some sixty years ago entered pertinaciously into the controversy over the illness of the Crown Prince Frederick.¹ The other kind of occasion of relaxed reticence is when some spectacular or unusual operation is performed: here it is the procedure rather than the person that is the focus of attention, and, inevitably, the surgeon who carries it out. Professor Aird's letter shows how the natural desire of a journalist to acquire news for his paper—in fact it is his duty as a journalist to do so—may embarrass the surgeon, needlessly alarm the patient's relatives, and have a harmful effect on other patients awaiting a serious operation.

An operation on Siamese twins is news. Modern medicine in the present exciting phase of its development is news. The public wants to know about these things, and any editor or journalist will therefore do what he can to give the public what it wants. How this news is gathered and presented depends upon a number of factors: the standard a paper sets itself; the competence and integrity of the paper's medical or science correspondent; the degree of intelligence and knowledge of science a newspaper's readers may be judged to have; and the extent to which the medi-

¹ See Morell Mackenzie, by R. Scott Stevenson, London, 1946.

cal profession may feel it can go in supplying the press with information. It is this last that concerns us most.

There is need for a clearer understanding by the medical profession and the press of each other's problems. Doctors have an intense dislike of publicity, quite unrelated to the fact that publicity may draw upon them the unwelcome attentions of the General Medical Council. In these days the surgeon who operates on a patient is a member of a team, and the operation he performs is more often than not the outcome of the work of others besides himself. His scientific conscience and sense of justice are therefore affronted when he sees himself singled out in the press as the hero of the occasion, and he may fear, not unnaturally, that his colleagues may suspect him of seeking such publicity, and that this will harm what is to him of supreme importance—his professional reputation—and lower him in the esteem of his colleagues; and nothing will horrify him more than to see his photograph staring at him from the front page of the *Daily X* when he opens it at his breakfast table. The journalist, however, knows that his public is interested above all in personalities; and that the only anonymity they will tolerate in a newspaper is the anonymity of the editor and, perhaps, his special correspondents. A matter of life or death, as an operation so often is, is something of intense human interest; when the operation itself is a dramatic one the interest is intensified and the public has a natural desire to know something about the person of the operator, and will tend to brush aside the conventions of the medical profession as of little account. When archbishops, bishops, deans, judges, barristers, field-m Marshals, authors, and artists submit to the publicity of the press with little demur, why, says the public, should doctors kick against the pricks? The short answer is that no other professional man has such an intimate relationship with his fellow human beings, or has to bring to bear upon them skills that may shift the balance between life and death, apart from the rarely operated skills of barrister and judge in cases of alleged murder.

In his letter Professor Aird suggests that the profession should face the fact that the press will not be content to wait for the presentation of medical facts in the medical journals before it breaks any particular news to its public, and that, this being so, such news might be given to the press through an intermediary such as a public relations officer. He hopes that in this way anonymity might be preserved and accuracy ensured. Helpful though the work of public relations officers is in meeting press inquiries, it may be doubted whether this is a solution to the problem. The press seems to be relying more than it used to do on scientific and medical

periodicals as a basis for the scientific and medical information the papers dish up for their readers; and, if we may judge from our own experience, reporters seek and welcome a closer co-operation with the editorial staffs of such periodicals in trying to ensure the accuracy of the accounts they write for their papers. Such co-operation might well be extended, and, busy though practising doctors are, they should, we suggest, do what they can to help the practising journalist when he makes a bona-fide request for information. A good journalist will always respect his informant's desire for anonymity and keep his word that any background information should be regarded as confidential. A better relationship between doctors and the press should go a long way to prevent a repetition of the harassing experiences which have provoked Professor Aird's letter, intensified as they were by the shocking behaviour of certain press photographers against whose thug-like intrusions the hospital authorities had to act by blacking out the lower halves of the windows of the wards where the Siamese twins were lodged. If any surgeon is faced with Professor Aird's dilemma in the future he would be well advised at the outset to seek the help of the public relations officer of the B.M.A. and thus make use of the facilities available in his own professional organization.

An operation on Siamese twins is as rare as the twins themselves, and such an intensive news-hunt is unlikely to be common. But our journalist colleagues of the lay press will surely remember on any such future occasion that the strain on those carrying out difficult medical or surgical procedures is heavy, and that any intrusion on them in the course of their work or in their homes can do nothing but harm. Possibly the many responsible science writers attached to newspapers would consider among themselves how best to deal with this matter of gathering and presenting medical news to their readers, if only for the reason that what they say and how they say it has a profound effect upon men and women who may at any time be in need of medical care. The medical profession has no wish to regard its art and science as an esoteric mystery, and recognizes that with a public more widely educated in science this cannot be the case. It fears, however, the ill effects of premature publicity and the dangers of the unwittingly distorting head-line. Professor Aird's letter will have served a useful purpose if it makes profession and press more conscious of each other's difficulties and makes mutual and responsible co-operation easier in the future. The doctor's first and last concern in all this is to protect the interests of his patients and their relatives.

GENERAL PRACTICE ANALYSED

In the opening pages of this issue we publish a paper by Drs. E. M. Backett, J. C. G. Evans, and Mr. J. A. Heady which reports selected results from a year's statistical study of what they call "some of the more quantitative aspects of the doctor's job." The authors of this study, which is an experimental part of a larger study of the methods which might be used to investigate general practice, examined one closely knit working-class urban practice of some 3,000 patients in charge of one principal assisted by a trainee and, occasionally, by another practitioner. Private practice is not mentioned, and presumably was non-existent. The principal and his assistants bore the main burden of record keeping—a simple basic form completed after every consultation and every six weeks members of the research team attended all consultations for one week and recorded in greater detail what went on. A consultation, the basic unit of work studied, was taken to mean any meeting between doctor and patient in which advice was given, and included telephone inquiries, visits to patients in hospital, "and the like." It is estimated that 99% of consultations were recorded.

Fry¹ and Logan² directed their studies to ascertaining the amount and kind of ill-health in particular practice communities, and Fry also reported figures illustrating the amount of work done by the doctor. In the present study the authors report only on the amount of work done and relate it to the nature of the practice population grouped by sex and age and by type of illness classified as serious or not serious, acute infective or acute non-infective, or chronic. The patients' occupations were not taken into account.

The following are some of the facts which emerge. During the year 15,788 consultations took place, which represent 72% of the practice population, or five for every registered person or seven for every person who consulted. On examination it is found that of those aged over 64 (10% of the practice) 25% of males and 32% of females consulted the doctor on 10 or more occasions. Thirty-six per cent. of the total consultations were in the patient's home, and, of this 36%, 50% were for children and the elderly. Only 12% of children aged 0-4 did not see the doctor at least once. In all age groups the percentage of males who had no contact with the doctor is greater than that of females. Half of all the work was on one-sixth of the patients (some 500), who saw the doctor 10 or more times, and 18% of the work concerned 4% (125), who consulted 20 times or more.

¹ *British Medical Journal*, 1952, 2, 249.
² *General Practitioners' Records*. General Register Office: Studies on Medical and Population Subjects, No. 7, 1953, H.M.S.O., London.

Twenty per cent. of diagnoses were of chronic disease and entailed 30% of the work. Acute infective disease accounted for 50% of diagnoses and 50% of the work, and the 10% of serious diagnoses accounted for 43% of the work. One certificate was given for every 4.5 consultations, and half of these were for National Health Insurance purposes. Reference to hospital or other agency occurred at the rate of 35 for every 100 registered persons. During 10,889 out of 15,788 consultations, one or more prescriptions were issued, and this equals at least five for every patient who consulted.

It is worth emphasizing that these facts relate to one community of people and one doctor and his assistant. They cannot be taken to be representative of general practice as a whole or even of practices of a similar kind, nor do the authors claim that they should. With this proviso in mind it may be remarked that the facts coincide in many respects with those of other observers and will confirm what has been up to now generally accepted on the evidence of experience. For instance, that old people and chronic illness should loom large in a G.P.'s work is to be expected, but perhaps the proportion of work with young children and females of all ages has not been so well realized. It is interesting that of the hard core of sick people in the practice over half were under 45 years of age and more than a quarter were children and therefore a fruitful subject for the practice of rewarding medicine. Likewise the fact that 43% of the general practitioner's work is associated with illness diagnosed as serious supports the same encouraging contention, and, as the authors say, tends to refute statements such as "the general practitioner is a specialist in the trivial."

Our correspondence columns have often borne witness to conflicting opinions on what are the aims of general practice and what are the principal needs that patients look to their family doctors to satisfy. The inquiries being carried out under the Medical Research Council and elsewhere will help to answer these questions, made the more urgent by the rapidity of technical advance in this mid-twentieth century, when the ascertainment, prevention, and treatment of disease in general practice are fast changing.

MYELOMATOSIS

Multiple myeloma is a condition which is all too often diagnosed incorrectly. A case with conspicuous bone lesions may be regarded as an example of secondary carcinoma from a latent and undiscoverable primary tumour, while sometimes the presence of bone lesions is not suspected during the life of the patient. For

reasons of this sort it is not easy to be sure of the frequency of occurrence of what is regarded by some as a very rare condition. The paper by Mr. A. Naylor and Dr. F. E. Chester-Williams which appears at page 120 of this issue of the *Journal* is therefore of interest in that it describes a series of twenty-five cases, twenty-four of which occurred in one hospital group during a period of five years.

Not only is their paper a reminder of the frequency of this condition, but the series of cases they describe emphasizes the diversity of clinical presentation associated with it. Seventeen of the twenty-five cases showed the conventional "generalized" picture with multiple bone involvement by discrete osteolytic lesions. Naylor and Chester-Williams regard this as the terminal stage of myelomatosis, and in an endeavour to institute early therapy, and to avoid confusion with other conditions, they draw attention to two other types of case which are perhaps not so generally known. In their series the first of these is a group of four cases in which a solitary lesion was initially found, and the second—also of four cases—was characterized by diffuse bone involvement without focal radiological lesions.

As to the way in which patients with multiple myeloma present clinically, it is of interest to note that in this series six of the patients with the generalized form of the disease sought medical attention because of general symptoms—particularly those related to the anaemia produced by replacement of bone marrow by myeloma tissue—and showed no clinical evidence of skeletal involvement.

Occasional examples of solitary myeloma (sometimes called solitary plasmacytoma of bone) have been reported, and have been reviewed recently by Raven and Willis¹ and by Lumb.² This type of case is rare, and in Naylor and Chester-Williams's series generalization soon occurred in each of the cases in which an initial solitary lesion had been found.

Of recent years interest has been aroused by chemical studies on the abnormal proteins present in the urine of many patients with multiple myeloma (originally noted by Bence-Jones in 1848,³ and known by his name), and in the related abnormal plasma protein constituents which are also present: studies of these proteins have been reviewed by Rundles *et al.*⁴ It has been shown by Martin⁵ and by Miller *et al.*⁶ by means of electrophoresis and ultracentrifugation that the myeloma tissue itself contains the same abnormal globulin as is present in the blood, which finding suggests that the plasma-celled tumour tissue is concerned in the synthesis of these protein molecules. This is of considerable importance in view of the increasing emphasis given by such workers as Fagraeus⁷ and Bjorneboe *et al.*⁸ to the role of plasma cells in the production of the rather similar globulin molecules of antibodies.

¹ Raven, R. W., and Willis, R. A., *J. Bone Jt Surg.*, 1949, 31B, 369.

² Lumb, G., *Ann. roy. Coll. Surg. Engl.*, 1952, 10, 241.

³ Bence-Jones, H., *Philos. Trans. B*, 1848, 138, 55.

⁴ Rundles, R. W., *et al.*, *J. clin. Invest.*, 1951, 30, 1125.

⁵ Martin, N. H., *ibid.*, 1947, 26, 1189.

⁶ Miller, G. L., *et al.*, *Cancer Res.*, 1952, 12, 716.

⁷ Fagraeus, A., *Antibody Production in Relation to the Development of Plasma Cells*, Stockholm, 1948.

⁸ Bjorneboe, M., *et al.*, *J. Immunol.*, 1947, 55, 121.

A NEW ORAL DIURETIC

Efficient diuretic treatment is almost as important as digitalis therapy in the management of congestive heart failure, and is of major importance in the treatment of many other oedematous states. No other diuretics compare in efficacy with the organic mercurials, and in view of their many clinical applications it is rather surprising that they are not used more often in general practice.¹ Doubtless the necessity of administering mersalyl parenterally militates against its more common use. For maintenance treatment many patients require two or three intramuscular injections a week, and, as these may have to be continued over some years, the treatment is apt to be abandoned in the course of time. These inconveniences would be obviated by the discovery of orally administered diuretics which are really effective. Recent clinical trials in America²⁻⁴ have been carried out with 3-chloro-mercuri-2-methoxy propyl-urea. Named in the U.S.A. "neohydrin," and now made available in Britain with the name "mercioran," it is an extremely effective diuretic whose potency when given orally is about one-fourth of its potency when given by intramuscular injection. No other mercurial diuretic approaches such a favourable ratio of oral to intramuscular potency. Experience suggests that a daily individual dose is more effective than the same amount given in divided doses throughout the day. As with mersalyl, the dose should be given immediately after breakfast, and its effect is potentiated by the previous administration of ammonium chloride and a low sodium intake.

Besides the two problems presented by an injected diuretic—systemic toxicity and diuretic potency—an orally administered agent presents a third problem of local gastro-intestinal irritation, and unfortunately this is very commonly produced. Clearly if the oral dose is small enough the incidence of such side-effects vanishes, but so does the diuretic action, and it appears impossible to obtain with mercioran the diuretic effect commonly produced by, say, 2 ml. of intramuscular mersalyl, without inducing a prohibitive number of unpleasant gastro-intestinal symptoms. Few patients indeed seem to be able to tolerate a dose which will give a diuretic response of more than would be expected from about 0.5 ml. of intramuscular mersalyl. Nevertheless, even if abdominal cramps, nausea, vomiting, diarrhoea, and bloody stools develop in about two-thirds of patients after effective doses of mercioran, there is the remaining one-third of patients who will tolerate it well. These can be discovered only by trial and error, but for them the inconvenience of long courses of injections can often be eliminated; in others, more sensitive to the drug, it may be possible by the use of appropriate smaller doses to prolong the interval between injections. While, therefore, the use of this preparation may be limited, it is likely to prove a useful addition to the list of new drugs.

¹ Dunlop, D. M., et al., *British Medical Journal*, 1952, 1, 292.
² Greiner, T., et al., *Proc. Soc. exp. Biol. (N.Y.)*, 1952, 80, 117.
³ Brennick, E., and Abramson, J., *New Engl. J. Med.*, 1953, 249, 681.
⁴ Greiner, T., and Gold, H., *J. Amer. med. Ass.*, 1953, 152, 1130.

INHALED FOREIGN BODIES

When a foreign body is aspirated into and retained in a bronchus many pathological changes may arise. Most foreign bodies irritate the bronchial mucosa, causing chronic inflammation which gives rise to a persistent cough. If the bronchus is completely occluded by the foreign body, the corresponding pulmonary segment collapses; distal infection in the collapsed segment often proceeds to bronchiectasis or lung abscess. Even when bronchial obstruction is not complete, the lung segment is liable to recurrent pneumonia, which may be complicated by pleurisy or empyema. Finally, it is possible for a foreign body to cause valvular obstruction to the bronchial lumen, so that air cannot escape during expiration and obstructive emphysema is produced. Thus the clinical features resulting from the accidental inhalation of material into the bronchus are extremely variable, and in the absence of a clear history of such an accident the underlying cause of the trouble is easily overlooked.

The hazards of inhaling foreign bodies are greater in young children, in whom the choking and gagging due to "something going the wrong way" are of commonplace occurrence. On page 125 of this issue of the *Journal* Dr. Bernard Laurance describes the cases of three children who developed serious pulmonary disease after inhaling foreign bodies. In one child, who had recurrent lung abscesses, pleural effusion, recurrent pulmonary collapse, and repeated haemoptyses, the true cause of the disease was discovered only after lobectomy showed an ear of barley within an abscess cavity in the removed lobe. Several thorough bronchoscopic examinations had failed to disclose the offending ear, although its presence had been suspected. In the other two children re-expansion of a collapsed lobe followed the successful removal of vegetable bodies by bronchoscopy, but in one case there was residual bronchiectasis. Dr. Laurance emphasizes that both lung abscess and haemoptysis are rare manifestations of bronchial foreign bodies in children. His cases also serve as a useful reminder that there is often a long latent interval between the inhalation of foreign bodies and the onset of respiratory symptoms. Indeed, it is not unknown for large bony fragments to be removed from the bronchus of patients who vehemently deny any possibility of their having been inhaled.

The diagnosis of foreign bodies in the bronchus is not always easy, but the possibility should be constantly remembered. When a history of inhalation of foreign material or choking over food is given by a parent or patient, full examination should never be neglected. Radiographs in the postero-anterior and lateral positions may assist diagnosis by showing segmental collapse, consolidation, or emphysema, but if any doubt remains bronchoscopy should be done. Even in the absence of a history of inhaling a foreign body, bronchoscopy should be done in patients with lung abscess, persistent pulmonary collapse, or prolonged or recurrent pneumonia. Such patients are often found to have underlying bronchial obstruction, and if a foreign body is found to be the cause its

removal at bronchoscopy is usually all that is required to bring about full clinical recovery.

CURRENT RESEARCH ON INFLUENZA

By the end of the last war laboratory methods for the study of influenza had been so simplified that it seemed opportune to study the disease on an international scale. The primary task of co-ordination and of promoting the exchange of scientific information was undertaken by the World Health Organization, whose latest monograph¹ gives an account of research on influenza. A principal task has been the detailed examination of virus strains from all over the world. Two main serological types of virus, A and B, have been recognized since 1940 (a third type C has been described, but its relation to epidemic disease is not yet clear). Virus A has consistently been found in association with major epidemics. A closer examination of A strains shows a definite change in antigenic character, whereas B strains are more homogeneous and less concerned with epidemic disease.² The original strain of 1933 (WS) was largely replaced about 1935 by a new type, PR8, which in turn gave way in 1947 to the current A-prime strains. There is every indication that this is a progressive change, though some doubt exists about its cause. As to further changes, time will show.

It seems clear from the behaviour of influenza in recent years that influenza-A epidemics may not only spread from country to country but may have multiple points of origin. Andrewes³ considers this to be in favour of the concept of a "hidden" or "basic" virus in the inter-epidemic period which reappears when conditions are favourable. A virus which is capable of such antigenic change will clearly be at an advantage in securing a foothold if it differs from its predecessor. In addition the influenza-A viruses appear to have developed a more flexible method of coping with the immediate problem of survival in a partially immune population. Strains have been recovered which show a marked variation in susceptibility to antibody. Isaacs considers that this biphasic change (P-Q variation) may be a more common form of variation than the appearance of a new strain.²

In the laboratory it has been found possible to create new virus types. Australian workers⁴ have shown that following infection of the chick embryo with two distinct influenza strains the resulting viruses may under appropriate conditions show a switch-over of inherent properties. Fascinating as this subject of virus recombination is, its precise relation to human disease is by no means clear. The emergence of new strains in 1947 is also reflected, not unnaturally, in antibody changes in the population⁵ and in the constitution of virus vaccines.⁶ Francis⁶ has shown that by incorporating A-prime strains into vaccines significant protection can be obtained even when the current strain is not identical

¹ *Influenza*. W.H.O. Monograph Series No. 20. 1954.
² Isaacs, A., *Brit. med. Bull.*, 1953, 9, 208.
³ *Influenza*. W.H.O. Monograph Series No. 20. 1954. P. 9.
⁴ Burnet, Sir Macfarlane, *ibid.*, p. 67.
⁵ Hilleman, M. R., et al., *ibid.*, p. 25.
⁶ Francis, T., *ibid.*, p. 125.
⁷ *Ibid.*, p. 141.

with that incorporated in the vaccine. Recent experimental work on combining adjuvants with virus vaccines has given encouraging results. Preliminary tests in man point to a much higher antibody titre with adjuvant vaccine than with aqueous vaccine.

Influenza can be a lethal disease with considerable variation in severity from one epidemic to another. In the 1918 pandemic an undue proportion of young adults were killed. In the Liverpool epidemic of 1951 most of the deaths occurred in old people. Mulder and Stuart-Harris discuss⁷ the differential diagnosis and treatment of pulmonary complications such as influenzal bronchiolitis and pneumonia. Energetic treatment with antibiotics is particularly necessary in the latter case when infection with *Staph. pyogenes* is superimposed on an epithelium denuded by virus action. This monograph should do much to help international research into a disease capable of causing world-wide havoc.

IONIZING RADIATIONS

The ionizing radiations used in industry include x rays, and the alpha, beta, and gamma radiations emitted by radium, mesothorium, and many radioactive isotopes now available from atomic energy establishments. The description of the manifold industrial applications of these sources of radiation, contained in a pamphlet¹ issued by the Factory Department of the Ministry of Labour and National Service, shows clearly how the speed, efficiency, and improvement of modern chemical and engineering processes are dependent on the facilities which radiography provides for examination and control of their products. The examination of castings, forgings, and metal articles subjected to high stress, for which x rays were until recently chiefly used, is now widely carried out by means of radioactive isotopes such as cobalt⁶⁰, tantalum¹⁸², and iridium¹⁹², since they have the advantages of mobility, relative cheapness, and automatic control. Among the many other uses of ionizing radiations are the elimination of static electricity in processes where accumulation of an electric charge may be either dangerous or highly inconvenient, measurement and control of the thickness of materials, sorting of packets passing along conveyor bands, and calibration of monitoring instruments. The chief application of radium itself or of mesothorium is its incorporation into a self-luminous compound for painting instrument and clock dials in the process known as "luminizing."

This is the only use of radioactive material in which precautions against health hazard are specially required by law (the Factories (Luminizing) Special Regulations, 1947). Other ionizing radiations are the subject of recommendations and safety codes which have been published from time to time in an attempt to minimize, on a voluntary basis, the risks to health arising from their use. Such are the recommendations drawn up by the British X-ray and Radium Protection Committee (Seventh Revised Report, 1948), and by the Sixth International Commission on Radiological Protection in 1950. The latter body agreed on the maximum permissible dosage rates, which are regarded as a proper basis for

¹ *Precautions in the Use of Ionizing Radiations in Industry*. Ministry of Labour and National Service. H.M.S.O. 2s.

protective measures and on no account to be exceeded. General precautions are directed towards minimizing the exposure of workers to powerful sources of radiation by suitable planning of equipment, so that protection may be given by distance, screening, and remote control. Other measures include the prevention of inhalation or ingestion of radioactive gases and dusts by suitable ventilation; adequate supervision by trained persons; recording of exposure by means of dosimeters or photographic films; and periodical medical examination with regular blood counts when possible and desirable. When all such precautions are carefully observed the danger of ionizing radiations has been found to be slight, but the potential hazard of overexposure through accident or carelessness must always exist. Awareness of it is particularly important at a time when the rapidly expanding use of radioactive substances entails exposure to them of an increasingly large section of the industrial population.

HYALINE MEMBRANE IN THE NEWBORN

Pulmonary hyaline membrane in the newborn is an amorphous, acidophil deposit on the walls of air spaces, chiefly respiratory bronchioles and alveolar ducts. It forms only in spaces that have received air, though similar hyaline material may occur in lumps in unexpanded alveoli. The affected air spaces become overexpanded, while the rest of the lung substance is in complete atelectasis. Rupture of overexpanded air spaces may produce interstitial emphysema and pneumothorax.

Hyaline membrane is a common condition. Potter¹ considers that it is responsible for more deaths of live-born infants in the neonatal period than any other single cause. It is seen chiefly in the premature, and is usually the only apparent cause of death. It occurs much less commonly in full-term infants, and is rare in premature babies weighing under 1,000 g. (2½ lb.). It is not found in the stillborn, and has not been observed under one hour after birth. Several observers have noted a high incidence in babies delivered by caesarean section.

In the typical clinical picture the baby breathes spontaneously and may appear well until several hours after birth, when respiratory difficulty develops, with inspiratory recession of the sternum and lower ribs, and cyanosis. Deterioration is progressive until death, which is usually within 30 hours of birth, though some live till the fourth day or longer. While this picture should suggest hyaline membrane, it can be due to other causes, and the diagnosis can be confirmed only by microscopic examination of the lungs. It is not known how often affected infants survive. Clinical observation suggests that some recover, and the recent radiological study of Donald and Steiner² supports this view.

The cause of death is atelectasis, which is constant and always severe. It is usually regarded as resorption atelectasis, developing after membrane has formed and sealed off the more distal air spaces. This opinion is supported by the study of Donald and Steiner, who

demonstrated radiological changes in the lungs indicating progression of atelectasis from alveolar to lobular or lobar extent. Histological studies, however, suggest that the atelectasis may be in part primary.

The chemical composition and the cause of the membrane are not fully understood. Because it often contains stainable lipoid, it was for long believed to be composed of vernix caseosa, inhaled together with liquor amnii; but lipoid is not constantly present. Claireaux³ recently claimed to have produced it experimentally by injection of macerated epithelial squames from liquor amnii. Blystad *et al.*⁴ suggested that it is formed from protein of the amniotic fluid concentrated after a period of air breathing. Other workers believe that the membrane is an exudate or transudate. Hyaline membrane is not peculiar to the newborn; similar membranes have been described in older subjects in various diseases, including influenzal and rheumatic pneumonia, irritant gas poisoning, and heart failure. In the newborn, some authorities have suspected oxygen as the cause, but the condition occurs in the absence of oxygen therapy. Although most affected babies who survive for 48 hours develop pneumonia, there is no evidence that the membrane is of infective origin. Failure of adaptation of the pulmonary circulation to postnatal conditions, possibly associated with persistent primary atelectasis, might be responsible.

While the cause of the condition remains uncertain, treatment and prophylaxis can only be empirical. Some workers claim success for measures directed to thorough clearing of the air passages, while others recommend oxygen and high atmospheric humidity. A comprehensive review by Tran-Dinh-De and Anderson⁵ is recommended to the interested reader.

THE ANNUAL MEETING

This year's annual meeting of the B.M.A. is to be held at Glasgow on July 19, and the provisional programme is published in the *Supplement* this week so that members may make a note of the dates and as many as possible arrange to attend. The President-Elect is Sir John McNee, who after a distinguished career in London gave lustre for seventeen years to the post of Regius Professor of Practice of Medicine in the University of Glasgow, retiring last October. A great variety of events are being prepared for the instruction and entertainment of the visitors. These include three plenary scientific sessions. The success of the plenary sessions in the last two years has encouraged the organizers to hold them again, and the themes chosen for discussion at Glasgow are "The Problem of Sleep," "Food and Disease," and "The Problem of Pulmonary Tuberculosis To-day." Seventeen scientific sections will meet on July 7-9, and there will be a scientific exhibition on the lines of those which were so successful at Dublin in 1952 and at Cardiff last year. A number of special excursions have been arranged for the ladies. Early reservation of hotel accommodation is advisable, and it is hoped that as many doctors as possible will be able to attend, even if only for a day or so, and share in the warm hospitality that is an invariable feature of the Scottish scene.

CLINICAL PATHOLOGY IN GENERAL PRACTICE EXAMINATION OF FAECES FOR INFECTION AND INFESTATION

BY

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When a patient has diarrhoea it is usually desirable to know the cause of the attack. The symptoms may be so mild that the doctor is inclined not to have the faeces examined, but an early investigation can provide valuable information, particularly if the disease does not clear up as quickly as expected. Also, even if the patient is only slightly ill, the same pathogenic agent could produce a severe illness in other members of the house.

The bacterial infections are those caused by the dysentery, the food-poisoning, and the *Bact. coli* groups of organisms. Bacillary dysentery is usually associated with diarrhoea, often accompanied by colic, and the organisms causing this disease belong to the genus *Shigella*. In England the commonest of these is the *Sonne bacillus*. *Salmonella* is the food-poisoning group, and one of the most often encountered in this country is *Salm. typhi-murium*. The patients usually have severe diarrhoea and often vomiting. The enteric group (typhoid and the paratyphoids) also belong to the genus *Salmonella* but are not usually included among the food-poisoning group.

During the past ten years many fulminating food-poisoning epidemics have been caused by organisms which do not belong to the salmonella group, such as the enterotoxin-producing *Staphylococcus aureus* and the heat-resistant strains of *Clostridium welchii*. The symptoms in this type of food-poisoning are caused by toxins produced in the food by these organisms, and for this reason the incubation period is a very short one of only a few hours. In this form of toxic food-poisoning it is nearly always possible to isolate the causal organisms from the faeces.

Diarrhoea can also be caused by protozoal infections. Apart from the importance of diagnosing the cause of an attack of diarrhoea, an examination of the faeces is often necessary to prove whether or not there is a worm infestation or whether there is a metabolic disorder which affects the intestinal tract.

Collection and Delivery of Specimens

Rectal Swabs.—The passage of an ordinary sterile throat swab through the anal canal is a convenient way of obtaining a specimen that will not be contaminated after it leaves the body. Apart from any aesthetic objection to this method, these specimens are very often anal and not rectal swabs. Once the swab has passed the external sphincter the cotton-wool can be caught by the loose anal mucosa, which makes it feel as if any further pressure would tear the mucosa. Anal swabs, as distinct from rectal swabs, can provide misleading false cultural results.

Sheathed Rectal Swabs.—Some laboratories surround the swab with a suitably sized glass sleeve with rounded ends. These swabs are sterilized with a small quantity of liquid paraffin at the bottom of the containing test-tube and the lower end of the glass sleeve is lubricated. This lubricated glass tube is inserted through the anus with a to-and-fro rotary movement until the internal sphincter is felt as a distinct obstruction. The tube is pushed gently through the internal sphincter and the swab is then passed up into the

rectum, after which it is withdrawn within the glass sleeve. Both are then removed and reinserted into the test-tube. In babies with acute diarrhoea this method is very convenient, as on touching the internal sphincter the whole of the glass sheath is filled with liquid faeces, which otherwise would have soaked into a nappy.

Faeces.—Care must be taken to avoid contamination of the specimen after it leaves the body. All laboratories provide sterile containers which incorporate a spatula with which faeces can be picked up. In hospitals it is relatively easy to obtain uncontaminated faeces, and there are several ways of doing this in the home. One is to pour boiling water into a chamber-pot, which is then emptied; when it is cool the motion is passed into it. Another method, which avoids using a chamber-pot, is for the patient to empty his bladder and then fill the lavatory pan with many layers of toilet paper, on to which the motion is passed. The specimen is obtained with the spatula, after which the toilet is completed. Before using the technique it is convenient to remove the nether garments, as otherwise it is awkward for the patient to turn round to obtain the specimen.

Delivery to the Laboratory.—When cultural examinations are required a delay may reduce the numbers of the viable pathogens, especially if the specimen is on a rather dry rectal swab. When the specimen is being examined to establish a diagnosis, this delay may be dangerous to both the patient and his contacts. Very often some member of the patient's household can deliver the specimen to the laboratory if it is not too far from the home. Some laboratories issue tubes containing glycerol-saline into which a specimen of faeces is placed. This helps to prevent pathogenic organisms dying in transit, and it may be convenient for the practitioner to keep a supply of these bottles in his surgery. A specimen with only an occasional pathogen present will give entirely negative results if tested when 18 hours old—that is, if posted to the laboratory. Examinations for *Entamoeba histolytica* must be made on very fresh specimens, as only the cysts will be seen in faeces which have been allowed to cool.

Information Provided

Most laboratory examinations of the faeces are carried out to exclude or confirm the presence of pathogenic organisms or parasites. Therefore normal appearances and results are not usually reported, merely whether or not abnormalities are detected.

Routine examinations should enable infections caused by salmonellae, shigellae, the specific serological types of *Bact. coli*, *E. histolytica*, and *Giardia lamblia* to be diagnosed. The presence of an infestation with ascarides (roundworms) or with rarer worms such as whipworms is usually relatively easy to determine.

Direct Wet Smears.—Many laboratories make a direct examination of the faeces, without which the presence of amoebae, amoebic cysts, and *G. lamblia* would be entirely missed. In the acute stages of a dysentery and of many salmonella infections the finding of pus and red cells in excess of mucus may indicate the need to institute barrier nursing within a very short time of the specimen having been received in the laboratory. In infants the presence of many fat globules may be the earliest indication of fibrocystic disease of the pancreas; these babies are sometimes first seen as cases of diarrhoea. In ulcerative colitis there is usually a great deal of blood and mucus as well as pus in

¹ Potter, E. L., *Pathology of the Fetus and the Newborn*, p. 249. Chicago, 1952.

² Donald, I., and Steiner, R. E., *Lancet*, 1953, 2, 846.

³ Claireaux, A. E., *ibid.*, 1953, 2, 749.

⁴ Blystad, W., *et al.*, *Pediatrics*, 1951, 8, 5.

⁵ Tran-Dinh-De, and Anderson, G. W., *Obstet. gynec. Surv.*, 1953, 8, 1.

the faeces, but the proportion and amount of each of these are very variable. Except that there is usually more blood present, this exudate may be very like that of a dysentery and may be misleading at first.

How Soon?

Immediately

The direct examination, outlined above, allows an immediate diagnosis of amoebiasis and *G. lamblia* infestation, but it must be remembered that the latter is not uncommonly associated with Sonne dysentery, both infections having been acquired at the same time. Worm infestations will be diagnosed immediately but they are more conveniently dealt with separately.

The laboratory may also be able to suggest that dysentery is present by demonstrating an exudate in the direct smears: this could allow early segregation of the case, which might help to prevent the infection spreading.

After 18-24 Hours

The specific serological types of *Bact. coli* which cause epidemic enteritis in infants are primarily identified by slide agglutinations of 18-hour-old cultures. These results have to be confirmed by further laboratory tests, which take a day or more to complete. False-positive reactions are relatively common when a laboratory first undertakes these examinations, so the confirmatory tests are extremely important. With experience the number of false-positive results becomes much smaller, as the technician soon learns which type of reaction is a false-positive result if he is constantly checking the slide-agglutination results by tube agglutinations. Therefore laboratories which are constantly making examinations for these *Bact. coli* types can fairly safely diagnose their presence within 18 hours of the receipt of the specimen.

The Sonne bacillus gives very characteristic colonies on desoxycholate citrate plates, and slide agglutination of 18-hour-old cultures provides an answer which further laboratory tests usually confirm as correct.

The colonies of salmonellae on selective media can be examined by slide agglutination, and experienced workers will often be able to make a tentative diagnosis of a salmonella infection after one day's incubation. As the danger of a false-positive result is much greater in this type of infection than it is with Sonne dysentery, some pathologists prefer to wait another day, when confirmatory tests would be available.

After Two Days

Confirmatory biochemical and tube agglutination tests on organisms isolated on the first day will be nearly completed after 24 hours. The more specialized selective media, such as Wilson and Blair's bismuth sulphite plates for the enteric group, will be producing their first identifiable colonies. The enrichment media, such as selenite, tetrathionate, and brilliant green, will be subcultured after 24 hours, and the subcultures will be giving recognizable colonies after 48 hours.

It will thus be seen that after 18 hours a tentative diagnosis of infections due to *Sh. sonnei*, specific types of *Bact. coli*, and a few species of *Salmonella* can be made, but the confirmatory tests will take a few days longer. However, it is not unusual to isolate the pathogens by means of the enrichment techniques only, which means that the first positive results might not become available for three to four days.

Reference Laboratories.—Because of the great complexity of the antigenic structure of the members of the shigella and salmonella groups, in which there are over 250 types, reference laboratories have been established by the Medical Research Council. Laboratories are encouraged to send all salmonella and shigella cultures, except those of *Sh. sonnei*, to these reference laboratories so that the identity of the organisms can be confirmed. Therefore a provisional report naming a salmonella may be followed by a second giving an entirely different name. However, the treatment of the

condition will be the same: correct identity of the organism is of importance only to the public health authorities in their efforts to trace the origin of the cases and the connexion between them.

Infestation with Worms

If the whole worm or segments can be sent to the laboratory so that its identity could be confirmed any clean convenient container is suitable.

Threadworms (*Oxyuris vermicularis*) (Fig. 1) can occasionally be seen adhering to the surface of faecal scybala, otherwise they are rarely found in faeces. If there is any doubt about the identity of threadworms, it is advisable to send the specimens to the laboratory, as vegetable fibres can be mistaken for these small worms (about $\frac{1}{2}$ cm. long).

The ova of threadworms (Fig. 2) are never found in the faeces, as they are deposited on the perineum by the female worms. A "sellotape" slide produces a very convenient and easy method of diagnosing threadworm infestations. The slides can be prepared by placing a strip of 1-in. (2.5-cm.) sellotape on a glass slide. In the morning, before the child dresses, the mother detaches from the slide nearly the whole length of the sellotape. The sellotape is stuck on the skin near the anus and is immediately slowly



FIG. 1.—Two threadworms. (×12.)



FIG. 2.—Threadworm ova photographed through a sellotape slide. The coiled larvae can be seen within the transparent shells. (×280.)

removed. It is then stuck back flat on the glass slide and sent to the laboratory. These slides are much easier to examine than the old N.I.H. "cellophane" swabs.

Roundworms (*Ascaris lumbricoides*) can be between 3 and 8 in. (7.5 to 20 cm.) in length.

Tapeworms (*Taenia saginata* and *Taenia solium*). When mature segments (Fig. 3) are passed they measure about $\frac{1}{4}$ by $\frac{1}{2}$ in. (1.3 by 0.6 cm.), are coloured pinky grey, and may show slow movements. The type of taenia infection can be ascertained easily if one of these segments is blotted very thoroughly so that the adherent mucus is removed, dried, and then pressed firmly between two microscope slides. When held up against a bright light the number and arrangement of the uterine horns are easy to see. The commonest tapeworm in England is *T. saginata*, which has 20-30 uterine horns. If the laboratory is to look for the head of the

*All the photographs in this article were taken by Mr. J. G. Williamson, of the Children's Hospital, Birmingham.

"STATUS LYMPHATICUS," THE GROWTH OF A MYTH

BY

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tapeworm (Fig. 4), all the faeces passed after the administration of the saline aperient should be sent for examination. A search is made for the head by washing the faeces through a metal 28-mesh sieve. Unless such a sieve is used the head of the worm may be lost, so no attempt should be made to concentrate the specimen before it is sent to the laboratory. Specimens should be sent to the laboratory as

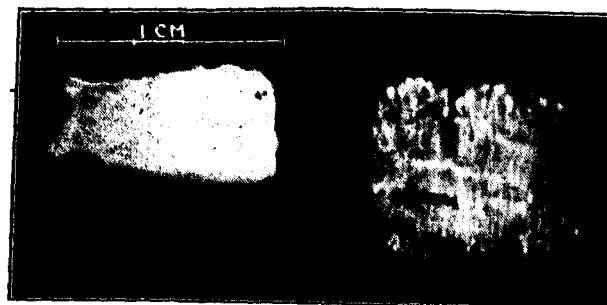


FIG. 3.—*Taenia saginata*: mature segment and flattened segment showing uterus.



FIG. 4.—Head of *T. saginata*. (×25.)

soon as possible, for once the worm has been passed it tends to degenerate. It is worth remembering that tapeworm ova are very rarely found in the faeces, because they are not liberated until the mature segments degenerate.

Criteria of Cure

If any of the antibiotics, such as chloramphenicol, aureomycin, or terramycin, have been given, or one of the intestinal sulphonamides, tests of cure should not be started until about five days after the drug has been stopped.

Salmonella and Shigella.—At least three consecutive negative examinations are necessary before a cure can be established. Because salmonella organisms often localize in the gall-bladder, it is best to obtain a specimen of faeces after a saline aperient, which will act as a cholagogue.

Specific Serological Types of Bact. coli.—Before it is safe to allow a child who has been excreting these organisms to enter an uninfected community of infants at least six faeces cultures, taken on alternate days, should be negative. If the baby is living in a community in which a specific type of *Bact. coli* is endemic, then it is preferable for the clearance tests to be made when the baby is away from that community. If the infant is going to its home, and other babies are not in the house, three negative results would be sufficient.

G. lamblia.—Three daily specimens should be examined three days after the mepacrine course has finished. It must be remembered that other members of the household may be infected and in this way the patient may easily become reinfected.

Ascaris, etc.—Examination for the ova of worms is preferably made on faeces obtained following a saline aperient, and at least six negative specimens should be obtained.

E. histolytica.—At least six daily specimens obtained after saline aperients should be examined for the cysts. It is also advisable to repeat these examinations six months later.

Next article on Clinical Pathology.—"Chemical Examination of the Faeces," by Dr. W. W. Payne.

The latest edition (the sixteenth) of *Principles and Practice of Medicine*, originally edited by Osler, defines status lymphaticus as "a combination of constitutional anomalies, among which are hyperplasia of the lymphoid tissues and of the thymus gland, hypoplasia of the cardiovascular system and peculiarities of configuration, with frequent sudden death." Results of the condition are various, among them are: (1) Liability to sudden death—this may be from anaphylaxis, cerebral haemorrhage, or, in young children, pressure on the trachea by the enlarged thymus gland. (2) Increased susceptibility and decreased resistance to acute infections. (3) Increased danger in childbirth. (4) Psychical instability; these subjects forming a large proportion of cases of drug addiction and suicides.

The most circumstantial account of the condition is given by Hower (1953). According to him the findings of Kemp (1932), Campbell (1937), Moncrieff (1938), and the late Sir Bernard Spilsbury, in spite of several attempts to discredit their work, have definitely established the existence of the syndrome. It would seem that Hower bases his case that status lymphaticus exists as a clinical entity upon three claims: (1) that the condition has been recognized for some 300 years; (2) that there is a recognized clinical picture with three classical signs; and (3) that there are well-recognized post-mortem findings. I propose to show that not one of these claims is supported by the available evidence.

Attitude of the Textbooks

In contrast to the above the attitude of the textbooks of pathology is much less positive, although the writers of such works must have much greater experience of the post-mortem findings in such cases; or is it for just that reason that their attitude is one of doubt or of definite scepticism?

Thus Boyd (1947) states that "there is no proof that the thymus gland has anything to do with stoppage of the heart." Dible and Davie (1950) state: "There is no doubt that ignorance of the great variation in size to which the thymus gland is subject in health and disease has often led to an unjustifiable resort to the convenient diagnosis of status lymphaticus in cases of sudden death. . . . Many pathologists of experience are of the opinion that there does exist some abnormal constitution or condition which is associated . . . with a liability to sudden death from relatively trivial stimuli, such as excessive sensitivity to stimuli of the autonomic nervous system, but no constant anatomical or pathological abnormality." Muir (1951) quotes the findings of the Joint Committee of the Medical Research Council and of the Pathological Society of Great Britain and Ireland, its general conclusions being that the facts that have been ascertained afford no evidence that the so-called status thymo-lymphaticus has any existence as a pathological entity.

The conclusion in Muir's textbook is that "this does not imply that there is not a constitutional condition of low resistance power, with a tendency to sudden death; simply that it is not possible to relate it definitely to thymic or lymphoid hyperplasia."

Green (1949) states that there are "no manifestations of the condition during life, but violent exertion, rapid temperature change or anaesthesia may lead to sudden death," and, finally, "it has been agreed that status lymphaticus

as a pathological syndrome, based upon pure thymic dysendocrinism, does not exist."

If Dr. Hewer's story were correct we should expect to be able to follow these references to status lymphaticus back to the earliest editions of current works and further back still in the earlier editions of books now out of print but in being before Osler's *Medicine* was produced.

Ewing and the Vienna School

Actually there is no reference to the condition in Osler's first and second editions, or in any contemporary medical or pathological book I have been able to discover such as Fagge (1888, 1891), Bristowe (1890), Roberts (1873, 1890), Taylor (1890), or Coats (1895); in fact, it is not until the third edition of Osler's *Medicine*, published in 1898, that any reference is made, and then in these terms: "Much attention has been paid lately to a somewhat rare condition . . . and the reader is advised to consult an article by Ewing (1897).

Ewing in discussing the views of Paltauf (1889) begins: "There have recently been described a series of cases . . ."; he continues, "The importance of the constitutio lymphatica and its relation to some forms of sudden death, especially to fatalities under chloroform narcosis, have been recognized by the Vienna school of pathologists, but have received very scant attention elsewhere."

Six successive editions of Osler's *Medicine* carried the passage based upon Ewing's article but without his final sentence, which ran: "In conclusion, while the studies of the Vienna observers seem to have placed the existence of the constitutio lymphatica upon a firm basis in pathology, the observations yet remain far too limited fully to demonstrate the truth of an hypothesis which connects a large class of sudden deaths with simple hyperplasia of the lymphatic structures of the body."

It is surely significant that Paltauf makes no mention, in a long list of references, to any work published earlier than 1850; equally so that John Simon (1845)—although his bibliography is immense, going back as far as Galen and Rufus of Ephesus—seems entirely to have missed this historical association.

Growth of the Legend

The history of the growth of the legend of status lymphaticus can be quickly told; gradually during the first decade of the twentieth century the idea of a status lymphaticus began to spread, so that in the eighth and ninth editions of Taylor's *Practice of Medicine*, in 1908 and 1911, references begin to appear, and in 1911 for the first time a separate entry of diseases of the thymus gland makes its appearance in the annual report of the Registrar-General for England and Wales.

In 1917 Dr. Symmers, professor of pathology at the Bellevue Hospital, New York, published an original work upon status lymphaticus in which he recorded the weights of the thymus gland in 66 cases out of 249 which he had diagnosed "status lymphaticus."

The weakness of Dr. Symmers's case is that he publishes no standard for normal weights of the thymus gland, and if we compare the weights of his enlarged glands with the normal weights arrived at by Hammar (1916), or by the Medical Research Council's Joint Committee (1931), whose findings were based on a much larger published collection, we find that a preponderance of these abnormally heavy glands of Dr. Symmers's fall within these other observers' normal weights.

However, Dr. Symmers's views have gained much popularity and have formed the basis of the description of the condition in Osler's *Medicine* from the eighth edition, of 1920, to the latest, the sixteenth, published in 1947.

Platter's Observations

Felix Platter's name does not appear in connexion with status lymphaticus until 1925, although his name was brought

to the attention of American medical men some years earlier by C. G. Cumston (1912), who quoted some extracts from Platter's memoirs and from some other papers of his still preserved in the museum of his native Basle.

In 1925 Ruhrah gave a short sketch of Platter's life and the text of a short article to be found in his *Observationum in hominis affectibus*, together with an English translation (not without error). Ruhrah's own comment was: "To paediatrics we know he made one contribution of great value, the description of thymus death; like many first descriptions of disease it is contained in a few words."

Marine (1928) referred to this observation of Platter's, and in 1932 Kemp began a long original article upon status lymphaticus with Ruhrah's translation of the paragraph from the *Observationum*—error and all.

The first edition of Hewer's *Recent Advances in Anaesthesia and Analgesia* appeared earlier the same year, I presume, since there is no reference in his work to Platter's observation; but in the second edition, published in 1937, Platter's article is quoted and the legend of the 300-year-old tradition is fairly launched in British medical literature; although one tentative diagnosis at one post-mortem examination is perhaps rather scanty material. From the fourth to the latest (the seventh) edition of *Recent Advances* the date of Platter's article has been placed in 1641; one can only say what a remarkable old gentleman Felix Platter must have been to have published his three volumes of clinical reminiscences at the age of 104. However, there can be little doubt that the date of his death as given on the plaque in Basle Cathedral—July 28, 1614—is the correct one; the 1641 edition of the *Observationum*, a copy of which is to be found in the library of the Royal Society of Medicine, is really only a reprint of the work brought out a few months before the author's death in 1614.

"Classical" Signs

With regard to the "classical" clinical signs—those of Sergeant, Schridde, and Orroya—they are mentioned for the first time by Kemp (1932), who quotes no case notes to support his statements; no other writer records cases presenting these physical signs, nor that of Madan; while the three leading medical dictionaries—Dorland's, Stedman's, and Blakiston's "New Gould"—make no reference to Orroya or to Madan.

Campbell (1937) lists an impressive number of physical signs, far too numerous to be mentioned here, associated with status lymphaticus, but, like Kemp, fails to favour us with any case records.

As to Sir Bernard Spilsbury's post-mortem findings in status lymphaticus, I have been completely unsuccessful in my attempt to discover any published work in which such findings are quoted. In 1926 there was set up a Joint Committee of the Medical Research Council and of the Pathological Society of Great Britain and Ireland, which published its report in 1931; some 680 post-mortem examinations were made, and the care and detail with which these cases were analysed place this investigation in a class by itself. Hewer (1953) relegates all reference to this committee's report to a footnote, it being apparently one of "several attempts [that] have been made to discredit the existence of the condition," and prefers to base his belief upon the views of Kemp, Campbell, Spilsbury, and Moncrieff, although the last-named alone of these four quotes any case notes—those of seven children, none of whom are reported as having died but whose thymus glands are diagnosed as enlarged by x-ray photography—a somewhat unreliable basis, as the writings of Garland (1929) and of Capper and Schless (1934) have emphatically shown.

I suggest that were this account of status lymphaticus other than a fable ample material in support could have been found among the thousands of post-mortem examinations reported since 1945 by Helperm and Rabson (1945), Keith Simpson (1947), Richards, (1947), Deadman (1947), and others, or from among the odd 200 deaths reported annually by the Registrar-General for England and Wales.

Conclusion

In conclusion, until some such evidence is produced we must surely accept, as does Professor Weiss (1940), that instantaneous physiological death occurs, but is not associated with either clinical or pathological signs, that the twelve conclusions of the Joint Committee remain the considered judgment of informed opinion, and that the last sentence of their report holds good: "In the opinion of the Joint Committee the facts elicited in the present inquiry are in harmony with those of Hammar (1926, 1929), and of Greenwood and Woods (1927) in affording no evidence that so-called status thymo-lymphaticus has any existence as a pathological entity."

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Nova et Vetera

"THE NAPOLEON OF SURGERY"

Medical students' notebooks written in the more leisurely days of the last century or earlier sometimes provide little-known facts about their teachers, the state of contemporary medical education, and the day-to-day events, all so valuable to the historian who comes after.

Professor Charles McNeil recently published¹ some excerpts from a notebook kept by his father, William McNeil, in the year 1861. At that time William was a student of James Syme, the Edinburgh surgeon, and the importance of the notebook is that it brings back to life some of the words and acts of Syme at the height of his achievement and influence.

Before the advent of anaesthesia Syme already had a reputation for conservatism in surgery. He was neither quick nor brilliant as a technician, but he always insisted on scrupulous cleanliness at operations. In 1829, having failed to obtain an appointment on the surgical staff of Edinburgh Royal Infirmary, he opened a small surgical

¹A Student's Notebook of James Syme's Class of Clinical Surgery in 1861-62. Kept by William McNeil, M.D. Ed. 1864: with Extracts and Comments by Charles McNeil. *Edinb. med. J.*, 1952, 59, 266.

clinic at Minto House, where he rapidly built up a reputation second to none in Europe. His lectures were always crowded, and he was received by his assistants and students like a monarch. Alexander Miles has called him "the Napoleon of surgery." His pupils included Lawson Tait and Joseph Lister, who both inherited his zeal for surgical cleanliness and who were afterwards to diverge so widely in their methods of developing it. Lister later married Agnes, Syme's daughter.

An earlier pupil (in pre-anaesthetic days) was John Brown, later to distinguish himself as an essayist. His sketch *Rab and His Friends* immortalized the little hospital at Minto House. Syme was the surgeon who operated on Ailie for a cancer of the breast, who "dressed her [wound], and spoke to her in his own short kind way, pitying her through his eyes."

Professor McNeil has included sufficient extracts from the notebook to show the setting in which a great surgeon worked 90 years ago. "Beside him are his assistants—the house-surgeon and dressers; around, on the crowded benches his students, attentive and admiring; over the head of the surgeon bending to his work the invisible but felt aura of his experience and reputation." The patients, too, are not mere cases, but become living creatures, like the little girl from Wales, aged 8, who "seemed in the very highest spirits, was carrying a large doll very gaily dressed, and laughed immoderately at the round of applause with which the students greeted her appearance." There is also the man with cancer of the scrotum who did not reply when Syme asked whether or not he would like chloroform.

"Pr. [Professor] Syme with a pair of scissors at once cut out the cancer which was situated in the most dependent part of the scrotum. The shouts of the fellow were terrific. Pr. Syme, after he had completed the tying of the vessel cut, questioned him concerning the period of its growth, and got for a reply: 'Hoo the devil can I answer any questions just noo?' This created a very hearty laugh among the students, which did not improve the temper of the patient. He left the theatre uttering imprecations on Pr. Syme and all concerned."

The callousness of surgeon and students sometimes implied by the notes is, as Professor McNeil points out, countered by the sympathy and pity for the patient so well expressed in *Rab and His Friends*: "Don't think them heartless; they are neither better nor worse than you or I: they get over their professional horrors, and into their proper work; and in them pity as an emotion, ending in itself, or at best in tears and a long-drawn breath, lessens, while pity as a motive is quickened and gains power and purpose." And again, after the operation on Ailie: "It is over; she is dressed, steps gently and decently down from the table, looks for James; then, turning to the surgeon and the students she curtsies, and in a low, clear voice, begs their pardon if she has behaved ill. The students—all of us—wept like children."

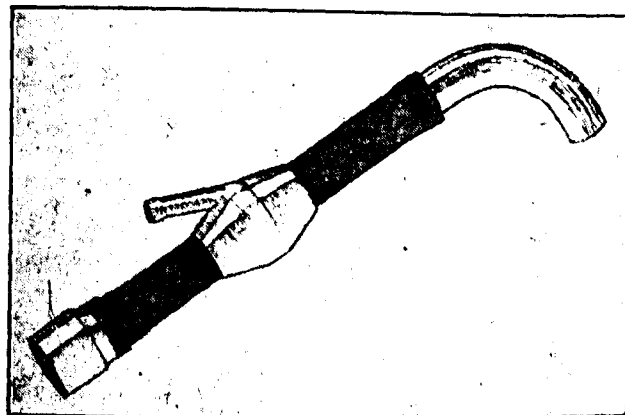
With the notebook we can picture the dramatic scene in the surgical theatre 90 years ago; on the stage the surgeon, assistants, and patients; in the audience the students, with eyes and ears directed to the stage, where Syme dominates the scene and conducts the play.

Preparations and Appliances

AUSCULTATION IN ANAESTHESIA

Dr. J. D. LAYCOCK, consultant anaesthetist at St. Thomas's Hospital, writes: During thoracic operations it is important for the anaesthetist to be able to detect with ease the presence of secretions in the bronchial tree so that he may pass a suction catheter and remove them. A large amount of secretion may be recognized by an audible rattle which is not easily missed, but smaller amounts may pass unnoticed.

If seems that the most logical way to find out what is happening in the bronchial tree and whether there are secretions there is by direct auscultation. With this object I have designed a small appliance which can be fitted over the wide-bore rubber tube that leads from the anaesthetic apparatus to the endotracheal connexion. The appliance



is a metal cuff surrounding the rubber tubing and connected to a stethoscope which can be worn by the anaesthetist. Various shapes of cuff have been tried, but the most satisfactory has been the one shown in the drawing. This is made to fit firmly over the tube, and it is essential that the fit should be airtight, to prevent extraneous sounds from entering.

The application of the cuff, of course, interferes in no way with the gases passing through the rubber tube inside it. During normal respiration breath sounds similar to those heard over normal lung in clinical examination will be heard, but the sounds are distinctly louder when respiration is controlled or assisted, as is usual in thoracic operations. Kinking of the endotracheal tube causes a characteristic change in these sounds, and the appliance is thus a ready means of detecting even a slight degree of kinking. Bronchial secretions can be heard very easily. The tone of the bronchial musculature can be studied, and the wheezing of asthma or bronchial spasm can be noticed even if very slight.

There is probably no simpler or more certain way of checking up on the state of the bronchial tree and its contents at any stage of the operation, and if bronchial secretions are present they can be recognized at once and dealt with by suction. The efficiency of the suction can be checked by listening again afterwards. The cuff may be used with advantage in general surgical operations where information regarding the tone of the bronchial tree, or secretions within it, is likely to be of value.

The appliance is manufactured by Blease Anaesthetic Equipment Ltd., 12, Hinde Street, London, W.1, and is supplied complete with a wide-bore rubber tube fitted with a universal catheter mount for connexion to the anaesthetic machine. I am grateful to Miss J. Davenport for the drawing.

A SIMPLE INDICATOR FOR EXTRADURAL ANALGESIA

Dr. G. A. JACKSON, anaesthetic registrar, Plymouth Hospitals, writes: The extradural potential space is often difficult to demonstrate with certainty, using negative pressure and other methods. I have described a syringe and method (*British Journal of Anaesthesia* 1950, 22, 150) which gave a more positive approach to the problem, it being an improvement on the Dogliotti technique. In our hands it had one disadvantage: it was not always easy to place the needle-point in the interspinous or ligamentum flavum in such a position

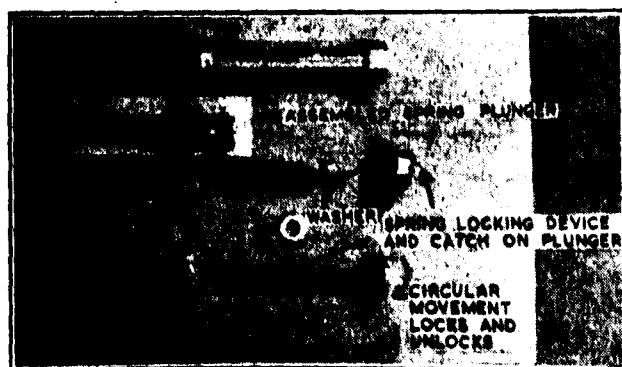
that the strong spring in the syringe did not sometimes force the saline indicator to leak into the tissues. This might happen before the extradural space had been demonstrated. It occurred mostly in the obese, who presumably had poor ligaments which were to some extent infiltrated with fat. When it does happen a good method is rendered useless.

The syringe to be described overcomes the difficulty completely by using a weaker spring. It is simple and costs very little. It has been used with entire success in very many cases. An extradural block is now as easy and reliable to administer as a spinal analgesic.

A 2-ml. Record-type syringe is very simply modified and acts solely as an indicator. A small compression spring is fitted on the spindle between the piston and the handle, together with a washer between the spring and the metal syringe cap. The photograph shows the assembly perhaps more clearly than words. The spring should be approximately the same length as the spindle, so that it is not compressed until the plunger is manually withdrawn. This spring should be of such a strength that it will just bring the piston gently home without any undue force. It should preferably be of a non-rusting variety.

The locking device is desirable, but not essential. It consists of a very thin piece of springy brass soldered to the syringe end cap and arranged just to touch the spindle. On extension this locks into a notch cut in the spindle as shown. It is easily released by turning the handle clockwise or anti-clockwise.

The patient is positioned and prepared in the usual way. The space chosen is infiltrated with a little local analgesic



and the skin pierced with a cutting needle. The syringe is filled with saline and locked. A fine lumbar-puncture needle is inserted in the usual fashion in the midline for about 1 in. (2.5 cm.) until it is felt to be firmly gripped by the interspinous ligament. The syringe is attached and unlocked. No saline should leak into the ligaments. The needle is very slowly advanced until the saline is automatically ejected into the extradural space. The needle-point is now just in the space, and the advancing saline tends to push the dura mater away from the advancing needle-point without damage.

The syringe is disconnected after several aspiration tests for cerebrospinal fluid. Should a small amount of saline emerge from the needle it should be felt on the back of the hand or on the wrists. It will be cold as compared with warm cerebrospinal fluid. The analgesic solution is now slowly injected.

This method has been used in Plymouth for some time now without dural puncture. In fact, latterly, test doses have been omitted with perfect safety and with a great saving of time. Lignocaine hydrochloride 1-1.5% is used in varying quantity.

The syringe will be obtainable from Medical and Industrial Equipment Ltd.

I should like to thank my senior colleagues for their most helpful criticism and advice while this technique has been devised.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Press Publicity

SIR,—In two very recent instances my name has appeared in the daily newspapers in relation to patients. The embarrassment which has attended such publicity is a private affair of mine, but there have been aspects of the contacts between my department and the press which have raised very much broader issues covering the whole field of the relationship between medicine and the press.

In the first of these instances intimate medical details have been obtained by medical correspondents of newspapers and have been published sometimes with mathematical accuracy so that an almost complete picture of the medical course of the case could be built up, and indeed has been built up, exclusively from press cuttings. The great majority of these details, and all the minor details, have been unofficially obtained.

In the second case, news of a procedure which had been developed in my department was reported in the press with the names of the doctors concerned. This information had also been obtained through what doctors would regard as irregular channels. Several inaccuracies in this report were embarrassing and I had to enlist the good offices of the Press Association to publish a short true account without mention of names of doctors or hospitals.

What we doctors do not sufficiently realize is that reporters in general believe that it is perfectly legitimate to collect medical news by any means available to them and that any method of collection is entirely legitimate and honourable. We have up to date not admitted this premise, but on the other hand have held strictly to the rule that medical information should be communicated by a doctor only through the columns of a medical or scientific journal. This ideal method of presentation of medical news is to my mind no longer attainable, and by attempting to attain it we are inviting for ourselves and for our patients all the inconvenience and even dangers which attend the uncontrolled competitive search for medical news by professional journalists. During the past few weeks we have in this medical school suffered this inconvenience in an extreme degree.

I do not wish to stress the private inconvenience which my family and I suffered. It is sufficient to say that on one evening the police had to be called to clear the precincts of my home of objectionable men who claimed to be reporters but who from their behaviour at a late hour and in the darkness may well have had more felonious intentions than the collection of news, but there may in fact, from this situation, be an actual danger to the patient. The patient himself, or his relations and friends, may be dismayed by the reports they read of an operation still to be faced and openly described in the press with an unbalanced estimate of the dangers attendant upon it. Patients awaiting treatment by new techniques may be extremely disturbed by an inaccurate lay record of its details. This is the most serious effect of inaccurate medical reporting in the public press and I have experienced how potent that effect may be. Press publicity may also affect a patient indirectly; it does not make it easier for a surgeon to decide to undertake a dangerous or novel operation in the full glare of hourly publicity. Not only the press reports but the technique for the collection of news has its effect too. The relatives of patients may be subjected to a constant degree of press interest which amounts almost to persecution. Working conditions may become almost intolerable in a hospital invaded by dozens of reporters competing for exclusive news and by crowds of press photographers who consider that they have the right to photograph almost any clinical situation, who enter wards almost indiscriminately if they can, and who, if they are refused entrance, try to take pictures through the ward

windows. Added to all this there is the effect on the morale of the staff of the hospital in these circumstances; natural professional reticence has to be replaced by an overconscious sense of the need for security, and if leakage occurs an atmosphere of suspicion may develop; leakage is almost inevitable in a community where many of the relevant medical facts are known to hundreds of people.

It would seem that with increasing newspaper appreciation of the public interest in fresh medical news the best that we can hope for is that our individual anonymity will be preserved and that any reports that are issued are accurate and unharmed. The press requirement for news can in fact be relatively easily satisfied, and once it is satisfied all persecution ceases. In one of the cases I have mentioned part of our responsibility was to a great public company. This company offered us the services of its public relations office, and as soon as we took advantage of these the whole situation improved immeasurably. All press inquiries were canalized through that public relations office. I satisfied ethical requirements by not giving any information whatever to the press directly but by giving the company concerned a report of their patient from time to time, and at their discretion they furnished what particulars they thought were suitable to the press. I believe that my hospital and I could have remained anonymous if the press had not already been in possession of my name before the arrangement with that company was made.

If a route of this sort were available for hospitals to provide the press anonymously with a certain amount of information, and if opportunities were permitted for the press to ask those questions which they consider publicly important through an intermediary, my recent experience with the press suggests that the newspapers in return would go a long way towards preserving our wishes about anonymity and about the date of publication of medical matter. —I am, etc.,

Hammersmith, W.12.

IAN AIRD.

Sensitivity to P.A.S.

SIR,—In view of the recent reports of allergy to para-aminosalicylic acid in the journals, and the widespread use of this drug in the treatment of tuberculosis, the following example of sensitivity to P.A.S. may be of some interest. The sequence of symptoms, fever, depression of the white cell count of the blood, and later urticaria, was quite definite.

A Chinese nurse, aged 24, single, was admitted to hospital on September 29, 1953, complaining of vague ill-health, loss of weight, and a bad family history of tuberculosis. Examination was negative except for tenderness deep in the right loin. Laboratory findings were: red cells, 4,370,000 per c.mm.; Hb, 11.9 g.%; white cells, 4,800; blood film, no malaria parasites seen; urine, S.G. 1017; faint trace of albumin; sugar, nil; x-ray of lungs, N.A.D. An intravenous pyelogram showed normal excretion, but the lower end of the right ureter as high as the pelvic brim appeared double. At retrograde pyelogram the ureteric catheter could not pass beyond the "double" part of the right ureter, but radio-opaque injection in this position filled both "arms" of the "double" section.

A 24-hour specimen of urine, when centrifuged, showed acid-fast bacilli resembling *M. tuberculosis* in all respects, and guinea-pigs were inoculated. This examination was repeated twice more with similar results.

On October 13, going by the excellent results obtained with this therapy in pulmonary tuberculosis here, the patient was started on P.A.S. 2 g. four-hourly, and isoniazid 50 mg. twice a day, this latter being increased to 100 mg. twice a day on October 22. On this day, in the evening her temperature rose to 100° F. (37.8° C.), to 103° F. (39.4° C.) on October 23, and again on October 24 to 103° F. (39.4° C.). All treatment was stopped on the morning of October 24 and crystalline penicillin G 80,000 units four-hourly started. White cell counts were as follows:

October 23, 4,200; October 24, 3,200; October 25, (a.m.) 3,000, (p.m.) 4,400; October 26, (a.m.) 3,800, (p.m.) 4,600; October 27, 4,600; October 29, 4,000; October 30, 5,600; November 9, 6,400 per c.mm.

All differential counts showed a normal distribution of cells, despite several repeated examinations to detect a true agranulocytosis. She was apyrexial by October 26, and the penicillin was stopped on the 28th. On November 8 a desensitizing course

of both drugs was commenced—one dose of P.A.S. 50 mg. and one of isoniazid 5 mg. being given. There was an immediate flare-up of temperature to 99.2° F. (37.3° C.) and mild urticaria. On November 9 P.A.S. 25 mg. only was given with a similar recurrence of symptoms, plus swelling of the face and a "lump in the throat." Symptoms were controlled quickly with anti-histamines and adrenaline.

On November 10 a patch-test with P.A.S. 1% aqueous solution was strongly positive after four hours (a control was used). On November 11 the girl was started on isoniazid 50 mg. twice a day without any ill effects, this later being increased to 100 mg. twice a day, as well as injections of dihydrostreptomycin.

—I am, etc.,

Sarawak.

K. F. D. SWEETMAN.

The Diploma in Public Health

SIR,—The discussion which follows Dr. Max Park's remarks on the curriculum for D.P.H. (*Journal*, October 3, 1953, p. 778) is both instructive and inspiring. An elaboration of comprehensive curriculum leading to the D.P.H. is a very responsible task, as its ultimate aim is to secure success for the diplomad, and, through this, ultimate good for the community in which he is working.

A few years ago I attended the D.P.H. course in London, and after its completion I worked in Canada and the States. The course is divided in two parts: the preliminary part, leading to C.P.H., and introducing comprehensively the basic subjects and the historical background of public health, the syllabus of the second part being based on the student's direct and very active participation in the course. His duties are not only to listen and to learn, but to observe, to report, and to share his experience with his classmates and instructors during frequent class discussions or special seminars. Elective subjects and studies were encouraged according to the student's liking. Many problems are illustrated through excellently diversified field-visits and field-work. In retrospect, I recollect that course as a splendid example of instructors' and students' co-operation, based on the promotion of better human relationships and the application of the medical and scientific achievements to public health.

It must be extremely difficult for the committee responsible for the D.P.H. curriculum to decide what subjects should be actually taught and for how long. While the main object of public health is still the same as it was in Chadwick's and Shattuck's time, yet the tools and ways for its achievements have changed almost completely. In addition to epidemiology, sanitation, medical statistics, and public health administration, the sound knowledge of paediatrics, nutrition, psychology, and psychiatry is very indispensable to the public health physician working with a progressive community. The study of human relationships seems to be of the utmost importance, and it should be included in the curriculum besides the detailed studies of the environmental and genetic factors.

The idea of elective subjects introduced some time ago at the London School of Hygiene and Tropical Medicine features also the possibility of extending knowledge in particular subjects during the D.P.H. course. This, indeed, is proving to be very useful, as many public health physicians are performing duties limited to the special fields, as in the case of school medical officers, epidemiologists, haematologists, nutritionists, public health paediatricians, public health psychiatrists, etc. This trend and need for specialization within public health medicine may support the view that the curriculum for D.P.H. should be changed appropriately, and elective subjects extended to the various "specialties" within the public health curriculum.

It may also have to be considered seriously at the same time that not only the D.P.H. curriculum but also its name and the name of the diploma should be changed; likewise the name M.O.H. should be replaced by P.H.P., or public health physician.—I am, etc.,

Boston, Mass.

L. L. KULCZYCKI.

What is Encephlo?

SIR,—I would suggest that the answer to Dr. J. Cauchi's interesting query (*Journal*, December 19, 1953, p. 1378) is "erysipelas." If the late Robert Rawlinson, C.E., took the statement quoted in Dr. Cauchi's letter from a medical report, it would, at that time, have been in manuscript and probably written in the traditional obscure handwriting of a doctor.—I am, etc.,

Pangbourne, Berks.

ERIC DONALDSON.

Post-operative Backache in Women

SIR,—As a general practitioner I welcome Dr. E. Schleyer-Saunders's memorandum on post-operative backache in women (*Journal*, January 2, p. 28).

Before the use of relaxants in anaesthesia very few of my patients suffered in this way, but during the last 6-7 years there has been a succession of such cases in my practice, nearly all following operation or examination under anaesthesia in the lithotomy position. The most difficult have been those with symptoms of sacro-iliac subluxation, which have sometimes resisted prolonged treatment or relapsed at intervals, a characteristic sequel when those joints have been disturbed.

I have assumed that the lifting or lowering of one leg at a time has produced a torsion strain on a sacro-iliac joint in the absence of any protecting muscle tone. In many cases the backache has been only moderate in degree during the few days in bed and accepted up to a point by the patient, often without saying much about it in the ward. It is on returning home that the pain and fatigue are indignantly complained of, and all the more so if the operation in question was a trivial one. This condition may in fact be more familiar to the family doctor than to the gynaecological departments, which have sometimes disclaimed any responsibility in causing it.

A change in theatre drill and organization on the lines suggested in the memorandum would probably abolish this very troublesome and increasingly frequent sequel to operations which would otherwise be followed by the briefest convalescence without discomfort or disability. I am, etc.,

London, W.2.

ANNIS GILLIE.

The Accident-prone

SIR,—In the conclusion of his illuminating study of "The Accident-prone in General Practice" (*Journal*, December 12, 1953, p. 1306) Dr. R. M. McGregor refers to the importance of parallel studies. One such study, just published, by J. M. M. Hill and E. L. Trist,¹ is unlikely to come to the attention of your readers and may be briefly summarized here.

The study was of detailed four-year work records in a large iron and steel works. In such industrial studies it is possible to relate "withdrawal from work" due to sickness to that due to accidents and to what is known as "voluntary absence." Hill and Trist (in agreement with Dr. McGregor) find a positive correlation between absence due to accident and that due to sickness; but with the aid of additional figures they have shown an even stronger correlation between accidents and "voluntary absence." The work concerned is to be continued and offers strong evidence of the need to extend current studies in this field to include the characteristics of the social relationships of the individual, both in his work situation and elsewhere.—I am, etc.,

London, W.1.

A. T. M. WILSON.

REFERENCE

- 1 "A Consideration of Industrial Accidents as a Means of Withdrawal from the Work Situation," *Hum. Relat.*, 1953, 6, 357.

SIR,—I should like to pass certain comments on the article by Dr. R. M. McGregor entitled "The Accident-prone in General Practice" (*Journal*, December 12, 1953, p. 1306).

Urban dwellers are more accident-prone than countrymen.—Dr. McGregor assumes that all accidents in his practice are reported to him. Surely he realizes that the countryman, for reasons of distance and self-sufficiency, bred in the days of necessity when medical aid was not available, does not report many of the minor accidents that the urban dweller living near his doctor does. I suggest that it is this fact that Dr. McGregor's figures prove, and not, as he deduces, that the urban people are more accident-prone than the rural.

Existence of accident-prone people.—Surely it is agreed that clumsy people meet with more accidents than do the skilful. However, Dr. McGregor's figures do not prove

this; but rather that a man who reports one accident will report another, while another man would treat both himself and report neither to the doctor.

The accident-prone are illness-prone.—The figures given do not prove the above contention, but rather confirm my view that there are doctor-conscious patients who report every bruise or cold and self-reliant patients who do not trouble the doctor over trivialities.

Sex ratio of patients.—A cardinal factor affecting the reporting of accidents is the need for a certificate. Since Dr. McGregor does not confine his figures to insured persons, and since there is a much higher proportion of men insured than women, Dr. McGregor's conclusion, regarding the sex ratio of accidents is invalidated.

Change in sex ratio of accidents over 45 years of age.—May this not be apparent rather than real? I would suggest that many women under 45 have young children, and consequently ignore their minor accidents so that they can carry on their domestic responsibilities, whereas women over 45 have reached a stage in life where their duties are less onerous and they can indulge in the luxury of a little fuss, sympathy, and a trip to the doctor.—I am, etc.,

Wantage.

D. LEIGH.

Malaria Prophylaxis

SIR,—In view of the present interest in the new anti-malarials, I am sending you a record of two families here who have been taking pyrimethamine ("daraprim") 25 mg. weekly during the malaria transmission season, which has been more severe than usual owing to exceptionally heavy rains. Malaria here is almost entirely malignant tertian variety.

One family, that of the writer, who personally supervised the administration of the drug, consists of three English adults and three children under 4 years (non-immunes) and four Sudanese servants (immunes). All the adults, including the servants, have had pyrimethamine 25 mg. regularly once a week. The children have had half a tablet (12½ mg.) once a week. Four weeks after taking pyrimethamine, W.P., aged 2½ years, English (never had malaria), became irritable and feverish, temperature 99.4° F. (37.4° C.) (axillary), blood film: positive malignant tertian malaria. Cured by taking mepacrine ("atebrin") ½ tablet twice a day for five days.

After three months of continuous pyrimethamine prophylaxis, the following also had malaria: M.P., age 30, English (never had malaria), complained of severe headache. Temperature 100° F. (37.8° C.). Blood film: positive malignant tertian malaria. Cured with mepacrine (1 tablet three times a day) for five days; S.S., age 18, English (never had malaria), complained of cold for three days and severe headache. Temperature 99.4° F. (37.4° C.). Blood film: positive malignant tertian malaria. Cured with mepacrine (one tablet three times a day) for five days; R.P., age 10 months, English (never had malaria), cross and irritable for two days. Temperature 99.6° F. (37.55° C.) (axillary). Blood film: positive malignant tertian malaria. Cured with four intramuscular injections of quinine; J.P., age 35, English (had malignant tertian malaria once before in 1946). Temperature 102° F. (38.9° C.) Headache. Blood film not taken. Cured with camoquin (three tablets on first day and two on second day); A.N., Sudanese (Nuba), age about 34. Complained of cold and headaches for two days. Temperature 99.8° F. (37.4° C.). Blood film: positive malignant tertian malaria. Cured by four intramuscular injections of quinine; K.K., Sudanese (Nuba), age about 21, complained of pain in back and chest. Temperature 101° F. (38.3° C.). Blood film: positive malignant tertian malaria. Cured by four intramuscular injections of quinine; O.I., Sudanese (Darfuri), age about 26, complained of diarrhoea for two days. Temperature 99.2° F. (37.3° C.). Blood film: positive malignant tertian malaria. Now having mepacrine (one tablet three times a day); H.W., Sudanese (Darfuri), age about 55 years, complained of fever. Temperature 100° F. (37.8° C.). Blood film: positive malignant tertian malaria. Cured by four intramuscular injections of quinine.

The other family consists of two English adults and three children under 5 years. The adults have been taking pyrimethamine 25 mg. weekly, and two of the children half a tablet (12½ mg.) weekly, since their arrival from England in July, 1953. E.H., age 34, English. Temperature 99.6° F. (37.55° C.). Com-

plained of diarrhoea. Blood film: positive malignant tertian malaria. After taking mepacrine 1 tablet three times a day for five days, a second blood film was positive. She was then given four intramuscular injections of quinine; R.H., age 38, English (has had malaria before). Temperature 99.8° F. (37.7° C.). Complained of headache and lack of concentration. Blood film: positive malignant tertian malaria. Cured with camoquin three tablets on the first day, followed by two tablets on the second day; A.H., age 5, English (never had malaria before). Cross and irritable and mild diarrhoea. Temperature 99.4° F. (37.4° C.). Blood film positive malignant tertian malaria. Cured with mepacrine ½ tablet twice a day for five days; C.H., age 3, English (never had malaria). Temperature 99.8° F. (37.7° C.). Blood film: positive malignant tertian malaria. Cured with camoquin one tablet followed by one tablet on the following day; C.H., age 9 months, English, did not take pyrimethamine until a month ago when she had malaria, which was cured with four intramuscular injections of quinine. After that she had ½ tablet weekly for two weeks. Following this she again had diarrhoea. Temperature 99.4° F. (37.4° C.) (axillary). Blood film: positive malignant tertian malaria. Cured by intramuscular quinine.

Only one person in these households has not had malaria since taking pyrimethamine: E.P., age 4 (E.P. had a typical attack of malaria four months ago before taking pyrimethamine. Temperature 102° F. (38.9° C.) (axillary) with delirium). All the attacks have been mild and all the cases ambulant. One patient (E.H.) failed to respond to mepacrine therapy and had to have quinine. The two infants had quinine as they could not take mepacrine. Three Sudanese servants expressed a preference for quinine injections. Proguanil has been used prophylactically by a few English and Greek families resident in this area during the post-war period. The number of local Sudanese families taking the drug is probably less than 1%.

Although it appears to mitigate the attack, pyrimethamine in the dosage given appears to be quite inadequate in preventing attacks of malignant tertian malaria in Dueim.—I am, etc.,

Dueim, Sudan.

MARY G. PHILLIPS.

Partial Hepatectomy

SIR,—I read the very refreshing article by Sir Heneage Ogilvie on partial hepatectomy (*Journal*, November 21, 1953, p. 1136) with great interest, and I was particularly impressed by his description of a simple but extremely effective technique which I have never seen in use nor previously heard described. Apart from the subject of biopsy little has been published about partial hepatectomy either in connexion with malignant disease or otherwise. In this connexion the following case, with whose treatment I assisted Professor Mercer several years ago, is of interest.

A man, aged 64, complained of pain, sickness, severe borborygmi, flatulence, and diarrhoea for two and a half years. On examination he demonstrated the features of subacute small bowel obstruction and visible peristalsis was noted. Barium meal examination, with follow-through, showed an incomplete hold-up at the lower end of the ileum. Laparotomy revealed an almost complete obstruction at the lower end of the ileum of the string stricture type. The tumour was solitary, there was a little free fluid, but there was a superficial nodule approximately the size of a pigeon's egg on the lower part of the anterior surface of the right lobe of the liver. Resection and anastomosis of the affected portion of the bowel and its mesentery was carried out. The pathological report stated that the tumour was a carcinoid. In view of the accessibility of the only detected metastasis it was decided to excise the nodule from the liver. This operation was accordingly successfully performed 20 days later. The tumour was excised by diathermy and the cut liver edges exposed by deep sutures. The pathologist reported malignant carcinoid. The patient was discharged 16 days later and his doctor has written to say that he remained in good health, and fit for work, for over three years. Subsequently liver enlargement became evident and he eventually died three and a half years after operation.

Although the long-term result, in this case, was unsuccessful, the patient at least enjoyed a further three years of active life, and one can only speculate that probably he would not even have enjoyed this period if the liver nodule had not been removed.—I am, etc.,

Kirkcaldy.

WM. DRUMMOND.

Studies on Pancreatitis

SIR.—I read with much interest the instructive article "Studies in Pancreatitis" (*Journal*, December 19, 1953, p. 1335), and the authors are to be congratulated on endeavouring to throw some light on the vexed problems concerning the surgery of the pancreas.

However, few would agree that in cases of acute pancreatitis "if an occasional laparotomy is needlessly performed little harm to the patient is likely to follow." The consensus of opinion is that operative interference in acute pancreatitis carries a mortality of 30%, as compared with 3% treated symptomatically, and who are mostly fulminating cases who are doomed whatever may be done. Therefore every precaution must be taken to avoid laparotomy, even in the occasional case, and a valuable physical sign in acute pancreatitis is tenderness over the left renal angle—i.e., over the tail of the pancreas.

I have for many years been interested in the difficult problem of the "post-cholecystectomy syndrome," to which I have referred in a recent article.¹ My experience agrees with those expressed by the authors, with one exception. I believe that spasm, or even fibrosis of the sphincter of Oddi, is a definite clinical entity, manifested by recurrent attacks of dyspepsia, colicky pains, and even slight jaundice. These attacks are usually relieved by pethidine, but, if they incapacitate the patient, division of the sphincter, preferably by means of a sphincterotomy, not only relieves back pressure on the liver but also provides drainage of the main pancreatic duct, and thus lessens the risk of progressive infection. I have performed this operation on 14 patients, in 10 of whom symptoms were entirely relieved, and the remaining 4 were improved sufficiently enough to be grateful. —I am, etc.,

MCNEILL LOVE.

London, W.1

REFERENCE

¹ *Brit. J. Surg.*, 1952, 40, 214.

Appendicitis in the Course of Measles

SIR.—The article by Dr. W. H. Galloway on this subject (*Journal*, December 26, 1953, p. 1412) is of interest to all who have to deal with children, and especially those who have the difficult task of deciding whether the appendix of a young child is inflamed or no. There seem to be three points of importance.

(1) It might be better to separate off a group and call it pseudo-appendicitis. In Dr. Galloway's seven cases all the appendices were removed, but two were "apparently normal," one showed "slight redness," and one was "slightly inflamed." Lacking further details one can only suggest that these four were possibly removed unnecessarily. (2) In making a diagnosis, a count of the white blood cells may be useful. Dr. Galloway does not give his figures, but it is usual to find a leucopenia in early measles. I have notes of two cases which were seen last spring. They had both been admitted to hospital with the diagnosis of acute appendicitis. One, a boy of 7, had his appendix removed, and it was found to be covered with Koplik's spots but otherwise normal. A white blood count taken next day showed 7,500 cells per c.mm., of which 81% were polymorphs. The measles rash appeared two days later. In the other child, a girl of 4, the white blood count was 4,300, with 80% polymorphs. Operation was not performed; the rash appeared next day and she made a perfect recovery. (3) The routine use of sulphonamides in measles is important in preventing respiratory complications, especially in children under 3 years of age.

Obviously there are some cases where it would be dangerous to delay and exploratory laparotomy is essential; but as often as not the situation is not so grave and a period of observation in hospital with special attention to the search for Koplik's spots in the mouth and a white blood count may solve the problem without surgical and anaesthetic intervention.—I am, etc.,

Bath.

H. R. E. WALLIS.

The College of General Practitioners

SIR.—I really cannot allow to pass unchallenged Dr. J. Inglis Cameron's remarks in the *Journal* of December 19, 1953 (p. 1376), on the future of the College of General Practitioners. While it is not my purpose to argue with his suggestion that there should be no delay in applying for a royal charter, although it would seem to me that such an honour should be conferred upon a body which has proved its worth, I am wholly against advocating a registrable diploma of general practice.

Dr. Cameron's concern for improving the standard of general practice is, of course, understandable, but I am sure that his traditional plan for attaining this end is the wrong one. The mind boggles at the thought of yet another diploma to be added to the surfeit of examinations for this and that which we have already. And the fact that it will shortly be impossible to practise medicine at all after the completion of one's house appointments without a "higher qualification" makes a mockery of the qualifying examination. If it be true, as Dr. Cameron asserts, that the equality of colleges partly depends upon whether they are also examining bodies, then I am sure that, when it becomes widely appreciated that to-day one's diploma count is more important than one's experience, the problem will cease to exist among the ensuing inevitable and widespread changes. (If the loss of a lively source of income is felt too deeply, then I for one will be glad to subscribe to an annual flag day.)

No, let us resist the temptation to foster this present impossible system of promotion by creating an examination for general practitioners, and instead allow the College of General Practitioners to prove its worth by influencing the revolution in medical education which is now spluttering into life. Let it ensure that the curriculum for the qualifying examination is designed to produce general practitioners, and not housemen. Let it then encourage a system of promotion based on experience instead of academic honours. In this way, perhaps the new College will be able to find its own feet by helping to recover the dignity of the established royal colleges, which is waning in face of this craze for collecting diplomas instead of beer-bottle tops. Until then, we are in no position to ridicule the reasoning of the patient who prefers his general practitioner to be an M.R.C.S., L.R.C.P., rather than a plain M.B., B.S. "After all, has he not eight letters as against four? He must be twice as good!" I am, etc.,

Barnstable.

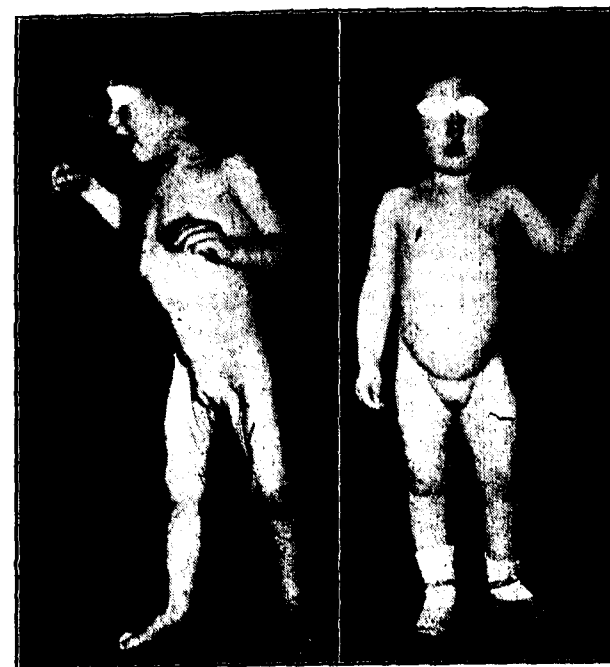
G. V. BALMFOURTH

Ferrous Sulphate Poisoning

SIR.—Dr. F. G. M. Ross's article (*Journal*, November 28, 1953, p. 1200) prompts us to record a similar case of pyloric obstruction following ferrous sulphate poisoning. At the same time we wish to support the views expressed in the leading article in the same issue on "Accidental Poisoning of Children" (p. 1207). These show there are many medicines prescribed for adults which should be labelled "Poisonous for Children," and in this particular instance the manufacturers of the green sugar-coated ferrous sulphate pills should also be urged to make their preparation less like "smarties," the sugar-coated chocolate sweets beloved by all small children. Attempts along these lines made by the Paediatric Department in Oxford have been unsuccessful, and it is to be hoped that another appeal with the weight of the B.M.A. behind it may be more effective. Ferrous sulphate is extensively prescribed for mothers attending antenatal and post-natal clinics, and after the arrival of the new babe it has seemed to us that it is the toddler of 1-2 years, temporarily less well supervised, who is in danger; certainly the majority of the seven cases seen here in the last three years fall into this category.

A baby girl, aged 16 months, arrived in hospital from the country just over an hour after swallowing an unknown number of ferrous sulphate tablets, 20 of which she had vomited immediately. She was pale and restless on admission, and vomiting

blood-stained fluid; a stomach washout with sodium bicarbonate produced more fresh and altered blood, but no tablets. She continued to vomit, and at the end of 24 hours looked ill and shocked. Her haemoglobin had fallen to 55%, so she was given a small blood transfusion, followed by one of glucose saline to maintain hydration. Her condition then steadily improved and she was discharged well after 12 days, taking a light diet without vomiting, and weighing 18 lb. 10 oz. (8.38 kg.). Seen after three weeks, her appetite was said to have been poor, she had vomited occasionally, but had gained weight. Seen again four weeks later, however, she presented with symptoms of pyloric obstruction, weighing only 15 lb. 11 oz. (7.06 kg.).



Before operation.

3 1/2 months after operation.

At operation many adhesions were found between the stomach and surrounding viscera, and in particular those between stomach and liver were so tough as to necessitate sharp dissection for their separation. The distal half of the stomach was thickened, rigid and fibrotic, the proximal half was hypertrophied and dilated, but was otherwise normal, as was the duodenum. The fibrotic portion of stomach was resected, a Billroth I type of partial gastrectomy being performed. The post-operative course was satisfactory, and a rapid gain of 4 lb. (1.8 kg.) in the first four weeks occurred. Subsequent progress during the past two years has continued to be good.

The pathologist's report on the portion of stomach removed stated: "The gastric wall almost up to the upper limit of resection was grossly fibrotic and 0.75 cm. in thickness. The mucosal surface had a granular brownish appearance, and the lumen of the whole pyloric antrum and pylorus was narrowed to about 0.1 cm. diameter. Histology: Over part of the specimen gastric mucosa remains, while elsewhere this is replaced by a granulation tissue layer in areas of ulceration, or by squamous epithelium which is presumably due to metaplasia. The mucosa shows slight irregularity of pattern, with scattered small cysts lined by flattened epithelium, and exaggerated mucus secretion. The squamous epithelium is regular with no invasive tendency. The submucosa and granulation tissue are congested and oedematous, with a very dense inflammatory exudate including polymorphonuclear leucocytes, plasma cells, and lymphocytes. The muscularis and subserosa are also congested, with interstitial haemorrhage, but here the most obvious change is a diffuse fibroblastic proliferation. Inflammatory infiltration similar to that in the submucosa extends down into these layers, chiefly around vessels, and iron-containing histiocytes are present in large aggregates. The mucosal cells give only a weak staining reaction for iron, and the histiocytic accumulations may be due to interstitial haemorrhage, but their extreme frequency makes this unlikely. A thin fibrinous layer covers the serosa. The appearances as a whole are in keeping with a corrosive poison, and the intra-epithelial iron is a strong indication that the poison was or included an iron compound."

It is evident that "pyloric obstruction" does not adequately describe the pathological lesion, which is in fact an extensive fibrosis affecting all coats of the distal half of the stomach and leading to a near obliteration of its lumen.

In these cases of poisoning it appears that the children swallow the tablets whole, and it is only after the sugar coating dissolves that the caustic action of the ferrous sulphate occurs. The oesophagus, therefore, escapes completely, and it follows that the maximum damage is done to the pyloric end of the stomach. This is borne out in Ross's case, where the x-ray several days before operation showed obstruction to barium in the distal half of the stomach. The appropriate treatment must be, therefore, to relieve the gastric obstruction by a gastro-enterostomy or gastrectomy.—We are, etc.,

A. ELLIOT-SMITH.

PAMELA A. DAVIES.

Oxford.

Tales of a Pomander

SIR.—Professor Charles Singer (*Journal*, December 19, 1953, p. 1373) is surely wrong in stating that Richard Mead made no important contribution to medical science. In 1748 Mead first described the occurrence of fatty liver in a case of diabetes mellitus, and held the view that the liver was in some way concerned in the aetiology of the disease. This was quite revolutionary in an age when medical opinion was divided between those who believed diabetes mellitus to be due to a "disordered assimilation," by the intestines and those who supported the theory of a "morbid affliction" of the kidneys, and, of course, antedated Claude Bernard's important discoveries by a hundred years. The wonder is that any man with Mead's reputation as a practising physician could have found the time to indulge in medical research.—I am, etc.,

London, S.E.1.

A. PATON.

Medical Needs in the Gold Coast

SIR.—Dr. D. B. Scott's letter (*Journal*, December 19, 1953, p. 1377) is very interesting. First, let me say that I was in the Gold Coast Medical Service until June, 1953—not years ago. Next, it is certain that the Government would eagerly offer permanent pensionable posts to specialists if they could be found. The response to advertisements has been uniformly poor, so, rightly or wrongly, they seem to think that if they offered contract terms a few highly qualified men could be found by a form of secondment. For instance, a consultant could go to the Gold Coast to do, say, two tours with full assurance that only strictly temporary locums would assist his group in his absence. After his contract he would then be able to return to his former job invigorated, having also given new vitality to the Colony. This scheme is clearly capable of development and diversification. In the interest of avoiding waste of professional men, could the B.M.A. not usefully press for S.H.M.O. posts for ex-colonial specialists and for similar measures?

Finally, a vague air of dissatisfaction surrounds Dr. Scott's letter, and the reason for it is not quite clear. There are at least two fellow Cambridge men in the Gold Coast Medical Service, recently employed, who show every sign of enjoying their work.—I am, etc.,

Manchester.

K. A. TAYLOR.

Distinguishing a Psychopath

SIR.—The exchange of views between eminent legal and psychiatric experts on the definition of a psychopath (*Journal*, November 28, 1953, p. 1224) serves to show how difficult it is for lawyers and alienists to attain mutual understanding. The crux of the problem appears to lie in the fact that lawyers, accustomed to dealing in tangibles, are for ever pressing the psychiatrist to confine himself to nice definitions. Although the diagnostic term "psychopathic personality" is widely recognized among psychiatrists, nobody has succeeded in defining it in a universally acceptable or succinct manner. The definition given by Dr. Denis Hill to the Royal Commission on Capital Punishment stresses

the violent propensities of the aggressive psychopath, but psychopaths are not necessarily aggressive or impulsive. Indeed, the inadequate psychopath may be totally lacking in these qualities. The definition of psychopaths (used by Mr. Christmas Humphreys) as "those persons who do not suffer from a disease of the mind, but suffer from some form of character deficiency or emotional instability which makes it impossible for them to enter into normal contact with society," is much broader than that attributed to Dr. Hill. However, it must be as difficult to define "normal contact with society" as to define "normal behaviour." The latter definition might perhaps be strengthened if the words "from a disease of the mind" were altered to read "from one of the well recognized diseases of the mind," and the words "normal contact with society" changed to "harmonious contact with society." Dr. A. Shepherd's definition (*Journal*, December 19, 1953, p. 1379) lacks the virtue of brevity, yet it fails to cover the cardinal features of all types of psychopath.

Criticism of the above definitions has been made to support a belief that a psychopathic personality defies precise definition. The term psychopathic personality has been frequently stretched to include not only personalities displaying immaturity with volcanic aggressiveness, but chronic liars, spongers, swindlers, vagrants, perverts, and addicts. Clearly, it is impossible to adopt a Procrustean attitude towards such a motley group of social misfits. Nevertheless, it would make medico-legal practice easier if lawyers and psychiatrists could agree on some broad, working "definition" of a psychopath (like that quoted by Mr. Humphreys) leaving the interpretation of such expressions as "abnormal behaviour" and "normal contact with society" to the common sense of judge, jury, and counsel.—I am, etc.,

Littlemore, Oxford.

J. TODD.

SIR,—The definition by Dr. Denis Hill (*Journal*, November 28, 1953, p. 1224), as is the case of all other definitions, invites criticism. The most obvious weakness lies in the word "abnormal," which is repeated three times. Mr. Justice Hilbery did not hesitate to pounce upon this, and sought definitions of "abnormal" and "normal" behaviour—which of course were not forthcoming. I doubt whether it is possible to define these terms accurately, any more than it is possible to define insanity and sanity; and similarly I do not believe it is possible to define clearly what constitutes "psychopathic behaviour." The only definition of psychopathic personality that I like at all is the quotation given at the beginning of a paper by Drs. Curran and Mallinson: "I can't define an elephant; but I know one when I see one." Unfortunately this can be readily criticized as having the flaw of a variable, personal bias.

The other observation I would make is that positive types of abnormal behaviour are referred to, but not negative types. Violent outbursts of temper can certainly be pathological, but a poverty of emotional reactivity is surely just as pathological. There are passive, relatively unemotional psychopaths who fall into criminality through such negative constitutional failings, often being the tools of aggressive psychopaths; and if we are to claim some measure of diminished responsibility for the latter we should logically also demand a similar privilege for the former.

Finally, I would point out that Dr. Hill's definition can be descriptive of some cases of cyclothymic illness, and is therefore not exclusive.—I am, etc.,

I. ATKIN.

REFERENCE

- ¹ "Recent Progress in Psychiatry," *J. ment. Sci.*, 1944, 90, 266.

Treatment of Blood Disorders with A.C.T.H. and Cortisone

SIR,—The M.R.C. Haematology Panel has again published a report to the Medical Research Council (*Journal*, December 26, 1953, p. 1400); and it is difficult to imagine how it can be of use to the practising physician, even although it may quite possibly be what the Council requires. The first

report made the task of the haematological physician much more difficult than it need have been, because competent general practitioners, who had read that "A.C.T.H. and cortisone, as at present used, are not likely to have an important part to play in the treatment of disorders of the blood" were not keen on co-operating with those of us who, aware of the work of Dameshek,¹ wanted to treat cases of acquired haemolytic jaundice with these hormones. The second report is not likely to be quite such a nuisance, but it will certainly not be a help. Thus there is the veiled suggestion that if A.C.T.H. in adequate dosage fails, as it did in two of the Panel's cases, cortisone will be equally useless. And this suggestion seems to be based on failure in the only case in which cortisone was given—in inadequate amounts. My own (inevitably small) experience has clearly shown that there are cases in which A.C.T.H. fails to arrest the haemolytic process, whereas cortisone will do so. And I am not alone in this experience: Aitchison² has demonstrated the fact quite clearly.

This letter is not intended to record my experiences in the treatment of acquired haemolytic jaundice with A.C.T.H. and cortisone, but to pose the question whether such reports as the present one should not remain in the archives of the M.R.C., because in my opinion they can be no use to the practitioners for whom they are intended, and can, indeed, do great harm by discouraging physicians who have little experience in clinical haematology.—I am, etc.,

London, W.1.

A. PINEY.

REFERENCES

- ¹ *British Medical Journal*, 1952, 1, 1261.
² *Blood*, 1950, 5, 779.
³ *British Medical Journal*, 1953, 1, 78.

SIR,—The second report to the M.R.C. (*Journal*, December 26, 1953, p. 1400) records a more favourable impression of the value of A.C.T.H. and cortisone in the treatment of acquired haemolytic anaemia and thrombocytopenic purpura. In deciding to concentrate in future on the long-term treatment of these two conditions the advisory panel of haematologists may discourage the use of cortisone in the non-thrombocytopenic purpuras, notably Schönlein-Henoch disease. The value of any treatment is difficult to assess where spontaneous remission is the rule rather than the exception, and not unnaturally opinions differ.

Professor L. S. P. Davidson *et al.* (*Journal*, November 15, 1952, p. 1059) recorded no beneficial results from hormonal treatment of four cases of non-thrombocytopenic purpura (allergic). Dr. M. G. Philpott refers (*Journal*, October 24, 1953, p. 937) to nine children who did not respond although severe constitutional disturbances might have been alleviated as in one of Davidson's cases. Dr. M. Stephanini (*Lancet*, September 19, 1953, p. 620) in a similar series of nine children believed that A.C.T.H. was of great value even if it might not modify the pathogenetic mechanism of the disease. Unlike Philpott he thought that the improvement in cases which did respond was "too prompt to be exclusively due to spontaneous recovery." Dr. D. G. Adamson *et al.* (*Journal*, September 19, 1953, p. 656) obtained an apparently conclusive response in a girl of 13 years. From personal experience I know that cortisone promptly controlled the abdominal features of Schönlein-Henoch purpura which had increased in severity for three weeks during which time all other treatment had been tried by my most skilled and attentive colleagues. The associated joint pains also responded, but the purpuric spots persisted for long after the cessation of cortisone treatment (28 days).

So long as the existence of purpura and positive capillary tests applied to the skin are regarded as the criteria of non-success then such cases must be recorded as failures of hormonal therapy despite the dramatic and possibly life-saving effect of cortisone or A.C.T.H. on the visceral lesions in certain cases. Purpura of the skin may be produced by minimal disturbances and accentuated by mechanical considerations. It may be illogical to associate its pathogenesis directly with that of the viscera despite the

fact that the only abnormality in the classical Schönlein-Henoch syndrome is diminished capillary resistance. It is likewise generally accepted that the syndrome is an allergic phenomenon despite the fact that the allergen is rarely, if ever, found and no response is elicited by antihistamine drugs.

So little is known of its pathogenesis, or for that matter of the action of cortisone or A.C.T.H., that one cannot say with any certainty that hormone treatment is either useless or specific. At the same time there would appear to be enough justification to administer cortisone or A.C.T.H. in full doses to every case of Schönlein-Henoch purpura, bearing in mind that spontaneous remission, in this admittedly rare disease, is not the foregone conclusion that some present-day clinicians might have us believe.—I am, etc.,

Kirkcaldy.

J. R. W. HAY.

A Cosmetic Amputation

SIR,—What Sir Heneage Ogilvie said in his letter (*Journal*, December 12, 1953, p. 1322) appealed to me so much that I wrote and told him so. I am consequently bound to express a little surprise that Mr. Ian Lawson Dick (*Journal*, January 2, p. 45) differs so markedly. It may be that in time his views will change.

Some years ago I also was impressed and attracted by this "cosmetic" operation—"nobody notices that there are only three fingers," "the 'knob' does not catch on openings of pockets or bags," and so on. But with the passage of time I have come to the conclusion that on balance the cosmetic gain does not by any means justify the functional loss. With the head of the metacarpal many manual assets including the "hollow of the hand" disappeared, but, what is more important, the control of which the hand is capable is seriously impaired. I say that the operation should never be performed on manual workers, and that even for other patients it should be used only after the most careful consideration and explanation. I am, in fact, inclined now to advise such patients for whom the metacarpal amputation appears to be justified by diminution of disfigurement and of convenience to wait and see how much inconvenience the metacarpal knob really causes before they have it removed. "Two bites at a cherry"—I know, and quite right too.—I am, etc.,

Liverpool, 1.

BRYAN MCFARLAND.

Whither Anaesthesia?

SIR,—In Dr. C. Langton Hewer's letter (*Journal*, January 2, p. 42) he poses the question "Whither Anaesthesia?" and criticizes the new approach to anaesthetic problems. It is, of course, impossible to hazard a guess as to where physiological and pharmacological research may lead us in the near future. It appears to us that if we are to fulfil our duty to our patients we must take advantage of every means by which they may be protected from the effects of surgical aggression.

Anaesthetic techniques in general use to-day, however skilfully employed, and with the aid of supportive measures, have well recognized limitations. In fact the term "anaesthetic shock" is still in current use. The precise physiological mechanism by which surgical shock is induced is not completely understood; but the factors which lead to the onset of shock in surgical procedures are well known. These have been admirably classified by Dr. Langton Hewer himself.¹ By the use of the artificial hibernation technique, reaction to all but one of these causes is removed or diminished. As we have already stated (*Journal*, December 5, 1953, p. 1247), the circulating blood volume must be maintained. In the beginning we employed this technique only in those cases where operation could not otherwise have been contemplated. Our experience of what must necessarily be a small series of this type was so encouraging that we felt that an exchange of views with other workers in this field would be an advantage. We hope soon to publish a much larger series of results.

In answer to Dr. Hewer's charges that the technique is complicated and uses a multiplicity of drugs, we would point out that it is extremely simple, and, in fact, fewer drugs are used than in many methods in current use. We have in the past used these drugs, pethidine, promethazine, and chlorpromazine, as adjuvants to normal anaesthesia. We found this line of research impractical, as the results were equivocal and any improvement could not be definitely attributed to the drug under investigation. It is also suggested that paralytic ileus and pulmonary complications are more frequent. This is certainly not so where hibernation alone is employed. Physical cooling introduces additional hazards and has not been employed by us.

Dr. Langton Hewer is concerned about the term "artificial hibernation." We have taken pains to point out that it is not a truly comparable state to that found in the hibernant mammal, but is a term we have used to avoid confusion with methods employing active physical cooling. We await another Oliver Wendell Holmes to improve on it.—We are, etc.,

ANGUS SMITH.

J. G. FAIRER.

London, N.W.1.

REFERENCE

- ¹ *Recent Advances in Anaesthesia and Analgesia*, 1953, 7th ed. Churchill, London.

Management of Ulcerative Colitis

SIR,—May we comment upon the annotation on the management of ulcerative colitis (*Journal*, December 19, 1953, p. 1364) and challenge the traditional view that patients with this disease are primarily "inadequate and dependent sufferers"—a belief that leads many to regard it as a disorder of psychogenic origin? Wittkower did, indeed, find that in many patients psychological abnormalities were present before the colitis began; but he also found the same in patients suffering from pulmonary tuberculosis.¹

We would again raise the *post hoc propter hoc* argument and submit that the personality features of those with ulcerative colitis, such as lack of aggressiveness, timidity, reliance on others, undue resentment of the disease, and "immaturity," are the result of months or years of diarrhoea—the most humiliating and incapacitating of symptoms. No one has, or is ever likely, to study the personalities of the patients before the complaint begins. Now, however, many have been restored to a normal active life by surgery and an efficient ileostomy bag; the observation of these is far more important than any psychiatric assessments made during the course of the illness. This group of patients that have been "cured" seem to us to be a remarkably normal cross-section of the community. There are 70 cases who regularly attend this centre for follow-up review; all except three have by now returned to a full-time job. The women have had no difficulty in adjusting themselves to family life, socially and from the sexual aspect; the complete range from labourer to teaching and high executive posts with heavy responsibilities is represented by jobs now undertaken by our male patients. As individuals they appear to be as capable of enjoying life as their more fortunate fellows who have not been afflicted with this disease. Many have been seen regularly over five years or more and are strikingly free from neurotic traits or induced symptoms. They have not been submitted to psychiatric assessment; yet it may be that our personal and intimate knowledge of them over a period of time is as valuable as an interview with a psychiatrist.

Psychological factors are important in every case of diarrhoea, whether this be due to ulcerative colitis, steatorrhoea, or Crohn's disease, for the influence of the mind on the alimentary tract is great. We ourselves believe that any of these diseases will produce the same type of personality if the diarrhoea is sufficiently prolonged, but that this will disappear when it is relieved.—We are, etc.,

B. N. BROOKE.

C. F. HAWKINS.

Birmingham.

REFERENCE

- ¹ *Lancet*, 1949, 2, 805.

Obituary

LORD GEDDES, P.C., G.C.M.G., K.C.B., M.D.

The career of Lord Geddes, who died in hospital at Chichester on January 8, furnishes another instance of a man who turned from medicine to serve the State in many high capacities, including that of Ambassador to the United States.

Auckland Campbell Geddes was born on June 21, 1879, in London, and was educated at George Watson's College and at Edinburgh University. His studies were interrupted by the South African war, in which he served as lieutenant with the third Highland Light



(Elliot & Fry, Ltd., London)

Infantry. Returning to Edinburgh for his medical studies—he was one of Sir William Turner's pupils—he graduated M.B., Ch.B., with honours, in 1903. He took a prominent part in university life and played in the first Rugby football fifteen. After postgraduate study on the Continent he won the gold medal for his M.D. thesis in 1908. His first appointment was that of demonstrator and assistant professor of anatomy at Edinburgh, and later he became professor of

anatomy of the Royal College of Surgeons in Ireland. In 1910 he was secretary of the Section of Anatomy at the B.M.A. Annual Meeting, and in 1912 vice-president of the same Section.

His next appointment was to the chair of anatomy at McGill University, Montreal, but when war broke out in 1914 he obtained extended leave and recrossed the Atlantic, serving first with the Northumberland Fusiliers on the east coast of England and in 1915 and 1916 in France, where he was promoted brevet lieutenant-colonel for gallant and distinguished conduct in the field. He served for a time with great success as Deputy Assistant Adjutant General and came to the notice of the war leaders. The Prime Minister at that time, Mr. Lloyd George, had a great opinion of the abilities of Auckland Geddes and of his brother Eric, and Auckland was made Director of Recruiting at the War Office in 1916. In the following year he became Minister of National Service at a time when Britain was being fitted into the unfamiliar and uneasy battle-dress of conscription. He entered Parliament for Basingstoke and Andover in 1917, and his first task was to introduce a Military Service Bill.

In 1918 Sir Auckland Geddes, as he had now become, was made President of the Local Government Board, while retaining his position as Minister of National Service. The days of the Local Government Board were numbered, for the Ministry of Health was in the offing. *This Journal*, in acclaiming the appointment of a medical man to this position, said that no doubt the state of the physical fitness of the nation, which had been brought home to the Minister of National Service as a result of the recruiting figures, would influence the

advice he gave to his Cabinet colleagues on the establishment of the Ministry of Health. Geddes, however, was not destined to be the first Minister of Health; that post, by a coincidence, was for another anatomist, Dr. Christopher (later Lord) Addison. Geddes continued as Minister of National Service, a Ministry which, with the end of the war, had left the active for the passive stage, and to this was added the Ministry of Reconstruction, which really meant that he shouldered a principal responsibility for demobilization. Later in 1919 for a brief period he followed Lord Ashfield as President of the Board of Trade.

In 1919 an invitation came to him to return to McGill, this time as Principal, his duties to begin in the autumn of that year. He had no sooner accepted the appointment than he had to resign it, for early in 1920 he was appointed British Ambassador in Washington. In spite of some expectation to the contrary he did well in this post and added to his already great reputation. Unfortunately serious eye trouble forced him to resign in 1924. Later he forsook both the academic world and the world of politics and diplomacy and became immersed in big business, being chairman of the Rio Tinto Company and interested in other corporations.

Early in 1939 the imminence of war again brought him into public prominence. He was appointed regional commissioner for the south-eastern district of England, with headquarters at Tunbridge Wells, to direct civil defence. He resigned this post in September, 1941, for he had to undergo an operation for cataract, resulting from a burn of the right eye (he had lost the sight of his left eye while serving in Washington). His recovery was a good one, and in December, 1941, he was made regional commissioner for the north-western region, but owing to impairment of his general health he was compelled to resign this appointment also. For the last few years of his life he had been totally blind.

In the New Year's honours in 1942 he was raised to the peerage as Baron Geddes of Rolvenden, where he had a country house in Kent. He had been created K.C.B. in 1917 and G.C.M.G. in 1922. Lord Geddes married in 1906 Isabella Gamble, the daughter of W. A. Ross, of New York, and had four sons and one daughter.

CYRIL LEWIS, M.D.

Dr. Cyril Lewis, one of the oldest and most respected physicians in South Wales, died peacefully at his home at Cardiff on December 30, 1953, in his 85th year. His death severs a link with bygone medicine. His father, a doctor, born in the year of Waterloo, was apprenticed to a Dr. Watkins, and was educated at University College Hospital, London, where he was gold medallist in surgery. He qualified in 1838 and later took the M.D. and the M.R.C.P. After holding resident appointments at University College Hospital for two years, he returned to his native Carmarthen, where he practised for many years and was physician to the Carmarthen-shire Infirmary. He was a justice of the peace and lived to the age of 87.

Born in 1869, Cyril Lewis was educated at Carmarthen Grammar School, at Bedford School, and at Edinburgh University, where he graduated M.B., Ch.B., in 1891. He proceeded to the M.D. six years later, receiving a commendation for his thesis. After graduation he acted as assistant medical officer to the Mental

Hospital at Carmarthen for three months, and in 1892 became resident medical officer at the Royal National Hospital for Diseases of the Chest, Ventnor, "at a salary of £100 a year," which after 18 months was increased to £120 and later to £150. After six and a half years at Ventnor he went to the Metropolitan Hospital, London, as senior house-physician "at a salary at the rate of £40 a year with board, washing, and lodging." In 1899 he became house-physician to Birmingham General Hospital, and was there for two years. In 1902 he settled in practice at Cardiff, being elected honorary anaesthetist to Cardiff Royal Infirmary later in the same year. Early in 1906 he was appointed honorary assistant physician to the Royal Infirmary, and in 1913 was promoted to the senior staff as honorary physician, which post he held until he reached the age of retirement in 1934. Throughout the 1914-18 war he served as a major on the staff of the Third Western General Hospital, and in the last war he gave his services to the Military Hospital at Whitechurch and the Prince of Wales Hospital, Cardiff.

A knowledgeable physician who enjoyed the practice of medicine, Dr. Lewis visited his wards almost daily and would never fail to call to see every emergency admitted to them. Always willing and eager to try new remedies, he never forgot that his patients were human beings with individual personalities and physiques, and he took both into account when considering diagnosis and treatment. For many years he gave the lectures in medicine to the nurses at the Royal Infirmary, and on the establishment of the Welsh National School of Medicine in 1931 he became a recognized clinical teacher. He took a keen personal interest in his students and in the welfare of his old house-physicians, and was not averse to dropping hints to them on "suitable young ladies." He himself married a trained nurse and held the firm view that nurses made the best of wives.

As a man Dr. Lewis was completely unselfish, self-effacing to a degree, full of sympathetic understanding, kindness, and never-failing courtesy. He treated all alike, from the junior probationer to the senior surgeon. He was a good amateur carpenter and mechanic, and at his home had a fitted workshop where he loved to pass his spare time making all sorts of things. Failing health obliged him to give up active work in 1946, and, although confined to the house for the 12 months preceding his death, he was alert mentally to the end and ever interested in all that was going on. Out of the fullness of years his reminiscences of men and affairs were always most informing:

"His head was silvered o'er with age,
And long experience made him sage."

In his younger days Dr. Lewis was extremely versatile. While at Edinburgh he served in the volunteer medical staff corps and attained the rank of staff sergeant. He was a great cyclist, and is known to have cycled on a "penny-farthing" machine from Edinburgh to his home in Carmarthen for his holidays. He was a good tennis player and had played in amateur tournaments. Having a knowledge of music and a good voice, he was active in organizing and taking part in entertainments for patients when he was a resident medical officer. At Ventnor, in particular, he did much to help in the amusement of the patients. He took part in concerts and amateur theatricals not only at the hospital but also at the local assembly rooms, and, being an excellent

performer, often gave solos on the flute. When he left Ventnor a most successful farewell concert was arranged in his honour, and a clock and an illuminated address were presented to him. On leaving the hospital the patients and staff lined the drive and cheered him on his way. Thus in his young days, as in his old, he was sincerely loved by all. A member of the British Medical Association for 61 years, he was one of the two honorary secretaries of the Cardiff Division from 1907 to 1912, and in 1928, when the Association held its Annual Meeting at Cardiff, he served as a vice-president of the Section of Medicine. The funeral service was held at St. Andrew's Church, Cardiff, where he had been a churchwarden for 35 years. He is survived by his widow and two sons, one of whom is a member of the medical profession in practice at Hove.—A.M.K.

Dr. JAMES WARNOCK, who died at Oxford on December 4, 1953, at the age of 74, was for 40 years a well-known general practitioner in Leeds. As a student he had a distinguished career at Queen's College, Galway, and at Belfast. He took the B.A. of the Royal University of Ireland in 1901, gaining first place and first-class honours, and when he proceeded to the M.A. two years later he obtained first-class honours in mathematics and was awarded a special prize. He then entered the faculty of medicine and graduated M.B., B.Ch., B.A.O. in 1906, gaining first-class honours. He rounded off his scholastic record by winning a gold medal when he proceeded to the M.D. in 1908. In the following year he settled in general practice at Leeds, where he remained until he retired to live at Abingdon, Berkshire, in 1949. He served with distinction in the first world war, being mentioned in dispatches, and in 1919 he was appointed O.B.E. On returning to civilian life he built up an extensive family practice, while as certifying factory surgeon he took a special interest in industrial medicine long before it became a vogue. A shrewd and sound clinician, he was a family doctor of the old school, enjoying to the full the confidence and affection of his patients, notwithstanding his absolute frankness, for he had no time for any humbug or window dressing. Of a somewhat shy and diffident nature, he took little part in public affairs, although he was prevailed upon to serve on the executive of the Leeds Division of the B.M.A. for a time and was chairman of the Division in 1934-5. Dr. Warnock was a man of considerable culture and erudition. The study of higher mathematics remained an engaging passion to the end of his life; it was not uncommon to find him after his afternoon surgery deeply engrossed in some problem of the calculus. His other hobbies showed the same love of refined detail and scrupulous exactitude, although in a more practical form. He made furniture of a very high order of craftsmanship, while his inlaid trays and mirrors were especially attractive. In his latter years he took up bookbinding with the same enthusiasm and attention to detail. All these additional accomplishments made him an arresting personality and a rather unique type of family doctor. His passing is a great loss to his many friends and medical colleagues. Dr. Warnock is survived by his wife, a married daughter, and a son, Mr. G. J. Warnock, who is a Fellow and tutor of philosophy of Magdalen College, Oxford.—W. MACA.

Dr. HANS SCHAEFER, a well-known general practitioner at Enfield, Middlesex, died in a London nursing-home on December 14, 1953, after a short illness. He was born on February 15, 1888, and was educated in Berlin. After qualifying, he worked as a surgeon in several hospitals there, and in 1923 became assistant in Professor Borchardt's surgical department. Later Dr. Schaefer established his own general practice, while still retaining his keen interest in orthopaedic and plastic surgery. In 1934 he

came to England, and after re-qualifying in Scotland in 1936 he settled again in general practice in the Enfield area, where he soon acquired an excellent reputation among his patients, to whom he became not only a medical adviser but a good friend. His chief interest outside his professional life was sculpture, and he was himself an artist of exceptional ability. To all his friends he was a man of eternal youth and of unfailing charm and kindness; in spite of his brilliant attributes he remained always humble. Our deep sympathy is extended to his widow.—E. G.

The death occurred on December 27, 1953, of Dr. JAMES GILCHRIST in a nursing-home at Sydenham, where he had been in general practice for nearly half a century. He was 76 years of age. James Gilchrist was born in Aberdeenshire on July 4, 1877, and from the local grammar school he entered Aberdeen University in 1894, graduating M.A. in 1898, and taking the degrees of M.B., Ch.B. three years later. After five years spent chiefly in private practice he proceeded to the M.D. in 1906, and then settled in general practice in Sydenham. From 1918 to 1930 he was honorary surgeon to the South-eastern Hospital for Children at Sydenham, and for many years was medical officer to the Passmore Edwards Teachers' Home, district medical officer to the Post Office, and medical referee to assurance companies. A member of the British Medical Association for 40 years, he was chairman of the Lewisham Division in 1923-4, and represented the division at the Annual Representative Meeting held at Glasgow in 1922. From 1928 to 1950 he was treasurer of the Sydenham District Medical Society, which he joined in 1909, and proved himself a prudent adviser. He had also been president of the society. His great sense of humour was very much appreciated by his fellow members, to whom he would relate anecdotes in a way that was all his own. "Gilly," as he was known to his many friends, was a pattern of the old kind of family doctor; a good physician and surgeon, he devoted his life to the relief of suffering in others, and was well loved by his patients. He is survived by his widow, who was a most devoted helpmeet in his practice, and two sons, both members of the medical profession, the elder being a wing commander in the Royal Air Force and the younger a member of the Colonial Medical Service.—F. M. B.

Dr. BERNARD RIVIERE died at his home at Salhouse, near Norwich, on December 27, 1953, at the age of 73. He retired from general and surgical practice in Norwich nearly thirty years ago, and this enabled him to give more time to ornithology, on which he was a well-known authority. Bernard Beryl Riviere was born in London on April 13, 1880, the son of Briton Riviere, a Royal Academician, from whom he inherited some of his artistic talent. Educated at St. Paul's School, London, and at St. Andrews University, he received his clinical training at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1904. Two years later he obtained the diploma of F.R.C.S. After qualification he held the appointments of house-surgeon at Bart's, clinical assistant at the East London Hospital for Children, and house-physician at Birmingham General Hospital. Then, in 1908, he joined a partnership in Norwich, where he also became honorary surgeon to the Jenny Lind Hospital. In 1914, for health reasons, he was obliged to leave Norwich, and for the next two years lived in Switzerland and South Africa. On his return to England he resumed his medical work at Norwich until the mid-twenties, when increasing anxiety about his health forced him to retire. Eventually he made a good recovery, and in 1929 he was appointed to the board of the Norwich Union Insurance Societies. He took an increasingly important part in the business and for a short time during the last war he was vice-president of the Norwich Union Life Society. He was also a trustee of the East Anglian Trustee Savings Bank. Always a keen naturalist, Dr. Riviere had been a

member of the Norfolk and Norwich Naturalist Society for 45 years, serving a term as president, and he was also treasurer of the Norfolk Naturalists' Trust. In 1930 he published *A History of the Birds of Norfolk*, the best work on the subject there is. He was also the author of many pleasantly written articles on the habits of individual birds. In 1927 he was co-opted a member of the Norwich Museums Committee, his knowledge of natural history and art proving of great value in the work of the committee. As an artist he had a number of small works of sculpture to his credit, and he was a member of the Norfolk and Norwich Art Circle. He is survived by a widow, formerly Miss Veronica Mack, and three sons.

Dr. MONTAGUE WAY, a member of a well-known Portsmouth family, died at his home at Southsea on December 30, 1953, at the age of 78. Montague Harold Way was a medical student at Guy's Hospital, where he held the post of house-surgeon after qualifying in 1897. After a short period of service in India as a plague medical officer he returned to England and went into practice in Portsmouth, where he had been senior house-surgeon at the Royal Portsmouth Hospital. In addition to devoting himself to his steadily growing practice, Dr. Way took a great interest in public affairs and was a member of the Portsmouth City Council for eight years. He was also a past chairman of the Portsmouth Conservative and Unionist Association. In 1926 he was appointed a justice of the peace. For 13 years he was a member of the old Portsmouth Insurance Committee and its chairman in 1930-1; he was also a member of the local panel committee and for a number of years attended the annual Panel Conference. During the first world war he served as a captain in the R.A.M.C. at the 5th Southern General Hospital and in Salonika. A member of the British Medical Association for 56 years, he was chairman of the Portsmouth Division in 1924-5. He retired from practice as long ago as 1932. Seven years later he was appointed O.B.E. in recognition of his political and public services.

M. A. K. writes: The death of Dr. Montague Way has removed from the ranks of general practitioners in Portsmouth a notable member. His father was a well-known Portsmouth solicitor, and his uncle was equally well known as a doctor in Portsmouth before him so that he inherited a name already well respected and appreciated in the city. Municipal and magisterial honours followed in due course and were combined with much activity in politics, horticulture, and other interests. He was a frequent attendee at B.M.A. meetings almost to the end of his life. But it is in the hearts of his patients that a family doctor's memory may be enshrined, and this can be said of Dr. Montague Way. He leaves two sons, Dr. John Way, of Hordle, and Mr. Paul Way, of London, by his first wife. He afterwards married Miss Scott Foster, a daughter of Sir Scott Foster, a previous Lord Mayor of Portsmouth. To his widow and sons we offer our deep sympathy.

The sudden death of Miss B. E. NESBITT, the well-known ear, nose, and throat surgeon, in Edinburgh on December 30, 1953, at the age of 55, leaves a gap that will be hard to fill. Born at Galway on July 7, 1898, Belinda Elizabeth Nesbitt was educated at the Methodist College and at Queen's University, Belfast, where she graduated M.B., B.Ch. in 1924. She then held house-surgeon posts at the Royal Ear Hospital (now the ear, nose, and throat department of University College Hospital, London), the King Edward VII Hospital, Windsor, and the Birmingham and Midland Ear and Throat Hospital. After further extensive postgraduate study in London and Vienna she became a Fellow of the Royal College of Surgeons of Edinburgh in 1931 and immediately set up in consultant practice. Later she became ear, nose, and throat surgeon to the Bruntsfield Hospital and the Eye, Ear, and Throat Infirmary, Edinburgh, the Redlands Hospital for Women, and the Dunfermline and West Fife Hospital. Always a hard worker, she built up a wide and

busy practice and took infinite pains with all her patients. Her bright and happy disposition never failed to bring comfort to all who came under her care. Miss Nesbitt was a skilled pianist, but her chief recreation was golf, a game she took up after the war, and to it she devoted the same keenness and enthusiasm which characterized her work. She won the trophy of the City of Edinburgh Branch of the British Medical Association on two occasions and the Notts Ladies' Challenge Cup at the Annual Meetings of the B.M.A. in 1949 and 1950. Her husband, Mr. C. R. Duncan Leeds, won the Treasurer's Cup in the latter year, and this was possibly a unique event in the history of these competitions. To Mr. Duncan Leeds, who is an ophthalmic surgeon in Edinburgh, we offer our sincere sympathy in his loss.

Medico-Legal

DIABETIC MOTORIST ACQUITTED

Salford's stipendiary magistrate, Mr. Leslie Walsh, gave his reserved judgment on January 8 in the case of Robert Geoffrey Healey, 28, of Heywood, Lancs, who had pleaded not guilty to driving his car under the influence of a drug and dangerous driving.

The alleged offences occurred, said the Stipendiary, when Healey's car was involved in an accident in Bury New Road, Salford, on November 7, 1953. Police said that Healey's car ran backwards into a bus and then shot forward and collided with a van. The magistrate said that Healey suffered from diabetes and was treated with insulin. On the day of the accident he attended a diabetic clinic in Manchester and was seen by a doctor. He left the clinic and was later involved in the accident in circumstances which prima facie showed dangerous driving. Medical evidence was given, which was not contradicted, that his condition—hypoglycaemia—could occur without the defendant knowing about it.

"It is clear from the medical evidence," he continued, "that hypoglycaemia could arise without premonitory symptoms, and I am satisfied that Healey had no warning of the attack. In these circumstances the issue on dangerous driving is covered by a High Court ruling on motorists suddenly attacked by an illness which incapacitates them. I find that he was not guilty of dangerous driving. As for the charge of driving under the influence of a drug, I think that this section of the Act was never intended to cover such cases. The condition of hypoglycaemia could be caused in a diabetic by other factors than insulin, such as extra exertion, worry, or exasperation. As I am satisfied that Healey took only his normal dose of insulin on the day in question, and had never previously suffered ill effects as the result of that dose, I am not satisfied that he was under the influence of insulin at the time of this accident. Before the accident he was seen by a doctor, when his condition was normal. The charge will therefore be dismissed."

Universities and Colleges

UNIVERSITY OF OXFORD

The Theodore Williams Scholarship in Pathology for 1953 has been awarded to Antony Babington Herring.

UNIVERSITY OF CAMBRIDGE

Dr. W. E. Hick has been appointed Reader in Experimental Psychology from October 1, 1953.

The following degrees were conferred on November 28, 1953: M.D.—M. G. Thorne, J. K. Wagstaff. Sc.D.—Kenneth Bailey, Ph.D., F.R.S.

The Raymond Horton-Smith Prize for 1952-3 has been awarded to Dr. John Perrin and Dr. Ernest Keith Westlake (equal).

UNIVERSITY OF LONDON

The degrees of M.B., B.S. were awarded to D. D. J. Rees on October 21, 1953, the date to be inscribed on the diploma to be June 25, 1952.

The following candidates at the Institute of Psychiatry have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—G. F. Vaughan, Lorna Wheelan. Part I: R. H. Gosling, W. A. Kennedy, J. Pisani, N. H. Rathod.

UNIVERSITY OF MANCHESTER

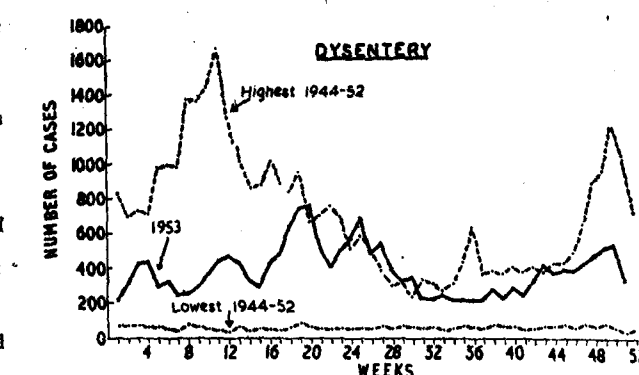
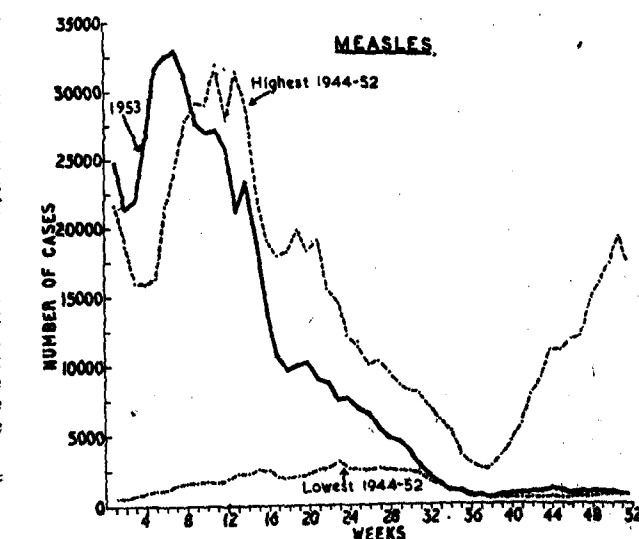
The following candidates have been approved at the examination indicated:

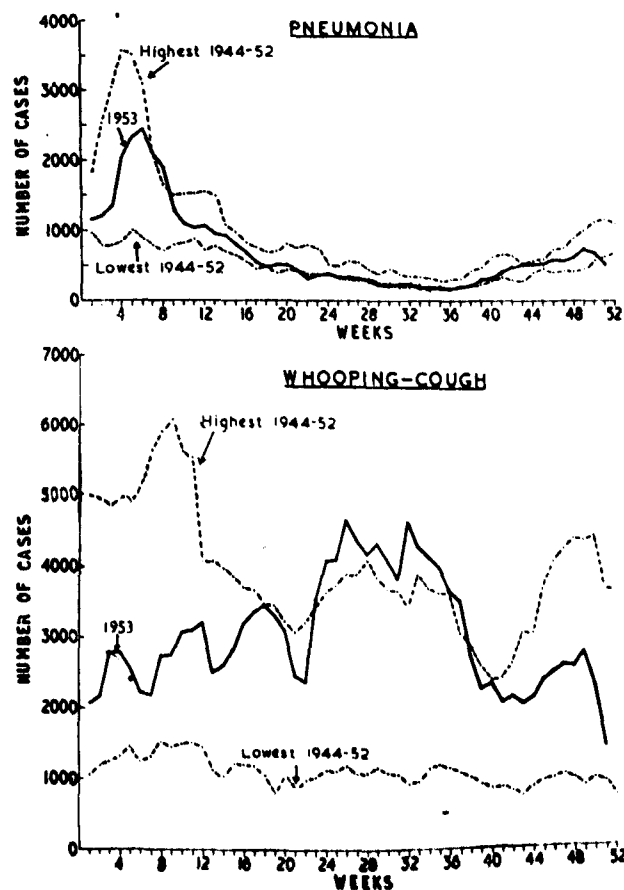
FINAL M.B., Ch.B.—Sheila Berry, J. K. Bleasdale, C. Booth, Margaret A. Broughton, J. W. Chamberlain, G. H. H. Dwyer, Pauline R. Dyckhoff, G. Gold, L. Goldie, A. Greenbaum, Mabel L. Haigh, Daphne J. Hall, F. Heyworth, J. Johnson, J. B. Jones, L. K. Levens, J. S. Lord, F. G. Lucas, Jean McCracken, C. Mawdsley, V. B. Maxwell, P. W. Murphy, W. C. Newport, J. Parkin, L. Reece, Eve M. Roper, J. G. B. Russell, Ruth M. Sellars, Joan E. Singleton, J. N. Standing, A. O. F. Stuart, A. T. Thompson, S. T. Whitehead.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ———, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

The usual fall in the number of notifications of infectious diseases that occurs during Christmas week was reported in England and Wales during the week ending December 26. The decreases in the number of notifications included 880 for whooping-cough, from 2,304 to 1,424; 335 for scarlet fever, from 1,284 to 949; 194 for dysentery, from 503 to 309; 167 for measles, from 778 to 611; and 162 for acute pneumonia, from 692 to 530.

The largest falls in the notifications of whooping-cough were 80 in Lancashire, from 220 to 140; 59 in Derbyshire, from 85 to 26; 56 in Southampton County, from 110 to 54; 47 in Kent, from 109 to 62; 46 in Essex, from 115 to 69; 45 in London, from 101 to 56; 44 in Glamorganshire, from 83 to 39; 44 in Yorkshire West Riding, from 177 to 133; 40 in Durham, from 69 to 29; 39 in Hertfordshire, from 61 to 22; and 36 in Middlesex, from 79 to 43. The largest fall in the local returns of scarlet fever was 37 in Essex, from 83 to 46. 15 cases of diphtheria were notified, being 1 fewer than in the preceding week. The chief features of the returns of diphtheria were a fall from 5 to 0 in Durham and a rise from 1 to 5 in Lancashire. The only large decline in measles was 43 in Lancashire, from 177 to 134.

29 cases of acute poliomyelitis were notified during the week. These were 20 fewer for paralytic and 2 fewer for non-paralytic cases than in the preceding week. The largest returns were London 4, Kent 3, and Lancashire 3.

The largest returns for dysentery were London 52 (Islington 19), Yorkshire West Riding 39 (Sowerby Bridge U.D. 15, Bradford C.B. 9), Lancashire 35 (Bolton C.B. 12), Leicestershire 23 (Leicester C.B. 20), Middlesex 21 (Enfield U.D. 11), Norfolk 21 (Norwich C.B. 20), and Kent 20 (Cranbrook R.D. 13).

Week Ending January 2

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,111, whooping-cough 2,284, diphtheria 29, measles 1,327, dysentery 340, acute poliomyelitis 53, paratyphoid fever 0, and typhoid fever 1.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending December 26 (No. 51) and corresponding week 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng & Wales	London	Scot	N. Ire	Eire	Eng & Wales	London	Scot	N. Ire	Eire
Diphtheria	15	0	7	0		23	3	6	0	
Dysentery	309	52	107	0	8	327	34	77	4	4
Encephalitis, acute	3	1	0	0		7	0	0	0	
Enteric fever: Typhoid Paratyphoid	0	0	1	0		5	0	0	0	
Food-poisoning	109	11		2		58	8		0	
Infective enteritis or diarrhoea under 2 years				10	10				6	14
Measles*	611	1	16	9	60	19,551	1797	181	23	40
Meningococcal infection	21	3	15	0		38	0	16	2	1
Ophthalmia neonatorum	30	2	2	0		29	2	5	0	
Pneumonia†	530	26	257	13	3	1,141	99	413	5	4
Poliomyelitis, acute: Paralytic Non-paralytic	19 10	3 1	7 1	2 1	1	35 12	3 1	3 1	2 2	2
Puerperal fever‡	171	24	6	0		160	29	12	2	
Scarlet fever	949	50	212	26	28	1,881	110	320	48	60
Tuberculosis: Respiratory Non-respiratory			109 15	17 5				147 19	15 1	
Whooping-cough	1,424	56	252	30	52	1,748	90	102	57	65

DEATHS in Great Towns	1953					1952				
	Eng & Wales	London	Scot	N. Ire	Eire	Eng & Wales	London	Scot	N. Ire	Eire
Diphtheria	0	0	0	0	0	1	0	0	0	0
Dysentery	0	0		0		0	0		0	
Encephalitis, acute		0			0		0			
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	12	1	2	1	1	18	4	3	0	0
Influenza	12	0	2	0	0	45	9	3	0	0
Measles	0	0	0	0		0	0	0	0	
Meningococcal infection		2	2				3	0		
Pneumonia	219	29	31	9	3	515	125		16	9
Poliomyelitis, acute	1	0			0	6	3			0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory Non-respiratory	80	9	27	2	1	160	37	14	5	4
Whooping-cough	3	1	0	0	0	1	0	2	0	0
Deaths 0-1 year	188	22	47	7	3	256	34	42	9	12
Deaths (excluding stillbirths)	4,541	637	641	88	104	7,679	1,523	746	143	125
LIVE BIRTHS	4,575	639	666	184	206	6,764	1,045	769	197	277
STILLBIRTHS	153	12	14			168	13	25		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
‡ Includes puerperal pyrexia.

Medical News

Pharmaceutical Research.—The cost of research in the British pharmaceutical industry is now between £2,000,000 and £2,500,000 a year, according to Mr. S. M. Lennox, president of the Chemists' Federation. He was speaking at a dinner given by the National Pharmaceutical Union to the Chemists' Federation and the Council of the Pharmaceutical Society on January 6. He added that the industry now employed over 50,000 people and produced pharmaceutical products to the value of over £90,000,000 a year.

Scottish Hospital Endowments Research Trust.—The Secretary of State, Mr. James Stuart, has now appointed the trustees. The chairman is Sir John Erskine, formerly general manager of the Commercial Bank of Scotland, and the members are Lieutenant-Colonel Donald Cameron of Lochiel, Mr. J. T. Dowling, Mr. R. L. Gwilt, Dr. James Lawson, Bailie James A. Mackie, and Mr. Iain Maxwell Stewart. The Trust's general funds, which will provide an income of up to £120,000 a year, will be built up from a proportion of the endowments of the former voluntary hospitals in Scotland, and also from gifts and legacies from private individuals. The Trust is charged with the duty of assisting medical research in Scotland, and will be advised by the Advisory Committee on Medical Research in Scotland, of which Sir Edward Appleton is chairman.

Diploma in Health Education.—The University of London Institute of Education has arranged a year's full-time course in health education (fee £62 10s.) leading to a diploma. It is intended for those wishing to train for work in this field and is open to lecturers in training colleges and departments of education, qualified teachers, doctors, nurses, health visitors, sanitary inspectors, and others. The London School of Hygiene and Tropical Medicine and the Central Council for Health Education have agreed to give some help with the course, which will comprise lectures, seminars and discussions, and field work. The syllabus includes the following subjects: principles of education; principles of social and preventive medicine; history and administration of public health and education; scientific bases of health and human behaviour; and principles, methods, and media of health education. Behind this new move by London University is the recognition that the best use of the nation's health services demands an instructed public. Improvements in the public health depend largely on the individual layman taking the trouble to observe the elementary rules of hygiene. Further details about the course may be obtained from the secretary, University of London Institute of Education, Malet Street, London, W.C.1.

Deaf Children.—One of the most urgent problems for the parent of a deaf child is what to do about his child's education. To help with this, the National Institute for the Deaf has published a booklet, "The Education of Deaf Children," prepared with the help of the National College of Teachers of the Deaf, which answers many of the questions such a parent would want to ask. The booklet contains a number of articles on teaching deaf children by leading British authorities and a full list of the schools for the deaf and partially deaf in the British Isles. The booklet costs 1s. 3d., and may be obtained from the National Institute for the Deaf, 105, Gower Street, London, W.C.1.

The Cost of Private Treatment.—The London Association for Hospital Services, controlled by a council of management whose members are nominated by the B.M.A., the Royal Colleges, and the King Edward's Hospital Fund for London, offers a comprehensive insurance scheme to those who wish to provide in this way for the costs of private medical treatment. Lately the London Association has been able to improve its benefits and conditions. One

scheme is intended specially for doctors. It covers the expenses of private in-patient treatment at any hospital or recognized nursing-home, including monetary gifts to professional colleagues. The latter are sent direct by the London Association as a present from the doctor who has received treatment. Full details of this and other schemes may be obtained from the London Association for Hospital Services, Tavistock House South, Tavistock Square, London, W.C.1.

Dispensing Opticians.—The Board of Registration of Medical Auxiliaries has issued a "Register of Dispensing Opticians." It contains the names of 352 dispensing opticians whose applications for registration were received and approved by the Board up to the end of last November. The names are classified geographically and alphabetically. In each case place of employment, private address, telephone number, and qualification are given. If an artificial eye service or contact lens service is provided this is also indicated. Copies of the Register may be obtained, free, on application to the Secretary and Registrar, Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, London, W.C.1.

Sir Ewen Maclean's Will.—After various substantial legacies, which included £1,000 each to the Welsh National School of Medicine (to augment the Ewen Maclean Research Scholarship) and the Cardiff Royal Infirmary and £500 to the B.M.A. Charities Fund, Sir Ewen Maclean left one-third of his residuary estate to the Welsh National School of Medicine and another third to the Royal College of Obstetricians and Gynaecologists, of which he was president from 1935 to 1938. Sir Ewen Maclean was president of the B.M.A. in 1928 when the annual meeting was held in Cardiff, and previously he had been chairman of the Representative Body.

President of British Association.—At a ceremony at Burlington House on January 8 Dr. E. D. Adrian, O.M., president of the Royal Society, was inducted as the 116th president of the British Association by the retiring president, Sir Edward Appleton.

Editorship of "Brain."—Sir Russell Brain, F.R.C.P., has assumed the editorship of *Brain* in place of Sir Francis Walshe.

Sir Andrew Davidson, Chief Medical Officer of the Department of Health for Scotland, is to retire on March 31. He was appointed in 1941.

Lord Horder.—In honour of his 83rd birthday Lord Horder's former house-physicians entertained him to dinner on January 7 at the Royal Society of Medicine. Dr. A. C. Roxburgh was in the chair.

Mr. R. Scott Stevenson, who has left London to live in Gibraltar, was presented with a gift in recognition of his services as chairman of the National Institute for the Deaf from 1945 to 1954 at a dinner held on January 7 with Lord St. Audries in the chair.

Professor W. O. Reinhardt, of the department of anatomy, University of California, is coming to Bristol for a year next September to work with Professor J. M. Yoffey on the reaction of the bone marrow to anoxia. Professor Reinhardt has been given a grant by the United States Public Health Service for this purpose.

COMING EVENTS

Oxford Graduates' Medical Club.—The winter dinner will be held at the Royal College of Surgeons, Lincoln's Inn Fields, on Friday, January 29, at 7 for 7.30 p.m. Sir Russell Brain will be in the chair. Tickets (price 38s.) may be obtained from Mr. Selwyn Taylor, 3, Roedean Crescent, London, S.W.15.

Contraceptive Technique.—A lecture and demonstration will be given by Marie Stopes, Ph.D., at the Mothers' Clinic,

108, Whitfield Street, London, W.1, on Thursday, February 4, at 2.30 p.m. Admission free, but tickets must be obtained in advance.

Fifth International Congress on Mental Health.—The congress will be held in Toronto from August 14 to 21, and the theme will be "Mental Health in Public Affairs." Further information may be obtained from 111, St. George Street, The Congress Office, Toronto, Canada.

NEW ISSUES

Annals of the Rheumatic Diseases.—The next issue (Vol. 12, No. 4, December, 1953) will be available in a week's time. The contents include:

ARTHRITIS. Philip Ellman and F. Parkes Weber. **PULMONARY LESIONS OF DISSEMINATED LUPUS ERYTHEMATOSUS.** S. I. Rapoport, L. Meisner, F. M. Steele, and S. R. Caniglia. **PRODUCTION OF ARTHRITIS IN THYROIDECTOMIZED RAT BY INJECTIONS OF DEOXYCORTONE ACETATE.** R. G. Harrison and T. J. Barnett. **FINGER CONTRACTURES DUE TO TENDON LESIONS AS A MODE OF PRESENTATION OF RHEUMATOID ARTHRITIS.** B. M. Ansell and E. O. L. Bywaters. **RESTORATION OF KNEE JOINT FUNCTION IN CHRONIC RHEUMATOID ARTHRITIS.** Robert L. Preston. **EFFECT OF ACTH AND SODIUM SALICYLATE ON THE URINARY URIC ACID: CREATININE RATIO, AND CIRCULATORY EOSINOPHILS IN MAN.** F. O. W. Marston. **COLLAGEN DISEASE COMPLICATING MALIGNANCY.** John Lambury. **RHEUMATIC DISEASES IN DENMARK.** K. Kalbak. **EPIDEMIOLOGY OF RHEUMATIC FEVER IN A RURAL DISTRICT IN ITALY.** A. Poppi, G. Labo, G. Lenzi, and L. Rossi. **INCIDENCE OF REFLEX SYMPATHETIC DYSTROPHY OF THE UPPER EXTREMITY.** Velkko A. I. Laine.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d. Available from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, January 18

HUNTERIAN SOCIETY.—At the Mansion House, 8.30 p.m., Hunterian Lecture by Dr. George Crile (Cleveland, Ohio): Under Southern Seas. **ROYAL EYE HOSPITAL.**—5.15 p.m., Dr. T. H. Whittington: Care and Treatment of the Squinting Child.

Tuesday, January 19

BRITISH POSTGRADUATE MEDICAL FEDERATION. At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor G. R. Cameron, F.R.S.; Tissue Repair. **INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. W. N. Goldsmith: Vegetating Dermatoses. **LONDON UNIVERSITY.**—At Meyerstein Theatre, Westminster Medical School, 5.30 p.m., special university lecture in medicine by Dr. George Crile (Cleveland, Ohio): Medical Treatment of Hyperthyroidism and Thyroiditis. **ROYAL EYE HOSPITAL.**—5.30 p.m., Dr. B. S. Cardell: Pathology of the Ocular Melanoma. **ST. MARY'S HOSPITAL MEDICAL SCHOOL.**—5 p.m., Professor W. I. C. Morris: Complete Perineal Test. **SOCIETY FOR THE STUDY OF ADDICTION.**—At 11, Chandos Street, Cavendish Square, W., 8 p.m., Dr. J. H. Gould: Biochemical Detoxication in the Treatment of Alcoholism; Lady Frankau: Vitamins Plus Subconvulsive Therapy in the Treatment of Long-standing Alcoholism. **SOUTH-WEST LONDON MEDICAL SOCIETY.**—At Bellinghame Hospital, Wandsworth Common, 8.30 p.m., Dr. W. D. W. Brooks: Aetiology and Treatment of Bronchitis (illustrated by lantern slides).

Wednesday, January 20

BURGESS SOCIETY.—At Burlington House, Piccadilly, W., 5.30 p.m., Dr. J. Spencer, Ph.D.: Delinquent Behaviour: Some Unanswered Questions. **HARVEIAN SOCIETY OF LONDON.**—8.15 p.m., Presidential Address by Dr. Tom Hare: The Tudor Ancestors of Dr. William Harvey. **INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. H. Haber: Clefts, Vesicles, and Bullae. **INSTITUTE OF UROLOGY.**—4.30 for 5 p.m., Mr. R. Ogier Ward: Stone in the Ureter. **LONDON UNIVERSITY.** DEPARTMENT OF EXTRA-MURAL STUDIES AND ATOMIC SCIENTISTS' ASSOCIATION.—At Beveridge Hall, Senate House, 7 p.m., Sir John D. Cockcroft, F.R.S.: Atomic Research at Harwell. **MIDDLESEX COUNTY MEDICAL SOCIETY.**—At Edgware General Hospital, 3 p.m., clinical meeting, Dr. G. S. C. Sowry: The Inheritance of Essential Hypertension; coloured film by Dr. G. Riddell Royston: A Case of Scurvy. **MIDLAND MEDICAL SOCIETY.**—At Birmingham Medical Institute, 8.15 p.m., joint meeting with Junior Legal Club, Birmingham Law Society. **PHYSIOTHERAPISTS ASSOCIATION, LTD.**—At Bonnington Hotel, Southampton Row, W.C., 7 p.m., Mr. R. Rowden Foote: Varicose Veins (with coloured film). **ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5 p.m., Mynihan Lecture by Dr. George Crile (Cleveland, Ohio): Treatment of Diseases of the Thyroid Gland. **ROYAL EYE HOSPITAL.**—5.30 p.m., Mr. L. H. Savin: Ophthalmic Operations and Their Indications (4). **SOCIETY FOR ANALYTICAL CHEMISTRY.**—At Institution of Electrical Engineers, 6 p.m., joint meeting with Royal Institute of Chemistry. Subject: Determination of Alcohol in Blood and Urine. Paper by Dr. D. W. Kent-Jones, Ph.D., F.R.I.C., and Mr. G. Taylor, F.R.I.C. **SOCIETY OF PUBLIC ANALYSTS.**—At Institution of Electrical Engineers, 6 p.m., joint meeting with Royal Institute of Chemistry. Subject: Determination of Alcohol in Blood and Urine. Paper by Dr. D. W. Kent-Jones, Ph.D., F.R.I.C., and Mr. G. Taylor, F.R.I.C.

Thursday, January 21

BRITISH POSTGRADUATE MEDICAL FEDERATION. At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. D. D. Reid: Design of Clinical Experiments. **EDINBURGH CLINICAL CLUB.** At 7, Drumshugh Gardens, 8 p.m., Dr. E. H. Cameron: Ophthalmology in General Practice. **GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.**—At Glasgow University Union, 7.30 p.m., Honorary Presidential Address by Professor R. A. Lennie. **INSTITUTE OF CHILD HEALTH.** 5.30 p.m., Miss B. C. Marshall: Handling of the Family in Mental Deficiency. **LIVERPOOL MEDICAL INSTITUTION.** 8 p.m., demonstration of cases of pathological interest. **LONDON JEWISH MEDICAL SOCIETY.** At Medical Society of London, 8.30 p.m., films: (1) Early Diagnosis of Acute Anterior Poliomyelitis; (2) Industrial Dermatitis; (3) Venomous Snakes—Medical Aspects. **ROYAL COLLEGE OF SURGEONS OF ENGLAND.** 5 p.m., Ophthalmology Lecture by Professor Arnold Sorsby: Abiotrophy. **ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.** 7.30 p.m., Lieutenant-Colonel A. K. Brown, R.A.M.C., and Dr. A. Knudsen: Acute Haemorrhagic Fever—Clinical and Pathological Aspects. A discussion will follow. **ST. ANDREWS UNIVERSITY.** At Physiology Department, Dundee, 5 p.m., Dr. Macdonald Critchley: Parietal Symptomatology. **ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.** 5 p.m., psychiatry demonstration by Dr. M. Partidge.

Friday, January 22

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. W. N. Goldsmith: Vegetating Dermatoses. **LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.**—7.30 p.m., pathological meeting. **POSTGRADUATE MEDICAL SCHOOL OF LONDON.** 2 p.m., Professor Henry Barcroft, F.R.S.: Sympathetic Control of Human Blood Vessels. **ROYAL MEDICAL SOCIETY, Edinburgh.** 8 p.m., Professor J. W. Crofton: Tuberculosis: Scotland's Problem. **ROYAL SANITARY INSTITUTE.** At Town Hall, Slough, 10 a.m., Symposium on Industrial Health. Miss F. Schofield: Factory Law and Health; Dr. A. A. Banger: Slough Industrial Health Service and Area Services; Dr. M. E. M. Herford: The Appointed Factory Doctor: Possible Developments; Dr. E. Hughes: The View of a Medical Officer of Health.

Saturday, January 23

BRITISH ASSOCIATION OF ALLERGISTS. At Royal Society of Medicine, 11 a.m., Professor G. Payling Wright: Fate of Injected Soluble Antigens; 11.40 a.m., Dr. J. H. Humphrey: Participation of Formed Elements of the Blood in Experimental Allergic Reactions; 2.40 p.m., Dr. J. O. Cunningham: The Actions of Ethylenediamine Tartrate in Industry; 3 p.m., Dr. H. Wiles: Some Unusual Industrial Sensitivities; 3.30 p.m., Dr. P. B. S. Fowler: Printers' Asthma.

APPOINTMENTS

CURRAN, A. P., M.B., Ch.B., D.P.H., Deputy Medical Officer of Health and Deputy School Medical Officer, County Borough of West Ham. **GRAY, DAVID KEMPSON, M.B., B.S.,** Resident Aural Registrar, The Hospital for Sick Children, Great Ormond Street, London, W.C. **LIVERPOOL REGIONAL HOSPITAL BOARD.** R. D. Holston, M.B., Ch.B., M.R.C.P., Part-time Consultant Physician to Hospitals in North Wirral Area; P. M. O'Flanagan, I.R.C.P.S.I., D.P.M., Whole-time Consultant Psychiatrist to Winwick Hospital; A. H. Bruce, FR.P.S., M.M.S.A., D.A., Part-time Consultant Anaesthetist to Central Wirral and Chester Areas. **STARR, VIDA I. McE., M.D., D.P.H.,** Senior Medical Officer (Maternity and Child Welfare), Liverpool Public Health Department. **YOUNG, WILLIAM C., M.B., Ch.B., D.P.H., D.P.A.,** Medical Officer of Health, Borough of Motherwell and Wishaw.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Crane. On January 1, 1954, at Dr. Nest Crane (formerly Llewellyn), wife of Dr. J. E. Crane, Carmarthen, a son David Llewellyn. **Fox.** On October 14, 1953, to Rosemary (formerly Wilson), M.B., B.S., D.P.H., wife of Percy Francis Fox, of Melchester, Southern Rhodesia, twin daughters, Annabelle and Philippa, and on December 27, 1953, a son Timothy. **Smith.** On December 1, 1953, at Leeds, Yorks, to Kathleen (formerly Turner), M.B., B.S., wife of Irvine Smith, F.R.C.S., a daughter—Dorothy Battinson.

DEATHS

Butler. On December 16, 1953, at 2, Whybourne Crescent, Tunbridge Wells, Kent, George Guy Butler, M.B.E., M.D. **Dargatzis.** On December 14, 1953, at his home, Inglebrook, Upper Clarendon Road, St. Heller, Jersey, Patrick Arthur Dargatzis, M.R.C.S., I.R.C.P., Lieutenant-Colonel, I.M.S., retired, aged 69. **Dew.** On December 15, 1953, at Colindale, Wimblesbury Road, Horeham, Sussex, John Wescott Dew, M.C., M.B., B.Ch., aged 66. **Fothergill.** On December 17, 1953, at 65, Bromley Road, Beckenham, Kent, Arthur Fothergill, M.D. **Heller.** On December 6, 1953, at 1, Ivywell Road, Bristol, Joseph Heller, M.D., aged 79. **Higgins.** On December 11, 1953, at his home, Nazareth Cottage, Monkstown, Co. Cork, Eire, John Higgins, M.R.C.S., I.R.C.P., late R.A.M.C., retired. **Joan.** On December 11, 1953, at Wilkesborough Hospital, Ashford, Kent, Murray Parry Jones, M.R.C., I.R.C.P., Surgeon Captain, R.N., retired, of Wye, Kent, aged 81. **Kelly.** On December 20, 1953, at Harman's Cross, Swansea, Dorset, Harry Beatty Kelly, O.S.O., M.B., B.Ch., Colonel, late R.A.M.C., retired. **Stephen.** On December 12, 1953, Karin Stephen, M.R.C.S., I.R.C.P., of 1, Upper Harley Street, London, N.W., aged 64. **Welch.** On December 12, 1953, at Daleford, Hartley, Longfield, Kent, Frederick Day Welch, M.R.C.S., I.R.C.P., aged 75.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Hot Syringes and Vaccines

Q.—To what extent are vaccines damaged by being aspirated into a hot syringe? Does the vaccine cool the syringe sufficiently quickly for loss of inoculating material to be unimportant?

A.—Although some bacterial vaccines might not be damaged appreciably by brief contact with a hot syringe, the undue haste in inoculation technique implied by the question is undesirable. Moreover, a technique begun with apparent safety for a certain bacterial vaccine might lead to disaster if used for a relatively unstable product like yellow fever vaccine or for a therapeutic serum which is readily coagulable by heat. It is unnecessary to discuss the high specific heat of water or to define a "hot syringe," but a practical working rule might be that, if a syringe has cooled sufficiently to enable it to be held comfortably in the hand, it is not too hot for use.

Penicillin Lozenges

Q.—What is the place of the penicillin lozenge in therapy?

A.—Penicillin lozenges are not intended to provide an adequate concentration in the blood: they are used solely for their local effect.

The originators of this method of treatment, McGregor and Long, used a pastille with a gelatin base. In this, with its fairly high water content, penicillin was unstable, and when such a product came to be manufactured stability was ensured by giving it in the form of a dry tablet with a lactose base. This is the product which has caused soreness of the mouth, owing at least in part to the merely mechanical action of granules of the excipient. There may be other factors: prolonged use leads to overgrowth of a penicillin-resistant flora, and it is possible that the lactose itself affords a pabulum for bacterial growth. The position has changed again with the commercial production of stable gelatin pastilles and chewing gums; these are to be preferred to tablets.

Treatment of this kind is of little use unless continuous: a pastille should remain in the buccal sulcus until dissolved and then be replaced by another, this being continued throughout the day. It is indicated for Vincent's gingivitis and for mild haemolytic streptococcal throat infections. Whether other forms of sore throat will respond depends on their aetiology and the sensitivity to penicillin of the causative organism. Indiscriminate use will inevitably lead to many disappointments. The treatment is naturally less effective than penicillin given by injection, and whether this should replace local treatment or perhaps be given in addition to it is a matter for individual judgment.

Central Heating and Colds

Q.—An intelligent headmaster tells me that he always postpones the central heating in his school as long as possible, regardless of the discomfort to himself, the teaching staff, and the boys, because he finds that a really troublesome epidemic of colds always follows the first use of central heating. Is this proper hoc pro merito post hoc?

A.—The only answer that could be supported by enough facts to satisfy the intellectual integrity of the headmaster is, "We do not know." Nevertheless, it has been claimed by some, e.g., van Loghem,¹ that periods of cold weather are commonly followed by a high incidence of colds, and this may support the questioner's post hoc interpretation. I know of no adequate study in which the effect of the use

of central heating, or of its commencement in the autumn, has been related to the incidence of colds.

REFERENCE

¹ J. Hyg. (Camb.), 1928, 28, 33.

Tetanus and Sport

Q.—In games played on grass, such as football, hockey, lacrosse, etc., in which there is a risk of open wounds, is there any evidence of a raised incidence of tetanus amongst the players? Where the playing fields are used for grazing cows and horses, or if manure is spread over the ground, is there any evidence that there is an even greater risk of tetanus? Is it advisable to inoculate schoolchildren and adults who play games under these circumstances?

A.—While nothing is known of the existence of any series of figures showing a greater incidence of tetanus in those who play games on grass, it is relevant that the tetanus bacillus is more numerous in places where horses and cows have been grazed or where their manure has been thrown. Thus the risk of contracting tetanus would appear to be greater in playing fields where such manuring is done, or in back gardens, than in the streets of modern cities where there are relatively few horses. The largest number of cases of tetanus in peacetime occurs between the ages of 5 and 14 years, when children are very active and presumably more prone to slight septic wounds and whitlows. As might be expected, males develop tetanus much more often than females.

Since tetanus antitoxin cannot be administered prophylactically after every injury or scratch, active prophylaxis with tetanus toxoid is being used increasingly, particularly in the United States. Schoolchildren and adults, playing games on grass, could certainly be protected. Moreover, the use of a diphtheria-pertussis-tetanus prophylactic is worth considering for infant immunization.

Inheritance of Eye Colour

Q.—How is the colour of the eyes inherited? What are the chances that two brown-eyed parents will have a child with blue eyes, and vice versa?

A.—It used to be thought that brown versus blue eyes depended on a single gene difference, brown eyes being dominant. If this were true, brown-eyed parents could have children with brown or with blue eyes, whereas two blue-eyed parents could have only blue-eyed children. It is now known, however, that this view is oversimplified, though it may be accepted, perhaps, as a rough approximation. Probably all that can be said at present is that it would be very unusual for two blue-eyed parents to have a brown-eyed child. Some studies have, however, shown instances of this, but it is difficult at present to express an opinion as to how many may be real, how many due to faulty observation, and how many to the difficulties of classifying eye-colour.

Sunlight and Neoplastic Changes

Q.—Is there any evidence that undue exposure to sunlight predisposes to neoplastic changes?

A.—Reference to any standard textbook will give much information on the effects commonly resulting from undue exposure to sunlight, including neoplastic changes. They are seen more particularly in the white-skinned races, on exposed parts, in the elderly, outdoor workers, sailors, and in those who live in hot climates. Such changes are very commonly seen in Australia. There is great individual variation which to some extent goes with the degree of pigmentation, the fair and red-haired being more susceptible. In cattle, epithelioma may arise only on white patches of hide.

There is a rare congenital condition, xeroderma pigmentosum, where the susceptibility is so extreme that minimal exposure produces grave effects, and before puberty the patient may have developed numerous epitheliomata.

There is no convincing evidence that artificial sunlight therapy as ordinarily employed provokes such changes, even

when used intensively over the course of some years as was usual in the treatment of lupus vulgaris until recent years.

Growth and its Control

Q.—What is the driving force which causes growth?

A.—The term "driving force" is not clearly defined. Growth can be regarded as the result of the increase in size of cells and in some instances an increase in their total number. The deposition of structural material in the cell, and the processes which lead to cellular fission, are influenced by enzyme systems which in turn are influenced by genes present in the cell nucleus. The congenital absence of nuclear factors may lead to improper growth of the tissue concerned. In the more complex organisms the endocrine glands also influence growth. Hormones which affect growth include the growth hormone of the anterior pituitary gland, thyroxine or triiodothyronine from the thyroid gland, androgens from the sex glands and adrenal cortex, and adrenal-cortical hormones from the adrenal cortex. In general the adrenal-cortical hormones appear to antagonize the growth-stimulating action of pituitary growth hormone, although where adrenal insufficiency exists the administration of small doses of suitable adrenal steroids may stimulate growth. Pituitary growth hormone, as its name implies, is of particular importance in the stimulation of growth, though its mechanism of action is not known, and many physiological actions other than that of stimulating growth are ascribed to growth hormone. One view that has been put forward is that growth hormone facilitates the entry of amino-acids into the cells in order to provide for growth, but there is no certain evidence on this point. There is some evidence that insulin may exert an action similar to that of growth hormone under some conditions. Hormones which stimulate growth usually stimulate the appetite also, and the food intake and the search for food must obviously be important factors in the driving force which causes growth. But how the hormones stimulate the appetite, why the hormones which stimulate growth do not continue to do so indefinitely throughout life in higher animals, and why an organ, in the absence of a derangement of growth such as that caused by cancer, is controlled with respect to growth in relation to other organs of the body, are still matters for investigation.

Vitamin K and Dental Haemorrhage

Q.—In what conditions is vitamin K indicated as a prophylactic against dental haemorrhages? What preparation is advised, when should it be given, and in what dosage?

A.—Vitamin K is only indicated when the prothrombin activity has been diminished by liver damage, obstructive jaundice, malabsorption (in some cases), anticoagulant therapy with coumarin derivatives, and long-continued salicylate therapy. It is naturally of no value in dental haemorrhage due to other causes, such as scurvy or purpura. If there is no urgency it can be given orally as acetomenaphthone, 20 mg. daily, for two or three days before the extraction. Should there be any urgency, however, it should be given parenterally; intramuscular injection is painful, so 20 mg. of a water-soluble preparation should be given intravenously.

Disinfectants in the Lavatory Pan

Q.—To what extent is it safe to use bleaching agents and disinfectants in a lavatory pan which drains into a cess-pit?

A.—It is not clear what is meant by a "cess-pit." If this is a cesspool, a mere receptacle for the retention of sewage without any attempt at purification the admission of disinfectants or bleaching agents is of no importance.

If, however, the "cess-pit" is a septic tank, the bacterial process will be discouraged by the introduction of disinfectants, which should not be used. A bleaching agent, however, would normally be diluted by bath water, etc., to such an extent as to render its presence unimportant.

NOTES AND COMMENTS

"Stripping" for Varicose Veins.—MR. HAROLD DODD (London, W.1) writes: Your contributor's reply to the question, "What place has the operation of 'stripping' in the treatment of varicose veins?" damns the method by faint praise ("Any Questions?" December 12, 1953, p. 1334). Actually this procedure, preceded by an efficient sapheno-femoral or sapheno-popliteal ligation, is the operation of choice for varicose veins. We are indebted to Myer for an efficient stripper. I started stripping the saphenous trunks in 1951, and since January 1, 1953, have used it exclusively on 170 legs. Before this, I did a five year series of over 700 operations for varicose veins, which consisted in "top" ties followed by internal abrasion and fractional sclerosing injections of the saphenous trunk. This gave over a 90% "cure" or "much improved" rate in patients followed-up for over two to five years. The stripping procedure promises equally good results without the need for so many subsequent sclerosing injections. For instance, in my out-patients, before using stripping, it was usual to give 25-30 sclerosing injections per session; it is now down to four to six, during which time 30-40 patients with varicose veins will be seen. As your contributor says, the method tears off the tributaries, which afterwards thrombose; there is also subcutaneous bruising and staining for a fortnight or so, but neither are of temporary or remote disadvantage; in fact the after-progress is singularly trouble-free considering that the method is a comparatively crude one. After stripping, as in all operations below the diaphragm in adults, there is the need for constant movement and early ambulation, and further, on the slightest pain in the calf, suggesting deep thrombosis, anticoagulants must be given, an elastic bandage applied, and exercises steadily maintained, sedatives being administered to enable patients to do so. In the hands of those interested in varicose veins, stripping is now established and it has placed in the hands of general surgeons an effective remedy for varicosis which when done with the same care that is usual for a hernia is as free from risk and as effective. I think that shortly stripping of varicose veins will appear on the operating lists of general surgeons with the same regularity that a radical cure of a hernia or appendicectomy does, and that out-patient operations for varicose veins will be shortly abandoned and given the same sort of disapproval as is now given to out-patient tonsillectomies, although it is only ten years or so since they were fairly general practice.

OUR EXPERT replies: The questioner asked what place the operation of "stripping" had in the treatment of varicose veins, and the first sentence of the reply was as follows: "It is difficult to say exactly what place the operation of 'stripping' has in the treatment of varicose veins, but it is certain that at the present time this type of operation is carried out by only few surgeons." This surely represents a cautious attitude of mind towards the reintroduction of a technique which had once been abandoned. Many of the objections to this blind type of surgery, which tears across veins, including deep communicating ones, must remain, and Mr. Dodd's experience of the method is still fairly recent. One pertinent question that must be asked is, how often does deep thrombosis actually occur with the present method of stripping? In any case the variety of clinical pictures presented by varicose veins makes it unlikely that any one type of operation or procedure will meet all requirements. It is certainly premature to suggest that the stripping operation can be compared with the radical cure of a hernia or with an appendicectomy.

"Any Questions?" Book. The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 23 1954

PROBLEMS OF MALARIA CONTROL IN TROPICAL AFRICA

BY

LEONARD J. BRUCE-CHWATT, O.B.E., M.D., M.P.H., D.T.M.&H.

(Malaria Service, Medical Department, Nigeria, British West Africa)

Three years ago the introductory sentence of an excellent world-wide review of modern methods of malaria control read as follows: "Into Africa—perhaps the most malaria-ridden of all continents—modern methods of control by residual insecticides were introduced at a late date and on a small scale" (Pampana, 1951). It will be only fair to admit that during the past few years there has been no radical improvement of the situation in tropical Africa. Although there are to-day many signs of forthcoming changes, it might be of value to outline the main reasons for the hitherto slow progress of malaria control in Africa south of the Sahara.

Two years ago one of our greatest living malariologists, at the end of his extensive journey through East and Central Africa, said: "There is nothing mysterious about African malaria; it is only the size of the problem that is different." This is true, but the quantitative difference is so great that it imparts to African malaria several exceptional characteristics.

The speed with which we can reach the objective of achieving and maintaining better standards of public health depends in the first place on the knowledge of the causes and conditions that favour the spread of communicable diseases. Secondly, there must be the will, the means, and the favourable environment to apply the existing knowledge in order to promote health.

We know that malaria can be eliminated either by attacking the parasite or by dealing with the insect vector. A nearly perfect degree of malaria control can be achieved by chemotherapy and chemoprophylaxis in organized communities or under supervision. A similar degree of malaria control in ordinary communities in tropical areas has never been attained, mainly because of practical difficulties in regular drug administration. It seems, however, that the new anti-malarials (chloroquine, pyrimethamine) may open new possibilities of chemotherapeutic control of malaria. An interesting example of this new trend is the mass-administration in Brazil (Pinotti, 1953) of chloroquine incorporated into common salt distributed by a government agency. Nevertheless, the general consensus of opinion is still overwhelmingly in favour of malaria control by attacking the anopheline vector, preferably by the use of residual insecticides.

The following factors are of importance in considering malaria control by residual insecticides in tropical Africa: (1) Knowledge of the amount and distribution of malaria and of the importance of this disease from the point of view of public health; (2) knowledge of the

natural history of the disease, particularly with reference to its insect vector; (3) technical knowledge of the action and methods of application of residual insecticides, particularly in rural areas; (4) economic possibility of carrying out a large-scale malaria control on a long-term basis, first as a special project, but as soon as possible within a framework of general health services of the country; and (5) sociological background for malaria control and its possible future implications. An analysis of each of these factors, with reference to tropical Africa generally but on a basis of personal experience mainly in West Africa, gives the following results.

1. Malaria in Tropical Africa

Our knowledge of the amount and distribution of malaria in tropical Africa is still woefully inadequate. The blame for the lack of general information on morbidity and mortality due to malaria is often ascribed to medical administrators, but the conditions in tropical Africa are particularly difficult. With an average of one qualified medical practitioner to 90,000 inhabitants and one hospital bed to 3,000 inhabitants, only a small proportion of the African population has the benefit of medical attention. But even when the medical officer is available the malaria morbidity records are far from adequate, since the diagnosis of this disease in Africa leaves a wide margin for personal interpretation of clinical symptoms and of laboratory data.

Some striking differences between two successive annual rates of malaria in the same locality could be traced to a change of medical officers who had different ideas on the diagnosis of this disease.

It is only recently that investigations carried out in Nigeria estimated that the age-specific malaria mortality figures expressed per 1,000 Africans exposed to risk were as high as 12.5 in infants, 7 in small children, and much lower (about 0.5) in older children, adolescents, and adults. If these malaria mortalities hold good for the rest of tropical Africa, with its 150 million inhabitants, it means that in this part of the world at least 175,000 children below the age of 15 die every year from the direct effects of the disease. The amount of morbidity due to malaria is so imperfectly known that even an approximate estimate of it would be merely a guess. In the absence of reliable biostatistical records the classical malariometrical indices provide a guide, but some of these indices, based mainly on experience in other parts of the world (India), can be misleading if applied uncritically to African conditions, and might have to be amended.

Any comprehensive malaria-control project must therefore be provided with a yardstick by means of which the efficacy of adopted methods can be assessed. Since clinical morbidity statistics are not available and biostatistical records cannot be compared with previous data, which do not exist,

the only thing that remains is a constant and critical checking of malariometrical indices by an ancillary survey organization initially forming a part of the control project and later remaining as a permanent feature of a mobile field unit dealing with rural public health. Wherever impressions are substituted for facts they are usually favourably biased in projects which are expensive and regarding which there is an understandable and perhaps subconscious desire to show good results for expended money.

The results reported from Mauritius (Dowling, 1953) have shown that moderately endemic malaria can be eliminated within a relatively short time by a residual spraying campaign. Similar though not so convincing results were reported from other African areas with epidemic or hyper-endemic malaria. The results of the Ilaro scheme in Nigeria are interesting. There, a continuous though not quite complete control of two main vectors within a small holo-endemic area changed in three years the picture of the local malaria to a surprising degree. If such results can be achieved in a small area, supersaturated with malaria, surrounded by a dense tropical forest, with a long period of transmission, then there is little doubt that equally good or better results could be expected from larger and more sustained projects (Bruce-Chwatt *et al.*, 1953).

The imperfect knowledge of the true parasite-host relationship in African malaria is the root of the controversial problem whether it is advisable to control malaria in holo-endemic and hyperendemic areas where the community has achieved a high degree of tolerance to the parasite at a cost of considerable mortality of its youngest members. We still do not know what part the acquired defence mechanism plays in the group tolerance to superinfection and how far it must be considered in conditions when eradication of the vector species without a chance of reimportation or a permanent malaria control over a wide area cannot be guaranteed (Macgrath, 1950).

Are we justified in concentrating on localized malaria control for the benefit of those continuously protected but who run a risk of their reinfections becoming more serious should they become accidentally exposed to it? Would it be wise to embark lightly in holoendemic areas of tropical Africa upon unrestricted measures of malaria control? What would happen if the control over a large area broke down because of a financial slump, difficulty in obtaining supplies of insecticide, or political unrest? Would the vector sweep the country and cause outbreaks of malaria, with a high fatality rate in the younger generations (Wilson, Garnham, and Swellengrebel, 1950)?

Our present state of knowledge is still inadequate to answer those haunting questions. It must be realized, however, that the possibilities of detrimental effects of incomplete malaria control are somewhat theoretical, and not confirmed by any reliable observations. The problem will not be decided until we have more basic data to work upon instead of arguments often derived from the personal philosophy of their proponents.

Whatever the future solution, it seems to-day that as a result of recommendations of the Kampala Conference (W.H.O., 1951) there is throughout tropical Africa a welcome and growing awareness of the need for pilot malaria control, whatever the original degree of endemicity.

2. The Anopheline Vectors of Malaria in Tropical Africa

Of the 30 species and varieties of Ethiopian anophelini only 11 can be regarded as vectors of human malaria. Seven of these (*A. brunnipes*, *A. hancocki*, *A. hargreavesi*, *A. moucheti*, *A. nili*, *A. pharoensis*, *A. rufipes*) are of some local importance in areas where and when the main vectors are rare. The part played by the secondary vectors is, however, insignificant in comparison with the continent-wide amount of transmission of malaria by *A. funestus* and *A. gambiae* (including *A. gambiae melas*). There is little doubt, therefore, that with some local exceptions the con-

trol of malaria by residual insecticides must be concentrated on the two main vectors, which are both characterized (though not to the same degree) by their wide distribution, predominantly house-haunting (endophilic) and man-biting (anthropophilic) habits, and high infective potential. All these factors comprise what Gabaldon (1953) calls the "vectorial power."

A. funestus has always been regarded as essentially endophilic and anthropophilic with a relatively stable breeding potential and fixed habits. It was therefore anticipated that residual insecticides would be highly successful in the control of this mosquito. The results did not deceive the expectations. Reports available from Madagascar, from Mauritius, from the Belgian Congo, and from Nigeria are particularly striking in their similarity. Whatever residual insecticide was used the density of *A. funestus* in these areas decreased with a spectacular speed and bordered on eradication, with a concomitant decrease of malaria transmission. These results would not have been achieved if the species concerned could either change its habits or produce any number of bionomically varying strains.

In contradistinction to the experience with *A. funestus*, the results recorded with *A. gambiae* in similar malaria-control schemes in tropical Africa varied most unpredictably. Methods that eliminated *A. funestus* from Mauritius and Madagascar have not succeeded in doing so to *A. gambiae* in these two islands, though the species concerned was reduced to small numbers and has apparently ceased to invade the human habitations and to transmit malaria. In a small-scale experimental scheme in Nigeria the density of *A. gambiae* decreased very greatly, but a certain amount of malaria transmission was still occurring. In the Belgian Congo, Ruanda-Urundi, and Southern Rhodesia the density of this mosquito decreased so much that the transmission was cut down to a very low level, but there was no evidence of the change of habits of the species. In Freetown the use of residual insecticides to improve still further the good results of a larvicidal scheme reduced *A. gambiae* density to extremely low levels but did not eliminate it entirely. On the other hand, in an experimental area in East Africa (Kasanje) and in Swaziland there was relatively little difference between the results of surveys carried out before and after the application of residual insecticides for over two years. In Transvaal, in a sparsely inhabited large rural area, a well-organized control by residual insecticides was very effective for six years, during which the rainfall was not unduly heavy, but one exceptionally rainy year proved the imagocidal control to be insufficient and led to a considerable influx of *A. gambiae*, which had to be dealt with by additional larvicidal measures (Annecke, 1953).

The inconsistency of results reported from various parts of tropical Africa cannot be fully explained by the differences in the size of the area, climatic conditions, type of the insecticide, method of its application, etc. It seems that at least some of the divergencies are due to our ignorance of the bionomics of *A. gambiae*, and particularly of the subtle interplay between the habits of this mosquito, its longevity, and macroclimatic and microclimatic conditions of the environment.

Habits of *A. gambiae*

A. gambiae was known to be the most man-linked malaria vector in tropical Africa, and yet it has been shown that it can be found in great numbers in dense, uninhabited forests of East and West Africa, that it might feed in nature on various animals as well as on man, that it can be induced to do so in a laboratory colony, that it might feed indoors and out of doors, that it can use for a shelter not only human or animal dwellings but also natural haunts, and that its infectivity may vary greatly from season to season in one area or from one area to another during the same season.

It might be that *A. gambiae* is either a species with a most remarkable plasticity which undermines the present concept of physiological races or perhaps it is really a

species complex with at least two cryptic subspecies (Holstein, 1952) and many varieties with bionomical differences, particularly with regard to their preferential feeding habits. These differences, however, will have an epidemiological significance only when confirmed by similar differences of the infectivity of the subspecies concerned.

The apparent differences in feeding habits of *A. gambiae* might, on the other hand, be explained in a simpler way, as suggested by Muirhead-Thomson (1951). It has been shown that in this species some of the females may rest in houses after the blood-meal, while a proportion will leave the house at this stage and rest out of doors. The less suitable the feeding site as a daytime resting place the higher the number of mosquitoes which will leave after feeding. While many human dwellings provide suitable daytime shelters, many domestic animals are kept in exposed structures, so that mosquitoes feeding there at night seek daytime shelters elsewhere. Thus precipitin tests on the blood found in the stomachs of anopheles collected out of doors will reveal a high proportion of animal bloods, even though the bulk of the mosquito population feeds preferentially on man.

All these obvious gaps in our knowledge of the habits of the main malaria vector in Africa prevent the rational and systematic application of available techniques of control by residual insecticides. This knowledge might be ultimately more important for the future of malaria control than many data on the physical and chemical properties of insecticides.

3. Residual Insecticides in Tropical Africa

In spite of the fact that large-scale use of D.D.T. for malaria control dates from 1944, our present knowledge of technical problems associated with the choice of the residual insecticide, its adequate dosage, best formulation, duration of adequate toxicity to mosquitoes, and any danger to man and his animals is in a state of flux which makes any large-scale planning of malaria control rather difficult.

It is a matter of regret that the published reports of laboratory and field investigations show a disconcerting lack of agreement on the significance of their results. This indicates perhaps the importance of some unknown or insufficiently corrected variables in their design.

The often-neglected practical aspect of any malaria control scheme—namely, the consideration of the ratio of the size of the mosquito-breeding area to the size of the toxic area (represented by the total surface of sprayed walls and ceilings)—has led to some disappointments. In one case at least (in the Gambia) this was recognized at an early date and recommendations were made accordingly, substituting a plan for swamp drainage in preference to a residual control of a small area by insecticides.

It seems that in some parts of Africa too much reliance has been placed on the possibilities opened up by the residual insecticides. This has led to their uncritical or perhaps inexperienced use, and was often accompanied by a neglect of simple laws of environmental sanitation or by a rejection of the time-honoured, cheap, and logical methods of prevention of mosquito-breeding.

The results obtained in Ilaro (Nigeria) have shown clearly that the success of a malaria-control scheme by residual insecticides depends in Africa, as elsewhere (Gabaldon, 1953), on the size of the controlled area. It is possible to decrease but not to eliminate the malaria transmission from a relatively small area surrounded by a vast uncontrolled territory. Two factors will constantly upset the results: the influx of infected mosquitoes from the outside and the usually underestimated mobility of the indigenous population, liable to acquire new infections when leaving temporarily the narrow limits of the controlled area.

The discovery of the irritant effect of D.D.T., the knowledge of the relationship between its particle size and the toxicity to mosquitoes, the crystallization effect from oil solutions, the absorptive and chemical effect of some mud

surfaces, the fumigant and particulate effect, the importance of suspensibility of water-dispersible powders, the nature and proportion of the diluent, the effect of tropical storage, and many technical aspects of the spraying routine such as blockage and erosion of nozzles, uniformity of coverage, ratio of absorbent to non-absorbent components of the wall surface, etc., all these slowly emerging factors have not ceased to emphasize the fact that residual spraying needs a careful planning, thorough execution, and constant supervision—postulates not easy to follow in tropical Africa with its chronic shortage of trained personnel.

Reports on some large malaria-control schemes in Africa were somehow conflicting. D.D.T. was claimed to have been very successful in the Belgian Congo, Ruanda-Urundi, Transvaal, Mauritius, and Reunion, less satisfactory in Swaziland, and disappointing in Uganda (Kasanje).

The arrival of B.H.C., with its high initial toxicity at very low dosage, its relative lack of irritant effects on the mosquito, the absence of the factor of critical particle size, and, last but not least, its low cost, aroused great hopes and seemed to point to it as the ideal insecticide for malaria control in tropical Africa. In most of the schemes in which B.H.C. was used (particularly in Southern Rhodesia, according to Alves and Blair (1953), and partly in Nigeria) it gave good results, but it was found unsuitable in Mauritius.

During the last two years evidence began to accumulate that, applied at the initially advocated low dosage of 0.11 g. gamma isomer per m.² B.H.C. has a satisfactory residual effect shorter than the expected three months, and there is now in tropical Africa a growing tendency to use much higher doses, up to 0.4 g. gamma isomer per m.² (Alves and Blair, 1953) to prolong the duration of the residual action.

"Dieldrin"—the latest arrival on the field of residual insecticides—is extremely promising because of its high initial and long residual toxicity to mosquitoes even at a very low dosage, because of its effect on culicines as well as on anopheles, and because of the economy in its use. Its higher toxicity to man and his animals might be less important than expected, and does not prevent its use on a large scale, as shown in Venezuela. It is possible that dieldrin will prove to be the most suitable insecticide for tropical Africa.

Long Residual Action

The object of malaria control by residual insecticides is to create artificial conditions in which the reproduction rate of malaria is consistently kept below 1.0 (Macdonald, 1952). In rural areas of tropical Africa the density of *A. gambiae* is often so high that even when the man-biting index is below the conventional figure of 0.5 the reproduction rate of the disease cannot be maintained at its target figure below 1.0 unless the persistent anopheles mortality is at least 70% (Macdonald and Davidson, 1953). Thus for the purpose of malaria control in these areas a steady level of toxicity of sprayed indoor surfaces is more important than a short high initial kill. An insecticide combining a small effective dosage with a long residual action is particularly necessary in rural tropical Africa with its low population density, shortage of trained labour, and poor communications.

The advantages of an insecticide with a long residual action lies not only in its saving of costs of labour and transport. Problems of malaria control in underdeveloped areas have their ethnological and sociological implications, which must not be forgotten. In the almost mediaeval, closed, Moslem societies of West and Central Africa, with their strict customs, seclusion of women, and distrust of strangers, any invasion of the privacy of the compound is resented and will be tolerated only when absolutely necessary. Here again if we want to preserve the good will and gain the co-operation of the local people the residual spraying must be restricted to one or at most two cycles per annum.

Resistance of mosquitoes to insecticides, reported from other parts of the world, has not been recorded from tropical Africa, where attempts at control by contact insecticides have been few. Nevertheless, the possibility of its happening must not be overlooked, and it can safely be predicted that should it ever happen it would concern *A. gambiae*. The use of a highly toxic insecticide with a long residual action is less likely to produce any resistant strains.

4. Economic Aspects of Malaria Control in Tropical Africa

The problem of costs of malaria control is the leitmotiv of many conflicts not only between the public health officer and the administrator, but also between the malariologist and the public health officer. And it is the economic possibility of malaria control within the general framework of medical and health services that presents one of the challenging dilemmas in Africa. In some malaria-control projects carried out in tropical Africa the assessment of costs is often made very casually if reported at all, and the lack of standards for uniform appraisal of costs in widely varying conditions makes any comparisons between them very difficult, to say the least. The new W.H.O. proposals for standard assessment of costs of malaria control will improve the situation considerably.

Calculating the cost of malaria control by residual insecticides from some African projects, and expressing it in a convenient consolidated figure per head of the protected population per annum, we arrive at figures varying between 1s. 6d. (25 U.S.A. cents) and 5s. (70 U.S.A. cents), with a median cost of 3s. (42 U.S.A. cents).

It is interesting to note how the proportion of separate items of the cost of malaria control varies according to the type of the area, type of the insecticide used, number of spraying cycles, labour wages, and transport problems. Averaging the differences and oversimplifying the overall picture, one can say that in a large-scale project in rural African areas the cost of the insecticide constitutes about 30-50% of the total expenditure, the cost of labour and supervision between 25 and 40%, the cost of transport between 10 and 40%, and the cost of spraying apparatus and contingencies between 2 and 5%.

The cost of labour and transport is an important item in any large-scale malaria-control scheme in Africa, and this more than anything else will irresistibly increase the demand for an insecticide with a long residual action. It is in this field particularly that the competition between the relatively cheap B.H.C. and the relatively expensive dieldrin will become acute.

It was of interest to calculate the costs per head per annum of a pilot malaria-control project in Northern Nigeria and assess them separately for three main insecticides (D.D.T., B.H.C., and dieldrin) at generally accepted dosages and spraying cycles.*

Relative Costs

This calculation shows that, taking into account only the insecticide, labour, and supervision, the cost of a D.D.T. project amounts to 3s. per head per annum, the cost of a B.H.C. project to 2s. 3d., and the cost of a dieldrin project to 2s. 4d. (42, 32, and 33 U.S.A. cents respectively). If we add, however, the costs of transport over a large area with primitive roads and the high cost of fuel, lubricants, and repairs, then the differences between the above figures become even more pronounced, and are: 3s. 3d. for D.D.T., 2s. 9d. for B.H.C., and 2s. 7d. for dieldrin (46, 39, and 37 U.S.A. cents respectively).

The above costs of residual spraying of rural areas of tropical Africa are calculated at frequencies of spraying as

*D.D.T. at 2 g. para-para per m.² twice per annum. B.H.C. at 0.15 g. gamma isomer per m.² four times per annum. Dieldrin at 0.25 g. per m.² twice per annum. All as water-dispersible powders, of 50% concentration for D.D.T. and dieldrin, and of 6.5% concentration of B.H.C.

adopted by the Kampala Conference (1951). It is possible or even probable that in parts of tropical Africa, where climatic conditions are sharply seasonal and the malaria transmission period short, a reduction by half of the frequency of spraying might be adequate to intercept the infection.

In that case the total cost of malaria control by residual insecticides might decrease to something between 1s. 4d. and 1s. 9d. a head per annum, equivalent to 21-25 U.S.A. cents. This is the lowest possible cost of adequate malaria control in semi-rural or rural areas of tropical Africa, in the present circumstances, and with the barest amount of supervision.

The sum of 1s. 4d. to 1s. 9d. (21-25 U.S.A. cents), readily acceptable in many parts of the world and perhaps also in some more developed parts of Africa, is, however, seen in a different perspective when one recalls that over most of tropical Africa the total expenditure on all medical and health services amounts to something between 1s. 6d. and 3s. (21-42 U.S.A. cents) a head per annum.

It is here that the malariologist comes to an argument with the medical administrator and the medical officer of health. How can we hope to extend malaria control over wide rural African areas if our lowest estimates of costs represent in the best case 50%, and in the worst case 120% of the total medical and health budget per head?

Administrative Point of View

We know that in the African tropics malaria is an insidious, ever-present enemy, killing infants and young children, sapping the energy and strength of the people, interfering with education, decreasing the labour output, and preventing or slowing down the economic development. And yet, because of the absence of epidemic malaria, this steady wastage of life and human assets is not dramatic. The medical administrator who has to balance his financial estimates between general hospital care, sanitation, malnutrition, and such spectacular social diseases as leprosy, sleeping sickness, yaws, tuberculosis, smallpox, schistosomiasis, yellow fever, and so on, has often little patience with our, to him, one-sided and expensive argument.

From another point of view malaria-control schemes find little favour with the administrative authorities. Unlike a vaccination campaign or the checking of an outbreak of cerebrospinal meningitis, a malaria-control project is a long commitment without a prospect of rapid and dramatic result even if it is successful. In the latter case, as pointed out by Covell (1953), it is often difficult to maintain the control, because the administration is reluctant to provide further funds when malaria is no longer serious for the community.

It seems that at the present time an efficient country-wide malaria-control programme can hardly be undertaken and be integrated into the general framework of public health services in underdeveloped areas in tropical Africa. This does not mean, however, that we must wait patiently for some future changes in economic conditions. On the contrary, we must make every possible effort to start and to carry out malaria control pilot schemes in varying environmental conditions and using different methods. These projects when properly supervised, assessed, and reported will produce series of basic data which, when interchanged between different African territories, will bring us much closer to the ultimate solution of the problem of expanding malaria control as efficiently and as economically as possible, and of fitting it permanently into the standard public health activities in tropical Africa.

The need for such projects is vital, and the fact that no fewer than five of them (in Liberia, French West and Equatorial Africa, British East and West Africa) are already in their early stage and that they have the active co-operation and help of such powerful bodies as W.H.O. and Unicef is a good augury for the future.

5. Sociological Environment in Tropical Africa

The problem of uncontrollable population pressure is often quoted as an argument against the "premature promotion of malaria control in tropical Africa." The example of the Far East has shown that large-scale public health programmes improve human welfare in an immediate sense, but may defeat their own aim by leading to a rapid growth of population, which more than offsets the benefits that might otherwise have been enjoyed by a steady improvement in economic conditions. How does this situation, so well studied in the Far East and giving rise to so much concern, apply to tropical Africa, with its inherently high reproductive potential?

The population of tropical Africa—estimated in 1935-6 at 96 million (Hailey, 1938)—is estimated to-day at about 150 millions, with an average density of 17 per square mile. Such average figures are apt to be misleading, however, since we must exclude from the calculation the land not suited for human occupation. Variations in the average population density of tropical Africa will become apparent when it is realized that area densities of the population are from 1 per square mile in Bechuanaland, through 5 in the Sudan and Northern Rhodesia, 12 in Belgian Congo, 40 in Uganda, Nyasaland, and the Gold Coast, 67 in Sierra Leone and Nigeria, to over 150 per square mile in South-eastern Nigeria and in Ruanda-Urundi. This uneven distribution of the population is due to an uneven distribution of land suitable for continuous human occupation.

The population of tropical Africa, stationary or perhaps even declining during the eighteenth and nineteenth centuries, because of epidemics, wars, and the infamy of the slave trade, is now increasing at a rate on which the demographers cannot quite agree. Notenstein (1949) estimates that the most probable annual rate of the present population increase in tropical Africa is about 1.5%, and that this rate of growth will continue until 1970. Thus within the span of a man's life tropical Africa will double its population if the present rate of growth is maintained.

This may not be entirely due to the imperfect and, until now, only half-hearted methods of improving the health of the population, but it would be reasonable to assume that these methods have contributed a great deal and that they are gathering momentum. The increase of population in Africa is mainly due to an increased rate of survival.

Farming and Population Problems

The greatest part of tropical Africa is favourable to pastoral rather than to agricultural economy, but an enormous proportion of the potential cattle country is infested by the tsetse fly, which makes cattle rearing impossible. Most of the arable land not already in use is marginal and needs a great amount of work, fertilizers, and agricultural pesticides to give reasonable returns. Those who think that modern methods of mechanized agriculture will help in developing marginal lands forget that in Africa much of the unused land is very short of water.

There are possibilities of temporary nature such as improvement of present farming methods by mixed farming and fertilizing with animal manure. Unfortunately such advances have been in many instances offset by deforestation and by the general worsening of soil erosion. A more balanced approach could be achieved only by collective scientific farming instead of the primitive and wasteful small-farming methods. But this needs a heavy capital outlay, skilled technique, and, above all, a revolutionary change of old social traditions of land tenure. This change must be voluntary, since any coercive methods are out of the question from the point of view of the present administrative policy.

There is no agreement among the demographers and social scientists about the actual existence of the problem of

population pressure over tropical Africa. Macmillan (1949) goes so far as saying that "the population of Africa as a whole is positively inadequate. Many hands are needed even to clear the minimum of land at present under cultivation and then to keep it effectively occupied. The people are really all too few." On the other hand, most experienced colonial administrators agree that there is undoubtedly serious overcrowding in many areas and land hunger with all its attendant evils.

At the present time the problem of overpopulation of tropical Africa as a whole is not yet acute, and there is still some margin of safety. But this margin is narrowing every year, more slowly in some parts, faster in other parts, and the stage is set for future problems as difficult as those that mankind is facing now in Asia, if not more so. It is unlikely that in its present stage of economic development tropical Africa could withstand any considerable population pressure.

That successful malaria-control projects in Africa may have similar effects on the demographic curve as they have had in India, Ceylon, and British Guiana can be seen from the example of Mauritius and Madagascar, where the infant mortality has decreased spectacularly within the last few years. Small wonder that some people view our efforts with concern and refer to us as "sorcerer's apprentices," unable to control the primaevial forces that we might unleash. A rapid improvement of economic conditions is therefore necessary to provide for the growing population and to create all the essentials important for the well-being of modern States.

But the standard of health and education both influences and is influenced by the economic status. African standards of health and education cannot rise unless more wealth can be produced to provide for them; on the other hand, higher standards of health and education are equally necessary to increase economic production, since ill-health and ignorance are powerful factors in keeping people poor. Poor health conditions and backwardness are the main barriers to an economic development based on the increased food production per head so as to support the growing population with greater efficiency (Batten, 1949). It is my deep conviction that better health and better education are basic conditions for greater receptivity of modern trends in improvement of the economic environment in tropical Africa.

It is true, as Davey (1950) points out, that in countries of the Western Hemisphere diseases were not originally controlled as a result of a sudden medical intervention but by a steady improvement in standards of living, by a process compared to a biological growth, the speed of which depended on the technological level, and above all on the general education and active co-operation of the population. To-day we are trying to reverse this process—a method which has not yet been tested by long-term results, and which, although imposed from without, is generally followed by spectacular immediate successes in bringing down the high morbidity and mortality of underdeveloped areas.

It is clear that an attempt to solve the immensely complicated problem of overpopulation should be made not only in those countries where it already exists but also in those where it is looming in the distance, since in the latter case it may be easier to introduce the stabilizing processes. These stabilizing processes are a balanced and simultaneous development along educational, economic, medical, and social lines, with special attention to raising the status of women, and to a gradual stabilization of the population by birth control. Problems related to voluntary limitation of the size of the family are notoriously difficult to put into practice because of the religious and moral principles involved. But "the social ethic, like the law, is mutable . . . and will have to be adjusted to the circumstances of a world in which the major quest is for social amelioration" (Crew, 1953).

The difficult problem of population growth will never be solved by neglecting public health. And withholding

the resources of modern public health methods, of which malaria control is one of the most brilliant achievements, will certainly not create an environment suitable for a balanced development. As Russell (1952) says: "Pooled intelligence is required, not passive dependence on those capricious forces of nature which indiscriminately sacrifice human lives and cultural institutions."

Discussion

This is the background against which the medical and health policies in tropical Africa should be framed and must be judged. The health situation needs attacking from many angles: prevention of disease, treatment, health education, nutrition, and control of population increase. The difficult point is to decide on the order of priority of these goals, not only in relation to their respective importance but also with regard to the economic possibilities of rural areas which are providers of food and foci of disease.

Seeing that the rapidity of results achieved by modern public health measures and particularly by the control of insect-borne diseases always outstrips other aspects of harmonious socio-economic development, the administrator, the social scientist, and the agricultural officer would like us to keep pace with them, to adjust our methods to their stride, and to take part in a "co-ordinated" programme of development. But experience has already shown that the speed of such a co-ordinated programme will have to be adjusted to the speed of its lowest component. Can we slow down for the sake of keeping in line? Have we any choice?

It seems that, even had we desired it, we cannot impede the march of events for the sake of theoretical considerations: primarily because we have been taught by experience that even for a co-ordinated programme it is a better policy to emphasize at first one or two fields—either health or education, or both. Later, when the first field is established, the comprehensive programme can be developed, and will be speeded up by the example and success of one part of it.

We often hear the argument that a single-purpose project is bound to fail, and examples of such failures are often quoted. But the truth is that nearly all of these failures are due to careless planning. It will be pertinent to outline here the five points of sound planning of any programme of technical aid in underdeveloped areas quoted after Marshall Balfour (1952).

1. Objectives of the plan must be clear and definite, and they should have prospects of realization.
2. The personnel needed for it must be competent, qualified, and, above all, available.
3. The environment of the plan must be favourable for its realization. In other words, a need for the plan must be either felt by the population concerned or it must be created.
4. Sufficient time must be allowed for the job and there must not be too much pressure for immediate results.
5. There must be adequate funds to carry out the plan, remembering that long-term projects have considerable financial implications.

The other reason why we cannot possibly slow down the progress of modern public health to keep it in line with the gradual development of all spheres of social and economic activity is the demand for faster improvement of health standards in tropical Africa. This demand comes primarily from the growing national political movement, which desires the African (and quite rightly so) to have his share in the progress of mankind.

Intelligent nationalism can be a strong unifying factor wherever the people are not unified on the basis of common culture. There is no doubt that the days of crude colonialism have gone, and the new national political trends are most obvious in British West Africa, where the idea of trusteeship has originated and where no attempt has been made to suppress the indigenous culture or to model it according to some pattern. However, there are forms of extreme

and destructive nationalism which create a distrust and antagonism towards all things that are foreign, and which will jeopardize any honest attempt to help the underdeveloped areas. To prevent these extreme forms of nationalism, and to create the collective African effort which will be the basis for social and economic development, we must have genuine African leaders on our side. And so we come back in a circle to politics again in its widest application.

As Huxley (1948) says: "There is no problem in tropical Africa that it not part of some other problem. All are intertwined; nothing can be treated in isolation." How, then, to provide adequate medical care and how to control the numerous prevalent communicable diseases over a huge area inhabited by a large and varied African population, the majority of whom are at a low stage of social and economic level, live under unsanitary environmental conditions, suffer from malnutrition, have a very high infant mortality rate, and yet continually increase in numbers? How to make the necessary progress when this population is as yet unable to contribute substantially toward the financing and staffing of a tolerably adequate medical service and has to rely almost entirely on help from the outside? How to extend the social services in spite of the acute shortage of trained staff, and how to minimize the time lag between rapidly growing needs of the people and much slower economic development, hampered at times by the social confusion and political tensions of a culture in an acutely transitional stage? A tall order, indeed!

For centuries the rhythm of Africa remained unchanged. In the enormous, brooding, hot silence of this cruel and beautiful continent, man's activities were moulded by the environment. But, to-day, Africa is different. It is a continent in spasmodic transition, in ominous ferment, launched on an irreversible social revolution, and it would be unthinkable and dangerous to try to withhold from it any fruit of human progress.

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CLINICAL AND CHEMICAL STUDIES IN HUMAN LACTATION

BY

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I. COLLECTION OF MILK SAMPLES

The greatest single difficulty in the study of human lactation has always been the collection of milk, and if the study is to be of practical physiological significance the milk collected for analysis must be at least all that the infant would have taken by suckling both in quantity and in composition. Further—and this will be demonstrated in later papers—a true estimate of the quality of lactation at any stage must be based on an analysis of milk representing the whole of every feeding for 24 hours.

To satisfy these conditions the infant must be replaced at each feeding by some mechanism which will remove milk without disturbing the course of lactation. It can probably never be known to what extent this is possible, because the suckling of a baby has, for the mother, emotional overtones beyond the mere local stimulation of the nipple and areola; and the mechanical replacement of this local stimulus, however ingenious, cannot hope to be an entirely effective substitute for the baby.

The shortcomings of artificial milking methods have been controlled in the past, so far as may be, firstly, by the use of methods which are reputed to be effective and to cause little or no discomfort; and, secondly, by the choice of subjects who are interested and willing to take part in the study. The advantages of having co-operative subjects are obvious, but restriction of a study to volunteers tends to select those with higher milk yields, as, for example, those donating a surplus to a milk bank.

Methods of Milk Expression

Most authors in the past have found hand expression more satisfactory than the mechanical pump, and one such manual method, used by Macy in her extensive studies, is described in detail by Davies (1945). It was used in the study by Roderick *et al.* (1946a, 1946b), and a progressive rise in milk yield during five-day sampling periods found by these authors has been illustrated by Morrison (1952). The level of milk production prior to the sampling periods is not shown, so there is no evidence that the method of sampling revealed the true yield. Morrison interprets the rise as a return towards normality from an initial depression. Deem (1931), who described a similar method, found that an infant put to one breast obtained more milk from it than could be obtained from the other breast by manual expression, but no cross-over experiments were made to eliminate the possibility of unequal breast capacity. She also found manual expression to be unsatisfactory when applied to the "large flat muscular type of breast," and excluded such cases from her study.

Personal experience in the use of both manual expression and the standard types of mechanical breast pumps has shown them to have many drawbacks. Both are uncomfortable, and the pumps often cause oedema and cracking of the nipple. Although skilled manual expression can probably empty a breast, it is time-consuming, and the use of a single operator to maintain a standardized technique throughout a 24-hour period is impracticable. The mechanical pumps are, on the whole, less effective than manual expression in emptying the breast.

*Described in the *British Medical Journal*, 1951, 2, 234.

The most recent work in man and animals stresses the importance of the milk ejection reflex in assisting milk removal, and it has been shown that injections of pitocin may replace or amplify the mechanism. Newton and Newton (1948), who used a mechanical breast pump, found that more milk was obtained from one breast when the other was simultaneously suckled and even more if pitocin was given first. These results do not suggest that the yield induced by pitocin is necessarily that which most closely represents the normal yield to the infant. It is also probable that the prospect of five intramuscular injections in one day will upset many subjects and thus have the effect of diminishing the milk yield. It would be better, therefore, to try to find a mechanical method which would imitate suckling to the extent of inducing the milk ejection reflex in the normal manner.

In the present studies, a recently devised breast pump, the "humalactor,"* has been used. This apparatus mechanically mimics the mouth action of the baby. It is much more comfortable than manual expression and seems to evoke milk ejection in each case where this has been experienced in suckling the baby. So far as can be judged, it is slightly more effective than expert hand expression in emptying a breast, since it is rarely (and only in some apprehensive subjects) that milk can be forced from the breast by hand when the humalactor has finished, whereas the humalactor can, in many cases, remove a little milk from a breast which has already been stripped by hand.

The humalactor has additional advantages. Firstly, the technique is standardized and there is no dependence on skilled operators; secondly, a great deal of time is saved for the nursing staff; and, thirdly, more patients are willing to undergo a subsequent 24-hour sampling when the initial sampling has been easy and comfortable.

Results

Data by which the two methods can be compared are presented in Tables I and II.

TABLE I.—Milk Yield

6th Day			7th Day		
Yield (ml.)	Yield (ml.)	Fat (g./100 ml.)	Yield (ml.)	Yield (ml.)	Fat (g./100 ml.)
580	695	3.40	720	575	2.95
540	435	1.70	110	105	3.50
305	158	2.85	620	355	2.90
590	370	2.50	80	102	3.45
370	330	2.60	410	130	2.80
360	425	2.50	910	1,110	2.75
350	116	3.80	700	510	2.20
570	325	1.95	270	380	4.75
500	595	3.40	410	490	3.70
170	77	4.60	360	400	3.70
550	680	2.70	380	515	3.05
350	420	2.90	510	506	2.50
160	107	2.90	530	166	1.60
410	510	2.80	410	158	2.50
90	300	2.50	630	545	2.40
210	215	2.75	300	402	3.25
390	355	2.05	340	345	3.00
570	345	4.20	870	860	2.30
230	275	2.75	670	256	3.70
620	530	1.90	390	305	3.70
540	365	3.15	410	275	3.40
1,260	1,250	3.60	440	520	2.00
450	502	2.90	500	380	3.00
520	445	3.70	390	265	1.95
400	270	2.40	580	415	2.20
450	370	2.40	620	490	2.40
650	400	3.50	410	180	2.80
100	90	5.40	310	370	2.25
160	115	4.40	100	100	2.50
210	210	4.05	340	51	3.00
470	335	3.05	240	170	2.65
330	360	2.40	400	350	2.60
500	445	3.90	400	425	2.90
230	76	3.80	580	385	2.80
430	395	3.75	450	540	2.40
570	620	2.80	230	200	2.20
470	512	2.80	390	100	3.00
330	187	4.40	530	765	2.35
530	363	2.70	880	580	2.40
620	370	3.05	340	500	3.05
500	500	2.70	660	620	2.95
270	165	2.60			
Mean:			441.3	397.6	

TABLE II.—Milk Yield (The Seventh-day Yield was by the Humalactor)

6th Day	7th Day	6th Day	7th Day
Yield (ml.)	Yield (ml.)	Yield (ml.)	Yield (ml.)
120	71	485	690
370	514	210	800
160	258	540	690
600	695	350	380
430	356	330	298
400	352	450	540
420	410	220	250
130	170	320	445
270	150	400	620
370	990	270	375
660	405	415	455
580	380	505	630
540	440	400	420
600	435	435	450
500	220	170	275
440	400	365	375
520	460	310	270
460	330	350	350
390	720	670	510
75	91	400	570
510	385	360	420
140	170	430	450
390	315	320	270
610	470	410	370
500	855	410	670
640	560	280	265
380	350	680	880
510	426	1,180	1,034
330	265	330	225
620	490	300	260
460	590	260	215
540	590	390	575
275	225	510	545
410	470	430	310
255	555	490	550
790	680	470	330
395	450	500	560
335	275	500	518
460	480	400	610
415	415	350	400
372	310	340	690
440	450	420	440
220	225		
	Mean:	419.8	445

Table I shows a series of 83 subjects in a study made in 1948-9. Milk yield on the sixth day was computed from test weighing of the infant at each feed, with the addition of any residual milk manually expressed after each feed. Milk yield on the seventh day represents the result of manual expression of the whole of every feeding by an experienced and skilful nurse.

In Table II a series of 85 subjects from a current study, the sixth-day yield is again computed from test weighings and measured strippings, but the seventh-day yield was removed entirely by the humalactor.

In neither table, therefore, are the yields on the sixth and seventh days strictly comparable, since only the seventh-day yields are measured accurately. At this stage of lactation the yield is generally increasing, although many factors affect the day-to-day output, but in two series as large as these some increase in the mean from the sixth to the seventh day would be expected, whatever individual fluctuations there might be.

In the first series the mean seventh-day yield was 379.6 ml. and the sixth-day yield 441.3 ml. The reduction of 61.7 ml. is statistically significant at the 5% level.

In the second series the seventh-day yield averaged 445 ml. and exceeded that of the sixth day, 419.8 ml., by 25.2 ml., a difference which, while not statistically significant, is nevertheless an increase, and in line with the expected trend.

It is well known that a progressive rise in fat content occurs during a feeding, so that milk from completely emptied breasts would be expected to have a higher average fat content than milk from breasts which have been only partially emptied. There is no significant difference between the fat contents of the seventh-day milk in the two series; nor is any difference found if the mean fat content of milks which have decreased from the sixth to the seventh day is compared with that of milks which show an increased yield on the seventh day.

This suggests that both methods of milking can probably empty a given breast at any time in most subjects, but that manual expression, either from its discomfort or because of its lack of natural stimulation, at the time or in anticipation, causes a decreased amount of milk to be secreted.

Summary

The collection of a complete 24-hour milk output involves more than the mere emptying of the breasts at the usual feeding-times. The mechanism for milk removal should be such that not only is all the milk taken from the breast but also normal milk production is undisturbed.

This is probably not possible in all subjects, especially the more excitable, but the use of the humalactor breast pump gives encouragingly better results than manual expression.

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II. VARIATION IN MAJOR CONSTITUENTS DURING A FEEDING

The change in milk composition during the course of a feeding has been discussed in medical writings since Bartholomeus Metlinger (1473) advised that "... the wet nurse should first milk the breast so that the watery part runs from it, and then give the child to suck." During the past 50 years there have been frequent descriptions of the variations, both in man and in animals.

Morrison (1952) has made a comprehensive review of the literature on human milk, and it would be profitless to duplicate this. He quotes few exceptions to the general finding that the fat content increases from the beginning to the end of a feeding. However, Waller (1943) and Newton (1952) found a variable pattern, and Lucignani (1934) observed that the fat increased to a maximum in ten minutes and thereafter declined slightly.

There have been comparatively few observations of the variation of the other major constituents. Novellis di Coarazze (1936) described a diminution in lactose content, followed by a later recovery, in 15 out of 20 cases, but other workers have found no significant variation. A number of investigators describe no significant change in the total nitrogen content, but Macy *et al.* (1931), who examined milk from the first and last halves of the feeding, found a small but highly significant rise. The variation of nitrogen has been studied in more detail by Waisman and Petazze (1947), who found that the casein nitrogen rose and the non-casein nitrogen (including the non-protein nitrogen) fell as the feeding progressed.

Most previous observations have been made on only two or three samples from the feeding. The usual method has been to remove a sample from the breast

by hand before the infant is fed and another by stripping the breast when it is finished. One sample, or sometimes two samples, may be removed after interrupting the infant during the course of the feeding. Macy *et al.* (1931) had the entire feeding expressed by hand, but were content to divide it into first and last halves. Thus, in the human, the pattern of change in the constituents of milk throughout a feeding has not been observed in any great detail.

Method

Collection of Samples.—In the present study a number of small samples have been taken during the emptying of a breast by the "humalactor," a machine whose efficiency has been shown in Part I of this paper. The humalactor was applied to the breast in the usual way, using, instead of a collecting-bottle, a test-tube marked to contain 12 ml. When this tube was filled it was replaced by another without stopping the machine. In this way a consecutive series of 12-ml. samples was obtained until the breast was emptied.

Methods of Analysis.—Fat was estimated by the Gerber method, lactose by a modification of the chloramine-T method of Hinton and Macara (1927), and nitrogen by a modification of the micro-Kjeldahl method described by Steel (1946) for plasma protein. Casein was precipitated by acetic acid at 40° C. (Rowland, 1938) and total protein by dialysed iron. When all these constituents were estimated it was necessary to mix adjacent samples to give the necessary volume of milk. This had the effect of halving the number of samples in these cases.

TABLE I.—Fat in g./100 ml.

Case No.	Post-partum Day	Sample Number	1	2	3	4	5	6	7	8	9	10
4	7	0.90	0.90	1.25	1.70	1.80	2.30	2.60	4.15	4.9		
5	6	1.80	1.95	2.05	3.30	3.30	3.45	4.65	5.05	5.10	5.95	
6	4	1.35	1.40	1.50	2.40	3.25	3.25	4.65	5.05	5.10	5.95	
7	7	1.15	1.20	1.25	1.95	2.45	3.45	3.95				
8	6	1.85	1.35	1.50	1.90	2.25	2.95	2.55				
9	6	1.40	1.65	1.40	1.50	2.10	2.50	2.05	3.30	3.20		
10	7	1.70	1.50	2.10	1.95	1.90	2.30	4.05	4.35	4.70		
11	6	1.80	2.20	2.20	3.10	4.00						
12	5	3.50	3.15	4.20								
13	5	3.60	3.55	4.10	6.60	7.00						
14	6	3.10	3.20	3.90	5.85							
15	5	1.20	1.45	2.15	2.25	2.25	1.90	2.90	4.10			
16	7	1.45	2.05	2.75	3.60	4.20	5.05	4.30	6.10	6.25		
17	7	3.40	3.65	4.35	5.45	7.30						
18	9a	2.95	2.55	2.30	2.95	3.55	4.85	4.80				
19	9b	3.90	3.40	3.55	5.40	6.60						
20	10a	3.90	3.70	4.55	4.80							
21	10b	5.40	5.70	5.20	5.80							
22	11	3.95	4.15	5.80	6.85	7.15						
23	14	5.30	6.25	7.20	7.40							
24	15	4.05	4.45	5.20	5.90							
25	16	2.35	3.30	4.25	5.75	5.85						
26	17	3.85	3.40	4.45	4.85	4.90	5.50	5.65				
27	18	3.35	4.55	6.00	5.95	6.30	7.30	8.90				
28	19	1.70	1.65	2.35	2.45	3.50						
29	20	2.30	3.00	5.60	6.35							
30	21	3.10	2.90	2.95	3.70							
31	22	0.90	0.55	1.25	1.95	3.70	4.25	4.45				
32	23	3.05	4.20	4.95								
33	24	2.10	2.40	3.25	4.40	5.80						
34	25	1.30	1.65	2.30	3.95	3.90						
35	26	1.65	2.10	2.70	3.25							
36	27	1.50	1.50	1.70	2.40	2.45	3.85					
37	28	1.70	1.70	2.20	2.30	2.80	2.35	2.45	1.90	2.50		
38	29	3.85	4.40	3.80	4.40	4.50	6.20	6.30				
39	30	4.90	5.30	5.75	7.95	6.60	10.15					
40	31	1.95	2.00	2.05	2.80	2.30	2.45	2.75	4.45	5.50	4.40	
41	32	3.00	3.50	3.70	4.30	4.65	4.70					
42	33	0.45	0.70	0.60	1.00	1.05	1.90	2.65	3.10	3.80	4.80*	
43	34	0.55	0.70	0.95	2.20	3.70	4.25					
44	35	5.55	6.70	8.15								
45	36	5.40	6.40	8.05								
46	37	1.15	1.60	3.00								
47	38	0.70	1.50	2.45	2.90							
48	39	2.20	4.05	5.95	10.05							
49	40	1.20	1.30	2.50	4.40	7.00						
50	41	2.00	2.10	2.40	2.90	3.40	4.80					
51	42	3.30	3.30	4.95	6.70							
52	43	2.60	3.65	4.90	6.95							

* The amount increased to 5.90 and 6.25 in the eleventh and twelfth samples respectively.

Results

In any one case the breasts seldom produced equal volumes of milk unless both had been emptied completely at the previous feeding. The breast which gave the larger

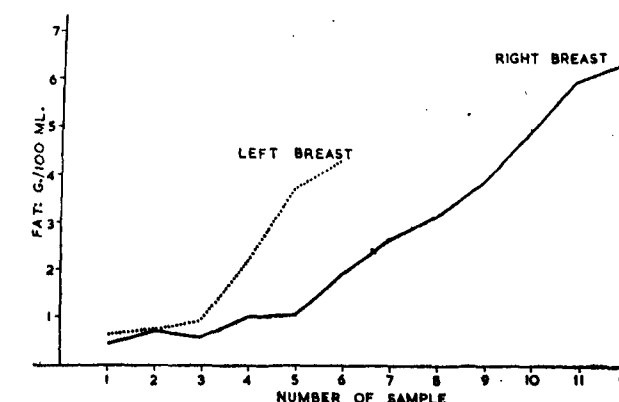


FIG. 1.—Case 18, fourth post-partum day, showing the progressive rise in fat content of the milk during emptying of the breasts.

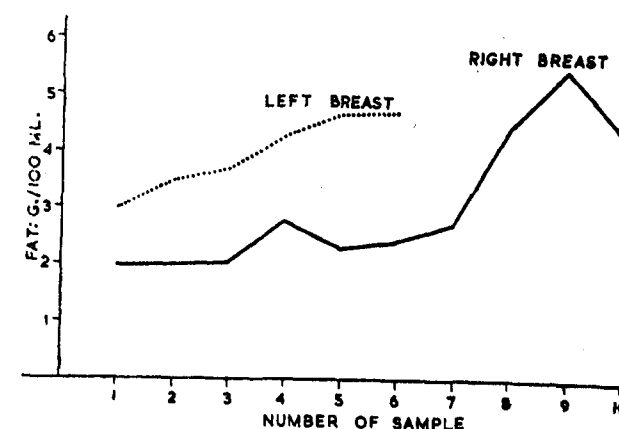


FIG. 2.—Case 16, seventh post-partum day, showing the degree of irregularity which can occur in the usually progressive rise in the fat content of milk during emptying of the breasts.

volume was usually the one at which the infant had suckled last and which had been left with more residual milk than the other.

The changes during a feeding in fat, lactose, and nitrogen found in this investigation are shown in Tables I, II, and III. The experiments are numbered so that when more than one constituent was estimated the values of all constituents can be compared together.

Fat.—A rise in fat concentration always occurred, but there was considerable variation in both the regularity of the rise and its degree (Table I). Fig. 1 demonstrates the most commonly found shape of curve, showing a flat, somewhat irregular start and an increasingly rapid terminal rise. The curve from the

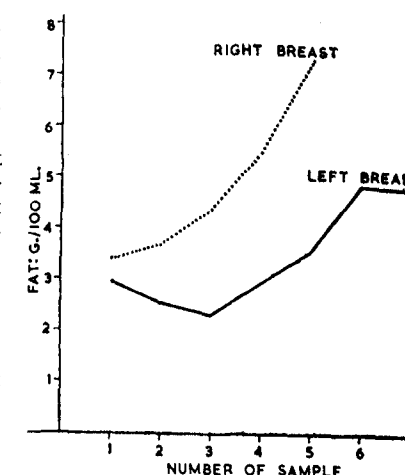


FIG. 3.—Case 13, seventh post-partum day, showing, in the right breast, the smooth and rapidly rising fat content which can occur as the breast is emptied and, in the left breast, the usual degree of irregularity found.

right breast represents the maximum percentage rise found in the series: from 0.45 g. to 6.25 g. per 100 ml. Fig. 2 shows a more irregular rise that was sometimes found. The abrupt changes of direction seen in the curve from the right breast are discussed later. Fig. 3 shows, in the curve from the right breast, the smooth uninterrupted curve which was seen on only three occasions.

Lactose.—The lactose content shows an inverse relationship to the fat, falling from a maximum in the first sample to a minimum at the end of the feed (Table II). This is to

TABLE II.—Lactose in g./100 ml.

Case No.	Post-partum Day	Sample Number							
		1	2	3	4	5	6	7	8
11	7a	6.70	6.50						
	7b	6.75	6.64						
12	5	6.81	6.58	6.58	6.64	6.58			
		6.23	6.43	6.40	6.23	6.12	6.10	6.10	6.02
45	4	6.60	6.60	6.50	6.38	6.35			
	9	6.85	6.71	6.57	6.51	6.51			
46	9	6.78	6.94	6.78					
		6.64	6.47						
47	3	6.17	6.60	6.57	6.60	6.55			
	8	6.98	7.08	6.95	6.98	7.08	6.98		
57	5	5.27	5.05	4.95	4.95	4.85			
	5	6.37	6.44	6.44	6.30	5.96			
78	7	5.20	5.00						
	5	6.92	6.98	7.04	6.51	5.64	6.57		
79	5	6.60	6.40	5.92	5.65				
	6	6.15	5.96	5.68	5.48				
86	5	6.84	6.76	6.72	6.55	6.40			
	8								

be expected, since, in a given quantity of milk, the volume of water is dependent on the volume of fat present, so that a rise in fat will cause, by displacement, a lower volume of water, and therefore less water-soluble constituents. The overall change in lactose was usually small, and the maximum fall, from 6.60 g. to 5.65 g. per 100 ml., was associated with an increase in fat content from 2.20 g. to 10.05 g. per 100 ml.

Nitrogen.—The total nitrogen gave a variable pattern, but the changes were in any case usually very small (Table III). In milk of the first three or four days of lactation the total nitrogen falls from beginning to end of the feeding, but after the fifth day there is usually a slight increase.

TABLE III.—Nitrogen in mg./100 ml.

Case No.	Post-partum Day	Sample Number						
		1	2	3	4	5	6	7
Total Nitrogen								
45	4	333	323	318	316	316		
46	9	280	285	282				
47	3	332	330	342				
	8	425	400	394	372	382		
57	5	259	277	270	259	266		
	5	298	300	307	(Lost)	308		
64	7	283	277	297	297	297		
78	7	356	356	372				
79	5	290	291	297	291	300	302	
85	6	288	292	294	277			
86	5	347	344	342	333			
101	8	238	238	238	232	238		
190	6	295	290	297	307	295	295	
196	7	276	263	267	269	270	269	
197	6	312	321	317	315	304	307	
202	7	312	291	273	276			
203	6	349	335	340	333	336		
208	8	273	276	272	265			
209	6	400	393	399	407	402	399	416
Casein Nitrogen								
101	8	87	84	83	84	95		
190	6	131	123	133	143	126	128	
196	7	121	113	114	108	117	109	
197	6	126	140	141	139	123	116	
202	7	137	144	134	132			
203	6	104	104	117	112	111		
208	8	112	126	119	121			
209	6	131	162	182	179	177	179	179
Non-protein Nitrogen								
45	4	56	58	53	52	51		
46	9	70	72	71				
47	3	62	62	62	56	38		
	8	64	67	68	64			
57	5	62	56	62	64	64		
	5	67	56	62	70	56		
64	5	70	76	79	67	69	78	
78	7	64	53	48	46			
79	5	53	67	67	56			
85	6	47	38	40	34	30		

The inconsistency may be explained if the protein is recognized as two fractions differing in behaviour. Casein, which may be partially adsorbed to the fat, either rises slightly at the end of the feed or remains at an almost constant level, but the soluble protein falls as less water per unit volume is available. The pattern for total nitrogen will depend, therefore, on the relative proportion of its fractions, and in the very early milk the fall is due to the characteristic preponderance of globulin. Non-protein nitrogen showed a haphazard variation in most cases, although changes were small. There was a decrease in a few cases.

Mechanism

A number of theories have been advanced to explain the mechanism of the rise in fat concentration. The belief has been expressed by earlier workers that the fat globules are arrested mechanically by the finer ducts in the breast and are squeezed out finally only by the pressure of milking, but Petersen (1929), who studied the distribution of fat in the bovine udder histologically, denied this. Lowenfeld *et al.* (1927) and von Sydow (1944) have suggested that the magnitude of increase in fat is dependent on the method of extraction, a more forcible process causing a higher final fat content; and Götz (1940), who attributed the increase to a difference in viscosity between fat and the other solids, believed the increase to become apparent only with inept evacuation. Johannson *et al.* (1952), who supported the theory of mechanical arrest of the fat globules, were able to obliterate the rise in fat content, in the cow, by vigorous massage of the udder before milking.

The steep terminal rise found in many of the present experiments is suggestive of fat being adherent to the alveolar and duct surfaces of the breast, probably by adsorption; if this is so, it should be possible to duplicate the phenomenon by exposing milk to a large and suitably arranged surface for a few hours. A rubber sponge was chosen to test this. This type of sponge has finer spaces than others available, and it is thus more nearly comparable to the breast in structure. There are, however, no spaces fine enough to hinder the passage of any fat globule. Rubber has no specific affinity for fat in globules. The sponge, cut to fit a porcelain filter funnel (Fig. 4), was filled with milk and allowed to remain immersed in it for four

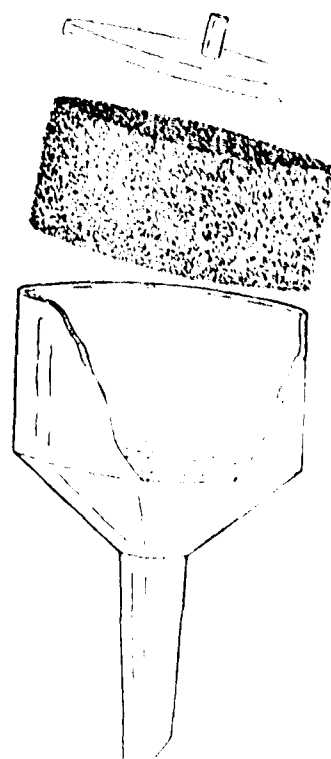


FIG. 4. Apparatus used in demonstrating the adsorption of milk fat to the surface of a sponge.

TABLE IV

Sample	Fat (g./100 ml.)		
	Time of Immersion		
	3 Hours	4 Hours	12 Hours
1	2.30	2.65	0.70
2	2.30	2.85	1.15
3	2.85	3.35	2.00
4	4.00	5.25	4.45
5	6.60	7.75	9.80

hours. At the end of that time it was removed from the milk and the excess not held within it was allowed to drain. It was then placed in the filter funnel and compressed by a plunger until empty. In a number of experiments the sponge was inverted in the filter funnel so that any effect of "creaming" within the spaces could be eliminated. The milk was collected as successive 15-ml. samples, and the fat contents of these samples invariably gave a curve similar to Fig. 5. The steepness of the fat rise varied with the time allowed for adsorption, and Table IV shows the fat contents of samples obtained from a sponge immersed in milk for 3, 4, and 12 hours. This is in accord with the behaviour of the breasts, the gradient for fat being steeper on the side which has been left the longer.

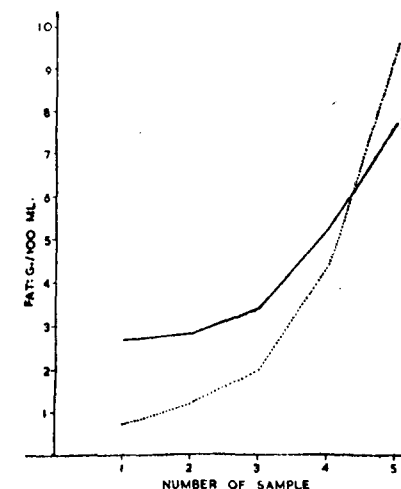


FIG. 5.—The progressive rise in fat content which occurs when a sponge soaked in breast milk is emptied by compression. Curve I is from a sponge after four hours' immersion in milk, and curve II from a sponge after 12 hours' immersion.

In most cases the second breast to be sampled was, as in the usual breast-feeding practice, the breast first suckled at the previous feed. It may therefore have had an hour longer than the other breast for adsorption. This effect has also been demonstrated in the cow, a steeper gradient occurring after the long night interval than after the shorter daytime intervals (Johannson *et al.*, 1952). A breast which has been incompletely emptied at the previous feed will show a higher initial fat content than one which has been stripped completely, since its residual milk, to which the subsequent secretion is added, is of high fat content.

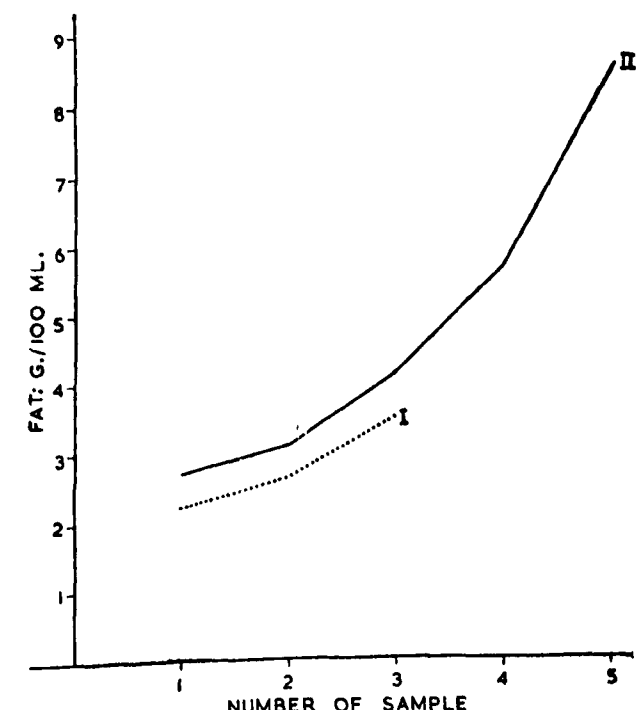


FIG. 6.—The effect of refilling with milk a sponge which has been only partially emptied. Curve I is from a sponge partially emptied after four hours' immersion in milk, and curve II from the same partially emptied sponge after a further four hours' immersion in more of the same milk.

Fig. 6 shows the effect produced when the sponge, after four hours' immersion, is partially emptied of milk and then re-immersed in more of the same milk for a further four hours before it is squeezed empty.

It is not surprising that the breast seldom shows in its output of fat the smooth curve of Fig. 5, since it consists not of a simple unit like the sponge but of up to 20 separately drained lobules. Only if all the lobules act in unison can such a curve be expected. Clinically, this is observed infrequently, and if the collecting-bottle of the breast pump is watched the steady trickles of milk can often be seen to be joined by an additional jet as a new lobule comes into action. In this way the rising fat concentration may be suddenly reduced by the dilute first milk of the new lobule (Fig. 2). This may explain the occasional reverse changes found by some workers, and particularly the terminal drop described by Lucignani. The findings of Lowenfeld *et al.* and of von Sydow also might be explained by the theory of physical adsorption, since the removal of the fat closely adherent to the walls of the ducts would require considerable mechanical force.

The other major constituents behaved in the sponge as they do in the breast. This would confirm that the fall in the water-soluble constituents is due to simple displacement by the fat.

Summary

During the course of a feeding there is a progressive and usually large increase in the concentration of fat, associated with a small decrease in the concentration of lactose. The total nitrogen falls from the beginning to the end of a feeding during the first few days of lactation, but as the milk matures there is usually a small increase due to a relative rise in the casein concentration.

It is suggested that the behaviour of the fat is due to the mechanical phenomenon of adsorption of the fat globules to the large secretory and duct surface of the breast, and the changes in the other constituents are secondary to this.

The entire picture has been duplicated by soaking a rubber sponge in breast milk and emptying it by mechanical compression.

I am grateful to Professor Dugald Baird and to the staffs of the Midwifery Department and the Aberdeen Maternity Hospital for invaluable help, and to Dr. I. Leitch, of the Commonwealth Bureau of Animal Nutrition, Bucksburn, for criticism and advice.

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III. DIURNAL VARIATION IN MAJOR CONSTITUENTS OF MILK

The more recent literature on human milk has paid particular attention to the diurnal variation of both yield and composition, since most of the earlier work done on milk from a single feeding gave widely divergent results and little indication of the sort of milk which would be available for the whole 24 hours.

Most workers have examined the output of milk at the conventional feeding-times of 6 a.m., 10 a.m., 2 p.m., 6 p.m., and 10 p.m., with an eight-hour interval between 10 p.m. and 6 a.m., and there is general agreement that the volume is maximal at the 6 a.m. feeding and decreases during the rest of the day. Macy *et al.* (1930), however, made an analysis of milk drawn off every four hours during the day and night, including one sample at 2 a.m., and found no such early morning peak. Apart from this unusual sampling method, their results are in any case not strictly comparable with other studies, since their subjects were quite exceptionally large milk producers whose lactation had been artificially maintained and prolonged by manual expression.

Deem (1931) studied the output of a single breast in 27 cases and was able to demonstrate a mean yield dropping from 150 ml. at 6 a.m. to a level of approximately 75 ml. for all other feeds. That the yield following an eight-hour interval was double the yield after a four-hour interval strongly suggests a constant hourly secretion rate for the whole 24 hours, but no other studies have been able to confirm this, and Morrison (1952), who reviewed this literature in some detail, believes there is insufficient evidence that the yield varies only with the interval between milkings.

There is more general agreement about the very considerable variation in the fat content, the agreed pattern showing a minimum value at 6 a.m., rising steeply to a maximum at 10 a.m., and falling off during the following three feeds.

TABLE I.—Yield in Millilitres

Case	Day	6 a.m.	10 a.m.	2 p.m.	6 p.m.	10 p.m.
28	3	116	61	118	115	51
29	3	14	12	37	37	45
31	3	14	10	28	31	41
42	3	235	125	84	155	100
172	3	67	33	68	61	94
21	4	152	142	67	143	62
27	4	74	78	57	68	48
43	4	71	136	116	88	48
172	4	69	33	77	142	95
23	5	82	85	57	46	72
26	5	87	38	39	49	74
30	5	81	82	14	41	32
34	5	109	87	51	21	36
172	5	212	56	92	26	45
22	6	163	155	150	116	97
33	6	175	137	162	133	131
37	6	80	85	72	66	69
40	6	103	97	102	77	39
41	6	210	107	59	76	50
172	6	64	150	85	170	55
25	7	224	126	97	128	116
36	7	149	122	76	89	78
39	7	93	133	127	145	24
172	7	133	90	120	140	100
181	7	100	32	76	133	90
200	7	76	54	114	42	70
163	7	166	74	95	109	78
38	8	50	61	24	61	23
172	8	210	135	100	120	105
Mean	..	116.5	87.4	80.7	90.6	67.9
35	21	290	192	143	157	172
159	22	100	58	36	53	52
162	32	178	86	100	133	118
35	37	281	174	153	138	189
198	38	222	120	114	126	99
138	40	95	120	72	108	80
119	41	60	81	68	54	45
151	47	192	130	129	147	145
116	48	135	88	128	95	84
161	48	158	137	50	74	62
163	48	238	205	164	173	177
115	49	66	63	56	51	66
74	50	114	113	117	99	117
102	50	143	88	149	56	87
139	50	229	227	206	146	146
110	53	120	75	89	130	97
177	53	148	125	93	130	137
121	62	228	180	133	92	142
174	62	172	79	48	59	85
75	135	198	198	135	118	113
Mean	..	168.3	126.9	109.1	106.8	110.6

No systematic change in any of the nitrogen fractions or in lactose has been described, although for both there may be substantial differences from feed to feed in the same individual.

The collection of the entire milk output for 24 hours presents considerable difficulties, particularly without the convenience of a hospital, and it would be much more practicable to collect merely the total output of one feeding. The following study was partly undertaken, therefore, to discover to what extent any single feed is representative of the whole day.

TABLE II.—Fat in g./100 ml.

Case	Day	6 a.m.	10 a.m.	2 p.m.	6 p.m.	10 p.m.
28	3	2.55	2.45	2.30	3.00	2.25
29	3	2.20	2.60	2.25	2.25	2.20
31	3	1.55	2.15	2.25	2.25	2.20
42	3	1.95	3.45	1.65	1.90	1.95
172	3	2.40	4.40	2.70	2.25	2.05
21	4	2.10	3.35	3.50	3.30	4.00
27	4	3.90	3.95	4.25	2.90	3.40
43	4	1.70	2.65	3.75	3.50	3.50
172	4	2.70	2.80	2.50	4.35	3.30
23	5	1.90	3.05	2.80	2.20	1.60
26	5	2.95	3.05	1.95	2.15	2.00
30	5	1.00	2.30	3.05	1.70	1.65
34	5	1.20	3.50	5.60	2.20	2.60
172	5	3.40	3.90	4.05	2.75	4.05
22	6	2.60	3.40	3.35	3.20	2.80
33	6	2.90	4.05	4.65	2.70	4.00
37	6	1.65	2.30	4.20	2.85	3.90
40	6	1.30	1.95	2.35	2.90	3.35
41	6	3.95	6.70	5.85	4.40	2.45
172	6	1.90	3.20	3.60	2.75	3.80
25	7	3.15	4.70	4.30	3.10	3.95
36	7	2.70	2.75	3.30	3.60	3.30
39	7	2.00	2.90	2.40	3.15	2.90
163	7	3.20	4.70	3.50	4.10	3.40
172	7	1.90	3.00	3.10	2.70	3.10
181	7	2.20	1.80	2.70	4.00	3.00
200	7	2.50	4.00	4.10	3.70	3.00
38	8	1.85	1.40	1.15	1.30	1.15
172	8	2.40	3.90	3.80	2.90	2.60
Mean	..	2.34	3.25	3.12	2.98	2.98
35	21	2.95	4.15	4.65	3.65	3.10
159	22	3.30	5.70	5.00	4.30	3.80
162	32	2.60	5.80	3.20	3.40	3.80
35	37	2.15	5.30	3.15	3.15	2.75
198	38	3.10	4.20	4.60	4.00	3.00
138	40	3.20	3.75	3.80	3.00	3.40
119	41	2.30	3.80	4.00	3.90	3.40
151	47	2.80	5.20	3.20	4.95	5.25
116	48	1.90	3.10	2.80	3.30	2.20
161	48	1.50	2.70	2.10	2.60	1.40
163	48	3.20	4.60	4.50	4.30	4.50
115	49	1.40	2.60	1.60	0.70	0.95
74	50	1.80	2.50	2.70	3.10	2.90
102	50	2.60	4.30	4.00	4.15	3.00
139	50	3.00	4.00	4.00	4.20	4.00
110	53	2.55	3.20	3.00	2.80	2.10
177	53	3.90	4.70	4.00	3.70	3.10
121	62	2.90	5.00	5.40	5.50	4.10
174	62	3.00	5.30	4.50	3.15	2.20
75	135	3.00	4.50	4.50	3.60	3.20
Mean	..	2.64	4.15	3.81	3.58	3.12

Method

Altogether, 49 24-hour samples were collected from 42 subjects. The 24-hour sample comprised the whole output of both breasts collected by the "humalactor" at the usual feeding-times of 6 a.m., 10 a.m., 2 p.m., 6 p.m., and 10 p.m. To ensure that no residual milk from the previous 24 hours was included, the breasts were completely emptied by the humalactor after the last feed prior to the sampling period. Samples from the first week of lactation were obtained from patients in the Aberdeen Maternity Hospital, and the more mature samples from patients in the mother and baby unit of the Royal Aberdeen Hospital for Sick Children and from unmarried mothers in the Aberdeen Mother and Baby Home. The methods of chemical analysis used have been outlined in Part II of this paper.

Results

All estimations of yield and of fat, lactose, and nitrogen content are shown in Tables I-V. When any relationship has been tested statistically the level of significance is shown in parentheses.

TABLE III.—Lactose in g./100 ml.

Case	Day	6 a.m.	10 a.m.	2 p.m.	6 p.m.	10 p.m.
28	3	6.67	6.53	6.60	6.53	6.78
42	3	6.23	6.16	6.08	6.16	6.13
172	3	5.72	6.09	5.89	5.75	5.20
21	4	6.12	6.17	6.00	6.30	6.18
27	4	6.12	6.19	6.67	6.74	6.85
43	4	6.45	6.02	5.68	6.02	6.44
172	4	5.48	5.96	5.82	6.20	6.30
34	5	4.80	4.64	4.80	4.88	5.41
172	5	6.37	6.23	6.85	6.02	6.37
33	6	6.71	6.50	6.64	6.67	6.67
37	6	6.71	6.54	6.51	6.47	6.54
40	6	6.44	6.27	6.09	6.36	6.30
41	6	5.96	5.73	6.00	6.16	6.33
172	6	6.16	6.57	6.54	6.51	6.33
36	7	6.46	6.47	6.47	6.44	6.37
39	7	6.57	6.54	6.40	6.16	6.37
172	7	6.64	6.44	6.51	6.33	6.37
38	8	6.68	6.40	6.37	6.66	6.68
Mean	..	6.24	6.19	6.22	6.24	6.31
35	21	6.98	6.78	6.85	6.81	6.85
35	37	7.27	7.10	7.07	7.07	6.85
138	40	6.33	6.68	6.60	6.47	6.37
151	47	6.78	6.78	7.15	6.82	6.95
163	48	7.33	6.85	6.78	7.05	6.92
115	49	6.64	7.08	7.15	6.92	6.92
74	50	7.12	7.12	7.29	7.10	7.22
102	50	7.15	7.26	6.85	6.92	6.92
139	50	6.85	6.85	6.92	6.88	6.81
75	135	7.19	7.05	7.05	7.05	6.78
Mean	..	6.96	6.96	6.97	6.91	6.86

TABLE IV.—Total Nitrogen in mg./100 ml.

Case	Day	6 a.m.	10 a.m.	2 p.m.	6 p.m.	10 p.m.
28	3	360	392	379	368	355
42	3	288	277	266	283	274
172	3	483	420	363	321	309
27	4	435	441	398	378	372
43	4	353	361	364	367	353
172	4	301	287	314	290	281
34	5	525	497	470	575	481
172	5	295	293	301	265	294
33	6	255	260	238	253	257
37	6	294	308	316	288	277
40	6	286	305	295	321	316
41	6	388	414	405	402	360
172	6	287	284	281	281	284
39	7	336	312	327	319	343
172	7	290	273	276	265	267
38	8	260	260	256	250	245
Mean	..	339.7	336.5	328.0	326.6	316.7
35	21	268	254	275	266	270
138	40	231	221	207	225	223
151	47	213	203	214	218	213
163	48	209	203	218	214	200
115	49	182	216	207	190	186
74	50	194	183	178	179	189
102	50	181	192	206	193	178
139	50	200	195	195	189	193
75	135	147	141	144	147	141
Mean	..	202.8	200.8	204.8	202.3	199.2

TABLE V.—Non-protein Nitrogen in mg./100 ml.

Case	Day	6 a.m.	10 a.m.	2 p.m.	6 p.m.	10 p.m.
28	3	74	68	75	62	74
42	3	48	50	49	53	52
43	4	81	60	66	71	71
172	4	68	68	64	65	52
34	5	61	61	63	62	62
172	5	63	60	63	57	65
33	6	63	55	72	73	70
40	6	69	73	67	70	70
41	6	91	83	80	69	69
172	6	54	63	55	68	54
39	7	80	65	71	63	65
172	7	60	57	71	65	65
38	8	65	52	84	78	70
Mean	..	67.5	62.7	67.7	65.8	64
35	21	69	68	72	62	63
35	37	47	43	50	54	44
138	40	60	59	52	60	52
151	47	70	62	81	68	76
163	48	55	52	63	52	53
115	49	59	42	62	53	62
74	50	60	62	60	62	65
102	50	45	53	56	48	34
139	50	39	62	48	55	62
75	135	41	32	39	45	40
Mean	..	54.5	53.5	58.3	55.9	55

in milk from the first week of lactation the decreasing nitrogen content characteristic of this period is so rapid that it is obvious even from feed to feed, and a progressive drop throughout the day can be seen (Table IV). In this small series the drop is not, however, statistically significant. Non-protein nitrogen, in general, remains almost constant through the day, although there are quite large variations in some cases (Table V). The differences between feeds are not statistically significant, and the slightly lower mean value at 10 a.m. is due to a few cases in which the value was much lower than the average. This may have occurred because the 10 a.m. specimen was usually analysed within one hour of its removal from the breast, whereas the other specimens were stored in a refrigerator for periods up to 20 hours, and some protein breakdown may have occurred.

Apart from the milk volume, which can be estimated with reasonable accuracy by test-weighing the infant, fat is the only variable of any practical consequence, and the results were examined to determine whether any particular feed had a fat content similar to the overall fat content of the whole 24-hour output. The fat contents were considered to be similar if they were within 0.1 g. per 100 ml. of each other. In 26 cases there was no one feed similar to the average for the 24 hours, and in 23 cases one feed was similar—the 6 a.m. in four cases, the 10 a.m. in five cases, the 2 p.m. in three cases, the 6 p.m. in five cases, and the 10 p.m. in six cases.

Discussion

The difficulties of obtaining milk samples which represent the normal yield have been stressed in Part I of this paper, and for this reason the average values, by ironing out such sampling irregularities as occur in the individual case, may have more real meaning. With the exception of the low 10 p.m. volume found in the earlier milk, the graphs in Fig. 1 show a levelling off during the day similar to those published by Deem; but although the volumes of the 10 a.m., 2 p.m., 6 p.m., and 10 p.m. feeds are almost constant, the volumes at 6 a.m. do not support her evidence of a constant hourly secretion rate in either the early or the more mature milk. There are, in fact, only three cases out of the 49 in which the 6 a.m. yield is double the yields of the other feeds. This does not, in itself, nullify the hypothesis, since the breast must have a limited capacity for milk storage, so that although most breasts can probably store four hours' full secretion, only a few may be able to accommodate twice that volume. A more detailed discussion of breast size and capacity will be presented in a later publication, but a striking illustration of this limiting effect is shown by Case 74. This woman had particularly small breasts, and her output at the five feedings of 114, 113, 117, 99, and 117 ml., strongly suggests a ceiling of milk storage.

The low fat content at 6 a.m. rising steeply to a maximum value at 10 a.m. and falling off during the rest of the day confirms previous results, although there have been no published descriptions of the variation in early milk and of the changing pattern as the milk matures. There is no evidence to support Ruzicic's (1936) belief that the variation is merely a reflection of meal-times, since all the subjects supplying early milk, and many of those giving mature samples, showed widely different patterns while living on an institutional diet which was uniform in composition and eaten at strictly regulated times. Nor does it seem to be an individual characteristic, since the same subject was able to produce different patterns on different days. For example, Case 35 on the twenty-first day had fat contents of 2.95, 4.15, 4.65, 3.65, and 3.30 g. per 100 ml., but on the thirty-seventh day produced 2.15, 5.30, 3.35, 3.35, and 2.75 g. per 100 ml. at the five feeding times. The pattern of variation was apparently unaffected by the level of total daily fat secretion, and two extreme cases—No. 41 with an overall fat content of 4.80 g./100 ml., and No. 115 with 1.45 g./100 ml.—both produced the characteristic changes throughout the day.

Bartlett (1929) found that the fat content of morning milk was particularly low in cows with small udders. He believed that the increased tension caused resorption of

milk, but this would imply that the fat was selectively resorbed, which seems unlikely. In these series the low fat content at 6 a.m. occurred even when the breast was in no way distended or even apparently full.

Kon and Mawson (1950) found that the fat content tended to be high in samples taken within four hours of the last feed and low in samples taken after six hours. This result could be explained if the breasts had not been fully emptied, as is possible with manual expression, since the first milk of a breast left longer will contain less fat than that from a breast left only a short time (Part II of this paper).

It might seem at first sight that there is some interdependence of fat concentration and milk volume, so that the rising fat and the falling milk yield would combine to produce a constant amount of fat for each feed (Fig. 3).

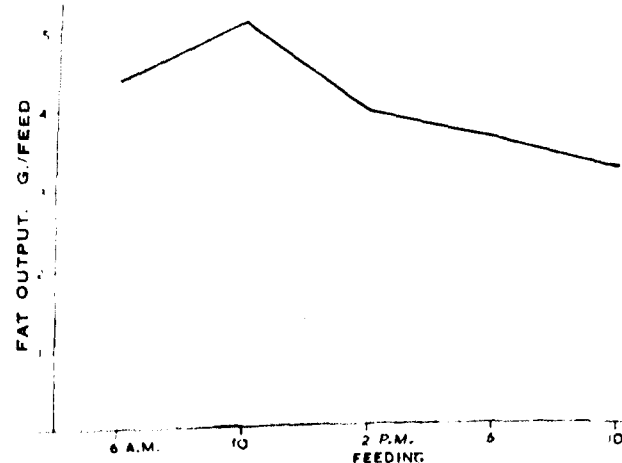


Fig. 3. Mean diurnal variation in the output of fat in milk from the 21st day of lactation or later.

shows the mean quantities of fat at each feeding, in mature milk, and it can be seen that almost half the daily fat output is available in the first two feeds. There is no obvious physiological advantage to the infant in this arrangement.

It is clear from the above data that the total daily output of fat cannot be assessed accurately from the analysis of any single feed.

Summary

There is a very marked diurnal variation in both the volume and the fat content of human milk, but the other major constituents show no systematic change. The variation, particularly in fat content, is very irregular in milk from the first week of lactation, but it tends to conform to a pattern in the more mature milk.

The volume of milk obtained at a feeding may be due to a combination of two factors—the length of time since the last milking and the storage capacity of the breast—but no clear conclusion can be reached from the data presented.

The reason for the very substantial variation in the fat content remains obscure.

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FURTHER STUDIES ON THE REDUCTION OF GASTRIC ACIDITY

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The gastric acidity of patients with duodenal ulcers is more effectively reduced by the continuous sucking of alkaline tablets* than it is by the intermittent administration of antacids (Douthwaite and Batty Shaw, 1952). The above trials were made during the course of the digestive period of gruel test meals, and subsequently by drawing samples from the stomachs of fasting patients. Criticism that results based on a relatively inert gruel meal were of little value must be in part accepted. However, this type of meal has been extensively used in studies of gastric acidity over the past thirty years, and it was therefore chosen as a basis for comparison.

In the above paper were reported experiments made on the gastric pH of fasting patients exhibiting the characteristically low pH of duodenal ulceration. It is probable that this high acidity of the inter-prandial periods is responsible for maintaining duodenal ulceration. The alkaline tablets were shown to raise the pH from figures of 1.5 to 8 during the period of sucking. When food was brought into the ward a fall of pH was often noted, presumably as a result of psychic stimulation. It was therefore decided to carry out a similar series of investigations on patients with peptic ulcer taking ordinary meals, except that solid food was minced. Patients 1 and 12, however, were eating ordinary food, unminced.

Choice of Patients.—Twelve patients were chosen who were suffering from chronic ulceration—one in the stomach, eleven in the duodenum. They gave a typical history and showed the clinical and radiological signs of the disease. Those in the wards were ambulant and were eating a mixed diet, as stated above.

Method

The patients were deprived of all drugs for 18 hours before the tests. Within an hour of their usual ward or home breakfast, or lunch, they came to the laboratory and 2-ml. samples

*Subsequently given the trade name of "Nulacin."

were drawn from the gastric contents every 15 minutes. During the first hour no medicaments were given, but in the subsequent two hours the patients sucked either alkaline tablets or dummy tablets without alkali. The tests were made on two successive days; in some instances the dummy tablets were given on the first day and in some on the second. A comparison of the gastric acidity during the first-hour periods shows the degree to which the measurements are reproducible on successive days. Where the acidity on the test day is reasonably similar to that on the control day it seems legitimate to attribute differences between the two following periods to the difference in composition of the tablets. Immediately after each experiment was completed the pH of each sample was measured electrometrically.

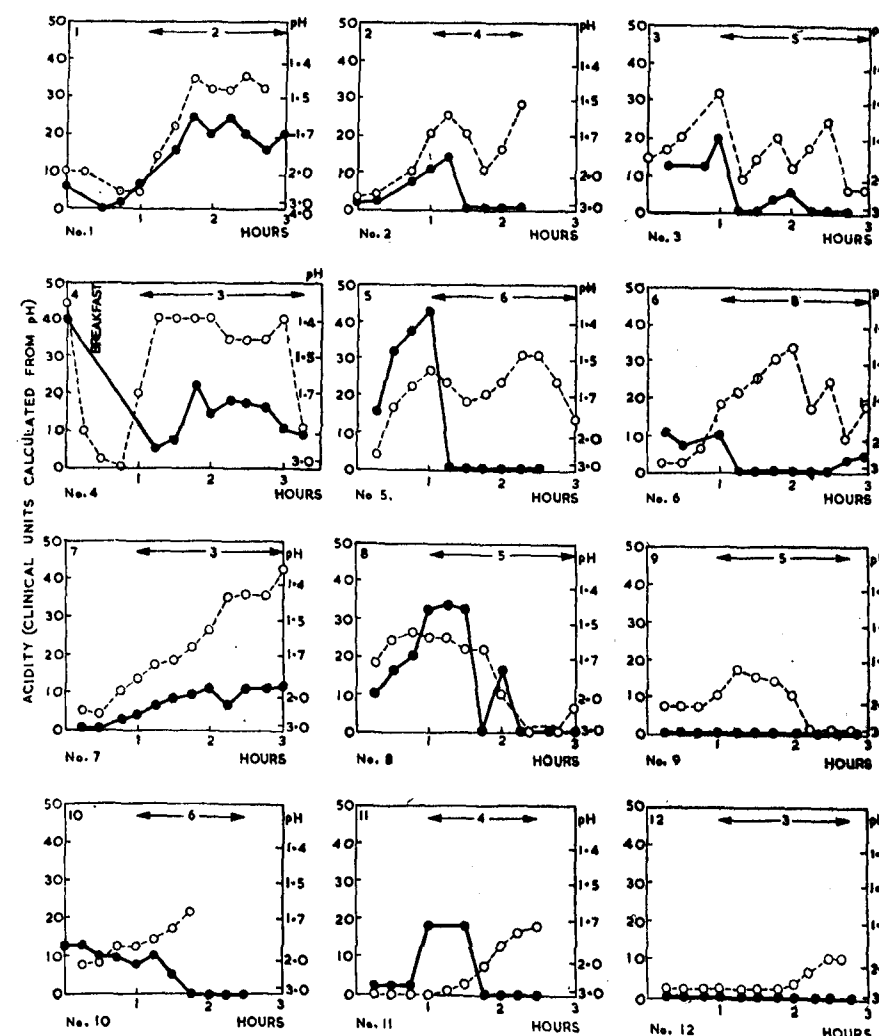
The composition of the alkaline tablets is:

Solids from whole-milk, combined with dextrins and maltose	40 gr. (2.6 g.)
Magnesium trisilicate	3½ gr. (0.23 g.)
Magnesium oxide	2 gr. (0.13 g.)
Calcium carbonate	2 gr. (0.13 g.)
Magnesium carbonate	½ gr. (0.03 g.)
Ol. menth. pip.	q.s.

This tablet, if lodged between gum and cheek, was found to take 20 to 30 minutes to dissolve. Its food value was approximately 11 calories.

Results

The results of the tests in the order of their performance are shown in the accompanying graphs. It may be seen that in every case the alkaline tablets produced an appreci-



Acidity of gastric contents plotted against time. ← → Shows the period of tablet-sucking and the number of tablets taken. ●—●—●=Alkaline tablets. O—O—O=Dummy tablets.

certainly to a mild or moderate attack. It was found, however, that under cortisone these attacks were either extremely mild or completely absent. This encouraged us to increase the inhalation period under large doses of cortisone to double and later to treble the period which had previously caused a mild attack. Without cortisone protection such an abrupt increase must invariably be expected to cause a most violent reaction. A second exposure of the same duration was carried out when the patient had decreased his daily cortisone intake to 75 or 50 mg., a third a few days after the end of the cortisone course, and a fourth about two weeks later.

In the later experiments the second or third exposure was omitted and only three exposures were made, one under large, one under small cortisone doses, and one after the cortisone influence had ceased. Skin tests were carried out before, during, and after the course, and the blood pressure, weight, and subjective impressions of the patients recorded. No changes of blood pressure or weight were found. There was no oedema of the ankles. In one case there was slight "mooning," and in several cases the patients reported increased appetite, or nycturia, or a mild degree of sleeplessness, particularly towards the morning.

Recently two patients* were found in whom, contrary to previous experience, cortisone neither suppressed nor modified the response to a 30-33% increase of antigen dosage. It was thought inadvisable to double or treble the antigen dosage in these patients, and they are not included in the results.

Results

The results of the 18 experiments are included in the Table. Two of the experiments could not be completed because of intercurrent febrile infections. In the attacks before cortisone medication the reduction of the vital capacity was between 160 and 830 c.cm., and it occurred within 5 to 10 minutes. Under high cortisone dosage, when the period of exposure was doubled or trebled, the reduction was between 0 and 785 c.cm., and it occurred within 4 to 15 minutes. After omission of the cortisone the reduction was between 0 and 640 c.cm., and it occurred within 7 and 15 minutes. It is noteworthy that in eight experiments carried out during or after cortisone it took longer than 10 minutes to reach a significant reduction of the vital capacity. These figures show that in the immediate reactors the exposure to very large amounts of allergen was followed under cortisone by the same mild reaction which had been demonstrated after much smaller amounts of allergen without cortisone. In some cases the attacks under cortisone were even milder than those seen before, and this persisted when cortisone was omitted. In our experience this was evidence that tolerance to double or treble the amount of inhaled allergen (hyposensitivity) had been established. If this was correct we should have been able, in consequence, to increase the inhalation period further in the way which had become the routine without cortisone protection. We were able to do this in all cases.

The seven experiments with the "late reactors" differed from the others in so far that no reactions occurred under full cortisone, under reduced cortisone, and immediately after its omission. After the effect of cortisone had disappeared, mild attacks occurred in three experiments. When the exposure was repeated these attacks disappeared. It is interesting to note that this phenomenon occurred in one experiment with the subject (Case 7) who underwent two similar experiments. In the first the inhalation period was doubled and no reaction occurred after the cortisone effect had disappeared. In the second it was trebled, and a mild attack occurred after cortisone protection had ceased.

*In one of these patients the reason for this failure has now been discovered. The lowest amount of allergen capable of inducing a mild attack had not been determined accurately enough, and the experiment had been started with too large an amount of allergen as a basic value. It has now been repeated, with a satisfactory result.

Among the immediate reactors there was one exception (Case 3) from the general experience. In this experiment the attack under reduced cortisone dosage was more severe than under high dosage. It was feared that without cortisone the reaction might become too severe, and the inhalation period was therefore accordingly reduced the next time. When the whole experiment was repeated with the same subject two months later no severe reaction occurred after any of the exposures.

The skin tests did not show any decisive changes under cortisone influence. The immediate weal and flare were not suppressed in any of the cases. In two of the immediate reactors we had the impression that the skin reaction was not as intensive under cortisone as it was before. In these two cases there had been a considerable area of redness and oedema secondary to the local weal and flare. In four of the patients late positive skin reactions occurred, consisting of a local area of redness and slight swelling. These reactions were not influenced by cortisone, although suppression of the late tuberculin reaction by cortisone has been reported frequently.

The size of the weal and flare areas showed some variation on repeated testing, and sometimes an allergen showed a positive result, whereas it had been negative before or was negative afterwards. These variations were quite irregular and could not be attributed to the cortisone influence.

Discussion

An obvious possible objection to these experiments is the absence of controls. I am unable to fill this gap except from previous experience. We know what happens if a patient is exposed to an overdose of his allergen. In every case a violent attack with more or less serious consequences (hypersensitization) has followed, whether the overexposure occurred from ignorance (as in the first experiments) or by a technical error. Moreover, we have seen that attempts to increase the dosage by more than 33 to 40% above the previous exposure regularly produced too violent a reaction; since then every precaution has been taken to avoid even such minor overexposures; to double the exposure time without cortisone protection merely in order to provide a control experiment can hardly be justified.

It must be regarded as certain that without cortisone protection violent attacks would have occurred in both immediate and late reactors. It would have been expected that cortisone, so efficient in severe chronic asthma, would suppress every sign of an induced severe attack. The attacks were, however, not completely suppressed. In some of the late reactors a mild attack reappeared after the cortisone action had ceased, and in the immediate reactors the violent attack was modified into a harmless and transient wheeze. Cortisone therefore does not abolish the immediate acute attack, and it must be remembered that it does not abolish the immediate skin reaction either. There is a definite difference between the cortisone effect in the immediate and late reactors, but I cannot explain this difference.

The facts suggest that under cortisone protection an overdose of antigen has not the violent effect it otherwise would have. The after-effect is also different: no hypersensitization follows. On the contrary, the same overdose may be repeated under small cortisone doses, and later without it, without any stronger reaction than before. We see, therefore, that the mild attacks caused by a sudden twofold or threefold increase in antigen dosage (overdose) under cortisone have the same effect as the mild attacks caused by an increase of 20 to 25% without cortisone protection—that is, the development of tolerance to the higher dose (hyposensitization). The difference is that under cortisone protection a higher level of tolerance is quickly reached. This might be explained by supposing that hyposensitization is effected by the formation of a larger amount of circulating antibody in the blood, and that the more antigen is supplied the more antibody is formed. Normally, a sudden large supply of antigen leads to a violent reaction and to a condition in which the body remains more sensitive than

before—that is, hypersensitive. The mechanism of this is not understood, but it seems that cortisone suppresses it and, at the same time, allows hyposensitization to proceed undisturbed and on a larger scale than would otherwise be possible.

This action of cortisone is very different from that of sympathomimetics and antihistamines. These substances are capable of protecting against or suppressing minor and even major attacks caused by overdoses of antigen; but as soon as their effect has faded the violent reaction to the overdose becomes apparent and requires a new dose of sympathomimetic; it seems that hypersensitization as a secondary effect cannot be avoided, although this can be deduced only from general experience. Evidence from experiments is still lacking.

Our experiments have so far been done on patients with mild or moderate asthma who were either in an asthma-free interval or had chronic asthma of moderate intensity kept under control by small amounts of drugs. Whether the same effect can be achieved with severe cases of asthma remains to be seen. We know from clinical experience that the continuous severe asthmatic reaction to the allergen can be suppressed by cortisone, and that it continues to be absent for a short time after the omission of the cortisone. Gradually, however, the asthma returns. One might think that in these cases the hyposensitizing effect which may develop under cortisone is soon replaced by the hypersensitizing mechanism which has been present before.

We shall not be able to understand these observations until the action of the cortisone is more fully understood. It may be concluded, however, that in certain types of asthma hyposensitization is greatly facilitated by cortisone.

One practical conclusion follows. It will be possible to shorten the cumbersome process of hyposensitization by proceeding in bolder steps under cortisone protection. So far the therapeutic success of hyposensitization has been poor, in spite of the sometimes enthusiastic statements in many textbooks of allergy (see also Rackemann, 1932; Unger and Wolf, 1943). Hurst (1943) has expressed strong doubts of the efficacy of hyposensitization, and Herxheimer and Prior (1952) have shown that objective success is rare and can probably be achieved in only 2.5 to 4% of all asthmatics. With the help of cortisone it may be possible to by-pass some of the otherwise unavoidable setbacks, and to extend the procedure to patients with polyvalent allergy in whom this treatment so far has been less successful.

Summary

In 18 experiments on 11 asthmatic patients the amount of inhaled allergen causing a mild attack was determined. The patients were given cortisone, and when under its full influence were exposed to double or treble the amount of the same allergen. This exposure was repeated when cortisone dosage had been reduced and again after the cortisone influence had ceased.

The doubling or trebling of the amount of inhaled allergen, which normally would have caused a violent and severe attack, caused under cortisone influence either a very mild and transient attack or, in the late reactors, no attack at all. The same overexposure under reduced cortisone dosage had the same result, and this did not change after the omission of cortisone. In the immediate reactors the asthma attack tended to become still milder towards the end of the experiment, until it finally disappeared when the exposure was repeated a second or a third time after omission of the cortisone. In two other patients* cortisone did not influence a mild induced attack, and these patients were therefore not exposed to double or treble the antigen dosage.

*See note at foot of page 186.

It is concluded that, in most moderate and mild cases of asthma, cortisone protects the patients from the violent attacks through overexposure. Moreover, it prevents the otherwise unavoidable hypersensitization and permits hyposensitization to develop in spite of over-dosage.

Cortisone can therefore be used to speed up the process of hyposensitization.

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FATAL BRONCHIAL ASTHMA

A REVIEW OF 18 CASES

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The serious results of repeated attacks of bronchial asthma are well recognized, the usual sequence of events being that emphysema gradually develops, giving rise so often to "pulmonary failure" (Fulton, 1953) and ultimately to death. The asthmatic attack itself, however, although regarded as an annoying interlude in a patient's life, causing domestic and social upset, rarely ends fatally.

The first full pathological review of a case of asthma was given by Leyden in 1886, but during the ensuing 35 years only 15 further case reports, giving both macroscopic and microscopical details, seem to have been published. Huber and Koessler (1922) summarized those 15 cases together with six of their own. Since then at least six outstanding articles (Lamson and Butt, 1937; Thieme and Sheldon, 1938; Craige, 1941; Rackemann, 1944; Unger, 1945; Walton *et al.*, 1951) have appeared, dealing with conjoint clinical and necropsy findings, the most recent of which stresses the low number of recorded cases and gives the opinion that this could be due to lack of recognition of the condition at necropsy.

The distressing consequences of this disease, both immediate and remote, have been recorded by various authors. Lamson and Butt considered that approximately 40% of cases may survive not more than four years of symptoms. In a review for insurance purposes Old (1933) estimated that the ratio of actual to expected deaths in 274 asthmatic subjects was 121% $\pm$ 5%. In differentiating between extrinsic and intrinsic asthma,

Cecil and Loeb (1951) believe that extrinsic cases do not die of the disease alone unless in very exceptional circumstances, whereas the death rate for the intrinsic group is 7.6%. The possible causes of death—hypoxaemia, dehydration, peripheral vascular collapse, drug intoxication, etc.—are fully dealt with by Segal (1950). Herxheimer (1952) reminds us that the course of bronchial asthma is always unpredictable and that even the psychologically induced attack may end fatally.

It is impossible to obtain accurate figures of death directly attributable to asthma; nevertheless reference has been made to the Statistical Review of the Registrar-General for England and Wales (1940-8) and to the Annual Reports of the Registrar-General for Scotland (1940-8), bearing in mind possible errors of certification due to diagnostic difficulties. From these reports it would seem that the average annual death rate is 3,268 for England, Wales, and Scotland. It is significant that by far the greatest number of deaths in England and Wales were recorded during 1940 (4,167), a time of particular stress in the life of the nation, which no doubt affected the asthmatic personality as adversely as those prone to perforation of gastric and duodenal ulcers (Illingworth *et al.*, 1944).

The possibility of a serious outcome from any asthmatic attack should always be borne in mind, however mild it may appear to be in the beginning. Because of the small number of reviews dealing with combined clinical and pathological findings, it has been decided to record a series of cases which fulfil all the recognized criteria of asthma.

Investigation

The following consists of a review of 18 cases, all of which were treated as in-patients in the Royal Infirmary and associated hospitals in Edinburgh between the years 1939 and 1952.

Post-mortem examination, including a careful microscopic study of the lungs and bronchi, was carried out in all cases. The clinical features of each patient were consistent with a diagnosis of bronchial asthma. In some, although other factors contributed to death (as noted in Table III), the main immediate cause was always asthma.

TABLE I

Case No.	Sex	Age	Known Duration of Asthma	Date of Death
1	F	54	Many years	24/9/39
2	F	46	4 days	5/10/45
3	M	57	9 months	7/12/47
4	M	42	35 years	16/1/48
5	F	65	Unknown	20/9/49
6	M	14	5 years	26/9/49
7	F	47	42 "	17/10/49
8	F	49	9 "	18/6/50
9	M	48	3 months	18/7/50
10	F	66	6 years	6/10/50
11	M	45	10 "	19/10/50
12	F	50	1 year	26/10/50
13	M	67	21 years	31/10/50
14	F	59	10 "	24/2/51
15	F	47	1 1/2 "	17/9/51
16	M	46	22 "	24/4/52
17	F	41	8 "	17/7/52
18	F	47	4 "	2/10/52

The sex incidence, 11 females to 7 males, in such a small review, cannot be regarded as significant. The majority died between the ages of 40 and 50 years. The variable duration of the disease (Table I) suggests that this factor cannot be related to a fatal outcome in the present series. The seasonal distribution of deaths—11 out of 18 in the months of September and October—corresponds with previous findings (Williams, 1952), the incidence having been related to respiratory infections.

For the purpose of aetiological classification three groups were recognized: psychological, allergic, and infective. It

was realized, however, that more than one of these factors could be operative in the same patient at the same time, as is evident in Table II, in which the predominant factor is placed first. A psychological background was present as either a primary or secondary factor in 12 cases. Two

TABLE II

Sex:	P		P and A		P and I		A		A and I		I		I and P	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M
No. of cases	4	1	3	—	1	1	—	1	1	2	—	2	2	—
	5		3		2		1		3		2		2	

modes of death were apparent: sudden and unexpected in 13, and progressive exhaustion and terminal coma in 5. The duration of the fatal attack varied from a few minutes to 12 days.

The pathological criteria accepted were: *Macroscopic*: (1) Voluminous lungs which did not collapse when the thorax was opened. (2) Mucous plugs in the large and small bronchi. *Microscopic*: (1) The presence of mucous plugs in the bronchi associated with excessive mucus production by the bronchial glands. (2) Hyaline thickening of the basement membrane of the medium-sized bronchi. (3) Hypertrophy of the muscle of the medium-sized bronchi. (4) Eosinophilic infiltration, especially in the bronchial walls.

These features were looked for and recorded in each case. All were not constantly found, but no case was included unless the pathologist discovered unequivocal evidence of asthma. Eight cases fulfilled all criteria. All cases showed

TABLE III.—Summary of Pathological Findings

Case No.	Voluminous Lungs	Mucous Plugging	Thickened Basement Membrane	Hypertrophy of Muscle	Eosinophilia	Active Mucous Glands	Other Pathological Findings
1	—	+	+	—	+	+	Left ventricular hypertrophy. Polyp in sinuses
2	++	+	+	—	+	+	
3	++	+	+	+	+	+	
4	++	+	+	+	+	+	
5	++	+	+	+	+	+	
6	+	+	+	—	+	+	Small area probably allergic pneumonia. Right lower lobe
7	+	+	+	—	+	+	
8	+	+	+	+	+	+	Bronchitis
9	+	+	+	+	+	+	Scattered areas of local organization. Right ventricular hypertrophy
10	+	+	+	+	+	+	Partial collapse. Left lower lobe. Atheroma, pulmonary arteries. Right atrial and ventricular hypertrophy
11	+	+	+	+	+	+	Early basal bronchopneumonia
12	+	+	+	+	+	+	Right ventricular hypertrophy
13	+	+	+	+	+	+	
14	+	+	+	+	+	+	Right ventricular hypertrophy, early bronchopneumonia
15	+	+	+	+	+	+	Bronchitis
16	—	+	+	—	+	+	Right ventricular hypertrophy
17	+	+	+	+	+	+	
18	+	+	+	+	+	+	

mucous plugs in the bronchi with active glands. Eosinophilia was present in all but one. The right ventricle was hypertrophied in seven. Records of Cases 3 and 15 are given below.

Case 3

A miner aged 57 was admitted on November 26, 1947. He had felt well until nine months before admission, when he first developed attacks of sneezing in the mornings, soon to be followed by attacks of breathlessness in bed at night. No precipitating cause for this could be found. The attacks at first lasted 30-60 minutes but became more severe and of longer duration, and eventually occurred nearly every night.

He also had occasional milder attacks during the day. Oral ephedrine gave slight relief. A severe attack developed in the early hours of the day of admission and adrenaline subcutaneously gave only temporary relief. He had a cough with slight mucoid sputum. His previous and family history showed nothing relevant.

On examination he was seen to be a hardy well-built man, distressed, dyspnoeic, and slightly cyanosed. His temperature was 98° F. (36.7° C.), pulse 100, and respirations 32. There was no finger-clubbing. Wheezing was audible in both phases of respiration. The chest was emphysematous. Auscultation revealed rhonchi, mainly expiratory, all over the chest. There were no crepitations. Cardiovascular system: the blood pressure was 130/80; pulse 100; no oedema; heart sounds were of poor quality. There was slight tenderness over the right antrum. On November 27 the E.S.R. was 8 mm. in the first hour; W.B.C., 9,000; Hb, 100%; a few organisms were found in the sputum. On November 28 an x-ray film of the chest showed slight emphysema, and an x-ray film of the sinuses showed some opacity in the right antrum. The E.C.G. was normal on December 2.

The patient responded initially to intensive adrenaline therapy and slept well after taking paraldehyde. He was maintained on oral ephedrine and stramonium mixture, frequently supplemented by adrenaline, "adrenutol," theophylline with ethylenediamine by injection, also phenobarbitone, amylobarbitone sodium, phenobarbitone sodium, and on one occasion pethidine, 50 mg. intravenously. He was very nervous and tense, and "sat waiting for his next injection." On December 6 all drugs except phenobarbitone were stopped, some 40 minims (2.4 ml.) of and adrenaline were given during the day. The bronchospasm subsided and he was much better. He then collapsed and died suddenly and unexpectedly at 1.30 a.m. on December 7.

Necropsy showed only bronchial asthma with marked plugging of the bronchi.

Case 15

A married woman aged 47 had suffered from a winter cough of only mild severity for many years and was not incapacitated. Eighteen months before admission she became breathless and wheezy one morning. She was in bed for 14 days, relieved by isoprenaline and theophylline with ethylenediamine. Since then she had had several relapses. The attacks were usually worse at night and were best relieved by isoprenaline. She was able to go about, apart from occasional spells of a few days in bed. There was some tension regarding her employment, and at the time of admission she was apprehensive and in bronchospasm of moderate severity. She had had an acute anxiety state when her husband died of cerebral tumour in 1933. Since then she had been very nervous and easily upset. She had had an artificial menopause induced in 1939.

On examination she was pale, thin, and anxious, but not cyanosed. Her temperature was 98° F. (36.7° C.), pulse 90, and respiratory rate 22; no finger-clubbing. There was slight emphysema; rhonchi, mainly expiratory, were heard all over both lungs. There were no crepitations. Cardiovascular system: the pulse was 102, regular; blood pressure, 110/70; heart not enlarged—sounds normal and no oedema. Endocrine system: palms were warm and moist, there was slight tremor. There was no thyroid enlargement, and no bruit was heard over the gland. On September 3 the sputum contained the usual respiratory organisms. The an x-ray film of the chest showed possible slight emphysema, and an x-ray film of the sinuses was negative.

Bronchospasm of moderate degree was present on admission. She responded to sedation with phenobarbitone sodium and oral theophylline with ethylenediamine, plus sodium and oral theophylline with ethylenediamine, plus phenobarbitone. Isoprenaline sulphate was also used on occasion. As it was thought there might be a thyrotoxic state, thiouracil was begun on September 7 with slight effect. The patient was reasonably well at 12 noon on September 17,

with slight bronchospasm. She collapsed suddenly at 1.30 p.m. and died in a few minutes.

Necropsy revealed asthma and emphysema, with marked plugging of the bronchi with tenacious mucus.

Discussion

It is generally thought that most cases of asthma react to treatment. A fatal issue can, however, be tragically sudden and unexpected. The possibility of error in an unduly optimistic attitude is emphasized by the fact that 18 such deaths have been available for review (3 in 1949, 6 in 1950, 2 in 1951, 3 in 1952, along with 4 earlier ones) from four general hospitals in this area. Analysis of the aetiology, age, and duration of disease has shown that these factors are unreliable aids to prognosis in any single attack.

The treatment carried out in all cases consisted of the usual measures employed in hospital. The drugs used included bronchodilators, expectorant mixtures, sedatives, anti-histamine drugs, and antibiotics. Oxygen and oxygen-helium mixture were often used. Bronchoscopy was performed in some cases. Cortisone was available for the most recent case.

No new pathological feature was observed, but ample confirmation of the importance of plugging of the bronchi with tenacious mucus was apparent.

The immediate cause of death in bronchial asthma has not yet been clearly defined. From the nature of the condition it would seem probable that several factors can be responsible. It is proposed to review a few which have emerged from this investigation.

As previously noted, two modes of death were observed. It is reasonably easy to account for exhaustion and ultimate death from a prolonged severe resistant attack of bronchospasm which has lasted several days without remission. Progressive anoxia and failure of the right heart are responsible. Although it may be significant that a psychological element existed in 12 cases, the reason for the failure of response to therapy cannot be related to any constant clinical or pathological pattern.

The sudden death of an asthmatic patient who was relatively well until within a few minutes of death is more difficult to explain. At the present time we can only offer the following suggestions for consideration.

In a very severe acute attack progressive rise in the intra-alveolar pressure must quickly overcome the pulmonary capillary blood pressure of 10 mm. Hg. This would lead to occlusion, as when the pressure in the cuff of a sphygmomanometer approximates to that in the brachial artery. The much-increased resistance of the pulmonary vascular bed thus cannot be overcome by the right ventricle, which fails, with consequent cyanosis, collapse, and death.

It must be regarded as significant that mucous plugging was invariable in this series. The possibility of mechanical asphyxiation by this means has been previously noted in the literature. This may be explained by tenacity of mucus, bronchial spasm, and oedema, along with the fact that the mucus is sucked deeper and deeper down into the bronchial tree until it becomes impacted. The effect of this is inadequate alveolar gaseous interchange, with sudden death due to suffocation. Such can occur in a relatively well asthmatic subject with much mucus in the large bronchi who inspires deeply because of emotional or physical stress—for example, excitement, or, as happened in one of our cases, straining at stool on a bedpan.

The importance of an adequate initial clinical assessment and subsequent management of the asthmatic patient between attacks is already recognized. In view of the varied therapeutic measures used in the cases under review, it is thought that suggestions outlining a programme of treatment for the acute attack, rationally based on clinical and pathological findings, might be of interest.

The patient in an acute attack who shows signs of increasing cyanosis, dyspnoea, and distress within a few hours, in spite of attempted control, should be transferred to

hospital. This decision would be hastened by a history of previous resistant attacks. On admission attention must first be directed towards relief of bronchial spasm.

Adrenaline when used "in adequate dosage" must still be considered the most effective bronchodilator. It should be stressed that many allegedly resistant cases have been shown to be due to too small a dose. In the absence of obvious cardiovascular contraindications we would recommend the immediate injection of 20 minims (1.2 ml.) of 1:1,000 adrenaline hydrochloride as advised by Herxheimer, and used by one of us (C. K. R.) Where contraindications exist 0.25 g. of theophylline with ethylenediamine may be given intravenously.

For the severe, acute, cyanosed asthmatic sufferer from anoxic anoxaemia the early use of oxygen/carbon-dioxide mixture 95.5% is obviously indicated at a rate of 6 litres a minute. This mixture is used in preference to pure oxygen as the carbon dioxide helps to prevent the onset of apnoea and has an expectorant action (Basch *et al.*, 1941).

While one cannot condemn the use of morphine in status asthmaticus too strongly, because of its central depressant action on a respiration already barely adequate, these patients are as a rule fatigued and apprehensive, and benefit from the safe sedation produced by phenobarbitone sodium, 3 gr. (0.2 g.) intramuscularly.

Mucous plugging has been stressed throughout this paper, as it has apparently often contributed to the death of the patient. Potassium iodide renders sputum less viscid and thus easier to expectorate. It should therefore be given as soon as possible, in the form of Lugol's solution, 10 minims (0.6 ml.) three times a day.

Cortisone and A.C.T.H. are accepted as powerful anti-allergic agents and can be used in attacks resistant to the scheme of treatment outlined above. These drugs encourage fluid retention, however, and this should be borne in mind if there is any sign of cardiac failure.

In the asthmatic patient with an infective sputum penicillin should be given in anticipation of bacteriological results.

Summary

The relevant literature on bronchial asthma is briefly reviewed. Eighteen cases of fatal asthma are recorded, with clinical and pathological findings. Thirteen deaths were sudden and unexpected.

Possible immediate causes of death are discussed.

Treatment is considered.

We wish to thank Dr. Robertson Ogilvie and the staff of the Pathology Department of the University of Edinburgh for valuable co-operation. We are indebted to the physicians of the Royal Infirmary, Edinburgh, and associated hospitals for access to case records.

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CHRONIC BRONCHITIS IN GENERAL PRACTICE

BY

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General Practitioner

Diseases which are commonly encountered in hospital practice are not necessarily the most important from the point of view of national health and personal suffering. In considering disease from these aspects we must have regard to (a) its total incidence; (b) its average duration; (c) the types of persons affected and the period of life at which it produces its effects—thus a disease during the working years is of more national economic significance than one affecting the retired age groups; (d) the loss of time from work which it causes; (e) its mortality; (f) its preventability; and, above all, (g) the suffering which the victim undergoes. The most important national diseases, with regard to these factors, are the infections of the upper and lower respiratory tracts, the nervous and mental disorders, acute and chronic rheumatic manifestations, tuberculosis, and disorders of the digestive and cardiovascular systems.

As a distinct clinical entity, chronic bronchitis is one of the most important of diseases in this group—both numerically and socially. It is only in general practice that it is seen in all its stages and in all the effects it produces on the individual and the family group. In hospitals the condition is encountered only when the patient is referred there by the general practitioner, and this is usually only for diagnostic purposes—x-ray examination and sputum analysis—during an acute exacerbation and during the late stages with cor pulmonale.

Chronic bronchitis is in some degree responsible for over 30,000 deaths annually in Great Britain. It has been estimated to account for the loss of some 16½ million working days a year (Report of Ministry of National Insurance, 1950), and this does not include the condition as it affects the housewives, who, although an important and essential working group, do not receive insurance benefits. In general practice it accounts for a large volume of work. In my own practice in S.E. London it was in 1952 responsible for some 8% of all attendances, while Pemberton (1949), in Sheffield, estimated that it accounted for some 11% of all attendances. Proportions are probably higher still in some north-west areas of England.

The condition produces serious disablement. The Disabled Persons Register (*Ministry of Labour Gazette*, May, 1950) lists 7.9% of its total as being disabled on account of "non-tuberculous disease" of the lungs, of which chronic bronchitis constituted the largest proportion. The Treasury Deputy Medical Adviser's Report for the G.P.O. for 1951 shows that chronic bronchitis was responsible for 15% of all retirements on health grounds.

Other factors which make the disease one of such major national importance are its long duration, often causing trouble for 25 to 30 years, and the fact that each winter it causes a considerable loss of worktime. In addition, it affects principally middle-aged men in their most active and able years, which makes the absence from work of even greater significance. The fact that it is probably largely a preventable condition adds to its

importance and introduces an urgent and imperative need for further researches and actions in this field.

What is "Chronic Bronchitis"?

Having glibly talked of "chronic bronchitis," implying it to be a specific and distinct clinical entity, I must attempt to define the condition before proceeding further. Almost certainly what we now know, or think we know, as "chronic bronchitis" consists of a number of separate but allied conditions, and it is necessary to separate these clinically and to seek out their different causes before we can proceed to its rational and satisfactory management.

For the purposes of this paper the term has been used to depict a chronic condition as seen in patients who have been under my care for some years and in whom the chief features are an irritating and recurring productive cough with variable amounts of sputum, to which some degree of dyspnoea is usually superadded. These patients have at some time during the course of the illness had their chests x-rayed to exclude such conditions as tuberculosis, neoplasms, pneumoconiosis, etc. Cases of asthma and bronchiectasis have been excluded from this series.

A survey is made of a series of 127 cases of chronic bronchitis, using the term in a broad sense, seen in my practice. It is most important to stress this, for the results and observations can by no means be taken to represent the state of affairs in the country as a whole, but perhaps it might show the need for, and the possibilities of, a nationwide investigation.

The Condition as Seen in General Practice

Before discussing the disease it is essential to know something of the population at risk and the area in which they live. The practice is situated on the south-eastern outskirts of London and is typically suburban. The patients, numbering 4,500, are principally in social classes 3 and 4, being employed either in local light industry or in clerical and administrative duties in London, which is some 10 miles distant. The age distribution includes the usual proportions of all ages (Table I). The climate is that common to the

TABLE I.—Numbers at Risk in Age Groups

Age	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70+
No.	663	466	670	790	780	550	370	208

British Isles. This area has its share of temperature changes in winter and summer, and is also liable to have severe winter and autumnal fogs. Atmospheric pollution is probably not excessive, but, while there are no large industrial concerns, each house—and these are all of the simple semi-detached three-bedroom variety—burns at least one fire almost continually during the winter.

For the purposes of this survey a note has been kept over the past few years of all patients thought to be suffering from chronic bronchitis; the report is a retrospective one covering in detail the year 1952, which in some ways was an abnormal one, as it included a severe and persistent fog.

In September, 1952, there were 127 chronic bronchitics in the practice, five of whom died during the following 12 months. This gives an incidence of 28 per 1,000. On these figures there might be some 1½ million such patients in the British Isles at the present time.

Sex Distribution.—There were 71 males and 56 females. Although there is a slight male preponderance, it is not nearly so marked as that quoted by Oswald *et al.* (1953) and Goodman *et al.* (1953). The former had an 8:1 male predominance and the latter had a mortality from chronic bronchitis of four males to one female. The actual numbers in the different age groups and the rates per 1,000 of the practice's population are given in Table II. The incidence

TABLE II.—Age Distribution of Chronic Bronchitis and Rates Per 1,000

Sex	Under 40		40-49		50-59		60-69		70+	
	No.	%/100	No.	%/100	No.	%/100	No.	%/100	No.	%/100
Males	7	7	12	30	20	67	27	142	12	125
Females	7	7	19	30	13	52	16	90	13	127

is seen to rise with age, especially when the true rates per 1,000 are studied, and here, too, can be seen the definite male preponderance, except in the under 40 and the 70+ groups, but this may be peculiar to the practice.

Social Classes.—As already stated, the practice consists principally of social classes 3 and 4, and the chronic bronchitics show roughly the following distribution:

Social Class:	1	2	3	4	5
Males	..	..	..	35	30
Females	..	..	1	30	20

Goodman *et al.* (1953) showed that the mortality from chronic bronchitis increased inversely with the social groups, but their figures were for 1931. Oswald *et al.* (1953), however, found that the distribution of chronic bronchitis was parallel to that of the controls. It cannot be concluded, therefore, that the condition is one of the lower social groups.

The duration of the condition is shown in Table III.

TABLE III.—Duration of Condition (Years)

	Less than 5	5-9	10-19	20+
Males	6	13	30	22
Females	9	12	17	18

The age of onset was usually between 30 and 60 (Table IV).

TABLE IV.—Age of Onset

	Under 20	20-29	30-39	40-49	50-59	60-69	70+
Males	1	5	16	16	28	5	—
Females	2	9	9	19	12	5	—

The personal habits of the patients may possibly have a bearing on the condition, and some attempt has been made to examine these. Most of them had always resided in London and its environs.

Tobacco smoking has recently been prominent as a possible cause of carcinoma of the bronchus, and it must also be considered in chronic bronchitis. No real differences were found between the smoking habits of the chronic bronchitics and those in a series of controls of similar age and sex distribution (Table V). Oswald *et al.* (1953), on the

TABLE V.—Smoking Habits of Chronic Bronchitics Compared With a Series of Controls

		Consumption of Tobacco		
		Non-smokers	Under 20 Cigarettes a Day	20+ Cigarettes a Day
Males	Chronic bronchitic	10	36	25
	Control	11	38	22
Females	Chronic bronchitic	22	19	15
	Control	30	21	5

other hand, found a significant difference: 9% of non-smokers among the chronic bronchitics and 20% among the controls.

There was no evidence of alcohol being a causal factor, nor were there any significant occupational hazards.

A family history of chest disease was rather difficult to ascertain accurately, but it was thought to be significant in some 47 instances (25 men and 22 women).

Extent of Morbidity

Some 25% of all attendances in general practice are for conditions of the respiratory tract. Most of these are on account of minor upper respiratory affections such as the common cold and its complications. In 1952, in my practice, this group of upper respiratory infections accounted for some 60% of attendances for respiratory conditions. Chronic bronchitis was responsible for 25% of the total respiratory attendances (over 1,000), representing 8% of all the attendances during the whole year.

These attendances for chronic bronchitis showed a rise with age corresponding to the age incidence of the condition, and again there was little difference in the sexes. As would be expected, there was a marked seasonal variation, the attendances for chronic bronchitis being six times more in December than in August. Almost a third of these patients had to have more than one month away from work during the year, and the majority of them were men (Table VI). It is common knowledge that the housewife cannot afford as much time for illness as her husband.

TABLE VI.—Duration of Sickness in Chronic Bronchitis Over One Year

	Incapacity Time		
	Nil	Less than 1 Month	More than 1 Month
Male	26	15	30
Female	30	16	10

Clinical Features

Difficulties in connexion with the diagnosis and conception of the disease are partly due to the fact that a number of other conditions have very similar clinical features which require differentiation.

Asthma, as a diagnosis, should be reserved for cases which are characterized by sudden and limited bouts of dyspnoea with signs of bronchospasm and in which, at least in the early stages, cough and sputum are not prominent. The late stages of asthma, on the other hand, can present a picture identical to that of chronic bronchitis, with severe productive cough, dyspnoea, and the barrel-chest deformity and heart failure. **Pulmonary tuberculosis**, especially in elderly men, can present clinical features like those of chronic bronchitis, and can be excluded only by chest x-ray examination and sputum analysis for tubercle bacilli; these investigations should therefore be carried out in all chronic bronchitics. The various types of **fibrosis of the lungs**, both occupational and others, can also present similar features, and here again radiological differentiation is necessary. **Congestive heart failure** at times presents difficulty when a productive cough is a prominent symptom.

Clinically, chronic bronchitis is a condition with few symptoms and signs. It is characterized by a productive cough—at first present only in the winter months and usually worse in the morning and evening—and dyspnoea, which varies both in degree and in duration. The course of the condition is often punctuated by acute exacerbations with severe local and systemic disturbances. The signs are merely those resulting from the presence of secretions in, and obstruction of, the bronchial tubes—namely, rhonchi and rales. In the later stages non-specific structural changes take place and produce the barrel chest and emphysema.

There are no specific diagnostic tests. Chest radiography shows little abnormality in the early stages and only features of non-specific emphysema later, but it should be carried out to exclude other conditions already mentioned. Sputum analyses have not been found of any real value in either diagnosis or treatment.

Closer study of any large group of chronic bronchitics will reveal certain grades of severity, and it is of value to define and describe them.

The onset itself is variable; usually it is slow and insidious, with a productive winter cough, increasing in severity year by year; but in some, particularly the more elderly patients, it may be sudden, often following a pneumonia; in others there may be no apparent cause.

Case History.—A fit groundsman aged 58 had never suffered from a cough until the influenza epidemic in 1951, when he contracted pneumonia, which was complicated by severe bilateral lobar pneumonia. Since then he has had a persistent cough with much sputum and dyspnoea. The chest skiagram is not abnormal and bronchography reveals no bronchiectasis.

Grading

It must be realized that the following grading does not necessarily imply that the condition is a progressive one from one grade to the next. It can remain stationary at one level without any deterioration. The distribution is shown in Table VII.

TABLE VII.—Distribution of Different Grades of Chronic Bronchitis in the Two Sexes

	Males		Females		Total	
	No.	%	No.	%	No.	%
1. Winter cough	26	36	15	27	41	33
2. Winter cough and acute exacerbations	13	19	17	30	30	25
3. Symptoms all year round	20	28	19	34	39	30
4. Complete invalid	12	17	5	9	17	12
	71	100	56	100	127	100

1. **Winter Cough.**—The least troublesome form of chronic bronchitis is that which is characterized merely by a recurrent winter cough. There are usually no abnormal physical signs. The sputum varies in quantity and appearance, most often being mucopurulent. The symptoms usually begin in October or November, following a cold which "goes to the chest," and persist until about April. In the present series this form represented 33% of the total, being slightly more common in males.

2. **Winter Cough and Acute Exacerbations.**—The next group is those patients with the winter cough who, in addition, are liable to have acute exacerbations. This complication occurs as a sudden deterioration in the chronic state with urgent dyspnoea and severe systemic upset—but there are various degrees of severity. Some cyanosis is usually apparent and there is a distressed wheezing respiration. The pulse is rapid and full, and the temperature may vary from subnormal to a high fever. Examination of the chest most commonly reveals restricted movements and suppressed breath sounds with added rhonchi and rales. There is no evidence of any consolidation, either clinically or radiologically. The exact cause of this serious and common complication is unknown, but it seems to be the result of an acute superadded condition affecting the bronchial and bronchiolar mucosa in a subject with an already defective respiratory apparatus. It is suggested that the infection in some way disturbs the distribution of the pulmonary blood flow (*Lancet*, 1953). This condition was particularly common during the severe fog of December, 1952.

3. **Symptoms All the Year Round.**—Patients with these symptoms constitute the next group. By the time this stage is reached—and it accounts for some 30% of all the cases—the patient is becoming increasingly dyspnoeic and disabled. Although the productive cough is present all the year the symptoms are worse in the winter, and at this time, too, the course is apt to be complicated by the acute exacerbation already discussed. Each such attack leaves the victim more disabled, and the condition eventually merges into the next grade.

4. **Complete Invalidism.**—This group, which fortunately accounted for only some 12% of the total, presents a distressing and pathetic picture. It is more common in men and is the stage of respiratory and cardiac failure. Dyspnoea is severe; the cough is extremely irritating and

disturbing, and is associated with the expectoration of a large volume of purulent and mucopurulent sputum. There is a profound accompanying general systemic upset with loss of weight and appetite, lack of sleep, headaches, nausea and vomiting; and eventually death occurs, either from cor pulmonale or during an acute exacerbation.

Management

It is the general practitioner who has the task of caring for these patients in all their stages. For they are seen in hospital practice only when the diagnosis is being considered and when some special forms of treatment and special nursing are necessary. At all other times the G.P. is responsible for the physical and moral care of these cases, and it should be stressed that the latter aspect of treatment is a most important one. "Sympathetic encouragement" is an absolute essential in management. It should be stressed that treatment cannot be applied rationally, but only empirically, on account of our lack of knowledge of the causes, but these empirical measures can help our patients considerably.

General advice on the best type of occupation and on ways of improving living conditions and the removal or correction of any aggravating factors can be of great value. Breathing exercises are important in maintaining good respiratory movements.

Relief of the cough is a most difficult problem. Although the scientific value of expectorants and linctuses is doubted, our patients invariably tell us what relief they have had from our favourite mixtures. Postural drainage should be encouraged night and morning, and is often of much value.

Bronchospasm and dyspnoea are sometimes helped by antispasmodics such as ephedrine, isoprenaline, and others—either by mouth or as sprays. It is important that the acute exacerbations be treated energetically, with antibiotics and oxygen, when necessary, in order to prevent any deterioration in the already poor pulmonary reserves.

It is wrong to pretend that we can influence the natural course of the condition, with the exception of the acute exacerbations, and it is much more important to endeavour to devise methods of preventing it rather than to seek new forms of therapy for the established state.

Discussion

Before we can prevent the disease we must know more of its causes. In order that we may be able to do this it is essential to study more carefully and thoroughly what is known about the disease and its natural history. We should seek reasons to explain differences in age and sex incidence, and the differing mortality and morbidity rates in the different countries of the world. We must study the possible influences of smoking, climate, atmospheric pollution, and any other factors which may present themselves.

Global Incidence

It is difficult to compare vital statistics from different countries, particularly when they relate to an indefinite condition such as chronic bronchitis. Nevertheless, interesting and useful information is obtainable (W.H.O., 1952). The death rates for "bronchitis" for many countries of the world are given and can be presented as rates per 100,000 of the population.

A difficulty is that this term includes both acute and chronic forms, but this can to a certain extent be overcome by excluding countries where the death rates from bronchitis are greatest in children. This will leave us with figures which, although not necessarily representing the true incidence of deaths from chronic bronchitis, will give roughly comparable figures. Table VIII shows that the death rate is 100,000 in various countries. It shows that the death rate is highest in England and Wales, and the term "English disease" might well be transferred to chronic bronchitis, which alike appears to be a typical product of English weather and murky towns" (*British Medical Journal*, 1953).

TABLE VIII.—Showing Death Rates Per 100,000 from Bronchitis in Different Countries of the World in 1950

England & Wales	65	S. Africa (White)	15	Chile	7
N. Ireland	47	Italy	15	France	6
Scotland	43	New Zealand	14	Uruguay	6
Spain	35	Australia	12	Sweden	4
Japan	30	Netherlands	11	Canada	4
Belgium	28	Germany	10	Israel	2
Portugal	25	Austria	10	U.S.A.	2
Switzerland	20	Puerto Rico	10	Finland	2
Ceylon	16	Norway	7	Denmark	1

Although these figures require more investigation and confirmation, it can be seen at once that great differences exist between countries with similar degrees of social and economic development. Thus the death rate for England and Wales is 30 times greater than that for U.S.A. and more than twice as much as for more industrialized and more thickly populated Belgium.

Lewis-Fanning (1940) compared the seasonal variation in mortality rates between Great Britain and the U.S.A., and found that, whereas the total rates do not differ much over the year, the mortality rates from chronic bronchitis were over 12 times greater in Great Britain during the winter and more than six times greater in the summer.

There are also differences in the rates for different areas in the same country. In this country the death rates are highest in the regions of Newcastle-upon-Tyne, West Riding of Yorkshire, Liverpool, S.E. Lancashire, Birmingham, and South Wales, and there is a definitely increased rate in the urban areas as compared with the rural areas (Goodman, Lane, and Rampling, 1953). Lewis-Fanning (1940), however, in his survey of New England, U.S.A., found that the death rate from chronic bronchitis was greatest in the rural areas.

Climate and Atmospheric Pollution

We have only to look back to the fog of December, 1952, to see the effects which cold and atmospheric pollution exert on the mortality from respiratory disease. During this period some 4,500 deaths were directly attributable to this cause. Almost all these deaths occurred in chronic bronchitics over 45. Similar effects were observed in Glasgow in 1925, in the Meuse Valley in 1933, and in Donora, U.S.A., in 1948. In my own practice that fog produced severe effects on some 35% of these chronic bronchitics (Fry, 1953). There is therefore no doubt that atmospheric pollution, as fog, produces serious effects in the chronic bronchitic. It is another matter, however, to deduce that chronic bronchitis is caused directly by atmospheric pollution, but there is strong evidence for this point of view.

The effects of the climate have received all too little attention. Woods (1928) showed that the most extraordinary relationship exists between the fall in temperature and deaths from respiratory disease. Further attention should be paid to the physiological and pathological effects of climate on the respiratory tract.

Conclusions

Chronic bronchitis, accounting as it does for 30,000 deaths annually and for 16½ million days lost from work every year, is indeed a national wasting disease.

It is extraordinary that, whereas the mortality rate from pulmonary tuberculosis has decreased sevenfold in the past 100 years (3.11 per 1,000 in 1847 and 0.47 per 1,000 in 1947), the rate for chronic bronchitis has not altered conspicuously (0.96 per 1,000 in 1847 and 0.75 per 1,000 in 1947) (Daley, 1951). What are the reasons for the mortality remaining at this high level? It may be that the condition is merely a degenerative state which now reflects our ageing population. It may result from an increase in our atmospheric pollution, which, acting in conjunction with our cruel climatic conditions, produces inflammatory changes in the bronchi. It may be the aftermath of certain acute infective conditions such as influenza. It may be connected with our changed smoking habits—although in this series no appreciable difference was noted in chronic bronchitics and controls. All these factors need further inquiry.

We must also explain the differences in mortality rates from chronic bronchitis in the different countries of the world. Why should our mortality rate from this condition be almost 30 times greater than in the U.S.A.? And why should it be more than twice as much as that of Belgium? Obviously there is a great need for further research and inquiry into the causation of and variation in the disease.

This research should be carried out at a number of levels, one of which should be in general practice, for it is here that the true incidence and course can be observed. That this is possible has been proved, and perhaps it should be the first step in a national and possibly world-wide investigation and effort. It is considered by many to be a preventable disease (Lewis-Fanning, 1940; Pemberton, 1952; Joules, 1953a, 1953b). If this is borne out then vigorous steps at the highest levels should be taken to implement the findings.

Summary

The toll from chronic bronchitis includes 30,000 deaths and 16½ million lost days from work annually. In the G.P.O. 15% of all medical retirements are due to this cause. Around 10% of all attendances in general practice are for chronic bronchitis.

It is an indefinite clinical entity, which probably includes a number of separate and distinct clinical conditions.

In a study of a single S.E. London practice 127 chronic bronchitics were diagnosed (incidence of 28 per 1,000) during one year. Males numbered 71 and females 56. The incidence rises with age. No social predisposition was noted. It is indeed a chronic condition. In more than half the cases it had already been present for over 10 years. The commonest age of onset was between 30 and 60. In this particular series there was no difference between the smoking habits of those with chronic bronchitis and controls. A third of the patients were incapacitated from their usual occupation for more than a month during the year.

An attempt has been made to grade the disease into four groups of severity.

At present we have to rely almost entirely on palliative measures in the management of cases. Until its causes are defined and rational steps taken to prevent the condition, little progress can be made.

The most helpful lines of research may be closer studies of the natural course and distribution of the disease. The mortality rate from chronic bronchitis in England and Wales is far and away the highest in the world. It is some 30 times that in the U.S.A. These differences must be more closely examined.

There is a definite relationship between climate and atmospheric pollution and the disease. We have only to note that 4,500 deaths in December, 1952, were directly attributed to fog.

A nation-wide effort is necessary if we are to reduce the wasteful, and possibly unnecessary, effects of the disease.

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SALMONELLA DUBLIN OSTEOMYELITIS OF THE SPINE

REPORT OF A FATAL CASE

BY

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Bone and joint infections due to the food-poisoning salmonellae have been recorded much less often than have typhoid and paratyphoid infections. Ramon Guerra (1940), in his review of the literature on this subject, found 15 authentic cases of salmonella bone or joint infections during the period 1926–38. Thirteen of these were due to *Salm. suispestifer* and two to *Salm. breslau* (one of the two was a mixed infection with *Streptococcus haemolyticus*). Reports of *Salm. typhimurium* osteomyelitis were published by Stevenson (1938) and Krauss (1947). Vinke and Downing (1947), in their report of a case of *Salm. montevideo* infection of the knee-joint in an infant aged 6 months, state that in the 17 known outbreaks of *Salm. montevideo* infection in the U.S.A. this was the only reported instance of knee-joint involvement.

Salm. dublin, although well known as an intestinal pathogen, has seldom been isolated from bone or joint lesions. Lawrie (1952) described a chronic *Salm. dublin* osteomyelitis of the femur in a man aged 29 in which *Staphylococcus aureus* was found in association with *Salm. dublin*. Purnell (1952) reported a case of a woman aged 71 with a purulent prepatellar bursitis due to *Salm. dublin*.

The following case is reported because of the unusual localization of the *Salm. dublin* infection to the lumbar vertebrae. It was a post-mortem finding.

Clinical History

A man aged 77 who had enjoyed good health until the latter part of July, 1951, began to complain of lethargy. After a holiday in Scotland he had a shivering attack on August 11, and two days later was confined to bed with a temperature. He complained of increasing lethargy, headache, frequency of micturition, and pain in the left renal angle. Acute pyelitis was diagnosed. He was unsuccessfully treated with citrates and later with courses of penicillin and chloramphenicol. On August 28 he was admitted to the Lytham Hospital for investigation and was discharged in about a week. For the four and a half months until his death, treatment was continued in hospital and at his home. The earlier complaints persisted with increased severity and the patient suffered a long illness, characterized by rigors, high temperatures, and constant backache. Courses of chloramphenicol and aureomycin had surprisingly little effect, although the aureomycin controlled the temperature better than did the chloramphenicol. He died on January 13, 1952, the illness having lasted about five months.

Laboratory Investigations.—The bacteriological findings can be summarized as follows. *Salm. dublin* was isolated from two blood cultures, one early and one late in the illness, and from each of two specimens of urine and faeces, about midway in the disease. Many faecal specimens enriched by tetrathionate broth and selenite F medium failed to grow *Salm. dublin* except on two occasions, on October 8 and 20, 1951. It is noteworthy that before the initial isolation of *Salm. dublin* from the faeces five consecutive specimens of faeces were negative for salmonellae. The same negative results were obtained on examination of five consecutive specimens of faeces after the second isolation of *Salm. dublin*. This illustrates the difficulty which may be

experienced in isolating the organism in atypical cases of *Salm. dublin* infection. By the *in vitro* sensitivity tests the *Salm. dublin* strain was sensitive to chloramphenicol and aureomycin in the concentrations used in the disk method.

The results of agglutination tests with the patient's serum early and midway through the disease were as follows:

	September 13		October 31	
	H	O	H	O
<i>Salm. typhi</i>	Nil	Nil	1:25	1:25
<i>Salm. paratyphi B</i>	1:25	1:125	1:25	1:25
<i>Salm. enteritidis</i>	—	—	1:2,500	—

Radiographic examination of the abdomen on August 31 showed considerable osteoarthritic changes in the lower dorsal and lumbar spines.

Necropsy

Examination 20 hours after death showed an extensive haemorrhagic rash on the neck and upper part of the trunk, together with purpuric patches on the outer aspect of the left thigh and on the left great and second toes. The left thigh was very swollen, tense, and fluctuant. The mucous membranes were blanched. Basal bronchopneumonia and membranes were present. Both ventricles were oedema of both lungs were present. The myocardium was flaccid and moderately dilated, and the mucosa was slightly toneless. The whole of the small intestine was slightly dilated and the lower part of the ileum contained abundant mucus, while the mucosa itself was engorged. In the lower abdomen, the most striking feature was a large tumour mass in the retroperitoneal tissues which projected into the root of the mesentery of the small intestine and filled the left iliac fossa. It consisted partly of a saccular arteriosclerotic aneurysm of the posterior wall of the lower abdominal aorta, about 3 cm. above its bifurcation. It was a relatively large sac, the entrance measuring 4.5 by 3 cm., and the large sac, the entrance measuring 4.5 by 3 cm., and the walls were lined with thick layers of organized blood clot. It had burrowed posteriorly and to the left, and by means of its increasing size had pushed forward the lower part of the aorta. Behind the sac was a large psoas abscess which extended from the upper lumbar bodies along the psoas muscle to the mid-thigh. The bodies of the second and third lumbar vertebrae were partly destroyed and the residual portions were soft, necrotic, and oozing with pus, suggesting an acute pyogenic osteomyelitis with psoas abscess formation, associated with an aneurysm of the lower abdominal aorta. The kidneys showed chronic interstitial nephritis and at the necropsy the blood urea was 130 mg. per 100 ml.

The anatomical diagnosis was osteomyelitis of the lumbar vertebrae, *Salm. dublin* septicaemia, uraemia, basal bronchopneumonia, and cardiac dilatation.

Post-mortem radiographic examination of the lower spine revealed marked destruction of the bodies, the intervertebral disks, and of both contiguous and articular surfaces of the second and third lumbar vertebrae.

Histological examination of the affected lumbar bodies showed marked bone necrosis with polymorphonuclear response around the lesions, the pathological picture of acute pyogenic osteomyelitis.

Pure cultures of *Salm. dublin* were isolated from post-mortem specimens of blood (approximately 45 organisms per ml.) and of pus from the psoas and the thigh abscesses, and mixed cultures, including *Salm. dublin*, from the small intestine and the lung.

Discussion

The overall clinical picture was that of a typical *Salm. dublin* septicaemia characterized by rigors with high temperature and continued fever. The osteomyelitis with psoas abscess, clinically obscured by the lack of localizing symptoms and by the marked constitutional disturbance, was the main factor responsible for the continued and progressive severity of the illness, the blood stream having presumably been repeatedly infected from this source.

Bacteriological examination of post-mortem material from the lumbar and psoas abscesses showed that the progressive osteomyelitis was caused by a single salmonella type and not by a mixed infection. The histological appearances of the affected lumbar bodies, closely resembling the well-known picture of acute pyogenic osteomyelitis, serve to demonstrate that salmonella osteomyelitis may be similar to or identical with bone infections produced by other pyogenic organisms and that the diagnosis must always be made by the isolation of the actual organism from the lesion.

The localization of the disease to the lumbar spine could be explained as a metastatic lesion or as a haematogenous osteomyelitis. According to the literature, the latter is a relatively rare or infrequent finding. Weaver and Sherwood (1935) state that haematogenous osteomyelitis due to *Salm. suispestifer* apparently occurs only in infants.

A more likely explanation lies in the association of the lesion with the aneurysm of the lower abdominal aorta. The repeated and continued erosion of the lumbar bodies by a large aneurysm would provide a locus minoris resistentiae with localization of the organism and the production of acute osteomyelitis. Most authors agree that in the production of typhoid and paratyphoid osteitis and osteomyelitis injury is an important localizing factor. This association has also been observed and recorded in the food-poisoning salmonellae infections, although much less often than in the typhoid lesions. Steuer (1937), in his case of *Salm. breslau* infection in a boy of 12 years, states that a bicyclist accident eight days before the onset of the illness precipitated osteomyelitis of the sacro-iliac joint. The same article mentions the case of a young woman in whom obstetric manipulation was followed by fatal *Salm. suispestifer* infection. Purnell (1952), in his case of atypical *Salm. dublin* infection, states that a fortnight before the onset of the prepatellar bursitis the patient fell and injured her knee.

Although the psoas abscess could have caused the aneurysm of the lower abdominal aorta, the degree of aortic atheroma strongly favours the presence of an aneurysm long before the abscess developed.

The mode of infection could not be traced. Food-poisoning during the patient's visit to Scotland was the most likely explanation. Potential domestic sources of infection were explored. No history of infection was obtained from the only two surviving members of his family. Single faecal and urinary specimens from one of them failed to reveal salmonellae. Samples of the household milk, which came from four different sources, were examined for salmonellae, with negative results.

Summary

A fatal case of bacteriologically verified *Salm. dublin* osteomyelitis of the spine is recorded and the relevant literature is reviewed.

The localization of the osteomyelitic lesion was probably associated with a large arteriosclerotic aneurysm of the lower abdominal aorta.

There is no specific histological or radiological picture in salmonella osteomyelitis. The diagnosis rests upon the isolation of the organism from the lesion itself.

I am indebted to Dr. D. M. Anderson and Dr. J. Glynn for the clinical history, and to Dr. Joan Taylor for identifying the organism.

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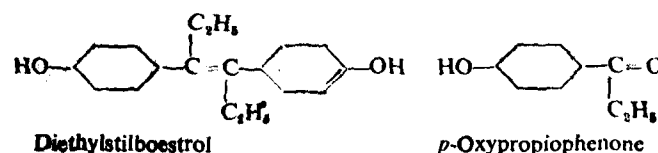
p-OXYPROPIOPHENONE IN TREATMENT OF MENOPAUSAL DISORDERS

A STUDY FROM GENERAL PRACTICE

BY

ALBERT W. BAUER, M.D., M.R.C.S., F.I.C.S.

No reliable agent for provoking the secretion of anterior pituitary follicle-stimulating hormone (F.S.H.) has yet been discovered. To inhibit its secretion, however, we can use oestrogens and androgens; these substances will act as a brake on the anterior pituitary, but they have unwanted and even dangerous effects on the genital organs. For a long time, therefore, a search has been made for a substance which would inhibit pituitary activity without exerting a peripheral stimulating action. Buu-Hoi *et al.* (1950) and Lacassagne *et al.* (1950) succeeded in modifying the chemical structure of synthetic oestrogens in such a way that they lose their peripheral oestrogenic action. The new compound, which they have called 4-hydroxy-propio-phénone, represents chemically one-half of the diethylstilboestrol molecule:



Perrault (1950) introduced this substance into therapy. Several authors (Perrault and Vignalou, 1949; Perrault *et al.*, 1949; Gennes *et al.*, 1950; Husslein, 1951) have reported that, in men, *p*-oxypropiofenone ("popp") tends to inhibit the gonadotrophic secretion of the anterior pituitary, although its oestrogenic activity is less than 1/10,000 to 1/1,000 of that of stilboestrol (Hohlweg, 1949). The potential value of the compound was quickly recognized. Perrault, de Gennes *et al.*, and Husslein used it clinically in conditions in which they suspected excessive anterior pituitary activity, especially where this was associated with hyperfolliculinaemia. They claimed that symptoms could be controlled without undesirable side-effects.

Clinical Trial

It seemed of interest, therefore, to try the compound in cases in which peripheral oestrogenic activity could be readily assessed, control of anterior lobe function seemed

Some Details About the 34 Patients Treated

Age Groups:	45-50	51-55
Last period 2 years ago	10	4
" " 3 or more years ago	12	8
Flashes up to 15 or more daily	16	8
" " 5 a day maximum	6	4
Vaginal smears, cornification present	20	7
" " semi-atrophic condition	4	3
Weight normal	11	5
" above normal	7	4
" under	4	3
" after treatment normal	15 (+4)	6 (+1)
" " above normal	3 (-2)	3 (-1)
" " under	3 (-1)	2 (-1)

desirable, and the symptoms could not be ascribed entirely or primarily to deficiency of oestrogens. The substance was therefore submitted to clinical test in 34 women complaining of post-menopausal disturbances, in particular of flashes (see Table). Most of these women had previously received treatment with oestrogens for periods of at least six months without improvement, and they could therefore be regarded as refractory. Before treatment with "popp" (four weeks or more after the last administration of oestrogens) vaginal smears were examined. In 27 cases vaginal cornification was still in evidence, whereas in the remaining seven cases the epithelium showed the typical semi-atrophic appearance with prominent basal and transitional cells. Eleven of these women were overweight, seven were somewhat below normal weight, and none of them showed any complicating systemic disorder. The group as a whole was thus highly selective, being composed of women with varying oestrogen levels but with the common characteristics of frequent flashes refractory to oestrogen medication.

After the initial vaginal smear, treatment was begun. Following Husslein's procedure 0.5 g. of "popp" was given twice daily by mouth and this dosage was maintained until the frequency of flashes was significantly reduced; the dose was then gradually lowered to a maintenance dose of 0.1 g. twice daily for two to three months, after which treatment was stopped. In the cases which did not respond the maintenance dose of 0.1 g. twice daily was also stopped after three months. During treatment vaginal smears were examined periodically.

Results

Effect upon Flashes.—In 31 out of the 34 patients the symptoms were readily controlled by treatment. For instance, in a woman aged 55 who had had no period for two years and had experienced up to 15 flashes daily the attacks were reduced after 11 days' treatment to one or two flashes daily. Continuation of the treatment at the reduced dosage level resulted in reducing their occurrence to one every third or fourth day, and ultimately to one weekly, and this only in the presence of some exciting factor such as agitation. The symptoms did not recur after stopping treatment, and the patient has remained free of symptoms (duration of observation one year). Similar striking results were observed in 30 other patients. In three there was no definite effect. They were sophisticated women who had already seen many physicians and had demanded hormones for their rejuvenating effect (which effect I failed to observe in them).

Effect upon Vaginal Smears.—Cornification persisted throughout treatment in 19 of the 27 women in whom it was present before treatment, nor did cornification appear to be reduced after treatment (six weeks after its termination). In the seven women in whom the smears had shown a more or less atrophic condition of the epithelium, cornification was not restored with the doses used; however, it must be stressed that the smears were taken after the dose had been reduced to 0.1 g. twice daily (equivalent to less than 1/1,000 to 1/100 mg. of stilboestrol).

Toxic Effects.—No toxic effects were observed, and the only side-effect was slight indigestion, which responded rapidly to sodium bicarbonate. Three overweight patients lost some weight. There was no vaginal bleeding either during treatment or after its termination, and no other pelvic changes were noted.

Discussion

The results indicate that in a high proportion of women with menopausal flashes refractory to oestrogens control may be achieved by "popp." (I have lately used "popp" indiscriminately in all cases of menopausal flashes with satisfactory results.) The response can safely be ascribed to medication rather than to any psychological reaction to treatment, since all the women had received treatment "with tablets" before the present course without reporting any response.

It is unlikely that the drug acted by virtue of its peripheral oestrogenic action, not only because animal tests have shown this to be low but also because the doses used failed to evoke vaginal cornification. The drug's apparent efficacy is of particular interest as its use may obviate two dangers which occur in oestrogen therapy. Oestrogens may advance precarcinomatous conditions; in addition, they may give rise to an "unphysiological state." In the natural climacteric oestrogens are gradually eliminated from the endocrine concert, and any artificial increase in their level, besides placing an additional burden upon the mechanism of sterol inactivation, tends to aggravate the state of disbalance now recognized to be present in many menopausal disorders (*British Medical Journal*).

In the present series absence of irregular vaginal bleeding was particularly noticeable, as bleeding is a common occurrence in patients receiving oestrogens and is worrying to both patient and physician alike.

While it is clear that the clinical effect of "popp" can hardly be ascribed to its minute oestrogenic action, it is difficult to provide a satisfactory alternative explanation. The control of anterior pituitary secretion which Lacassagne and others claimed for "popp" has not been observed by and others experimenting on animals (Guillemin, 1951; Money *et al.*, 1951; Paulsen *et al.*, 1951; Schaffenburg *et al.*, 1951). It is of course possible that the substance is sufficiently potent to regulate anterior lobe function during the labile menopausal state. Further clinical experiments, involving the study of the gonadotrophic titre of the urine, are now being planned.

Summary

Thirty-four women with post-menopausal flashes uncontrolled by oestrogens were treated with *p*-oxypropiofenone ("popp"). This drug is related to stilboestrol and is claimed to inhibit pituitary gonadotrophic activity without exerting a peripheral oestrogenic effect.

Of the 34 patients, 31 were completely relieved of their symptoms. There were no toxic effects and no vaginal bleeding such as may be encountered during oestrogen therapy.

Smears taken during and after treatment showed no evidence of vaginal cornification in seven patients with evidence of vaginal cornification in seven patients with evidence of vaginal cornification. This is interpreted as indicating that "popp" does not exert any appreciable oestrogenic effect.

The mode of action of the drug is discussed.

I am indebted to Messrs. Metochem, of Vienna, VI, Austria, for supplying tablets of "inphysen" (*p*-oxypropiofenone) and to Messrs. Arthur H. Cox & Co., Brighton, for making up such tablets. I am also indebted to Dr. Erica Wachtel for cytological information concerning vaginal smears.

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THE WINTER VOMITING DISEASE

A REPORT FROM GENERAL PRACTICE

BY

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About the end of January, 1953, we began to see a number of patients whose main complaint was sudden and severe vomiting. Measles and the usual feverish colds were prevalent, chickenpox was ending after a mild visitation, influenza due to virus A had just arrived from the South, and there were a surprising number of cases of true lobar pneumonia.

The typical story was of a person going to bed "as right as rain" and waking up in the early hours to vomit energetically, repeatedly, and copiously. This was preceded by brief nausea, accompanied by epigastric pain and some collapse, and followed by a few loose pale stools. The appetite was poor and nausea persisted for a day or two, after which recovery was complete and the patient was ready to accept the diagnosis of "gastric flu" from either his doctor or his friends.

This diagnosis was not confirmed by serological tests from nine patients. No change was found in complement-fixation titre to virus A or B of influenza, as between sera taken early in the disease and after recovery.

Faeces from six patients were not found to contain pathogenic organisms. E.S.R. and white-cell counts were done for four patients seen in the acute stage, and were normal.

It was decided to make a more detailed study, and it soon became apparent from patients whom we examined that friends and relatives had suffered from this disease but had not consulted a doctor. Of 46 patients 11 neither called nor consulted us for their attack of vomiting. It was obvious that the epidemic was far larger than we ever knew.

We were not impressed with the infectivity of the disease, for of our 46 patients 35 were the only sufferers in the household. Frequently there was another member of the family who had had a cold, but this was thought to be coincidental. Only five of our patients had an upper respiratory infection at the time of their attack.

The illness was brief, usually less than two days, though those patients whom we had previously treated for functional dyspepsias took longer to recover. There were six such patients, and their illness lasted six days on an average.

Only one patient had a relapse. Two patients who never vomited are included in the series. Both were seized with diarrhoea at dawn, for no obvious reason, and both lost their appetite for a day or two. One such attack was followed the next day by the typical illness in another member of the household.

It seemed to be impressive that only two patients ascribed their illness to food. Why food, which is blamed for hypertension, rheumatism, and the failing strength of old age, should escape incrimination for a gastro-intestinal upset is a mystery which was not solved. One man ascribed his attack to having just felt the first movement of his first child in his wife's abdomen.

The typical attack is easy to recognize in an epidemic; the less typical or the isolated attack has to be distinguished

Incidence of the Disease

By Date		By Age	
Week Beginning	No. of Cases	Years	No. of Cases
Jan. 1	0	*0-9	14
8	2	10-19	8
15	1	20-29	4
22	0	30-39	9
29	5	40-49	2
Feb. 5	10	50-59	1
12	12	60-69	4
19	6	70-79	3
26	4	80-89	1
Mar. 5	3		
12	2		
19	1		
26	0		
Apr. 2	0		

* Only 3 cases under 3 years old.

Frequency of Symptoms

Vomiting	44	Constipation	12
Anorexia	40	Headache	12
Nausea	37	Pale stools	12
Abdominal pain	29	General aching	10
Diarrhoea	22	Fever	8
Collapse	21		

Other less frequent symptoms were giddiness, bradycardia, hiccup, cramps, and abdominal distension.

Time of First Vomit

	No. of patients		No. of patients
Noon to 4 p.m. ..	2	Midnight to 4 a.m. ..	18
4 to 8 p.m. ..	3	4 to 8 a.m. ..	11
8 p.m. to midnight ..	6	8 a.m. to noon ..	4

Two patients did not vomit.

from food-poisoning, Sonne dysentery, infective hepatitis, appendicitis, and the beginning of an upper respiratory infection in children, especially measles. Laboratory tests help to exclude some of these. Positive help in establishing the diagnosis is not yet available.

The disease has previously been described under the name "winter vomiting disease" or hyperemesis hiemis, and reports of a few epidemics have been published.

The epidemic here described appears to conform; and the belief that there is no such disease as "gastric flu" seems to be strengthened.

I am grateful to my partners, who took the trouble to investigate thoroughly what was really a trivial disease, and to Dr. H. T. Findlay, of the Public Health Laboratory, Wakefield, for his advice and for the assistance given by his laboratory.

Medical Memorandum

Dysgerminoma of the Ovary

Dysgerminoma of the ovary is not a very common tumour, and when it does occur often presents before the age of 20. A case is described of such a tumour in a child of 8, the tumour itself having undergone torsion. So far as I can ascertain from the literature this is the first case in which this has been recorded. Novak (1941) reports a case in a child of 6, but this tumour had not undergone torsion.

CASE HISTORY

A girl aged 8 was admitted on March 4, 1951. She had been in good health until five days before admission, when she suddenly developed colicky pain in the mid-abdomen just below the umbilicus and vomited shortly afterwards. The pain had been present on and off ever since, but lately had become more constant. Vomiting had persisted since the onset. There had been normal daily bowel actions until the morning of admission. On this day she had had several loose motions. There were no urinary symptoms.

She was an ill-looking child with a temperature of 102.8° F. (39.3° C.) and pulse of 100. There were no abnormal findings other than those in the abdomen. Here an obvious swelling was visible in the lower part in the mid-line. It was hard and extremely tender, with a well-defined edge, and seemed to arise from the pelvis. There was no rigidity in the abdomen but some guarding; rectal

examination revealed a firm tender mass in the pouch of Douglas. A catheter produced a few drops of urine. The abdomen was then re-examined, the findings being exactly the same. Urine examination was normal, and the white cells numbered 19,000 per c.mm. An exact pre-operative diagnosis was not made.

It was decided to perform a laparotomy. The abdomen was explored through a right lower paramedian incision, and some free blood-stained fluid was seen. A solid ovarian tumour which had undergone torsion was found. This tumour had replaced the right ovary. The left ovary looked normal, and the uterus was the usual size for a child of 8. Rapid exploration of the abdomen did not reveal any evidence of disease elsewhere. The tumour was removed easily and convalescence was uneventful. The pathological report, for which I am indebted to Dr. A. G. Marshall, was as follows:

"The specimen consists of an ovarian tumour which is ovoid in shape, measures 10 by 7 by 6 cm., and weighs 147 g. Its surface is lobulated and one half is engorged. The cut surface shows this half to be heavily infiltrated with blood, but the rest consists of a white tumour; it is soft and has no definite structure, but there is a suggestion of cyst formation in it. It is very mucoid. Section shows the tumour to be composed of large cells having a fairly abundant cytoplasm and a large oval nucleus. They lie packed together in clumps, giving them a polygonal appearance. There are large numbers of mitotic figures. Between the clumps there are fibrous trabeculae, which in this case are not infiltrated by lymphocytes. While the capsule at this point is intact, there is infiltration of it by the tumour cells. An unusual feature is one alveolus made up of columnar cells. It might be an example of metaplasia, it might represent a residual embryonic structure, or it might suggest an origin in an embryoma. The appearance is that of a dysgerminoma of the ovary. Novak states that a fairly high proportion are malignant, but, of course, this case was operated on before there was evidence of local spread. It appears that radiotherapy is often useful. It is noted that there is no sexual abnormality. I should be interested to know whether there is an abnormality of the urinary tract, as so often occurs."

The Hogben test was negative.

On receipt of the pathological report the child was examined particularly for signs of pseudohermaphroditism, but no signs were found. A chest radiograph was quite normal. In view of Dr. Marshall's question about the urinary tract an intravenous pyelogram was performed, but this also was normal.

COMMENT

Dysgerminomas are not common tumours. Novak (1941) reports what appears to be the youngest case, that of a child of 6. Pick (cited by Matsner, 1923) records a case in a child of 9. Rösle (1912) records a bilateral dysgerminoma with metastasis in a child of 12. This case therefore appears to be the second youngest recorded in the literature and the first case of torsion of such a tumour. Willis (1948) states that three-quarters of the subjects are under 30 years of age and quotes Meyer's (1951) original review, in which 27 out of 48 cases were associated with pseudohermaphroditism. However, the proportion of subsequently recorded cases of dysgerminoma associated with pseudohermaphroditism has been much lower. The tumours are essentially malignant and capable of metastasis. Klasten (1933) refers to metastasis in the lymph nodes and peritoneum, and Kirshbaum and Newman (1943) performed a necropsy three years after removal of the ovarian growth and showed that there were deposits in the lungs, liver, kidneys, and peritoneum.

I am indebted to Mr. J. C. Newbold for permission to deal with this case and to Dr. A. G. Marshall for the pathological report and Hogben test.

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Reviews

THE MEGALOBlastic ANAEMIAS

The Megaloblastic Anaemias. By Professor L. J. Davis, M.D., F.R.C.P., F.R.C.P.Ed., F.R.F.P.S.G., F.R.S.Ed., and Alexander Brown, M.D., F.R.C.P.Ed., F.R.F.P.S.G. (Pp. 113. 21s.) Oxford: Blackwell Scientific Publications. 1953.

A few years ago a critic attacked clinical scientists for working on problems which were esoteric and unimportant. So far as the study of the symptomatology of advanced disease is concerned this is fair criticism, but he then went on to cite pernicious anaemia as a case in point. Few examples could have been worse chosen. Pernicious anaemia is a relatively uncommon disease, but it is one of a group of megaloblastic anaemias some of which cause much sickness and many deaths in the Tropics. The true answer, however, is that the study of pernicious anaemia has given us two new and important vitamins, folic acid and vitamin B₁₂, and has opened up a large number of problems of great physiological and pathological interest. To mention only a few, there are the significance of the gastric secretion, the aetiology of simple atrophy and cancer of the stomach, the ology of intestinal absorption, and the maintenance of mechanism of the long tracts of the postero-lateral columns of the spinal cord. This is the story that Davis and Brown have sat down to tell, and they have done it in small compass and with great skill. They discuss the whole range of pass and with great skill. They discuss the whole range of megaloblastic anaemias, which are clearly defined and catalogued. Haematological controversies and minutiae are logued. Haematological controversies and minutiae are skillfully avoided and the relevant facts are presented in their right perspective. Indeed, the skill with which they have outlined the numerous problems which are exercising and exciting research workers in this field is remarkable: to give but one example, the chapter on the aetiology of the megaloblastic anaemias is a model of exposition of a difficult subject. Where possible the approach is historical, and in this connexion the authors pay a deserved tribute to a brilliant essay on the history of pernicious anaemia by a Robb-Smith which is too little known. This book is a monograph which any physician will be able to read with interest and profit. It is delightfully produced, and it reflects much credit both on the publishers and on the Scottish school of haematology.

L. J. WITTS.

BRITISH MEDICAL MEN

British Medical Science and Practice. An anthology arranged and edited by G. F. Petrie, M.D. (Pp. 172; illustrated. 15s.) London: Longmans, Green & Co. 1953.

The British Contribution to Medicine. By Dr. Jaime Jaramillo-Arango. Foreword by Sir Arthur MacNalty, K.C.B., M.D., F.R.C.P. (Pp. 220; 45 plates. 25s.) London: E. and S. Livingstone Ltd. 1953.

British Medical Science and Practice is an anthology which was begun by the British Council during the second world war with the object of allowing doctors practising abroad to follow the development of British medicine. The book is in three parts. In the first part 10 medical pioneers are chosen and to each is allowed a chapter of pages of quotations selected from their own writings and from their biographies, and thus Dr. Petrie builds up an attractive portrait of his subjects' personality and achievement. This is an ingenious and successful method and there will be few readers who are not stimulated by some observation unknown or forgotten. The chosen 10 are Harvey, John Hunter, Jenner, Charles Bell, Bright, Addison, Simpson, Florence Nightingale, Lister, and Manson; the last of the list was born in 1844 and the first in 1578. Their greatness is undisputed, and in no alternative selection could rival them in achievement, in universality, or in personality. The third section is composed of 98 extracts from the writings of modern masters. Here the intention is to give a picture of the British contribution to medicine and its related sciences during the last

25 years. While the names of these stars cannot rival the Great Ten, it is inspiring to remember that they include Lewis, Barcroft, Sherrington, Hopkins, Dale, Harington, Almroth Wright, Ronald Fisher, Fleming, and Dodds. The quotations vary in significance and importance, but many of them record discoveries and advances which are landmarks in modern medicine. There is included a brilliant description by Sherrington of the activities of the "roof-brain" during sleep, a dramatic personal account of the effects of salt deficiency by McCance, and a physician's discussion by Christie of the physical signs of emphysema. Although the second part, which is devoted to selected aphorisms, does not equal in interest the other part of the book, it is yet pleasant to find here one modern—Geoffrey Keynes, our great surgeon-bibliographer—undismayed by his departed and distinguished company. Dr. Petrie has constructed an admirable book, well suited to occasional reading.

Dr. Jaime Jaramillo-Arango during the recent war was the ambassador of the Republic of Colombia to Great Britain and has written this tribute to British medicine. It is said to be a historical survey of six medical advances in which British workers have played a predominant part: antityphoid inoculation coupled, as the toastmasters say, with the name of Almroth Wright; penicillin and Sir Alexander Fleming; the mosquito in malaria and Ronald Ross; paludrine and F. H. Curd, D. G. Davey, and F. L. Rose; vitamins and Gowland Hopkins; stilboestrol and Sir Robert Robinson and E. C. Dodds. Although the toast is the British Contribution to Medicine, the book, like many excellent after-dinner speeches, strays from its subject. Its greater part deals historically with antibiotics, malaria, nutrition, and cancer. Medicine is universal and indivisible, and to have included only the British contribution to these world-wide investigations would have excluded too much. It would be churlish, however, to refuse a compliment from a surgeon-ambassador, and we can in reply congratulate Dr. Jaramillo-Arango on his erudition and his eloquence.

D. V. HUBBLE.

THE NEW PSYCHOLOGY

Progress in Clinical Psychology. Edited by Daniel Brower, Ph.D., and Lawrence E. Abt, Ph.D. Volume 1, Sections 1 and 2. (Section 1: Pp. 328. 37s. 6d. Section 2: Pp. 235. 43s.) New York: Grune and Stratton. London: George Allen and Unwin. 1953.

Since the second world war there has been rapid development in the application of psychological techniques, and in the clinical field in the U.S.A. this has received great encouragement from the policy of the Veterans Administration of making use of the highly trained non-medical worker in assessment, treatment, and rehabilitation. In America, industry and its administration, education, child care, psychiatry, criminology, and the armed Forces have made use of the graduate psychologist and are making an increasing demand on the universities for larger training programmes and for more specialized postgraduate training in this field. As defined in these books, the clinical psychologist is no mere medical auxiliary, and his clinic may be the school, the workshop, the personnel department, the court, or the advertising conference. The psychological consultant is now prepared to take charge of such problems as stammering, discontent in the factory, personal maladjustment, and vocational guidance, which have for long been thrown at the doctor as a sort of general sage, in spite of the fact that he has had no more preparation for it than any other intelligent citizen. Clinical psychology can now claim that it has no more seers and mountebanks in its ranks than psychiatry, and that there is so much to do that there is plenty of room for both clinical and medical psychologists. As a logical step it now seeks to establish a synthetic code of ethics, consonant with its non-traditional development, and this is roughly the position in the English-speaking countries at the moment.

The editors have undertaken the large task of selecting and summarizing the more important contributions to the

literature of the subject in the last seven years. They have also indicated more general trends and their place in the development of the subject as a whole. The first section is mainly devoted to developments in method, while the second deals with psychology as applied in a variety of fields, and its relation to the contributory sciences such as cultural anthropology, statistics, and sociology. The whole approach is American, as is by far the greater part of the literature quoted. Since psychology has manufactured its own jargon in the course of a rapid development, the terms used are often rather surprising. Dr. Abt, who is director of research in a department of biomechanics, is as concerned as we are at the irreconcilability of the psychologists, whose approach is too rigidly scientific, and of those who are by nature intuitive and "psychodynamic." In fact, he says that "there is a nomothetic-idiographic dichotomy in clinical psychology that demands resolution." On the idiographic side American psychology seems still to be tied very closely to the psycho-analytic approach and to the "client-centred" therapy in which it is applied.

There is no doubt that in spite of the variations in quality inseparable from multiple authorship this book is a most valuable conspectus and source-book of recent psychological literature in the field of human relations and human maladjustment. The sections on the development of children and the mental hygiene of the family give an indication of the amount of conflicting testimony in this field. In fact, from the work quoted a very sound case could be made for the thesis that the greatest danger to a child's successful adjustment to society is a consciousness on the part of his parents that he has any psychology at all.

It is intended to publish further volumes every second or third year, and as judged by the first two sections the book should find its place as a valuable work of reference.

ALEXANDER KENNEDY.

CLINICAL ELECTROCARDIOGRAPHY

Clinical Electrocardiography. By David Scherf, M.D., F.A.C.P., and L. J. Boyd, M.D., F.A.C.P. Fourth revised edition. (Pp. 490; 292 figures. 42s.) London: William Heinemann, 1953.

The authors begin by describing the standard bipolar leads. This is soundly done in the old-fashioned way. The description of the chest leads might well be clearer, and the unipolar limb leads come somewhat later. One feels that the large mass of information which the beginner must absorb in those sections might have been simplified considerably if approached in a more modern way. Sometimes also CR leads are referred to as well as V leads. There appears to be no guiding principle in all this, and mental confusion must result. The effect of the position of the heart on the electrocardiogram needs further exposition, particularly for readers who are going to use the old standard bipolar leads. The difficulties which arise in lead III are not made easy. The little section on artifacts is good; it is a pity these also appear in some of the illustrations; not a few are blurred and indistinct and are below the level one expects in a book from the U.S.A. The illustrations throughout are the three standard leads and sometimes a fourth; but what that may be is never indicated. When we look for more modern topics we find a remarkably clear account of the ventricular gradient; this is well done in two pages. The last chapter, on vector cardiography, is very good too, as clear an exposition as we have read anywhere.

There is a great deal of information in this edition, much more than in the second, while the book is very little longer, which is a matter for congratulation. But it does not seem that the now apparently complex subject of electrocardiography is made any easier by reading it. Most of the difficulties that baffle the beginner come from the standard bipolar leads. They do not muddle the more experienced, but for the neophyte a new approach is easier by way of the unipolar (so-called) leads. This has been done nowadays with much success and encouragement.

TERENCE EAST.

TEXTBOOK OF THERAPEUTICS

Therapeutics in Internal Medicine. By 84 Authorities. Edited by Franklin A. Kyser, M.D., F.A.C.P. Second edition, completely revised and reset. (Pp. 830. £5 10s.) London: Cassell and Co. 1953.

This is the fourth book on the therapeutics of internal medicine compiled in America which we have reviewed in the last year and a half. As this volume, like the others, is large and not inexpensive, it is a testimony to the wide spread interest in therapeutics which exists in that continent. Like the others also, this is a composite work written by a group of outstanding men whose investigations and teaching experience in certain phases of internal medicine qualify them to make authoritative statements. There are 84 of them, 66 of whom are professors, emeritus professors, associate professors, assistant professors, or directors of large units. As each of the other three volumes could field a team roughly comparable in size and distinction, and as there was practically no overlapping between them, they exemplify the number and diversity of the medical pundits of America.

This book covers much the same ground as the other four and gives much the same therapeutic advice. Indeed, in up-to-date teaching centres throughout America, in Britain, Canada, Australia, New Zealand, Scandinavia, and Holland, it is remarkable what general agreement there is on therapeutic principles, though the same cannot be said of other European countries. This volume is planned to present material related only to treatment, and discussions of physiology, aetiology, pathology, and clinical descriptions of disease are reduced to a minimum. In this respect it differs from at least one of its competitors, which is really a textbook of scientific medicine with an emphasis on treatment. It differs from another in that its information is conveyed in ordinary descriptive paragraphs and not in a notational or tabular form nor in the imperative mood. An extensive random sampling of the contents of this second edition leaves no doubt of its excellence. Likewise the printing and production are admirable.

D. M. DUNLOP.

In preparing the recently issued seventh edition of their now classic textbook *Disorders of the Blood*, Whitby and Britton have added a new chapter on cytochemistry and biochemistry, and have extensively revised the chapters on haemopoietic metabolism, therapeutics, coagulation, and the purpuric and haemorrhagic diseases. This is the third edition of the book to be issued since the end of the war, and though it bears the date 1953 the authors have attempted to bring it up to date to the middle of that year. It is published by J. & A. Churchill Ltd. for 63s.

Common Diseases of the Ear, Nose, and Throat by Philip Reading has appeared in a second edition. The book is intended for medical students and newly qualified doctors, and description of operative techniques is confined chiefly to those minor operations which a house-man might perform. It is published by J. & A. Churchill Ltd. for 22s. 6d.

Professor A. D. Gardner has revised his *Bacteriology for Medical Students and Practitioners* for the fourth edition (Oxford Medical Publications, 12s. 6d.), paying special attention to the rapidly growing specialty of virology.

Professor C. F. V. Smout and Dr. F. Jacoby have revised their textbook, called in its last edition *Gynaecological and Obstetrical Anatomy*, and have added to the title the words *And Functional Histology* so as to "indicate quite clearly the inclusion in it of the dynamic histology of the female reproductive system and its endocrine control." A new section has been included under the title "Milestones in Midwifery." The book is published by Edward Arnold & Co. for 35s.

Rawling's Landmarks and Surface Markings of the Human Body has been revised for its ninth edition by Mr. J. O. Robinson. Only a few minor alterations to the text have been found necessary, but the section on ossification and epiphyses of the skeleton has been extended. It is published by H. K. Lewis for 12s. 6d.

The Treasury of Human Inheritance, Volume 5, Part 2, is *On Syndactyly and its Association with Polydactyly*. It is by Dr. Julia Bell and Dr. L. S. Penrose, and in accordance with the usual plan includes a discussion on the subject, case histories, and pedigrees. The book is published by the Cambridge University Press for 10s. 6d.

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TORONTO MEETING OF THE B.M.A. 1955

The Annual Meeting of the B.M.A. in 1955 will be held in Toronto, jointly with the Canadian Medical Association. Plans for this are already far advanced and every effort is being made on both sides of the Atlantic to provide an outstanding scientific programme. Our Canadian colleagues are determined to make this, the fourth meeting of the Association to be held in Canada, an event which will long remain in the memories of those fortunate enough to attend it. The ties that unite Britain with the Commonwealth are perhaps now stronger than ever. In keeping them strong the professions in the various Commonwealth countries and in Britain have a vital part to play, and this is especially true of the medical profession. There is a steady two-way traffic of medical men and ideas between Britain and the Commonwealth which, moreover, affords an unrivalled opportunity for seeing and hearing doctors of two countries confer on those matters which are fundamental to the science and art of medicine.

The meeting in Toronto in 1955 will be particularly notable because Dr. T. Clarence Routley, now the General Secretary of the Canadian Medical Association, will be installed as President of the B.M.A. for 1955-6. Dr. Routley, a graduate of the University of Toronto, got to know many of his British colleagues during his four years' service in the war of 1914-18, and his many visits have since then ripened acquaintances into friends. During recent years he has played an outstanding part in the development of its Council Medical Association, being Chairman of its Council in its first five formative years. The letter from him in its first five formative years. The letter from him we print in this week's correspondence columns is typical of the open-handed generosity we have come to expect from our Canadian colleagues. Knowing the difficulty so many in Britain will have in obtaining dollars for the Toronto meeting, Dr. Routley tells us that "Toronto doctors and their wives are opening their homes to those members who indicate to the Secretary of the B.M.A. that they would be prepared to accept private hospitality during the week

of the meeting." Many distinguished members of our profession have already signified their intention to attend the 1955 Annual Meeting in Canada. It is hoped that those who have so far not made up their minds will take advantage of the Toronto doctors' generous offer of hospitality and write to the Secretary of the B.M.A. about it. Though the Bank of England will, in allotting dollars, take into account the desirability of the visit, a limitation of numbers is inevitable. Plans must be laid well ahead of the event. We would urge all those who can go to go, so that the British medical profession may be worthily represented on what will be a great occasion.

MALARIA IN AFRICA

It is a curious feature of a certain attitude to the most malarious of the continents that there alone men demand to know not only whether we can control malaria but also whether we are entitled to do so, postulating possible damage to the people from the well-intentioned act. The doubt was raised twenty years or so ago, particularly by Wilson,^{1,2} when it was academic only because man's inability to control malaria in Africa on any considerable scale then seemed certain. As the ability seemed to improve there was an increasing demand that action should be postponed until the long-term effects could be shown to be desirable, and the case against positive prevention was put more forcibly.^{3,4} The grounds of doubt lay in the undeniably common acquisition of a firm resistance by the African adult and the less well established belief that the child and even the young infant suffered little or no ill effect. In the extreme view the African found the malaria parasite a harmless commensal; in a less extreme view the infant suffered no more than moderately, but gained thereby an immunity which was a passport to safe travel in the most malarious circumstances and an insurance against the risks of a local recrudescence of the disease. If the extremists were right control was pointless; if those holding the less extreme view were right control would deprive the adult of an immunity worth more than the price paid for it. Controversy arising out of these opinions led the World Health Organization to assemble the Kampala Conference,⁵ at which it was agreed that control should never be withheld on the grounds of its undesirability. Since then, however, inaction has been advocated by Davey,⁶ Macgregair,⁷ and others for another reason—the effect of disease control in increasing pressure of populations. It may be noted that this reason is in direct opposition to the previous ones, according to which control should not have materially affected the death rate.

Meantime confidence in the ability to control malaria in equatorial Africa has been growing. There were initial disappointments in the effect of D.D.T. on African malaria, and work by Muirhead-Thomson⁸ led to the belief that the most potent vector, *Anopheles gambiae*, might not be poisoned by this insecticide. His work has been continued and much elaborated, notably by Davidson,⁹ and it is now known that that mosquito is fully susceptible, the reasons for Muirhead-Thomson's finding lying in the insecticide rather than in the mosquito. The point has been established by the successful control measures with either D.D.T. or benzene hexachloride in Rhodesia, the Transvaal, Mauritius, Madagascar, the Belgian Congo, and elsewhere. Analysis of the reasons for the early failures shows that insecticidal regimes which may be effective elsewhere might well prove insufficient to stop the intense transmission typical of Africa, but Davidson and Draper¹⁰ have shown the standards of efficiency needed. In the opening pages of this issue Dr. L. J. Bruce-Chwatt describes a pilot trial in an area of Nigeria selected on account of the difficulty of control; he shows that a particular method of benzene hexachloride dosage can virtually control the disease, and there is little doubt that a modified method could do so completely.

The story of failure is now becoming rare, though positive evidence of success is still lacking in some places, particularly in those parts of East Africa where the doubts have been greatest. It is reasonable to assert that African malaria at its worst can be controlled, but there is no doubt that prevention will be more expensive there than elsewhere because bigger doses of insecticide applied more often will be needed. So now the next doubt arises: Can Africa afford to control malaria? Bruce-Chwatt reviews all these questions as they affect Nigeria, and concludes that malaria can and ought to be prevented in so far as the country can afford it and provide the necessary administration and practical support. He might go further than he does. Britain's justification for authority abroad lies largely in adherence to a principle that the survival of the individual, and his freedom from fear, want, or disease, must not be sacrificed in the interests of the community save in the most pressing and evident danger to the latter. The entitlement of the public health authority to

prevent the transmission of disease has been put beyond question in our own country. Practice takes no account of loss of immunity or the fact that survivors might be a burden on the community, but rests solely on the harm done to the individual, on the practicability of preventive measures, and on the willingness of the public to pay for them. If our diminishing authority abroad is to have any justification we must actively support this attitude to the prevention of disease. But campaigns against disease must always be integrated with other work towards economic and social advancement and may often have to be sacrificed in the interests of temporarily better causes or of urgent need for economy. No harm is done thereby so long as a positive attitude is adopted that disease should be controlled unless good cause is shown why it should not be, instead of the negative one that action should be withheld until all avenues have been explored for any possible detriment to the community resulting from action benefiting the individual.

Among the fundamental weaknesses of Africa are lack of a traditional money economy, infertility of soil, land tenure and farming systems which diminish fertility, and ill-health. Further analysis and research is needed before remedies can be found for the first two; remedy of the third demands both analysis and disturbance of the social structure; but improvement in the last does not await technical knowledge, though of course more is desirable. The real problem is the full integration of all forms of progress: the justifiable fears are those of imbalance. Sanitary advance, which some think has been too long delayed, could be mounted on a scale which the countries could not support, and thereby lead to its own ruin. The aim is to achieve a rate of advance which is financially practicable and which will not weight the scale against other equally desirable forms of progress.

PULMONARY EMBOLISM

Considerable interest has been taken in venous thrombosis and pulmonary embolism during the last few years and the treatment of them has changed. Doctors are more "thrombosis-minded" and are becoming especially aware of the protean, and sometimes slight, manifestations of serious thrombo-embolic disease. But there is no room for complacency and far too many cases are still missed or misdiagnosed. Although many clinicians are quick to turn to anticoagulant therapy and the occasional strategic use of vein ligation, there are still some who prefer to adopt a relatively casual attitude to thrombo-embolism. Statistics on this subject are notoriously difficult to assess, and some rather dubious figures have been advanced in support of

different methods of treatment. Even so, there is good reason to believe that progress has been made in reducing the morbidity from these conditions. That less striking success has been achieved in the prevention of fatal pulmonary embolism may be partly due to the fact that often this catastrophe strikes like a bolt from the blue.

It is likely that pulmonary embolism and infarction are among the commonest acute lung conditions encountered in hospital. This was born out by Short's review¹ of his experience in a large general hospital, and there are many similar reports. Some of the problems in diagnosis of pulmonary embolism have recently been discussed in this *Journal*,² and reference has also been made to various outstanding problems in aetiology and treatment.^{3,4} We have also stressed the need for constant and critical review of our existing knowledge, and in this connexion there are several recent publications which warrant discussion.

It was not so long ago that many surgeons taught that pulmonary emboli following laparotomy arose from the veins in the abdominal wall. During the last decade most of us have come to accept the view that pulmonary emboli come from the veins of the lower limbs or, less commonly, from those of the pelvis. Cummine and Lyons,⁵ however, challenged this view when they suggested that primary pulmonary arterial thrombosis is a more common condition than is generally believed. Professor Harold Dew,⁶ of Sydney, speaking from his experience in the same hospital as Cummine and Lyons, supports this view and even goes so far as to say that large pulmonary emboli are rare. An examination of the available evidence would suggest that the Sydney school have overstated the case for pulmonary thrombosis and unduly minimized the incidence of embolism. But there is no doubt that primary pulmonary thrombosis does occasionally occur, and it is good to be reminded that not every pulmonary artery thrombus comes from the legs or pelvis.

An awareness of the frequency with which venous thrombosis and pulmonary embolism occur, the proper appreciation of the significance of unexplained pyrexia and minor leg symptoms, the recognition of minimal signs in lungs and legs, and the accurate interpretation of x-ray films of the chest will all contribute to earlier and more accurate diagnosis. The earlier specific treatment is instituted, the shorter is the time for which it is needed and the better the results obtained. To assist and fortify the clinician in making an early diagnosis various workers have tried to predict a prethrombotic state. Of the many laboratory tests devised, one of the simplest and most widely publicized is daily estimation of the clotting time. Cummine and Lyons keenly advo-

cate the use of daily clotting-time estimations, combined with a test for fibrinogen B, in detecting a prethrombotic state; but most other workers have failed, either partly or wholly, to confirm the value of these tests.⁷⁻¹¹ McCleery,¹² using a silicone-tube method, found the coagulation time to be shortened only in established thrombosis. It is curious that so many other investigators have failed to confirm the contention of Cummine and Lyons about the prognostic value of daily clotting times, and it is true to say that clinical sagacity is more useful than laboratory technique in predicting a thrombosis.

Many and varied have been the methods recommended in the prevention of pulmonary embolism, and a recent one of some interest is the routine use of elastic stockings by all patients confined to bed. Wilkins *et al.*¹³ published a preliminary report on this subject last year, and they have recently put forward further evidence in support of this policy.¹⁴ It has been shown that an even, concentric pressure on the leg, not exceeding 15 mm. Hg, causes marked increase in the linear velocity of the venous flow,¹⁵ and there is therefore experimental support for the recommended use of elastic stockings. There are practical difficulties in the routine use of stockings, but the clinician may well consider advising their use in selected cases. The wearing of elastic stockings may be of value to several groups of patients confined to bed, including those with a previous history of deep thrombosis, those considered to be especially at risk for thrombosis, and those with varicose veins. As with many other methods practised in the hope of preventing pulmonary embolism, dramatic results are not to be expected, but each contribution represents one more nail in the coffin of this common and sometimes fatal complication.

DEATH FROM ASTHMA

One of the perplexing facts about bronchial asthma is that some patients with severe asthma are like old soldiers and never die, whereas others succumb during comparatively trivial attacks. Death during attacks of asthma is not very uncommon. Williams,¹ from a study of the Registrar-General's reports, deduced that about 3,000 people die each year from asthma in England and Wales, and it is therefore important for the general practitioner to know how to detect the potentially dangerous case, to understand the reasons why death takes place, and to assess the value and pitfalls of the therapeutic measures in treating such patients. Some help in these problems has emerged from recent analyses of the clinical features of patients dying from asthma. In reviewing 41 personal cases together with those from the medical literature, Williams concluded that the risk of death was greatest in the chronic asthmatics over the age of 30 who were liable to status asthmaticus. Similarly Earle² found that whereas death in early adult life was rare there was a definite risk in patients aged

¹ *British Medical Journal*, 1952, 1, 790.

² *Ibid.*, 1952, 1, 809.

³ *Ibid.*, 1951, 1, 289.

⁴ *Ibid.*, 1952, 2, 29.

⁵ *Brit. J. Surg.*, 1948, 35, 337.

⁶ *Ann. roy. Coll. Surg. Engl.*, 1953, 13, 1.

⁷ Trethowie, E. R., *et al.*, *Brit. J. Surg.*, 1950, 38, 30.

⁸ Greig, G. W. V., *British Medical Journal*, 1949, 2, 845.

⁹ Greig, G. W. V., *British Medical Journal*, 1951, 64, 237.

¹⁰ Ryan, E. A., *Canad. med. Ass. J.*, 1951, 64, 237.

¹¹ Voorhees, A. B., and Pulanki, E. J., *J. Lab. clin. Med.*, 1949, 34, 1352.

¹² Murley, R. S., *Ann. roy. Coll. Surg. Engl.*, 1950, 8, 283.

¹³ *Surgery*, 1952, 31, 28.

¹⁴ *New Engl. J. Med.*, 1952, 246, 360.

¹⁵ Wilkins, R. W., and Stanton, J. R., *ibid.*, 1953, 248, 1087.

¹⁶ Wilkins, R. W., and Stanton, J. R., *ibid.*, 1949, 22, 553.

¹⁷ Stanton, J. R., *J. clin. Invest.*, 1949, 22, 553.

¹ *Report of the Malaria Unit, Tanganyika, 1933-34, 1936. Dar-es-Salaam.*
² *Trans. roy. Soc. Trop. Med. Hyg.*, 1936, 29, 583.
³ Swellengrebel, N. H., *Ann. trop. Med. Parasit.*, 1950, 44, 84.
⁴ Wilco, D. B., Garnham, P. C. C., and Swellengrebel, N. H., *Trop. Dis. Bull.*, 1950, 47, 677.
⁵ *Report of the Conference on Malaria in Equatorial Africa. W.H.O. Technical Report Series No. 38, 1951.*
⁶ *Suppl. Ann.*, 1951, 43, 190.
⁷ *J. Trop. Med. Hyg.*, 1951, 70, 445.
⁸ *Ann. trop. Med. Hyg.*, 1948, 32, 527.
⁹ *Ann. trop. Med. Hyg.*, 1951, 64, 211.
¹⁰ *Ann. trop. Med. Hyg.*, 1953, 47, 522.

¹ *Thorax*, 1953, 8, 137.

² *Ibid.*, 1953, 8, 195.

³ *Ibid.*, 1953, 8, 207.

⁴ Limber, C. R., Reiser, H. G., Roettig, L. C., and Curtis, G. H., *J. Amer. med. Ass.*, 1952, 149, 816.

⁵ Ungar, L., and Ungar, A. H., *ibid.*, 1953, 152, 1109.

between 40 and 65 years. Houston, de Navasquez, and Trounce² also suggested that death from status asthmaticus occurred particularly in adult life in those patients whose illness began late in life. Elsewhere in this issue of the *Journal* Drs. C. Kelman Robertson and Kenneth Sinclair describe the clinical and pathological features of 18 cases of fatal asthma. The majority of the patients were between the ages of 40 and 50 years. The fact that about two-thirds died in the autumn suggested that added respiratory infection played a part in the fatal outcome. Death in most patients was sudden and unexpected, the aetiology and duration of the disease giving no reliable guide to prognosis.

The mode of death in fatal asthma is often not obvious from clinical observation alone. Right heart failure may supervene in the chronic asthmatic, and death may sometimes occur from such complications as spontaneous pneumothorax. More often, however, death is apparently due to asphyxia, and at post-mortem examination widespread obliteration of the smaller bronchi by sticky mucous plugs is usually found. There seems little doubt that mucous plugging and desquamation of the ciliated bronchial epithelium play a greater part in the fatal issue than does bronchospasm. Although it has not been proved that infection plays any part in producing the viscid mucous secretion, there is some evidence that added bronchial infection is a contributory cause of death. These observations have some practical application to the management of patients with status asthmaticus. In the treatment of the adult patient the possibility of a fatal outcome must always be considered even though the initial symptoms are not severe, and the aim should be to achieve relief by energetic treatment as soon as possible. In addition to the administration of antispasmodics such as adrenaline and aminophylline in effective dosage, antibiotics can help those patients who have bronchial infection. Respiratory depressants may encourage the retention of mucous secretions and should be avoided: it has long been known that the use of morphine in status asthmaticus can precipitate death. However desirable it might seem to allay the anxiety and distress of the severely afflicted asthmatic, sedatives should be used with the utmost caution and morphine not at all. Active rather than passive measures should be the keynote of treatment. A possible new approach to the treatment of severe asthma lies in the use of purified crystalline trypsin.^{4,5} This substance has been given by aerosol inhalation as a mucinolytic agent, and there is good evidence that it can effectively help in removing the sticky bronchial secretions which constitute such a real danger to life in the asthmatic patient.

SKIN CANCER AND BURNS

The essential cause of epithelioma of the skin is unknown, but much has been learnt about it from observations on men as well as mice. The carcinogenic role of external and internal irritants in the aetiology of skin cancer has interested observers since Percival Pott described carcinoma of the scrotum in

chimney sweeps who as boys worked naked in hot chimneys. From one point of view the human being with cancer of the skin may be regarded as an experimental animal in whom the growth and character of the lesion can be observed, even though the factors responsible for its appearance cannot be controlled and cannot always be determined.

From observations on tar workers, mule spinners, and workers in contact with shale oil it has been established that certain tar products and various types of oil are carcinogens. The by-products obtained from an extraction process and also catalytically from petroleum have proved to be strongly carcinogenic.¹ Cutting oils used with machine tools probably have the same property.² Although the agent causing cancer may be recognized, there are so many factors playing a part—heredity, race, age, sex, and others such as hormones and arsenic—that any consideration of the aetiology becomes a complex matter.

In 1828 Marjolin³ described the development of epithelioma in scars and ulcers, and though nowadays those associated with radiotherapy are particularly important carcinoma may arise at the site of scarring from many causes. It has long been appreciated that a skin infection such as lupus vulgaris, which persists for many years and heals with scarring, may lead to carcinoma, though it is more common when radiotherapy has previously been administered. The common leg ulcer has been under suspicion, but there is some doubt because carcinoma associated with it is so very rare.⁴

Cancer of the skin after years of exposure to actinic rays is common in such countries as Australia, where it is found that European settlers are most susceptible. Heat, whether moderate and applied over a long period or intense and causing a burn, may lead to carcinoma. The natives of Kashmir are liable to cancer of the abdomen and thighs from burns caused by the kangri, or warming-pan, they carry under their clothing in cold weather, and Laycock⁵ has described "kang cancer" arising in the skin over the great trochanter in Chinese who sleep on heated brick beds. Carcinoma of the lips of clay-pipe smokers may have been the result of contact with the hot stems for long periods.

Some years after the skin has been severely burnt on a single occasion carcinoma may appear in the scar, usually when it has been ulcerated for some time. This is the commonest cause of Marjolin's ulceration. The scar following a burn has a poor blood supply, and its inelasticity causes it to be more readily injured than normal skin. Ulceration is likely to occur, and the repeated stimulation to growth of the marginal epithelium was thought by Treves and Pack⁶ to lead to carcinoma. The same authors suggested that tissue toxins released by autolysis and heterolysis from the burnt area might act as carcinogenic agents. According

¹ Hieger, I., and Pullinger, B. D., in *Recent Advances in Pathology*, ed. G. Hadfield, London: Churchill, 1953.

² Cruickshank, C. N. D., and Squire, J. R., *Brit. J. Industr. Med.*, 1950, 7, 1.

³ Marjolin, J. N., *Dictionnaire de Médecine*, 1828, Paris.

⁴ Knox, Lella C., *J. Amer. med. Ass.*, 1925, 88, 1046.

⁵ *British Medical Journal*, 1948, 1, 982.

⁶ *Surg. Gynec. Obstet.*, 1930, 81, 749.

⁷ *Occupational Tumors and Allied Diseases*, Springfield: Thomas, 1942.

⁸ *Surg. Gynec. Obstet.*, 1952, 95, 579.

to Hueper⁷ substances having such a quality may be produced by the destruction of organic matter by heat.

In carcinoma arising in the scars of thermal burns Lawrence⁸ has made a particular study of the influence of the age when the burn occurred and the length of the period before the diagnosis of carcinoma was established. He found that this period was inversely proportional to the age when the individual was burnt. He also found that carcinoma is less likely to occur when the burnt area has been grafted, and he believes that this provides evidence that carcinoma results not from carcinogenic agents embedded in the scar tissue, which should also cause cancer in an overlying graft, but solely from factors affecting the surface. Among these he includes an abnormal vascular supply, repeated trauma, and contact with environmental carcinogens. More work requires to be done on this subject, but from it much should be learnt about carcinogenesis.

MILLI-EQUIVALENTS

For many medical men who qualified more than a decade ago milli-equivalents share some of the mystery that irrational numbers hold for the non-mathematical. But, simple units of measurement that they are, they have largely replaced such traditional though flexible units as mg. per 100 ml. to record concentrations of ions. While readily convertible to metric units, their special features make them preferable to use in the estimation of the electrolytes of the plasma, which is becoming a commonplace laboratory investigation, essential for carrying out rational replacement or maintenance therapy of patients suffering from electrolyte depletion.

Milli-equivalents are units of measurement no less than are the other more familiar terms of metric weight; but they are units with this difference, that instead of being related arithmetically to other units of weight or volume within the metric system they imply a chemical relationship between the various ions under consideration. Thus, one milligram of sodium is not related to one milligram of potassium or one milligram of chloride one milligram of potassium or one milligram of chloride one milli-equivalent of sodium is chemically equivalent to one milli-equivalent of potassium and to one milli-equivalent of chloride and to one milli-equivalent of any bicarbonate, and in fact to one milli-equivalent of any substance, although the actual weights of these amounts are not the same when expressed in milligrams. The equivalent weight of a substance is a chemical term defining that weight of the substance which will combine with or displace one gramme-atom of hydrogen. A milli-equivalent weight of a substance is its equivalent weight divided by 1,000—that is, the weight of the substance which will combine with or displace one milligram-atom of hydrogen. Adapting an old axiom, things

¹ Example of calculation:
Sodium concentration = 340 mg. per 100 ml.
Sodium concentration = 340 / 10 = 3,400 mg. per litre.

23 mg. is the weight of 1 milli-equivalent of sodium.

Therefore 3,400 mg. is the weight of 3,400 milli-equivalents which are in one litre.

Therefore sodium concentration = 147.8 milli-equivalents per litre.

which are equivalent to the same thing (in this case hydrogen) must be equivalent to one another, and it is this which justifies the use of the term milli-equivalent in clinical chemistry to-day. Expressed in these terms, fluctuations in concentrations of electrolytes—not only in plasma but also in urine and gastro-intestinal contents—come to have some meaning in relation to one another. Calculation of concentrations expressed in milli-equivalents per litre from those in milligrams per 100 ml. is done by multiplying the milligrams per 100 ml. by ten to bring the concentration to milligrams per litre, and then dividing by the equivalent weight of the ion in question.¹ The equivalent weight of the monovalent ions sodium, potassium, and chloride is equal to the atomic weight—namely, 23, 39, and 35.5 respectively. Some laboratories report the concentration of chloride in the form of sodium chloride, in which case the concentration in milligrams per 1,000 ml. must be divided by 58.5 and not by 35.5. Special factors have been calculated for the conversion of bicarbonate from volumes per cent. and protein from grammes per cent. to milli-equivalents per litre.

ADMINISTRATIVE ACTION IN BLACKBURN

The closing on January 8 with less than 24 hours' warning of the 20 G.P. obstetric beds in the Springfield Maternity Home, Blackburn (see *Supplement*, p. 22), marks a further stage in an unhappy business. As already reported in the *Supplement* last December,² the Blackburn and District Hospital Management Committee decided to close these beds on the grounds of redundancy and the urgent claims on them of other users. The resentment of the local general practitioners against a decision which would take away the only institutional midwifery beds in the town available to them and their patients was aggravated by the failure of the hospital authority first to consult those who would be most affected. As a result, the Blackburn Executive Council passed a resolution of protest and asked that no action be taken until there had been an opportunity for discussion. This resolution was apparently ineffective.

Hospital authorities must, of course, carry out their function with proper regard to the many claimants on their all too few beds. The ultimate decision in these matters must be theirs. Nevertheless it would seem on the face of it that the Blackburn Hospital Management Committee, while sticking to the letter of its duties, has been singularly inept in failing to perform them in that spirit of co-operation which is essential if there is to be any smoothness at all in the working of the Health Service. It is an example of how not to do things.

But most disturbing of all is the report that the evacuation of the Springfield Home was carried out on the orders of a lay official at short notice and without any opportunity for the doctors concerned to decide upon the fitness or otherwise of their patients to be moved. If this is true it represents an interference with a doctor's clinical responsibility which is quite beyond the right of any administrative authority.

² *British Medical Journal Supplement*, 1953, 2, 234.

tion leading to gross reduction of bile will also produce failure of fat absorption without any evidence of other digestive errors.

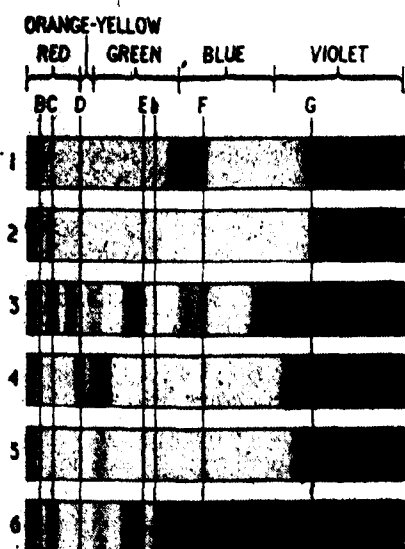
Digestive disturbances attributed to fat by the sufferer are often met with. In those who do not respond to the usual common-sense remedies it would be worth while to seek by examination of the stool for evidence of a real abnormality.

Ferments

Some information can be obtained by searching for digestive ferments, a procedure complicated by the instability of digestive ferments and by the presence of active bacterial ferments. In practice the estimation of tryptic activity is the most reliable method. This must be done on a freshly passed specimen not more than four hours old. The value of the results depends somewhat on the technique used, the simple film method (see Appendix) being less in agreement with the clinical findings than the test-tube method. If there is digestion at a dilution of 1 in 100 or more it is probable that adequate pancreatic juice is being secreted. The converse, that if no digestion occurs at a dilution of 1 in 50 or less it suggests absence of pancreatic secretion, does not hold except in infants.

Appendix: Simple Chemical Tests

Blood: Benzidine Test.—Take a piece of stool about the size of a pea and emulsify with about 2 in. (5 cm.) of water in a test-tube. Boil and cool. Take a knife-point of benzidine and dissolve it in $\frac{1}{2}$ in. (1.25 cm.) of glacial acetic acid



Spectrographic appearance of (1) stercobilin in acid alcohol; (2) chlorophyll, weak; (3) chlorophyll, strong; (4) acid porphyrin; (5) acid porphyrin, weak solution; (6) acid haematin in diluted hydrochloric acid.

acid alcohol (1 ml. concentrated hydrochloric acid into 100 ml. absolute alcohol or industrial methylated spirit). Mix. Stand overnight. Filter. Examine with a hand spectroscope. The bands to be seen are shown in the Figure.

Blue.—Make a thin emulsion of the stool and mix with increasing amounts of Fouchet's reagent (trichloroacetic acid, 25 g.; distilled water, 100 ml.; 10% ferric chloride solution, 10 ml.)—not more than equal parts—either on a white tile or in a test-tube. A green or blue colour indicates bile.

Trypsin.—Make an emulsion of the stool with 1% crystalline sodium carbonate solution, about 1 in 10 dilution. Place one drop of the emulsion and one drop (as control) of the sodium carbonate solution on a dry radiographic film or photographic plate. Incubate 30 minutes at 37° C. (Keep moist by placing a sheet of wet filter paper just above the film.) Wash under the cold-water tap. If trypsin is present the coating of the film will be dissolved and a clean round spot will be seen. The control will

only be slightly swollen up. Serial dilutions of the faeces can be made with the sodium carbonate solution and a semi-quantitative result obtained.

Next article on Clinical Pathology.—"The Laboratory Diagnosis of Pulmonary Tuberculosis," by Dr. J. W. Clegg.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

RECRUITMENT OF MENTAL NURSES

A three-day conference on mental nursing, arranged by the Royal College of Nursing, opened on January 12. The subject taken in the first session was "Staffing: a Survey of the Present Position."

Dame ENID RUSSELL-SMITH, Under-Secretary, Ministry of Health, in an opening address, said that this was one of the most difficult problems in the National Health Service. Mental nursing had been caught up, though in greater degree than most, in the difficulties that beset every profession. Perhaps for the first time in our history we were running short of man- and woman-power, and this was hitting us particularly at the professional level. Nearly all occupations were becoming more difficult and more technical, less manual and more professional, and therefore making ever bigger demands on a comparatively limited age group. The matter for immediate concern was the inadequate number of those offering themselves as students for mental nursing. The problem was not so much how to attract all and sundry to mental nursing: it was how to attract more student nurses of the right calibre.

The High Wastage

In the Report of the Working Party on the Recruitment and Training of Nurses, Dame Enid continued, it was calculated that the rate of wastage among mental nurses was about 80%. Another later calculation on a different set of facts gave a wastage rate nearer to 65%. She thought the latter figure was more likely now to be true, because the former was calculated during the disturbance of the immediate post-war period. A good deal was known about the causes of wastage. Some of these, of course, were inevitable, but others were susceptible of remedy. First came family reasons, including marriage, but some married women nurses, as in other professions, returned to work after their children began to grow up. There was also wastage owing to some people who had originally shown promise turning out to be unsuitable. A third reason was bound up with questions of pay, but as an arbitration was pending that question could not be discussed profitably on this occasion. Other reasons related to conditions of work and to the teaching and training itself. If the training was too difficult a student was naturally discouraged, as also if it was too elementary. Careful selection of students must be made, but if this were done there must inevitably be, at least temporarily, a drop in numbers. The question was how to fill the gap until the training was rendered more attractive. The National Advisory Council of the Ministry of Labour believed that enrolled assistant nurses should be trained and employed in mental hospitals, but the Minister's Standing Mental Health Advisory Committee was against the employment of enrolled assistant nurses and favoured the continued employment of nursing assistants, possibly for many years to come, while recommending that such assistants should be systematically instructed in the tasks they were called upon to perform. The Confederation of Health Service Employees held that the only type of nurses employed in the mental nursing service should be qualified nurses and student nurses, but

that to meet the present situation a proportion of students who failed to pass the final examination at the second attempt should be retained as nursing assistants.

Case for Nursing Assistants

Dame Enid said that the reasons which in the opinion of her Department counted against assistant nurses were the small number now in the Service, which offered no foundation on which to build, and the difficulties in the way of establishing training schools. As the law now stood it was not possible for the General Nursing Council to approve an assistant nurses training school based wholly on a mental hospital. Of nursing assistants there were more than 10,000 already in the Service, and the Ministry held the view that this number should be increased rather than that the difficult course be embarked upon of training a large number of assistant nurses for the Roll. The training given to registered mental nurses should be adequate to fit the nurse to hold the highest post in mental nursing without the need to go outside and get a double qualification, but the Department was also anxious to see an increase in schemes of combined training which gave the double qualification after four years.

Dr. J. CARSE, medical superintendent of Graylingwell Hospital, Chichester, said that on a conservative estimate 75% of the resident population of a mental hospital such as his own were long-stay patients; about two-thirds of these—that is, one-half the resident population—were able-bodied patients who were accommodated mostly in open wards and were engaged in various activities during the day in the grounds and other parts of the hospital, and the other third were patients senile on admission, a proportion which in some hospitals was rapidly increasing. The remaining 25% of the resident population were short-stay patients, who came in mostly for from four to eight weeks and responded well to treatment. In this small section there was an enormous turnover. With a total resident population of 1,150 in the hospital, they had approaching 1,100 admissions in a year.

Was it to be said, asked Dr. Carse, that 100% trained staff was needed in such a hospital? Even if they could get them they were not necessary. He thought that in mental hospitals they could do with quite a good proportion of nursing assistants. A sister or charge nurse should be in charge of every ward, but the wards could properly be otherwise staffed by nursing assistants. The difficulty about this grade was that they had no salary scales such as the staff nurse enjoyed, and had little prospect of promotion or improved salary. No one would deny that the time had arrived when nurses, whether State-registered or student, nursing assistants should spend their time in nursing duties and that a higher proportion of ward domestics should be employed and more labour-saving devices introduced. In recruiting he believed that local effort was likely to be more successful than a national campaign. The mental hospital was nothing to be ashamed of, and yet it was the Cinderella of medicine.

The other speaker in the session was Miss P. LOE, matron of St. James Hospital for Mental and Nervous Disease, Portsmouth, who said that her hospital had its full establishment of staff, about one nurse to five patients, but they could still really do with more than this. One of the chief reasons for the shortage was that mental nursing was not a job that appealed to many people; also some of those who joined the Service gave it up after a short time for a variety of reasons, chiefly marriage. Good relations between of reasons, chiefly marriage. Good relations between whole and its surrounding neighbourhood, were important factors in encouraging young people to offer themselves for service and to remain throughout their training and afterwards. She mentioned that when she started mental nursing the salaries of nurses in mental hospitals were 70% higher in most instances than in general hospitals, and the working time eight hours a week shorter. Now the salaries were about 5% higher and the working hours were the same.

After these addresses the members of the Conference split up into groups for discussion.

Nova et Vetera

THE MYSTERY MAN OF PHYSIOLOGY

Michael Servetus: A Translation of his Geographical, Medical, and Astrological Writings with Introductions and Notes. By Professor Charles Donald O'Malley. (Pp. 208. £1 1s.) Philadelphia: American Philosophical Society. London: Lloyd-Luke (Medical Books). 1953.

Before Harvey's book on the circulation (1628) stands, as has been long known, a clear statement of the lesser circulation by the Spaniard, Michael Servetus. It was made in a book entitled *Restitutio Christianismi*, "Christianity Restored," published in 1553 at the small town of Vienne, not far from Lyons. The book was highly heretical and Servetus was therefore "wanted" by both Catholic and Protestant authorities. The Catholics got him first, but he escaped from prison in France to Calvinist Geneva. There he was promptly captured, tried, condemned and, on October 27, 1553, burned at the stake. A note by Dr. Edwin Clarke in these columns recently (October 24, 1953, p. 934) was a reminder of the four-hundredth anniversary of this dreadful event, and it was accompanied by a picture of the expiatory monument raised by the citizens of Geneva in 1903.

There are many obscure points in the life history and opinions of Servetus, some of which have now been clarified in this little book by Professor O'Malley. The author has long been known for his great skill, penetration, and industry in translating and interpreting scientific works written in Renaissance Latin and not least those of Vesalius. This is an extremely useful service, especially since very few men of science can now read such difficult Latin.

Servetus, Professor O'Malley shows, was basically a restless, argumentative, offensively opinionated literalist who sought to interpret biblical doctrine in an exact verbal sense. He had considerable learning, but his medical training was inadequate, even on contemporary standards, and his course at Paris was not completed, so that his medical status somewhat resembled that of an unregistered practitioner of a few decades ago. Both Servetus and Vesalius had acted as dissectors for Guenther of Andernach, but not at the same time, and they probably did not meet. Servetus claimed to be introducing an idea not present in Galen's works. Professor O'Malley, however, points out that Galen had presented all the necessary information required for the description of the lesser circulation given by Servetus, of which he provides a translation. For Galen proclaimed the presence of blood in both veins and arteries, described the action of the semilunar valves, and indicated that there was "anastomosis" between veins and arteries. The meaning that Galen attached to the word *anastomosis* would take a special article to explain. But Galen had further suggested that something passes into the lungs by the pulmonary artery and from the lungs by the pulmonary vein, though the something was not blood but *pneuma* or "spirit."

Professor O'Malley provides us for the first time with translations of several others of the works of Servetus which are not generally accessible. These are necessary to enable the reader to form any proper estimate of the general physiological and intellectual climate in which the man lived.

Servetus had had a correspondence with Calvin in which he had been peculiarly offensive. After his flight from prison, on reaching Geneva he felt compelled to attend divine service. He was recognized and arrested. Calvin, the virtual dictator of Geneva, "was determined to have his victim though legally he had no grounds for a case. Personal vindictiveness, intolerance, and disregard of the law, though Calvin had been trained in it, brought about the execution of Servetus."

Professor O'Malley has filled a real literary gap. The idea of a lesser circulation was "in the air"—or should we say "in the *pneuma*"?—at the time, and Servetus enunciated it in the course of an exercise of ratiocination. He was no man of science and he had no experimental bias, but he was a virulent theologian, and though he was a martyr neither he nor Calvin emerges from the story as other

than unamiable characters. Our final reflection on Professor O'Malley's excellent book is that the calamities and quarrels of authors do not make edifying reading and that, since the pen is mightier than the sword, it is well that the law should be mightier yet. "Pray for the law," said one of the old rabbis, "for were it not for it, men would swallow one another alive."

CHARLES SINGER.

Reports of Societies

THE PSYCHOPATH

On January 12 the Section of Psychiatry of the Royal Society of Medicine held a symposium on "Psychopathy." Dr. E. B. Strauss, president of the Section, was in the chair.

In opening the symposium, Professor ALEXANDER KENNEDY said that the condition so often expressed itself as a disorder of citizenship as well as one of personal adjustment that medicine and the social sciences had a shared responsibility. The clinical psychopathic syndromes were the product of defects in brain structure, of the effects of these on the development of mind, and of the way in which the patient dealt with the sense of inferiority these defects engendered. The defect often showed itself in the monitoring mechanisms by which an individual checked his conduct against that of his fellow-men and foresaw its effects. These mechanisms were comparable to the way in which speech was controlled, and parallels could be drawn with disorders of the speech mechanism.

Importance of Physical Defects

Experience in early life also played its part in the laying down of personal attitudes and codes of conduct, but, if the physical means of doing this were lacking, developments must inevitably be abnormal. The natural experiment of the epidemic of encephalitis lethargica had shown that neural damage could produce similar effects. The speaker's own studies showed that, if this occurred while the sense of social responsibility was developing, the latter failed to develop and the patient showed the antisocial trends of a psychopath.

The advance of therapeutics was leaving us with many survivors of conditions formerly fatal whose lives had been spared at the cost of brain damage. The period from conception to maturity was fraught with opportunities for harm to the nervous system. Prematurity, birth injury, kernicterus, post-febrile encephalitis, tuberculous meningitis, and anoxia due to heart operations or anaesthesia with controlled hypotension all presented this danger of interference with normal brain development and of producing people who lacked the physical means of being morally aware and of exercising foresight in their personal affairs. Recent studies showed that inheritance also played an important part in psychopathic character-traits.

Alteration of the environment of the psychopath must be arranged in the interests of both patient (or prisoner) and society. With increasing complexity of civilization there were more people for whom science had no remedy and society no place. Segregation in productive communities with suspension of responsibility as citizens was kinder than prison and more realistic than certification. It could be tried first with the grosser criminal psychopaths before the principle was extended.

Institutional Therapy

Dr. MAXWELL JONES described an experiment in trying to improve the social adjustment of the psychopath through residence in a therapeutic community. The 100-bed unit for both sexes associated with Belmont Hospital, Sutton, had been in existence for seven years. Patients stayed up to a year, and the arrangements differed markedly from those of a hospital. The sister in charge did not wear

uniform, while her staff consisted of social therapists not medically trained. The doctors shed their professional status in their relationships with the patients, and one of the difficulties in running the unit had been to find doctors who were willing and able to do so.

In the therapeutic activities the patients were divided into groups (12 or under) and communities (over 12), and all problems and incidents were referred to the group and community meetings for discussion, criticism, and advice. Suicidal attempts, for example, were discussed at the group meetings, and antisocial conduct such as repeatedly disturbing the ward by coming back drunk was dealt with as a group problem. Discussion modified the patient's attitudes and prejudices and gave insight into those of others. A member of the patient's family was sometimes enrolled into the group. When an individual's behaviour was so grossly disordered as to threaten to disrupt the community life he might be asked to leave, but usually the anxiety threshold of the doctor was reached before the group sanctions came into operation.

Psychopathology and Prognosis

Dr. EDWARD GLOVER proposed, on the descriptive level, a division of psychopathy into benign and malignant (criminal) types. Criminal types could be roughly subdivided into violent and non-aggressive types—for example, the swindler—and the aggressive group again into those whose aggression found a predominantly sexual or a predominantly social outlet. All these could be further subdivided in accordance with the nature of the offence. But a classification according to the aetiological factors was more useful both in understanding psychopathic behaviour and in treatment. It was not possible as yet to put forward a wholly satisfactory classification on this basis, but Dr. Glover gave the following examples of an aetiological classification: (1) according to the form of the underlying instinctual aberration or stress, either sexual or destructive; (2) according to the nature of the defect in ego development, in particular in the formation of the super-ego; (3) according to the kind of defect in reality sense found to be present. He felt that the diagnosis of psychopathy should be narrowed down and a great many individuals, often included under the heading, placed elsewhere—for example, most alcoholics, nearly all suicidal individuals, and neurotic and paranoid characters. Sexual pervers should also be excluded, provided there was no accompanying ego-disorder.

Dr. Glover pointed out that the psychopathic behaviour of our time was the normal behaviour of other epochs. Even now, for instance in war, homicidal psychopathic behaviour was regarded as normal. From the practical point of view in treatment it was important to remember that spontaneous cure of psychopathy is common, especially after the age of 40, while any plan of psychiatric treatment must take into account the constitutional, predisposing, and precipitating factors, the characteristic constitutional factors being a demand for the immediate satisfaction of primitive needs and the inability to endure frustration. The reduction of past and present stresses was therefore essential. In psychopathic as well as in normal development the first five years were the most important, and a greater understanding of psychopathy together with more effective treatment would come through studying the interrelations of different types of environment and different types of emotional response during these years. Through the study of psychopathy, a greater knowledge of the mental development of children would also be obtained.

Dr. E. B. STRAUSS, the chairman, in thanking the three speakers, said that, in attempting the impossible task of adjusting to an impossible world, we all break down either into psychosis, neurosis, delinquency, psychopathic behaviour, or alternatively into "normalcy." We were ill-fitted to live in the kind of society we had made, and he looked forward to a symposium on the psychopathology of normalcy in a mad world.

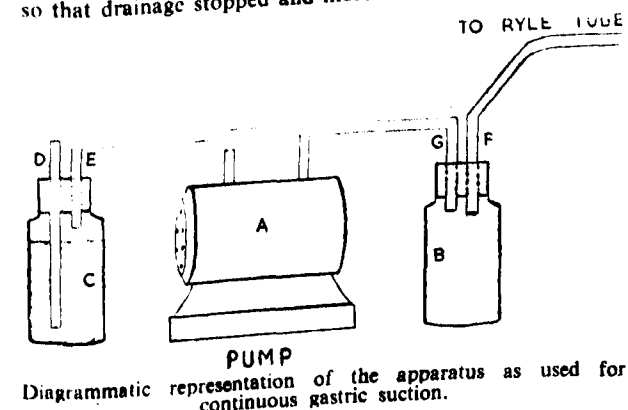
Preparations and Appliances

SIMPLE APPARATUS FOR CONTINUOUS GASTRIC SUCTION

Dr. EUSTACE J. SEQUEIRA, honorary assistant medical officer, Antenatal Department, B.Y.L. Nair Charitable Hospital, Bombay, writes: The apparatus described originally by Wangenstein, though inexpensive and simple enough to use, is somewhat cumbersome. Electrical appliances marketed for gastric suction are undoubtedly efficient but expensive. Therefore an attempt was made to devise an apparatus which is inexpensive, simple, and yet efficient. The apparatus described below, I believe, meets these requirements.

The suction pump used is a 24-volt anti-icer aircraft pump (de-icer pump) obtained from surplus war stock and used in conjunction with a suitable transformer. Equally suitable would be an aeration pump as used by aquarists and obtainable from any fish-fancier's store. As the negative pressure required is small, a powerful pump is unnecessary. The sure required is small, a powerful pump is unnecessary. The gastric tube would, of course, be connected not to the pressure but to the suction nozzle of the pump.

A difficulty was encountered, in that the gastric mucosa was often sucked up against the orifice of the Ryle tube so that drainage stopped and more and more negative pressure



Diagrammatic representation of the apparatus as used for continuous gastric suction.

sure kept developing in the appliance. This put a strain upon the pump and made drainage still more difficult. A simple release valve was therefore introduced which overcame this difficulty and made it possible to maintain trouble-free gastric suction indefinitely at a predetermined negative pressure.

The apparatus consists of the suction pump (A), the nozzle of which is connected to a T-tube (see Diagram). One arm of this tube is connected by means of a rubber connexion to the bottle (B)—fitted with an airtight rubber bung—which is in turn connected to a Ryle tube. Another bottle (C) is filled with fluid up to a level acts as a release valve. It has an airtight rubber bung through which pass two tubes—a longer one (D) that reaches down to 6 in. (15 cm.) of the bottom of the bottle, and a shorter one (E), whose lower end is clear of the surface of the fluid. This shorter tube is connected by means of a rubber connexion to the other arm of the T-tube.

The whole apparatus is placed on the floor at the patient's bedside so that the stomach is at a higher level than the collecting-bottle. When the pump is started negative pressure is created in the collecting-bottle B, and this, aided by siphon action plus the positive pressure within the stomach itself, causes the gastric contents to be aspirated into the bottle. If the gastric mucosa happens to be sucked into the bottle, air is drawn into bottle C through tube D, bubbles through the fluid and up through tube E and the T-tube to neutralize the negative pressure within the bottle B (and within the Ryle tube), and thus releases the mucosa which has been occluding the orifice of the latter. By this means steady uninterrupted drainage of the stomach is maintained. Once the stomach is empty air

is sucked in through bottle C, so that at no time is a strain placed upon the pump or trauma caused to the gastric mucosa. When fluid again collects in the stomach drainage restarts automatically. If the gastric contents are thick or if mucus obstructs the Ryle tube, it is a simple matter to close tube D so as to allow the desired level of negative pressure to be built up in order to clear it.

It should be noted that no expensive gauges or valves are necessary. Standard empty saline bottles are used both for the release valve and for the collection of gastric contents. The bore of the two tubes for bottle C is $\frac{1}{8}$ in. (5 mm.), and this is adequate for the pump used by us, which has a suction rate of about 1,000 ml. in about nine minutes. Under these circumstances the negative pressure developed by the apparatus will depend entirely upon the level and the nature of the fluid in bottle C. It follows also that variations in the performance of the pump owing to fluctuations in voltages in the mains will not cause any change in the amount of suction applied to the stomach. It must be emphasized, however, that if a much more powerful pump is employed the bore of tubes D and E must be much larger—as large as possible.

In order to find out the degree of negative pressure obtainable when some common fluids are used in the valve bottle, water, castor oil, and pure glycerin were used in turn. In each case the level of fluid was kept at 6 in. (15 cm.). The collecting-bottle (B) was connected to a mercury manometer and the negative pressure measured, the following values being obtained: water, 20 mm. Hg; castor oil, 22 mm. Hg; and pure glycerin, 28 mm. Hg. When the apparatus was used for gastric suction, with the patient in Fowler's position in a bed of normal height, the most suitable fluid was found to be pure glycerin at a level of 6 in. (15 cm.), the negative pressure obtained being 28 mm. Hg.

The apparatus may also be found of use in other situations—for example, drainage of an empyema cavity, or drainage of the urinary bladder in suitable cases. The desired degree of negative pressure could be maintained by simply increasing or decreasing the height of the fluid in the valve bottle.

The apparatus could be easily adapted for irrigation at a constant pressure and rate. When used for this purpose the T-tube is connected to the pressure nozzle of the pump instead of the suction nozzle, and one arm of the T-tube is connected to the short tube (G) of bottle B, which now contains the irrigating fluid. The outlet tube (F) from this bottle must be long enough to reach the bottom. The other arm of the T-tube is connected to tube D of the valve bottle instead of to tube E. By this means the irrigating fluid will be forced out from bottle B at a pressure dependent upon the level and nature of the fluid in the valve bottle. The positive pressures obtained with a 6-in. (15-cm.) column of fluid in this bottle were as follows: water, 20 mm. Hg; castor oil, 22 mm. Hg; and pure glycerin, 28 mm. Hg. Further variations of pressure could be obtained by increasing or decreasing the heights of these fluid columns. It should be noted that the apparatus when used for irrigation should be placed at the same height as the cavity to be irrigated.

I wish to thank Dr. F. J. Sequeira and Dr. E. J. D'Souza for their help, guidance, and suggestions in devising the apparatus and in preparing this article.

Tonic water as a cause of cinchonism is discussed in a recent letter to the *Journal of the American Medical Association* (December 5, 1953, p. 1304). These drinks are popular on both sides of the Atlantic and many of them contain a small quantity of quinine, commonly half a grain to the pint (56 mg. to the litre). Clearly a normal person would have to consume an enormous quantity of tonic water to suffer ill effects from it, but one who has an idiosyncrasy to quinine might begin to experience tinnitus, deafness, and other symptoms after drinking much smaller amounts. The author of the letter reports a case of cinchonism in a man aged 43 due to long-continued drinking of tonic water.

Correspondence

B.M.A. Toronto Meeting, 1955

SIR,—Greetings and good wishes for 1954. You have very kindly granted me space in this issue of the *Journal* to remind members of the British Medical Association of the One Hundred and Twenty-third Annual Meeting of the British Medical Association to be held in conjunction with the Eighty-eighth Annual Meeting of the Canadian Medical Association and the Seventy-fifth Annual Meeting of its Ontario Division, in Toronto, Canada, during the week of June 20, 1955.

This will be the fourth time during its long and illustrious history that the British Medical Association has met in Canada—in 1897, in Montreal, in 1906, in Toronto, in 1930, in Winnipeg—and we in Canada are looking forward with the keenest of interest and pleasure to the fourth meeting. Many members of the B.M.A. have visited Canada on previous occasions, and we hope their impressions were such as to impel them to return. They may be sure that a most cordial reception awaits them. To those who have never honoured us with a visit, may I say that this part of the New World, which is proud of its place in the British Commonwealth of Nations, will be delighted to welcome its kinsmen most heartily.

A number of committees are already busily engaged in preparing a programme which we are confident will be scientifically and socially acceptable. Outstanding members of the profession on both sides of the Atlantic Ocean have already indicated their willingness to participate in the programme. Work and play will be well blended. Plans are already near completion for an excursion to the famous Niagara Falls—a sight once to be seen, never to be forgotten. Altogether, the week promises to be an interesting one.

Conscious of the currency restrictions in the British Isles which will limit the purchase of dollars, we are happy to report that Toronto doctors and their wives are opening their homes to those members who indicate to the Secretary of the B.M.A. that they would be prepared to accept private hospitality during the week of the meeting. It is our understanding that members may purchase all of their transportation from home to Canada and return in sterling, so the dollar situation need not interfere with their plans. One realizes that June, 1955, seems a long way off, but remote dates have a way of catching up with us surprisingly quickly. We hope that members and their wives will make up their minds now that they are going to be among those present when the "Get Acquainted" Party is held in Toronto's famous Royal York Hotel on Sunday, June 19, 1955.

We confidently anticipate the joy of welcoming a large contingent from the British Isles, but I would like to think also that this joy would be considerably increased and augmented in welcoming many members from many other parts of the Commonwealth. B.M.A. members should, please, remember that this is their Association, and the Toronto meeting is their meeting. Their colleagues in Canada wish to join with me in extending to all a most sincere and cordial invitation to join with us in making the One Hundred and Twenty-third Annual Meeting of the British Medical Association one of the most interesting and memorable in the Association's history.—I am, etc.,

T. CLARENCE ROUTLEY,
President-elect of the British Medical Association
for the Toronto Meeting.

Lumbar Puncture

SIR,—I should like to make a few comments on the interesting criticisms and questions in recent letters about my article on lumbar puncture (*Journal*, November 7, 1953, p. 1069). In such an article it is difficult to cover all the points, and I attempted to supply only a working routine for

the relatively inexperienced or those who had not done a lumbar puncture for some while.

I agree with Mr. Norman Duggan (*Journal*, November 21, 1953, p. 1161) that the position of the operator is important. In particular, a comfortable position on a stool or seat greatly helps in providing stability and avoiding strain. Personally, I think local skin analgesia essential, except perhaps in cases of chronic meningitis where daily punctures are necessary. Patients understand the reason for numbing the operation site in much the same way as one does oneself at the dentist's. It is not so much the question of one or two pricks as the feeling of security. From long experience I do not believe it possible to guarantee a straightforward and successful puncture every time, and I have often been glad of a painless skin to work on.

With regard to the lateral approach mentioned by Dr. Rex Binning (*Journal*, December 5, 1953, p. 1271), it is not, in my opinion, to be used until considerable experience has been gained. Without the use of the nearer guide of the inter-spinous space, it is easy to have the point of the needle much too far to one or other side in the deep tissues.

Dr. W. A. Ball (*Journal*, December 5, 1953, p. 1271) asks if a puncture should ever be done in the home, and, if so, when. I have not myself ever done one in the home and I feel that if a patient really needs a puncture he needs to be in hospital. I can conceive of circumstances when a puncture at home might be done, but they are quite exceptional and somewhat fanciful. If the patient needing puncture refuses to go to hospital but consents to a puncture at home, the procedure would be advisable. In very unusual circumstances, such as a great epidemic, earthquake, snow, or flood, one might be forced into doing a puncture on the spot. In this country such circumstances are rarely or never found, but abroad it might be very different.

The final decision must always be a matter, not of rule, but of judgment.—I am, etc.,

London, W.C.1.

WILLIAM GOODY.

Controlled Hypothermia

SIR,—It is with diffidence that I venture to reply to an authority like Dr. C. Langton Hewer (*Journal*, January 2, p. 42). To begin with, it must be conceded that the complexity of the continental "cocktail" is to be deplored, as also the terminology, which, if not inexact, is certainly confused. Equally to be deplored is the outright condemnation of a method just because it is new. If the debut of curare had been received in this manner, anaesthesia would have stood still. The "considerable time to recover from these varied assaults" which Dr. Langton Hewer has noticed is surprising, for in my small series (26 cases) every patient has obeyed the golden rule of anaesthesia—a rapid return to normal physiology. Often the airway is resented on leaving the theatre, and the body temperature is rising to become normal in about two hours post-operatively.

The question of complexity, however, is clearer, for chemical hypothermia (or if I may add to the terminology "controlled metabolism") can be simplified considerably. Premedication is given as usual one and a half hours pre-operatively, but promethazine and pethidine is substituted for "omnopon," scopolamine, or atropine. The drip of chlorpromazine, promethazine, and pethidine given half an hour pre-operatively is an additional complication, but offset by the minute dose of thiopentone and the ridiculously small maintenance anaesthesia. What is lost on the roundabouts is made up on the swings.

As regards nursing, no difference is made whatever whether the patient has had a standard anaesthetic or hypothermia. The case is returned to a warm bed and adequately covered by blankets. No concession is made to the post-operative maintenance of hypothermia. Placing a potentially shocked patient in a warm bed is, I know, offending the rules of treatment of the collapsed. If we are to believe that the very defence mechanism of peripheral constriction initiates a vicious circle and finally kills the organism, then it is logical to aid peripheral vasodilatation by warmth. In the theatre these cases have stood up to major surgery better than those cases done under standard anaesthesia. In addition, either chlorpromazine or promethazine, or both, appear to have a "respiratory drive," and at the closure of the peritoneum additional cyclopropane is necessary to damp

down epigastric movement, although relaxation is adequate. The need for reversal of residual myoneural block by neostigmine (a cause of post-operative paralytic ileus) is not necessary. Finally, the use of hypothermia on every possible occasion will discredit this method as surely as was done with the methonium compounds. If the method is used on carefully selected cases, and not given to arteriosclerotics, hypertensives, and the aged with a subnormal B.M.R., it can prove a useful adjunct to anaesthesia.

The march of anaesthetic events is so rapid that it may well be that Dr. Langton Hewer's letter is a timely warning. If the reverse is the case, the shock protective factor of chemical hypothermia is well worth the slight extra complexity.—I am, etc.,

Edgware.

DAVID RECKLESS.

SIR,—In your annotation (*Journal*, January 9, p. 89) we are pleased to see that you have taken note of the work of Courvoisier and her colleagues' on chlorpromazine. This has been known and made use of for more than a year in clinical practice. We must reaffirm our belief that this drug has a central action, particularly at the level of the hypothalamus, depressing the reaction of the autonomic nervous system to stress, as well as depressing the temperature regulating mechanism. It is, of course, well known that many other drugs cause a fall in body temperature, but they do not have as great an effect on the physiological reaction to stress. In the "artificial hibernation" technique a fall in body temperature is only incidental to the more important action of this drug in modifying the stress reaction. In the poor-risk patient this may be life-saving.—We are, etc.,

ANGUS SMITH.
J. G. FAIRER.

London, W.C.2.

REFERENCE

Arch. Int. Pharmacodyn., 1953, 92, 305.

Suxamethonium Chloride and Muscle Pains

SIR,—I was rather surprised to read in Dr. H. C. Churchill-Davidson's article (*Journal*, January 9, p. 74) that he considers suxamethonium unsuitable for use in out-patient procedures because "it is followed next day in a large proportion of cases by muscle pains and stiffness, the severity of which is out of proportion to that of the minor operation." Suxamethonium has been in routine use at many psychiatric out-patient departments for some time now, apart from its daily use throughout the country for in-patients who are not afterwards confined to bed. The proportion of patients who complain is very small, and the reactions which are as severe as Dr. Churchill-Davidson suggests occur only rarely.

In arriving at his conclusions we are not told how the severity of the pains was established, as apart from a similarity and duration inquiry there is no special part of the questionnaire which could determine this. Obviously, with varying individual responses to pain, it is important to eliminate neurotic elaboration. It is unfortunate, therefore, that two at least of the three cases selected as examples should have a "psychological element" present. Having presented these cases to illustrate the severity and quoted the three descriptive phrases couched in anecdotal terms, the conclusion quoted above is reached. Surely this is one of the age-old fallacies in argument—e.g., that of deducing a general statement from particular cases. The value of suxamethonium, in psychiatry at least, outweighs any minor after-effects of the severity generally encountered.—I am, etc.,

Essex.

DAVID J. ADDERLEY.

Radiology and Lumbar Disks

SIR,—I was most interested in Sir Max Page's letter on the diagnosis and treatment of lumbar disk lesions (*Journal*, January 9, p. 97), but it is extremely disconcerting to learn that, since the diagnosis and treatment of this particular lesion became more precise, the period of disability has increased rather than diminished.

It cannot be denied that at the present time there is a tendency to attribute every case of low back pain, whether acute or chronic, to a lumbar disk lesion. This is a fallacy, for other factors are obviously involved. In our enthusiasm

for the disk we have forgotten the other components of the intervertebral joint. It behoves us to remember the posterior joints with their synovial membranes and capsules, and the intervertebral ligaments. All these structures, together or separately, can give rise to acute or chronic pain in the back or leg. Moreover, derangements of the posterior joints can give rise to a clinical picture indistinguishable from that of a disk lesion. However, the dramatic manner in which lesions involving these joints respond to traction serves to distinguish them from lesions of the actual disk. It becomes more and more apparent to me that many so-called disk lesions are nothing of the sort, and that the symptoms are capsular or ligamentous in origin.

I have always found it difficult to understand how a forced manipulation can reduce, and keep reduced, a large posterior annular protrusion. Conversely, thinking in terms of the posterior joints, it becomes perfectly clear how manipulation or traction can so quickly relieve symptoms due to a nipped synovial fringe. This does not imply that traction is inadvisable for the genuine disk protrusion, for it is a most rational procedure and should almost always be tried. However, results are seldom dramatic, and it is usually necessary to repeat the procedure in a number of occasions to obtain complete relief. I can assure Sir Max that there is still a place for the plaster jacket. A not inconsiderable number of disk lesions fail to respond to either rest or traction, and in such cases a plaster jacket often acts like a charm. Though the plaster jacket has admittedly been overdone in the past, it is my impression that cases adequately treated by this method seldom relapse. Thus, though the period of disability may be increased in the first place, it pays in the long run.

In conclusion, I would ask that we drop that dreadful term, "slipped disk," and substitute in its place, "deranged intervertebral joint." To borrow a phrase from the late Professor Joad: "It all depends on what you mean by a disk lesion."—I am, etc.,

London, W.1.

E. J. CRISP.

SIR,—For some years lumbar disk lesions have been the source of a never-failing spate of papers, leading articles, and correspondence in every medical journal. The views expressed vary widely, particularly in regard to treatment, and usually pass unchallenged. Yet there is no real difference of informed opinion regarding the pathological cycle and basic principles of treatment of these lesions. The more bizarre suggestions so often put forward provoke no reply only because the medical profession is, by and large, a busy one.

Mr. D. W. C. Northfield (*Journal*, January 9, p. 97) has already dealt faithfully with your leading article "Radiology and Lumbar Disks" (*Journal*, December 19, 1953, p. 1363), and it is reassuring to learn from so authoritative a source that some neurosurgeons share that "prejudice" against myelography attributed particularly to orthopaedic surgeons. It cannot be too widely appreciated that this procedure is by no means without its dangers and is of very limited value in the diagnosis of lumbar disk lesions.

In the same issue, however, Sir Max Page submits (p. 97) that though the aetiology of "sciatica and the like" may be established the resultant form of treatment has done more harm than good. Such a statement from a surgeon of Sir Max's stature should not be allowed to pass unchallenged. Sir Max's view, apparently based on his experience with the Metropolitan Police, appears to be that two factors retard recovery. The first is "premature" diagnosis—it seems that a policeman recovers more quickly from "lumbago" or "fibrositis" than from a disk lesion. It is not clear, however, whether Sir Max believes that these conditions actually exist or are meaningless terms hallowed by use. The second retarding factor is the prolonged immobilization of the lumbar spine in plaster or in a corset, and Sir Max suggests "limited rest, traction, and exercise" as alternative measures. In all "fairly severe" disk lesions as nuclear degeneration and fragmentation takes place, often accompanied by annular rupture with displacement of

nuclear substance. Healing is by fibrous tissue formation, and a satisfactory result is a firm fibrous ankylosis of the damaged joint. Favourable conditions for such healing can only be established by avoidance of mechanical strains on and movement of the lumbar spine. In other words, rest and immobilization of this region are the corner stones of conservative treatment, and it is difficult to see how any other measures could speed up, or even affect other than adversely, natural healing. For obvious reasons the figures compiled by insurance companies are not necessarily the most reliable guides to true disability periods, nor is there any real reason why a Metropolitan policeman should not carry out his duties wearing a lumbar corset with incorporated Goldthwait steels.—I am, etc.,

London, W.1.

J. R. ARMSTRONG.

Medical Needs in the Gold Coast

SIR,—Many letters both private and in the correspondence columns of the *British Medical Journal* in reply to my article (*Journal*, October 31, 1953, p. 987) show the keen interest that this subject has aroused.

Recruitment is slow and publicity is lacking. The difficulty rather than the opportunities seem to be stressed. The short-term service is a poor policy. The young man cannot have the Colony his main interest, but rather what he is going to do later. The candidate is young in experience, in administration, in prestige; if married, is young in wife. I have been written to by several people who by regulation of the National Health Service are forced to retire in the United Kingdom at the age of 65. The use of people of this age has not been considered before, and yet there is much to be said for it. They are senior in knowledge, worldly wisdom, administration, and by then the family may be able to spare them. At that age they cannot expect security of tenure, or a pension, and would be glad to accept an interesting job with good pay for some years. This might also suit the Gold Coast. I know of one or two from London teaching hospitals who would be an asset. Their age would carry prestige. This is being done to my knowledge in other departments in West Africa—e.g., the banks.

There seems to be no regular picture of the medical establishment that the Colony requires, and, even if there was an establishment, it must change from year to year. The presence of a 500-bedded hospital with its specialist departments and the probable medical school in the future all change the established figure that has stood with so little alteration through the years.

A conference of the four interested parties—the Minister of Health of the Gold Coast, the Colonial Secretary, the Chief Medical Officer of the Colonial Office, and the British Medical Association—could publish a statement which would clarify the position.

Remuneration both for the active medical officer, and when on pension, at one time was considered to be more generous for the Gold Coast than other Colonies—"danger money." With the increased health of the area the latter does not arise, and to meet Europeans who have been there 25 years and never ill, or perhaps one attack of malaria, dispels the old fear. However, the price of living both there and at home has now gone up so much that the present salary and pension is quite inadequate. It is cheaper to pay a man well and get good service with experience rather than pay him poorly so that he retires early and is on pension for a long period. The post must be made attractive to the officer of 10-20-30 years' service to retain him.

Security of tenure cannot be given in the Gold Coast or the United Kingdom or anywhere, but with a published programme of expansion and establishment the candidate can guess at the possibilities and not be dependent for the future on nebulous promises.

Africanization will come, but to be good and permanent it must come slowly. The Gold Coast must be selective and African highly trained and expert in the specialty and should be (and I feel will be) appointed. A Colony such as this would do well when fully organized to link itself up with a university and medical school. Possibly a

provincial school would be best as the medical schools of London are so decentralized and not therefore a good example for a small country. The home university would fill the original vacancies and train the African later to take over these posts. The medical officer from the United Kingdom taking up a teaching career would gladly do one year abroad, and the African would have a permanent base where he could come on his study leave for refresher courses for his higher degrees. As the Colony gets further advanced and requires a neurosurgeon, a plastic surgeon, a cardiac surgeon—these trainee Africans can come for the necessary instruction. The nursing staff for their specialist branches can all be trained in the same way under the same teachers, and so, till the Colony is self-supporting, a gradual overlap and a slow build-up can take place from this parent body.

The immediate needs are (1) a conference with the heads of the Ministry of Health of the Gold Coast together with the interested bodies in the United Kingdom. (2) The publication of the proposed expansion and the views of the Colony. (3) An increase in salary. (4) A link-up with a suitable university would be better than the haphazard training of individual African students here and there throughout Great Britain. (5) Full consideration should be given to the employment on short or on indefinite service of the senior specialist or consultant from the United Kingdom, who would accept service without asking for security of service or a pension.—I am, etc.,

Belfast.

IAN FRASER.

The Feeble-minded

SIR,—With reference to the article, "A Survey of Patients in Twelve Mental Deficiency Institutions," by Drs. N. O'Connor and J. Tizard (*Journal*, January 2, p. 16), it appears that "sampling" was done in twelve hospitals with a population of 11,850. The sample consisted of 592 patients, of whom 49 were actually tested by the authors at the time of the survey. The percentage of sample to population was therefore 8.27% and the percentage tested to population was 0.41%. Five hundred and forty-three patients were assessed by reference to the clinical diagnosis of presumably at least twelve different medical officers, and it is not stated how many of these patients had been tested previously, or by what method.

It should be noted that the application of progressive matrices to mental defectives is by no means universally accepted. If the authors' figures are correct, that over 50% of these 11,850 patients are considered to have intelligence quotients of 70 plus, then it is no wonder that a certain Sunday newspaper claims that many of these people should not be under orders of detention, but should be attempting to earn their living in the world at large. Upon such figures as are given certain conclusions may in the future be drawn in reference to important matters such as nurse/patient ratios, building requirements, workshop equipment, etc., and it is necessary that such figures should be accurate and so avoid incorrect conclusions.

I am able to compare the figures given with those already completed as part of a somewhat similar inquiry now proceeding in my own hospital, and these figures show, after careful individual testing of each of 1,011 patients, a percentage of gradings as follows:

	Idiot	Imbecile	Feeble-minded Person
O'Connor and Tizard	5.9	41.7	52.1
Prudhoe and Monkton Hospital	24.3	50.3	25.1

The percentage of patients with intelligence quotients of 70 plus to total patients in this hospital is 3.6.

Your annotation (*Journal*, January 2, p. 35) states that "to those familiar with the problem it will not come as a surprise to learn that over half the patients in mental deficiency hospitals are classed as feeble-minded or that the average intelligence quotient in young adults confined in these institutions is above 70." I am not concerned with hospitals other than my own, but it should be known

that the figures you quote are not the only figures available, and that conclusions drawn from "sampling" may possibly be incorrect.—I am, etc.,

Prudhoe-on-Tyne.

G. MCCOULL.

SIR,—The survey by Drs. N. O'Connor and J. Tizard (*Journal*, January 2, p. 16) is welcome for many of the reasons stated in your annotation (p. 35), but may we hope to see an early end to this revival of the quaint old custom of measuring I.Q.s and drawing conclusions from them irrespective of clinical findings in individual cases? It becomes particularly serious when we find your leading article discussing the reason for "detaining for an indefinite period" those with I.Q.s above 70. Surely the reason for their need of prolonged treatment is a temperamental disability which is not reflected in the I.Q. and which does not become apparent in the sheltered environment of the hospital, and yet has caused difficulties in the larger community.

None would quarrel with the statement that "a high proportion of patients in mental deficiency institutions are potentially employable in building, in factories, or in agriculture," but few would not wish to add that employability in a social group is of little value unless accompanied by the ability to live within that group.

However, the shortage of accommodation in our hospitals has led some of us to attempt a more rapid social rehabilitation for many of our patients than has been the usual practice. The results are doubtful but not easy to judge when numbers are small, so the survey you suggest on this aspect of the problem would be very welcome.—I am, etc.,

Morpeith.

C. GUY MILLMAN.

Rheumatic Heart Disease Complicating Pregnancy

SIR,—I would like to congratulate Drs. M. I. Drury, M. K. O'Driscoll, T. D. Hanratty, and A. P. Barry on their interesting and stimulating contribution (*Journal*, January 9, p. 70) to the already extensive literature concerning rheumatic heart disease and pregnancy. It does seem apparent that the treatment and their conclusions are based almost entirely on the physical state of women with this cardiac lesion from the time of conception until approximately six weeks post-partum. The authors refer, for example, to five women who died more than one year after delivery, death in each case being due to heart failure. "They had reached the end phase of their disease. The fact that they survived their latest pregnancy by more than one year suggests that pregnancy did not contribute to these deaths." Of course they had reached the end phase of their disease, but did they reach such a phase earlier than they would have done had they not experienced at least one pregnancy and labour some time more than one year previously? To suggest that pregnancy did not contribute to their early demise is surely more wishful than logical thinking.

The conclusion that there is no place for sterilization or therapeutic abortion is based, it seems, also on the immediate effects of pregnancy and labour (religious reasons excepted). I would agree that the increasing employment of valvotomy in suitable cases will appreciably reduce the numbers of patients hitherto recommended for such measures. There is, however, no mention in this article of the social side of the problem—the care of the child of the patient, and the decreasing amount of time borne by the patient, and the decreasing amount of time available for the rest she needs. Does not this also affect the prognosis for the patient? How often have we heard the dyspnoic pregnant woman voice her fears about her ability or inability to adequately care for this coming child "along with the others"? In conclusion, Sir, the fault of this otherwise excellent article is summarized in its title, "Rheumatic Heart Disease Complicating Pregnancy."—I am, etc.,

London, W.1.

FRANK DENNY.

SIR,—The conclusions reached by Dr. M. I. Drury and his colleagues in their paper "Rheumatic Heart Disease Complicating Pregnancy" (*Journal*, January 9, p. 70) that "it is

considered that there is no place for therapeutic abortion or sterilization," and their condemnation of contraceptives, must be taken as an expression of belief rather than as a deduction from their facts.

Their survey is concerned with "250 pregnancies in 175 patients with rheumatic heart disease" over a limited period of four years. Their patients are drawn from "underprivileged groups, with poor home conditions and no home help, who are fertile to a degree which workers in other countries rarely see." The average rate of birth for the group was "a pregnancy every two years," and so we may conclude that the mothers studied in the survey will continue their "uninhibited child-bearing" until death or the menopause intervene.

However much good antenatal care can minimize the direct risk of pregnancy and child-bearing, it will not ease the life of the under-privileged mother living in poor home conditions with increasing family responsibilities and diminishing cardiac reserves. As scientists we must weigh up the risks of a life of this sort against those of contraception and sterilization, and place these alternatives before the patient. If we wish to condemn these procedures, we should make it clear that our condemnation has a religious or emotional basis only.—I am, etc.,

London, N.W.5

ANTHONY RYLE.

A.P.T. and Poliomyelitis

SIR,—That recent inoculation against diphtheria and whooping-cough predisposes to poliomyelitis seems, to judge from your annotation (*Journal*, September 19, 1953, p. 669), to be a view that is now coming to be accepted. Yet a recent discovery that might cause us to modify this view appears to be escaping attention.

In Oxford, Anne McLaren¹ found that the susceptibility of mice to the virus of encephalomyelitis, when injected intramuscularly, was increased tenfold after they had been similarly inoculated with freshly obtained diphtheria A.P.T. and pertussis vaccine. But repeating the experiment on a fresh group of animals when the vaccine mixture was a month older failed to reproduce the same effect. A later experiment on mice inoculated with the vaccine after it had been stored for seven months at low temperatures disclosed the striking fact that its effect on the animals' susceptibility was reversed. This time, it actually increased ten times their resistance to the disease. In short, the effect of the vaccine, in one direction or the other, seems to depend on its age.

For obvious reasons, it does not necessarily follow that injecting a child with A.P.T. will protect it against poliomyelitis. But the principle brought to light by McLaren—that the influence of certain immunizing agents on an animal's susceptibility to a neurotropic virus depends on the age of the inocula—may possibly be a fundamental one. If so, it is important to ascertain if that principle has a clinical application.

The answer may already lie in the records of those authors who have demonstrated a relationship between inoculation and the occurrence of poliomyelitis. If not, the Medical Research Council could provide one of the requisite sets of statistics by arranging for future inoculations to be performed with prophylactically valid material of different ages. Meanwhile, the World Health Organization may be able to clarify the issue by collecting details of the dates of manufacture of immunizing agents that have been used in previous large inoculation schemes. From such data it may be possible to relate the age of the inoculum to the incidence of subsequent poliomyelitis infection among those inoculated.—I am, etc.,

London, E.C.4.

ALFRED BYRNE.

REFERENCE

¹ *Nature*, 1953, 172, 38.

Infection and Poliomyelitis

SIR,—I was interested to read your leading article (*Journal*, December 5, 1953, p. 1258) on infection and poliomyelitis, and Dr. J. H. C. Clarke's letter (*Journal*, January 9, p. 99).

In this practice, a rural one in Yorkshire, there was a small outbreak of acute poliomyelitis last autumn, eight cases in all. Being a relatively closed area, it was possible to assess the spread of the infection with regard to contact. Three of the cases were direct contacts with three earlier cases. The most interesting case arose in a different dale: there the family had kept away from the epidemic area completely. But one of the children developed poliomyelitis (confirmed, non-paralytic). The only feasible source of infection was from a visitor, a little girl who had been a direct contact of a confirmed paralytic case. The dates of interest are: (1) contact between carrier and first case October 4, 1953, (2) diagnosis of first case October 6, (3) carrier visited second case October 17-20, (4) diagnosis of second case November 2.

This small epidemic confirms that the mode of spread is by direct contact, and, in the last case, spread by a healthy carrier. Localization of an outbreak can be helped by more thorough isolation of contacts.—I am, etc.,

Hawes, Yorks.

J. D. McDONALD.

A Cosmetic Amputation

SIR,—The only difference between Mr. Ian Lawson Dick (*Journal*, January 2, p. 45) and myself is that he speaks of his own results while I speak of the results of operations done by Tom, Dick, and Harry. Dick's results may be grand, but Tom's and Harry's are lousy.—I am, etc.,

London, N.W.8.

HENRAGE OGILVIE.

Valvotomy in Mitral Stenosis

SIR,—The excellent operative results recorded by Mr. T. Holmes Sellors and Drs. D. Evan Bedford and Walter Somerville (*Journal*, November 14, 1953, p. 1059) in selected cases with a mobile and pliant valve tempt me to ask them to reconsider the situation in a large group of patients who are excluded from surgical help by their present criteria—that is, in those with extreme narrowing of a rigid orifice. There are theoretical considerations in favour of a minimal digital dilatation in such cases, with acceptance of the consequent increase in the regurgitation, and of giving, in fact, limited but essential help in cases where a perfect result is clearly unobtainable.

It is known that with a fluid of high internal friction flowing in a laminar manner through an orifice, the frictional loss of energy is inversely proportional to as much as the fourth power of the linear dimension of the opening.¹ Roughly, therefore, for a given differential head of pressure, the flow would be doubled by a linear increase of 2 mm. in an orifice of 1 cm. diameter, or by a dilatation of less than 1 mm. in an opening of half this size. Clearly, with filling pressures in the usual range a critical point exists below which a small contraction will produce an insuperable barrier and where, conversely, a modest dilatation would give disproportionate relief.

Further, Rodbard and Saiki² have demonstrated a probably different critical level below which occurs a rapid alternation of energy conversion between kinetic energy of flow and static pressure on the orificial walls, with a chattering effect producing a harsh sound and an abrupt fall of the flow/pressure ratio.

The diagnosis of mitral narrowing to the region of such critical levels may be thought to call for minimal dilatation beyond them where surgically possible. To go further than this must necessarily be disastrous, and it may be that it is through attempts to achieve a functioning valve in such cases that this important group of cardiac invalids has become surgically disreputable.

The prognosis in a patient so left with a rigid valve depends largely on the myocardial state and need not be wholly black. All interested in the subject must see many who live to a considerable age in some comfort, and Lenel, Strauss, and Schlichter³ demonstrated severe valvular deformities in patients over 50, 18% of whom were free from symptoms. Many patients with insistent symptoms in their late 30's

would be glad to accept an imperfect result if, for example, their chance of living to see their children settled was thereby increased.

I have many reasons to be grateful for the judgment and skill of the authors of this article, and my respect for them makes me open this topic with genuine diffidence. I was encouraged, however, by their mention of "unexpected clinical improvement" in some of the few cases of this type that found their way into the series.—I am, etc.,

London, N.19.

H. E. S. PEARSON.

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Press Publicity

SIR,—As a journalist, may I thank you for your leading article (*Journal*, January 16, p. 141) on the difficult subject of relations between the press and doctors? As you point out, "an operation on Siamese twins is news." It was my duty to obtain this news for my newspaper, which is not sensational, but will go to any legitimate length in serving a growing body of readers.

Do you, Sir, or does Professor Ian Aird, consider it fitting and conducive to the dignity of the art and science of medicine that for news of the first operation in this country for the separation of Siamese twins the press should be dependent on information supplied by a commercial company, however great and even though it was footing the bill, including transporting the children and their mother to London? Surely if a public relations officer was to be used the B.M.A.'s own John Pringle was the man. I do not for a moment defend any bad behaviour there may have been, but opportunity for this may not have occurred if Professor Aird had enlarged his sessions with the company's P.R.O. to include a few responsible journalists.

It was my lot recently, too, to write about the magnificent history of war surgery published by the Stationery Office. One could not help referring to such authors and subjects as Sir Heneage Ogilvie, Sir Gordon Gordon-Taylor (his chapter on abdominal injuries is a wonderful piece of writing), and, again, Professor Aird and his adventures among the Germans in the Libyan desert. What possible objection can there be to such publicity?

I submit that doctors and the B.M.A. should think again, and deeply, on this whole business, with your leading article as text. And, if I may so far presume, I would urge them to trust the journalist more.—I am, etc.,

London, E.C.4.

JOHN PRINGLE.

SIR,—The letter of Mr. John Prince (*Journal*, January 2, p. 43) under the title "Press Publicity" deals with a subject which everybody knows has been a sore one for many years. It is so difficult to explain to journalists the reasons why the medical profession dislikes publicity. It is equally difficult to show editors the dangers of cutting copy to leave a misleading half-truth in medical matters.

It is for these reasons that the Central Council for Health Education are helping reporters on non-professional publications by giving them accurate factual information and assisting them to present these facts effectively. The council have always been ready to assist the press in these matters, and receive many requests for help of this kind.—I am, etc.,

London, W.C.1.

JOHN BURTON.

Appendicitis in the Course of Measles

SIR,—Dr. W. H. Galloway's series of seven cases (*Journal*, December 26, 1952, p. 1412) is most instructive, but his conclusion that "during the course of measles, symptoms of acute appendicitis warrant immediate operation" requires qualification. Abdominal symptoms associated with measles may be met with as (a) an initial manifestation in which there is transient iliac discomfort; (b) a prodromal appendicular colic which Mayerhofer¹ refers to as pseudo-appendicitis; (c) the suppurative condition which occurs after the

rash has appeared; and (d) a fortuitous association of measles with acute appendicitis.

The first is not exclusive to measles, since it can be encountered at the outset of other infections—e.g., typhoid, smallpox, and poliomyelitis. Appendicular colic is occasioned by the virus of measles, and is not uncommon. "Several times we have observed typical appendicular symptoms in the early stage of measles which caused the attending physician to send the patient to the surgical unit" (von Gröber²). Since Finkeldey³ described the histological appearances in the tonsils and pharyngeal mucosa, many writers have recorded cases presenting a similar picture in the appendix. The case of Schultze⁴ is noteworthy because sections of the removed appendix reminded him of Finkeldey's tonsillar illustrations and suggested a diagnosis of a typical eruption, confirmed by the later appearance of a typical rash. I am surprised that Dr. Galloway could not find "any report on this matter in a British journal," as in 1936 I recorded instances of appendicular symptoms in the infectious fevers⁵; the section dealing with measles was annotated in the *Lancet*.⁶ The importance of examining the buccal mucosa was stressed because, like the prodromal laryngitis which was also given rise to difficulty in its management, the natural tendency is for the acute symptoms to abate when the fourth-day rash appears. Recognition of Koplik's spots will usually clarify the issue and help to limit the spread of infection if the patient is being treated in a surgical unit.

With regard to the surgical aspect, operation in the first category is unlikely to show the elongated pinkish appendix which is seen in the second group. Banks⁷ says: "It is surprising how often appendectomy is unnecessarily performed in the prodromal stage of the exanthemata," but he goes on to remark that true appendicitis does occur in persons with an exanthematous rash in much the same proportions as in other people." When Dr. Galloway states that he feels "that the occurrence of the two together is not fortuitous," I would agree in so far as his remarks apply to the eruptive phase of measles. Here the position may be akin to the pyogenic complications (otitis media, etc.) occasioned by the action of a second organism for which the virus has prepared the way. His two cases with abscess formation were in the eruptive stage. That has also been my experience. Until 1953, when I saw two examples, I had not met with suppurative appendicitis in prodromal cases which did not require operative interference. Should the symptoms in the eruptive stage be equivocal, a white-cell count is valuable; instead of the customary leucopenia, it will show a leucocytosis if the patient has a true appendicitis.

Everyone will agree with his statement that cases should be operated on when a definite diagnosis of appendicitis has been established. A fortuitous association of measles with acute appendicitis can, of course, occur in any stage. Fortunately, such cases are not common.—I am, etc.,

G. W. RONALDSON.

London, E.9.

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Medicinal Teaspoons

SIR,—The dose of one fluid drachm has for many years been interpreted as one teaspoonful. This practice was given more formal expression by the issue of British Standard 1348, 1949, which defined a medicinal teaspoon with a capacity of one fluid drachm as 3.5 ml.

It is regrettable, therefore, that recently some pharmaceutical manufacturers have adopted and, in at least one case, are issuing, a 5-ml. teaspoon, the use of which for other preparations can only result in overdosage and considerable waste, amounting to some 40%.—I am, etc.,

L. CARLYLE LYON.

Basing, W.5.

Obituary

WILLIAM GRIFFITH, M.B., M.R.C.P.

Dr. William Griffith, who was for many years physician to St. John's Hospital for Diseases of the Skin in London, died on December 28, 1953, in the Westminster Hospital at the age of 85.

William Griffith was born at Sebonig, Dyffryn, North Wales, on March 13, 1868, and was educated at Christ College, Brecon—where there was another scholar who later made his mark in London, Mr. John Howell Evans, the well-known surgeon—and at Owens College, Manchester. He graduated M.B., Ch.B. from the Victoria University, Manchester, in 1891, and then held resident appointments at the Manchester Southern Hospital, Denbighshire Infirmary, and the London Temperance Hospital. He continued his postgraduate studies at University College and at the Middlesex Hospitals, and in 1901 he worked as a medical referee for the London County Council and the St. Pancras Borough Council during the smallpox epidemic of that time. Having decided to specialize in skin disorders, he obtained the M.R.C.P. in 1909, and then became successively registrar, assistant physician, and finally physician to St. John's Hospital for Diseases of the Skin. From 1914 to 1919 he served as a specialist in the R.A.M.C. in the Aldershot command, and was mentioned in dispatches.

Dr. Griffith was an active member of the B.M.A., and was one of the honorary local secretaries of the Annual Meeting held in London in 1910. In addition he was honorary secretary of the Section of Dermatology at the same meeting. For three years until 1913 he was honorary secretary of the Metropolitan Counties Branch, and was then elected a vice-president. He became honorary treasurer of the Branch in 1929 and served in that capacity until 1934, and was then elected president of the branch. For a short time, in 1927-8, he was a member of the Journal Committee of the Association. From 1927 to 1929 he was honorary secretary of the Marylebone Division, and from 1933 to 1934 he was its chairman.

During his long life Dr. Griffith saw great changes in the treatment of skin diseases, and himself took an important part in the development of treatment by Finsen light. At the old London School of Dermatology he was the Chesterfield lecturer in diseases of the skin. He was a Fellow and former President of the Dermatological Society of London, now merged in the Royal Society of Medicine, and published a number of papers in its *Transactions*.

Medico-Legal

LEGAL AID

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Recently in an action for negligence against three doctors the plaintiff at the trial unreservedly withdrew his allegations of negligence against them. The judge, when awarding costs against the plaintiff, observed that as the case had been brought under a legal aid certificate the order for costs would not be enforceable.

Although the English sanction that the unsuccessful litigant will be ordered to pay a substantial part of his

opponent's costs is an effective deterrent to the bringing of frivolous and ill-founded claims by people of substance, it has never effectively deterred those who have no property upon which an order for costs could be executed, and who have nothing to lose by being made bankrupt. In this respect the Legal Aid and Advice Act, 1949, has not affected the position, because, although it alters the liability of the assisted litigant for his opponent's costs, it does so by providing that he shall have to pay only what the trial judge thinks reasonable in all the circumstances, including the means of all the parties. The result in practice is that anyone who has anything to pay with will be ordered to pay, and the man who has nothing will not be ordered to pay, and the successful litigant will have no better and no worse prospect of getting his costs paid than he had before.

The real sanction operating on the impecunious plaintiff before the Legal Aid and Advice Act used to be that his own professional advisers would generally not act for him unless the prospect of success was such that it was likely that he would be left at the end of the day with something out of which to pay their bill. Since the 1949 Act their bill—it is true on an "austerity" scale—is met out of the Legal Aid Fund irrespective of the result of the litigation.

But although the 1949 Act has thus removed this sanction it has not left the matter purely to the conscience of the impecunious litigant's professional advisers. Anyone who applies under the Act for a State subsidy to bring his case, which is the form which legal aid under the Act assumes, has first to satisfy the Assistance Board that his means are within the limits laid down under the Act and be assessed according to his means for his contribution towards the costs of the litigation, which has to be paid into the Legal Aid Fund. But he has also to satisfy a Certifying Committee of practising solicitors and barristers appointed under the Act, and not in any way concerned in the impending litigation, that he has a good prima facie case on the information which he puts before them, and that the case is a reasonable "business risk." Not only would it be the Committee's duty to refuse a certificate for legal aid if the applicant did not appear to have a case on which he was likely to get judgment, it would equally be its duty to refuse it if any judgment the applicant got would obviously be barren because the prospective defendant could have no means of satisfying it.

This machinery cannot prevent the launching of the case in which there is no real prospect of success and in which allegations of negligence have to be withdrawn at the trial. The Certifying Committee can hear only one side of the story, and, even if everything told to it is true, truth may assume a wholly different aspect when the other side of the story is told. The Committee cannot and ought not to usurp the function of the court. However, it is difficult to see how, once the principle of State-subsidized litigation for the poor man is accepted in the interest of justice, a better filter could be arranged. It is probably a lesser evil for the community that someone who is not so impecunious as to be able to get legal aid to defend himself should have to pay for his own defence in an action which ought not to have been brought than that a man who has an action which ought to be brought should be prevented by poverty from bringing it.

Universities and Colleges

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

The following medical degrees were conferred on December 3, 1953:

M.D.—E. W. Lillie.
M.B., B.Ch., B.A.O.—S. Allen, I. C. Bailey, Anne Bewley, A. W. Browne, W. Brownlee, Barbara M. Cooke, W. Dobson, F. F. Doran, Dorothy A. Foster, J. B. Gill, H. Hardman, N. L. Harte, C. A. Isola, A. Kahnta, J. E. Latham, G. R. L. Lyons,

D. McCaughan, S. W. McVicker, J. R. Noble, J. O'Carroll, W. G. Speer, J. D. Tate, E. C. Tees, E. G. Weyhausen.
LICENCE IN MEDICINE, SURGERY, AND IN OBSTETRIC SCIENCE.
L. A. H. Oulton.

CONJOINT BOARD OF IRELAND

The following candidates were duly admitted Licentiates in Medicine and Midwifery on December 4, 1953, having passed the final examination in medicine, surgery, and midwifery of the Conjoint Board of Ireland: A. M. van Bergen, Constance M. Coogan, B. C. F. Dalton, J. T. Devlin, G. G. Dibue, Eileen M. Dodd, Kathleen M. N. Gibney, T. S. Gilpin, M. Jeffries, Wee Soon Lee, D. M. McCarthy, P. B. McKenna, Monica M. McLoughlin, Priscilla R. K. Nicol, A. N. Obonna, A. R. G. H. Peermohamed, N. B. Smyth, E. H. Wells, R. J. Whitty, W. J. Wilmot, M. Wright, Maria E. T. Wyganowska.

The following candidates have been approved at the examinations indicated:

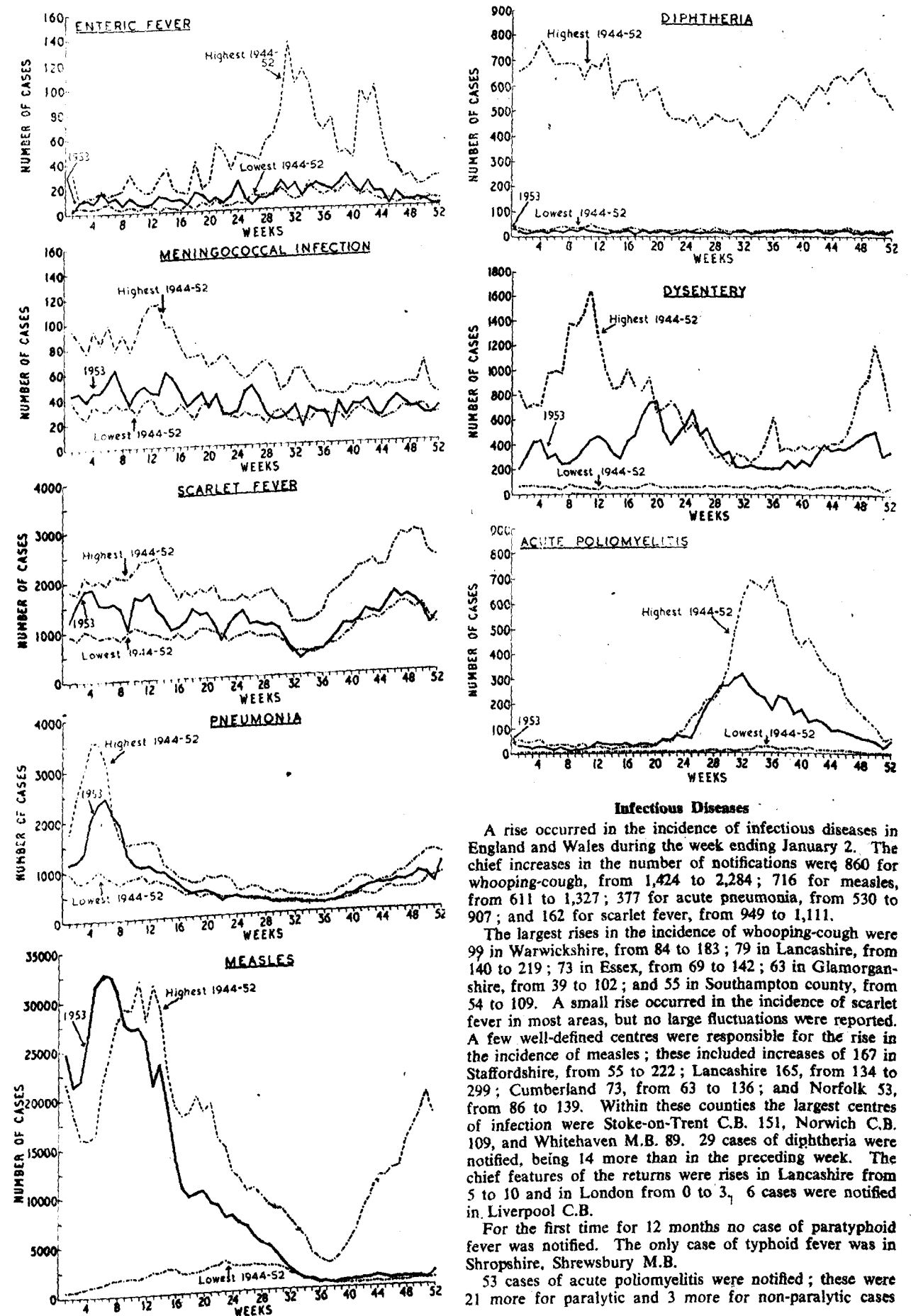
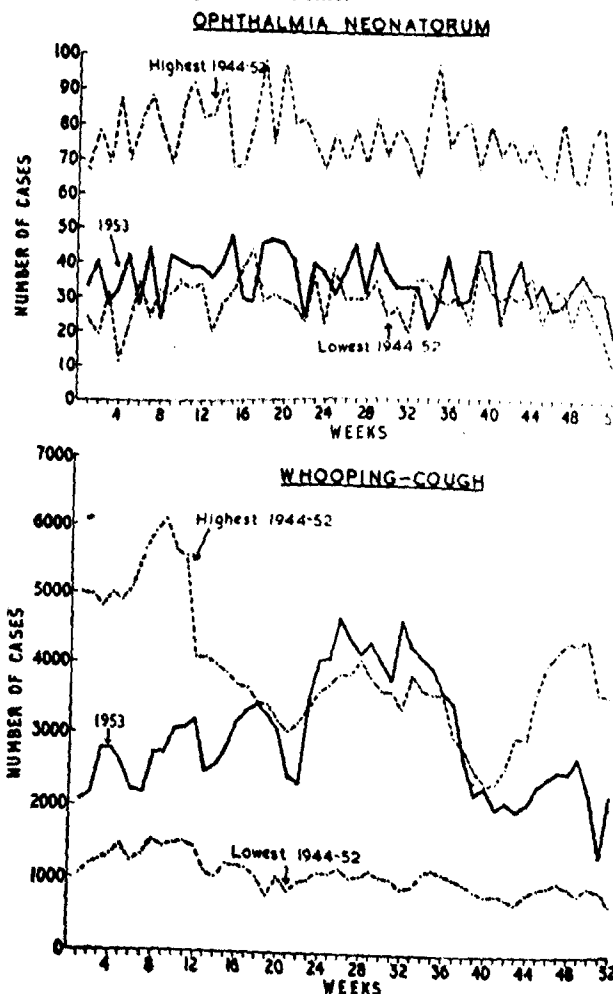
D.C.H.—N. Adhya, Margaret Bell, Muriel Bannister, Rosaline Power.

D.A.—R. E. Bourke, Una B. Byrne, Mary M. Gordon, J. Levin, L. C. Luck, D. O'Leary, M. R. Porter, P. J. Boyle, J. G. Goodbody, R. C. Gray, J. Lomaz, R. W. Milner, E. F. O'Riordan.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ———, the figures for 1953 thus ———. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

A rise occurred in the incidence of infectious diseases in England and Wales during the week ending January 2. The chief increases in the number of notifications were 860 for whooping-cough, from 1,424 to 2,284; 716 for measles, from 611 to 1,327; 377 for acute pneumonia, from 530 to 907; and 162 for scarlet fever, from 949 to 1,111.

The largest rises in the incidence of whooping-cough were 99 in Warwickshire, from 84 to 183; 79 in Lancashire, from 140 to 219; 73 in Essex, from 69 to 142; 63 in Glamorgan-shire, from 39 to 102; and 55 in Southampton county, from 54 to 109. A small rise occurred in the incidence of scarlet fever in most areas, but no large fluctuations were reported. A few well-defined centres were responsible for the rise in the incidence of measles; these included increases of 167 in Staffordshire, from 55 to 222; Lancashire 165, from 134 to 299; Cumberland 73, from 63 to 136; and Norfolk 53, from 86 to 139. Within these counties the largest centres of infection were Stoke-on-Trent C.B. 151, Norwich C.B. 109, and Whitehaven M.B. 89. 29 cases of diphtheria were notified, being 14 more than in the preceding week. The chief features of the returns were rises in Lancashire from 5 to 10 and in London from 0 to 3, 6 cases were notified in Liverpool C.B.

For the first time for 12 months no case of paratyphoid fever was notified. The only case of typhoid fever was in Shropshire, Shrewsbury M.B.

53 cases of acute poliomyelitis were notified; these were 21 more for paralytic and 3 more for non-paralytic cases

than in the preceding week. The largest returns were Gloucestershire 5 (Bristol C.B. 4), Lancashire 5, Yorkshire West Riding 4, Middlesex 3, Nottinghamshire 3 (Nottingham C.B. 3), and Derbyshire 3.

The number of notifications of dysentery increased from 309 to 340. The largest centres of infection were Lancashire 59 (Bolton C.B. 19, Preston R.D. 18), London 52 (Islington 16), Yorkshire West Riding 35 (Bradford C.B. 13), Middlesex 24, Norfolk 23 (Norwich C.B. 23), Warwickshire 21 (Birmingham C.B. 19), Leicestershire 18 (Leicester C.B. 14).

Infectious Diseases in England and Wales in 1953

The incidence of diphtheria continued to fall during the year, and the number of notifications was the smallest recorded in any year. During the 22nd week only 10 cases were notified, the lowest level yet attained. During the year Staffordshire, Warwickshire, and Lancashire were the chief sources of cases, and the important centres within these counties were Coseley U.D., Birmingham C.B., and Liverpool C.B. The incidence of scarlet fever, measles, and acute pneumonia was relatively high during the first quarter of the year, but declined to below the average of the preceding 10 years during the last quarter. Although fewer cases of measles were notified than in 1951, the outbreak in the first quarter of 1953 was very severe, and 39,127 more cases were notified than in the first quarter of 1951. In the 6th and 7th weeks the notifications of measles were 32,359 and 32,890, and were the largest numbers notified in any week since notification began. A comparison of the number of notifications with those of the three preceding years is as follows:

England and Wales	1950	1951	1952	1953
Scarlet fever	66,832	49,421	69,091	61,578
Whooping-cough	157,714	169,394	116,311	137,772
Diphtheria	2,858	1,969	1,473	1,022
Measles	366,116	615,332	400,838	534,020
Acute pneumonia	36,714	43,181	31,403	37,058
Meningococcal infections	1,745	1,956	1,687	1,783
Acute poliomyelitis	1,699	3,093	4,504	5,251
Dysentery	18,135	29,488	15,663	19,340
Typhoid and paratyphoid	654	1,438	1,190	569
Great towns: Influenza deaths	2,537	8,361	1,019	3,381

The seasonal rise of acute poliomyelitis began during the 21st week, the usual date, and the incidence rose steadily. During the 28th and 29th weeks the number of notifications reached the highest level yet recorded for these weeks, 223 and 266 cases. Further increases were small, and a maximum of 318 was reached in the 32nd week; from this date the incidence fell fairly steadily. Considerable variations were recorded in the proportion of paralytic to non-paralytic cases in the regions. The ratio varied from 0.9 in the southern region to 3.7 in the East and West Ridings. The distribution of paralytic and non-paralytic cases by regions is as follows:

Region	Paralytic	Non-paralytic
Northern	131	81
East and West Ridings	311	85
North-western	357	149
North-eastern	212	192
Midland	387	197
Southern	257	290
South-western	294	187
Eastern	253	160
London and S.E.	944	527
Wales	136	86

Week Ending January 9

The notifications of infectious diseases in England and Wales during the week included scarlet fever 792, whooping-cough 2,156, diphtheria 21, measles 1,134, dysentery 322, acute poliomyelitis 44, paratyphoid fever 1, and typhoid fever 2.

Smallpox in Holland

Up to January 14, 23 cases of variola minor have been identified as contacts of a case in The Hague.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 2 (No. 52) and week No. 52 of 1952.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1953-4					1952				
	Eng & Wales	Land	Scot	N. Ire	Eire	Eng & Wales	Land	Scot	N. Ire	Eire
Diphtheria	29	3	3	0		26	0	10	1	
Dysentery	340	52	105	3	13	184	23	75	2	1
Encephalitis, acute	4	1	0	0		6	0	0	0	
Enteric fever: Typhoid	1	0	0	0		2	0	0	0	
Paratyphoid	0	0	0	0		3	0	0	0	
Food-poisoning	127	18		0		42	0		1	
Infective enteritis or diarrhoea under 2 years					16 22					8 1
Measles*	1,327	9	13	8	101	14,189	996	103	17	40
Meningococcal infection	27	2	8	3	1	31	3	14	2	
Ophthalmia neonatorum	18	2	4	0		9	1	10	0	
Pneumonia†	907	58	297	13	2	826	44	284	1	2
Poliomyelitis, acute: Paralytic	40	2				30	2			
Non-paralytic	13	0			6 1 8	3	0			2 0
Puerperal fever‡	228	34	9	0		145	17	13	1	
Scarlet fever	1,111	70	166	42	32	1,358	72	264	14	52
Tuberculosis: Respiratory			120	30				123	21	
Non-respiratory			23	7				23	4	
Whooping-cough	2,284	84	261	66	99	1,117	73	61	11	12

DEATHS In Great Towns	1953-4					1952				
	Eng & Wales	Land	Scot	N. Ire	Eire	Eng & Wales	Land	Scot	N. Ire	Eire
Diphtheria	0	0	0	0	0	0	0	1	0	0
Dysentery	0	0		0		0	0			
Encephalitis, acute		0		0			0			0
Enteric fever	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	16	0	0	0	0	11	2	3		1
Influenza	22	6	1	0	0	44	6	2		1
Measles		0	0	0	0		0	1		0
Meningococcal infection		1	1				2	1		
Pneumonia	332	48	27	12	6	449	91			9
Poliomyelitis, acute	3	0			0	2	0			0
Scarlet fever	0	0	0	0	0		1	0		0
Tuberculosis: Respiratory	124	15	14	3	9	120	21	27		3
Non-respiratory	4	1	1	1	1	2	5			0
Whooping-cough	4	0	1	0	2	6	0	0		0
Deaths 0-1 year	290	42	36	13	18	249	23	29		13
Deaths (excluding stillbirths)	6,767	1,022	647	158	183	6,472	1,029	763		173
LIVE BIRTHS	8,227	1,222	823	229	365	4,450	623	778		254
STILLBIRTHS	201	27	20			133	11	30		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
‡ Includes puerperal pyrexia.

Medical News

Royal Commission on Mental Certification and Detention.—Lord Percy of Newcastle has been appointed chairman of the Royal Commission which is to inquire into the certification and detention of persons suffering from mental illness and mental defect (see *Journal*, October 31, 1953, p. 998). Lord Percy is 65. He is best known in connexion with education. For many years he was Rector of the Newcastle Division of Durham University, and was President of the Board of Education from 1924 to 1929. Last year he was appointed chairman of the Burnham Committee on teachers' salaries. As Lord Eustace Percy he was M.P. for Hastings (1921-37).

Tobacco Industry's Reply.—The American Tobacco Industry, in an advertisement published in American newspapers on January 4, has announced the formation of a Tobacco Industry Research Committee to look into the question of cigarette smoking and cancer of the lung, thus acting on a suggestion made in the *British Medical Journal* of December 13, 1952. In charge of the research activities of this committee will be "a scientist of unimpeachable integrity and national repute." In addition there will be an advisory board of scientists disinterested in the cigarette industry. The advertisement states that a group of distinguished men from medicine, science, and education will be invited to serve on this board. So far none of these persons has been named, nor the chief scientific adviser. This move on the part of the American Tobacco Industry is in response to public anxiety in the United States following the report by Wynder, Graham, and Croninger on the production of skin carcinoma in mice painted with cigarette tar (see *Journal*, December 19, 1953, p. 1362). The Tobacco Industry's Committee, while reiterating the industry's belief that tobacco products are not injurious to health, states that it accepts "an interest in people's health as a basic responsibility, paramount to every other consideration in our business."

London School of Hygiene and Tropical Medicine.—One of the outstanding sections in the school's annual report for 1952-3 is Professor J. M. Mackintosh's account of the work of eight "study groups" which were formed by D.P.H. students. Each group was given a subject to investigate during the year and presented a report on it during the summer term. To illustrate the value of local history, one group studied the history of housing in the borough of Hammersmith. The modern tramp was the subject of another inquiry: here the group came down in favour of spending limited public funds on prevention rather than on attempts at rehabilitating the "end-product of this particular type of social misfit." Caravans and house-boats, the care of the elderly, the work of the occupational psychologist, and the role of the medical officer of health in slum clearance were tackled by other groups. A study on what factors had affected the results of the "eleven-plus" examination in children from a housing estate provided at least one surprising finding—among successful children there had been more changes of school. As might be expected, good health and good physique went with success, long absence from school with failure. An educated mother was more of an asset than an educated father. Television in the home was associated with poorer examination results. The last group investigated the part played by the popular press in health education. Contrary to their expectation, the group records that most of the newspaper articles were of high quality. The attitudes of three health editors interviewed were varied; one regarded promotion of circulation as his first duty and chose his articles for their news value; at the other end of the scale, another—an ex-nurse—felt the articles in her paper were filling a serious gap in the health services. In both cases the final result was much the same, the articles

having in the opinion of the group a high educational value. A popular article might draw as many as 16,000 letters from readers. The success of these study groups, which have now been in progress at the school for several years, must be judged by their capacity to educate the future medical officer of health. Professor Mackintosh has little doubt of this. "There is more in a D.P.H. course," he says, "than the diploma at the end of it." Study groups show how to reach agreement by discussion and teach the value of team-work.

Everest Doctors at the Royal College of Surgeons.—Two medical members of the successful Everest expedition gave a Hunterian Lecture, jointly, at the Royal College of Surgeons on January 13. Dr. Michael Ward described the climb up to 22,000 ft. and Mr. R. C. Evans continued with a description of the final stages of the attack on the summit. The speakers illustrated their remarks with photographic slides and with diagrams showing the results of some of the physiological investigations carried out by Dr. L. G. C. Pugh, who was in the audience. Later in the same evening the council of the College entertained Mr. Evans and Mrs. Ward and Pugh to dinner, and a large company of Fellows with their guests were present. Sir Reginald Watson-Jones presided, and introduced the three members of the expedition—whose health was drunk by the company in the favourite Everest drink, hot lemonade. After brief and modest speeches by the guests of honour, the company adjourned to another room to see part of the Everest film.

Treatment of Homosexuals.—The Howard League for Penal Reform has asked the Home Secretary, Sir David Maxwell Fyfe, for a committee to inquire into the treatment of homosexuals. In a letter to the Home Secretary, concerned particularly with male persons convicted of homosexual offences, the League states that it is not convinced that there are sufficient therapeutic facilities in prisons for all cases which might be amenable to treatment. "As for the psychopathic homosexual, he, in company with other psychopathic offenders, must await the opening of a special institution on the lines recommended by Sir Norwood East and Dr. Hubert." The League adds that any inquiry of this sort should also consider how far and in what circumstances male homosexuality should be considered a criminal offence.

University Grants Committee.—The reconstituted University Grants Committee includes three medical men: Dr. E. D. Adrian, P.R.S., Master of Trinity College, Cambridge; Professor W. Melville Arnott, professor of medicine at Birmingham and recently deputy president of the First World Conference on Medical Education; and Professor G. W. Pickering, professor of medicine of St. Mary's Hospital, London, a former Sims British Commonwealth Travelling Professor. The committee consists of 15 members and a full-time permanent chairman.

Paul Ehrlich Prize.—Dr. E. B. Chain, F.R.S., at present scientific director of the International Institute for Chemical Microbiology, Rome, has been awarded this year's Paul Ehrlich prize, a gold plaque. In 1945 Dr. Chain shared with Sir Alexander Fleming and Sir Howard Florey a Nobel Prize for his work on penicillin. This year is the centenary of Ehrlich's birth on March 14, 1854.

National Institute for the Deaf.—Mr. R. Scott Stevenson, F.R.C.S.Ed., has resigned from the chairmanship of the institute's council, a post he had held for nine years, as he is going to Gibraltar. His place is being taken by the present vice-chairman, Mr. Edward Evans, M.P., and another E.N.T. surgeon, Mr. I. G. Robin, F.R.C.S., has been elected as the new vice-chairman. At a farewell dinner on January 7 Mr. Scott Stevenson was presented with a radio-gramophone.

Dr. L. Cosin, clinical director, Geriatric Unit, United Oxford Hospitals, is visiting Israel for four weeks during

January and February to carry out a survey of chronic sick hospitals. He will be lecturing in Athens and Rome on behalf of the British Council.

Professor R. H. Parry, M.O.H., Bristol, has become the first president of the Bristol Branch of the Catering Managers Association of Great Britain.

25th Birthday.—*The Listener*, which is edited by Mr. Alan Thomas, celebrated its twenty-fifth birthday last week with a party at the Dorchester Hotel and a special number which included a selection of talks given over the wireless since 1929, beginning with H. G. Wells on "World Peace," and subtly ending with "The Uncertainty Principle," by Professor E. N. Da C. Andrade. *The Listener* is always packed with good things, and this birthday number is one to buy for keeps.

COMING EVENTS

Art Exhibition for Doctors.—Contributions from British doctors, pharmacists, dentists, and veterinary surgeons are invited for the twenty-sixth Salon des Médecins, Pharmaciens, Dentistes et Vétérinaires which will be held in Paris from March 7 to 21. There will be sections for paintings, sculpture, photographs, and applied decorative art. Those intending to exhibit should send their name, address, professional qualifications, and title of exhibit to Dr. Malet, 67, Avenue Pierre Larousse, Malakoff (Seine), France, and their exhibits (properly labelled) to Messrs. Davies Turner Ltd., 4, Lower Belgrave Street, London, S.W.1, not later than February 10.

Third International Congress on Diseases of the Chest.—The congress, held every second year by the American College of Chest Physicians, will take place from October 4 to 8 in Barcelona. The official languages will be Spanish, English, and French. Further information may be obtained from the general secretary of the congress, Córcega, 393, 40, 1^a, Barcelona, Spain.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, January 25

● **INSTITUTE OF CARDIOLOGY.**—9.30 a.m., Mr. P. R. Allison: Bronchoscopic Measurements of Left Auricular Pressure.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.

MANCHESTER MEDICAL SOCIETY: SECTION OF ODONTOLOGY.—At Manchester Dental Hospital 5 p.m., Professor A. D. Hitchin: Post-operative Sequelae.

MANCHESTER MEDICAL SOCIETY: SECTION OF GENERAL PRACTICE.—At Large Anatomy Theatre, Manchester University, 9 p.m., Dr. C. S. D. Don: Treatment of Some Chronic Chest Conditions.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., Meeting of Fellows; discussion to be introduced by Mr. J. Hamilton Doggart and Dr. S. Pinder Meadows: Ophthalmic Evidence of General Disease.

ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: Refraction Work in the Young and the Old. Appalsia.

Tuesday, January 26

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor J. B. S. Haldane, F.R.S.: Genetics of Some Biochemical Abnormalities.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. F. Borrie: Vascular Disorders.

MANCHESTER MEDICAL SOCIETY.—At Physiology Theatre, Manchester University, 4.30 p.m., discussion by Dr. Lennox M. Johnston and Professor J. Crighton Bramwell: Tobacco Smoking and Health.

ROYAL STATISTICAL SOCIETY: STUDY CIRCLE ON MEDICAL STATISTICS.—At Westminster Medical School, 6 p.m., Dr. D. J. Finney: Bio-assay.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Professor J. C. McClure Browne: Dysmenorrhoea.

Wednesday, January 27

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Parapsoriasis, Psoriasis, and Mycosis Fungoides.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Dr. R. Thomson: Laboratory Aids to Diagnosis.

● **LONDON UNIVERSITY: DEPARTMENT OF EXTRA-MURAL STUDIES AND ATOMIC SCIENTISTS' ASSOCIATION.**—At Beveridge Hall, Senate House, 7 p.m., Professor O. R. Frisch, F.R.S.: Atomic Weapons.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—7.30 p.m., Mr. A. G. Fishburn, F.P.S., F.R.I.C.: Formulary of the British Veterinary Codex; Dr. D. C. Garrait, Ph.D., F.R.I.C.: Standardization of the Drugs and Galenicals of the British Veterinary Codex.

ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Operations and Their Indications (5).

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Dr. John Burna Lecture by Sir Ernest Finch: The Forerunner: Leonardo Da Vinci's Contribution to Anatomy and Physiology.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Professor T. F. Rodger: Lecture-demonstration in Psychiatry.

SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP—NUTRITION PANEL.—At Chemical Society, Burlington House, 6.30 p.m., Dr. L. J. Harris: Vitamins and Newer Concepts.

Thursday, January 28

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor E. Boyland: Chemotherapy of Cancer.

● **INSTITUTE OF CHILD HEALTH.**—5.30 p.m., Dr. P. H. Sandifer: Cerebral Deterioration in Childhood.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Disinfection and Sterilization.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Mr. John C. McFarland: Bilateral Abductor Paralysis (with film); Dr. D. M. Zausmer: Some Cases of Tics in Childhood and Their Treatment.

NORFOLK ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, Headington, Oxford, 8.30 p.m., Professor J. Trueta: Michael Servetus and the Development of Modern Science.

ROYAL ASSOCIATION, Ciba Foundation. 41, Portland Place, W. 4.30 p.m., Dr. R. V. Fildwood: Factors in the Excretion of Sodium.

ROYAL ARMY MEDICAL CORPS.—5 p.m., Dr. C. H. Andrews: Recent Research on the Common Cold and Influenza.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor R. H. C. Robins: Primary Reconstruction of the Injured Hand.

ROYAL EYE HOSPITAL. 5.30 p.m., Miss M. Savory: Demonstration of Instruments.

ROYAL SOCIETY.—2.30 p.m., discussion to be opened by Sir Bryan Matthews, F.R.S.: Physiology of Man at High Altitudes.

ST. ANDREW'S UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor N. M. Dott: Intracranial Aneurysms—Their Management.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. D. Williams.

● **SOCIETY FOR CULTURAL RELATIONS WITH THE U.S.S.R.: MEDICAL SECTION.**—8.15 p.m., Dr. Phyllis Dobbs: Care of Women and Children in the Soviet Union.

● **WEST LONDON MEDICO-CHIRURGICAL SOCIETY.**—At South Kensington Hotel, 41, Queen's Gate Terrace, S.W., 7.30 for 7.45 p.m., dinner meeting; 8.30 p.m., Sir Harold Gillies: Surgical Aspects of Plastic Surgery.

Friday, January 29

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Edinburgh, 7.45 p.m., debate with Royal Medical Society.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. P. F. Borrie: Vascular Disorders.

INSTITUTE OF LARYNGOLOGY AND OTITIS.—3.30 p.m., clinical meeting for general practitioners. Mr. A. R. Dinale: Hoarseness Differential Diagnosis and Treatment.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION. At Royal Free Hospital School of Medicine, 8.30 p.m., Dr. Mary J. Wilmer: Children and Streptococci.

● **ROYAL INSTITUTION.**—9 p.m., Sir Lawrence Bragg, D.Sc., F.R.S.: X-ray Studies of Biological Molecules.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., debate with Glasgow University Medico-Chirurgical Society. Motion: This House Deplores the Lack of Culture in the Present-day Doctor.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Crook.—On January 13, 1954, at the Military Hospital, Tidworth, Hants, to Ruth (formerly Bellamy), wife of Major J. C. Crook, M.D., D.T.M.&H., R.A.M.C., a son—Philip Laurence Cooper.

Evans.—On January 13, 1954, at Nuffield House, Guy's Hospital, London, S.E., to Winifred (formerly Groom), wife of Dr. M. L. Hudson Evans, Lewisham, London, S.E., a brother for Timothy, Sara, and Jonathan Simeon.

Habibis.—On January 12, 1954, at Queen Charlotte's Hospital, London, W., to Stella M. Murray, M.B., B.S., D.C.H., wife of Dr. Homer S. Habibis, 1a, Porchester Terrace, London, W., their fourth child a daughter.

Lyall.—On December 30, 1953, at the Rubislaw Nursing Home, Aberdeen, to Beulah, wife of Dr. Douglas J. Lyall, of 56, Station Road, Sedgfield, Co. Durham, a sister for Joan.

Nicholson.—On January 14, 1954, to Dorothy Christine (formerly Clarke), S.R.N., wife of Nigel Geoffrey Nicholson M.B., B.S., a brother for Susan Penelope—Alan Francis.

Stowers.—On December 17, 1953, at Maryfield Hospital, Dundee, to Mary (formerly Alabaster), M.B., B.S., wife of John M. Stowers, M.D., M.R.C.P., a second daughter.

Tucker.—On January 2, 1954, at the Rubislaw Nursing Home, Aberdeen, to Helen (formerly Rennie), wife of Dr. Hugh M. Tucker, Urquhart Villa, Lossiemouth, Moray, a sister for Malcolm and Gillian Amanda Dawn.

Waind.—On January 7, 1954, at Risedale Maternity Hospital, Barrow-in-Furness, Lancs, to Catherine (formerly Rycoft), M.B., Ch.B., wife of Philip Waind, D.S.C., M.D., M.R.C.P., a brother for John and Sarah—David Philip.

MARRIAGES

Neill-King.—On January 9, 1954, at St. Michael and All Angels, Wilmington, Kent, Alexander Edward Neill, M.B., B.Chir., to Sheila King, M.B., B.Chir., B.A.O.

DEATHS

Ashford.—On January 1, 1954, at Clynt Cottage, Topham, Devon, William Ashford O.B.E., M.R.C.S., L.R.C.P., J.P., aged 82.

Blackstone.—On December 29, 1953, at Woking, Surrey, Leonard Christopher Blackstone, O.B.E., M.B., B.S.

Burn.—On December 23, 1953, Ronald Edgar Russell Burn, M.R.C.S., L.R.C.P., of The White Cottage, North Petherton Somerset.

Hosford.—On December 20, 1953, at 61, Heathfield Road, Handsworth, Birmingham, Alfred Stroud Hosford, M.R.C.S., L.R.C.P.

Lyons.—On December 26, 1953, at Old Court Clinic, Ealing, London, W., Elmina, beloved wife of Dr. L. Carlyle Lyons of 42, Cornhill, Ealing, W.

Scott.—On December 16, 1953, at Sidmouth, Devon, William Thurburn Scott, M.B., B.Ch., late of Banchoy, Kincardineshire, aged 77.

Tellet.—On December 17, 1953, at West Winds, Grange-over-Sands, Lancs, William Edward Tellet, M.D., aged 77.

Walker.—On December 22, 1953, at Nailsea, near Bristol, James Alexander Walker, M.B., B.S., D.O.M.R.C.O.G., late of Cheddar, Somerset, and Parkstone, Dorset, aged 52.

Wilkie.—On December 20, 1953, at 109, Princess Road, Leicester, Charles Hamilton Wilkie, M.D.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Scaphocephaly

Q. I have had referred to me an 8-months-old baby with scaphocephaly. The child is healthy, above average weight, and appears of normal intelligence. The parents have been told that an operation may be necessary. What is the prognosis and treatment of this condition?

A.—In the presence of premature synostosis of cranial sutures operation is indicated to prevent mental retardation, visual failure, and severe cranial deformity. The weight of the brain is doubled during the first seven months of life, and 80% of its entire growth is completed in the first three years. Any factor which interferes with this rapid increase of brain volume in early life—and premature synostosis is of raised intracranial pressure and gross deformity of the head may result. While operation will not be indicated in all cases, there is evidence which strongly suggests that if operation is to be followed by a good result it must be performed in the early months of life before serious symptoms have appeared.

Various types of operation have produced satisfactory results. Linear craniectomy is perhaps now the most favoured. Strips of bone are excised along the line of the closed suture or sutures, and the bone margins covered with a thin film of "polythene." With adequate surgery in skilled hands the risks are extremely small and the results good.

Crickets

Q.—Are crickets capable of carrying infection or in any way dangerous apart from being a nuisance? Mrs. X lives in the country, and during the summer months her house is infested by these creatures from a refuse dump across the road; they emerge during the night from crevices and from the skirting. What is the best way of getting rid of them and keeping them away?

A.—It is difficult to envisage any possible way in which crickets could transmit infection, and the only danger seems to be a possible neurasthenia induced by their presence in large numbers. The chirruping of a solitary cricket may be an agreeable accompaniment to a boiling kettle (witness Dickens's *Cricket on the Hearth*); but few would appreciate invasion by one of the autumnal hordes that sometimes migrate from their perennial breeding sites in refuse tips. Malcolm Burr, in his little book on British grasshoppers, records the official report of a Cheshire coroner on a sanitary inspector who had been "driven by crickets to despatch and suicide." However, this cannot be a general reaction, for most travellers in the Tropics fall asleep to a continual din of assorted chirruping. One other aspect of cricket nuisances may be mentioned: they are prone to bite exploratory holes in various fabrics.

As regards control, a dust containing about 0.5% gamma-benzene hexachloride or 10% dicophane (D.D.T.) is probably the best weapon. This should be blown with a dust gun into crevices where the insects hide. The same dust scattered at the rate of 1 cwt. per acre (125 kg. per hectare) might be applied to the infested refuse tip should the nuisance be general. This may have to be repeated once or twice at fortnightly intervals if the infestation is severe.

Herpes and Facial Palsy

Q.—Is herpes zoster frontalis ever associated with facial palsy? A patient of mine developed facial palsy on the same side as the zoster four weeks after the onset of the latter. The paralysis cleared up completely in two weeks.

A.—A facial palsy can occur in herpes zoster. The type of the disease in which it occurs is the so-called geniculate zoster (Ramsay Hunt's syndrome): in this condition there is usually pain in the ear and sometimes in one side of the throat; vesicles may be scanty, but can usually be seen on the pinna, in the external auditory meatus, and on the pillars of the fauces; in the course of a few days a lower motor neurone facial palsy appears, and this may be accompanied by labyrinthine symptoms such as vertigo. The facial palsy has been ascribed to involvement of the geniculate ganglion by herpes zoster: pathological proof of this theory is, however, lacking, and it may be that the facial nerve itself rather than the ganglion is involved. It is probable that in the patient mentioned in the question Gasserian ganglion herpes zoster was complicated by geniculate herpes.

Treatment of Huntington's Chorea

Q.—What are the best measures of treatment in Huntington's chorea? What degree of improvement can be expected from treatment?

A.—Huntington's chorea is a relentlessly progressive disorder. No treatment is known which will stem its course. The most that one can expect from therapy is to abate the violence of the involuntary movements, and, secondly, to remove some of the more distressing emotional aspects of the progressive dementia. For the former symptoms, sedatives such as phenobarbitone or amylobarbitone, or drugs of the "artane" class, may at least be worth trying. Recently oral procaine amide had been advocated, in the dosage of 0.25 to 1 g., four times daily. The writer has no personal experience with this drug, however. For the latter set of symptoms, which may include depression, irritability, and violent unbridled behaviour, there may be a case for the serious consideration of the merits of electric convulsion therapy, or even leucotomy.

Operative Treatment of Bicornute Uterus

Q.—Is there any operative treatment for congenital abnormalities of the uterus, such as uterus bicornis, which result in repeated miscarriage? What is the prognosis with regard to achieving a live baby?

A.—If other causes for recurrent abortion can be excluded it is sometimes justifiable to recommend a plastic operation—on a bicornute uterus. Before this is done, however, there should have been at least three miscarriages and no pregnancies resulting in a viable child. Moreover, the patient should appreciate that the result of the operation cannot be guaranteed though the prognosis is quite good in certain cases. The prospects of success depend in large measure on the type and degree of abnormality present and on the development of the uterine horns. If the uterine cavities are narrow and widely separated the operation can be difficult and the result unsatisfactory. Factors such as these, some of which can be judged by hysterosalpingography, also determine the type of operation carried out. Sometimes a wedge of tissue between the two horns can be excised, sometimes it is better to open each horn longitudinally on its inner aspect and to suture the free edges of two horns together. If one horn is much better developed than the other, it may be advisable to excise the rudimentary horn.

In the event of pregnancy after uteruloplasty it is usually wise to deliver the baby by elective caesarean section before term. This is because this operation, unlike other operations on the normally developed non-pregnant uterus, often leaves a weak scar, and rupture of the uterus in late pregnancy or in labour is a real risk.

Unpleasant Sensations and Thundery Weather

Q.—I should be grateful for information regarding the cause of those unpleasant vasomotor effects from which some people suffer in thundery weather or whenever the atmospheric pressure varies widely within short periods of time. The ones particularly for which advice would be appreciated are headache, nausea, dizziness, and the peculiar sinking feelings in the lower abdomen.

A.—It is considered most unlikely that the unpleasant sensations described are directly due to barometric pressure changes. If the latter were sudden and marked it is possible that there would be some ear discomfort in the presence of a blocked eustachian tube, but there would be no more than slight deafness.

One cause of the symptoms described may be the great increase in relative humidity which occurs when the barometric pressure falls suddenly. This will greatly interfere with body heat loss, and the resultant vasomotor adjustments may be uncomfortable and disturbing, particularly in those with cardiac insufficiency, vasomotor instability, or excessive awareness of such changes. Finally, we are still very close to the primitive man who was no doubt frightened by the natural phenomena which often inaugurate violent storms. A conscious or subconscious fear of thunder and lightning, which is very common indeed, may also initiate these abnormal sensations, particularly the nausea and sinking feelings in the abdomen.

Laryngeal Vertigo

Q.—What is laryngeal vertigo? Is there any treatment for this condition?

A.—It was formerly thought that laryngeal vertigo was a disease in its own right, like Ménière's disease, but this is not so. It occurs as a rule in middle-aged men who are subject to a spasmodic type of cough. The episode may be provoked by eating or drinking, or by inhaling an irritant such as tobacco. Usually there is a fit of coughing, with spasm of the glottis, so that the combination of violent respiratory movements and complete closure of the glottis causes a violent variation in the cerebral circulation and momentary syncope. A detailed description of the physiological mechanisms in these cases has been given recently by Professor E. P. Sharpey-Schafer.¹

Any causal condition in the respiratory tract should be treated, and care exercised in the choice of food and drink, if these are precipitating factors. Smoking should be forbidden.

REFERENCE

¹ *British Medical Journal*, 1953, 2, 860.

Iron Carbonyl

Q.—What are the toxic hazards of iron carbonyl? It is supplied as a liquid and added to the oil fuel used for certain diesel engines. Are any special precautions necessary in handling it?

A.—Little information is available on the practical question raised here. All carbonyls split into the metal and carbon monoxide when sufficiently heated, and when mixed as vapour with air may even explode. The penta iron carbonyl which is referred to is regarded as being somewhat less toxic than nickel carbonyl and no cases of industrial poisoning have been reported.

Upon inhalation of the vapour, these carbonyls are thought to decompose with the liberation of carbon monoxide and a fine deposit of the metal over the surfaces of the alveoli. The immediate symptoms are likely to be those of dizziness, headaches, and difficulty in breathing, while some 12 hours later pulmonary oedema may develop.

Steps should be taken to see that the concentration of the vapour in the air is kept in the neighbourhood of 1 p.p.m., and fire risk must not be overlooked.

Childbirth and Cataract

Q.—I have a patient, a young woman, who is shortly to be married. She is very worried because both her mother and her mother's sister developed severe cataracts after the birth of their first child. Both were about 30 years of age and apparently had completely normal pregnancies and confinements. There is no other relevant family history. Is post-natal cataract well known, and is there a special risk of my patient suffering from it if she has children?

A.—Childbirth does not directly cause cataract. It is difficult to make any realistic comment upon the cataract which is said to have afflicted the patient's mother and aunt after the birth of their first children without having precise information about its type. If the cataracts were of the familial type, then the patient in question might well be implicated, irrespective of any pregnancy.

NOTES AND COMMENTS

Facial Disfigurement after Dental Extractions. Mr. N. J. AINSWORTH (London, W.1) writes: I think that the question on facial disfigurement after dental extractions ("Any Questions?" December 19, 1953, p. 1388) was misunderstood by your expert. The vertical lines referred to were surely not the nasolabial groove but the fine furrows running vertically down to the vermilion edge of the lips. These are due to loss of skin elasticity and muscle tone; they are never seen in the young even with full or no dentures, and are only exaggerated in the elderly by inadequate restoration of contours by the dentist. "Plumping" is useless, and the only mitigation possible is the placing of the tips of the artificial upper incisors as far forward as natural appearance permits. Some sacrifice of function is permissible to obtain the lip eversion required, and stability is surprisingly little interfered with.

Prickly Heat.—SURGEON COMMANDER ALAN ROBINSON, R.N. (London, S.W.19), writes: In an answer to a question on the aetiology, diagnostic features, and treatment of prickly heat ("Any Questions?" January 2, p. 54) no reference was made to the use of a detergent in treatment. Between 1948 and 1950 we obtained, in Singapore, almost invariable cure of prickly heat by substituting cetrimide for soap. The effect was usually dramatic, and I have not known it to fail. Another treatment was to rub on gingelly oil (oil of sesame) before the bath, so that the oil could penetrate and soften the skin. This was quite successful, but not so efficient as the detergent.

OUR EXPERT writes: So many remedies have been enthusiastically claimed to be of value in prickly heat but have later been shown to be ineffective that caution is advisable regarding such claims. The treatments here mentioned have gained no wide degree of acceptance and time alone will show whether they are of real merit.

Correction.—In the leading article on cerebral arteriography (*Journal*, January 9, p. 85) the following sentence in the fifth paragraph should have appeared as printed here: "It is this effect on the blood brain barrier or vascular spasm which probably causes the transient hemipareses which may complicate arteriography."

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: Attilagey, Westcent, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 30 1954

THE VALUE OF PHYSIOLOGY IN MEDICINE*

BY

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First of all I wish to thank you for the honour you have done me in inviting me to deliver the two hundred and thirty-fourth Harveian Oration; secondly, to commemorate the memory of William Harvey, and all other benefactors of the College. Although I had learnt a little about Harvey in my physiology days, I did not really appreciate the magnitude of his achievement until the tercentenary of the publication of his great work, *De Motu Cordis*, which was celebrated in this College in 1928. I was especially impressed by the cinematograph film prepared by Sir Thomas Lewis and Sir Henry Dale, which demonstrated most clearly the arguments and experiments which he used to prove that the blood circulated through the heart. The film is now shown to all physiology students, but it is unfortunate that many of the men and women who qualified before 1928 have not had an opportunity of seeing it, and of appreciating to the full the value of Harvey's work. I should have liked to show the film this afternoon, but it would have taken too long. I hope, however, that all the members of the staffs of teaching hospitals, and not only the physicians, will take the opportunity of seeing it when it is demonstrated to their students, and so realize the difficulties which Harvey overcame. He has been called the first of the physiologists, and it is for this reason that I have chosen as a title "The Value of Physiology in Medicine."

Although the science of physiology progressed slowly throughout the centuries, there was often a tendency to decry its value. This is well shown by the experience of Sir Henry Dale, when a little more than 50 years ago he clerked for that very able clinician, Dr. Samuel Gee. He was told, "When you enter my wards your first duty is to forget all your physiology. Physiology is an experimental science—and a very good thing, no doubt, in its proper place. Medicine is not a science but an empirical art, and it is as such that you may learn something of it here" (Dale, 1950). I do not know how much Dale learnt of the "empirical art," but he has carried out himself, and has directed, much research work which has been of very great value in the whole field of medicine. He has therefore greatly helped to advance the day which Gee indeed foresaw, that "some day medicine, too, might become an experimental science." When I came down from Cambridge 49 years ago nothing so foolish was said to me, but no one seemed to pay any attention to physiology. Thus when I was a surgical dresser I was astonished to hear Sir

Anthony Bowlby, an able surgeon, call for very hot saline in the course of an operation, and I was told that this was done to stop haemorrhage. This seemed most extraordinary, as the heat would, I thought, cause dilatation of the blood vessels and capillaries, and increase the bleeding, but the house-surgeon assured me that it did stop haemorrhage. I was too frightened to ask Bowlby for the explanation, which I think he might have known.

Advances in Physiology

The advances in physiology have been made not only by those who work in the physiological laboratories but also by the whole army of clinicians, chemists, biochemists, biologists, physicists, anatomists, pharmacologists, and pathologists who have contributed their experiences. The final building up of the subject must, I think, be done by the physiologists and biochemists, who test out the evidence provided by their colleagues and finally assess the value of the work.

Some clinicians have, in the past, spoken contemptuously of the value of physiology in medicine and expressed a disbelief in results obtained from a "pithed" frog. The frog has been most useful to mankind; it is cheap to buy and the brain is easily destroyed, so that the student can do his experiments without causing any pain. Many important studies have been made on its heart, and it was of value in the study of nervous reflexes, but has now been displaced by Sherrington's decerebrate cats. But it is of importance to repeat the work on different animals, for they often differ considerably. Thus the great advance which has taken place in our knowledge of scurvy was made possible by the guinea-pig. This is the only animal besides man which is unable to synthesize ascorbic acid, and develops scurvy, which can be studied, under controlled conditions, at all stages of the disease. In man, scurvy is nowadays rarely seen and it is difficult to carry out controlled experiments. But the work of Crandon *et al.* (1940) is of importance because, while Crandon was doing his full work as a surgeon, he abstained from eating anything known to contain ascorbic acid. After 116 days he had slight symptoms of scurvy, and a surgical wound on the 182nd day did not heal. Again, the first investigations on anaphylactic shock were made on guinea-pigs, which develop bronchial constriction, whereas a dog develops congestion of the liver from spasm of the hepatic veins, and in the rabbit the arterioles are constricted.

The dog has been invaluable in the study of diabetes mellitus. It was used by von Mering and Minkowski

*The Harveian Oration delivered at the Royal College of Physicians of London on October 16, 1953.

(1890) when they removed the whole of the pancreas to study fat absorption and found that the puppy developed diabetes mellitus, and much useful information has been gained by experiments on the depancreatized dog. Young (1937) also used the dog in order to produce diabetes by injections of extracts of the anterior pituitary gland, and so destroy the islands of Langerhans. The rat, on the other hand, does not develop diabetes, no matter how much extract of the anterior pituitary is injected, and the islands of Langerhans seem larger than usual (Marks and Young, 1939).

Anaesthesia

Anaesthesia, so valuable in the treatment of patients, sometimes makes the clinical observations most misleading. Thus it is known, as a result of x-ray films and opaque meals, that the stomach of man in the erect posture has a J shape. But even after this had been fully established, more than 40 years ago, some surgeons refused to accept the proposition, saying that they had never seen it at operations, or in the post-mortem room. This was understandable in the operating theatre, because under the anaesthetic all the muscles are relaxed, and, if they are not, the anaesthetist is blamed. In the post-mortem room this is nearly always the case, but every now and then the stomach is found firmly contracted and of the J shape. After I knew about the shape of the stomach I was lucky enough to see it myself four times in the five years or so that I performed post-mortem examinations, the cases varying from that of a child to that of a woman who had died with her stomach full of blood from a leaking aneurysm. The stomach in this case was enormous and extended into the pelvis, and the muscles were still firmly contracted. Two specimens are now in the anatomical museum at St. Bartholomew's Hospital, but I regret to say that at first they were mounted with the long axis in the transverse instead of in the vertical position. Many others must have seen similar specimens throughout the ages, but the evidence was neglected until x-ray films proved the point.

In experiments on animals a doubt always exists about whether the anaesthetic has affected the results. Pituitrin was thought to be a diuretic since it caused a diuresis in the anaesthetized animal, but if an anaesthetic was not given the flow of urine decreased, and this action is of great value in the treatment of diabetes insipidus. Again, the English workers were unable to show that stimulation of the vagus caused a secretion of the juice because of the anaesthetic. Heidenhain and others in Germany also failed because they did not use any anaesthetic, and the pain prevented the secretion. Pavlov succeeded in 1895 because he isolated the vagus nerve in the neck and made an exterior pouch of the stomach under an anaesthetic. When the dog had completely recovered he stimulated the peripheral end of the nerve painlessly and observed the flow of gastric juice. Histamine, again, will kill a cat with "shock" if an ether anaesthetic is given, while the unanaesthetized cat is quite unaffected.

Animals as Test Subjects

The difference between animals, again, is of very great value and certain species will take certain diseases. Thus, the distemper of dogs also affects ferrets, and this enabled Laidlaw and his co-workers to prepare the vaccine which protects dogs from the disease. The ferret is the only

animal which develops influenza when injected intranasally, though the mouse can be infected through intrapulmonary injections. Among the diseases which cannot be communicated to any animal are the common cold and rheumatic fever and infective hepatitis, and it is to be hoped that some animal will soon be found which will take these diseases, so that they may be studied more easily. Another instance is the variety of animals used for determining whether a woman is pregnant. Thus an immature female mouse (Aschheim-Zondek test), an immature female rabbit (Friedman test), a female frog (*Xenopus*), and an adult male toad (*Bufo arenarum*) are used, and the results in these four different species are said to be equally reliable. The early tests on the potency of insulin were made on the rabbit, the veins on the ear being most useful for collecting blood, but the mouse and the guinea-pig are also used for this purpose. Harvey studied the hearts of mammals, birds, snakes, fishes, and even shrimps, and insects like wasps. It is not easy to time the contraction of the auricle and ventricle by the eye in small animals, but he found it easy to confirm his impressions by watching contractions of the long heart of the adder and of the dying heart of the tortoise. These illustrations suffice to show that results which appear of value in one species must be tested on other animals, and the final experiments must be made on man himself if possible. In the physiology laboratories a good many observations are now confirmed on the students themselves, though those which involve danger cannot, of course, be performed.

Clinicians often differ very much over which hypothesis is the right one, and physiology in its wide sense is often able eventually to settle which school of thought is right. An instance of this is the treatment of rickets. One school stated that cod-liver oil was of great benefit, whereas another school asserted with equal conviction that treatment with olive oil gave results which were just as good. Mellanby's work on puppies showed that vitamin D cured rickets, and that olive oil contained none whereas cod-liver oil did, and that, if given in sufficient amounts and not diluted with malt and iron to one-quarter of its value, would cure rickets, and thus settled this controversy. The physiology which I visualize is a living and growing subject, and the principles which govern it are, I believe, of great value in the theory and treatment of medicine.

Coagulation Time

I said earlier on that as a young student I had not understood why very hot saline was used to stop oozing haemorrhage. I did not learn the explanation until nearly 20 years later when I was estimating the coagulation time of a patient with haemophilia by Dale and Laidlaw's (1911) shot method. They chose to work at a temperature of 37° C. because the coagulation time was least affected by slight alterations of temperature, and Macfarlane (1948) confirmed this.

The great shortening of the coagulation time at temperatures between 40 and 45° C. (Fig. 1) explains why the bleeding stops, although there is an increased blood supply as a result of the heat. I have asked several surgeons, and they tell me that it works

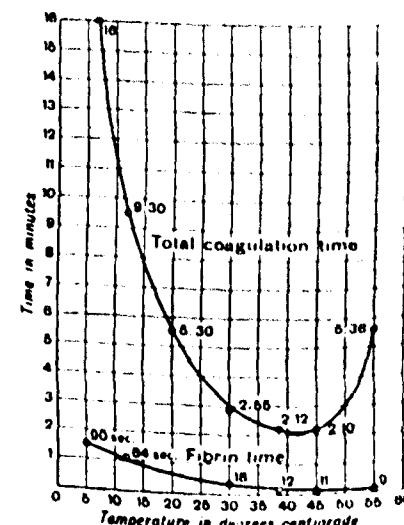


FIG. 1.—Effect of temperature upon coagulation time of normal blood.

but that they did not know the explanation. This had been given by Lister (1863) in an interesting paper on the coagulation of the blood, when he said, "It has long been known that blood coagulates more rapidly at a high temperature than at a low temperature, and that a little

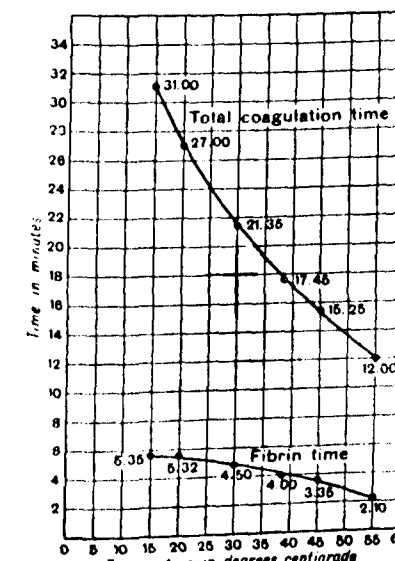


FIG. 2.—Effect of temperature upon coagulation time of haemophilic blood.

increase again. Haemophilic blood obeys the same law, and Macfarlane has observed the coagulation time at different temperatures (Fig. 2). I doubt, however, whether the shortening of the coagulation time to 12 minutes in this patient at a temperature of 55° C. would be enough to counteract the increased flow of blood.

Changes in Electrolytes after Operation

There are so many diseases in which physiology is of the greatest importance that it was difficult to choose what to talk about. I finally decided to discuss the changes which take place in the water and electrolytes of the body after severe operations. A proper understanding of these has greatly improved the treatment of patients. The co-operation of the surgeon and the physician with the physiologist, biochemist, pathologist, and others in the study of disease is necessary both to advance knowledge and to apply it to the treatment of the patient. Unless this co-operation exists, our practice lags far behind theory. The first advances in our knowledge were made by Sydney Ringer, Professor of Medicine to University College Hospital, 71 years ago, and were at first neglected by the clinicians. In the past ten years great advances have been made in our knowledge of electrolytes in medicine, which call for the closest co-operation of all concerned with the treatment of patients. These are well described by Gamble (1947), Darrow and Pratt (1950), and many others.

Ringer (1880-2) found that a frog's heart would beat for some hours in a solution of 0.65% NaCl—which is isotonic for the frog—as made up by his laboratory's assistant. But when the assistant fell ill, and Ringer made up his own solution with distilled water, the heart very soon ceased to beat. When the assistant recovered, and made up the solution, the heart once more continued to beat. Ringer then found that the assistant, being lazy, had not bothered to use distilled water but had used tap-water instead. This contains calcium and potassium, and Ringer (1883-4) proceeded to determine the ideal conditions for enabling the heart to beat. If calcium chloride was added to 0.65% saline, in the proportion of 1 in 19,500, a heart which had just stopped beating started again. The diastole, however, grew shorter and shorter and the heart eventually stopped in systole. If potassium chloride was added to 0.65% saline in a propor-

tion of 1 in 10,000 instead of calcium chloride, a heart which had just stopped beating in isotonic saline started again, but this time the diastole was lengthened and the heart eventually stopped in diastole. Ringer made numerous trials, and found that both potassium and calcium were necessary, and that the best results were obtained when they were present in the same concentration as in frog's plasma (Table I). If too much potassium was added so that the heart tended to stop in diastole, the addition of extra calcium prevented the poisonous action, so that poisonous doses of both

TABLE I

	Ringer's Solution for Frogs	Ringer-Locke Solution for Man
NaCl ..	0.65 g.	0.9 g.
KCl ..	0.014 "	0.042 "
CaCl ₂ ..	0.012 "	0.024 "
NaHCO ₃ ..	0.02 "	0.05 "
NaH ₂ PO ₄ ..	0.001 "	0.1 "
Glucose ..	0.2 "	0.1 "
H ₂ O ..	to 100 ml.	to 100 ml.

potassium and calcium might be present without affecting the heart at all (Ringer, 1884-5). I do not think many intravenous injections were made in those days, as surgical operations were nothing like so numerous or severe as they have now become.

When I came to hospital in 1905, saline, if thought necessary, was usually given subcutaneously. Many students, fresh from their physiology, must have asked, as I did, why Ringer's solution was not used, only to be told by a house-surgeon that the potassium and calcium were not necessary. I think that this was correct then, as it was rare indeed for more than 1 pint (570 ml.) of isotonic saline to be given intravenously, and it was assumed, if it was thought about at all, that the reserves of calcium in the bones and potassium in the cells would supply the necessary amounts. During the past 48 years, however, operations have increased enormously in number and magnitude. Many operations on the stomach, oesophagus, and intestines prevent any feeding by mouth for several days, and also involve evacuating the stomach or intestines by suction to prevent dilatation of these organs. Under these circumstances the amount of fluid given intravenously has been as much as 3,000-3,500 ml. a day for many days. This was sometimes isotonic saline, so that 27 g. or more of sodium chloride might be given in the day; sometimes two-thirds or one-third isotonic, so that 18 or 9 g. of sodium chloride might be given together with glucose in 5 or 10% concentration, the patient receiving as much as 150-300 g. of glucose daily.

The syndrome which results from long-continued intravenous injections of sodium chloride was first described by Whipple (1923) under the name pancreatic asthenia. He had observed asthenia, amnesia, nausea, vomiting, tendency to bleed, ptalism, abnormal stools, epigastric pain and tenderness, rapid emaciation. These symptoms came on 2-10 days after operations on the pancreas and gall-bladder and disappeared when the patient could start eating. Hartmann (1934) stressed the importance of giving not only sodium chloride but also some potassium, calcium, magnesium, and phosphates, and used the Ringer-Locke solution. Many others, myself included (Graham, 1938), hoped that this solution would give better results, but it is now recognized that potassium is contraindicated for 24 hours or more after an operation, and that after this time the amount of potassium is too small to be of any value. Further, the proportion of sodium to potassium, 16:1, is so high that the action of the potassium is completely swamped by that of the sodium.

Excretion while Fasting

Since many patients are unable to take any food by mouth after serious operations, the observations which have been made on men who have fasted for 20-40 days are of importance, and I will first describe them and then discuss how the operation alters the normal reactions of the body. The

most comprehensive of these researches was carried out by Benedict in 1915, on a man aged 40 and weighing 60.1 kg., and lasted 31 days. I shall refer only to the excretion of water and nitrogen and the electrolytes in the first 14 days, though there are many other points of interest in the monograph which repay study (Table II). The amount of water given

TABLE II

Days	Intake		Output				
	Water (ml.)	Urine (ml.)	Nitrogen (g.)	Chlorine (g.)	Sodium (g.)	Potassium (g.)	Calcium (g.)
1	750	660	7.1	3.77	2.07	1.63	0.217
2-4	750	582	10.5	0.80	0.926	1.368	0.243
5-6	750	638	10.29	0.41	0.276	1.445	0.274
7-8	750	555	10.03	0.44	0.154	0.883	0.253
9-10	750	636	10.40	0.30	0.128	0.944	0.237
11-12	900	540	10.19	0.33	0.10	0.975	0.219
13-14	900	604	10.49	0.29	—	—	0.226
15-16	900	823	9.02	0.15	0.109	0.814	0.250
30-31	900	566	6.94	0.13	0.053	0.606	0.138

to drink was 750 ml. daily for the first ten days, and the volume of the urine was about 600 ml. daily. Although the man did not complain of thirst the intake was raised to 900 ml., and four days later the output rose to over 800 ml.; the average output in the last 10 days was 688 ml. The excretion of nitrogen before the fast was 11.54 g. and after an initial drop to 7.1 g. the average output for the second to fourth days was 10.5 g.; it then remained fairly steady above 10 g. up to the fourteenth day, when a sudden drop occurred to below 10.0 g. The small excretion on the first two days is ascribed to the sparing effect of the glycogen in the body. After the third day the nitrogen excretion must come solely from the breakdown of the muscle and other cells.

The excretion of chlorine, sodium, and potassium is higher on the first day than on the next three days, and this is thought to be due to the amount in the previous diet. The figures for the second to fourth days show that more potassium is excreted than sodium and that after the sixth day the sodium and chlorine decrease rapidly, while the potassium remains high. The muscles and other tissues of the body which are used up in a fast contain very little sodium, and this explains the great decrease in the output, though it is known that the kidney tubules are able to reabsorb some sodium and so reduce the amount lost from the body. The potassium excreted in the urine comes almost entirely from the breakdown of the muscle and other cells, and the N:K ratio is thought to be about 10:1. In Benedict's case the N:K ratio was 10:0.77 on the second to fourth days; altered to 10:1.1 on the seventh to ninth days, and then slowly changed to 10:1.21 on the 31st day. For a ratio of 10:1 on the second to fourth days the potassium excretion should be 1.05 g. instead of 1.368 g., so that rather more potassium was being excreted than the ratio allows; while on the 31st day 0.606 g. was excreted instead of 0.734 g. This decrease in the potassium excretion might be due to the broken-up muscle containing less potassium at the end of the fast or to the tubules of the kidney reabsorbing more of the potassium and so conserving it in the body; the latter hypothesis seems the more likely.

Metabolic Changes Following Shock

When an operation is performed the shock which may occur alters the metabolism of the patient very profoundly.

(1) Water Output

The fluid intake, 900 ml., with an output of urine of 700-800 ml., is much too small for patients after operation. Thus, Maddock and Collier (1937) have estimated that the water lost by the skin and lungs after operation varies from 1,000 to 1,500 ml. a day, and this amount will be increased by, say, 500 ml. if fever is present. The healthy kidney can excrete all the electrolytes in 500 ml., but the damaged kidney needs 1,500 ml. to achieve the proper excretion. Avery Jones and Naunton Morgan (1938) have also stressed

the importance of giving plenty of fluid, 3,000-3,500 ml. to patients after operation, and of increasing this amount to make up for the loss of fluid vomited or removed from the stomach after severe abdominal operations. They also stress the danger of giving too much salt in uncomplicated cases. Le Quesne and Lewis (1953) gave patients a fluid diet containing 4,000 ml. before operation, and the urine output decreased from 3,195 to 1,115 ml. (average of 15 cases) on the day of the operation. Hence the fluid intake after operation should be 1,500-2,000 ml. for the afebrile patient with healthy kidneys, and 3,000-3,500 ml. for the febrile patient with poor kidneys. If sulphonamides are required, an output of more than 1,000 ml. is necessary to prevent any ill effects in the urinary tract.

(2) Protein

If a patient after operation takes very little food there is bound to be much destruction of protein, such as occurred in Benedict's starving man. This may amount to 7-10 g. a day, and will coincide with the excretion of 1 g. or so of potassium a day. If, however, the patient is able to take the same diet on the operation and subsequent days as he did before operation, the extra nitrogen loss is so small that it does not seem that the operation causes any destruction of body protein (Werner *et al.*, 1949).

(3) The Electrolytes Sodium and Potassium

The effect of the operation on the sodium and potassium is to cause a considerable increase in the potassium excretion but a decrease in the sodium excretion. The increase in the potassium excretion is to be expected from the increased protein breakdown due to lack of food, but it is much greater than could be expected from this cause, and the paradoxical condition may arise in which the serum potassium may be very high at a time when the potassium in the muscle has been greatly depleted. This discrepancy is due to the kidney being unable to excrete the extra potassium. The giving of sodium as isotonic saline in amounts of from 9 to 27 g. of sodium chloride, which has been the current practice for so many years, has obscured the fact that, coincident with the increase in the potassium excretion, there is a decrease in the sodium excretion. This change has been studied by Tabor and Rosenthal (1945). They applied a tourniquet to one leg of a mouse for two hours, and estimated the change in the injured and uninjured muscles. One-third of the potassium left the muscles and was replaced by sodium. The excretion of potassium in the urine was greatly increased, but in spite of this the serum potassium was also increased. The excretion of sodium, on the other hand, was decreased and sodium chloride given intravenously might be retained. Fox and Baer (1947) repeated these observations on a rat and analysed the tissues four hours later (Table III).

TABLE III

	Sodium in Muscle		Potassium in Muscle		Sodium and Potassium in Serum	Na/K Ratio
	mEq/kg. Water	mg./100 g.	mEq/kg. Water	mg./100 g.		
Normal	81 ± 3	186 ± 5.75	126 ± 3	492 ± 7.8	207 ± 3	0.644:1
Shock leg	142 ± 2	327 ± 4.6	48 ± 3	187 ± 19.5	190 ± 4	2.96:1
Opposite leg	77 ± 4	177 ± 9.2	133 ± 3	520 ± 11.7	210 ± 4	0.578:1

This experiment shows a great reduction in the potassium and its replacement by sodium, and a change of the sodium/potassium ratio from 0.644:1 to 2.96:1. They also estimated the sodium space by means of the radio sodium and radio bromide method, and found that the sodium was much increased. Darrow (1945) showed that half the potassium might leave the muscles and that the intracellular sodium was equal to one-half the extracellular sodium. This was the case in animals, and he thought that similar, if less marked, changes occurred in man. Both the above pairs of workers observed that the mice were very ill after removal

of the tourniquet, and Tabor and Rosenthal produced symptoms of potassium poisoning by injecting small amounts of potassium. They were able to prevent death in shock by giving isotonic saline by mouth or through a stomach tube in 24 hours in a volume equal to 10 or 15% of the body weight. In severe cases it was necessary to give it intravenously. If only a volume equal to 5% of the body weight was given the percentage recovery was less (10% of the body weight in a man of 65 kg. would be 6,500 ml.). A 5% solution of glucose gave little better results than in the controls, but a 10% solution of glucose was not used. These amounts per kg. are much more than those used in man, and the shock produced must have been very great. The increase in the amount of sodium in the muscles and the decrease of potassium seemed very surprising, as it had been believed that the sodium could not enter the cells. But Darrow (1945, 1946) showed that sodium could cross the cell membrane and enter the cells and that potassium left them. This effect can be produced by giving sodium chloride intravenously, and as much as half the potassium may leave the cell.

It had previously been shown by Fenn and Cobb (1936) that when the muscle of the rat was stimulated for three hours, at a frequency of over 400 a minute, the potassium in the muscle decreased greatly, while the sodium increased. When the muscle was allowed to recover for two hours the potassium increased slowly while the sodium decreased rapidly. These observations on animals have been confirmed in patients after operation. Idris Evans (1950) showed that the amounts of sodium and potassium present in muscle were altered after operation (Table IV).

TABLE IV

Case		Muscle Removed at Operation		Serum Potassium	
		mEq/kg. Wet Muscle	mg./100 g. Wet Muscle	mEq/litre	mg./100 ml.
1	Sodium	39.2	90	3.63	14.2
	Potassium	72.4	282		
2	Sodium	46.5	107	1.7	6.65
	Potassium	41.3	161		

Both the sodium space and the bromide space after operation have been investigated by Eliel *et al.* (1950), by injections of radio sodium and radio bromide. They found a great increase in the sodium space—showing that sodium had entered the muscles—and a decrease in the bromide space. Another consequence of the migration of the sodium is that there may be insufficient sodium to combine with bicarbonate, and a persistent hypochloreaemia may result. The sodium/potassium relation in muscle is also upset by injections of deoxycortone. Darrow and Miller (1942) injected 2-4 mg. a day into rats for 30 days, and showed that the potassium in muscle decreased from 48.9 to 38.4 mEq per litre (191 to 150 mg. per 100 ml.) per 100 g. of fat-free solids, and that areas of necrosis occurred in the cardiac muscle, which resembled those produced by low-potassium diets.

When a dog is injected with 25 mg. of deoxycortone daily for four weeks it develops a polyuria at once, and, after some time, weakness and finally a paralysis of the muscles (Ferrebee *et al.*, 1941). The potassium in the serum decreased from 4 to 2.9 mEq per litre (15.6 to 11.4 mg. per 100 ml.) after four weeks; the sodium and chlorine increased slightly. The potassium in the muscle decreased from 82.5 to 54 mEq per litre (325 to 211 mg. per 100 ml.) per 100 g. of fat-free muscle in one experiment, while the sodium increased from 33.9 to 55.6 mEq per litre (78 to 128 mg. per 100 ml.) and the chlorine from 24.7 to 26.6 mEq per litre (87.6 to 94.5 mg. per 100 ml.). Eliel *et al.* (1950) have suggested that the surgical trauma increases the production of A.C.T.H. from the pituitary fluid, and this stimulates the adrenal cortex and is thus responsible for the excretion of the potassium and retention of the sodium. MacPhee (1953) also thinks that these "electrolytic charges

are the result of increased adrenocortical activity" and "are the natural response of the body to trauma." These observations suggest that the use of deoxycortone after operation is contraindicated, since the changes in the potassium and sodium of muscles are similar to those which occur two to four days after operation.

Effects of Potassium-deficient Diets

The changes which occur in the potassium after operation, and the symptoms which may arise, are so remarkable that the effect of diets containing little potassium has been studied on rats, dogs, and man. Follis *et al.* (1942) observed the effects in rats. After the 15th day opaque white areas could be seen macroscopically beneath the epicardium. Microscopically, definite changes could be seen as early as the eighth day. These were a loss of structure of individual muscle fibres and a failure of the hyaline fibres to stain with eosin. By the 15th day the opaque areas were shown to be necrotic and the heart muscle contained 35% less potassium than the controls. The skeletal muscle did not show any change, but the first convoluted tubules of the kidneys were dilated and the cells were vacuolated. Dogs kept on low-potassium diets developed periodic paralysis and respiratory failure, which was made worse if excess of sodium was given. On microscopic examination the myocardium was unaffected, but a waxy degeneration of the skeletal muscle was present.

The effect of a diet containing little potassium has been studied by two pairs of workers in England. A diet was given from which the potassium had been absorbed by means of an exchange resin "zeo-karb 225 sodium" (Black and Milne, 1952a, 1952b), or the resin was eaten with a fixed diet (Fourman and Ainley-Walker, 1952). Black and Milne's experiments lasted six to seven days, and a loss of 268 and 289 mEq (10.48 and 11.3 g.) of potassium was observed. A metabolic alkalosis was produced and the serum potassium decreased from 4 to 3.1 mEq per litre (15.6 to 12.3 mg. per 100 ml.) and 3.2 mEq per litre (12.5 mg. per 100 ml.), but the potassium in the red cells was unaltered. The symptoms observed were a little general apathy. The only change in the E.C.G. was the appearance of a U wave. Fourman and Ainley-Walker's three experiments lasted longer, 12 and 11 days, and the negative balance for potassium varied from 338 to 839 mEq per litre (13.2 to 32.8 g. per 100 ml.) and in their cases a slight acidosis instead of a metabolic alkalosis occurred. The subjects felt and looked ill, became absent-minded and then confused, and one developed oedema of the face and legs. The change in the E.C.G. was the appearance of a prominent U wave. Black and Milne pointed out that the amount of potassium lost was about equal to that lost after an operation, and doubted whether the symptoms occurring after operation were due to the lack of potassium. If these experiments are repeated it would be of great interest to determine the sodium and bromide space and also the amount of potassium and sodium in the muscle tissue. The injection of 18 g. of sodium chloride a day intravenously might also intensify the symptoms, since some of the sodium might enter the cells and increase the loss of potassium. The giving of glucose and insulin might produce great weakness or even paresis of the limbs like a periodic paralysis. This sometimes occurs after serious operations.

The changes which occur as a result of intravenous injection of sodium chloride before and after operation have been studied by Marks (1950). He carried out a complete water, nitrogen, chlorine, sodium, and potassium balance for three days on a patient with pyloric obstruction before operation. The actual amounts of fluid and electrolytes given intravenously varied from day to day, and the figures are given for the three-day period in Table V. The amounts excreted in the urine or removed from the stomach by suction were measured, and enable a proper balance to be struck.

Table V shows that there was an apparent positive balance of 1,020 ml. of fluid in the three days. But no allowance is made for the loss of fluid from the skin and lungs, and it is probable that a negative balance of more than 2,000 ml.

TABLE V

Fluid	Intake for 3 Days	Output for 3 Days			
		Urine	Gastric Contents Obtained by Suction	Balance	
				mEq	g.
Sodium	10,850 ml.	4,390 ml.	5,440 ml.	+1,020 ml.	
Calculated as sodium chloride	907	20.86	134	3.08	191
Potassium	7.4	0.29	156	6.1	37
Calculated as potassium chloride	0.55	11.6	2.76	11.2	34.0
Nitrogen	7.2	36.5	4.4	11.2	34.0
				-185.6	-7.25
				-13.8	-33.7

occurred in the three days in spite of the large intake of fluid. This was due to the large amounts of fluid removed from the stomach, which amounted to 5,440 ml. in the three days. It is now recognized that the fluid vomited or removed from the stomach or intestine by suction should be measured and an equivalent volume added to the intravenous injection so as to ensure that the body does not suffer from lack of water. Since some potassium as well as sodium is lost from the stomach, the intestines, and biliary tract, the appropriate solutions for each tract should be used (Darrow, 1945). The chlorine and sodium figures show that a retention of 13.39 g. of sodium or 34 g. of sodium chloride occurred in three days, while there was a loss of 7.25 g. of potassium or 13.8 g. of potassium chloride. The nitrogen intake was very small and a loss of 33.7 g. occurred in the three days, which would account for a loss of 3.37 g. of potassium, leaving 3.88 g. of potassium unaccounted for.

The changes in the blood, which occurred in the three days (Table VI), show that the treatment with saline was satisfactory in that there was a decrease from 42 to 24.1 mg. in the blood urea nitrogen, although it is still a little too high. The alkali reserve, which had been very high, was now within normal limits. The chloride, which had been on the low side, was within normal limits; the sodium content, which had been slightly on the low side, was within normal limits. The potassium, which had been normal at 4.3 mEq per litre (16.8 mg. per 100 ml.), was now very low at 2.75 mEq per litre (10.75 mg. per 100 ml.). The patient developed gastric retention after the gastrectomy and was quite ill for three weeks. Small doses of potassium chloride were given by mouth, but two and a half weeks elapsed before the serum potassium and the electrocardiograph returned to normal. Table VI shows the changes in the blood serum during the course of the treatment.

TABLE VI

Days	Blood Urea Nitrogen mg./100 ml.	HCO ₃ mEq/L	Vol. CO ₂ per 100 ml.	Chloride		Sodium		Potassium	
				mEq/L	mg./100 ml.	mEq/L	mg./100 ml.	mEq/L	mg./100 ml.
1	42.2	50.2	112	85	303	137.0	315	4.3	16.8
2	36.8	45.2	102	89	316	139.0	320	3.4	13.6
		38.3	85.7			141.5	325	3.1	12.2
3	32.2	37.4	83.7	96	340	137.0	315	3.2	12.5
		32.0	71.6			139.0		2.8	10.95
4	24.1	27.0	60.5	102	362	140	322	2.75	10.75

Another patient was studied four days after operation. Sodium was omitted and the potassium was increased to 2.34 g. in four days. The potassium excreted in the urine and that removed from the stomach in four days was 4,395 g. The negative balance of potassium was 2,005 g., which is much less than in the other patient, to whom 20.82 g. of sodium was given in four days.

Randall *et al.* (1949) have also made careful observations which show that the loss of potassium that occurs after operations considerably exceeds the amount of potassium that could possibly come from the breakdown of

protein, and which emphasize the decrease in the serum potassium which occurs after three to four days. This can be prevented by giving potassium by mouth or intravenously, starting 24 hours after the operation.

Symptoms Ascribed to Hypopotassaemia

These have been analysed by Eliel *et al.* (1950) in 32 patients, and are similar to, though more severe than, those described by Whipple (1923). They consisted of lethargy, apathy, and depression, 17; nervousness, irritability, and apprehension, 7; confusion, disorientation, and delusions, 4; irregular pulse, 3; muscular twitching and tetany, 3; muscular weakness, 13; abdominal distension and cramps, 19; anorexia, nausea, and vomiting, 15; paralytic ileus, 7; shallow respiration, 7; oedema, 9 cases. When the serum potassium is less than 4.2 mEq per litre (16.4 mg. per 100 ml.) the E.C.G. shows definite changes. The T wave becomes smaller and smaller the lower the serum potassium, and may be almost absent. When potassium chloride is given intravenously the T wave reappears. Fig. 3 shows the changes in the electrocardiogram due to hypopotassaemia, and the restoration to normal after potassium has been given.

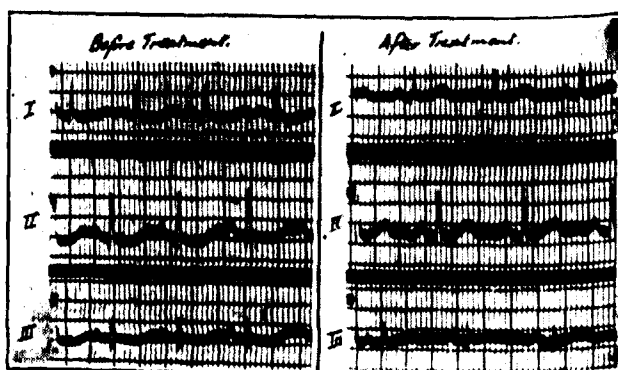


FIG. 3.—Electrocardiogram showing the changes which occur when the serum potassium is low, and after treatment with potassium.

Effect of too Much Potassium in the Serum after Operation

Ever since Ringer (1883-4) showed that the heart stopped in diastole if too much potassium was present, there has been great fear of causing potassium poisoning if any potassium was given intravenously, even the small amount in Ringer-Locke solution. This fear has been intensified by the work of Winkler *et al.* (1939). They showed that when an isotonic solution of potassium chloride was injected into a 21-kg. dog at a rate of 112 mg. a minute the dog died in 50 minutes after 5.96 g. of potassium chloride had been injected. In this time the potassium in the serum increased from 4.1 to 14.7 mEq per litre (16 to 57.5 mg. per 100 ml.). Death occurred with the heart in diastolic arrest, and the E.C.G. showed characteristic changes—an increase in the amplitude and a shortening of duration of the T wave. This occurred in a concentration of 5 to 7.8 mEq per litre (19.5 to 30.6 mg. per 100 ml.) and the T increased in size until it equalled that of the QRS complex. Later the ST segment dropped below the isoelectric line, and the QRS complex became wider and finally completely disorganized. The critical concentration seemed to be 14-16 mEq per litre (55-62.5 mg. per 100 ml.), or nearly four times the normal figure. Fig. 4 shows the changes in the electrocardiogram due to hyperpotassaemia.

Three points in that paper seem to have escaped general notice: (1) If this amount was given slowly to healthy dogs no ill effects occurred. (2) The effect of adding glucose to the solution was not tried. The glucose would have enabled the muscles and liver to lay down more potassium with the glycogen and thus reduce the amount of potassium in the serum more rapidly. (3) The equivalent amount of potas-

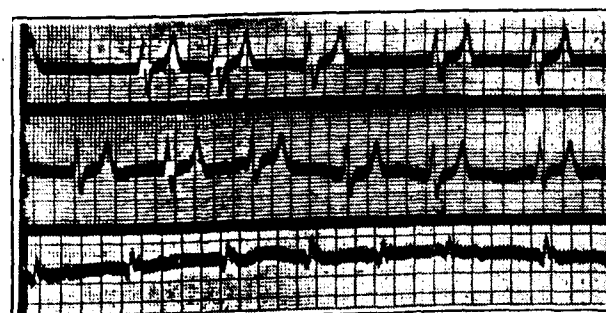


FIG. 4.—Electrocardiogram taken when the serum potassium was 10.3 mEq per litre (40 mg. per 100 ml.).

sium chloride for a man of 65 kg. is 19.3 g., which is rather more than has been suggested even for patients suffering severely from hypopotassaemia.

It is very remarkable that these experiments on healthy dogs should have deterred many workers from using potassium in the past and should still frighten some. Since the giving of potassium is regarded by many as a dangerous procedure it is important to consider how much potassium is present in the blood and extracellular and intracellular fluids. If 1 g. of potassium (1.9 g. of potassium chloride) is quickly given intravenously to a man weighing 65 kg. whose serum potassium was 4.5 mEq per litre (17.6 mg. per 100 ml.) the maximum increase would be 12.3 mEq per litre (48.4 mg. per 100 ml.), which would be nearly a poisonous dose. But if the solution was given slowly, say in eight hours, the potassium would enter the extracellular fluid and then the intracellular fluid, and some would be excreted in the urine. The maximum rise would be 2 mEq per litre (7.8 mg. per 100 ml.) if the extracellular fluid alone was entered, and 0.56 mEq per litre (2.2 mg. per 100 ml.) if it was spread equally over the intracellular fluid. It follows that if the potassium is taken up equally by the extracellular and intracellular fluids of a 65-kg. man, a deficit of 1 mg. per 100 ml. in the serum potassium will mean a deficit of 0.0079 g. of potassium per kg. (0.0133 g. of KCl)—that is, 0.455 g. = 0.87 g. KCl per 65 kg.

It is generally agreed by those who have found potassium valuable in post-operative treatment that it should not be given until more than 24 hours have elapsed since the operation, when the kidneys have recovered their power of excreting water and the chance of a retention of potassium in the blood has passed.

Symptoms due to Hyperpotassaemia

These have been described in patients with renal failure (Finch *et al.*, 1946). The patient rapidly develops a true paralysis of two or four limbs, with shallow, laboured breathing. The reflexes are absent, but sensation of pain is present though numbness of hands may occur. The condition is said to resemble a Landry's ascending paralysis. The heart sounds are characteristically "dulled, prolonged, as if the heart were beating in slow motion"; bradycardia is present, with frequent irregular pauses. Bull *et al.* (1953) have also reported the rather sudden onset of paralysis in three patients with uraemia. At first sight the symptoms of hyperpotassaemia resemble those due to hypopotassaemia. But in the latter they develop slowly several days or more after the patient has been operated on. Again, the condition of the limbs is described as a weakness rather than a paralysis such as occurs in hyperpotassaemia. These differences should be enough to make a differential diagnosis easy after an operation. Thus, hyperpotassaemia may occur after a severe operation if the kidney fails to excrete the potassium liberated from the muscles.

Eliel *et al.* (1950) found one patient with a serum potassium of 12.2 mEq per litre (48.5 mg. per 100 ml.) on the day after operation, and Tabor and Rosenthal (1945) noted that mice were very sensitive to injections of small amounts of potassium some hours after the tourniquet had been removed from the leg. Any risk of this occurring should be

past by 24-36 hours after operation, provided sufficient water, sodium chloride, and glucose are given. In the next two to six days hypopotassaemia may develop, and any weakness of the limbs occurring at this time must be due to the lack of potassium, which can be confirmed by the flat T wave in the E.C.G., and a serum potassium which may be very low. This condition must be treated with potassium, and the weakness of the limbs will soon disappear. If, now, paralysis of the muscles develops suddenly in a patient who is receiving or has just finished a potassium injection, the condition can safely be diagnosed as due to hyperpotassaemia. The fact that paralysis or weakness of the limbs occurs both with excess and with lack of potassium seems extraordinary, but there is a parallel in diabetes mellitus, in which coma develops, owing to ketosis, when insulin is lacking, but also when insulin is in excess, owing to the lack of sugar in the blood. In this case, also, the history of the onset is of value, since when insulin is lacking the coma develops slowly, whereas when insulin is in excess the coma develops very rapidly. Thus in both hyperpotassaemia and hyperinsulinism the treatment consists in giving glucose as soon as the diagnosis is made.

Treatment for a Dangerous Hyperpotassaemia

An immediate injection of 20-30 units of insulin should be given, followed by 50 g. of glucose by mouth, or, in an emergency, by injection of 1,000 ml. of 10% glucose (Bywaters, 1944; Bull, 1951-2). This will cause an immediate deposit of glycogen and potassium in the liver and muscle (Fenn, 1939) and will cause a reduction in the serum potassium. Bull (1951-2) has reported a case of anuria in which the potassium was 10 mEq per litre (39.1 mg. per 100 ml.), and two hours after the giving of 50 g. of glucose intravenously and 50 units of insulin, the potassium had decreased to just over 7 mEq per litre (27.4 mg. per 100 ml.) and the character of the T wave of the E.C.G. was much less abnormal. But the action of the glucose can only be temporary, for as soon as the glycogen is needed for energy requirements the potassium will be liberated and will again enter the serum. It is probable that by this time, 6-12 hours, some of the potassium will already have been excreted in the urine, unless renal failure is present. If necessary the glucose and perhaps the insulin can be repeated in eight hours, but the possibility of hypoglycaemia occurring must be remembered, and the blood sugar estimated before more insulin is given. Darrow and Pratt (1950) found that a calcium injection was as useful but had a temporary effect only. To be of real value the dose of calcium necessary to neutralize the poisonous action of potassium would also have to be a poisonous one (Ringer, 1884-5), and after the potassium excess had passed the calcium might cause equally serious symptoms. If it is known that the serum calcium is definitely lowered, 1-2 g. of calcium gluconate should be given intravenously, and 1-2 g. of calcium carbonate given by mouth every four hours if vomiting is not present, together with 10,000 units of calciferol or 3.75 mg. of tachysterol by mouth to ensure the absorption of the calcium from the gut.

Pre-operative Treatment

It is important to consider how the patient should be prepared for operation so as to steer between the Scylla and Charybdis of too much and too little potassium. The diet taken by patients with a good appetite contains about 3 g. of potassium, but patients who are being strictly dieted for a gastric ulcer with, say, 20 oz. (570 ml.) of milk, 25.6 mEq (1 g.) K; 3 eggs, 5.27 mEq (210 mg.) K; 2 oz. (57 g.) of biscuits, 2.56 mEq (100 mg.) K; 3 oz. (85 ml.) of orange juice, 3.84 mEq (150 mg.) K, will take 37.4 mEq (1.46 g.) K daily. If an oesophageal or pyloric obstruction is present the amount of potassium imbibed may be very much less, and a diarrhoea or a biliary fistula (Darrow, 1948) will cause great loss of potassium. In this type of case 1 g. of potassium should be given three times a day in order to ensure that the body has a proper store of potassium. The serum potassium should be estimated and an E.C.G. taken. The following amounts of potassium salts each contain

approximately 1 g. of potassium and can be taken in 30 ml. (1 oz.) of orange juice and water.

Potassium chloride, 1.91 g. = 1 g. K. = 25.6 mEq K
Dipotassium hydrogen phosphate, 1.36 g. } = 1 g. K. = 25.6 mEq K
Potassium dihydrogen phosphate, 1.36 g.
Potassium citrate, 1 g.
Potassium acetate, 1 g. } = 1.15 g. K. = 29.4 mEq K
Potassium bicarbonate, 1 g.

If a patient is vomiting, or is unable to swallow, the potassium should be given intravenously. Before this is done the serum potassium and the size of the T wave should be determined. If these show a definite lack of potassium, 1 g. of K (1.9 g. KCl) in 1,000 ml. of 5% glucose in distilled water should be given intravenously in eight hours twice a day until the serum potassium and the T wave are within normal limits. An operation should not be performed, except in an emergency, until the serum potassium and the other electrolytes are within or nearly within normal limits. This procedure might reduce the necessity for gastric and duodenal suction after the operation.

Post-operative Treatment

From what has been said already it is plain that the problem is very complex, and the correct treatment varies according to the degree to which the sodium and potassium balance has been upset (1) by the "shock" of the operation; (2) by the treatment necessary to combat the effects of the "shock"; and (3) by the rapidity with which the serum potassium returns to normal, making it possible to give adequate amounts of potassium and so enable it to re-enter the muscle cells and displace the sodium. In most patients the "shock" of the operation is not serious. Soon after recovery from the anaesthetic the patient may be able to take fluid by mouth, and an effort should be made to give some 3,000 to 3,500 ml. a day. The next day some food may be given, and, since this will contain potassium, the chances of a serious lack of potassium developing is negligible. If fluid cannot be taken by mouth (or this is not considered desirable) it should be given per rectum—2,000–3,000 ml. If fluid only is needed, tap-water is probably the best, as it does not seem to irritate the rectal and sigmoid mucous membrane and is well absorbed. Avery Jones and Naunton Morgan (1938) have found that one-fifth isotonic saline is well tolerated, and 3,000 ml. will contain 5.4 g. of sodium chloride, which is adequate for patients in whom the "shock" is slight and in whom food containing both sodium and potassium will soon be eaten. The shock of the operation and the 5.4 g. of sodium chloride will have probably displaced little potassium from the intracellular space, and as soon as food containing potassium is taken by mouth the convalescence should be smooth. When the "shock" is more severe it may be necessary to give the fluid intravenously, since more sodium chloride will be needed than can be absorbed from the sigmoid and colon. The volume of intravenous fluid should be 3,000–3,500 ml., but the amount of sodium chloride given must depend on the assessment of the degree of "shock" which has occurred. If 9 g. of sodium chloride is needed, the 3,000 ml. can all be given as one-third isotonic saline, with 5 or 10% glucose; if 18 g. is needed, 2 litres of isotonic saline and glucose and 1 litre of 10% glucose; while if 27 g. is needed, it can all be given as isotonic saline with 5 or 10% glucose. Any fluid recovered from the stomach and intestines must be added to the volume given as I have already pointed out. The composition of this additional fluid depends on whether the fluid lost comes from the stomach or intestines, since the amount of potassium lost directly in this way varies (Darrow, 1945). Cooke and Crowley (1952) have suggested the use of two solutions for this purpose.

For loss of gastric fluid:

	mEq		
Ammonium	70		
Sodium	63		
Potassium	17		
Chlorine	150		
		or	
		Ammonium chloride	3.74
		Sodium chloride	3.68
		Potassium chloride	1.27
		Water to 1,000 ml.	
		Sodium to potassium, 3.7:1	

For loss of intestinal fluid:

	mEq		
Sodium	138		
Potassium	12		
Lactate	50		
Chlorine	100		
		or	
		Sodium chloride	5.15
		Sodium lactate	5.6
		Potassium chloride	0.895
		Water to 1,000 ml.	
		Sodium to potassium, 11.5:1	

Some 24 hours after the operation, when the "shock" is over and the urine output good, an assessment of the case is necessary to determine how much sodium chloride is necessary and when the potassium can be started to replace that which has been lost from the intracellular space. In these severe conditions it is usually impossible to give the potassium by mouth, and there is no evidence at present that it is absorbed per rectum. It is necessary to give it as an isotonic solution with 5% glucose either subcutaneously or intravenously. If the hypopotaemia is not very marked a mixture of sodium and potassium chloride can be given, and that used by Randall *et al.* (1949) seems suitable. After 24–36 hours, if the patient is not seriously ill they give:

110 mEq sodium, 2.53 g.		Sodium chloride, 6.44 g.
30 mEq potassium, 1.172 g.	or	Potassium chloride, 2.44 g.
140 mEq chloride, 4.87 g.		Glucose, 50 g.
		Water to 1,000 ml.

This gives a proportion of sodium to potassium of 2.16:1, compared with 16:1 in Ringer-Locke solution. Either 2,000 or 3,000 ml. is given in the day. If the patient is more seriously ill and the serum potassium is already low and the E.C.G. suggests a hypopotaemia Randall *et al.* give:

30 mEq potassium, 1.173 g.		or potassium chloride, 2.24 g.
30 mEq chloride, 1.066 g.		
		In 1,000 ml. of 5% glucose.

Two or three litres is given, depending on serum potassium and the E.C.G.

Conclusion

I spoke earlier of steering between Scylla and Charybdis, and I would like to elaborate the point. During the period after the operation, when the serum potassium may be high, it is necessary to steer away from the Scylla of hyperpotassaemia and towards Charybdis, using plenty of water, salt, and glucose, but as soon as the danger of being wrecked on Scylla is passed, and Charybdis with its low serum potassium and ileal stasis is being neared, the helm must be put over for Scylla, using water, potassium, and glucose, and either greatly reducing or omitting the sodium altogether. In this way the ship will slip easily between these two hazards and reach port safely—that is, the patient will make a rapid recovery. To ensure the proper co-ordination of treatment of these difficult cases it is necessary to have a team consisting of a surgeon and a physician, who should both have a real appreciation of the physiological principles involved. They should be able to call on the electrocardiograph department and on the biochemist for the essential determinations which govern the treatment. The registrar, house-surgeon, and nursing staff should appreciate the difficulties which may arise and report them promptly. The giving of potassium injections should not be left to the night nurse, and if it is necessary to do so at night a senior person should be responsible.

I have here been concerned with the changes which take place in the sodium and potassium in the body. The work on Addison's disease has shown that the sodium in the body is controlled by the hormones of the adrenal cortex. If they are deficient, the sodium in the blood decreases. At present there is no direct evidence on how the potassium is controlled, though it is clear that the sodium and potassium are closely linked. The giving of deoxycortone causes an excretion of potassium in the urine (Ferree *et al.*, 1941; Darrow and Miller, 1942) and the giving of potassium to a patient with Addison's disease causes an excretion of sodium. The conditions under which hypopotaemia occurs are "surgical shock," diarrhoea due to any cause, loss of bile (Darrow, 1945), and periodic paralysis, and all these can be

successfully treated with potassium salts. A syndrome associated with cardiac symptoms, muscular weakness, and hypotension has been described by Kjerulf-Jensen *et al.* (1951). The hypopotaemia in these conditions suggests that a hormone directly concerned must be present, though where it is formed is unknown. If this indeed exists, it would seem that it is upset in surgical shock and that if and when it is known it would be of great use in preventing this condition. I realize that I am putting forward a wholly unproved hypothesis, but the analogies to the control of other electrolytes like iodine by the thyroid, calcium by the parathyroid, and sodium by the adrenal cortex are very close. I believe that each electrolyte in the body is controlled by a hormone and not by pure physical laws, and that it is only a question of time before the hormone is discovered.

I wish to thank my friends with whom I have discussed my problems: Dr. R. G. Macfarlane for the slides, Professor V. H. Mottram, Professor A. Wormall, Dr. E. F. Scowen, and especially Dr. F. Avery Jones for much assistance.

Since the Oration was delivered my attention has been drawn by Professor E. C. Dodds to the papers by Simpson *et al.* (1952) and Grundy *et al.* (1952). These show that a hormone has been isolated from the adrenal which has a specific effect on the potassium as distinct from the sodium.

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A COMPARISON OF CORTISONE AND CODEINE MEDICATION AS AN ADJUVANT TO MANIPULATION IN RHEUMATOID ARTHRITIS

A REPORT TO THE JOINT COMMITTEE ON CORTISONE AND A.C.T.H. IN CHRONIC RHEUMATIC DISEASES OF THE MEDICAL RESEARCH COUNCIL AND THE NUFFIELD FOUNDATION

A common problem in dealing with rheumatoid arthritis patients is that of flexion deformities of the knee-joints. These commonly arise during periods of rest in bed when the position of the knees has not been controlled by rest splints. In a proportion of cases these contractures cannot be corrected by conservative methods, and manipulation under a general anaesthetic is required. It was thought that the period of increased pain and disability due to the trauma of this operation might be curtailed, or even avoided altogether, by performing the operation under cover of cortisone. At the same time it would be possible to observe the effect of such treatment on the general as well as on the local reaction following manipulation, to note any general exacerbation of the disease that may sometimes, it is said, follow this procedure, and to assess the long-term usefulness of such therapy as it affects the manipulated limb and its function. Accordingly a small-scale controlled trial was set up by a Subcommittee of the Medical Research Council/Nuffield Foundation Joint Committee on Cortisone and A.C.T.H. in Chronic Rheumatic Diseases* in which four centres participated: Bath (Dr. G. D. Kersley and Mr. J. Bastow), Sheffield (Dr. H. F. West and Mr. G. Gordon), Stanmore (Dr. Harwood Stevenson and Mr. H. J. Seddon), and Taplow (Dr. E. G. L. Bywaters and Mr. G. P. Arden). The analysis of the results of the trial was made by Dr. J. T. Boyd, of the Statistical Research Unit of the Medical Research Council, London School of Hygiene and Tropical Medicine.

Type of Patient

The patients selected were between the ages of 5 and 64 years; they had been diagnosed as having arthritis beyond any clinical doubt, and had four joints or more involved. Each had a knee contracture which had been present for at least six months and was in need of manipulative correction. Patients with severe disease activity or with completely ankylosed knees were excluded.

Allocation to Treatment

After admission to the trial patients were allotted to treatment with cortisone acetate or tab. codein. co. according to instructions given in serially numbered and sealed envelopes prepared in advance in random order. Approximately half the patients were allotted to each type of therapy.

Dosage

Following five days of preliminary observation and assessment, a total of 2.15 g. of cortisone was given to 18 patients over a period of 16 days at the level of 200 mg. for the first day; 300 mg. on the second and third days; 200 mg. on the fourth and fifth days; 150 mg. on the sixth, seventh, and eighth days; 100 mg. on the ninth and tenth days; and 50 mg. on the eleventh to the sixteenth day. The drug was given by mouth in three divided doses daily.

*The members of the subcommittee were: Dr. E. G. L. Bywaters (chairman), Mr. W. D. Coltart, Dr. J. J. R. Duthie, Professor A. Bradford Hill, Dr. G. D. Kersley, Dr. F. H. Stevenson, and Dr. H. F. West.

Tab. codein. co. were given orally to 15 patients over the same period of 16 days at the rate of two tablets three times daily throughout. If any further analgesics were needed, pethidine only was used.

Technique of Manipulation and Assessment

All the manipulations at each centre were performed by the same person, who was unaware whether the patient belonged to the codeine-treated or to the hormone-treated series. The manipulation took place on the second day of therapy in the afternoon after the second 100-mg. dose on that day—that is, after a total of 400 mg. of cortisone or 10 tablets of tab. codein. co. After the manipulation the knee was placed in plaster which was bivalved for assessment at the twenty-fourth hour, the posterior shell thereafter being replaced. Assisted active movements were carried out by the physiotherapist daily after assessment and every endeavour was made to get the patient walking as early as possible. Daily assessments were made for five days prior to treatment, for five days following its commencement, and thereafter at five-day intervals for a total period of 26 days from the patient's admission to the trial. During this time the patient remained in hospital. These assessments were made by the same group of observers at the same time each day. They had, inevitably, to know the treatment. A follow-up examination was made at approximately two months from the time of manipulation on all but 6 of the 33 patients.

The assessments included (a) observations on the manipulated knee; (b) observations on another of the affected joints, usually the contralateral knee; and (c) assessments of general reaction.

(a) The observations on the manipulated knee included pain on pressure (grades 0-3), pain on active and passive movement (grades 0-3), range of movement measured between maximum flexion and maximum extension, circumference of the knee at the top of the patella, and skin temperature (the last-named was recorded in only 17 of the 33 patients).

The time taken to do five complete flexion-extensions with the heel supported on a skate in the horizontal position was used as a test of function. Observations were also included on the strength of thrust and on the time at which the patient began to walk, but these records proved not to be comparable from one centre to another and have not been used.

(b) Observations on an affected but unmanipulated joint included similar tests to the above, particular attention being given to pain, range of movement, and the functional test.

(c) The general assessments included maximal daily oral temperature (taken four-hourly for the first 10 days of the trial and thereafter twice daily), total and differential white blood cell counts, sedimentation rate (Westergren method), and haematocrit reading. These last estimations were performed twice before manipulation and subsequently at five-day intervals up to day 26. A note was made of any complications.

Results

In total, 33 cases were admitted to the trial, 18 being manipulated under cover of cortisone and 15 under cover of tab. codein. co. Initially the two treatment groups were closely similar in age and sex and also in the length of time that the manipulated knee had been contracted (Tables I and II).

TABLE I.—Age and Sex of Patients in the Two Treatment Groups

Age (Years)	Males		Females	
	Cortisone	Codeine	Cortisone	Codeine
<20	0	0	1	0
20-40	0	0	4	3
40-60	3	2	8	6
60-64	1	1	1	3
All ages	4	3	14	12

TABLE II.—Duration of Knee Contracture in the Two Treatment Groups

Duration (Years)	Cortisone	Codeine
<1	1	1
1-3	12	11
3-10	3	2
10+	1	0
Not stated	1	0
All durations	18	15

The main results of treatment are given in Table III and the Chart, which show the mean assessments of the treated joints at intervals from the start of the trial. After some slight decrease in pain after institution of treatment there is, as would be expected, a sharp increase on the day following manipulation. The mean values are, however, very similar in the two treatment groups (2.33 cortisone and 2.40 codeine for pain on pressure and 2.44 cortisone and 2.20 codeine for pain on motion). This increased pain declines somewhat in both groups during the subsequent two days, but it remains above the average pre-manipulation level and is similar under both treatments. By about day 15-16 it has returned to the pre-manipulation values in each group.

The average range of movement, which improved slightly with the start of treatment, is decreased in both groups for one day following manipulation; it thereafter immediately rises to a mean value above its original level and improves somewhat with the passage of time. If anything, the codeine group fared slightly better in this respect than the cortisone group.

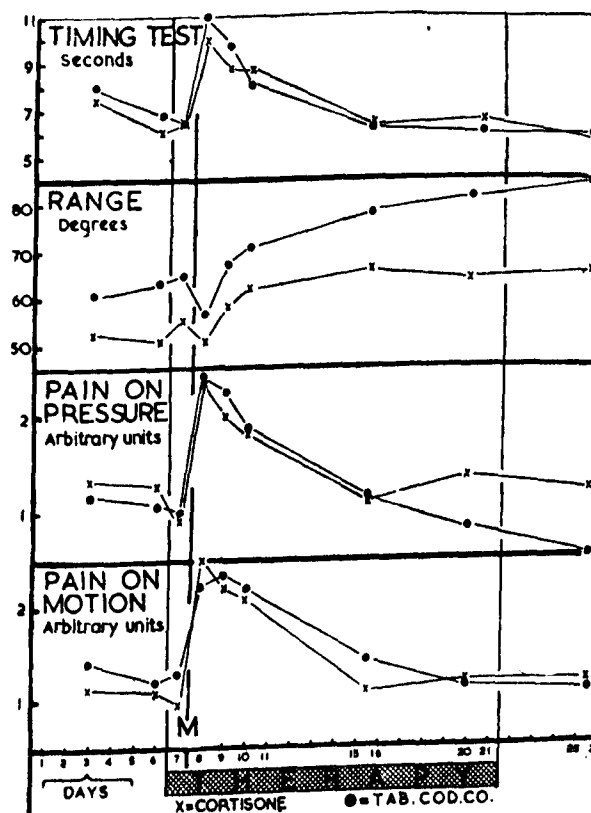
The joint circumferences showed no great change throughout. The functional timing test showed, as expected, considerable lengthening in both groups following manipulation and returned to pre-manipulation levels by day 15-16. The

TABLE III.—Joint Assessments and Sedimentation Rates at Intervals from Start of Trial (Mean Values for Each Treatment Group)

Day*	Pain on Pressure (Arbitrary Units)		Pain on Motion (Arbitrary Units)		Range of Movement (Degrees)		Circumference of Knee (in.)		Timing Test (Sec.)		Sedimentation Rate (mm. hr. Westergren)	
	Cortisone	Codeine	Cortisone	Codeine	Cortisone	Codeine	Cortisone	Codeine	Cortisone	Codeine	Cortisone	Codeine
1-5	1.30	1.15	1.13	1.27	52.5	60.2	14.7	14.9	7.5	8.0	24.4	19.9
6	1.28	1.07	1.06	1.20	51.7	63.1	14.6	15.0	6.1	6.8	21.3	19.9
7	0.89	1.00	0.94	1.27	55.7	65.1	14.6	15.0	6.5	6.5	—	—
(Manipulation)	—	—	—	—	—	—	—	—	—	—	—	—
8	2.33	2.40	2.44	2.20	50.7	56.9	14.8	15.3	10.0	11.0	—	—
9	2.00	2.27	2.17	2.33	58.4	67.7	14.8	15.4	8.9	9.8	—	—
10	1.78	1.87	2.06	2.13	62.1	71.0	14.9	15.5	8.8	8.1	—	—
11	—	—	—	—	—	—	—	—	—	—	—	—
15-16	1.11	1.13	1.06	1.40	65.9	78.1	14.6	15.2	6.4	6.3	24.4	24.3
20-21	1.33	0.80	1.17	1.13	64.1	81.4	14.7	15.1	6.6	6.1	14.3	24.5
25-26	1.17	0.60	1.17	1.07	65.4	83.9	14.7	15.1	5.8	6.0	16.5	22.8
27±7	1.27	0.30	1.20	1.08	61.3	81.3	14.7	15.5	5.3	4.8	15.5	27.1
67±7	1.00	0.83	1.33	1.17	59.8	79.8	14.8	15.2	4.8	5.0	28.2	20.4

* Days 1-5 pre-treatment; days 6-21 treatment; days 25-26 post-treatment.

† The observations in the last two lines are limited to those patients for whom observations were recorded at day 25 or 26 and day 67 ± 7.



Joint assessment at intervals from start of trial. Mean values for each treatment group.

skin temperature over the manipulated knee rose in both groups during the two days following manipulation (Table IV), but it had subsided in both by the twenty-first day.

Analgesics (pethidine) were needed, most commonly on the day of manipulation, in approximately two-thirds of the patients in each group—namely, in 12 of the 18 patients on cortisone and 9 of the 15 patients on codeine. There was

TABLE IV.—Mean Skin Temperature (°C.) Over Manipulated Knee* and Mean Skin Temperature Ratio†

Day	Temperature		Skin Temperature Ratio	
	Cortisone	Codeine	Cortisone	Codeine
1-5	32.0	32.4	1.002	1.001
6	31.4	32.5	0.999	1.001
7	31.7	31.6	0.993	0.989
(Manipulation)	—	—	—	—
8	32.8	33.1	1.030	1.022
9	33.2	33.3	1.020	1.027
10	32.9	32.7	1.041	1.031
15-16	32.5	32.3	1.030	1.012
20-21	32.3	32.7	0.996	1.001
25-26	32.0	32.1	0.997	1.021

* Based on the 9 patients on cortisone and the 8 patients on codeine for whom the necessary data were available.

† Skin temperature ratio = Skin temperature (°C.) over manipulated knee / Skin temperature (°C.) over contralateral knee. Based on data from 8 patients in each treatment group.

little evidence of any general reaction as judged by the packed cell volume, the white blood cell count, the polymorph percentage, and the sedimentation rate, although the latter fell temporarily in the cortisone-treated group. Isolated peaks of body temperature to above 99° F. (37.2° C.) occurred during the period following manipulation in five patients on cortisone and in five on codeine. Only one patient in the entire series showed a reaction in other joints (on days 23 to 26 inclusive and at follow-up on day 67). He had been treated with cortisone.

There was no marked difference between the two groups in the subsequent progress as judged from the data available on patients who were assessed at days 25-26 and also at day 67 ± 7 (see Table III).

As would be expected, the observations on the contralateral knees which were not manipulated showed them, as a group, to be less severely affected than the knees chosen for manipulation. Under treatment with cortisone or codeine they showed some improvement as measured by pain on pressure, range of movement, and functional timing test recordings (Table V). On the other hand, there was

TABLE V.—Assessment of Contralateral Knee-joints (Non-Manipulated) At Intervals from Start of Trial (Mean Values for Each Treatment Group)

Day†	Joint Assessment					
	Pain on Pressure (Arbitrary Units)		Range of Movement (Degrees)		Timing Test (Sec.)	
	Cortisone	Codeine	Cortisone	Codeine	Cortisone	Codeine
1-5	0.78	0.87	89.5	92.2	6.9	7.0
6	0.88	0.71	89.9	94.4	6.1	5.6
7	0.71	0.64	92.5	95.1	6.1	5.6
8	0.65	0.71	90.7	94.6	6.3	5.9
9	0.53	0.43	93.1	97.2	5.9	5.6
10	0.47	0.50	95.7	98.9	5.6	5.4
15-16	0.29	0.36	94.8	98.7	5.4	5.2
20-21	0.29	0.29	97.8	98.2	5.3	5.2
25-26	0.53	0.36	97.4	98.4	5.1	5.0

Based on data from 17 patients in cortisone group and 14 patients in codeine group.

clearly no material difference between the cortisone-treated and the codeine-treated groups. In short, both in the manipulated knee and in the contralateral knee these treatment groups were more remarkable for the similarity of their reactions than for a dissimilarity.

Conclusion

In this investigation cortisone revealed no advantage over tab. codein. co. as a cover for manipulation of the knee. There was little, if any, systemic disturbance attributable to the manipulation in either treatment group except an occasional temperature spike which appeared equally in both groups. A general exacerbation in other joints was seen only once and could be attributable in this case to cortisone rebound rather than to the effects of manipulation. There is no evidence, therefore, that cortisone was of any greater value than tab. codein. co. given in this dosage and for this period of time as a cover for manipulative correction of contracted joints in rheumatoid arthritis.

Summary

A controlled trial has been made of the value of cortisone as a cover to manipulation of the knee-joint in patients with rheumatoid arthritis. Each patient had a knee contracture of at least six months' standing. Eighteen were treated with cortisone and 15 with tab. codein. co., this treatment being allocated in a random order. In the dosage given there was no evidence that cortisone was in any way superior to tab. codein. co. for the purpose at issue.

The Ministry of Pensions and National Insurance has compiled a large *Digest of Statistics Analysing Certificates of Incapacity, 1950*, copies of which may be obtained from the Ministry at 10, John Adam Street, London, W.C.2. The figures will not be published in the ordinary way, because they are not considered to be of sufficient general interest. They are based on medical certificates given in support of claims to State insurance benefits. Like many other statistics of this kind, they are of necessity incomplete in several respects: for instance, they do not include figures for illnesses of two or three days' duration. Moreover, the certifying medical practitioners do not always indicate the diagnosis with precision. Now that certificates are being used for statistical purposes, the Ministry hopes that doctors will show on them the cause of incapacity as accurately as possible. If the present volume is found to be useful, similar digests will be issued for 1951 and some later years.

ACTIVITY OF ERYTHROMYCIN AGAINST STAPHYLOCOCCUS AUREUS

BY

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Erythromycin is a new antibiotic derived from *Streptomyces erythreus*. Its chemical and physical characteristics were described by McGuire *et al.* (1952), and its biological properties were investigated by the same workers and by other groups (Haight and Finland, 1952a, 1952b; Heilman *et al.*, 1952). Erythromycin was found to be active *in vitro* in very low concentrations against a wide range of Gram-positive organisms, but was inactive against Gram-negative organisms with the exception of *Neisseria*, *Haemophilus influenzae*, *Haemophilus pertussis*, and strains of *Brucella*.

Erythromycin, which can be given orally, has low toxicity for man and laboratory animals; it gives satisfactory concentrations in the blood and urine but not in the cerebrospinal fluid of normal persons (Heilman *et al.*, 1952). The ability of erythromycin to protect mice against experimental infections was found to parallel the sensitivity *in vitro* of the infecting organism and to be related to the blood concentration of the drug (McGuire *et al.*, 1952). Clinical trials of erythromycin have been reported by Heilman *et al.* (1952) and by Haight and Finland (1952c). Favourable results have been obtained in various streptococcal, pneumococcal, and staphylococcal infections. Erythromycin has been shown to be particularly effective against staphylococci, whether the strains were penicillin-sensitive or penicillin-resistant (McGuire *et al.*, 1952).

There is an increasing emergence of strains of *Staphylococcus aureus* which are resistant to penicillin, streptomycin, and to one or more of the "broad-spectrum" antibiotics. The high incidence, especially in hospitals, of infections caused by such strains makes it highly desirable to have a new antibiotic at our disposal which is effective against staphylococci. Since it seems likely that this will be the chief potential role of erythromycin, the present report is devoted to laboratory experience of the drug's activity against pathogenic staphylococci.

Materials and Methods

A supply of pure crystalline erythromycin (potency 915 µg./mg.) was provided through the courtesy of Abbott Laboratories. A stock solution of the white powder was made in distilled water in a concentration of 2 mg./ml. To aid solution a little ethyl alcohol was used. This stock solution could be stored in the frozen state at -20°C for as long as eight weeks.

Many of the strains of *Staph. aureus* used were recently isolated from patients with staphylococcal infections or from normal nasal or oral flora. Stock laboratory strains were also included.

Sensitivity tests were performed with serial dilutions of erythromycin either by a tube method with digest broth as the medium or by a plate method (modified from May and Morley, 1952) with Levinthal agar. Five-hour broth cultures of organisms to be tested were obtained by picking individual colonies from

the growth on blood-agar plates. In the tube test the final concentration of antibiotic ranged from 20 to 0.01 µg./ml. The inoculum was estimated to yield a final concentration of 5×10^3 organisms per ml. The sensitivity of the organism was taken to be the minimum final concentration of antibiotic that completely inhibited growth as judged by visible turbidity after 18-24 hours' incubation.

The inoculum in the plate test was one 2-mm loopful of the broth culture (approximately 10^5 organisms). The sensitivity of the strain was expressed as the concentration of antibiotic which completely inhibited growth of the organism. The sensitivity of staphylococci to other antibiotics was estimated by a plate method (May and Morley, 1952).

In the production of resistant variants of originally sensitive strains of staphylococci two methods were employed. The first was that of Haight and Finland (1952c) in which the organism was subcultured serially at 48-hourly intervals on a series of 10% blood-agar plates containing increasing concentrations of erythromycin. The inoculum was one loopful of a broth suspension of the growth from the plate with the highest concentration of antibiotic allowing good growth. The second method was a modification of that of Barber (1953). The organism was subcultured serially on erythromycin ditch plates. These were of 10% blood agar with a ditch cut at one side of the plate and filled with the same medium containing at first 20 and later 100 µg. of erythromycin per ml. Subcultures were made from the edge of growth nearest to the ditch.

In both methods each parent strain was subcultured on antibiotic-free medium at the same intervals as the derivative strain.

Result of Experiments

Factors Influencing *in vitro* Sensitivity

The sensitivity of *Staph. aureus* G 1 was not affected by variations in the size of the bacterial inoculum, ranging from 5×10^3 to 50 organisms, in either the tube or the plate method. The effect of continued incubation was slight. In the tube test, incubated for 24 hours, *Staph. aureus* G 1 was inhibited by 0.25 µg. of erythromycin per ml. After 48-72 hours' incubation slight growth was visible in this tube. No new growth was visible in tubes containing higher concentrations of antibiotic.

It has been shown by Knox *et al.* (1952) that in sensitivity tests of mycobacteria with isoniazid the end-point is more unstable at some temperatures than at others, and that results obtained after arbitrary periods of incubation may vary widely. In tube sensitivity tests of *Staph. aureus* with erythromycin, variation of the temperature of incubation over a range 26-40°C. did not affect the results previously obtained.

The sensitivity of four strains of *Staph. aureus* was not affected by performing the tube test with broth to which 25% serum had been added. Plate tests with blood agar or nutrient agar in place of Levinthal agar gave identical results.

In comparative tests of 50 strains of *Staph. aureus* by the tube and plate method the results were identical with 40 strains. The sole discrepancy in the remaining 10 cases was that a scanty growth was observed on the plate corresponding in erythromycin concentration with the minimum inhibitory concentration in the tube test. On continued incubation this growth became complete, but no growth developed in plates containing higher concentrations of antibiotic.

The plate method has been adopted for routine sensitivity testing of large numbers of strains of *Staph. aureus*. Prepared

plates maintain unimpaired erythromycin potency for over two weeks after preparation if the plates are kept in the refrigerator until required.

Growth of Staphylococci in Varying Concentrations of Erythromycin

A five-hour broth culture of *Staph. aureus* G 1 was added in a final concentration estimated at 5×10^3 organisms per ml. to serial broth dilutions of erythromycin and to a tube of broth containing no antibiotic. After varying periods of incubation at 37°C., 0.1-ml. samples were taken from each tube and bacterial counts were made by the method of Miles, Misra, and Irwin (1938). At daily intervals the whole of 1-ml. samples was plated out from the tubes containing 4, 1, and 0.5 µg. of erythromycin per ml. The results are shown graphically in Fig. 1. With increasing concentrations of erythromycin the number of viable organisms re-

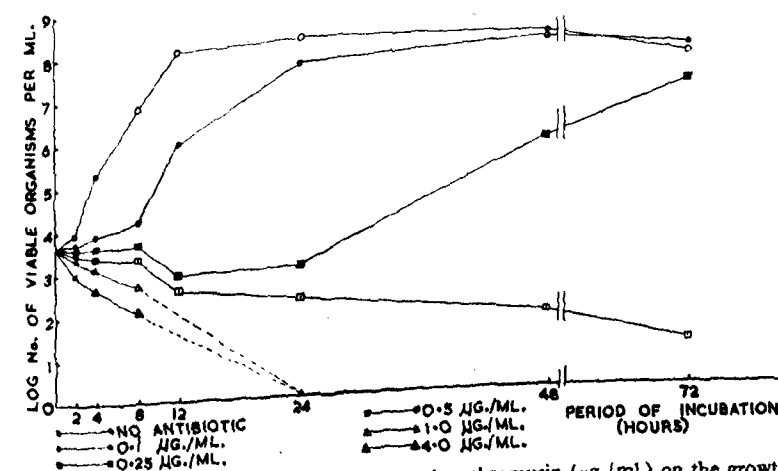


FIG. 1.—Effect of various concentrations of erythromycin (µg./ml.) on the growth of *Staph. aureus* G 1.

mained stationary for decreasing periods of time and then declined progressively. There was no growth in 4 or 1 µg./ml. after 24 hours. With 0.5 µg./ml. complete sterilization was not achieved even after 72 hours. At lower concentrations of erythromycin the number of organisms re-concentrations of erythromycin for long periods or fell slightly maintained almost stationary for long periods or fell slightly and then began to rise. In the case of 0.1 µg./ml. the bacterial count was almost the same as in the control culture after 24 hours.

Sensitivity of a Large Number of Strains of *Staph. aureus*

A total of 213 strains were tested. All strains were coagulase-positive and fermented mannite. The distribution of sensitivity of staphylococci to erythromycin is shown in Table 1. Thirty-three strains of *Staph. aureus* of known phage type were selected. These fell into each of the three main phage groups. There was no difference in erythromycin sensitivity between any of these strains. All were sensitive to 0.25-0.5 µg./ml. The sensitivity of 47 strains of

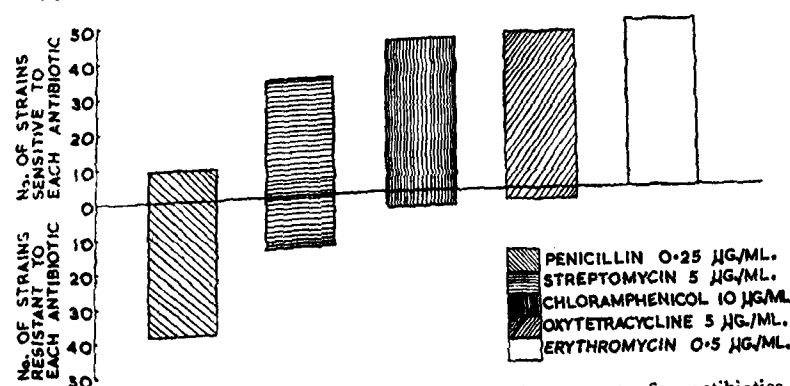


FIG. 2.—Comparative sensitivity of 47 strains of *Staph. aureus* to five antibiotics, tested by a plate method (May and Morley, 1952).

TABLE 1.—Sensitivity of 213 Strains of *Staph. aureus* to Erythromycin (Plate Method)

	Minimum Inhibitory Concentration of Erythromycin (µg./ml.)					
	>1	0.5	0.25	0.1	0.05	0.01
No. of strains sensitive to each concentration of antibiotic	0	157	49	6	1	0
Percentage of strains sensitive to each concentration	—	100	26.5	3.5	0.5	—

Staph. aureus to penicillin, streptomycin, chloramphenicol, and oxytetracycline ("terramycin") was tested. The strains selected included penicillin-resistant and penicillin-sensitive organisms and strains with varying combinations of resistance to other antibiotics. All were sensitive to 0.25-0.5 µg. of erythromycin per ml. whatever their behaviour to any of the other antibiotics. The results are shown in Fig. 2.

Resistance to Erythromycin

It is believed that resistance to antibiotics may develop by mutation of organisms in a "sensitive" strain to resistant forms. On contact with the antibiotic these resistant forms will be selected out. By serial subculture in the presence of antibiotic it is thus possible to develop strains whose antibiotic resistance is much greater than that of the parent. Two patterns of resistance have been described: (a) the penicillin pattern, in which resistance is gradual and "step-wise," depending on a series of small mutations; and (b) the streptomycin pattern, in which "one step" resistance of a high order can occur owing to selection of highly resistant variants in the original culture.

From an overnight culture of *Staph. aureus* G 1 a sample was taken for bacterial count and 1-ml. aliquots were spread evenly over the surface of 10% blood-agar plates containing erythromycin. Various concentrations of antibiotic were tested in separate experiments, 15 plates being used each time. The average inoculum was estimated at 2×10^4 organisms. No growth was discovered on plates containing 100, 50, 20, 10, or 5 µg. of antibiotic per ml. There was confluent growth on control plates with no antibiotic. In an experiment with 1 µg./ml., six plates gave no growth, and on eight plates a small number of colonies (2-10) appeared. On plates containing 0.5 µg. of erythromycin per ml. a variable number of colonies appeared on all plates.

These colonies could represent either mutants present in the culture or organisms which had undergone adaptation in some way during their contact with erythromycin. To decide this point the fluctuation test designed by Luria and Delbrück (1943) and adapted for work with antibiotics by Demerec (1948) was performed. From a single culture of staphylococcus G 1, small inocula (approximately 300 bacteria) were subcultured into 16 bottles of broth. After overnight incubation 1 ml. of each of 15 broth cultures was plated on to blood-agar plates containing 0.5 µg. of erythromycin per ml. From the 16th broth culture 15 samples were similarly plated (approximately 2×10^3 organisms per plate). After incubation the number of colonies on each plate was counted. The variation between plates was 15 times greater in the series of independent cultures than in the series of replicate platings of a single culture. These findings suggest that erythromycin-resistant bacteria in a culture of a sensitive organism arise spontaneously by mutation. If these bacteria originated by a process of adaptation when the culture and the antibiotic came into contact, a similar number of colonies would occur on all plates whatever the origin of the sample plated.

Development of Erythromycin-resistant Strains

Fourteen strains of staphylococci sensitive to 0.25–0.5 μg . of erythromycin per ml. were serially subcultured by the method of Haight and Finland (1952e), as described above. All the strains increased in erythromycin resistance rapidly. Two strains grew on plates containing 80 μg ./ml. after only

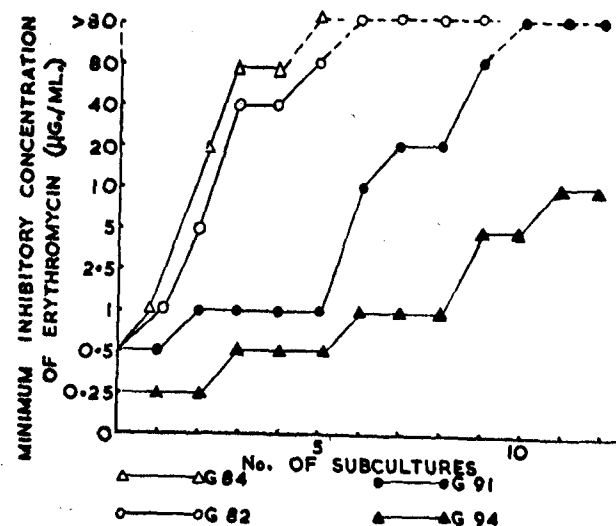


FIG. 3.—Changes in antibiotic resistance occurring during repeated subcultures of four strains of staphylococci on blood agar containing erythromycin.

five subcultures. The behaviour of four strains during 12 transfers is shown in Fig. 3. The parent strains subcultured on antibiotic-free agar retained their original sensitivity.

The resistant variants of all 14 strains of staphylococci have shown no significant change in resistance to erythromycin after 10 subcultures on antibiotic-free medium.

Metabolic Effects of Acquired Erythromycin Resistance

The 14 parent strains of staphylococci and their resistant variants were observed for colonial appearance, mannite fermentation, and coagulase production. The phage-pattern of six strains and their resistant variants was examined. None of these characteristics was changed following development of erythromycin resistance. The only

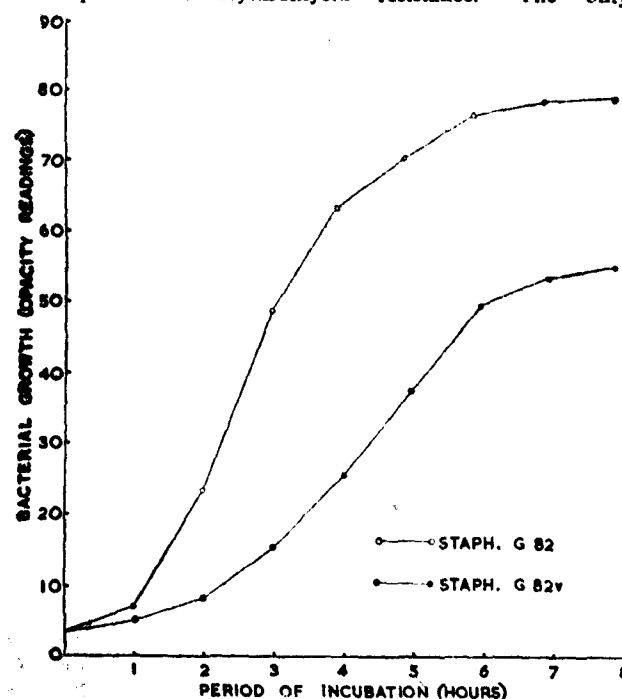


FIG. 4.—Growth curves of *Staph. aureus* G 82 and its derivative strain G 82v resistant to 80 μg . of erythromycin per ml.

difference noted was that growth of resistant variants was less active than growth of the parent strain. The growth in broth of *Staph. aureus* G 82 and its variant resistant to 80 μg ./ml. was estimated turbidimetrically. The growth rate of the resistant variant was slower than that of the parent strain (Fig. 4). Each resistant variant was examined to exclude the possibility that acquired resistance might be associated with the production of an erythromycinase. The test employed for this purpose was a modification of Got's plate test for penicillinase (Haight and Finland, 1952d). There was no evidence of erythromycinase production.

The 14 staphylococci and their resistant variants were tested for their sensitivity to penicillin, streptomycin, chloramphenicol, and oxytetracycline. In no case was the development of resistance to erythromycin associated with the development of cross-resistance to any of the other antibiotics. During the course of this investigation a sample of a new antibiotic, carbomycin ("magnamycin"), was obtained through the courtesy of Messrs. Charles Pfizer, Ltd. The antibacterial activity of this agent has been described by Tanner *et al.* (1952) and by English *et al.* (1952). The range of activity of carbomycin closely resembles that of erythromycin. Cross-resistance between the two antibiotics has been reported by Finland *et al.* (1952). Four of the staphylococci used in the present investigation, and erythromycin-resistant variants selected at various levels of erythromycin-sensitivity, were tested against the two antibiotics by the plate method already described. It will be seen from Table II that increase in resistance to erythromycin was accompanied by an increase in resistance to carbomycin. Each strain tested required two to four times as much carbomycin, weight for weight, as erythromycin to produce complete inhibition.

TABLE II.—Cross-resistance Between Erythromycin and Carbomycin

Strain of Staphylococcus	Sensitivity of Strain (μg ./ml.)	
	Erythromycin	Carbomycin
G 3	0.25	1.0
G 3v	10.0	40.0
G 6	0.5	5.0
G 6v	40.0	160.0
G 5	0.25	1.0
G 5v	80.0	160.0
G 7	0.5	0.5
G 7v	10.0	20.0

Three strains of staphylococci were subcultured serially on blood-agar plates containing erythromycin in a lateral ditch. There was a similar progressive increase in resistance, but no colonial variants were seen of the type described by Barber (1953) in her study of penicillin- and streptomycin-resistant staphylococci, nor were any erythromycin-dependent variants isolated.

Discussion

Laboratory tests with erythromycin have shown that it may be readily adapted to standard procedures used routinely for other antibiotics. The tube dilution and the agar-plate dilution methods of testing gave comparable results. Growth curves of *Staph. aureus* in varying concentrations of erythromycin show that concentrations of antibiotic higher than the minimum inhibitory concentration cause a reduction in the number of viable organisms, and may sterilize the culture, whereas with lower concentrations the organisms escape from the inhibitory effect of erythromycin after a period of bacteriostasis.

In the present study the sensitivity of 47 strains of *Staph. aureus* to erythromycin was shown to be independent of the pattern of sensitivity to four other antibiotics. Even strains which were resistant to penicillin, streptomycin, chloramphenicol, and oxytetracycline were completely inhibited by 0.5 μg . of erythromycin per ml. Sensitivity to erythromycin was also shown to be independent of phage type of the strain.

Resistance of staphylococci to erythromycin developed readily *in vitro* but appeared to follow the "stepwise" pattern of acquired resistance to penicillin rather than that of streptomycin. From the experiments described above it would appear that a culture of a sensitive strain of staphylococcus may contain spontaneous mutants which are more resistant to erythromycin. Mutants resistant to high levels of erythromycin were not found in these experiments. However, by serial subculture on media containing erythromycin progressive increase of resistance occurred in 14 strains of staphylococci tested. These strains differed from each other in the speed of development of resistance, but in no case was the first "step" to a resistance more than four times that of the original strain. Apart from some reduction in rate of growth, the biological characteristics and phage pattern of the resistant variants were unchanged. Haight and Finland (1952e) observed that development of resistance was associated with loss of coagulase activity. This finding has not been confirmed in the present study or by later experience of the same group of workers (Purcell *et al.*, 1953). Resistant variants were not found to have developed cross-resistance to any other antibiotic except carbomycin. Similar experiences have been reported by Haight and Finland (1952e) and Finland *et al.* (1952). The fact that originally sensitive strains of staphylococci rapidly develop resistance *in vitro* and also *in vivo* (McGuire *et al.*, 1952) is a potential drawback to the use of erythromycin. However, recent work (Purcell *et al.*, 1953) shows that *in vitro* combinations of erythromycin with penicillin or with streptomycin will delay or depress the emergence of resistance to both erythromycin and penicillin or streptomycin.

Summary

Methods for sensitivity testing of staphylococci with erythromycin are described. Factors affecting these tests are discussed.

The sensitivity to erythromycin of a large series of strains of *Staph. aureus* is shown to be of the order of 0.5 μg ./ml., and to be independent of their phage type or their behaviour to four other antibiotics.

The effect of erythromycin on the growth rate of staphylococci has been shown to vary according to the concentration of antibiotic. Concentrations above the minimum inhibitory concentration produce a fall in the number of viable organisms.

The development in staphylococci of resistance to erythromycin appears to follow a stepwise pattern resembling that seen with penicillin.

Resistant staphylococci were found to differ from the erythromycin-sensitive parent organism only by slight differences in growth rate and by the acquisition of cross-resistance to carbomycin.

My thanks are due to Dr. R. E. O. Williams, Staphylococcal Reference Laboratory, Central Public Health Laboratory, Colindale, for performing phage-typing on the strains of *Staph. aureus* used in the resistance experiments.

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SOME LESSONS FROM 4,000 UTERO-TUBAL INSUFFLATIONS*

BY

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Personal experience of just over 4,000 utero-tubal insufflations has taught several practical lessons. The foremost lesson, in my opinion, concerns the gas employed and its safety.

Rubin's Test

Utero-tubal insufflation was first described by Rubin in 1920, so that more than 30 years have elapsed to permit the evaluation of a large number of these tests by investigators all over the world and the accumulation of recorded complications and untoward sequelae. It must not be overlooked, of course, that details of mishaps and even fatalities might pass unpublished. An illustration of this is to be found in the report of the meeting of the Section of Obstetrics of the Royal Academy of Medicine in Ireland on November 7, 1947, in which a speaker made the bald statement that he knew of eight deaths in Ireland following the Rubin test. Nevertheless, a study of the replies to Rubin's (1947) detailed questionnaire, returned by 356 gynaecologists and involving 80,376 insufflations, must supply the data to answer the more important questions, including the safety of the procedure. Among all these insufflations, embolism occurred in 15 patients, of whom 3 died. These deaths are additional to the 10 known post-insufflation deaths from embolism reported in the literature; Frommolt (1925), 1 case; Moench (1927), 2 cases; Mansfeld and Dudits (1934), 1 case; Weitzman and Cohen (1937), 1 case; Dible *et al.* (1938), 1 case; Feiner (1942), 1 case; Finn (1945), 1 case; and Faulkner (1946), 2 cases. In all these fatal cases air or oxygen was used; in no instance is there a record of death from embolism following insufflation with carbon dioxide. Non-fatal but alarming clinical effects, in varying degrees, have been observed by many investigators, but these are rarely seen with the use of carbon dioxide.

At the Royal Samaritan Hospital for Women, Glasgow, insufflation has been employed for nearly 25 years, and at no time has any gas other than carbon dioxide been used. The test has been carried out by various members of the staff on an aggregate of over 6,500 occasions. My personal share of these experiences amounts to just over 4,000 insufflations. None of us has seen any evidence of embolism and there certainly has been no fatality. It is reasonable, therefore, to conclude from accumulated clinical experience that carbon dioxide is the gas of choice. Moreover, it must be pointed out that Rubin, in more than 10,000 insufflations personally carried out, with the exception of approximately the first 100 cases in which he used oxygen (a procedure which was quickly abandoned by him because of the disadvantage that it takes 24–100 hours to be absorbed from the peri-

*The basis of a lecture given to Greenock and District Faculty of Medicine on March 3, 1953, at Greenock Royal Infirmary.

to operate. No great difference, either in the level at which patency is established or in the appearance of tubal-contraction waves, is usually seen when insufflation is repeated even after several months. Rubin (1939) maintains that the tracings can be correlated with phases of endometrial or ovarian activity. I have not been able to confirm this. More active or more frequent peristalsis may be seen at various stages of the menstrual cycle and spasm may also be exhibited for no apparent reason. Moreover, if two or three insufflations are performed on the one day—that is, within a few hours of one another—the tracings obtained need not be closely similar.

Summary

Some of the more important lessons gained from just over 4,000 utero-tubal insufflations during the past 25 years are:

- (1) Practice bears out the theoretical advantages of carbon dioxide. There were only five cases of infection and no deaths.
- (2) Two or more tests, with the pressure advanced to 250 mm. Hg, one at least without anaesthesia, provide a reliable diagnosis of non-patency.
- (3) Primary sterility patients numbering 902 were traced for 12 months; 30% became pregnant. In a group of 253 patients in whom a uterine sound was passed, only 17.7% became pregnant within twelve months.
- (4) The kymograph is a useful adjunct.

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"Arterial Grafting" was the subject of a meeting of the Section of Surgery of the Manchester Medical Society at which Professor C. G. Rob spoke on December 12, 1953. He began by outlining the history of the subject. In 1912 Carrel had been awarded the Nobel Prize for his researches on blood vessel grafting and the transplantation of tissues and organs; in 1913 Lexer reported that he had resected three aneurysms of peripheral arteries and restored continuity with an autogenous vein graft. The first successful arterial graft in man was inserted by Gross in 1947; he established an artery bank based on the principles elaborated by Carrel. The indications for blood vessel grafting included congenital abnormalities, such as certain coarctations of the aorta, some aneurysms and arterio-venous fistulae, wounds, primary thromboses, after some emboli, occasionally in malignant disease, and in arteriosclerosis after very careful selection. Most of these indications were obvious, but the question of arterial grafting in patients with arteriosclerotic occlusion of major vessels was debatable. These patients had a general disease; the arteriogram often showed a lesion anatomically suitable for grafting, but one was treating a patient and not an arteriogram. In all Professor Rob had grafted 35 arteries, but had treated in this way less than 3% of patients with arteriosclerosis who presented with the complaint of intermittent claudication.

DIAGNOSIS AND TREATMENT OF GALACTOSAEMIA

BY

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Galactose, formed during the metabolism of lactose, is normally converted into glycogen in the liver. In the condition known as galactosaemia this process is defective, resulting in a high concentration of galactose in the blood and its excretion in the urine. It is probable that galactose in such concentrations is toxic to some tissues and is itself responsible for the main pathological changes, but the exact pathogenesis is still uncertain. This disease is of more than academic interest because prompt treatment may bring excellent results. The original clinical description was by von Reuss (1908). Göppert (1917) was the first to report a familial incidence. Articles on the subject have appeared with increasing frequency in the past seven years, mainly in American paediatric journals. Gorter (1951) gave an account of the disease at a meeting of the British Paediatric Association, but no cases were reported in this country until Bray, Isaac, and Watkins (1952) published three and gave a full review of the literature. We know of other cases that have been diagnosed in this country, but we feel sure that knowledge of the disease is not yet widespread enough. An increased awareness will lead to earlier and more frequent detection of the disease.

The earliest signs appear in the neonatal period. The infant is reluctant to feed, may vomit occasionally, and is slow to gain weight. Jaundice is common but varies in intensity. In the most severe cases deep jaundice and ascites develop in 4 to 5 weeks and the infant dies from hepatic failure. In milder cases the infants pass gradually into a state of marasmus, and at 6 months may be only a few ounces over their birth weight. Enlargement of the liver is a constant physical finding, the edge being firm and extending nearly to the umbilicus. The spleen may be palpable. Lamellar cataracts are often found, but are not easy to detect in the early stages. Mental retardation is usually obvious by the end of the first year. Early routine investigations should reveal albumin and a reducing substance in the urine. The latter must be identified as galactose to establish the diagnosis.

Basically the treatment consists in removing lactose from the diet. When this is done rapid improvement may follow. The appetite returns, the weight increases, and the liver edge gradually recedes. Galactose disappears from the urine in one to two days and albumin a few days later. Cataracts may disappear in cases in which treatment is started early, in others needling may be necessary. Mental impairment has persisted in many

published cases, but further observation is needed to show whether early treatment will prevent this. The galactose-tolerance test is likely to remain permanently abnormal. Two patients at the ages of 18 years (Townsend, Mason, and Strong, 1951) and 7 years (Bray, Isaac, and Watkins, 1952) have been able to take some lactose in the diet without excreting galactose in the urine. Experience of the disease is still too limited for an accurate assessment of the prognosis following treatment. Reports of four recent cases are given below.

Case 1

A full-term male infant weighing 7 lb. (3,175 g.) was born on February 2, 1952. Two siblings were said to have died from pneumonia, one at 3 months and the other at 11 months. It was not possible to obtain information from the mother on the question of consanguinity.



FIG. 1.—Case 1 on admission, aged 3 months.

Early feeding difficulties and poor home conditions necessitated several admissions to hospital and then to a residential nursery. When 3 months old he was transferred to Whiston County Hospital under the care of one of us (R. H. W.-J.). Because of the disproportionate size of his head to his wasted body he was sent in with a provisional diagnosis of hydrocephalus. His weight was 8 lb. (3,630 g.) and his head circumference 15 in. (38 cm.). He was emaciated and miserable (Fig. 1). His heart and lungs were normal; his liver was enlarged, the edge being firm and palpable four fingerbreadths below the costal margin. Because of a wide and rather tense fontanelle a lumbar puncture was performed. The sugar content of the C.S.F. was 222 mg. per 100 ml. (as glucose), the other constituents being normal. This was the first clue to the correct diagnosis. The urine contained albumin but no casts. A reducing substance was present. The latter was thought to be galactose because mucic acid crystals were formed and Tollen's test was negative for pentose and glycuronic acid but positive for galactose. The fasting blood sugar was 190 mg. per 100 ml. (as glucose), and the glucose-tolerance

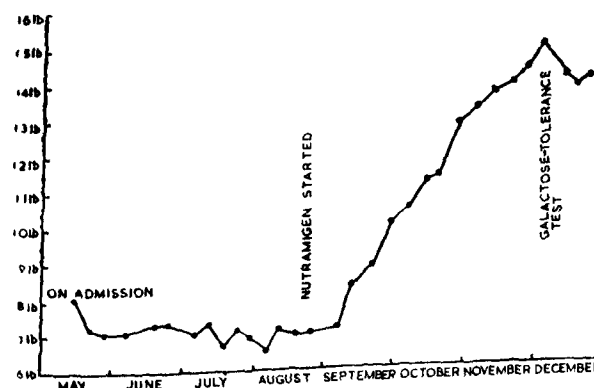


FIG. 2.—Case 1. Weight curve.

curve was abnormal, rising to 285 mg. after one hour. A paper chromatogram of the urine before starting treatment showed a normal amino-acid pattern.

The mother's Wassermann reaction was negative. The patient's Wassermann reaction was negative; blood urea, 47 mg. per 100 ml.; haemoglobin, 8.9 g. per 100 ml.; thymol turbidity, 3 units; alkaline phosphatase, 6.6 units per 100 ml. serum (King-Armstrong). X-ray films of the skull and long bones showed slight generalized osteoporosis. Mr. J. M. Broderick (ophthalmic surgeon) reported fine but distinct lineal opacities towards the periphery of each lens which were thought to be early lamellar cataracts.

From the time of admission the baby was reluctant to take feeds of dried milk and sometimes vomited. In the first week he lost 1 lb. (454 g.) in weight. A formula containing lactose-free protein, "dextri-maltose," and fat was given, but this was persistently refused and it was necessary to return to unmodified dried milk. When "nutramigen" was obtained the effect was dramatic. From the first feed the baby took well, and the weight, which had remained at about 7 lb., began to rise steeply and continued to do so (Fig. 2). The liver gradually returned to normal size, the cataracts disappeared, and the urine remained free from reducing substances. A galactose-tolerance test (Fig. 3) was performed when the baby weighed 15 lb. (6,800 g.). This helped to confirm the diagnosis, but for two weeks afterwards he was apathetic and listless, and lost weight. When 11 months old his condition had greatly improved (Fig. 4); he could raise his head from the pillow, smile, recognize people, and play with a rattle. He continued to take nutramigen well, and later had a lactose-free mixed diet.

Case 2

This infant, the first baby of healthy and unrelated parents, was born in 1949. She weighed 6 lb. 8 oz. (2,948 g.) at birth, and was delivered spontaneously after an uneventful pregnancy which went to term. Slight jaundice was present on the sixth day. It was deeper on the ninth day, and as she was feeding badly she was admitted to Alder Hey Children's Hospital. She was afebrile, the um-

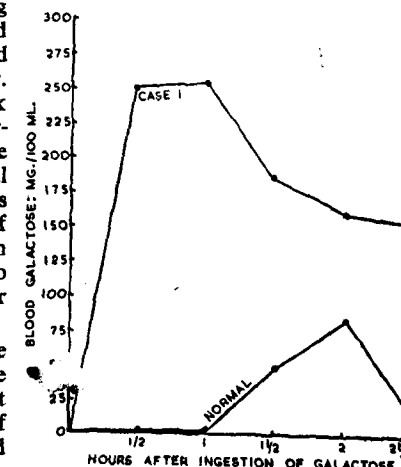


FIG. 3.—Case 1. Galactose-tolerance curves (1.75 g. galactose per kg. body weight).

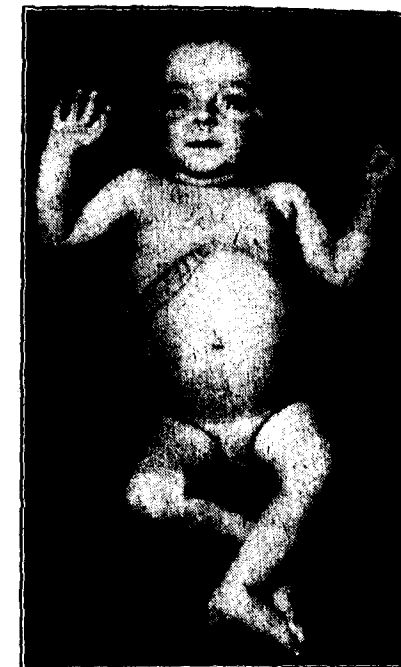


FIG. 4.—Case 1 aged 8 months.

Case Report

A male infant aged 4 months was admitted to hospital on August 30, 1951, because of failure to thrive. He was born at term, weighing 7 lb. 10 oz. (3.5 kg.). The labour was normal. His mother thought that he was a little jaundiced for a few days after birth. Breast feeding was not attempted and the baby was fed on a proprietary food until admission to hospital. Although he took his feeds eagerly and neither vomited nor had diarrhoea, he did not thrive prior to admission to hospital. His mother, father, and brother aged 4 years were stated to be in good health. The brother was examined clinically and no abnormality was detected.

On admission the infant did not look ill but was obviously underweight. His weight was 8 lb. 9 oz. (3.9 kg.), temperature 98° F. (36.7° C.), pulse 146, and respirations 30. On clinical examination the only abnormality was a firm enlargement of the liver to three fingerbreadths below the costal margin. The haemoglobin was 80% Sahli, the white blood cells numbered 21,000 per c.mm., and his blood was group O Rh-positive. The mother's blood was group O Rh-positive. On chemical examination of the urine no albumin or sugar was detected and microscopically no white blood cells or red blood cells were seen. Urine culture gave a light growth of *Streptococcus faecalis* and *Bact. coli*. The stools appeared to be normal, and on culture no pathogens were obtained. The Mantoux reaction (1:1,000) was negative. The Wassermann reaction was negative.

The infant fed well on full-cream National dried milk, but did not gain weight. Throughout the course of his illness bouts of pyrexia, as described above, occurred. The urine was repeatedly found to be normal, both chemically and microscopically, until the 35th day after admission, when a trace of albumin was detected. This albuminuria persisted, and on the 46th day Benedict's test became positive. Further laboratory investigation (see below) showed this reducing substance to be galactose. On the 97th day the infant was put on a lactose-free soya-flour mixture, which he took well. This resulted in the urine becoming sugar-free within 48 hours. He started to gain weight and his general condition improved, although there was no change in the size of his liver. A return to milk feeding for 24 hours resulted in the reappearance of a positive Benedict's test and the development of slight pitting oedema. However, these both disappeared when a lactose-free diet was recommenced. On the 147th day he developed an upper respiratory infection with pyrexia, vomiting, and diarrhoea. Chloramphenicol therapy was instituted. His condition appeared to be improving, when on the 156th day he collapsed suddenly after a feed and died within a few seconds.

Biochemical Investigations

Urine.—Chemical and microscopical examinations for cystine were negative on four occasions (October 17 and 25, and November 2 and 19). Amino-acid nitrogen on October 17, 23, and 31, and November 2 and 19 was 60, 116, 35, 40, and 30 mg. per 100 ml. respectively.

Blood.—September 6: serum proteins, 5.5 g. per 100 ml.; serum albumin, 4.2 g. per 100 ml.; serum globulin, 1.3 g. per 100 ml.; serum bilirubin, 0.5 mg. per 100 ml.; serum alkaline phosphatase, 42.1 units per 100 ml.; thymol turbidity, 3 units. October 16: blood urea, 31 mg. per 100 ml.; blood cholesterol, 140 mg. per 100 ml. October 17: serum alkaline phosphatase, 23.5 units per 100 ml. October 26: serum proteins, 6.25 g. per 100 ml.; serum albumin, 4 g. per 100 ml.; serum globulin, 2.25 g. per 100 ml.; serum bilirubin, 1.4 mg. per 100 ml.; serum alkaline phosphatase, 15 units per 100 ml.; thymol turbidity, 3 units. November 9: blood-sugar curve after 20 g. glucose orally was: fasting specimen, 110 mg.; ½ hour after 20 g. of glucose orally, 194 mg.; 1 hour after, 206 mg.; 1½ hours after, 183 mg.; 2 hours after, 181 mg. per 100 ml. (Further investigations were planned—for example, galactose-tolerance test—but owing to the clinical condition of the patient these were not carried out.)

Identification of the Reducing Substance in the Urine.—The reducing substance present was provisionally identified as galactose on the following grounds: it was not fermented by yeast; Bial's test for pentose was negative; Tollens's phenylglucosyl test was positive on prolonged boiling, as with pure galactose. The osazone was identical in crystalline form and in melting-point with that prepared from galactose. No depression of melting-point was produced on mixing the osazone isolated from the urine with known galactosazone. Mr. A. P. Kenny kindly confirmed the identification of the reducing substance in the urine by means of paper partition chromatography. He reported that the conclusion to be drawn from the chromatograms was that the principal reducing sugar in the urine was galactose, with a possible trace of free amino-sugar in certain specimens.

Aminoaciduria.—In no specimen of urine was the gross aminoaciduria recorded by Holzel *et al.* observed. Dr. H. Ellis C. Wilson kindly carried out two-way paper chromatograms of the urinary amino-acids. No gross aminoaciduria was observed. The following amino-acids were identified: glutamic acid, glycine, threonine, glutamine, alanine, phenylalanine, valine, histidine, oxyproline and nephrotoxic peptide.

Post-mortem Examination

The liver was regularly enlarged and of normal contour. On section there was marked pallor of the parenchyma with blurring of the lobular markings in places, giving a homogeneous appearance to the liver tissue. The lungs showed superficial areas of collapse in both lower lobes and there was congestion of all lobes, most marked basally. There was also marked pallor of the renal parenchyma and of the bowel mucosa.

Histology

The liver showed a diffuse monolobular cirrhosis with early fibrosis, formation of new bile ducts, and round-cell infiltration in the portal tracts. A few foci of round cells were seen among the liver cells. There was no glycogen present in the sections of liver examined. The ileum showed congestion of Peyer's patches with some lymphoid hyperplasia and slight round-cell infiltration in the villi. The mesenteric glands showed sinus hyperplasia. The spleen showed congestion of the pulp with reticulo-endothelial hyperplasia.

Discussion

Portal cirrhosis is a recognized complication of galactose diabetes, and although several theories have been advanced to explain its occurrence none has gained general acceptance. One theory is that the portal cirrhosis is due to galactose being directly toxic to the liver; another that it results from the absolute or relative hypoglycaemia which accompanies galactosaemia; while a third suggests that an inadequate diet leads to a deficiency of lipotropic substances.

The discovery by Holzel *et al.* of aminoaciduria in two patients suffering from galactose diabetes suggested a further possible explanation—namely, that a deficiency of lipotropic substances results from an excessive urinary loss of these. Such a mechanism has previously been suggested by Himsworth (1950) to explain the cirrhosis of the liver present in hepato-lenticular degeneration and Fanconi's syndrome, in both of which aminoaciduria occurs.

In the present case cirrhosis of the liver developed, although there was no gross aminoaciduria. However, the work of Bickel and Hickmans (1952) suggests that some of the amino-acids found do not occur in normal urine.

Summary

A case of galactose diabetes complicated by cirrhosis of the liver is described. The biochemical investigations are detailed with special reference to the identification of galactose in the urine and to the detection of the amino-acids in the urine. The pathogenesis of the cirrhosis of the liver is discussed.

We are indebted to Dr. J. B. McMillan, of Stobhill Hospital, Glasgow, for the pathological report; and to Dr. H. Ellis C.

Wilson, Royal Hospital for Sick Children, Glasgow, and Mr. A. P. Kenny, Victoria Infirmary, Glasgow, for undertaking the chromatography.

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ACRODYNIA ASSOCIATED WITH
EXCESSIVE INTAKE OF
MERCURY

BY

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Acrodynia is a disease of comparatively recent recognition, being first described in detail by Swift (1914) in Australia, and not reported in England before 1922. Since these earlier descriptions the disease has been recognized with increasing frequency in Europe and America as well as Australia, and in England it appears to be particularly prevalent in the neighbourhood of large industrial towns and cities of the North and Midlands—a distribution which may be of some significance, as is shown later. Another feature of some possible significance is the rather unusual fact that this disease is exceptional in that it affects breast-fed just as readily as artificially fed infants.

It being accepted that the cause and pathogenesis of acrodynia are unknown, it is not surprising that there have arisen a number of theories as to its origin, none of which is proved or even generally accepted. Warkany and Hubbard (1948) recorded several cases in which they suggested that the cause might be chronic metallic poisoning, incriminating mercury, and, in particular, the mercury administered so often to infants in the form of teething powders.

Bivings (1949) summarized all the recorded cases of acrodynia and found that mercury had been present in the urine of 28 out of 31 patients examined. He recorded also that of 15 patients treated with dimercaprol at least 11 showed prompt improvement or recovery; that is to say, these patients responded to the accepted treatment for mercurial poisoning.

There have been other brief references to the association of acrodynia with high levels of mercury in the urine, notably by Gaisford (1949), who states that in Manchester, where the condition is common, there is in almost every case a history of the ingestion of mercury, usually as calomel in teething powders. He states later (1950) that the general consensus of opinion appears to be that acrodynia is a general reaction to some poison in an infant hypersensitive to the offending substance, in most cases mercury. This opinion has been made widely known to chemists, being quoted in full in the *Extra Pharmacopoeia*, 1952.

Wilson, Thomson, and Holzel (1952), in describing five cases of nephrosis due to mercurial ingestion, urged that mercurial compounds should be eliminated from all teething powders, and that other mercurial compounds, such as grey pills, be used with care, and prolonged administration be avoided in young children. Less than a month later Holzel and James (1952) described 176 cases of acrodynia, over 50% of which gave a history of ingestion of teething powders, whereas of 1,561

healthy infants in the same area only 109, or 6.9%, were habitually given these powders.

Despite these numerous warnings of the potential danger of the administration of calomel to young infants, Miss Hornsby-Smith, replying on behalf of the Minister of Health to a question in the House of Commons in April, 1952, stated: "Inquiries are already in progress at various children's hospitals. Although indiscriminate use of teething powders is clearly undesirable, there is not yet definite evidence to justify general publicity."

Twenty months after that statement it does not appear that the results of the inquiries to which she referred have been made public, nor does it appear that physicians in general as yet regard the theory of Warkany and Hubbard as having been fully substantiated; for no concerted effort seems to have been directed towards the elimination of mercury from teething powders, or even towards the education of the public in the possible harmful results that may follow their administration.

The experience gained from a study of this disease in one of the industrial areas of the North Midlands, where acrodynia is particularly common, emphasizes the need for such action.

Case 1

A male child aged 9 months was seen at his home on August 6, 1952, because he was showing increasing irritability and loss of appetite. He had photophobia, was restless and miserable, sweating, had lost weight, and his hands and feet were puffy and peeling. He had marked tachycardia, and a slight sweat-rash was seen about the trunk—in fact, he presented the typical picture of acrodynia. He had been given teething powders on alternate days for the preceding three months.

On admission to hospital his urine was found to contain 1,450 µg. of mercury per litre. X-ray examination showed that his chest was free from disease and his Mantoux reaction was negative.

Treatment with dimercaprol was begun: 34 mg. for the first dose, followed by 17 mg. four hours later, and 17 mg. twice daily for a further two days. Ephedrine sulphate, 25 mg., was given orally before each injection.

By the fourth day after the starting of treatment the child seemed much happier, and the photophobia was less. After this course of treatment the urinary mercury dropped to 860 µg. per litre. A further course was given, using the same dosage of dimercaprol, following which his urinary mercury dropped to 300 µg. per litre.

At this stage the child became feverish, although his general condition was vastly improved, and an x-ray film showed an opacity in the right upper lobe. This took several weeks to resolve, not responding to antibiotics at all. At the same time radiographs of his long bones showed no abnormality; his serum calcium was 10 mg. and phosphorus 4.3 mg. per 100 ml.

A month later x-ray examination showed extensive decalcification of the long bones. As a result of this he was given "sterogyl," 300,000 units monthly, with calcium and phosphates by mouth daily, and it was decided not to give a further course of treatment with dimercaprol. A series of x-ray examinations showed that the decalcification had been arrested. Some six months from his admission to hospital his urinary mercury was down to 90 µg. per litre, his skeleton presented normal radiological appearances, and his general condition was satisfactory.

Case 2

A male child aged 10 months was admitted to hospital presenting the typical picture of acrodynia, except for the absence of any photophobia, and with a history of having been given teething powders on alternate days for a period

samples of mature milk from the 21st day of lactation or later were collected from a variety of sources; two subjects were still lying-in patients of the Aberdeen Maternity Hospital on account of post-partum complications; nine were resident in the mother and baby unit of the Royal Aberdeen Hospital for Sick Children with babies requiring some medical or surgical treatment; and another nine had been admitted with some feeding difficulty. Ten subjects were unmarried and living in the Aberdeen Mother and Baby Home. From eight of these latter subjects and from three others samples were obtained on the seventh post-partum day and also later in lactation. (c) From five women whose infants were premature and unfit to be put to the breast samples were obtained on a number of days during the lying-in period, and, from two of these, further samples were obtained by manual expression.

Method.—The whole contents of both breasts were removed by the "humalactor" at the usual feeding-times of 6 a.m., 10 a.m., 2 p.m., 6 p.m., and 10 p.m. After the last feeding prior to the sampling period the

TABLE I.—Samples From the First Two Weeks of Lactation, Excluding the Seventh Day

Case No.	No. of Pregnancy	Day	Volume (ml.)	Fat (g./100 ml.)	Lactose (g./100 ml.)	Total N. (mg./100 ml.)	N.P.N. (mg./100 ml.)	Protein (g./100 ml.)
221	5	1	54	6.80	2.40	1.061	332	4.67
223	1	1	15	2.20	5.00	1.852	654	7.68
224	1	1	28	15.65	5.21	996	437	3.33
229	1	1	12	0.90	7.05	1.791	1,082	4.54
230	1	1	7	—	4.11	—	245	—
233	2	1	12	2.65	3.97	1.292	274	6.53
117	3	2	115	2.50	6.02	449	80	2.37
172	3	2	40	1.90	5.38	925	234	4.43
201	1	2	2	—	—	951	228	4.63
220	1	2	94	3.40	6.37	530	105	2.85
224	1	2	46	6.35	6.26	530	178	2.38
235	2	2	17	3.55	4.11	960	109	5.45
236	1	2	28	0.50	6.57	1,532	563	6.21
28	1	3	461	2.55	6.61	371	70	1.93
29	1	3	121	2.15	—	—	—	—
31	2	3	124	1.85	—	—	—	—
42	2	3	699	2.40	6.17	280	50	1.47
117	3	3	307	3.20	6.02	401	64	2.16
172	3	3	530	3.30	6.41	345	92	1.62
201	1	3	323	3.45	5.65	370	64	1.96
224	1	3	52	1.20	5.27	486	102	2.46
233	2	3	295	3.85	6.37	384	85	1.92
236	1	3	170	2.90	6.37	370	111	1.66
236	1	3	235	1.90	6.09	468	85	2.46
31	2	4	566	2.90	6.17	—	—	—
37	1	4	325	3.85	6.47	409	—	—
43	2	4	439	3.20	6.04	361	68	1.88
48	1	4	500	2.20	6.57	311	87	1.44
56	2	4	810	2.60	5.82	280	73	1.33
117	3	4	550	2.90	6.71	322	88	1.50
172	3	4	416	2.70	6.01	294	63	1.48
224	1	4	425	2.80	6.34	349	88	1.67
233	2	4	190	2.80	6.47	386	109	1.78
236	1	4	340	2.60	6.19	353	83	1.73
23	1	5	342	2.40	—	—	—	—
26	3	5	287	2.30	—	—	—	—
30	1	5	270	2.80	—	—	—	—
34	8	5	304	3.05	4.83	506	62	2.85
117	3	5	745	3.45	6.78	312	70	1.55
172	3	5	431	3.55	6.44	294	63	1.48
224	1	5	450	3.50	6.51	343	83	1.67
233	2	5	180	4.40	6.02	361	87	1.76
236	1	5	305	2.95	6.23	350	87	1.69
22	1	6	681	3.50	—	—	—	—
33	1	6	738	3.65	6.64	252	67	1.19
37	3	6	372	2.70	6.56	297	73	1.44
40	3	6	418	2.10	6.29	302	70	1.49
41	3	6	502	4.80	5.98	395	82	2.01
172	3	6	524	2.90	6.47	283	61	1.42
224	1	6	419	4.60	5.96	340	77	1.69
233	2	6	275	2.40	6.16	302	73	1.47
236	1	6	560	2.80	6.44	342	87	1.63
38	1	8	219	1.45	6.56	255	68	1.20
70	2	8	710	2.00	6.57	260	53	1.33
172	4	8	670	3.05	6.64	270	68	1.29
233	2	8	310	4.20	5.96	246	56	1.22
236	1	8	560	2.80	6.82	311	73	1.53
233	2	9	325	4.00	6.37	263	59	1.31
236	1	13	540	4.20	6.64	294	62	1.49
236	1	13	380	2.90	5.79	210	53	1.01

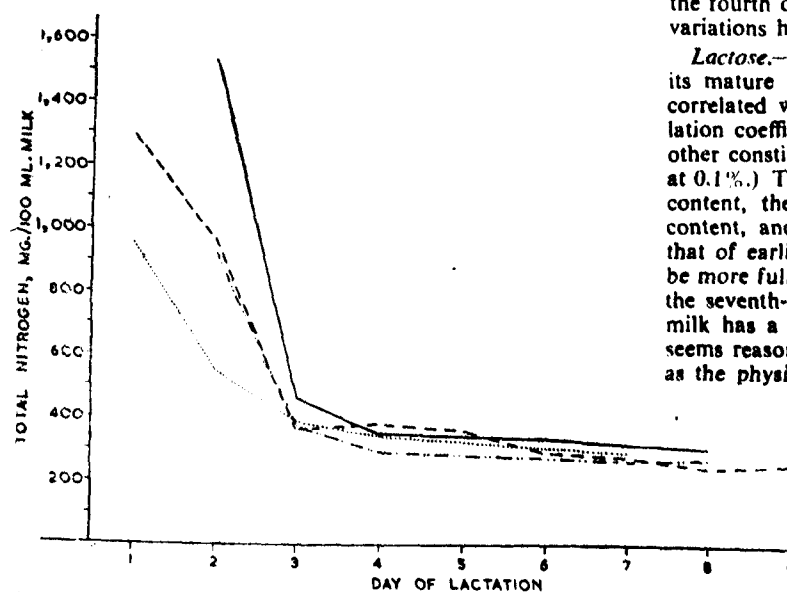
TABLE II.—Samples From the Seventh Day of Lactation

Case No.	No. of Pregnancy	Volume (ml.)	Fat (g./100 ml.)	Lactose (g./100 ml.)	Total N. (mg./100 ml.)	N.P.N. (mg./100 ml.)	Protein (g./100 ml.)
25	2	691	3.80	—	—	—	—
32	1	71	5.25	4.80	456	84	2.39
36	1	514	3.10	6.45	—	—	—
39	1	522	2.70	6.40	323	69	1.63
51	1	258	2.70	5.55	260	76	1.18
52	2	695	1.70	6.23	241	50	1.22
53	1	409	3.70	6.44	286	53	1.49
54	1	356	3.40	6.78	—	—	—
55	1	352	2.40	5.82	312	60	1.62
59	1	410	3.60	6.92	274	67	1.33
60	1	550	2.65	6.50	252	57	1.25
61	1	170	2.70	5.12	405	31	2.08
62	1	240	3.20	6.44	297	62	1.51
63	1	150	1.90	6.57	283	56	1.46
65	2	990	4.50	6.30	269	46	1.42
66	2	220	2.75	6.30	309	76	1.49
67	7	360	3.00	6.44	235	59	1.13
68	1	405	3.70	5.96	274	67	1.33
69	1	380	3.50	6.16	339	70	1.72
71	1	440	4.10	6.37	305	71	1.50
72	1	433	2.10	6.16	302	76	1.45
73	1	220	4.50	5.82	347	59	1.85
74	1	400	2.20	6.16	255	56	1.28
75	1	460	3.20	6.37	297	67	1.47
76	1	330	2.80	6.16	260	62	1.27
77	1	280	3.50	5.48	305	53	1.62
79	1	720	2.80	6.91	258	53	1.31
80	1	235	2.95	5.82	304	57	1.59
81	2	91	3.40	3.91	423	63	2.31
82	1	385	4.10	6.16	308	76	1.49
83	1	170	3.80	4.25	329	48	1.80
84	1	315	2.70	6.16	288	64	1.44
87	1	470	2.90	6.44	249	55	1.24
88	1	855	2.90	7.05	239	62	1.13
89	1	560	2.80	6.51	274	59	1.38
90	1	350	2.90	6.64	294	76	1.40
91	2	426	1.85	6.52	274	66	1.33
92	1	265	2.40	6.44	300	78	1.42
93	3	490	3.00	6.71	280	67	1.37
94	1	590	3.80	6.70	287	71	1.38
95	3	590	2.40	6.51	269	61	1.33
96	8	225	5.90	5.62	316	50	1.71
97	1	470	2.50	6.51	204	28	1.13
98	1	260	2.70	5.89	276	70	1.32
99	1	555	3.00	6.44	286	77	1.34
100	1	680	3.20	6.51	274	50	1.44
103	1	450	2.40	6.71	232	53	1.15
104	2	275	3.30	5.55	263	60	1.30
105	1	480	4.00	6.54	280	66	1.37
106	1	415	3.75	6.09	363	73	1.86
107	1	310	2.60	6.51	246	62	1.18
108	1	450	2.60	6.54	274	86	1.21
109	1	225	3.00	5.89	288	80	1.33
110	1	480	2.70	6.57	298	67	1.48
111	1	350	2.80	6.37	364	90	1.76
112	1	690	3.30	6.64	242	64	1.14
113	1	800	2.20	6.37	204	70	1.44
114	1	690	2.60	6.37	295	67	1.46
116	2	190	2.70	6.67	354	100	1.63
118	1	380	3.00	6.33	342	90	1.63
119	2	298	3.00	6.78	263	70	1.24
120	1	540	4.10	—	287	52	1.51
121	1	250	4.10	5.45	286	48	1.53
122	2	930	3.40	6.37	259	76	1.17
123	1	235	2.50	5.55	315	104	1.35
124	1	430	3.50	6.02	259	65	1.24
125	1	445	1.80	5.78	270	81	1.21
126	2	620	3.70	6.88	262	76	1.19
127	5	730	3.75	6.60	287	75	1.36
128	1	375	3.25	6.67	271	63	1.33
129	1	455	3.05	6.41	293	95	1.27
130	1	630	3.80	6.19	308	77	1.48
131	1	420	2.00	6.30	269	65	1.31
132	1	450	3.20	6.44	302	73	1.47
133	1	275	2.10	5.62	371	76	1.89
134	1	390	3.60	5.96	287	70	1.39
135	5	555	3.50	5.89	290	48	1.55
136	5	270	2.40	6.60	281	76	1.31
137	2	350	2.70	6.60	283	64	1.40
139	1	510	3.60	6.37	292	60	1.49
140	1	570	3.20	6.74	255	60	1.25
141	1	420	3.40	6.85	323	75	1.59
142	3	450	2.85	6.57	301	70	1.48
143	1	270	3.50	6.02	290	68	1.42
144	1	370	3.50	6.30	301	72	1.47
145	3	670	4.00	6.30	277	55	1.42
146	3	265	4.60	6.54	321	78	1.56
147	7	880	4.35	6.54	263	70	1.24
148	1	1,034	3.50	6.00	260	63	1.26
149	1	225	2.20	6.02	318	64	1.63
150	1	260	1.60	6.19	277	70	1.33
152	1	575	2.25	6.37	267	67	1.28
153	1	545	2.30	6.78	253	68	1.19
154	1	310	2.30	6.64	299	81	1.40
155	1	550	5.00	6.64	320	91	1.47
156	1	330	3.50	6.16	335	73	1.68
157	4	560	3.00	6.44	294	70	1.44
160	1	375	1.70	6.33	309	71	1.53
163	1	518	3.65	6.44	290	58	1.49
164	8	610	3.10	6.30	300	72	1.46
165	1	400	2.90	6.57	283	72	1.35
166	1	615	4.40	6.41	346	79	1.71
167	1	690	4.10	6.41	307	58	1.60
168	1	440	2.35	6.30	293	69	1.44

TABLE V.—Trend of Fat Content of Milk (g./100 ml.) in Four Subjects From Whom Serial Samples Were Obtained

Case No.	Day of Lactation													
	1	2	3	4	5	6	7	8	9	14	21	28		
172	—	1.90	3.45	2.70	3.55	2.90	2.75	3.05	—	—	—	—	—	—
224	15.65	6.35	3.85	2.80	3.50	4.60	—	—	—	—	—	—	—	—
233	2.65	3.55	2.90	2.80	4.40	2.40	4.00	4.00	—	4.20	4.40	4.90	—	—
236	—	0.50	1.90	2.60	2.95	2.80	3.05	2.80	—	3.10	—	—	—	—

maintain a stable fat content in the more rapidly increasing total milk yield. The trend beyond the end of the first week is illustrated by Table VI, in which 11 subjects, from whom samples were collected on the seventh day and again later in lactation, are detailed. The day of lactation on which the second specimen was taken is shown in the last column.



Four cases from whom serial milk samples were taken during the first nine days of lactation, showing the steep drop in total nitrogen content which occurs in the first three days, after which there is a gradual fall and a convergence to a narrow range of values.

It is clear, even from these few samples, that there is a rise in the fat content of milk beyond the seventh day, but, more important, Table VI shows that, unlike nitrogen and lactose, there is no tendency for the range to narrow towards what

TABLE VI.—Fat Content of Milk on the Seventh Day and in Mature Milk in Eleven Subjects

Case No.	7th Day Fat (g./100 ml.)	Mature Milk	
		Fat (g./100 ml.)	Day of Collection
74	2.20	2.55	30
75	3.20	4.00	135
110	2.70	2.95	53
116	2.70	3.60	48
119	3.00	3.90	41
121	4.10	4.65	62
139	3.60	3.90	50
163	3.65	4.15	48
183	3.20	3.75	28
205	3.10	4.90	58
235	4.20	4.70	42

might be a physiological norm. The difference which occurs between subjects at the seventh day is maintained, and there is a high correlation between the fat contents of the seventh-day milks and the fat contents of more mature milks ($r = +0.88$). There does not appear to be a continuous rise, because mature samples taken two or three months after the seventh day show no greater increment than those taken after an interval of only a month. It is likely, therefore, that the mature fat content of the milk is reached by the beginning of the second month of lactation.

Discussion

Volume.—The few results presented here conform broadly to the accepted picture. The enormous range of milk outputs is well recognized clinically, and has been studied in far greater numbers by the indirect method of test-weighing the baby.

Nitrogen.—The decline in the content of total nitrogen which occurs during the progress of lactation has never been explained. It has been suggested that the initially very high protein content, showing as it does a preponderance of globulin, is due to equilibration with the blood of milk secreted during pregnancy and lying in the acini. But this mechanism cannot explain the further decline which occurs after the milk is being secreted in large volumes. On the seventh day the protein content varies considerably, and in some subjects it is still as high as that found typically on the fourth or fifth day. By the end of the first month these variations have practically all disappeared.

Lactose.—The rate at which the lactose content reaches its mature value also varies, and the values are inversely correlated with total nitrogen content. (The partial correlation coefficient of lactose with total nitrogen, volume and other constituents remaining constant, was -0.49 , significant at 0.1% .) Thus, if milk on the seventh day has a low lactose content, then it will almost always have a high protein content, and the milk secretion as a whole will resemble that of earlier lactation. This difference in maturation will be more fully discussed in Part V of this paper, dealing with the seventh-day milk alone. The lactose content of mature milk has a coefficient of variation of less than 4% , and it seems reasonable to consider the value of 6.9 g. per 100 ml. as the physiological norm for the species.

Fat.—There can be little doubt from the figures presented that the fat content of milk increases from the beginning of lactation up to the second month. The fluctuations which occur during the initial stages of lactation appear to be due to an asynchronism between the increasing fat production and the more rapidly increasing total yield of milk, suggesting that there is a separate mechanism for the control of fat secretion. The differences in fat content on the seventh day seem to be the expression of individual characteristics and are not due, like differences in nitrogen and lactose contents, to differences in the speed of maturation of the milk. The fact that these individual differences in fat production are maintained throughout lactation means that the seventh-day sample can be used as a reliable index of the general level of fat production. For example, if the fat content of the milk on the seventh day is low, it will be low at any subsequent point in lactation.

In view of the above findings, it seems worth while to examine the meaning of the word colostrum in relation to human lactation. The colostrum period has been defined in the past by a number of authors as varying from three to twenty days, and some have refined the division still further by adding, between the colostrum and the mature milk, a period for "transitional milk." It is impossible to fix a time for the colostrum period, such as the first seven days, since a number of subjects will be producing milk within this period which is chemically similar to mature milk. It would appear, therefore, that if a term is required which will indicate an immature secretion, then it should be based on the chemical characteristics and not on some arbitrary date-line. Since the term seems to have little practical value in clinical medicine it is not intended to suggest any criterion by which it could be redefined.

Summary

Fat, lactose, total nitrogen, and non-protein nitrogen have been estimated in 240 24-hour samples of milk collected at different stages of lactation from 194 subjects.

During the first week of lactation there is a wide range of values for total milk yield, and for all the constituents examined.

The yield rises rapidly during the first week and more slowly thereafter; the lactose content rises from an initially low level to a stable level of about 6.9 g. per 100 ml. within the first month of lactation; total nitrogen and protein content fall steeply from an initially high level during the first three days and then much more slowly until at least the second month.

The fat content is usually low during the first few days of lactation, but increases slowly to a level which is characteristic of the individual by the second month. The value, however, is stable enough by the seventh day to indicate fairly accurately the fat content of the mature milk in the individual case.

The use of the term "colostrum" is discussed.

I am grateful to Professor Dugald Baird, to the staffs of the Midwifery Department, the Aberdeen Maternity Hospital, the Royal Aberdeen Hospital for Sick Children, and to Miss G. Winship, of the Aberdeen Mother and Baby Home, for invaluable help; to Dr. I. Leitch, of the Commonwealth Bureau of Animal Nutrition, Bucksburn, for criticism and advice; and to Dr. F. H. C. Marriott for statistical assistance.

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V. INDIVIDUAL DIFFERENCES IN COMPOSITION OF MILK

When all the variations in milk composition which may be due to sampling methods have been eliminated so far as is possible by the taking of 24-hour samples under specified standard conditions (see Part III), the composition of the milk yielded by different individuals varies widely. The study of this variation has been confused in the past by the use of unreliable sampling methods or by the selection of such unrepresentative subjects as professional wet-nurses. There is still a widely held belief that the composition of human milk varies very little, and this point of view has been summed up by Bourne and Williams (1953) as follows: "Researches on the quality of milk, that is the percentages of the main constituents, show that there is not much variation, even under harsh nutritional or other conditions or when the quantity is seriously falling." In the lay mind, on the other hand, the quality of milk is often blamed for unsatisfactory breast-feeding; a plentiful milk supply with a baby losing weight seems to be a not uncommon clinical syndrome.

It has been shown in Part IV of this paper that by the seventh day the composition of milk is stable enough in the individual case to indicate the composition of the mature milk. Detailed studies of individual variations in the seventh-day milk are here discussed.

Methods

All the subjects were in the lying-in wards of the Aberdeen Maternity Hospital. It is necessary to limit studies of individual variation to milks obtained at one period of lactation in order to minimize differences of maturity. The seventh day of lactation was chosen for the reason indicated above and because there was a day or two in which to re-establish the infant at the breast after the 24-hour break, before the mother was discharged from hospital. In addition to these considerations, it is desirable to obtain milk as early as possible in lactation, because breast milk of low calorie value is likely to be replaced before long by artificial feeds, and then will not be available for analysis.

Analyses were carried out on seventh-day milk from 121 primiparae and 29 multiparae. For six of the latter, volume and fat content of the seventh-day milk were known for a previous lactation.

The methods of milk collection and chemical analysis have been detailed in Parts I and II of this paper. The calorie value was calculated by using the factors 9.0 , 3.75 , and 4.0 for fat, lactose, and protein respectively. (The absolute calorie equivalents for human milk are not known, but the above factors are likely to be accurate enough for present purposes.)

Results

The results of the analysis of 150 samples collected on the seventh day have already been given (Part IV, Table II). There was no statistically significant difference in average volume and composition between the 121 primiparae and 29 multiparae.

The fat content and volume of seventh-day samples of milk obtained from six subjects during their first lactation in 1949 and during a subsequent lactation in 1952 are shown in the accompanying Table. No consistent trend can be

Fat Content and Volume of Milk During Two Lactations

Subject No.	Fat (g./100 ml.)		Volume (ml.)	
	1949	1952	1949	1952
52	2.40	1.70*	765	695*
65	3.60	4.50	880	990
66	2.80	2.75	158	220
70	3.30	2.00	910	710
122	2.75	3.40	1,100	930
227	2.50	2.75*	100	235*

* Third lactation; the remainder from 1952 are second lactations.

seen in the Table, but it is curious that in each subject the fat content is different in the two lactations. There is also some clinical evidence of gross differences between lactations of the same woman. Subject 161, for example, had fed her first baby for eight months with great ease (the milk was not analysed), but in the second lactation, although the milk yield was adequate, the baby lost weight and the fat content at seven weeks was found to be only 2.05 g. per 100 ml.

It is clear that more data will be needed to understand changes with parity; meanwhile analyses of individual differences will be restricted to the results from the 121 primiparae.

The mean values, together with their coefficients of variation (to illustrate the relative variability), are as follows:

		Coefficient of Variation
Volume	414 ± 172 ml.	41.5%
Fat	3.17 ± 0.78 g./100 ml.	24.6%
Lactose	6.29 ± 0.45 g./100 ml.	7.2%
Total nitrogen	296 ± 38 mg./100 ml.	12.8%
Protein	1.44 ± 0.22 g./100 ml.	15.3%

The mean calorie value, which is very closely associated with the fat content ($r = +0.97$), was 578 ± 73 calories per litre.

The frequency distributions of values for volume and for fat, lactose, and total nitrogen contents are shown in Figs. 1, 2, 3, and 4. The curves for volume and fat are not significantly different from normal. The distribution of values for lactose is skewed to the left (there is an excess of low values) and significantly so ($P < 0.05$), and the distribution of values for total nitrogen is obviously skewed to the right (an excess of high values), although the deviation from normal is not statistically significant. These deviations from a truly normal distribution suggest that there is a physiological upper limit to lactose content and a lower limit to protein content.

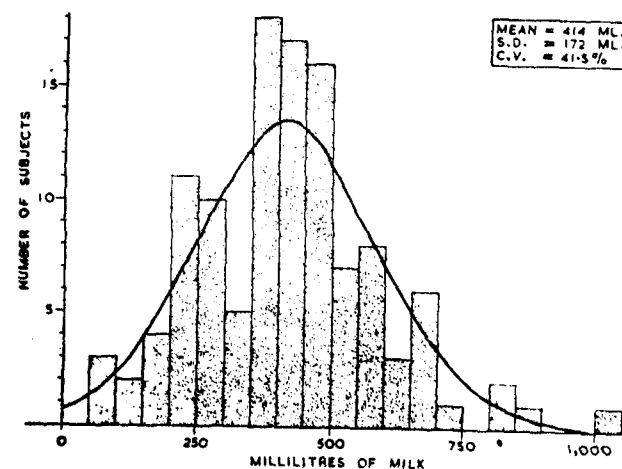


FIG. 1.—The frequency distribution of milk volume secreted on the seventh day. The normal curve is superimposed.

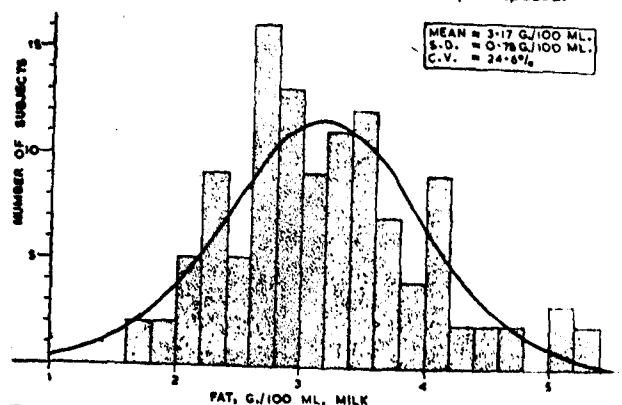


FIG. 2.—The frequency distribution of the fat content of milk secreted on the seventh day. The normal curve is superimposed.

Tests were applied to discover to what extent values for the several constituents were related to each other.* Briefly, it was found that the fat content of a given milk sample is virtually unpredictable without direct analysis. On the other hand, milk produced in large volume is likely to have a high lactose content and a low protein content, and vice versa.

Discussion

It has been pointed out in Part IV of this paper that, when samples from different individuals are considered, the values for the fat contents cover a wide range at all stages of lactation, but that the lactose and protein contents, although they may show a wide range in early milk, converge to within narrow limits as the milk matures. This is confirmed by the present study of the seventh-day milk: the fat content is clearly independent of volume and of lactose and protein, which are equally clearly closely concerned with each other. Simplified, the results indicate that if the volume of a sample is low then the lactose content is likely to be low and the protein content to be high; or that if one of these values is "immature," then the milk as a whole will be "immature." It therefore seems that the differences which are found in lactose and protein content on the seventh day of lactation are due to variation in the maturity of the milk. The skewness of the frequency distributions for the values of lactose and total nitrogen also lends support to this view, the longer tail of

*The regression equations are:
(1) Fat = $1.90(\text{protein}) + 0.0010(\text{volume})$
 $\pm 0.33 \quad \pm 0.0004$

(The effect of lactose was negligible). The standard deviation about the regression line was 0.70, compared with 0.78 for the standard deviation for fat content about its mean.

(2) Lactose = $-0.0062(\text{total N}) + 0.00086(\text{volume}) + 0.0014(\text{N.P.N.}) + 6.80$
 $\pm 0.0011 \quad \pm 0.00020 \quad \pm 0.0003$

The standard deviation about the regression line was 0.34, compared with 0.45 for the standard deviation for lactose content about its mean.

the graph comprising those milks which are maturing more slowly (and are therefore relatively immature at the seventh day), and the more abrupt drop at the other end indicating that a physiological norm is being approached.

Since the fat content of milk retains its wide range of values throughout lactation, it is reasonable to suppose that in mature milk there will be a distribution of fat similar to that shown in Fig. 2, shifted by perhaps 0.5 g. per 100 ml. to the right to accommodate the increase in concentration which occurs as the milk matures. On this basis there will be about 20% of women whose mature milk will have a fat content of 3 g. or less per 100 ml., and a calorie value of 570 calories or less per litre. Assuming that these women are capable of producing a litre of milk daily, which is a high yield (Morrison, 1952), and assuming that the calorie requirements of an infant are 115 calories per kg. body weight (Smith, 1951), then one-fifth of the lactating population will be incapable of adequately nourishing an infant beyond a weight of 11 lb. (5 kg.). The mother who explains her lactation failure by saying "my milk was too thin" may, in fact, be telling the truth.

The reason for these individual differences in fat content is at present obscure. That it should be a peculiarly human characteristic is understandable, since alternative methods of rearing an infant have probably always been available, either by wet-nursing or by artificial feeding, so that selective breeding for the ability to breast-feed, which has occurred in other mammals, has been avoided. However, although the level of fat production is an individual characteristic, it does not appear to be entirely genetically determined, since it is not always maintained in subsequent lactations.

In a later publication the relation of the fat content to a number of physical attributes of the mother, and also to some environmental factors, will be examined.

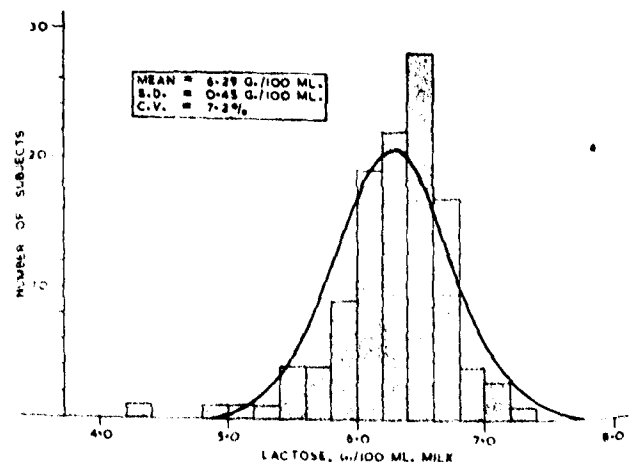


FIG. 3.—The frequency distribution of lactose content of seventh-day milk. The normal curve is superimposed.

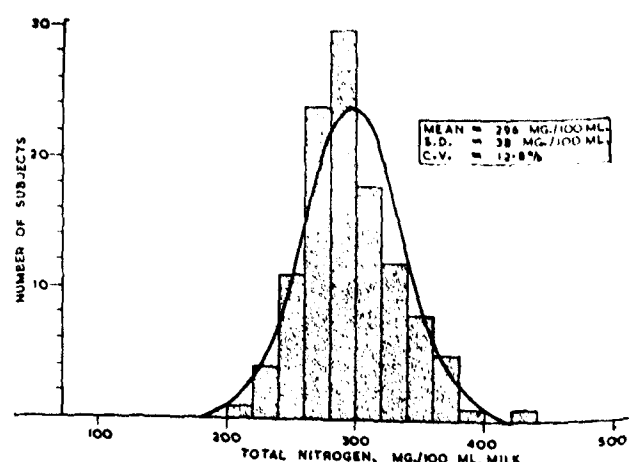


FIG. 4.—The frequency distribution of total nitrogen content in seventh-day milk. The normal curve is superimposed.

Summary

The differences occurring in the composition of milk on the seventh day of lactation have been studied in 150 women, 121 of whom were primiparae.

There is no statistically significant difference between the milk of primiparae and multiparae in this series, but evidence is presented to show that the same individual, in two lactations, may produce milk differing greatly in fat content.

There is a wide range of values for all the major constituents as well as for the total yield at this stage of lactation. The variability of the lactose and protein seems to be due to differences in speed of maturation of the milk.

There is a wide range of fat content, and consequently of calorie value. The fat content is not apparently related to the content of other constituents, and seems to be an individual characteristic. In some milks the fat content is so low that, even with a high milk volume, the child may be undernourished.

I am grateful to Professor Dugald Baird and to the staffs of the Midwifery Department and the Aberdeen Maternity Hospital for invaluable help; to Dr. I. Leitch, of the Commonwealth Bureau of Animal Nutrition, Bucksburn, for criticism and advice; and to Dr. F. H. C. Marriott for statistical assistance.

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IODODERMA OF THE FACE AND MARKED EOSINOPHILIA

BY

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(1951-2)

Iodine has a long-established place in the history of medicine. There are few drugs which have been used more freely in the treatment of coughs, syphilis, and thyrotoxicosis, apart from its popularity as a skin disinfectant. Relatively few cases of iodism have been reported despite the commonness of its use and importance in radiological contrast substances.

The present case draws attention once again to the dangers of iodine intoxication and demonstrates two features of some interest—an unusual skin lesion and a pronounced eosinophilia.

Case Report

A 60-year-old white man of French extraction, resident in British Columbia for over 30 years, was admitted to the Vancouver General Hospital on February 27, 1952. Asthma had troubled him at infrequent intervals for many years without producing any severe disability. During 1951 he had two major surgical procedures—a suture of a perforated gastric ulcer in April and a transurethral prostatectomy in November—and during this period his general health deteriorated and his asthma became increasingly severe.

In October, prior to his prostatectomy, he was submitted to intravenous pyelography, and developed a severe but temporary reaction to the iodine-containing contrast substance. In November, for a four-week period following his operation, he was given 5 gr. (0.32 g.) of potassium iodide three times a day in an attempt to avoid any fibrous con-

traction of the prostatic bed. During January, 1952, his asthma became more troublesome. Towards the end of the month he treated himself with proprietary asthma tablets, each containing about 1½ gr. (0.1 g.) of potassium iodide. He took an average of six tablets daily. A few days after beginning this treatment he noticed red vesicular raised spots appearing on his arms and trunk. He described them as being like "pimples from which no pus came." By the middle of February he had developed several spots on each malar region, and these gradually spread and coalesced to form fungating tumour-like masses. These lesions and his severe asthma caused his admission to hospital.

Physical examination on admission showed a firm raised reddish mass with an irregular surface over each malar region of the face; severe asthma with an emphysematous chest; hypertension (B.P. 190/108); and a few vesicular spots on the upper trunk and arms.

Laboratory studies on February 28 showed: Hb, 97%; W.B.C., 32,950 (P. 22%, staffs 1%, lymphs 6%, monos 4%, eosins 66%, basophils 1%); N.P.N., 38 mg. per 100 ml. Urinalysis: Sp. gr. 1.022; protein +++; W.B.C. +++; R.B.C. ++; and an occasional hyaline cast seen.

During the week February 28 to March 6 the patient's condition steadily deteriorated and oxygen was given continuously. Treatment included adrenaline, aminophylline, penicillin, and potassium iodide—5 gr. (0.32 g.) three times a day. Bacteriological examination of the facial lesions on three occasions revealed the presence of only coagulase-negative *Staphylococcus albus*.

A sternal puncture and haemogram were performed on March 4, the findings being: (1) Peripheral blood: Hb, 98% (14.2 g.); R.B.C., 5,300,000; platelets, 350,000; reticulocytes, 1%; haematocrit, 44%; W.B.C., 31,800 (neut. polys 16%, neut. staffs 2%, eos. polys 55%, eos. staffs 15%, lymphs 8%, monos 4%). (2) Bone marrow: On a 300-cell differential count 37.3% were lobed eosinophils, 11.3% staff eosinophils, 4.3% metamyelocyte eosinophils, 5% myelocyte eosinophils, and 0.6% promyelocyte eosinophils. The marrow was not as hypercellular as one would expect in a leukaemic condition, and in view of this, the absence of splenomegaly, and the excessive rarity of eosinophilic leukaemia it was felt that the latter was probably not the diagnosis.

On March 6 the patient was seen with a view to the possible administration of A.C.T.H. as a life-saving measure. His condition was critical. The striking lesions on the face had extended and the surface was now a blackish-red colour (Fig. 1). He was in an oxygen tent, his breathing was asthmatic and very laboured and noisy, and he was roused only with difficulty, his answers to questions being irrational. In addition to hypertension he had a marked tachycardia (pulse rate 160) with numerous extrasystoles. Examination of the upper trunk and arms revealed the presence of numerous rounded raised red papular spots of varying size, while similar spots were evident on the chin and ears.

The patient was put at once on intravenous A.C.T.H., digoxin, pethidine hydrochloride, and diphenhydramine hydrochloride, the pre-



FIG. 1.—Photograph of patient showing facial lesions.

vious drug treatment being stopped. After 48 hours under this regime he showed marked improvement, oxygen was discontinued, and a steady uneventful recovery was made.

The day following the change in treatment the full story of iodine intake was obtained and the diagnosis made of iododerma, the facial lesions being typical of some previously described in this condition.

A biopsy from one of the facial lesions was taken. The pathologist reported: "The surface of the lesions is covered by hyperkeratosis and parakeratosis. Extending deeply into the underlying cutis there is marked epitheliomatous hyperplasia with both large and small epithelial pearls. In the centre of many of the smaller projections are minute micro-abscesses. Despite this irregular and marked acanthosis, however, the constituent cells are well differentiated and prickle-cell bridges can be demonstrated. Nowhere does the lesion suggest cytologically a squamous-cell carcinoma, though the picture superficially is somewhat similar. The dermis in both the superficial and deeper parts of the lesion suggests a fibrosis and is heavily infiltrated with subacute and chronic inflammatory cells. The picture is consistent with a diagnosis of iodism."

In all only 85 mg. of A.C.T.H. was given intravenously over a period of eight days, the infusion being kept going almost continuously. The effect of the A.C.T.H. on the eosinophils and 17-ketosteroids is illustrated in Fig. 2.

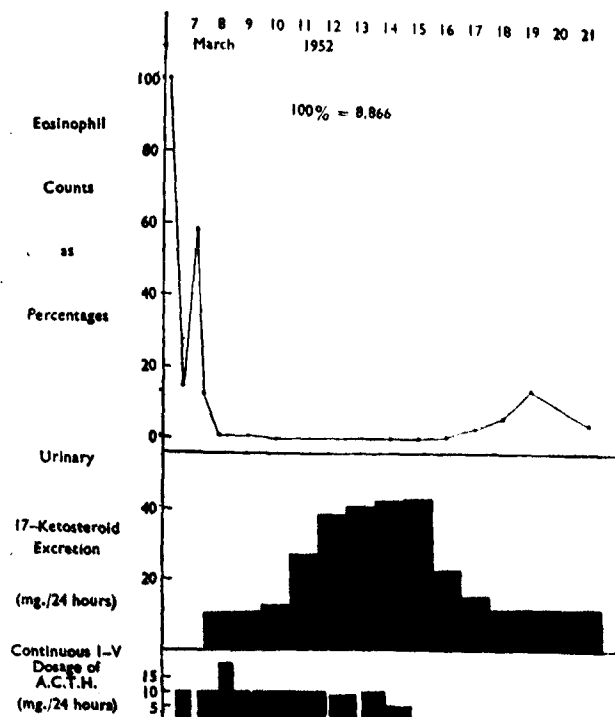


FIG. 2.—Showing effect of A.C.T.H. on 17-ketosteroid excretion and eosinophils.

During the recovery period the facial lesions slowly regressed. The asthma improved greatly without being completely relieved, while the pulse rate fell to between 80 and 90. The albuminuria remained +++ for about a week, and then gradually subsided, only a trace of albumin being noted on March 20, the day before discharge.

The patient was readmitted three weeks later for further study. At that time his total eosinophil count was about 1,000 per c.mm., his asthma was still troublesome, but the facial lesions had completely disappeared apart from some slight residual pigmentation of the skin. There was no albuminuria.

Comment

This case presents several unusual features which stimulate speculation on the mechanisms involved. Reactions to drugs can be broadly divided into two types; (1) toxic

signs and symptoms due to acute or chronic overdosage, and (2) signs and symptoms due to a personal idiosyncrasy producing hypersensitivity to the drug. In this particular case there are features of both types of reaction. The vesiculo-papular rash and tumour-like masses are recognized features of iodism due to chronic intoxication with the substance, while the sharp reaction to the pyelography and the very high eosinophilia of the later acute illness both suggest a hypersensitivity type of reaction. It is interesting to note that two months after the reaction to the pyelography a four-weeks course of potassium iodide produced no obvious symptoms, but after the beginning of the second course, six weeks later, the rash appeared almost immediately. The first course appeared to be a "sensitizer" which resulted in a hypersensitive response to the second. Seymour (1937) reported a similar effect with iodine applied to the skin. A 7.5% tincture was used for the skin preparation for the induction of an artificial pneumothorax. After the sixth treatment a rash developed which settled in a few hours. Eleven days later the procedure was repeated, and within a week the patient was dead from an exfoliative dermatitis.

The marked eosinophilia in the present case supports the idea of a sensitivity reaction. The patient was susceptible to allergic manifestations, being a chronic sufferer from asthma. As such he may have had a moderate eosinophilia for years, but the level of the eosinophils in the blood in this acute illness was much higher than normally found in asthma *per se*. Iodine in the blood stream is largely bound to protein. "Foreign protein" is regarded as exerting a "chemotactic stimulus" to the production of eosinophilia (Whitby and Britton, 1947). One may postulate, therefore, that in this hypersensitive individual the iodine-protein complex has acted as a "foreign protein."

During the past 20 years two clinical entities have been described in which asthma and extreme eosinophilia are the main features. These are Löfner's (1936) syndrome and tropical eosinophilia. Apley and Grant (1945) thought there was a good case for classifying them under the one heading "eosinophilia with pulmonary disease" or the "E.P. syndrome." Two cases of this syndrome have been reported due to chronic brucellosis (Elsom and Ingelfinger, 1942). Herbert *et al.* (1950) have observed a difference between the two conditions in their response to A.C.T.H. therapy. The present case also shows the main features of the syndrome, and a clear aetiology. It supports the suggestion that the "E.P. syndrome" is probably a non-specific response to a variety of different hypersensitive conditions.

It is difficult to assess the role of A.C.T.H. in this patient's recovery. It seems possible, however, that the hormone did accelerate it. It is of interest to observe the satisfactory response to relatively small amounts of A.C.T.H. administered by slow and almost continuous intravenous infusion. In a previous paper (Cape *et al.*, 1952) it was shown that the minimum intravenous dose of A.C.T.H. given in this way which produced a maximum effect on the eosinophils was about 0.2 mg. per hour. Approximately double this dose was given in the above case with entirely satisfactory results. The fact that this dose will not produce a maximum stimulation of adrenal steroid production suggests that adequate therapeutic responses may be obtained without such full stimulation. The effect on the peripheral eosinophils was dramatic, as in less than 48 hours the count had fallen to 19 per c.mm. from almost 9,000. (See Fig. 2.)

After stopping A.C.T.H. the eosinophils rose to a level varying between 600 and 1,000. This level appeared to be fairly stable, as on the second admission three weeks later it was 1,000. This is consistent with the eosinophilia seen in chronic asthmatics and suggests that this patient did normally have an increased level of the cells in his blood.

The significance of the urinary findings in the acute stage of the condition was not entirely clear in view of the previous history of prostatic trouble. However, older records showed that, while some white cells and a trace of

protein were present in the urine following the prostatectomy, no red cells were found. This and the manner in which the urinary abnormalities cleared up during the recovery period indicate that the iodism was accompanied by a moderately severe degree of an acute renal disturbance, part of a generalized allergic reaction.

Summary

A case of iododerma, with striking facial lesions, is described. The patient was a severe asthmatic treated, *inter alia*, with potassium iodide. Hypersensitivity to the iodine resulted in skin lesions, a marked eosinophilia, tachycardia, and proteinuria.

Recovery followed the withdrawal of iodine and the administration of A.C.T.H.

The mechanism of the intoxication is discussed with particular reference to the significance of the eosinophilia. A comment is made on the so-called "E.P. syndrome" and on the effect of A.C.T.H. in the recovery of the patient.

I would like to thank Dr. A. S. Turner for permission to publish this case, and Dr. R. A. Palmer, director of the metabolic unit, Vancouver General Hospital, for his stimulating advice and criticism.

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PRE-ERYTHROCYTIC STAGES OF HUMAN MALARIA: PLASMODIUM OVALE

A PRELIMINARY NOTE

BY

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Four species of malaria parasites are found in man—*Plasmodium vivax*, *P. falciparum*, *P. malariae*, and *P. ovale*. Pre-erythrocytic stages of *P. vivax* were demonstrated by Shortt *et al.* (1948) and of *P. falciparum* by Shortt *et al.* (1949) and Jeffery *et al.* (1952). Elucidation of this cycle in the remaining types presents two special difficulties: (1) the comparative rarity of the parasite, and (2) the poor infections usually obtainable in mosquitoes (an essential factor for success of an experiment of this kind is a large supply of heavily infected mosquitoes). Fortunately, *P. malariae*—the agent responsible for quartan malaria—has a replica in monkeys, *P. inui*, which in length of blood cycle (72 hours), length of infection in mosquitoes, and morphology closely resembles the human form; and the demonstration by Garnham (1951) of the tissue cycle of *P. inui* probably indicates the nature of the pre-erythrocytic stage of *P. malariae*. No such simian counterpart exists

in the case of *P. ovale*, and a human experiment was necessary if the problem were to be solved. A further practical difficulty to-day is the scarcity of cases of general paralysis in need of malaria therapy; practically none were available for this experiment, and, except for a short break when the infection was kept at Horton Mental Hospital, the strain had to be maintained amongst ourselves. The strain was obtained from Dr. A. R. D. Adams, who had originally isolated it from a patient from Liberia and had passed it through two patients by blood transfer before sending it to us.

The Experiment

Repeated attempts to infect mosquitoes (*Anopheles maculipennis atroparvus*) were made, but results were poor until the last trial (on J.W.), when 84% of a batch of approximately 750 became infective, with concentrations of sporozoites in the salivary glands varying from heavy to very light. These mosquitoes were allowed to feed on one of us (W.C.) on December 18, 19, and 22, 1953; many were made to bite more than once on each day by the process of interrupted feeding. Nine days after the first feed Mr. H. R. I. Wolfe excised a wedge-shaped piece of liver (about 1½ inches at the base) from the patient's left lobe.

Sections were prepared, and revealed the presence of pre-erythrocytic schizonts of *P. ovale*. A few hours after the operation the blood of the patient became flooded with ring forms of the parasite. The tissue forms were in two stages, nearly mature and completely mature schizonts. Their morphology more resembles that of the quartan parasite than of *P. vivax*, but further study of material is necessary before a definite conclusion about the affinities of this parasite can be reached.

Acknowledgments.—We are indebted to Dr. A. R. D. Adams for providing the strain and to Sir Gordon Covell and Mr. P. G. Shute for help in maintaining it. We are very particularly appreciative of the generous help of workers in Dr. Martin D. Young's laboratory in Georgia, U.S.A.—and particularly Dr. G. M. Jeffery—for taking the strain and passing it through numerous patients and mosquitoes, for the purpose of supplying us with an infective batch of mosquitoes if our own experiments had failed. We gladly acknowledge also the invaluable assistance rendered by the surgeon, Mr. H. R. I. Wolfe, Mr. R. Molloy, anaesthetist, and Professor A. W. Woodruff, Dr. S. Bell, and other members of the staff of the Hospital for Tropical Diseases, where we were looked after with kindness and efficiency.

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The Invalid Children's Aid Association's John Horniman Home at Worthing, Sussex, will admit from next April children (girls 7-16, boys 7-14) who need holidays, or care in family crises, but are so severely handicapped that they cannot be received in ordinary convalescent homes. It is hoped to provide for such cases as those with spina bifida, poliomyelitis, congenital deformities, haemophilia, muscular dystrophy, cerebral palsy (I.Q. not below 65), fragilitas ossium, and heart disease (congenital or rheumatic if quiescent). Children suffering from mental defect, epilepsy, blindness, or pulmonary tuberculosis cannot be received. The daily programme will be designed to provide the children with as many interests as possible, and will include handicrafts, painting, modelling, and probably a Guide company and Scout troop. Physiotherapy will be available. Holidays may be arranged ordinarily up to eight weeks. Accommodation will also be available for one or two nights for mothers whose presence may help a child to settle happily. Inquiries should be directed to the general secretary of the association, Miss Rattenbury, 4, Palace Gate, London, W.8.

Medical Memoranda

Thiopentone Injection into an Aberrant Artery

The following case is reported because of its unusual character and as a warning to anaesthetists to be ever alert against the possibility of inadvertent intra-arterial injection.

CASE REPORT

The patient, a woman aged 35, was admitted for dilatation and curettage. A venipuncture was made into what appeared to be a vein in the middle of the proximal part of the ventral aspect of the right forearm (at the point marked X in Fig. 1). About 2 ml. of 5% sodium thio-



FIG. 1.—Photograph of the patient's forearm. The black line shows the course of the aberrant vessel.

pentone had been injected when the patient complained of burning pain passing down the arm to the hand. Injection was stopped and the "vein" palpated; it was found that, proximal and distal to the point of injection, along the line of the "vein," pulsation could be felt. The needle was kept *in situ* and 5 ml. of 2% procaine slowly injected through it. On removal of the needle after injecting the procaine, blood issued from the puncture in little intermittent spurts. The pulse in the punctured artery was observed for some minutes; it remained unaltered. Anaesthesia was restarted and the operation carried out uneventfully. The patient was kept under careful observation for a few days before discharge; the colour, temperature, and pulses in the right arm remained unaltered.

An angiogram was taken two days later (Fig. 2). It showed the aberrant vessel arising at the bifurcation of



FIG. 2.—Angiogram of right forearm

the brachial artery and pursuing its course through the forearm to the ulnar border of the wrist. It will also be seen that the brachial artery bifurcates above the level of the elbow joint.

COMMENT

The vessel injected in this case was almost certainly an aberrant ulnar artery. Gray (1935a) states that when the ulnar artery arises above the elbow "it is usually superficial to the flexor muscles in the forearm, lying commonly beneath the fascia, more rarely between the fascia and the skin." In the present case the vessel was certainly subcutaneous. Macintosh and Heyworth (1943) report two cases of intra-arterial injection of thiopentone, in one of which the injection was made into an aberrant ulnar artery.

They also quote a further case in which thiopentone was injected into an aberrant ulnar artery (Van der Post, 1942).

Other arteries in the arm may occasionally be mistaken for veins. Thus, according to Gray (1935b), the radial artery occasionally takes a superficial course through the forearm. Again, Hoyer (1944) states that sometimes "the brachial artery takes an abnormally superficial course through the antecubital fossa."

It is recommended that, in order to avoid puncturing a superficially placed artery in mistake for a vein, the vessel to be injected should always be palpated *before* the tourniquet is applied to the limb.

I am grateful to the staff of Hope Hospital, Salford, for their co-operation.

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Presternal Oedema in Mumps

The occurrence of swelling over the manubrium sterni in cases of mumps does not appear to be well known in this country, and references to it in the literature are scanty. Radin (1918) writes: "There are a few cases in which mumps expresses itself by a general swelling of neck and chest, like Hodgkin's disease, a doughy gelatinous mass. . . . There is no tenderness. The tissues are soft and elastic and are easily agitated. . . . Rarer symptoms . . . were . . . dysphonia." He presents evidence of thymus enlargement in one case with presteral oedema. Barker (1943) reported three such cases from an outbreak involving 438 persons. Two of these three had dysphagia, and in one the epiglottitis and the right wall of the hypopharynx were seen to be swollen. Rappaport (1943) described two cases, both boys and both with mumps of normal severity. In an outbreak of mumps involving 502 patients at Fort Benning, Georgia (Gellis and Peters, 1944), 30 cases developed presteral oedema, two of them with dysphagia also. Twenty-five had one or both submaxillary glands swollen at the time the presteral swelling became evident, whereas the other five had parotid mumps only.

Among 263 cases of mumps encountered in a semi-rural area of Gloucestershire presteral oedema was seen five times, twice in males aged 4 and 8, and three times in females aged 4, 7, and 41. The circumstances of the study make it likely that the true incidence is far higher than these figures suggest, and that presteral oedema is as common a feature as swelling of the gonads. In our cases the oedematous area varied in size, sometimes attaining 3 in. (7.5 cm.) in diameter. The skin covering it was of a normal colour, and in at least one case pitting definitely occurred. Gellis and Peters reported that the skin became a dull red over the swelling in 3 of the 30 cases. The degree of presteral swelling was unrelated to the severity of the glandular involvement.

In describing his first case Barker mentioned that the oedema seemed to be more gelatinous than ordinary oedema and did not pit well on pressure. Gellis and Peters state that in all their cases the oedematous tissues pitted easily, and they demonstrated the fact by lateral soft-tissue x-ray films. Probably the swelling is due to obstruction of the lymphatic drainage, but it is a little difficult to see how this is brought about mechanically in those cases in which the parotids only are involved.

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Reviews

THE KINSEY REPORT

Sexual Behavior in the Human Female. By Alfred C. Kinsey, Wardell B. Pomeroy, Clyde E. Martin, and Paul H. Gebhard. (Pp. 842; 115 figures. 50s.) Philadelphia and London: W. B. Saunders Company. 1953.

The advertisement columns of the *Journal* have described this as "the most discussed and controversial book of the year." It has already received important notice by the more responsible press in this country, as well as lurid comment by those papers which enjoy a reputation for the unwholesome exploitation of sex and crime. It has not escaped the attentions of music-hall comedians—even those employed by the B.B.C. Indeed, the name of Kinsey is as well known to adolescent boys (and possibly girls as well) as was that of Freud in the days when their parents and grandparents were young.

This kind of introduction prejudices the reader's approach to the book; and a detached appraisal is made even more difficult because sex is so strong and basic an instinct that it cannot be viewed without an emotional bias governed by the personal experience and upbringing, and, in the case of the doctor, by the disclosures of his patients. This is well illustrated by the report itself. It sets out to be an impartial scientific statement of facts, but the authors cannot resist commenting on moral implications. They suggest, for example, that if premarital coitus were not taboo then homosexual practices might be prevented in large measure. The fact that 2,094 of their unmarried women who admitted coitus had produced 476 pregnancies is dismissed by pointing out that this means only one pregnancy in 1,000 sexual acts, and that methods of contraception are improving and becoming more widely known. Forty-four cases of venereal disease amongst these women is counted of little consequence because the treatment of these conditions is becoming more efficient. Again, figures in the report show that those men and women who have sinned according to the moral or legal codes of the community are less likely to condemn similar transgressions by others and are more likely to transgress again. Those who are sexually promiscuous before marriage are more likely to be unfaithful after marriage. fore marriage should be emphasized that the approach

Nevertheless it should be emphasized that the approach is basically scientific and the authors have set out to supply facts to replace impressions. The report is a companion to one on *Sexual Behaviour in the Human Male*, which was also written by Dr. Kinsey and his associates of the Institute of Sex Research at Indiana University and published in 1948, and the authors have wisely included summaries of their previous findings for purposes of comparison. The book is divided into three main sections. The first provides a general historical background and describes the methods of sampling and statistical analysis used in the inquiry. The last is concerned with the anatomy, physiology, and psychology of sex and sexual responses in both male and female. Nervous and hormonal controls are discussed, and there are interesting observations on the effect of castration on sex drive. The detail given and the variety of the approaches can be judged by the fact that there are even reproductions of electroencephalographs taken during orgasm in the human being.

The middle section and the main body of the report consist of an analysis of confidential information given by 5,940 white women interviewed during 15 years up to January 1, 1950. During the same period 934 coloured women and 915 white women serving prison sentences were also questioned, but the findings among these selected groups were used only for the general information of the authors. If the 8,603 males questioned at the same time are included, the authors' views and findings can be taken generally to be based on a study of 16,392 human beings. To this may be added several other sources of information, including a large literature on both animals and man (the list of refer-

ences occupies 50 pages), not to mention complete records of all the wall inscriptions found in 353 men's and women's public lavatories.

The work involved must have been considerable, for each individual was asked about 300 questions, and the duration of interview averaged 1½ to 2 hours. The writers evidently took great trouble to establish the validity of their data, but they nevertheless recognize that it is not always easy to get the truth, even from volunteers who are guaranteed secrecy by a special code system of recording. It was found in fact that there were not too many discrepancies when men's and women's statements were compared, and, interestingly enough, that women are not more likely than men to distort the truth.

The aspects of sex which are covered are both numerous and diverse. They include homosexual as well as heterosexual experiences of all types and degrees in infancy and adolescence, before and after marriage, and after the menopause. Masturbation, "petting," sex dreams, premarital coitus, extramarital coitus, marital coitus, and animal contacts, all find a place. Incidence, frequency, and techniques are considered as a whole and in relation to age, parental occupation, decade of birth, environment, and religion. No one could complain of lack of detail, and the revelations may surprise many who did not know of or did not wish to admit the existence of certain sexual practices or their extent. Much of it is disturbing as judged by accepted standards unless the reader realizes that terminology can turn an innocent kiss or a harmless flirtation into something rather sinister. Moreover, the figures do not distinguish between lust and love, and the latter is in danger of being completely overlooked.

The ultimate assessment of the reliability of the facts presented and the extent to which they can be applied can be made only by statisticians qualified to judge the methods of sampling and analysis. The authors do not claim that their findings necessarily apply to any except certain communities in their own country. To obtain their material they haphazardly approached a variety of groups of people—the staff and employees of a factory, the members of a church, college and school classes and their staffs, the members of women's organizations, patients attending a certain clinic, etc. These were distributed throughout the States and covered all levels of society in both rural and urban districts. An attempt was made to persuade all in a chosen community to give evidence, but on an average only 75% of women agreed to participate in this soul-searching and passion-probing investigation. It is natural to wonder what motives prompted some to refuse and others to comply. They might be such as to cause considerable distortion of the record in either direction. Again, the distribution of the women investigated by age and by religion is clearly different from that which obtains among the population as a whole. These and other points raise serious doubts about the selection of material.

If the statistics are accepted as reliable for the communities investigated, what is their value? People whose work brings them in close contact with human nature are already aware that the sex impulse is strong, that not all men and women are virginal at the time of marriage or faithful afterwards, and that masturbation occurs almost universally among both sexes at some stage of development. Is it any advantage to have figures which show that 62% of all women masturbate at some time in life, and which indicate the technique and incidence according to age, occupation, religion, and marital status? What value is it to learn, without full knowledge of all the attendant circumstances, that nearly 50% of married women have had premarital coitus (half of them only with their fiancé), and that 90% of women have had petting or flirting experience of one sort or another? The authors argue that "There is an honesty in science which refuses to accept the idea that there are aspects of the material universe that are better not investigated, or better not known, or the knowledge of which should not be made available to the common man." They point out, moreover, that to criticize their presentation on

the ground that it may be misinterpreted or misused is as idle as to condemn atomic scientists for the reason that their discoveries have been turned into atomic bombs. Splitting the atom, however, is a precise impersonal exercise, the validity of which cannot be put in doubt. Is this true of the mathematical dissection of sex? Cold figures take little account of the all-important context and they can distort perspective.

Knowledge for the sake of knowledge is all very well, but the dissemination of a little knowledge and the advertisement of evil can create or aggravate a problem. Would there be any "teenage" problem in the U.S.A. if parents and social workers ceased to talk of it? Would there be so many cosh boys and adolescent delinquents in Britain if crime were not reported in newspapers and gangsterism flaunted in the cinema? Might not many girls whose moral fibre is only as strong as public opinion be influenced in their behaviour by accepting Dr. Kinsey's statements on how many of their sex defy accepted codes either before or after marriage? Morality, after all, is not absolute but relative to the behaviour, opinion, and, indeed, faith of any particular community at any given epoch. And the standards of one community may not suit those of another.

Whatever view is taken of this latest import from the U.S.A.—and, as pointed out above, views will inevitably differ widely and strongly—it would be a mistake to underestimate its importance. It is not only monumental; it carries the backing of a university and has been financially sponsored by a research committee whose members include men of the highest integrity and scientific renown. This report will inevitably serve as a reference book for all concerned with human relations, and will be quoted throughout the world for many years to come. Those who use it and quote from it have a duty to do so wisely.

T. N. A. JEFFCOATE.

PHONOCARDIOGRAPHY

Fonocardiografia Clinica. By A. Caniggia. (Pp. 290; 232 figures. 3,000 lire.) Turin: Edizioni Minerva, 1953.

This book is described as a practical manual for doctors and students. In Britain clinical phonocardiography has no very general use, and in Italy this is the first monograph to be published on the subject. One may at the outset compliment the author on the clarity and elegance of the illustrative tracings; they are indeed excellent. It will be noted that the large majority of the tracings reproduced in this volume are recorded by the logarithmic method. This procedure eliminates any vibrations of too weak periodicity and increases others in a measure which is directly proportional to the sensibility of the human ear. The linear or stethoscopic technique has been used when it was thought important to stress the value of this method or to bring forward evidence of some vibrations of low periodicity. The actual tracings seem to have been done mostly by an oscillographic system which registers the differences of potential by an optical method on a photographic film; perhaps in some cases pens have been used, but it is not clear which they are. The timing is done by means of the electrocardiogram; this is chosen because of the convenience with which such a record can be obtained. Owing to technical difficulties, the jugular and carotid pressure tracings are thought to be less reliable. The author gives various examples of artifacts. He fully discusses the different sounds of the heart, and their modifications are beautifully illustrated. The effect of arrhythmias on the sounds is made very clear. There is an interesting account of gallop rhythm. As usual, in this thorny matter nomenclature introduces certain difficulties. The rest of the book is devoted to the murmurs, and very well illustrated they are. The value of this book does not rest solely on the illustrations; the text is also good. In fact we might say it is really a treatise on auscultation illustrated by phonocardiograms. The book can certainly be recommended, and the illustrations are suitable for teaching students.

TERENCE EAST.

RENAL DISEASE

Mechanisms of Urologic Disease. By Professor David M. Davis, M.D. (Pp. 156. £1 2s. 6d.) Philadelphia and London: W. B. Saunders Company, 1953.

The title of this book suggested an authoritative work on a section of the physiology of the urinary tract which has received less attention than it deserves—the mechanics and hydrostatics of the organs of the urinary system. But the author has preferred to use it to denote the way in which the whole urinary tract is affected when one of the common pathological changes involves one or more of the organs of this system. Thus the first chapter is on obstruction as it affects various organs. This is followed by chapters in a similar manner on infection, stone formation, neoplasms, congenital abnormalities, trauma, and neurogenic changes. In treating his subject on these lines the author briefly describes nearly all the commoner urological diseases and discusses the most recent treatments. But the brief way in which even the most important diseases are dismissed makes it difficult to understand for whom the book was written. The author claims that it was written for beginners and physicians who are not urological specialists, but it is unlikely to help the student pass his examinations, while the physician is unlikely to learn much he does not already know. Nevertheless its brevity allows it to be read rapidly, and the treatments described are the latest and most widely accepted. The chapter on history taking and physical examination is excellent, as is that on the technique of catheterization. This book may appeal to readers who want to refresh rapidly their knowledge of urology from a somewhat novel approach.

J. E. SEMPLER.

CHILD PSYCHOTHERAPY

Practical Child Psychotherapy: A Guide for the General Practitioner. By Curt Boenheim, M.D. Second edition (Pp. 184. 15s.) London and New York: Staples Press, 1953.

Psychotherapy is given an unusually wide connotation in this book, which is written as a guide to the general practitioner. Children provide the most plastic material the doctor encounters, and so all re-educative methods, such as dieting, exercises, environmental changes, and parental instruction, must find a place in child psychotherapy. An exclusively psychological approach, without needed somatic treatment, is bound to fail. Dr. Boenheim holds that the general practitioner should, and indeed must, himself treat the majority of the children who require psychotherapy. Hence the aim of the book is to show the significant part played by emotion in common complaints such as loss of appetite, vomiting, enuresis, stammering, and cardiac neurosis—to mention a few of the topics discussed. Treatment by a specialist or reference to a child guidance clinic will be desirable from time to time. It is not clear where the "minor psychotherapy" conducted by the family doctor ends and that of the specialist begins.

The classification adopted is based on symptoms, and this admittedly is unsystematic. But, it is argued, when symptoms are related to the personality of the child and to environmental influences the method is practical and can give considerable enlightenment on the problem of the sick, peevish, and difficult child. Whereas relief of the symptom can often be considered successful treatment, Boenheim insists that child psychotherapy—presumably by the specialist—should be based on a clear differential diagnosis and distinct indications. There is, on the whole, too much discussion of conflicting opinions on the psychotherapy of infants and children. The family doctor will be puzzled by these, and he cannot be expected to assess their relative merits. The sections on alimentary disorders, enuresis, and stammering deserve special attention.

E. A. BENNET.

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ERYTHROMYCIN

Erythromycin ("ilotycin," Lilly; "erythrocin," Abbott), which has hitherto been available in this country only in very limited quantities to hospitals in the National Health Service, will next week be freely obtainable on prescription. A statement issued by the Ministry of Health is published elsewhere in this issue (p. 270). It is more than usually important for the profession to decide what use it should make of this antibiotic. What the consequences of this decision will be depends on one entirely unknown factor, the extent of the natural resources which have yet to be tapped for further antibiotic drugs. If erythromycin is but one of a series of discoveries which is to continue—not indefinitely, for that is inconceivable, but at least for a comfortable period of years—then one can afford to use it freely, confident that when it begins to fail another will take its place. If, on the other hand, it proved that this series had come to an end, we should be well advised to husband our existing resources and to see that erythromycin retained its present inestimable value as long as possible by selective and careful use. It has already been shown¹ that its extensive use rapidly breeds a bacterial population resistant to its action.

Erythromycin has a similar "spectrum" to that of penicillin, Gram-positive organisms predominating among those sensitive to it, although these also include gonococci and other neisserias, *Haemophilus* spp. and rickettsias. There is no doubt of its efficacy in acute infections due to haemolytic streptococci or to pneumococci; thus the average acute sore throat or pneumonia will respond well to it. On the other hand, these species are also invariably sensitive to penicillin and to the broad spectrum antibiotics. It is particularly active, much

more so than penicillin, against *C. diphtheriae*, and should certainly be given an extended trial in diphtheria and even in the less promising task of eliminating the diphtheria carrier state. Without question its greatest usefulness is in the treatment of staphylococcal infections resistant to other antibiotics. That these are now often resistant to penicillin is well known, and we are beginning to be familiar in this country with their resistance also to aureomycin and terramycin, although this condition is so far much less frequent than in the United States, where 36% of strains were recently found to be resistant to these antibiotics at the Mayo Clinic² and 61% in Seattle.³ Such findings refer to hospitals where cross-infection is largely responsible for increasing resistance, but it is in hospital that serious staphylococcal infections often arise, and a drug capable of dealing with them may be necessary in order to save life.

Advantages of erythromycin are ease of administration, which is usually oral, although the intravenous route can be used if necessary, and freedom from toxic effects, other than gastric disturbance from large doses. Although some of the bowel flora, including clostridia, are suppressed, coliform bacilli are insensitive and hence unaffected, and the enteritis sometimes caused by aureomycin and terramycin has not been seen. One minor disadvantage is that according to most authors^{4,5} only low concentrations are attained in the cerebrospinal fluid, and a failure in the treatment of pneumococcal meningitis with subsequent rescue by penicillin has recently been recorded.⁶

The outstanding weakness of erythromycin is the ease with which bacterial resistance to it can be acquired, a property which is illustrated in Dr. D. Hobson's study of the drug published at page 236 of this issue. This change occurs more rapidly than with any other antibiotic except streptomycin, and has been shown to be the cause of failure in the treatment of infections which do not respond readily to treatment, particularly bacterial endocarditis. In the experience of Haight and Finland⁷ staphylococci isolated from the blood of two unsuccessfully treated cases of acute endocarditis had increased in resistance 32- and 250-fold. The results of treating subacute bacterial endocarditis have also been in general unfavourable, although there is some suggestion that erythromycin may be indicated in combination with streptomycin or bacitracin for infections resistant to penicillin.

How should a drug with these properties be regarded in the present situation of antibiotic therapy? Its novelty and efficacy in a wide range of conditions will in the ordinary course of events

¹ See report in the *British Medical Journal*, 1953, 2, 1043.

² Needham, G. M., and Nichols, D. R., *J. Lab. clin. Med.*, 1953, 41, 150.

³ Kirby, W. M. M., and Aher, J. J., *Antibiot. and Chemother.*, 1953, 3, 831.

⁴ Haight, T. H., and Finland, M., *Proc. Soc. exp. Biol. (N.Y.)*, 1952, 81, 175.

⁵ Smith, J. W., Dyke, R. W., and Griffith, R. S., *J. Amer. med. Ass.*, 1953, 181, 805.

⁶ Grigaby, M. E., Johnson, J. B., and Simmons, G. W., *Antibiot. and Chemother.*, 1953, 3, 1029.

⁷ *Proc. Soc. exp. Biol. (N.Y.)*, 1952, 81, 183.

⁸ Martin, W. J., Nichols, D. R., and Geraci, J. E., *Proc. Mayo Clin.*, 1953, 28, 609.

VARIATION IN HUMAN MILK

Infant feeding is often a source of worry to the family doctor, and, although feeding troubles are more common in artificially fed infants, everyone with experience of general practice knows that breast-feeding is by no means always free of them. Yet it is considered to be such a natural process, and the product so constant and uniformly adequate and satisfying, that the difficulties and inconstancies associated with it have perhaps received insufficient attention. Why do some mothers with apparently well-developed breasts and an abundant milk supply fail to satisfy their infants? Why do others feed one baby successfully and fail with the next or a subsequent one? What is the particular value of colostrum?

Colostrum has long been recognized as of different composition from mature milk, and great interest has been aroused by the possibility that the infant may absorb immune bodies in it, but its composition and day-to-day variation have not been much investigated. In general, mature milk has been accepted as a fairly constant product containing about 2% of protein, 6-7% of lactose, and 3-4% of fat. That it varies in volume is appreciated, as are the facts that the first feed in the morning is the biggest of the day and that worry or exercise may diminish the flow, but variations in the constituents of the milk at individual feeds and from day to day have not been considered important. Test weighing has generally been the method used in practice to determine the efficiency of breast-feeding, and it is often said that if the infant receives 2½ oz. per pound body weight per day (165 ml. per kg.) he is getting sufficient—without thought of the composition of the milk. The generalization is often made, too, that if an infant is not thriving on breast milk he is unlikely to do better on an artificial feed. There has rightly been much propaganda for breast-feeding, for breast-fed infants are better specimens, withstanding infections better, and, when they do get infections, recovering more quickly. It is difficult to reproduce the intestinal flora found in breast-milk stools with any modification of cow's milk, and this flora is of importance in vitamin synthesis and perhaps also in the production of a growth factor. The end products of protein and fat digestion of cow's milk are different from those of human milk, and the digestive processes are understandably not as complete. Furthermore, any organisms found in normal breast milk are harmless, but great care has to be exercised in the sterilization of cow's milk to ensure constant freedom from harmful bacteria. But it is well to

pause from time to time and examine our basic reasoning for this propaganda for natural feeding. Difficulties in breast-feeding do occur, and not all breast-fed infants are satisfactory in their progress. The reasons for this should be considered.

In a timely series of papers published in this and last week's issues of the *Journal* Dr. F. E. Hytten has drawn attention to the many variations in human breasts and their secretions. His carefully controlled experiments show that in any investigation it is necessary to collect the complete 24-hours milk output, and the mechanism of removing the milk is of great importance if errors are to be avoided. It is not always possible to empty the breasts completely by manual expression, but the use of an electric breast pump gives the maximum yield without disturbing the normal processes of secretion and production. With regard to variations in fat, lactose, and protein during any individual feed, Dr. Hytten confirmed that the fat increased as the feed proceeded and that the sugar decreased. By an ingenious mechanical device he showed that the most likely explanation for the progressive rise in fat was simply the mechanical adsorption of the fat globules on to the secretory and duct surfaces; the change in sugar and protein was probably secondary to the change in fat concentration, though the variation in the protein depended also on the maturity of the milk. In addition to these individual feed variations there is also a diurnal variation, both in quantity and particularly in fat content. Hytten's findings suggest that the volume changes are due not only to the interval between feeds but also to the storage capacity of the breast. He did not find any evidence that there was a constant secretion rate of milk, or that individual variations were due to any genetic influence. Another interesting finding was that milk produced in large volume (and therefore the most likely to find its way to a milk bank) generally had a high carbohydrate and low protein content. Hytten estimated that some 20% of women will have less than 3 g. of fat per 100 ml. in their milk and that it will have a caloric value of less than 570 per litre. It will therefore be incapable of adequately nourishing an infant after he has attained a weight of 11 lb. (5 kg.). Whether such poor milk can be enriched by changes in the mother's diet remains to be seen.

What practical conclusions can be drawn from Hytten's work? Human milk is not a static or constant product; it varies from day to day and from feed to feed perhaps—both in volume and composition, and if an infant is not gaining satisfactorily the explanation should be sought promptly.

First, the possibility of infection or of constitutional disturbance should be considered. Either of these is, in general, more likely to be responsible than faulty or insufficient maternal milk. But if no such evidence is found additions to the diet in the form of complementary feeds should be given. In view of the marked variations in human milk, which are without any ill effect on the infant's digestive tract, it seems illogical to insist on the need for a completely standard composition for artificial feeds; they might well vary as much as human milk without any detriment. So long as the milk offered is of adequate caloric value, clean, and digestible, and contains a sufficient amount of protein and carbohydrate and is supported by vitamin supplements, strict insistence on the exact composition of the formula is not of first importance. Few general practitioners will have the facilities available for examination of the mother's milk and may well be in doubt both about the total volume secreted and about the infant's caloric intake over 24 hours. Common sense must prevail in infant feeding, as in every other branch of medicine, and the decision to wean an infant, or to give complementary feeds, must be made at the doctor's discretion, with the infant's general condition and progress in mind above all else.

TEETHING POWDERS

Purging the newborn has been a traditional custom for many centuries, inspired perhaps by a desire to rid the infant of inborn evil spirits. So long ago as 1748 Cadogan objected to this practice, complaining that nurses "often do much harm where they intend to do good, by fancying Nature has left a great deal to their Skill and Contrivance." But in the nineteenth century and up to the present day various purgative mixtures have found a ready sale to the public as "teething powders," and countless millions have been forced down the throats of helpless infants. Indeed, mothers often give the powders to children of all ages as a laxative regardless of the claim that they assist teething. Others have confined themselves to giving one when the child is fretful "to soothe it" or "to cool the blood," but many give a regular dose as a kind of charm to ward off unknown hazards ahead. It has even been known for a mother to dip her finger in the powder and rub her baby's gums with it. Grandmothers impress upon their daughters the value of such remedies just as their mothers had done before them, and the popularity of these products has been maintained, against all medical progress, for over a century.

In recent years opinion has been growing among paediatricians not only that such powders are ineffective but that they have been dangerous also. The taint but that they have been incriminated as an important

tant aetiological factor in pink disease and also in some cases of nephrosis.¹ Dr. J. G. Dathan shows in a paper at page 247 of this issue of the *Journal* how dangerous they may be. It is not certain whether other factors are involved in the causation of pink disease (many have been postulated), but there will be a good opportunity for investigating the residual cases which occur after the present supplies of powders containing calomel have disappeared from the chemists' shops—provided all concerned follow the lead already given by one manufacturer in marketing these powders without calomel in future. If they fail in what is now their obvious duty, Parliament will no doubt intervene immediately, and it is to be hoped that there will be no need for the legal prohibition sought by Mr. S. T. Swinger, M.P., on January 21.² It would be as well also for doctors to refrain from prescribing grey powders for such conditions as jaundice, skin rashes, or gastro-enteritis, for which calomel has been a time-honoured remedy.

In paediatrics the aim should be to interfere as little as possible with the course of nature where normal processes are concerned. Non-interference is now recommended for many aspects of the care and management of the newborn; thus, the premature baby is left undisturbed for several days after delivery, the ritual of frequent bathing and vigorous cleaning of the mouth and eyes has been curtailed, restrictions on the time and quantity of feeds have been relaxed, unnecessary operations for tongue-tie and "phimosis" are in disrepute, and complicated orthopaedic measures for straightening the natural curves of the lower limbs are happily being abandoned so that spontaneous recovery (if indeed that is the right word) may take place unaided. A worthwhile task for family doctors is to do all they can to discourage mothers from the routine administration of unnecessary medicaments to their offspring. At present about 75% give gripe water and teething powders from the second month of life, incidentally thus initiating from the outset the bottle-of-medicine habit which is no credit to the N.H.S. Gallons of gripe water are given to young babies for the wind, but often unsatisfied hunger is the cause of the crying and more milk the appropriate remedy. Gripe water usually contains sodium bicarbonate, which gives off carbon dioxide when it reacts with the acid gastric contents; burping results, and its efficacy is plain for all to see. Teething powders seem likely to contain phenolphthalein in the future, so that their purgative action will be maintained, and mothers will presumably still be calmed by the fact that something is being done. Nevertheless teeth will continue to erupt at their own rate with or without causing symptoms and completely unaffected by any form of therapy.

UTERO-TUBAL INSUFFLATION

The procedure of utero-tubal insufflation will always be associated with the name of Rubin, who introduced it into gynaecological practice over 30 years ago and recently devoted a book to his long experience with it.¹ In this issue of the *Journal* (p. 239) Dr. Albert Sharman

¹ *British Medical Journal*, 1953, 2, 1317.
² See Medical Notes in Parliament, p. 281.

retails some of the lessons he has learnt from performing over 4,000 tests. He follows Rubin in advising the use of carbon dioxide as the test gas because no fatal case of air embolism or of pelvic infection has been reported from its use, whereas fatalities from these complications have occurred after the use of air and oxygen. Carbon dioxide is unquestionably the safest gas, but some gynaecologists remain satisfied with the careful use of air, for it requires only the simplest apparatus, an advantage of some importance if the test is to be performed in consulting-room or out-patient department. If the Bonney insufflator with a bulb without a valve is used, and if the capacity of the bulb, about 45 ml., is not exceeded, the risk of fatal embolism is almost obviated. Whatever gas is used, insufflation very rarely introduces infection into the genital tract; any reaction is almost invariably a recrudescence of an old infection, and, if severe, should raise the suspicion that genital tuberculosis is present. Tubal patency tests should be avoided if there is any acute or chronic vaginal discharge, if menstruation is imminent, in progress, or overdue, or if a previous test has caused a reaction; but, if a history of old pelvic infection is regarded as a contraindication, the test will be omitted when the information it may give is most needed.

It is generally realized that tubal patency tests can give false or misleading results, and White¹ has detailed some of the reasons, but the extent of their fallibility is often not appreciated. Dr. Sharman found that, of 102 consecutive women with negative tests, a further testing a few days later showed normal patency in 70. In a paper read at the 1953 Annual Conference of the Society for the Study of Fertility, Jeffcoate reported that 37% of negative insufflation tests were subsequently proved false by salpingography, laparotomy, or pregnancy. The proved false positive rate was much lower, about 3%. Dr. Sharman recommends that salpingography should be performed in all cases diagnosed as non-patent by insufflation. This complementary procedure more than halves the rate of proved error but does not obviate it; and indeed Jeffcoate found that even when both tests were negative the margin of error was 15%.

It might be argued therefore that, if only in the interests of accuracy, salpingography should replace insufflation as a diagnostic measure, but it is unlikely to do so for three reasons. First, insufflation is simpler, cheaper, safer, and more easily combined with other procedures such as endometrial biopsy. Secondly, many gynaecologists have implicit faith in kymography as an adjunct to insufflation. Dr. Sharman, like Rubin,² believes that the kymograph enables the observer to distinguish not only between patency and non-patency but also between tubes which are normally patent and those which are the site of spasm, stenosis, or peritubal adhesions. This belief presupposes that the oscillations of the recording needle are produced by tubal contractions and that these accurately reflect tubal health. These two assumptions may not be accepted unreservedly, especially by those who have performed insufflation with

kymography when the tubes are under direct vision at laparotomy. The third reason for retaining insufflation is that, whether the test proves positive or negative, if the patient does not become pregnant within six or twelve months thereafter, a different test, salpingography, can then be performed. If one tubal patency test can have a therapeutic value, how much more valuable are two, suitably spaced, for in the treatment of infertility time is a powerful ally for success on the side of the gynaecologist.⁴

GROUP PRACTICE ENCOURAGED

One of the recommendations of the Working Party on the Distribution of Remuneration among General Practitioners⁵ was that a provisional sum of £100,000 should be set aside annually to be used to encourage the formation of group partnership practices. Now, after consultation with the General Medical Services Committee of the Association, the Minister has decided that this money should be used to provide interest-free loans to those "general practitioners taking part in general medical service who propose to form a group practice or who, having formed a group, propose to provide new practice premises or substantially to improve the existing premises" (see *Supplement*, p. 27).

The last reports of the Medical Practices Committees of England and Wales⁶ and of Scotland⁷ show that the Working Party's recommendations about the loading of capitation fees and the fact that partnerships can gain the maximum advantage from this loading by arranging to be paid on notional lists have already done much towards increasing the number of partnerships. The Minister's decision to assist capital expenditure on premises for group practice purposes should help further to increase this trend by removing what has been, in some cases at all events, an obstacle to expansion.

Inquiries made by the B.M.A.'s General Practice Review Committee⁸ showed that enthusiasm for health centres was lukewarm and that fewer G.P.s were in favour of them than were against them. The Committee thought it preferable that any changes in the form of general practice should develop spontaneously from within practice itself rather than from the imposition from outside of some organization such as health centres. Certainly general practitioners have been showing an increasing interest of recent years in the advantages attached to group practice, and the Minister's proposals will give practical encouragement in a way which should be acceptable.

The annual sum of £100,000 for loans will be swollen in due course by repayments until eventually much more capital will be available. The favourable terms are likely to stimulate inquiry from many doctors into the possibilities of group practice, and at first the Group Practices Loans Committee—to be composed equally of G.P.s and Ministry officials—may well find their resources unequal to the demand on them.

CLINICAL PATHOLOGY IN GENERAL PRACTICE THE LABORATORY DIAGNOSIS OF PULMONARY TUBERCULOSIS

BY

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In any case of pulmonary tuberculosis the laboratory has two important roles to fulfil. First, it plays an essential part in the diagnosis; for until *Mycobacterium tuberculosis* has been demonstrated in exudate or tissues of a patient the diagnosis remains incomplete. Secondly, the laboratory has an important function to fulfil in the control of treatment. This paper is concerned only with the diagnosis of pulmonary tuberculosis. Nevertheless, at the stage of diagnosis there are certain steps which should be taken if the laboratory is to exercise its function in the control of treatment. These steps are mentioned in the course of the paper. The essential step in diagnosis is the demonstration of tubercle bacilli, and consideration is given first to the various tests that may be employed for this purpose. Later, their application to specific excretions or tissues is discussed.

Microscopical Detection of Acid-fast Bacilli

This is the most widely employed laboratory investigation in tuberculosis and has the great merit of speed. A report on the presence or absence of acid-fast bacilli in a given specimen is available in a few hours.

Unfortunately, there is no method of differentiating between *Myco. tuberculosis* and non-pathogenic acid-fast saprophytes under the microscope. *Mycobacteria* are, by definition, a group of bacteria which, when stained, resist decolorization with acid and alcohol. Since 1894, the Ziehl-Neelsen technique has been the accepted standard procedure all over the world. In this method the bacilli on the film are stained with carbol-fuchsin, decolorized with acid and alcohol, and counter-stained with methylene blue. The acid-fast bacilli thus appear under the microscope as red rods against a blue background, as viewed by reflected light. Recently a new technique has been developed whereby the acid-fast bacilli are stained by fluorescent dyes, decolorized in the normal way by acid and alcohol, and counter-stained. The stained bacilli, when irradiated by ultra-violet light, have the property of emitting visual light. This makes them appear larger and more easily seen under the microscope. While this new technique is a big advance from the laboratory point of view, it is essential to remember that it does not constitute a new development and that the property of acid-fastness is still the property which is recognized by both procedures.

Cultural Methods

Myco. tuberculosis is a slow-growing organism. Even when seeded on a culture medium favourable to its growth an inoculum containing viable tubercle bacilli may take from two to eight or more weeks to produce a recognizable colony. The length of time taken depends upon the number of viable bacilli in the inoculum, the smaller the number the longer the time. Obviously, if other bacteria are present in the material to be examined, these will overgrow the whole surface of the culture medium and will swamp the *Myco. tuberculosis*. It is therefore necessary to kill off the other bacteria in the specimen before inoculating it on to a culture medium. It is also desirable to concentrate as many as possible of the viable tubercle bacilli from the whole specimen into a small volume, for the larger the number of bacilli used the quicker the growth will become evident.

Fortunately, mycobacteria are far more resistant to the action of acids and alkalis than other bacteria, and the most satisfactory methods of concentration are based on this difference. It must be remembered that in a grossly contaminated specimen with much pus and secondary infection the amount of exposure to acid or alkali which is necessary to kill the secondary organisms in the specimen may also kill the majority of tubercle bacilli in that specimen. Therefore such specimens are apt to give false-negative results.

Animal Inoculation

Until the development of modern egg media, animal inoculation was a much more sensitive method of detecting *Myco. tuberculosis* than culture. From the large number of investigations which have been performed to compare the relative merits of the two methods, it is clear that cultures are now as sensitive as animal inoculation, and the high cost of the latter would prohibit a high proportion of the investigations now usefully performed by culture. In material in which contamination by acid-fast saprophytes is likely, as in specimens of urine, and in which typing of the strain is required, animal inoculation is still the method of choice. Indeed, the usefulness of animal inoculation is now very limited, and cultural methods on the more normally submitted material are every bit as accurate.

Pathological Material

These standard methods of investigation must now be considered in relation to the pathological material which is available for diagnosis in cases of pulmonary tuberculosis.

Sputum

The material most often examined in cases of suspected or proved pulmonary tuberculosis is undoubtedly sputum. The specimen should contain little saliva and be free from food particles. The early morning, before breakfast, is the best time to collect such a specimen and the patient should be provided with a clean, dry, wide-mouthed sterile container. If the disease has not previously been diagnosed the specimen should be examined by a direct film for microscopy, and whatever the result the specimen should be concentrated and cultured for *Myco. tuberculosis*. Unless the first specimen shows many acid-fast bacilli in the direct film, it should be followed by two further specimens, which will also be put up for culture if the diagnosis of pulmonary tuberculosis is regarded as likely on clinical grounds. If these three specimens prove negative on microscopy it will be necessary to repeat the test at frequent intervals until either a positive result is obtained or some diagnosis other than tuberculosis is established. In any event, the wisest course at this stage is to persist in cultures until a positive result is obtained, especially if there is any likelihood that chemotherapy will be instituted or any possibility that the patient has contracted the disease from a patient who has been treated with streptomycin.

Gastric Lavage

The stomach washings are useful material from which to cultivate *Myco. tuberculosis* in patients with pulmonary tuberculosis who fail to expectorate.

The specimen should be taken before breakfast and there should be no delay in submitting it to the laboratory. It must be remembered that the gastric juice is strongly acid and if the specimen is left unneutralized for more

¹ Rubin, I. C., *Utero-tubal Insufflation*. Mosby, St. Louis, 1947.
² White, M. M. J., *Obster. Gynaec. Brit. Emp.*, 1951, 58, 573.
³ Rubin, I. C., *Fertil. and Steril.*, 1952, 3, 179.
⁴ Bender, S., *British Medical Journal*, 1952, 2, 409.

⁵ *British Medical Journal Supplement*, 1952, 1, 283.
⁶ *Ibid.*, 1953, 1, 74.
⁷ *Ibid.*, 1954, 1, 9.
⁸ *Ibid.*, 1953, 2, 13.

than one hour it is probable that the tubercle bacilli will be killed. To the gastric washings 5 ml. of 10% trisodium-phosphate should be added to neutralize the acid. The presence of acid-fast bacilli in a smear made from the gastric contents is not conclusive evidence of the presence of *Myco. tuberculosis*. Many foodstuffs, notably butter, are often contaminated with saprophytic acid-fast bacilli. It is therefore essential to culture all specimens of gastric contents.

Laryngeal Swab

Gastric lavage is often difficult and usually impossible in general practice, and to meet this situation with patients who do not expectorate the technique of a laryngeal swab has been developed. A sterile swab, moistened with sterile water, is passed with the aid of a laryngeal mirror into the larynx. The patient then coughs, and any sputum in the upper part of the bronchial tree will adhere to the swab. This swab is treated with 10% sulphuric acid for five minutes, and then placed in 2% sodium hydroxide for a further five minutes. It is then inoculated on to Löwenstein-Jensen medium and incubated in the ordinary way. Nassau* obtained a positive swab from 44% of 273 sanatorium patients who did not expectorate, and Forbes and his colleagues† showed that the results of laryngeal swabs were as reliable as gastric lavage in out-patients.

Faeces

In children the faeces may be investigated for the presence of *Myco. tuberculosis* in cases of pulmonary tuberculosis in preference or in addition to the gastric lavage. This method is also sometimes used in adults, but here the presence of large numbers of tubercle bacilli are more likely to indicate tuberculosis of the intestinal tract than pulmonary tuberculosis.

Pleural Fluids

Simple non-turbid pleural effusions, although most commonly of tuberculous aetiology, often contain only few tubercle bacilli. The probability of demonstrating *Myco. tuberculosis* is increasingly likely the larger the volume of fluid used. As these fluids often contain fibrinogen, an anticoagulant should be added—for example, 1 ml. of 20% sodium citrate. If possible about 100 ml. of fluid should be examined microscopically. If no organisms or only acid-fast bacilli are seen, six slopes of Löwenstein-Jensen medium may be inoculated. If other organisms are seen the material is used first for culture of secondary organisms and then treated by Petroff's or the trisodium-phosphate techniques before cultivation for *Myco. tuberculosis*. A small volume of the fluid should be examined for cells, and in simple tuberculous effusion the lymphocytes will predominate.

Turbid and purulent fluids should be treated in the same way, and in these cases there will be greater probability of successful cultivation.

One of these procedures will result in a positive culture from a case of pulmonary tuberculosis. With the widespread use of chemotherapeutic agents in treating tuberculosis, it is inevitable that some cases of pulmonary tuberculosis will be found in which the organisms are resistant to one or other of the chemotherapeutic agents. It is therefore necessary that the first culture from a new case of pulmonary tuberculosis should be preserved and preferably have its sensitivity tested against streptomycin, P.A.S., and isoniazid, as, even if not immediately, chemotherapy is very likely to be used sooner or later in the course of the patient's treatment.

The definitive diagnosis of pulmonary tuberculosis depends upon the demonstration of *Myco. tuberculosis* in the tissues or excretions. Nevertheless, there are other ancillary tests which, while not actually diagnostic of pulmonary tuberculosis, are of great assistance in estimating its severity and the course of treatment. These tests may be divided into the serological tests and the haematological tests.

Ancillary Investigations

Middlebrook and Dubos‡ showed that sheep's erythrocytes suitably activated with an extract of the strain *Myco. tuberculosis* H37Rv were agglutinated by the blood serum of some cases of pulmonary tuberculosis. Various other workers have made investigations along these lines, each of them making minor modifications in the technique. Sohler, for instance, used purified tuberculin to sensitize the red cells and obtained good results with tuberculous sera but had a high percentage of false-positive results in normal controls. While this relatively recent development may eventually prove satisfactory, there is at present no serological diagnostic test of proved value available.

Haematology

The most constant alteration in the blood picture in all forms of pulmonary tuberculosis is a progressive hypochromic anaemia. This usually reacts well to adequate treatment.

There have been many investigations into the changes in the total and differential leucocyte counts which may be associated with pulmonary tuberculosis. The only fact which emerges with certainty is that there is no specific change in the leucocyte count of diagnostic value. On the other hand, the disease may be associated with either a leucopenia or a moderate leucocytosis. There have also been reports of a leukaemoid reaction in a few cases of tuberculosis. The monocyte count is often raised (over 10%), especially when fresh tuberculous tissue is being formed, while a raised lymphocyte count is often associated with healing tuberculous lesions.

Erythrocyte Sedimentation Rate

Although the erythrocyte sedimentation rate is not in any way specific for tuberculosis, it is nevertheless of great value. In all toxic conditions associated with tissue destruction the sedimentation rate is raised, and thus the test is no more specific than pyrexia or leucocytosis. The sedimentation rate is always raised in active tuberculosis and falls as healing takes place. Serial examinations are thus of great value in the control of patients suffering from pulmonary tuberculosis, and a spread of the disease may manifest itself by a rise in the sedimentation rate before there is any radiological or clinical evidence of it. The test is also often valuable in cases in which radiographs reveal a lesion which is of doubtful activity, and in these cases a raised sedimentation rate is strong evidence of activity.

Westergren's method is commonly employed in tuberculosis. In this method 0.4 ml. of 3.8% citrate solution is drawn into a syringe which is then introduced into a vein. Blood is withdrawn until there is 2 ml. of mixed blood and citrate in the syringe. The sedimentation tube, which has an internal diameter of 2.5 mm. and is calibrated in millimetres from 0 to 200, is then filled in the manner of an ordinary 1-ml. pipette. The column of blood is drawn up to the zero mark on the scale and the tube is placed to stand vertically in a rack. At the end of one hour the number of millimetres through which the erythrocytes have sedimented is recorded. The disadvantage of the method lies in the fact that it is impossible to correct for anaemia, but the ease of the technique more than compensates for this somewhat technical disadvantage. It has been found in practice that serial readings of the sedimentation rate by the Westergren method are of very great assistance in controlling individual cases, and it is therefore always desirable to take a reading as early as possible in every case of pulmonary tuberculosis.

Next article on Clinical Pathology.—"The Normal Blood Count," by Dr. George Discombe.

‡ J. exp. Med., 1948, 88, 521.

THE MONTREAL GENERAL HOSPITAL

BY

WILLIAM STORRAR, M.B.E., M.B., Ch.B.

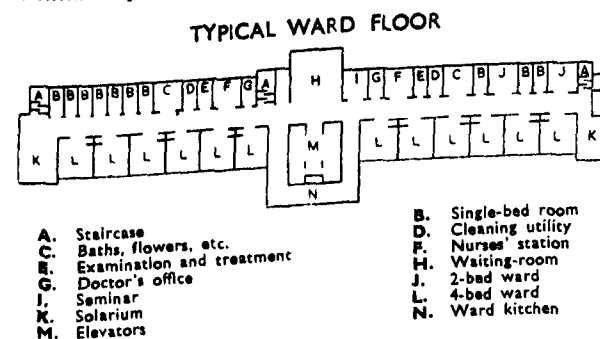
Medical Director, Montreal General Hospital

Great developments have taken place in Canada in the last decade, and with the large increase in population more hospital beds have become necessary. In the City of Montreal alone 3,000 hospital beds are being built at present to meet the demands of this rapidly expanding cosmopolitan city. The largest single hospital building project in Montreal, in fact in Canada, now being undertaken is the construction of the new buildings of the Montreal General Hospital.

The Montreal General Hospital, a teaching hospital of McGill University, was founded in 1821, and ranks as the oldest teaching hospital in Canada and one of the oldest on the North American continent. Founded by four Edinburgh graduates, it was built in the style of the Royal Infirmary of Edinburgh and throughout the years has maintained close ties with that city. In 1949 a survey of the hospital revealed that modernization of the present buildings would be impossible, and consequently it was decided to erect an entirely new hospital expanding from 640 beds to 750 beds. The hospital authorities were fortunate in securing an area of land of 360,000 sq. ft. (33,450 sq. metres) almost in the centre of the city and within easy reach of suburbs. On this site the new Mon-



FIG. 1.—Architect's drawing of the new buildings of the Montreal General Hospital.



trical General Hospital is being erected and one-half of it has now been completed. The cost of the hospital amounts to \$20m. (£7m. at the present rate of exchange). Two-thirds of this money has been obtained by public subscription, the remainder being provided by the Federal Government of Canada, the Government of the Province of Quebec, and the City of Montreal.

Internal Design

When completed the hospital will have 750 beds and 50 bassinets and a nurses' home to accommodate 250 nurses. The design of the hospital is unusual, as can be seen from the drawing, with an out-patient wing housing full out-patient services, a dental teaching school, and a floor devoted to a psychiatric department with some 20 in-patient beds and 15 beds which will be used for psychiatric patients who receive treatment during the day and go home at night. These same beds will also be used for psychiatric patients who are working during the day and have their treatment at night. The connecting wing will house all the ancillary and diagnostic services, kitchens and staff dining-rooms, and operating suites. The remaining wing is devoted entirely to in-patients, each floor providing accom-

modation for 64 patients each with two nursing units of 32. In order to make the maximum use of beds and have as flexible a plan as possible no ward will contain more than four beds; private patients will be accommodated in single rooms and numerous single and two-bed rooms have been provided on the public patient-floors. The nurses' home and interns' home are both connected with the main hospital by tunnel, every nurse having her own room and toilet facilities.

All the ten operating-room suites are air-conditioned, and provision has been

made for the installation of a cobalt bomb or million volt x-ray therapy machine. Oxygen will be piped to every bed. Automatic-pneumatic tubes will carry records, specimens, and drugs to thirty different outlets throughout the hospital, thus saving many man-working hours. It is hoped to install also a new "walkie-talkie" call system for interns, thus eliminating audible and visual call systems. Eight high-speed elevators are to be fitted, with provision for additional elevators should the need arise.

An amphitheatre to seat 230 people has been provided for. This is in addition to the numerous small lecture theatres available throughout the hospital for the teaching of undergraduates and postgraduate medical men. Every patient-floor has a waiting-room, lecture room, and sun lounges; all patient rooms are equipped with a nurses' call system allowing the patient to talk to the nurse direct from the bed to the nurses' station.

On the domestic side, there is an automatic ice-making machine on every patient-floor. A laundry is to be installed to meet the needs of the whole hospital, with linen chutes on every floor to carry the dirty laundry. All windows will be of the double-hung reversible type to allow easy cleaning. Heating will be by means of oil furnaces, and an independent generator will be installed in case of main electrical breakdowns. The basement will provide food storage space for a minimum of six months' supply of non-perishable foods at any time. All preparation of meat and vegetables will be carried out in the basement, thus allowing more freedom of movement in the central kitchen on the fourth floor, which also houses three large staff dining-rooms.

* Proc. roy. Soc. Med., 1941, 34, 397.
† Lancet, 1948, 2, 141.

It is thought the new Montreal General Hospital will be in operation by 1955. It will be the most modern teaching hospital on the North American Continent and its opening will be a great milestone in the history of medical and nursing teaching in Canada. It is hoped that many members of the British Medical Association when they visit Canada for the joint meeting with the Canadian Medical Association in 1955 will find time to visit this new hospital, which has such a strong tie with the Scottish and English medical schools.

ERYTHROMYCIN

Erythromycin in limited amounts has lately been made available by the Ministry of Health to hospitals in the National Health Service, and very shortly it will be freely available on prescription. The Ministry is therefore sending to all hospitals the following note by the Medical Research Council on its use.

Indications and Dangers

Erythromycin has a range of activity similar to that of penicillin and has been shown to be effective in acute infections due to haemolytic streptococci, pneumococci, and staphylococci. Organisms resistant to all other antibiotics are nevertheless sensitive to it; hence its greatest value is in treating staphylococcal infections not responsive to other drugs, the frequency of which, particularly in hospitals, is showing a disturbing increase. A peculiar form of this infection in which its action may be life-saving is the severe staphylococcal enteritis complicating therapy with the broad-spectrum antibiotics or with penicillin and streptomycin. Some other species, including members of the genera *Neisseria* and *Haemophilus* and *Rickettsia*, are also sensitive to it.

Erythromycin is itself a drug to which bacterial resistance can be acquired rather rapidly, and this may be a cause of treatment failure in infections difficult to eradicate, such as endocarditis. It has also to be remembered that bacteria rendered resistant in one patient may later cause infections in others which are insusceptible to the drug from the outset. It might be disastrous if a staphylococcal population were built up which was resistant to erythromycin as well as to earlier antibiotics. It is therefore most necessary that this drug should be prescribed with due regard to the risks of indiscriminate use. Penicillin should be preferred, on this ground—and, it may be added, that of economy—when it will serve equally well. Erythromycin should not be prescribed for most chronic conditions which respond poorly to it as compared with acute conditions—for trivial indications, or for those in which the bacterial cause is unknown.

ORDER OF ST. JOHN OF JERUSALEM

The London Gazette has announced the following promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem:

As Commanders (Brothers): Colonel F. A. Bearn, C.B.E., D.S.O., M.C., M.D., Major C. D. Donald, M.B., F.R.C.S., Mr. H. S. Taylor-Young, F.R.C.S., and Drs. D. J. Johnson, M.B.E., J. A. L. Roberts, J. B. McKay, W. Bain, N. J. L. Rollason, F. W. Hebblethwaite, T. F. Briggs, O.B.E., T.D., J. F. C. du Toit, and the Hon. W. Nicol. **As Officers (Brothers):** Surgeon Captain E. J. Mockler, M.B., Major G. Brown, M.B., Messrs. H. I. Mariner, F.R.C.S., E. A. Malkin, F.R.C.S., and St. J. M. C. Birt, F.R.C.S., and Drs. G. G. W. Hay, C. L. Worthington, A. E. Pinzger, A. T. G. Thomas, W. R. A. Line, J. W. Silversides, A. M. Boyne, W. M. Dinwoodie, M. C. Cooper, M.C., C. Homi, J. A. R. Lavoipierre, J. S. Binning, E. F. Baines, W. G. McAfee, H. A. Johnson, R. C. Webster, J. M. de Ville-es-Offrans, M.B.E., and R. E. Anderson. **As Officer (Sister):** Dr. Marian Maxwell-Roberts. **As Serving Brothers:** Mr. H. B. Walker, M.C., F.R.C.S., and Drs. A. B. Wallace, J. C. K. Chilcott, F. H. Cleveland, W. B. Boone, A. Burns, O.B.E., M.C., R. Cubitt, D. S.

Chowdhary, T. H. McLeod, J. F. D. Boyd, D. W. Hendry, V. F. Lyndall, J. A. H. Goldacre, A. Stewart, C. T. Newtham, J. E. Hilton, A. Hamerton, J. G. Wilson, A. S. Boyd, W. B. Wishart, L. N. Gollan, and J. V. Vaughan. **As Associate Serving Brothers:** Drs. J. B. Solomon and S. Adler. **As Serving Sisters:** Drs. Betty M. White and Ruth Hull. **As Associate Serving Sister:** Dr. Ray Schauder.

Reports of Societies

THE MANAGEMENT OF THE ALCOHOLIC IN GENERAL PRACTICE

A meeting of the Section of General Practice of the Royal Society of Medicine on January 20 was devoted to a discussion on the management of the alcoholic in general practice. Dr. A. TALBOT ROGERS was in the chair.

Dr. J. YERBURY DENT, Editor of the *Journal of Addiction*, gave an account of alcoholic patients whom he had successfully treated with apomorphine. He used apomorphine by mouth in the treatment of 75% of the addicts who came to him, and he knew of nothing so satisfactory in removing the compulsion. An overdose could not easily be given by mouth. For the first 24 hours the patient might still have a craving for alcohol; if so, he should remain in bed; on the following day the craving was likely to be much less or even gone, but the treatment should be continued for three or four days. A more drastic treatment, with intramuscular injections of apomorphine, usually lasted for a week or ten days, and after it the patients returned to work immediately. Some might relapse, but these could and often did treat themselves successfully by mouth.

Dr. Dent then gave an account of one man who, although a publican, had been treated and had remained a total abstainer for eleven years. The publican then proposed to marry and his intended bride asked him to drink to their future happiness. He told her of his earlier craving and his fear of relapse, but she said, "Then I am not going to marry a coward." He drank one glass of sherry with her, and the next day he drank nearly a bottle of whisky, whereupon she threw him over, saying: "I am not going to marry a drunkard." The man had a second course of treatment and was now once more a total abstainer and a bachelor.

Although there was an enormous literature on the subject of alcoholic addiction the general practitioner did little for his alcoholic patients. Practically nothing was to be found in the textbooks and little was done for the thousands of addicts and their families. The old idea that all troublesome drunkards should be dealt with by the police still obtained. It was not yet realized that addiction was a disease, however much the act of drunkenness might be considered a moral lapse. The general practitioner could do a great deal to help his patients, and the patient and his friends should bully the doctor, if necessary, into treating the condition seriously. Dr. Dent protested against alcoholic patients being handed over to the psychoanalyst, though he admitted that psychotherapy and psychology had their place in treatment.

The Role of Psychotherapy

Dr. J. A. HOBSON agreed that apomorphine was the most useful drug available for the treatment of alcoholism, but he did not agree with what he considered to be Dr. Dent's disparagement of psychotherapy. Probably Dr. Dent himself practised far more psychotherapy with his patients than he was aware of; he was interested in his patients as human beings and not as "cases." He was sure that "Dent without apomorphine would cure more alcoholics than would apomorphine without Dent."

Psychotherapy was something which general practitioners could practise. Many alcoholics coming to doctors were coerced by their relatives and consequently very suspicious and guarded in their demeanour. Unless the general practitioner could win their confidence he was likely to fail.

Accuracy in diagnosis was, of course, important and of great academic interest, but diagnostic history-taking should be postponed if there was any risk that it would antagonize the patient. Most alcoholic patients showed some psychological abnormality, but it was difficult to decide whether the alcoholism was secondary to a neurosis or the neurosis secondary to alcoholism; he thought the latter was more likely to be the case. Very frequently symptoms of anxiety and tension disappeared under treatment. Often, of course, the alcoholic, after he became teetotal, was left with some psychiatric symptoms, and in such cases then proper psychiatric treatment was given. The alcoholic presenting himself for treatment exhibited a sense of shame and failure, and was always on guard against moral accusations. A doctor who was himself an alcoholic had described his own state as an intense dislike of himself, his habits, his behaviour, his reactions to his friends, and imagined himself guilty of unspeakable infamies. An attempt must be made to combat the alcoholic's feeling of complete loneliness and extreme self-reproach. To this end it was preferable to treat alcoholics in groups of two or three at a time rather than in isolation. Fostering a group spirit was one of the ways in which Alcoholics Anonymous was of most help in reinforcing medical treatment.

Team-work

Dr. LINCOLN WILLIAMS pleaded for team-work in the treatment of alcoholism. To understand the alcoholic was to understand his needs. These could be summarized under several headings.

First came his physical needs. It was essential to eliminate organic disease and to repair the ravages of alcoholism by fortified vitamin therapy. Over the last 50 years medicine had concentrated almost entirely on physical treatment—gold cures, courses of atropine and strychnine, and the like—which enjoyed a fleeting reputation, afterwards to be discredited. Modern therapy was carried out by means of aversion conditioned-reflex treatment, using apomorphine and "antabuse" (tetraethylthiuram disulphide).

Then there was the need for a personality diagnosis. It was very important to understand what the patient was like before the onset of his excessive drinking. Was he fundamentally a normal person, or one suffering from neurosis, mentally a normal person, or was he a "bad hat" alcoholic or had he a mental disorder, or was he a "bad hat" alcoholic with an underlying psychopathic personality? One often came across patients who suffered from a chronic tension state which demanded more and more alcohol to allay it. This type of person responded extremely well to subconvulsive electrostimulation which removed the tension.

Furthermore, the environmental needs of the alcoholic must be considered. His wife must be helped to understand that compulsive drinking is an illness and not a moral failure. Where desirable, contacts might also have to be made with his employer, for many alcoholics held responsible positions in industry and had many years of productive work ahead of them. The social needs of the alcoholic could be met by membership of a group, and here the speaker gave wholehearted support to the work of Alcoholics Anonymous.

Finally the spiritual needs of the alcoholic also called for attention. The effect of religious conversion was well known. The Church to-day showed complete readiness to work with doctors and Alcoholics Anonymous and all others towards the successful rehabilitation of the alcoholic sufferer.

Dr. E. P. SCOTT said that he was disappointed that they had been told so little about the cause of alcoholism, whether physical or psychological, and also about its sequelae.

Three members of Alcoholics Anonymous also contributed to the discussion. One of them said that he had for 22 years been a hard drinker, and he had since spent two years in association with Alcoholics Anonymous and had won through to sobriety. It was very important that members of that organization should work under medical superintendence. Alcoholics Anonymous consisted of men and women

of every social grade who had learnt to live without alcohol and by their fellowship and sharing of experiences to help one another. Another member of the organization said that he was sure that the drinking of alcohol was due to a state of mind and not so much a physical urge.

Complications of Alcoholism

Dr. HOBSON, in replying on the discussion, said that to argue whether the cause of alcoholism was physical or psychological was a trick of language rather than a true dichotomy. As for the sequelae of alcoholism, he had been struck by the very low incidence of cirrhosis in alcoholic patients. He had not seen a case of cirrhosis of the liver in an alcoholic for four or five years. Nor had he seen cases of gout. A disease which was rather similar to gout was diabetes, and there was a high incidence of diabetes not only among alcoholics but among their friends. The complications he saw most frequently were peripheral neuritis and mental changes. With regard to the compulsive craving for alcohol, he mentioned one woman patient who had retrobulbar neuritis and was told that if she persisted in drinking alcohol she would go blind. Her reply was, "Even if I go blind I cannot give it up." In marked contrast with this were patients with tobacco amblyopia. One of these, who was addicted to excessive cigar smoking, gave up the habit at once on being given a similar warning.

Dr. DENT, also in reply, said that he had his doubts about the value of psychoanalysis in these cases, but he had no prejudice against psychotherapy. He had never suggested, however, in dealing with patients that he had an interest in their past. The past had to be forgotten so far as possible. He had seen several alcoholic patients with diabetes, but not a single case in nearly 20 years with cirrhosis of the liver.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Press Publicity

SIR,—As chairman of the Association of British Science Writers, I have been asked by our members to thank you for your tolerant and constructive leading article on "The Press and The Profession" (*Journal*, January 16, p. 141), and to tell Professor Ian Aird that we fully appreciate the circumstances which provoked his letter (p. 153).

No responsible journalist will defend or excuse the behaviour of certain newspaper men on that occasion. Such conduct (of the few) brings discredit on the press—except that when there is a matter of wide public interest, a "human story," like the case of the Siamese twins, there is no such entity as "the press," only a large number of competitive newspapers and competing representatives, each trying to secure an individual account or an exclusive picture. It would be an exaggeration to say that the jobs of those representatives depended upon getting the story, but it would be true to say that they would be unpopular with their news editors or picture editors if others got what they did not. Any newspaper (even the most dignified) likes a scoop, but every newspaper is aggrieved by a "miss." It is the proper function, therefore, of every journalist to get the information which his newspaper wants by fair means. But not by foul.

The question which Professor Aird raised and your leading article discussed was: What is "fair means" in terms of the medical profession, with its concern for the special relationship between patient and doctor and of the ethic of anonymity of both patient and doctor? The further question was raised of the proper understanding, and competent handling, of medical facts.

the first group the average dose was 88 mg. and in the second group it was 96 mg. Very few of my patients have had more than 50 mg.; most have had 30 to 40 mg. This may account for the higher incidence of muscle pains encountered by Dr. Churchill-Davidson.—I am, etc.,

Glasgow, S.2.

A. KILPATRICK.

Malaria Prophylaxis

SIR.—In "Any Questions" under the heading of "Malaria Prophylaxis" (*Journal*, January 9, p. 107) it is advised that daily proguanil ("paludrine") prophylaxis should begin a fortnight before entering a malarious area. Why a fortnight? There appears to be no pharmacological basis for this procedure, and one of the advantages of proguanil as a prophylactic drug is that a loading dose is unnecessary. Provided 100 mg. is being taken every day, I know of no advantage in administering it before the individual enters a malarial area, other than establishing the habit of the daily dose. The question is one of considerable practical importance. In air travel in malarious countries, for example, it is not feasible to give proguanil to travellers and air crews for a fortnight before each journey.

Evidence that proguanil prophylaxis need not be commenced before exposure to infective biting was first obtained by Fairley *et al.*¹ Seventeen out of 17 non-immune volunteers receiving one single dose of either 50 mg. or 100 mg. of proguanil between 39 and 120 hours after exposure to mosquitoes harbouring a New Guinea strain of *P. falciparum* failed to develop malaria, though the controls did. Nine out of 10 volunteers receiving a single dose of 25 mg. of proguanil between 48 and 131 hours after exposure were likewise protected, and 6 out of 8 volunteers receiving a single dose of only 10 mg. of proguanil between 48 and 120 hours after exposure to infective biting were completely protected. On the other hand, a single dose of 100 mg. of proguanil failed to protect 24 hours and 144 hours or later after exposure to infective biting. Two out of 3 volunteers receiving a single dose of 300 mg. of proguanil at 168 and 192 hours respectively after exposure to infective biting developed overt malaria; the third who received 0.3 g. at 144 hours was protected.

Subinoculation experiments² in non-immune volunteers experimentally infected with *P. falciparum* while taking a daily dose of an antimalarial drug for the prevention or suppression of malaria revealed that with quinine, mepacrine, and chloroquine asexual parasites appeared in the blood of the recipient in sub-microscopic density on the 7th day (>144 hours) just as they did in the controls, whereas with proguanil asexual intracorporeal parasites were never demonstrable in the recipients who invariably failed to develop malaria.

The Cairns experiments indicated that in falciparum malaria (New Guinea strain) (1) proguanil in one single dose of 50 to 100 mg. prevented malaria if given between the 39th and 131st hours following exposure to infective biting, (2) pre-erythrocytic parasites were much more susceptible to proguanil than were the corresponding asexual blood parasites, (3) when daily proguanil was being given to prevent malaria asexual trophozoites never reached the circulating blood.

As far as is known, these results hold for typical strains of *P. falciparum* everywhere. Even with the atypical West African strain studied by Covell *et al.*³ where proguanil failed to clear the blood of falciparum parasites during overt malaria, no difference was demonstrated in its action as a causal prophylactic. Thus 10 out of 10 individuals receiving proguanil in a dosage of 50 or 100 mg. daily were completely protected against multiple infective biting.

In vivax malaria evidence obtained by subinoculation experiments² showed that (1) vivax parasites appear in the blood on the 9th day (>192 hours) after infective biting in volunteers taking quinine, mepacrine, or chloroquine just as they do in controls taking no drug, but with proguanil

they never do so, and (2) proguanil inhibits schizogony of the pre-erythrocytic cycle, delays the appearance of asexual parasites in the blood, and prolongs indefinitely the incubation period while the drug is being taken. The fact that vivax relapses occur after proguanil administration is not due to failure of the drug to eradicate parasitaemia in typical strains of *P. vivax* but to the persistence of late exoerythrocytic parasites in the liver which from time to time erupt asexual trophozoites into the blood stream.

In the B.O.A.C. it has been the practice for the past 8 years to give 100 mg. of proguanil from the day of departure until the 10th day after leaving a malarious area. Sir Harold Whittingham, Director of Medical Services, B.O.A.C., informs me that during this period there have been only one or two malaria infections a year among a B.O.A.C. air crew strength of 1,360, about 1,000 of whom were constantly at risk. During this period the malaria rate has not exceeded 0.2% per annum, and careful inquiry has shown that every member of the air crew developing malaria had failed to take proguanil regularly.

No antimalarial drug has been studied more completely in man than proguanil. It would be unfortunate if a dosage regimen for malaria prevention and suppression so clearly indicated by extensive experimental studies under controlled conditions were not followed.—I am, etc.,

London, W.1.

N. HAMILTON FAIRLEY

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- ¹ *Trans. roy. Soc. trop. Med. Hyg.*, 1946, 40, 131
- ² Fairley, N. H., *et al.* (1946). *Ibid.*, 40, 670
- ³ *Ibid.*, 1949, 42, 343

SIR.—Dr. Mary G. Phillips's experience with the ineffectiveness of pyrimethamine ("daraprim") as a prophylactic against *P. falciparum* is interesting (*Journal*, January 16, p. 155).

There can by now be little doubt that proguanil ("paludrine") taken daily, and the dose never missed, is by far the most effective drug in the prophylaxis against malignant tertian malaria; proguanil is, of course, a true causal prophylactic against the *P. falciparum* parasite. One wonders whether the dose of pyrimethamine, or alternatively the frequency of its administration, might be increased before it is condemned as being useless as a prophylactic against malignant tertian malaria.—I am, etc.,

Isleworth, Middlesex.

JOHN C. L. ADAMS

"Status Lymphaticus"

SIR.—Dr. H. B. Dodwell must be congratulated for tracing so satisfactorily to its ultimate source the "myth of status lymphaticus" (*Journal*, January 16, p. 149). The concept is fed to every student of medicine; it is mentioned in most textbooks of surgery and pathology, and most anaesthetic textbooks devote a section to the matter. It will be a difficult task to abolish the notion that status lymphaticus does exist, especially as it offers a plausible excuse for some "anaesthetic" deaths.

Some such deaths occurring in the first few minutes of anaesthesia could without doubt be traced to some lapse on the part of the anaesthetist, but may be ascribed to the "myth" on official records. This does not necessarily reflect upon the integrity of the anaesthetist, who may sincerely believe at the time that nothing untoward had occurred during the administration up to the moment of death; however, later investigation by an independent observer would, I am sure, bring to light little incidents which could in retrospect be interpreted as danger signals: the little cough, breathholding, tinge of cyanosis, pulse irregularities, etc.—and which could have been corrected by appropriate action in time to obviate the crisis.

Most cases of death allegedly due to status lymphaticus fall naturally into the age group 0-20 years, where the thymus is probably still in evidence and has not atrophied to the extent of making the diagnosis untenable or even ridiculous. The majority of cases of which I have heard occur in babies or young children undergoing a surgical operation of a comparatively trivial nature—for example, circumcision, herniotomy, excision of small skin tumours, tonsillectomy, incision of abscesses, etc.: occasionally

it occurs in the young adult and may be associated with circumcision or dilatation of the cervix. In such cases, where death unfortunately occurs, the child is reckoned to be a pretty normal specimen of humanity—it is only in retrospect that the possibility of status lymphaticus is considered and details are accumulated to prove it. The thymus gland exposed at necropsy is magnified to a suitable size in the imagination and the diagnosis is clinched. Everyone is satisfied that death was, perhaps, inevitable.

The commonly quoted fatal combination is that of a struggling, screaming child saturated with circulating adrenaline and a pad soaked in chloroform pressed firmly to his face, the child in the meanwhile being held down by a body of nurses and porters; the child suddenly goes limp, and this is assumed by all to be due to the action of chloroform—it is (with apologies to the addicts), the action of chloroform added to the growing list of victims. Thus one more unfortunate is added to the growing list of victims of status lymphaticus. This state of affairs does not of course obtain in a well-run children's hospital, the children being asleep, in a "couldn't care less" frame of mind, or fully awake and prepared to co-operate, this latter state being achieved mainly by the manner and carefully chosen words of intelligent ward staff and to a lesser extent by the manner of the sympathetic, proficient, expert anaesthetist.

Similar deaths occur also with other anaesthetic agents in common use. Ethyl chloride is a well-known potent killer in expert hands. Soluble thiopentone certainly used to be a great lethal agent—due to actual or relative overdosage—and probably still is. Many deaths associated with its use in anaesthesia can be attributed to the rapid vasodilatation, greatly reduced venous return, lowered arterial pressure, coronary insufficiency, and ultimately death, which can and often does occur very quickly especially in toxic, dehydrated patients. Such cases can be labelled by thoughtless anaesthetists as idiosyncrasy, vagal inhibition, or status lymphaticus. Again, other deaths occur following "safe" agents—for example, gas-oxygen-ether sequence—where the rapid manipulation of patients for surgery occurs in association with the too rapid onset of surgery.

One could multiply and elaborate these instances, but enough has been said to illustrate the idea that bad anaesthetic technique can be a potent source of these mysterious cases of status lymphaticus.—I am, etc.,

Aberdeen.

DAVID A. FORBES.

SIR.—As Dr. H. B. Dodwell's article on "Status Lymphaticus," the Growth of a Myth" (*Journal*, January 16, p. 149) is largely a criticism of the views expressed by me in the seventh edition of *Recent Advances in Anaesthesia* I may perhaps be permitted to reply. I cannot possibly cover the many points raised in the article by a letter and will confine myself to two only. Dr. Dodwell states in two places that W. N. Kemp, while believing in the existence of the condition, does not cite any actual cases. In Dr. Kemp's book *Elementary Anaesthesia* chapter 23 is devoted to an excellent account of status lymphaticus and includes detailed reports of seven patients with anaesthesia.

Dr. Dodwell also states that he cannot find any account of the late Sir Bernard Spilsbury's views on the subject. Sir Bernard kindly discussed the condition with me fully at a time when I was about to consign it in my own mind to the category of discarded fables. Although he disliked the term status lymphaticus, Sir Bernard was convinced of the existence of a condition in children and young people who were more likely to die from sudden cardiac failure than normal individuals and in whom certain definite pathological changes could be demonstrated post-mortem. The chief findings were an enlarged thymus, general lymphatic hyperplasia, a narrowed aorta, and fatty infiltration of the heart muscle. I was later fortunate enough to see Sir Bernard demonstrating two classical examples of the condition in children who had died suddenly for no obvious reason and with no other post-mortem abnormalities than those mentioned above. Sir Bernard Spilsbury told me after his retirement he proposed to go through his post-mortem notes on cases of status lymphaticus (between 100 and 200) and to write a paper based upon them. Unfortunately, his tragic death prevented this project from being accomplished, but I would think that, if anyone had the time and ability to peruse and classify the immense number of meticulously accurate case reports which he left, not only would status

lymphaticus be clarified but also other obscure pathological conditions. Nobody who saw Sir Bernard's superb technique in the post-mortem room or who had listened to his logical reasoning in the lecture theatre or in the law courts could possibly imagine him capable of slipshod work or muddled thinking, and it is incredible that he should have pursued a chimera for so many years.

For this and other reasons I personally changed my view, and, while freely admitting that status lymphaticus has often been used quite unjustifiably as an escape mechanism by anaesthetists and others, I now believe that the condition does exist.—I am, etc.,

London, E.C.1.

C. LANGTON HEWER.

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- ¹ *Recent Advances in Anaesthesia and Analgesia*, 1953, 7th ed. London
- ² *Elementary Anaesthesia*, 1948. Baillière, Tindall and Cox, London.

Radiology and Lumbar Disks

SIR.—In his letter (*Journal*, January 23, p. 213) Mr. J. R. Armstrong has left out an important step in the treatment of disk lesions. The immediate treatment of most cases is not mere rest and immobilization, it is *reduction* followed by resting the joint in a good position by various forms of immobilization. Were this principle, so often applicable to fracture with displacement, applied equally to displacement of part of a disk, much of the prolonged disablement that Sir Max Page rightly deprecates would be avoided. Moreover, the reproach to our profession represented by osteopaths' successes would cease as well.

When a displacement is present, reduction followed by its maintenance compares favourably, in theory and in practice, with immobilization alone.—I am, etc.,

London, W.1.

JAMES CYRIAX.

SIR.—Your leading article (*Journal*, December 19, 1953, p. 1363), entitled "Radiology and Lumbar Disks," interested me greatly, as it was inclined to bear out my own personal opinion, that radiology is useless in the diagnosis of disk protrusions, but should be used to rule out any differential diagnosis.

The great number of disk lesions presenting themselves to the doctors nowadays surely rules out myelography as a diagnostic procedure. Thorough clinical examination should give the proper diagnosis without any radiological aid, except in a few cases.

I ought to agree with all that Sir Max Page says in his letter on this subject (*Journal*, January 9, p. 97), as I had the great fortune to be one of his dressers as a student, but I cannot agree with him that any diagnosis can be premature if correct. The sooner a disk protrusion is diagnosed the easier the treatment and the earlier the recovery. I do, on the other hand, agree with his complaint of the time wasted when the patient has to wait to see a specialist and have an x-ray. As I explained in my article "Manipulation and Accurate Manual Methods in General Practice" (*Journal*, July 4, 1953, p. 18), general practitioners should be trained in this work, both to save time and to prevent complications.

I also agree with him that prolonged partial immobilization is a too frequent routine, as manipulation or spinal traction will quickly relieve the majority of cases.—I am, etc.,

Hoddesdon, Herts.

R. BARBOR.

A Cosmetic Amputation

SIR.—Contrary to reactions of almost unqualified disapproval which Mr. Ian Lawson Dick's letter (*Journal*, January 2, p. 45) aroused in Professor Bryan McFarland (*Journal*, January 16, p. 159), Mr. Dick's strongly expressed and important observations concerning the cosmetic amputation brought me great satisfaction.

May I record that 28 years ago, when I was a surgical registrar, following accidental infection in the operating

theatre eventuating in chronic periosteomyelitis, it became necessary for me to have my left index finger amputated. Desiring an oblique section of the distal third of the shaft of the metacarpal bone, and anxious to have weighty approbation for this then seldom-performed operation, I consulted the late Professor Schoemaker, of The Hague, Professor Ernest Groves, of Bristol, Sir Robert Jones, of Liverpool, Professor de Quervain, of Geneva, as well as Sir Hugh Rigby, Mr. James Sherren, and Sir Robert (then Mr.) Milne, of the London Hospital. Independently, with the single exception of Professor de Quervain, this illustrious assembly were adamant : " Retain the head of your metacarpal bone—a surgeon requires manual strength as well as skill " was the refrain. Notwithstanding, I persuaded Sir Hugh Rigby to carry out the operation of my choice. Had the then orthodox operation been performed, for several reasons it is unlikely that I would have been able to follow my calling *in toto*.

Since then I have performed this cosmetic amputation several hundreds of times, always to the patient's eventual satisfaction. The cosmetic operation is suited eminently to women (without exception), those who follow the learned professions, business men, clerks, and the majority of highly skilled workmen. In my considered opinion it is the greater amount of compensation awarded to the plaintiff at law for the sacrifice of the head of a metacarpal that has unavoidably biased current practice.—I am, etc.,

London, W.1.

HAMILTON BAILEY.

Sickle-cell Anaemia

SIR.—With reference to Dr. H. Lehmann's letter on sickle-cell anaemia (*Journal*, November 28, 1953, p. 1217) and to the possible explanation as to the survival of the sickle-cell trait—including the evidence produced by Brain¹ that the sickler may have an advantage over the non-sickler in respect of some protection against red-cell parasitization by the malaria parasite—we are able to support this latter hypothesis, our evidence having been published in the *Tanganyika Annual Report of the Medical Laboratory* for 1952, in which it is stated:

"One of the unexplained facts about the congenital sickling abnormality is its apparent survival value in spite of the fact that the rapid homozygous sickler is liable to die in the early years of life of sickle-cell anaemia. It appeared that this survival value may lie in there being some advantage to the heterozygous sickle-cell trait individual in respect of decreased susceptibility of a proportion of his red cells to parasitization by *P. falciparum*. To test this theory watch was made for a heavy *P. falciparum* parasitization in a sickle-cell trait individual. This was eventually found. This patient's blood was then sickled by the simple wet sealed preparation technique, after which the cover slip was removed, the cells fixed by rapid drying and stained by Leishmann. The stained film showed large numbers of parasitized cells, but it was very obvious that these were well formed and not sickled. On the other hand, very few of the sickled cells were parasitized, although the majority of the cells were in fact sickled. The explanation of this phenomenon needs careful investigation; there is the possibility, however, that the sickle-cell haemoglobin may be an unsuitable intracellular environment for the growth and metabolism of the trophozoite. Alternatively, parasitization of a cell containing a certain proportion of a sickle-cell haemoglobin may lead to its *in vivo* sickling and phagocytosis, thus terminating the reproduction cycle in the case of cells so invaded."

It should be noted that, although the sickle-cell trait incidence in Dar es Salaam is 20%, only one of 16 heavy malaria infections was in fact sickle-cell trait positive. It is also relevant to record that in a sickle-cell survey carried out by Mackey³ in Dar es Salaam 16% of 330 infants, average age 6 months, were sickle-cell trait positive as opposed to 23% of 283 adults, average age 26 years. Dar es Salaam is in a hyperendemic malarious area, and it would seem that in this area the sickler has a better chance of survival to adult life than the non-sickler.—We are, etc.,

J. P. MACKEY.
F. VIVARELLI.

Der es Salaam.

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- ¹ *British Medical Journal*, 1952, 2, 880.
² *E. Afr. med. J.*, 1949, 26, 172.

Ophthalmic Surgery in India

SIR.—Dr. J. N. Tennent's article (*Journal*, January 2, p. 39) does far from justice to Rai Bahadur Dr. Mathra Das, the founder of blind relief camps. As the Rai Bahadur put it to me, he had early realized that the Rolls-Royce methods employed in hospitals were not capable of touching the fringe of the problem of cataract in India. Something of the nature of modern mass production was required, and he found it in the blind relief camps. When I last saw him he had the intention of retiring when he reached his 200,000th extraction, but the many calls on his skill prevented it. His records showed a "casualty" rate of less than 1%.

In company with a member of our staff, who had completed six months as junior and six months as senior ophthalmic surgeon, I visited one of Dr. Mathra Das's camps, and watched his methods. The average patient, after walking from his village to the camp, presented himself in the early part of the day and, after he had his preliminary examination by the surgeon, was given a card the colour of which decided whether he was deemed fit to stay for operation or to be sent back home again. Selected patients were given a wash-out, the anaesthetic, and might be on the table within the half-hour. With the help of a well-trained assistant, Dr. Mathra Das removed four cataracts per minute. Bandaging, etc., was done by trained assistants, and by the time the surgeon had finished at table four a fresh patient was ready at table one. He did nearly 400 operations that day, and a week later I returned to the camp to ascertain the results. Three of them had gone "wrong," and one of the three was a woman who disliked the surgical dressing enough to replace it by the softer stuffing of her mattress. Even if she be included among the casualties, the rate was still less than 1%, a truly remarkable achievement. The rate for that particular camp correctly sampled Dr. Mathra Das's overall rate for 200,000.

In my travels round India I heard much criticism of Dr. Mathra Das's technique, so, from his lecture, did Dr. Tennent. If such criticisms were comprehensively based there should have been something like 300 casualties at the camp which I visited and inspected instead of 3. The missing factor, so I suggest, is the high degree of acquired immunity which the Indian ryot's cornea must acquire against septic organisms through its owner living amid so much dust. Dr. Mathra Das had his own private camp hospital just outside Lahore where he did an easy hundred operations weekly, and trained his assistants in after-care before he took them to any outside camp. A month in that camp would give even a compounder more experience of this after-care than many of our own young specialists have had. Some of the assistants left behind for after-care were of compounder status, but they were far from inexperienced at the after-care of cataract. The head assistant was of the sub-assistant surgeon grade with a four-year qualification period.

My own opinion of Dr. Mathra Das, given in my book, *Climate and Labour*, is that no other Indian has done so much good to other Indians as he has. After all, 200,000 cataracts make an easy record which none of our eye specialists can even approach, and, doubtfully, any of our hospitals.—I am, etc.,

Malta, G.C.

W. BURRIDGE.

Eosinophils in the Sputum

SIR,—In connexion with the paper by Dr. John Vaughn (*Journal*, January 2, p. 27) I should like to mention the following case in which I was concerned, from the laboratory point of view, a couple of years ago, and which he may think supports his thesis that the presence of eosinophils in the sputum is a manifestation of a blood eosinophilia.

The patient was a man of 18 who presented with fever and migrating opacities in the lungs on radiography. These individual lesions were present for a few days and would then disappear, to be followed after a short interval by a

similar shadow in another part of the lung field, together with a brisk rise of temperature. I no longer have the records of the case, but as far as I remember the blood leucocytes numbered about 20,000 per c.mm., with up to 92% eosinophils. Between attacks the total count was about 5,000 per c.mm., with 40 to 50% eosinophils. There was also anaemia. At all times during the illness, and particularly during the acute pulmonary incidents, the sputum contained very large numbers of eosinophils. The most interesting point about the case is that the patient died a few weeks later in another hospital, where at necropsy the morbid anatomical findings were those of a classical myeloid leukaemia. I did not have an opportunity of seeing the sections myself. Such cases of eosinophilic leukaemia, though rare, are described in the literature. The important point, however, is that in this case a high blood eosinophilia, caused by a primary marrow dysplasia, was associated with what might be considered a Loeffler's syndrome and a marked excretion of eosinophils in the sputum.

--I am, etc.,

C. H. JONES

Liverpool, 7.

C. H. JONES.

Ulcerative Colitis

SIR.—I read with interest Sir Robert Hutchison's letter on ulcerative colitis (*Journal*, January 9, p. 98), and, whilst not wishing to venture into the aetiology of the condition, I should like to mention one point of interest.

When Case 4 in Mr. Stanley O. Aylett's series (*Journal*, December 19, 1953, p. 1348) was admitted to hospital there was for some time doubt about the diagnosis in view of her extreme youth (in actual fact she was aged 9 years when first admitted). In view of this, exhaustive tests were carried out and much questioning of the parents took place. Eventually it was discovered that the bowel symptoms were of acute onset dating from a most peculiar incident. She had met her parents returning from a Jewish funeral and had rushed in hysterics to a friend living in a flat in the same block, where she remained at her own request for several days. During that stay her bowel gave trouble for the first time. I am aware that this can be dismissed as coincidence, but at least it is peculiar coincidence.

In all fairness I would say, and I think Mr. Aylett would agree, that none of the other patients in the series could be classified as "emotionally immature."—I am, etc.,

Fowey.

MARTIN LUTHER.

SIR.—With reference to Sir Robert Hutchison's plea for the return of appendicostomy and colonic lavage as "far the best treatment" for ulcerative colitis (*Journal*, January 9, p. 98), I hasten to suggest danger. The results of our research in the x-ray department at St. Mark's Hospital for Diseases of Rectum and Colon reveal that quite a large number of cases labelled "ulcerative" colitis by the clinician have been shown at x-ray examination, and later confirmed by colectomy, to have no ulcers at all. Some of the so-called "fibrous strictures" have been found to relax after the employment of antispasmodics, as recorded at subsequent x-ray examination. Those that have had colectomy performed show only hypertrophy of the muscle wall and no fibrous changes. Perhaps most alarming of all has been the finding by Dr. Dukes at St. Mark's of seven microscopic cancers lined up in a section of the colon in a case of ulcerative colitis. Then there is the devastating, rapidly advancing destructive "polypoid" type of colon, studded with numerous groups of polyps, essentially inflammatory in nature, which do not turn malignant, whereas the familial variety do of course. The picture in these cases can alter so rapidly, showing in the beginning an almost normal bowel, and then within the short space of six months present a shrunken colon literally studded with polypi, with practically complete destruction of the mucous membrane. The patient goes downhill rapidly. Such cases are easily demonstrated by opaque enema examinations and especially if reduction density technique is carried out. Then there is

tuberculous colitis, the syphilitic colon, the dysenteric colon, and our old friend diverticulosis with diverticulitis which essentially starts as a localized colitis (sometimes preceded by a period of obstinate constipation) and so ending eventually as a state of diverticulosis, with possibly from time to time recurrent diverticulitis. Modern medicine to-day does not approve of such crude methods of treatment as appendicectomy to dissipate seven microscopic cancers, or some of these tragic cases of polypoid colitis.

I have great respect and admiration for Sir Robert's brilliant talents and his numerous contributions to medicine, and therefore, as a countryman of my own, same university, etc., I make the following suggestion with great respect. Might it just possibly be that some of these cases Sir Robert treated with appendicostomy and lavage with such success were cases the clinicians labelled in those days as ulcerative colitis, but in the light of modern advances they were probably only cases of chronic colitis, admittedly of long duration, but not ulcerative? Indeed, until recently some of the so-called "ulcerative" colitis cases were only labelled "ulcerative" for no better reason than that the course of the illness had been long and uninterrupted over a period of years. I have cases on record at St. Mark's of 5, 10, 20, and 27 years' standing labelled as "ulcerative" colitis, which at x-ray examination present a colon with circular and longitudinal muscle tone not far from normal and no signs of fatigue at all, and certainly no ulcers. In other words the clinical classification of "acute," "subacute," and the "chronic" is quite out of date, and in the *Lancet* (January 16, 1954, p. 159) I have briefly described our new x-ray classification of colitis which has now been in operation at St. Mark's for some time back.

No, as I see it, ileostomy is only performed essentially as a preliminary, prior to colectomy, and only resorted to in these true cases of ulcerative colitis where medical treatment has failed and appendicostomy or any other form of treatment has proved useless in what really amounts to a disease which is a potential precancerous disease of the colon.—I am, etc.,

London, W.1.

NORMAN P. HENDERSON.

Antibiotics in Bacteraemia

SIR,—In the discussion on antibiotics in bacteraemia (*Journal*, December 19, 1953, p. 1376) Dr. M. Anthony Peyman states that "it is perfectly possible for a patient to be cured of a bacterial infection by an antibiotic while *in vitro* tests demonstrate the organism to be insensitive to that antibiotic." This rash statement is partly upheld by Dr. A. Lawrence (*Journal*, January 9, p. 100). I know of no satisfactory evidence whatever to support it.

The difference of opinion may be due to lack of definition of "in vitro resistance." Unfortunately there is no standard method for sensitivity tests and therefore reports vary from different laboratories. The popular and rapid paper disk method is a good indicator of sensitivity when inhibition zones are large, but it is not always appreciated that small zones, or even absence of inhibition, may not indicate an untreatable degree of resistance. If a weak solution of antibiotic is used to prepare the disks (for fear of overestimating sensitivity) and if the potency of each disk is not controlled on each plate culture, resistance is likely to be falsely reported from time to time. I would not consider a microbe isolated from the blood to be resistant *in vitro* until titration in a serum medium, in parallel with a control strain of known sensitivity, had shown its growth to be unaffected by a concentration of antibiotic higher than that obtainable in the patient's serum.

Cure of a patient suffering from bacteraemia by a drug which has been reported inactive in the laboratory must not lightly be taken as evidence that conditions in the blood stream favour antibiotic action. It is an indication for further tests on "resistant" microbes, not for submitting patients to large doses of toxic drugs regardless of the laboratory report.—I am, etc.,

London, W.C.1.

E. JOAN STOKES

Studies of a General Practice

SIR.—The survey of work in general practice in an urban area undertaken and reported upon by Dr. E. M. Backett and others (*Journal*, January 16, p. 109) is of the greatest interest, and it may be opportune to report, and compare where possible, a survey taken over a period of one year (November, 1952, to October, 1953) in an N.H.S. practice classified as rural. This survey was concerned only with diseases and the amount of work involved.

The practice consists of a partnership of two, each partner, as far as possible, seeing his own patients. The survey was taken of one of the partners' work, the N.H.S. list varying over the year between 2,100 and 2,200 persons. The practice area is in a radius of 10 miles from the surgery with a handful of patients up to 12 miles. The hospital and maternity home are 11 miles away.

The N.H.S. medical work was 9,675 items, consisting of 5,017 visits (51.8%) and 4,658 consultations at the surgery (48.2%). Work such as the signing of pension forms, certificates for coal and housing, life assurance reports and examinations, telephone conversations to hospitals, etc., was not included in the 9,675 items listed, nor were long conversations with patients (if they did not directly concern that person's disease—if any). For the purpose of the survey, diseases were classified under 17 headings as shown on the chart. The small number of patients referred for specialist opinion is mainly due to the fact that the hospital laboratory and x-ray department are willing to carry out any investigation on our direct request. This facility is very much appreciated.

	No. of Consultations Plus Visits	Consultations Plus Visits % (Approx.)	No. of Cases Seen (New)	New Cases % (Approx.)	Referred to Specialist
1 Respiratory ..	1,932	20	578	20	33
2 C.V.S. ..	1,315	14.5	144	5	8
3 Digestive system ..	640	6.75	229	8	12
4 Blood diseases ..	433	4.5	62	2	2
5 Orthopaedic ..	790	8	285	10	27
6 Endocrine distur- bances ..	155	1.5	41	1.5	1
7 Midwifery ..	483	5	34	2	4
8 E.N.T. ..	751	7.75	443	15.5	24
9 Neurosis ..	424	4.5	94	3.25	9
10 Skin diseases ..	555	5.75	266	9.25	12
11 Infectious diseases ..	350	3.5	105	3.5	1
12 Minor surgery ..	327	3.25	117	4	2
13 Accidents ..	325	3.25	167	6	8
14 Renal system ..	287	2.75	60	2	6
15 Gynaecology ..	225	2.25	50	2	14
16 Eyes ..	174	1.75	118	4	8
17 Surgical ..	489	5	62	2	25
Total ..	9,675	100	2,875	100	196

Comparing Dr. Backett's figures in the urban practice with the above rural practice, it can be seen that there is no great variation—that is, (1) psychiatric disorders, or neurosis, involved 5% of all cases in the urban area and 3.25% in the rural, while work involved was 1 to 7% urban and 4.5% rural; (2) cardiovascular system: 3% of all cases urban and 5% rural, work involved 2 to 10% urban and 14.5% rural; (3) skin: 11% of all cases urban, 9.25% rural, work involved 6 to 12% urban, 9.25% rural. The one outstanding variation between the two practices is in the percentages of work involving visits to the patient's home—36% urban, 51.8% rural. There are a few patients who think that it is easier for the doctor to travel to his house than for him or her to get to the surgery. There is also the "snob" element in a few patients which is difficult, and not always wise, to break. It may be that the rural patient has to be iller than his urban brother before he seeks advice (although up till now this had never occurred to me). Or perhaps it just goes to show that no two practices are alike. If the latter is the case, is it really worth wallowing in a mass of figures?—I am, etc.,

Brightlingsea, Essex.

JOHN MIDDLETON.

Training General Practitioners in Psychotherapy

SIR.—Dr. Michael Balint's warm-hearted and sympathetic article on "Training General Practitioners in Psychotherapy" (*Journal*, January 16, p. 115) must have been read with gratitude by many analytical psychotherapists. The practitioner's relationship to the psychiatric consultant of the analytical persuasion is one of the most complex and paradoxical issues in present-day medicine. The author describes certain aspects of this relationship which exist on both sides. From the long waiting-lists in all psychiatric institutions and the longer ones in the few existing analytical clinics, it becomes quite obvious how much in need the practitioner feels of the help of medical psychotherapists. Yet when he sends his patient to the analyst, he is often—certainly more often than not—ignorant of the analytical methods and its many implications. He so often feels that analysis is glorified pep-talking, only more expensive, and that if he had the time he could do most of it himself. He usually has heard little of positive and negative transference and less of the meaning of symbols in dreams and free associations. He may marvel at the long time an analysis with one of his patients may take and at the continuation of symptoms even after many months of treatment. He may even wonder whether the relationship between patient and analyst, which is based on the transference, is the right thing for his patient.

All this may make the practitioner into a far from whole-hearted ally of the very specialist whom he has called in. As soon as the practitioner's co-operation with the psychotherapist becomes less than whole-hearted, the analysis may be adversely affected, and the patient may then, with the intuitiveness of the neurotic, begin to see a way of "escape from cure" by playing off the two authorities one against the other. I am quite sure that the practitioner has sometimes most unsympathetic colleagues among the analytical specialists and finds that the latter may have little idea of his own work and its complexity. Ideally, therefore, not only should the practitioner learn much more about analytical psychotherapy in practice, but equally the analyst should miss no opportunity to acquaint himself with the work confronting the practitioner in his daily tasks. Dr. Balint's article may inspire many of his readers to seek a closer understanding and more intimate knowledge. Perhaps it will become possible, not only in London, to have training and discussion groups established, which would be such a blessing to both practitioner and specialist and bring more effective help to so many neurotic patients. I am, etc.,

Edinburgh, 9.

W. P. KRAEMER.

SIR.—In his good and stimulating paper, "Training General Practitioners in Psychotherapy" (*Journal*, January 16, p. 115), Dr. Michael Balint says that "the only training which systematically caters for these difficulties [difficulties in personality of the prospective psychotherapist] is the psycho-analytic training."

May I be allowed the hospitality of your columns to correct and supplement this statement? The Society of Analytical Psychology also provides a training with identical aims.—I am, etc.,

London, W.1.

MICHAEL FORDHAM.

Treatment of Angina

SIR.—Dr. David Weitzman's paper (*Journal*, December 26, 1953, p. 1409) on penta-erythritol tetranitrate (P.E.T.N.) raises a number of interesting points, and his somewhat inconclusive results correspond to those which other observers have found with this preparation and with its precursor, erythrol tetranitrate (E.T.). Twenty years ago Evans and Hoyle¹ reached the conclusion that E.T., in common with a large number of other potential vasodilators, had practically no value in the management of angina pectoris, but their conclusion is not borne out by practical experience spread over a large number of cases.

Obituary

Lord GEDDES, P.C., G.C.M.G., K.C.B., M.D.

Dr. J. B. WRATHALL ROWE writes: Your obituary notice (January 16, p. 160) of Lord Geddes makes no mention of the fact that, in addition to his other talents, he was an accomplished musician. During the first few years of the century he composed a number of airs for marching songs and wrote choruses for smoking concerts. One of the best known of these songs is "Route Marchin", with words by Rudyard Kipling, published in the *British Students' Song Book*. It is probable that other compositions of his would have become well known had it not been for the fact that his musical MSS. were stolen from his tent when he was in camp at the Curragh before the 1914-18 war.

Dr. D. SAGE SUTHERLAND, formerly medical superintendent of Monsall Isolation Hospital, Manchester, died suddenly at Edinburgh, where he was living in retirement, on January 9 at the age of 78. Donald Sage Sutherland was born at Lochaber, Inverness-shire, on March 19, 1875, the son of the late Rev. Donald Sutherland, and was educated at Garnethill School and Glasgow University, where he graduated M.B., Ch.B. in 1898. He received a commendation for his M.D. thesis in 1903. After a brief period in general practice at Keighley, Yorkshire, he held the post of senior resident house-physician and surgeon at the Cumberland Infirmary, Carlisle, his work there being interrupted by a period of service as a medical officer in the South African Field Force in 1900-1. From Carlisle he moved to London to begin his long association with the fever hospital service. After holding the appointment of assistant medical officer at Brook Fever Hospital, Woolwich, under the old Metropolitan Asylums Board, he became medical officer at the South-Western Fever Hospital, Stockwell, in 1906 and remained there until 1914. An enthusiastic Territorial—he joined the force in 1909, when he was attached to a London brigade of artillery—he was transferred to the 2/1 City of London Field Ambulance as second in command when war broke out in 1914. He served throughout the war, and in 1917 became commanding officer of an isolation hospital at Calais.

On his return to civilian life Dr. Sage Sutherland became senior medical officer at the Eastern Fever Hospital, Homerton, in 1918 and held the post until 1923, when he was appointed medical superintendent of Monsall Isolation Hospital, Newton Heath, Manchester. He also became clinical lecturer in infectious diseases in Manchester University. In Lancashire he continued his connexion with the Territorial Army, first with the Manchester Artillery as medical officer and then, in 1930, when he was promoted to the rank of lieutenant-colonel, as officer commanding the 2nd Western General Hospital. He was awarded the Territorial Decoration in 1925 and he retired from the Territorial Army in 1934. When war broke out again in 1939 he was engaged for a short time as officer in command of administration at the Territorial depot of the R.A.M.C. in Manchester. On his retirement from the post at Monsall Hospital in 1941, Dr. Sage Sutherland went to live first at Ambleside and later at Edinburgh. He leaves a widow and two young sons.

Dr. J. W. DEW, who was in practice at Horsham in Sussex for many years, died at his home on December 15, 1953, at the age of 66. John Westcott Dew was born at Hoddesdon, Hertfordshire, on January 10, 1887, and was educated at Tonbridge School, where he was head boy and for two years captain of football and cricket. His career at Cambridge, where he was at Clare College, was equally distinguished,

The unpredictable effect of P.E.T.N. and E.T. is common to both preparations, but the former has fewer side-effects and has been better tolerated in my own series.

The error into which we seem to have fallen is that of regarding all cases of angina pectoris as having identical aetiology, although everyone is familiar with the mild sclerosis which can be found at necropsy in a patient who has had severe angina and, at the other end of the scale, the gross calcification of the main coronary arteries in the patients who have never suffered from ischaemic pain. It is hardly surprising that some patients do not respond to these long-acting vasodilators whose potency is relatively low, even though they respond so well to glyceryl trinitrate. In view of the findings in my own series, which are comparable with those reported by Dr. Weitzman, I am now concentrating on treating those patients who derive benefit from P.E.T.N., and I am trying to assess its value by the use of genuine and identical dummy tablets.

This seems to be an example of a condition where a direct statistical approach may give a fallacious answer, and to work on an unselected series may bring into disfavour a drug which seems to me to have a definite place in the management at least of some patients with angina pectoris.—I am, etc.,

A. L. WINGFIELD.

London, W.1.

REFERENCE

Quart. J. Med., 1934, 27, 105.

POINTS FROM LETTERS

Disease and the Pig Bin

Dr. KATHLEEN VAUGHAN (London) writes: I have not seen any report on the remarkable disappearance of the ordinary house-fly with a soft proboscis and its replacement by a fly looking much the same but furnished with a spike with which he draws your blood. Squash one of these and there is always red blood inside. Where do they breed? In those awful tins labelled "Pig's Food," where bits of meat, stale vegetables, tea leaves, carpet, and paper bags are deposited and left without early removal or disinfection. No self-respecting pig would eat the contents. May not the stinking pig's food bin prove to be the breeding ground of diseases whose origin is still obscure?

Masked Appendicitis

Dr. R. G. WIGGERS (London, S.E.6) writes: A male patient, aged 50, walked into my surgery complaining of upper abdominal pain, which he said had been present for about 24 hours. He had no nausea or vomiting and felt well except for this pain. His temperature and pulse were normal, tongue clean, lungs normal, and the only abnormal physical sign found was, to my mind, slight rigidity and guarding in the right iliac fossa. There was no tenderness in the right iliac fossa, but there was rebound tenderness present. He was sent immediately to hospital—query tenderness present. He was found only some voluntary guarding in the right iliac fossa, but no rigidity. A laparotomy was performed and an acutely inflamed appendix was removed. The patient made a satisfactory recovery following operation. This case serves as a reminder that an acute appendix can be present with only minimal symptoms and signs.

Sale of Antibiotic Lozenges

Dr. G. FIELDING (Nottingham) writes: It appears that "tyrozoets" and similar antibiotic throat lozenges can be freely bought in any chemist's shop over the counter. I saw a patient to-day with a typically inflamed denuded "antibiotic" tongue who had treated herself with a tube of these lozenges. As these tablets are potentially dangerous and also contain 5 mg. of benzocaine, their sale should be restricted in the same way as penicillin lozenges already are.

Disposal of Anaesthetics

Dr. L. RUNDLE-BAKER (Cardiff) writes: In his letter Dr. M. Essex-Lopresti (*Journal*, December 26, 1953, p. 1433) complains that its blue colour prevents the use of waste trichlorethylene ("trilene") for cleaning purposes. He will find that a small bag containing activated charcoal (as used in laboratories for gas absorption) will remove the waxolene-blue dye from the trichlorethylene, leaving a clear fluid which is quite suitable for cleaning and degreasing purposes. The waste trichlorethylene and ether can then both be of use.

and he took a first in Part I of the Natural Sciences Tripos and went on to the London Hospital with an exhibition. He graduated M.B., B.Chir. in 1912, and held the appointments of house-surgeon and ophthalmic house-surgeon at the London Hospital. He served throughout the war of 1914-18 with No. 10 Casualty Clearing Station, becoming a surgical specialist with the rank of major. He was twice mentioned in dispatches and in 1918 was awarded the Military Cross for attending wounded under heavy fire. After the war he settled at Horsham in 1919 and soon acquired a busy private practice. He also joined the staff of Horsham Hospital and became responsible for a large share of the operative work there. Dr. Dew was in fact that rare combination, a first-class general practitioner and a very good surgeon: not only was he a skilled operator but he possessed that invaluable asset, sound surgical sense. His opinion on a difficult abdomen was eagerly sought and willingly given, and he rarely made a mistake. But he will be remembered chiefly as a most lovable individual. By nature he was modest and unassuming and his innate honesty and sincerity made him beloved by his patients, to whom he was counsellor and friend. Many of his poorer patients could tell stories of his kindness quite outside the accepted obligations of a doctor. His tact and common sense were a great asset to the various hospital committees on which he served for many years. He was honorary secretary of the Horsham Division of the British Medical Association from 1922 to 1925, and he had a wide range of interests outside his profession. He was a first-class shot and a keen sportsman, and excelled at all games. Not only did he play them very well but he had a gift of inspiring others with his enthusiasm and obvious enjoyment. He was a keen philatelist and a talented musician, being a faithful member of the church choir. But probably his greatest love was bird-watching and bird-photography. Some of his happiest memories were of holidays spent, together with his wife, following this hobby, in some distant corner of Scotland or on some small island off the coast. His photography was of a very high order, evidence of many hours of patient watching and waiting. He worked hard and played hard, and never spared himself. He worked to the end, knowing well that the cardiovascular disease from which he was suffering might at any time prove fatal. Our sincere sympathy goes out to his widow, and to his two sons, the elder, Dr. J. A. Dew, having recently joined him in practice at Horsham.—G. S. M.

Dr. W. H. ROWELL, who was in general practice for 14 years before he joined the public health service, died suddenly in hospital on January 4 at the age of 79. Born on May 8, 1874, William Henry Rowell studied medicine at Newcastle-upon-Tyne and graduated M.B., B.S. from the University of Durham in 1895. He proceeded to the M.D. three years later, and obtained the degree of B.Hy., with honours, in 1899. Serving as a volunteer in the South African war, he took part in actions at Kimberley and in the relief of Mafeking in 1900. On his return home he was elected an honorary freeman of the city of Newcastle-upon-Tyne. After taking the D.P.H. in 1901, he settled at Grimsby, where he spent the first part of his professional career in general practice until the outbreak of war in 1914. Already a Territorial attached to the Lincolnshire Yeomanry, he served throughout the first world war, attaining the rank of major and being twice mentioned in dispatches. In 1919 he was appointed O.B.E. He then returned to civilian life and in 1920 he took the degree of D.Hyg. before joining the staff of the public health department at Stockport, where he was one of the pioneers in the school health service. He worked as assistant school medical officer in that town until 1943, when he retired to Grange-over-Sands to be near the lakes he loved so well. The pleasant and soft surroundings of Grange, where he enjoyed his 10 years of leisure, were in keeping with his own nature, for he was a modest man, full of love and sympathy for his fellow men. His end came quickly, with a sudden heart attack, as he would have wished. He is survived by his wife.—J. Y.

Medical Notes in Parliament

Treatment of Blindness

Mrs. EIRENE WHITE asked the Minister of Health on January 21 if he had considered the report of Professor A. Sorsby on the causes of blindness, and what action he proposed.¹

Mr. IAIN MACLEOD said he had asked hospital authorities to review urgently, and where necessary improve, their arrangements for the treatment of persons suffering from eye diseases, in particular cataract and glaucoma. He had also asked medical officers of health to include in their annual reports for 1953 information about the steps taken to follow up cases shown on registration as requiring remedial treatment. He was considering whether the examination at registration could be used to obtain better information on the possibilities of the blindness being relieved.

Mr. SOMERVILLE HASTINGS suggested that the Minister should consider sending to general practitioners a request that all cases of incipient blindness not due to errors of refraction might be sent at once to an eye specialist. Mr. MACLEOD said he would consider it.

Mr. BARNET JANNER asked the Minister of Health what response he had received from his circular to hospital boards asking them to review urgently their arrangements for the treatment of ophthalmological patients. Mr. MACLEOD replied that there had not yet been time for boards to decide what action should be taken, and in any case he had not thought it necessary to require boards to submit formal proposals on this.

Cancer Research

Mr. NORMAN DODDS, questioning Mr. Iain Macleod on January 21 about cancer research and treatment, said there was a feeling among the public, rightly or wrongly, that not all that might be done was being done. Mr. MACLEOD replied that it was important to keep the matter in perspective. Apart from cancer of the lung, of which there had been a considerable increase, the causes of which were still in medical and scientific dispute, and a small number of other sites, the death rate for cancer had not increased when allowance was made for the increase in the age structure of the population. The increase was not confined to this country, and they were doing everything they could to combat it.

Health Service Specialists

Mr. A. BLENKINSOP asked the Minister of Health on January 21 for information about the number of full-time and part-time specialists employed in the Health Service, and asked him also to keep this matter very much in mind, in view of the strong feeling that part-time specialists were being too much favoured, to the detriment of full-time specialists, and that this might have a dangerous effect on the Service. Mr. MACLEOD said that he would bear it in mind.

Mr. H. MARQUAND asked the Minister if he would care to deny the feeling in some parts of the medical profession that he might have been encouraging or directing a change from full-time to part-time service. Mr. MACLEOD stated that it was not a matter in which he had taken any initiative at all.

Health Service Frauds

Mrs. EIRENE WHITE asked the Minister of Health on January 21 if he was satisfied that safeguards against frauds in the Health Service were adequate, in view of the statement by the President of the G.M.C. on undisclosed fraudulent practices.² Mr. IAIN MACLEOD replied that the matter was under constant review, but he had no reason to think there was any serious inadequacy.

¹See *Journal*, November 7, 1953, p. 1038.
²See *British Medical Journal Supplement*, December 5, 1953, p. 217.

Mrs. WHITE said that a statement by such a prominent medical authority naturally caused uneasiness. Had the Minister taken any action since it was made? Mr. MACLEOD said that he had not, but it was fair to say that perhaps the right interpretation had not been put on what was said. As he understood it, this was a warning that the G.M.C., quite rightly, took a grave view of any laxity in these matters, and was not an allegation that fraudulent practices or conduct were at all widespread.

Pay-beds in Hospitals

Dr. BARNET STROSS asked the Minister of Health on January 21 whether he was satisfied that pay-beds in hospitals were being fully used, and why, at some hospitals, their use was much less than in the service as a whole. Mr. IAIN MACLEOD said that statistics for last year were not yet available, but he had impressed on hospital authorities the importance of ensuring that the total occupancy of these beds, whether by paying or by non-paying patients, was no lower than that of other beds. Reasons for any unusually low occupancy would depend on the circumstances of the particular case.

Dr. STROSS suggested that the high cost was a factor, and that the whole matter should be reviewed. Would the Minister consider abolishing pay-beds as such, and turning them into normal beds and amenity beds, which would be very much better? Mr. MACLEOD said he certainly would not abolish pay-beds, which he believed had a valuable part, just as had private practice, in the development of the Service.

Welsh Health Statistics

The Minister of Health is arranging for a separate section of the state of the public health in Wales to be included in the next annual report of the Ministry of Health, together with separate statistics of special interest to Wales, according to a Parliamentary answer he gave on January 21.

Calomel in Teething Powders

Mr. S. T. SWINGLER asked on January 21 if the Home Secretary would now prohibit the use of calomel in the manufacture of teething powders. Sir DAVID MAXWELL FYFE replied that he had no power to prohibit the use of calomel in the manufacture of teething powders, but he understood that the only firm known to have been manufacturing such powders wholesale in recent times had decided to omit this ingredient. Retail pharmacists who manufactured their own brands of teething or soothing powders had been advised in the *Pharmaceutical Journal* to use safe aperients in lieu of calomel.³

Food and Drugs Bill

When the Food and Drugs Amendment Bill was considered in committee by the House of Lords on January 20 Viscount BLEDISLOE moved a new clause requiring that all milk sold for public consumption must contain at least 3% of butter fat. He said the present policy in regard to the quality of milk sold to the public was fair neither to the dairy farmers who tried to produce high-quality milk, nor to the public who were getting a lower quality of milk. What was called the legal presumptive minimum of butter fat content, 3%—which was low compared with requirements in other civilized countries—could be reduced by what was called "an appeal to the cow." He mentioned the practice in several countries where a higher standard was demanded, and said that in Canada and the United States, where 3.5 and even 4% tested milk was not infrequently found, recently the craze for slimming had produced a so-called "skim milk," which was reduced to a 2% content of butter fat; and that a small but significant quantity of skimmed milk was now being sold to those anxious to maintain willowy figures. The "appeal to the cow" was definitely putting a continuing premium on the production of low-quality milk.

³See annotation at p. 265.

LORD SILKIN expressed some doubt that the amendment would result in a shortage of milk. It would mean that there would be a considerable quantity which could not be sold as milk. To improve the quality involved breeding and housing problems that could not be solved immediately. The cost would also be increased.

LORD BALFOUR OF BURLEIGH said that in Kensington sample figures taken over many years showed that the quality of milk sold there was steadily deteriorating. The Government should study the possibility of payment by quality, giving some premium for additional fat content.

LORD WEBB-JOHNSON supported the desire of Viscount Bledisloe to improve the quality of milk, but thought the amendment would lead to a decrease in milk available for consumption, and that would be unfortunate. He agreed with suggestions that the price as well as the milk might be graded. Anything below 3% fat content should be labelled sub-standard milk, but it should be cheaper. For culinary and domestic purposes many people might prefer to buy cheaper milk, leaving available a larger amount of high-grade milk for the infants and children who needed it.

LORD CARRINGTON, Parliamentary Secretary, Ministry of Agriculture, defended the presumptive minimum of 3% and the "appeal to the cow." They were all agreed on the necessity to protect the consumer against deliberate fraud by adulteration of milk, but it would be an entirely new principle to make it a criminal offence to sell a natural product merely because the quality of the product was poor. Farmers had done a magnificent job, and were producing better-quality milk than ever. The proper way to deal with low-quality milk was to see that a lower price was paid for it.

The amendment was withdrawn, after Viscount BLEDISLOE had asked for an assurance that the Government would accept the objective of establishing at no distant date a minimum fat content of 3%, and Viscount WOOLTON had promised to represent this to the appropriate Minister.

Blackburn Maternity Home

Mr. H. HYND asked on January 21 whether the closing of Springfield Maternity Home, Blackburn, was carried out with the Minister of Health's approval, and what consultations took place with the doctors before their patients were ordered to leave the maternity home.⁴ Mr. IAIN MACLEOD replied that his approval was not needed, but he was aware of the proposal and saw no reason to dissent. Seven patients were sent home and five transferred elsewhere. Steps were taken to consult all the doctors concerned before action was taken. The doctors of the seven patients accepted the proposal. The doctor of one of the five transferred patients objected. The other four unfortunately could not be reached before transferring, but a message was left for them. He regretted more time was not available for consultation, but understood that no ill effects had followed the transfer.

Mr. HYND indicated that the Minister had been misinformed about whether the doctors were consulted, and asked him to look into the matter again, because of the local indignation about the high-handed way in which the closing took place. Mr. MACLEOD said he would do so. In reply to Mr. R. FORT he said that Springfield, formerly a 20-bed general-practitioner maternity home, was to become a home for 30 chronic sick.

Mrs. BARBARA CASTLE asked whether the Minister was aware that many women were being compelled to have their babies at home owing to the shortage of maternity beds, and that the closing of Springfield would make the situation worse. Mr. MACLEOD replied that even after the Springfield closure the number of general-practitioner beds available was 50%, which was much higher than in most parts of the country.

Mr. HYND gave notice that he would raise the matter on the Adjournment.

⁴See *British Medical Journal*, January 23, p. 205.

object of the Fellowships, as defined in the Trust Deed, is to give special opportunities for study or research to suitably qualified British subjects of either sex "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms." The Fellowships will, as a rule, be awarded to candidates who wish to make their studies or inquiries elsewhere than in the United Kingdom. The Fellowships provide for the payment of a maintenance allowance at the rate of £650 per annum for a single Fellow and £900 per annum for a married Fellow, subject to appropriate adjustment in the case of Fellowships tenable at centres outside the sterling area; in addition, an allowance will be made for travelling and other approved expenses.

Further particulars and forms of application may be obtained from the Secretary, Medical Research Council, 38, Old Queen Street, Westminster, S.W.1, with whom applications must be lodged not later than March 15, 1954.

Medical Auxiliaries.—It is nearly a year since the Minister of Health, answering a Parliamentary question about the Cope report, stated that he would make regulations laying down the qualifications required of medical auxiliaries employed in the National Health Service. The National Health Service (Medical Auxiliaries) Regulations, 1954, have now been issued, and after April 1, 1954, hospitals and local health authorities may employ only those qualified under them. The regulations refer to two groups of auxiliaries—those who on March 31, 1954, come within the definition of being qualified on that date, and those who will qualify on or after April 1. The first group comprises (1) those who are already employed in the N.H.S.; (2) those who hold qualifications recommended by the Cope Committee as appropriate; and (3) certain holders of qualifications given by the Joint Council of Chiropodists and the Physiotherapists Association. Those qualifying after April 1 must obtain a certificate from one of the appropriate bodies named in the regulations. Employing authorities can accept the certificates when the Minister has approved the course of training and examinations to which the certificate refers. The Cope Committee recommended that there should be statutory registration for medical auxiliaries. The Minister said in Parliament that there was insufficient agreement on fundamental matters to proceed with this—an opinion with which we disagreed (June 6, 1953, p. 1267). The Minister has now announced that he is setting up a Working Party to draw up a scheme of registration which will be acceptable to him and to the professional bodies concerned.

Rockefeller Grants.—Among the Rockefeller grants announced this quarter perhaps the two of most interest to medical men are those to Professor Vincent du Vigneaud, of Cornell University, for the continuation of his work on what appears to be synthetic oxytocin (see *Journal*, December 5, 1953, p. 1260), and to the School of Public Health, Harvard, the Christian Medical College of Ludhiana, Punjab, and the Government of India for a pilot study in the Punjab preparatory to a long-term investigation of "population dynamics" in India. Individual British workers who are awarded grants include: Professor J. M. Yoffey at Bristol for research in experimental histology and physiology (£6,200); Dr. Max Perutz, director of the M.R.C. Unit for Research on the Molecular Structure of Biological Systems at Cambridge, for equipment (£4,000); Dr. H. Lehmann, to visit centres of sickle-cell research in the United States (£2,505); Dr. Robert Murray, a medical inspector of factories in Lancashire, for a visit to occupational health and hygiene centres in the United States and Canada (£2,350); Professor A. V. Hill for visits to the scientific conferences and centres of biophysical research in the United States (£2,100); and to Oxford University for equipment to be used in the Subdepartment of Microbiology under Dr. D. D. Woods.

President's Tour.—Sir Cecil Wakeley, P.R.C.S., has just returned from a two months' visit to Ceylon and the Middle East. He went to open the ninth annual session of the Ceylon Society for the Advancement of Science, where he

spoke on "Surgery through the Ages." While in Ceylon, he gave a broadcast on "Positive Health" and a B.M.A. lecture on the surgery of the temporo-mandibular joint, as well as lectures to the Medical Society of Kandy and the Dental Society. On his return journey, at the invitation of General Sir Charles Keightley, Sir Cecil spent a day inspecting the Army medical services in the Canal Zone. He saw a demonstration of the Fleming mass inoculation technique, which is rapidly becoming the standard method there, and a hospital surgical service where the regimental medical officer brings his patients for minor surgery instead of doing it in the unit medical inspection room. In the afternoon there was a joint clinical meeting of the medical services of the Royal Navy, Army, and R.A.F. at the British Military Hospital, Fayid, under the chairmanship of Major-General W. A. D. Drummond.

The Common Cold.—Aptly situated on one of the bleakest hilltops in England, the Common Cold Research Unit at Harvard Hospital, just outside Salisbury, opened its doors to the Press on January 21. This hospitality is rarely possible, because the claims of complete isolation must normally come first. Dr. C. H. Andrewes, F.R.S., director of the studies there, outlined the work that had been carried on for the last six years. Some advance has been made towards the control of this exceedingly obdurate virus in that, as reported last year, it is being serially propagated in fragments of human embryonic lung, but human volunteers are still needed to detect its presence. It has been found that the most active nasal washings produce colds in only 55% of women and 43% of men aged 18–40, and a possibly fruitful line for further research is thought to be a study of why individuals differ in their susceptibility.

North of England Obstetrical and Gynaecological Society.—At the annual general meeting of the North of England Obstetrical and Gynaecological Society, held in Manchester on January 15, honorary fellowship was conferred on Sir William Fletcher Shaw (Manchester), Dr. Henry Brown (Brighton), and Dr. W. A. MacKay (Southport), all of whom have been members of the society for over 45 years. The following officers were elected for 1954: *President*, Dr. K. V. Bailey; *Hon. Treasurer*, Dr. C. H. Walsh; *Hon. General Secretary*, Mr. D. C. Racker; *Hon. Reporting Secretary*, Mr. S. Bender.

COMING EVENTS

Society for Endocrinology.—The next meeting will be held jointly with the Endocrinological Section of the Royal Society of Medicine at 1, Wimpole Street, London, W.1, on February 24 at 10 a.m. It will take the form of a symposium on "The Technique and Significance of Oestrogen Determinations." Those wishing to attend who are not members of either society should write to Professor N. F. MacLagan, Westminster Medical School, 17, Horseferry Road, London, S.W.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, February 1

INSTITUTE OF DERMATOLOGY.—Fifth of series of semi-permanent exhibitions by Mr. R. J. Lunn: Medical Photography. (February 1 to 20.)

Tuesday, February 2

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor L. P. Garrod: Causes of Failure in Antibiotic Therapy.

LIVERPOOL MEDICAL INSTITUTION.—At Newsham General Hospital, Liverpool, 3 p.m., clinical meeting.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Mr. J. R. Armstrong and Mr. Aleck W. Bourne: Backache in Women.

Wednesday, February 3

EDINBURGH CLINICAL CLUB.—At the City Infectious Diseases Hospital, Edinburgh, 4 p.m., clinical meeting. Dr. G. Sangster: Gastro-enteritis in Infants.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Practical

Diagnosis of Superficial Mycoses.

INSTITUTE OF LARYNGOLOGY AND OTITIS.—5.30 p.m., Professor P. Van der Calkwyck (Bruged): Bronchial Diseases and Pathology of the Upper Respiratory Tract. Clinical Aspects and Therapeutic Conclusions.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Dr. J. J. Stevenson: X-rays.

● **LONDON UNIVERSITY. DEPARTMENT OF EXTRAMURAL STUDIES AND ATOMIC SCIENTISTS' ASSOCIATION.**—At Beveridge Hall, Senate House, 7 p.m., Professor F. E. Simon, F.R.S.: Power from Atomic Energy.

MANCHESTER MEDICAL SOCIETY. SECTION OF MEDICINE.—At Large Anatomy Theatre, Manchester University, 4.30 p.m., Dr. W. H. Trethowan: Psychopathological Reactions to A.C.T.H. and Cortisone.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., Dr. T. L. Hardy: Functional Disorders of the Colon.

Thursday, February 4

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor A. A. Miles: Reactions to and Bacterial Invasion.

FACULTY OF HOMOEOPATHY.—5 p.m., Drs. W. Lees Templeton, L. R. Twentyman, E. K. Ledermann, C. O. Kennedy, and N. J. Pratt: Reports on Research.

● **INSTITUTE OF CHILD HEALTH.**—5.30 p.m., Mrs. J. M. Williams: Prevention of Backwardness at School.

LONDON UNIVERSITY.—(1) At School of Pharmacy, 5.30 p.m., Special University Lecture in Pharmacy by Professor J. H. Gaddum, F.R.S.; (2) At Senate House, 5.30 p.m., Special Discoveries in Pharmacology.

MANCHESTER MEDICAL SOCIETY. SECTION OF ANAESTHETICS.—At Medical School, Manchester University, 8 p.m., Dr. E. A. Pask: James Brown.

SCHOOL OF MEDICINE.—At Southfield School, Glenville Road, Cowley Road, Oxford, 8 p.m., Dr. A. G. M. Weddell: Science and Medicine.

ROYAL COLLEGE OF SURGEONS OF ENGLAND AND INSTITUTE OF LARYNGOLOGY AND OTITIS.—At Royal College of Surgeons of England, 5.30 p.m., Professor G. Hadfield: Co-carcinogenesis.

ST. ANDREW'S UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. J. N. Morris: Epidemiological Approaches to Coronary Disease.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Sir Paul Mallinson.

UNIVERSITY COLLEGE LONDON.—Public Lecture by Professor F. Bergel, Physiology Theatre, 5.30 p.m., Public Lecture by Professor F. Bergel: Ph.D., D.Sc.: Some Chemical Aspects of Abnormal Growth.

Friday, February 5

INSTITUTE OF CARDIOLOGY.—9.30 a.m., Dr. S. J. Sarnoff (Harvard): Haemodynamic Effects of a New Sympathomimetic Amine, Aramine, and the dynamic Effects of its Use in the Hypotension and Low Cardiac Output of Rationale for its Use.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. H. W. Gordon: Benign New Growths.

INSTITUTE OF NEUROLOGY.—5 p.m., Professor H. Gastaut (Marseilles): So-called "Psychomotor" and "Temporal" Epilepsy.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. J. E. Richardson: Unusual Presentation of Common Gastric Disorders.

ROYAL MEDICAL SOCIETY. Edinburgh—8 p.m., Dissertation by Mr. D. Q. Sutherland: Mind over Matter.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Dr. Hugh Ramsay: Tuberculosis Services, Yesterday and To-day.

Saturday, February 6

KENT PAEDIATRIC SOCIETY.—At Royal Star Hotel, Maidstone, 2.15 p.m., discussion by Mr. R. H. Percival and Dr. P. N. Swift: Circumcision.

MIDLAND TUBERCULOSIS SOCIETY.—At Birmingham Chest Clinic, Mr. P. R. Allison: Some Diseases at the Lower End of the Oesophagus.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—G. L. Davies, M.R.C.S., L.R.C.P., D.P.M., Assistant Psychiatrist, Ipswich Child Psychiatry Clinic; W. Boyd, M.B., Ch.B., Senior Registrar in Mental Deficiency and Child Psychiatry, Little Plumstead Hospital; W. P. D. Green, M.B., B.S., Senior Medical Registrar, East Suffolk and Ipswich Hospital; K. W. Baruch, M.B., Ch.B., Anaesthetic Registrar, West Suffolk General Hospital; J. A. Reynolds, M.R.C.S., L.R.C.P., and T. K. Thorlakson, M.D., F.R.C.S., Surgical Registrars, East Suffolk and Ipswich Hospital; E. A. Burdett, M.R.C.S., L.R.C.P., D.P.M., Assistant Psychiatrist, Hellesdon Hospital, Norwich.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Arndt.—On January 15, 1954, at Queen Charlotte's Hospital, London, W. to Frances (formerly Ondatie), M.B., B.S., D.Obst.R.C.O.G., wife of Reverend George Arndt, a daughter—Theonie Frances.

Gibb.—On January 3, 1954, at St. Bartholomew's Hospital, London, E.C., to Mary (formerly Feetham), wife of William Eric Gibb, D.M., F.R.C.P., a son.

Griffiths.—On December 18, 1953, at King's College Hospital, London, S.E., to Barbara (formerly Grand), wife of Dr. Glyn I. T. Griffiths, a second daughter—Caroline Barbara.

Levis.—On December 31, 1953, at the Central Middlesex Hospital, London, N.W., to Renée (formerly Anderson), wife of R. D. Levis, M.B., D.A., a daughter—Julia Allison.

Rutherford.—On January 19, 1954, at 192, Staines Road, Bedford, Middlesex, to Tess (formerly Tomlinson), wife of Dr. G. T. Rutherford, a son.

Williams.—On December 21, 1953, in Nairobi, Kenya, to Philippa Gaffikin, M.B., Ch.B., wife of John G. Williams, a daughter.

DEATHS

Clarke.—On January 9, 1954, at 74, Earham Green Lane, Norwich, Norfolk, Andrew Campbell Clarke, M.B.E., M.D., aged 79.

Corcoran.—On January 1, 1954, at 48, Queen's Gate, London, S.W., Gerald Corcoran, L.R.C.P.S.I.&L.M., D.P.H., formerly of Southsea, Hants.

Cramer.—On January 7, 1954, at The Whin, Snape, Suffolk, John William Cramer, M.B., F.R.C.S.Ed., of Maryport, Cumberland, aged 86.

Davies.—On January 2, 1954, at 113, Fox Lane, Palmer's Green, London, N., Sidney Richard Davies, M.R.C.S., L.R.C.P., D.P.H., aged 87.

Lloyd.—On December 22, 1953, at 4, Overdale, Ashted, Surrey, Richard Harry Lloyd M.R.C.S., L.R.C.P., late R.A.M.C., retired, aged 87.

West.—On December 27, 1953, at St. Lawrence's Hospital, Bodmin, Cornwall, Sigmund Henry West, M.R.C.S., L.R.C.P., aged 87.

Roberts.—On January 1, 1954, at his home, Garth, Fairfield Avenue, Rhyll, Flint, Anceuria Evan Roberts, M.B., B.S., D.P.H.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Mouth-breathing

Q.—Is there any effective treatment for re-establishing nose-breathing in children who have had tonsils and adenoids removed and in whom there is no nasal obstruction? Is diastolization still used for this?

A.—Defective nose-breathing in a child may be due to a cause within the nasal cavity itself, to excessive lymphoid tissue in the post-nasal space (adenoids), or to habit.

It is customary to attribute any nasal symptoms in a child to adenoids, just as it is usual to attribute such symptoms in an adult to "catarrh." In both cases a proper examination of the nose after a careful history has been taken should be the rule. In not a few instances it will be found that the nasal obstruction is variable, possibly being worse in the morning on rising, and then an allergic cause should be considered. If the possibility of allergy has been excluded, and enlarged tonsils and adenoids have been removed, and the nasal airway seems clear, then the possibility of habit must be considered. Children who have of necessity been habitual mouth-breathers acquire a pattern of mouth-breathing which is continued even when the nasal airway has been restored. For these, breathing exercises are needed.

In some there may be a dental malformation which requires correction, and in very persistent mouth-breathers who have a good nasal airway it may be necessary to prescribe an obturator for wearing at night.

Diastolization is not generally practised now, though at one time it was popular in some children's clinics.

Anticoagulant Therapy at Sea

Q.—I sometimes have to treat cases of coronary occlusion while at sea, where no elaborate laboratory facilities are available. Should anticoagulants be used in these circumstances? If so, which are advised, how should they be given, and what is the minimum essential laboratory control?

A.—None of the anticoagulants which act by depressing the liver function should be used without laboratory facilities for measuring the prothrombin time from day to day: this applies to dicoumarol, ethyl biscoumacetate ("tromexan"), and "dindevan." Heparin, however, may be used safely without laboratory tests, and may be given in doses of 12,500 units twice daily, intramuscularly or intravenously. Intramuscular heparin is usually painful, and is best combined with 1 ml. of 2% procaine. Heparin is supplied in ampoules of 25,000 units per ml., or in a weak strength of 5,000 units per ml. The injections should be given with the least trauma possible; severe bruising at the site of the injection occurs sometimes despite precautions, but it is very rarely serious. At sea, the clotting time could easily enough be measured if there was any doubt about dosage, but the test would vary considerably according to the time it was done after the injection. One should aim at keeping the clotting time between two and three times normal. Protamine sulphate should be available so that the heparin could at once be neutralized if spontaneous haemorrhage occurred. It should be given intravenously in a dose of about 100 mg., repeated if necessary. One milligram of protamine neutralizes approximately 1 mg. of heparin. Anticoagulant treatment, if used at all, should be continued for three weeks at a minimum.

Travellers' Diarrhoea

Q.—Does the intestinal flora change when a person moves from one locality to another, and is this the cause of the attacks of enteritis which quite often accompany a change of habitat? What can be done to prevent them?

A.—Little is known about the normal composition of the intestinal flora, and no studies have been made of changes, if any, which follow movement of an individual from one locality to another. It has been conjectured that such changes might form the basis of the attacks of diarrhoea which commonly affect new arrivals in various districts, but of this there is no proof. The recent discovery that in children certain coliform organisms may cause enteritis opens up the possibility that diarrhoea in adults may be caused by similar organisms.

To make special efforts to maintain a high standard of hygiene while moving from one locality to another is the best method of preventing these attacks of enteritis. When travelling in the Tropics or setting up house in a new station, food and drink are often obtained, or may only be obtainable, from dubious sources. In these circumstances bacterial infections are readily acquired, as it may be difficult to boil drinking water or to ensure that salads and other uncooked foods are adequately prepared. To avoid such articles of diet and unboiled drinking water is probably the most important single hygienic measure in the prevention of the attacks of enteritis.

Burial of the Dead

Q.—What is the law on the burial of the dead? In particular, what regulations must be complied with before burial? Must the fact of burial be notified? May burial be elsewhere than in a churchyard? May it be an entirely secular affair? May burial be performed after dark?

A.—The law on burial of the dead cannot satisfactorily be compressed into a brief statement. It is embodied in a number of statutes, enacted between 1853 and 1906. Repeal or amendment of several of their provisions has created a situation which calls for the reconsideration of the whole field and consolidation of the law in a new statute. Reference should be made, in particular, to *The Law of Burial* (Fellows, A., 2nd edition, Madden, Best & Co., London, 1952) and to *The Disposal of the Dead* (Polson, C. J., Brittain, R. P., and Marshall, T. K., English Universities Press, London, 1953).

The regulations which apply to burial will depend upon the circumstances. When the death is due to natural causes, and is not a matter for report to the coroner, the first step is the issue of a medical certificate of cause of death and a notice to the informant by the registered medical practitioner who was in attendance upon the deceased during his or her last illness. These documents are required by the registrar of births and deaths before he may register the death, which step, in normal circumstances, must also be taken before burial is lawful. In addition, the person effecting disposal of the remains must notify the registrar within 96 hours of so doing. Burial after an inquest, or after a post-mortem examination ordered by the coroner but without the holding of an inquest, calls for modified procedure. It is also possible to effect burial prior to registration of the death provided written notice, supported by a medical certificate of cause of death, is received by the registrar. In these circumstances the informant is required to attend at the office of the registrar in order to complete the process of registration of the death.

Burial may take place not only in a churchyard but also in a burial ground, cemetery, or, for that matter, in any place conforming with regulations that relate to public health and town and country planning. Burial at sea is also lawful.

Burial may be an entirely secular affair. The Burial Laws Amendment Act, 1880, provides that burials may take place in the churchyard or burial ground of any burial board, without the service of the Anglican Church (section 1); and

the burial can take place without any kind of religious service if the person in charge of the burial so desires (section 6).

Burial may take place after dark, but it is advisable to consult the authorities in charge of the proposed place of burial, since their by-laws will probably include special provisions which concern unusual times of burial.

Streptomycin in Pregnancy

Q.—I would be grateful for an answer to the following query on the antibiotic treatment of pulmonary tuberculosis during pregnancy. It has been suggested that streptomycin reaches a high concentration in the amniotic fluid and causes damage to the vestibular apparatus of the foetus. Is this correct?

A.—Streptomycin has now been given to many pregnant women. There is no evidence that it has ever caused damage to the vestibular apparatus of the foetus. Streptomycin should not therefore be withheld from pregnant women who need it.

Ascorbic Acid and Phenylbutazone

Q.—I have gained the clinical impression that the administration of 50 mg. ascorbic acid with phenylbutazone increases the effectiveness of the latter drug. Is this effect recognized, and, if so, what is its mechanism?

A.—There is no scientific basis for believing that ascorbic acid increases the effectiveness of any analgesic drug, although "clinical impressions" to this effect have been recorded not infrequently. There is no contraindication to such a combination being given if this belief is held.

NOTES AND COMMENTS

Ergot Preparations and Migraine.—Dr. J. N. G. Druy (Blaby) writes: In your expert's reply to a query about ergot preparations and migraine ("Any Questions?" November 28, 1953, p. 1230) he says that dihydroergotamine may be used prophylactically, but the results are capricious, and its major value is when given at the first warning of an attack. I started to use this preparation two years ago and have had a small series of cases—ten or so—under observation for most of the time. No males have been treated. The frequency of onset of headache has been from two headaches a week to one a fortnight. All patients stated they had been nearly "laid out" by the headaches, and occasionally had to go to bed. I beg humbly to differ with your expert in that I believe the use of dihydroergotamine prophylactically is of more value (almost) than when given for an attack. All my patients have been taking five drops or so daily with 30 drops at the onset of an attack. I can say that in all cases the interval has been lengthened considerably—possibly one per month—and the "knock-out" attack now occurs infrequently. I have not observed any untoward side-effects. The patients complain only if for any reason they have not kept up taking the drops and the headache returns.

Our Expert writes: This is an interesting series and further observations would be useful. Certainly dihydroergotamine is not always a successful prophylactic.

"Any Questions?" Book.—The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 6 1954

THE BASIS OF SENSATION*

SOME RECENT STUDIES OF OLFACTION

BY

E. D. ADRIAN, O.M., M.D., D.Sc., F.R.C.P., P.R.S.

Master of Trinity College, Cambridge

It is probably inevitable that there should be a period when successive Banting lecturers will find themselves with little to say about their proper theme. We commemorate a man whose work was directly responsible for the prolongation of many million lives, whose biography should be far more interesting than that of most successful scientists. But those best qualified to give a picture of his unusual talents have already spoken, and he did not live so long ago that the lecturer can deal with the historical setting of his career. Successive Harveian Lectures add to our knowledge of Harvey's discoveries by describing the theories and politics of the Jacobean age: it is so far away and the thought of that period is so different from ours that the more we hear about it the better we shall understand Harvey. But the period of the first world war is too close to many of us to be treated objectively. A century hence historians may have plausible theories to show why we thought and acted as we did, and may try to explain why the sustained emotional pressure of the first war seemed different in quality from that of the second; but these lectures will be much more convincing when there is no one left alive to say that we did not feel like that.

Impressions from a Wartime Meeting

I am, in fact, too much a contemporary of Banting to pass historical judgment, and I had too little contact with him for personal reminiscence. Indeed, I met him only once—at the beginning of the second world war, when he was on a mission in England. Naturally it was difficult not to colour one's impression of him to match the almost legendary background of the insulin period, but even if one had known nothing about it I think one would have set him down as a man capable of great achievement. He was gentle and friendly, but one could feel his energy and determination. I had the impression that he would grasp at the essentials and be impatient of the details, and that he would face the simple issues which never occur to subtle but more conventional minds; and, of course, like all of us, he wanted very badly to be doing something. I think my strongest impression is of this impelling desire for action: since he had once scored so notably by taking the bull by the horns, he might have been even more impatient than he was. But he certainly gave me the impression of someone who had

*Banting Memorial Lecture delivered in Toronto on September 16, 1953.

it in him to take the bull by the horns again and would put through what he wanted to do by convincing everyone not so much that it was the best and the only thing to do, but that he would not rest till he had done it.

Soon after that he was killed, but, whatever he might have done, it is difficult to believe that the outcome could have satisfied his vision of what science might accomplish. His laurels came early, and he was not the kind of man to think he had done all that he ought to do. That was how he seemed at a brief meeting in the last war, and I have mentioned that impression because it is still curiously vivid. But wartime memories are notoriously coloured by the mood we were in; at that time the prevailing mood of biologists and medical scientists led them to believe that their science could have great practical uses in war if people in high office could only be persuaded to grant facilities and if the scientist could make up his mind what he wanted them for. The medical history of the war shows that they were not far wrong. But these were prodromal symptoms; after the temperature rose in the summer of 1940 we should probably have shown a different complexion. In this place where Banting lived and worked you know far better what sort of man he was, and it is enough for me to set down my feeling of the unusual kind of ability and courage which made him still a leader, not at all weighed down by the thought that no one could score again as he had done twenty years before.

Banting and Best's work has saved innumerable lives, but it has another reason to make it memorable—the fact that it was conceived by a young medical practitioner, able and ambitious, but with little training in research. It stands, therefore, as a constant beacon to young people who enter on the study of physiology or medicine and are not content to think as they are told. It should encourage them to believe that the first sight of the wood may give the clue that cannot be seen by all the experienced professors who are lost among the trees. Most of us are more or less lost and would be grateful for fresh light, though the older we get the more grudgingly we might accept it. At all events, most of us could point to chapters in the textbooks which seem to need the fresh outlook of a mind not weighed down by too much knowledge of details. Advertising our difficulties may not be the best way of getting out of the wood, for if our hearers paid much attention to what we told them we should

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drag them into the forest to share our obscurity. But it is better to speak of the mess we are in ourselves than to enlarge on that of our colleagues; and so the best tribute I can pay to Banting's memory must be to tell you how much we want new light in the field I know best, that of the physiology of sensation.

A Fundamental Difficulty

There is, first of all, a fundamental difficulty which does not seem to me to be soluble at all by experimental science—the difficulty of connecting physical and mental events, of bringing sensations and thoughts into the framework that we use so effectively for describing our external world. I cannot myself see how further knowledge of brain physiology will help us to reconcile mind and matter, but I am prepared to believe that a hundred years hence it will be difficult to understand why we ever puzzled about it. Even now there are many scientists and many philosophers who themselves find no difficulties and think they arise from faulty premises and outworn habits of thought. They may well be right. I should have more courage in thinking them wrong if I could forget the curious chapter in the history of biology when the scientific world was divided between the Ovists, who held that the embryo was a development of the ovum alone, and the Animalculists, who held that it was essentially a development of the spermatozoon. The notion that it might come from both together seemed too absurd to be considered—until something happened to break the spell and the joint origin became a reasonable idea.

No doubt the Renaissance produced many examples of the same sort, difficulties which vanished when ideas which had seemed inherent and unchangeable were found to be out of date. And so I am ready to believe that future generations will not find it as difficult as I do to include my mind in the scientific picture of the world. I am content to think that it is a puzzle for me, but that it may be no puzzle at all to someone without my particular preoccupations.

Cellular Mechanism of the Nervous System

If we discuss sensation we can scarcely leave the mind out of it, but I want to do so in what follows, for it will be mainly concerned with the cellular mechanism of the nervous system. I want to discuss the general organization of the nervous system which makes us react differently to different external events. We have a large number of receptor cells sensitive to different material changes, and we have a large number of motor neurones coupled to the muscles which produce our reactions. The environment and our reactions to it are changing all the time, and much of what we do cannot well be related to any one sensory stimulus, but it is a convenient simplification to think of a particular pattern of receptor stimulation as the cause of a particular pattern of response, and I make no apology for doing so. Admit, then, that the stimulation of certain receptors will produce a particular sequence of movement and the stimulation of others will produce a different sequence. What sort of organization is there to account for all the differential reactions which our nervous system will produce?

Obviously a great deal depends on the course of the pathways from the receptors to the motor nerve cells. We turn right or left when the stimulus is one-sided, because the signals enter the central nervous system from that side and are not evenly distributed; and we react differently to a sound or a light because the signals come by the auditory and the optic nerves and follow a different route. In less elaborately organized animals—sea anemones, for

instance—each group of receptors may serve a particular group of muscle fibres; the connexions are fixed and there is no central integration. But in the vertebrates there is a great deal of integration, and that means that the connexions and the route travelled by the signals can be varied considerably. The responses are different movements, and each involves a particular spatial and temporal distribution of activity in the motor nerve cells—a particular changing pattern of excitations and inhibitions. In the same way the signals from the receptors have particular spatial and temporal distribution for each event. The afferent and the efferent pattern are partly related by anatomical connexions, but there is an intermediate region where the connexions are sometimes open and sometimes closed and where a great variety of transmission is possible.

Sensory Excitation

The gross distribution of the sensory excitation is obviously of the first importance. We can recognize and react appropriately to a spoken word because it produces a particular sequence of excitation patterns in the cochlea, and we can recognize a face because the retinal excitation has the right shape. But the receptors of the eye show us colours as well as shapes, and the receptors of the skin give sensations of hot and cold and of various sorts of pain as well as of contact. We are aware of (or, if the mind is to be kept out of it, we react to) particular qualities of the stimulus as well as to its location and its intensity. Differences in the colour of adjacent patches in the visual field may perhaps be signalled by differences in the temporal evolution of the signals from them. This would avoid the need to credit the retina with special nerve fibres for colour from each point, but we know that the skin does use a different set of fibres to signal contacts, temperature, and pain, fibres of different diameter which lead to different pathways in the spinal cord. So we must be prepared to find that a sensory surface uses a variety of fibres to signal differences in the quality of the stimulus and that the result depends both on the general distribution of the excitation and on the particular varieties of nerve fibre which convey it.

How do these different sorts of fibre produce different effects in the central nervous system, different kinds of sensation, and a different reaction of the body? Though the fibres may be intimately mixed in the nerve trunks, there is often an anatomical sorting out when they enter the central nervous system; for instance, the fibres from the skin which signal touch extend up to the brain stem, whereas the non-medullated C fibres end in the cord. Even where there is no detectable sorting out it remains an obvious possibility that fibres from different kinds of receptor may have different kinds of dendritic connexion. But we are still faced with the need for a process which balances one excitation against another, and I believe we may be mistaken in thinking of the central nervous system as though it were made up of neurones which differ only in their structural features. I think we ought to consider the possibility of some variation in their chemistry as well.

So I am going to discuss the suggestion that the neurones from different varieties of receptor may liberate somewhat different material when an impulse reaches their dendritic endings and that the precise composition of the molecular output decides which of the succeeding neurones will be stimulated. It is true that this merely substitutes differences in humoral excitants for differences in dendritic structure, and there is more evidence for the latter, but I make the suggestion because I have been forced to realize how nervous elements which look much the same may differ greatly in their chemical sensitivity.

Olfactory Receptors

I am thinking, of course, of the olfactory receptors. The nose can distinguish an immense variety of molecules brought to it in the air drawn in at each inspiration. When we smell something we are aware of the intensity of the

smell, and we can usually tell where it comes from, but our chief awareness is of pure quality without any spatial or temporal attributes. Now the olfactory receptors are nerve cells furnished with hairs, which project into the mucous layer on the olfactory surface, and at the opposite pole with a non-medullated axon, which runs through the cribriform plate to end in the olfactory bulb. The number of these cells runs into millions even in a relatively small olfactory organ like that of man, and they are so closely packed that the position of the bulge formed by the nucleus varies from cell to cell. In some the nucleus is nearer the hairs and in others nearer the axon, but this is the only histological difference visible in a stained preparation. Two kinds of olfactory hair have been described in fresh preparations from the frog, and it is possible that they are parations from the frog, and it is possible that they are present in the mammal too, but there is no indication of any sharp division into two or more kinds of cell. In fact, the organ seems to be composed of a large surface packed with receptors which differ from one another only in the position of the nucleus in the cell and the position of the cell in the olfactory surface.

It is not possible to record the signals which pass to the olfactory bulb in the non-medullated axons, but we can record axon spikes in the neurones to which they lead. These are the mitral cells: large nerve cells with medullated axons which can be reached by a wire electrode thrust into the olfactory bulb. Since there are only 70,000 of them in the rabbit's bulb for many million receptors, the axon discharge must be a condensed version of the receptor signals, and a great deal of interaction may have taken place in the synaptic regions. But the receptors in touch with one mitral cell seem to be confined more or less to one part of the olfactory epithelium, though the extent of the receptive field is unknown.

Not only are the mitral-cell signals at one remove from the receptor signals, but they can be recorded profitably only in highly abnormal conditions, under anaesthesia deep enough to suppress all the spontaneous activity in the bulb. But if in such conditions we find that different smells give distinctive discharges they would scarcely fail to do so in the normal animal.

In the early stages, before I had learnt how to record from single units, I could get little satisfactory evidence of differential sensitivity in the receptors leading to any one point in the bulb. Smells strong enough to produce a mitral discharge would usually cause one in many units; sometimes the axon spikes seemed larger or smaller according to the nature of the stimulus, but that was all. On the other hand, there was no doubt that the different regions of the olfactory organ were not equally sensitive or equally accessible to all the molecules which could stimulate some part of it. Amyl acetate, ethyl acetate, and ether would always evoke a discharge in the anterior part of the bulb—corresponding to the anterior part of the olfactory surface—and the less volatile oils would rarely stimulate there, though they would give a large discharge at the back of the bulb. I still think that this large-scale difference in the distribution of the excitation is probably an important factor in the discrimination of smells, for in many animals the olfactory surface is so large and is folded into such complex channels that molecules of different properties carried in by the air stream would be unlikely to be deposited in an identical pattern. Another distinguishing feature may be the undoubted difference in the temporal evolution of the excitation with different substances. Volatility and solubility in water both favour a rapid rise and decline of the discharge, with little persistence between one inspiration and another. Thus the spatial and temporal pattern of the excitation will vary with the molecules which enter the nose, in much the same way as the pattern varies for the eye with the object in view and for the ear with the sound.

But these differences in timing and distribution cannot be shown to give more than a rough sorting out into a few categories, possibly dependent on the behaviour of the

material in water and in lipoids. Some further discriminating mechanism is needed to account for the great variety of smell which can be recognized even by the human nose, and it is supplied by the selective sensitivity of the individual receptors.

Selective Sensitivity

This was not evident until a method was devised for exposing the rabbit's nose to a concentration of the stimulating molecules which could be increased gradually from zero, the relative strength being signalled at each moment on the record of the impulse discharges. The method is simply to send two streams of air into the facepiece which covers the snout. Both are purified by filtration through charcoal (a necessary precaution to make them inodorous), and one is passed through a small bottle containing the substance to be tested, usually in liquid form. The rate of flow of this stream can be gradually increased by opening a screw valve, and the extent of the opening is signalled on the recording film.

With this arrangement and with a suitable position of the electrode and a good cranial circulation it is nearly always possible to show that different substances in threshold concentration will employ different mitral cells for signalling the stimulus. Usually a particular substance can be found that will evoke a discharge which is confined to a single unit near enough to the electrode to give large axon spikes. Another substance may give a threshold discharge confined to another single unit, though there will often be several units in action, and none of them close enough to the electrode to give distinctive axon spikes.

A discharge confined to one mitral unit is presumably due to an excitation confined to the particular group of receptors which lead to it, and since adjacent mitral units react to different substances it follows that adjacent groups of receptors have some degree of selective sensitivity. The degree of specificity varies greatly from one unit to another. The electrode may be close to a mitral cell which is in such unstable equilibrium that a very slight lightening of the anaesthesia will make it discharge spontaneously. Such a cell will usually start a discharge when the nose is tested with a wide variety of smells, and it may be impossible to pick out one which seems to have any specific relation to that cell alone. And the specific relation is a matter of degree; when one substance gives a threshold discharge confined to a single unit, related substances will usually stimulate that unit in low concentration, though they will stimulate other units as well. For instance, if benzene vapour gives a single series of large axon spikes, toluene and xylene will evoke similar spikes, though even at the threshold they will be mixed with smaller spikes from other units.

Many substances have been used in searching for these specific effects, but no attempt has been made to cover the whole range of odours. Yet enough experiments have been made to show that the substances tested fall into distinct groups, each tending to pick out particular mitral units, and that within each group one substance usually shows the greatest specificity—that is, one substance is most often found to give a discharge limited to a single one of the units within range of the electrode. Such substances are acetone in a group which includes esters like amyl acetate and ethyl acetate, benzene in the group of aromatic hydrocarbons, octane in the group of paraffin hydrocarbons, heavy oils, etc. Dipentene, cedar-wood oil, and eucalyptus belong to the large group of terpenes and related compounds, and all three have often given single unit discharges. Probably there are many other groups—for example, mercaptans. At least ten different substances have been found to pick out a single unit, but sometimes the same unit is picked out by several substances from different groups—for example, dipentene and acetone, benzaldehyde and amyl acetate, etc. In fact, the evidence suggests that particular types of molecular configuration have an affinity for particular varieties of receptor, but that the physical properties of the substance are also important.

In view of the regional differences in sensitivity found in the earlier experiments one would expect that the units responding, for example, to acetone would be found more often in the front part of the bulb and those responding to heavy oil at the back. There is undoubtedly a segregation of this kind, although, in the middle region, unit discharges have been obtained with substances from all the groups. It is true that most of these units can be made to discharge to a wide range of stimuli if the concentration is raised, but there will always be outlying parts of the olfactory organ where it has the threshold value needed to bring out the differential effects.

Assessment of the Different Factors

A great deal remains to be done before we can assess the different factors concerned in olfactory discrimination, but the important point is that neighbouring groups of olfactory receptors have marked differences in their sensitivity to different smells. I have no doubt, therefore, that olfactory discrimination is not due solely to the complex structure of the organ—that is, to the deposition of the material in different patterns on its surface owing to differences in the rate of air flow, size of molecules, etc.

In fact the olfactory epithelium proves to be a large collection of nerve cells which look alike, apart from the position of the nucleus, but differ so much in their properties that some will be excited by a trace of acetone vapour and others by a trace of benzene. This, of course, is no more than would be expected by anyone who contemplates the remarkable discriminative power of the nose. But it is an important point to have established, and I do not regret the time I have spent in trying to develop a different hypothesis.

It may be that the point is important only in connexion with the working of the olfactory organ; the receptors there may be the only cells which have developed such a high degree of chemical discrimination. But nerve cells in other places may show traces of the same discriminative power. Let us suppose, then, that there are sheets of such cells in the central nervous system with dendrites ending freely amongst the dendrites of afferent neurones, so that material liberated from these might come into contact with the dendrites from more than one cell. It cannot be expected that the terminations of the afferent neurones would liberate molecules as different as acetone and benzene, but if some neurones liberate acetylcholine and some noradrenaline it is not impossible that the molecules liberated by the fibre from a temperature receptor might differ considerably from those liberated by a pain fibre. The ultimate destination of the different signals reaching the dendritic network would then be determined by the different chemical sensitivities of the neurones whose dendrites are stimulated.

It is perhaps worth pointing out that the excitation of an olfactory receptor is a rapid process which ceases usually at the end of inspiration when the delivery of vapour is suspended, that the number of molecules needed to excite must be very small, and that they must be removed or neutralized rapidly. The same could be said of the excitation of a nerve cell by a humoral transmitter. I am bound to admit the difficulty of believing that all the different groups of molecules which stimulate the olfactory receptors are dealt with by different specific enzymes, as cholinesterase deals with acetylcholine, but they are certainly inactivated rapidly and completely.

Speculations which cannot be put to experimental test are seldom worth elaborating, and I cannot pretend that we should be in a much better position if this speculation turned out to be correct. A selective transmission determined by the nature of the material set free in the dendritic network might allow more variation than one determined by the detailed connexion of dendrites, but that is all that can be claimed for it.

Yet I think the olfactory organ may have something to teach us about the organization of the nervous system.

Since its nerve cells are found to have such selective properties we must be ready to look for similar properties in nerve cells elsewhere.

Conclusion

That, I am afraid, is a poor conclusion to a lecture which commemorates a man whose researches were of such immediate practical benefit to so many people. I wish I had something better to offer than these incomplete results on a sense organ which has never roused much interest. I can still recall the intense interest which the work of Banting and Best aroused in all of us, in physiologists as well as in every doctor. But such triumphant victories come very rarely, and they are separated by the slow, plodding attack on a wide front. I have described a minor incident in that attack with a speculation attached to it; but I have done so because most of our research is like that, and because it is with such inconclusive results that you must contrast the spectacular advance which came with the finding of insulin.

PROTECTION AFFORDED BY SICKLE-CELL TRAIT AGAINST SUBTERTIAN MALARIAL INFECTION

BY

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The aetiology of sickle-cell anaemia presents an outstanding problem common to both genetics and medicine. It is now universally accepted that the sickle-cell anomaly is caused by a single mutant gene which is responsible for the production of a type of haemoglobin differing in several important respects from normal adult haemoglobin (Pauling *et al.*, 1949; Perutz and Mitchison, 1950). Carriers of the sickle-cell trait who are heterozygous for the sickle-cell gene have a mixture of this relatively insoluble haemoglobin and normal haemoglobin; hence their erythrocytes do not sickle *in vivo*, whereas some at least of the homozygotes, who have a much greater proportion of sickle-cell haemoglobin, have sickle cells in the circulating blood, with inevitable haemolysis and a severe, often fatal, haemolytic anaemia. There is also a much smaller group of sickle-cell anaemia patients who are heterozygous for the sickle-cell gene as well as for some other hereditary abnormality of haemoglobin synthesis (Neel, 1952).

It is thus possible to approach the problem from the clinical or the genetical side. From the clinical point of view it is important to distinguish between carriers of the sickle-cell trait who show no other haematological abnormalities and patients with sickle-cell anaemia, who have a haemolytic disease which can reasonably be attributed to sickling of the erythrocytes. From the genetical point of view the main distinction is to be drawn between those who are homozygous and those who are heterozygous for the sickle-cell gene. In the great majority of instances two classifications coincide—that is, most individuals with the sickle-cell trait are heterozygous and most cases of sickle-cell anaemia, in Africa at least, are homozygous for the sickle-cell gene.

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The sickle-cell trait is remarkably common in some parts of the world. Among many African negro tribes 20% or more of the total population have the trait, and frequencies of 40% have been found in several African tribes (Lehmann and Raper, 1949; Allison, 1954). In parts of Greece frequencies of 17% have been described (Choremis *et al.*, 1953), and as many as 30% of the population in Indian aboriginal groups are affected (Lehmann and Cutbush, 1952).

Wherever the sickle-cell trait is known to occur sickle-cell anaemia will also be found. For a time it was thought by some workers that sickle-cell anaemia was rare among African negroes, but so many cases have been described during the past few years that this view is no longer tenable (Lambotte-Legrand and Lambotte-Legrand, 1951; Foy *et al.*, 1951; Edington, 1953; Vandepitte and Louis, 1953).

The main problem can be stated briefly: how can the sickle-cell gene be maintained at such a high frequency among so many peoples in spite of the constant elimination of these genes through deaths from the anaemia? Since most sickle-cell anaemia subjects are homozygotes, the failure of each one to reproduce usually means the loss of two sickle-cell genes in every generation. It can be estimated that for the lost genes to be replaced by recurrent mutation so as to leave a balanced state, assuming that the sickle-cell trait—that is, the heterozygous condition—is neutral from the point of view of natural selection, it would be necessary to have a mutation rate of the order of 10^{-1} . This is about 3,000 times greater than naturally occurring mutation rates calculated for man and, with rare exceptions, in many other animals— 3.2×10^{-5} in the case of haemophilia (Haldane, 1947). A mutation rate of this order of magnitude can reasonably be excluded as an explanation of the remarkably high frequencies of the sickle-cell trait observed in Africa and elsewhere.

Possibility of Selective Advantage

Of the other explanations which can be advanced to meet the situation, one has received little attention: the possibility that individuals with the sickle-cell trait might under certain conditions have a selective advantage over those without the trait. It was stated for many years that those without the trait was in itself a cause of morbidity, but the sickle-cell trait was in itself a cause of morbidity, but this belief seems to have been based upon unsatisfactory criteria for distinguishing the trait from sickle-cell anaemia. The current view is that the sickle-cell trait is devoid of selective value. Henderson and Thornell (1946) found that in American negro air cadets who had passed a searching physical examination the incidence of the sickle-cell trait was the same as in the general negro population of the United States. Lehmann and Milne (1949) were unable to discover any correlation between haemoglobin levels and the presence or absence of the sickle-cell trait in Uganda Africans. And Humphreys (1952) could find no evidence that the sickle-cell trait was responsible for any morbidity in Nigerian soldiers.

However, during the course of field work undertaken in Africa in 1949 I was led to question the view that the sickle-cell trait is neutral from the point of view of natural selection and to reconsider the possibility that it is associated with a selective advantage. I noted then that the incidence of the sickle-cell trait was higher in regions where malaria was prevalent than elsewhere. The figures preliminary to Lehmann and Raper (1949) for the frequency of the sickle-cell trait in different parts of Uganda lent some support to this view, as did the published reports from elsewhere. Thus the trait is fairly common in parts of Italy

and Greece, but rare in other European countries; in Greece the trait attains its highest frequencies in areas which are conspicuously malarious (Choremis *et al.*, 1951).

Relation between Malaria and Sickle-cell Trait

Other reports appeared suggesting more directly that there might be a relationship between malaria and the sickle-cell trait. Beet (1946) had observed that in a group of 102 sicklers from the Balovale district of Northern Rhodesia only 10 (9.8%) had blood slides showing malaria parasites, whereas in a comparable group of 491 non-sicklers 75 (15.3%) had malaria parasites. The difference in incidence of malaria in the two groups is statistically highly significant ($\chi^2=19.349$ for 1 d.f.)*; hence Beet's figures imply strongly that malaria is less frequent among individuals with the sickle-cell trait than among those without the trait. The difference in malarial susceptibility between sicklers and others seemed to be most pronounced at the time of the year when malaria transmission was lowest.

Later, in the Fort Jameson district of Northern Rhodesia, Beet (1947) found that the same difference was present, although it was much less pronounced. Of 1,019 non-sicklers, 312 (30.6%) had blood slides with malaria parasites, whereas of 149 sicklers 42 (28.2%) showed malaria parasites. This difference is not statistically significant. However, among the sicklers from Fort Jameson enlarged spleens were less common than among non-sicklers. In a series of 569 individuals there were 87 with the sickle-cell trait; 24 (27.9%) of these had palpable spleens, as compared with 188 (39.0%) with splenomegaly out of 482 non-sicklers. This difference is again statistically significant ($\chi^2=4.11$ for 1 d.f.). Beet concluded that Africans with the sickle-cell trait were probably liable to recurrent attacks of thrombosis, with resultant shrinkage of the spleen.

Brain (1952a), also working in Rhodesia, confirmed Beet's observation that the spleen is palpable in a much lower proportion of sicklers than of non-sicklers; he went on to suggest that the finding might be explained by diminished susceptibility to malaria on the part of the sicklers. Moreover, Brain (1952b) compared the proportion of hospitalized cases in groups of African mine-workers with and without the sickle-cell trait. He found that the sicklers actually spent less time in hospital, on an average, than did the control group of non-sicklers. The incidence of malaria and pyrexias of unknown origin was much lower in the group with sickle cells.

It became imperative, then, to ascertain by more direct methods of investigation whether sickle cells can afford some degree of protection against malarial infection, thereby conferring a selective advantage on possessors of the sickle-cell trait in regions where malaria is hyperendemic. An opportunity to do this came during the course of a visit to East Africa in 1953.

Incidence of Malarial Parasitaemia in African Children with and without the Sickle-cell Trait

The observations of Beet and of Brain on differences in parasite rates and spleen rates are open to criticism because the populations were heterogeneous and were drawn from relatively wide areas. It was decided, therefore, to carry out similar tests on a relatively small circumscribed community, where all those under observation belong to a single tribe. Children were chosen rather than adults as subjects for the observations so as to minimize the effect of acquired immunity to malaria. The recorded incidence of parasitaemia in a group of 290 Ganda children, aged 5 months to 5 years, from the area surrounding Kampala (excluding the non-malarious township) is presented in Table I. The presence of sickling was demonstrated by chemical reduction of blood with isotonic sodium metabisulphite (Daland and Castle, 1948). Fresh reducing solutions were made up daily.

*These and other statistics in this paper are my own, using available figures.

TABLE I

	With Parasitaemia	Without Parasitaemia	Total
Sicklers	12 (27.9%)	31 (72.1%)	43
Non-sicklers	113 (45.7%)	134 (53.3%)	247

It is apparent that the incidence of parasitaemia is lower in the sickle-cell group than in the group without sickle cells. The difference is statistically significant ($\chi^2=5.1$ for 1 d.f.). In order to test as many families as possible only one child was taken from each family. There is no reason to suppose that these groups are not comparable, apart from the presence or absence of the sickle-cell trait.

The parasite density in the two groups also differed: of 12 sicklers with malaria, 8 (66.7%) had only slight parasitaemia (group 1 on an arbitrary rating), while 4 (33.3%) had a moderate parasitaemia (group 2). Of the 113 non-sicklers with malaria, 34% had slight parasitaemia (group 1), the parasite density in the remainder being moderate or severe (group 2 or 3).

It may be noted, incidentally, that of the four cases in the sickle-cell group with moderate parasitaemia three had *P. malariae*, even though this species is much less common than *P. falciparum* around Kampala. It seems possible from these and other observations that the protection afforded by the sickle-cell trait is more effective against *P. falciparum* than against other species of plasmodia, but much further work is necessary to decide the point.

These results suggest that African children with the sickle-cell trait have malaria less frequently or for shorter periods, and perhaps also less severely, than children without the trait. Further evidence regarding the protective action of the sickle-cell trait could be obtained only by direct observation on the course of artificially induced malarial infection in volunteers.

Progress of Malarial Infection in Adult Africans with and without the Sickle-cell Trait

Fifteen Luo with the trait and 15 Luo without the trait were accepted for this investigation. All the volunteers were adult males who had been away from a malarious environment for at least 18 months. The two groups were

of a similar age and appeared to be strictly comparable apart from the presence or absence of the sickle-cell trait. Two strains of *P. falciparum* were used: one originally isolated in Malaya and one from near Mombasa, Kenya; in Table II these are marked with the subscripts 1 and 2 respectively. The infection was introduced by subinoculation with 15 ml. of blood containing a large number of trophozoites (B in the table) or by biting with heavily infected *Anopheles gambiae* (M in the table). At least 3 out of the 10 mosquitoes applied had bitten each individual, and the presence of sporozoites was confirmed by dissection of the mosquitoes.

The cases were followed for 40 days. Parasite counts for each case were made by comparison with the number of leucocytes in 200 oil-immersion fields of thick films, the absolute leucocyte counts being checked at intervals. The abbreviated results of these counts are shown in Table II. In the few cases in which parasitaemia was pronounced and the symptoms were relatively severe the progress of the disease was arrested. At the end of the period of observation in every case a prolonged course of antimalarial chemotherapy was given.

Discussion

It is apparent that the infection has become established in 14 cases without the sickle-cell trait. The parasitaemia is relatively light, however, when compared with that observed in non-immune populations—for example, the Africans described by Thomas *et al.* (1953). This is to be expected: the Luo come from a part of the country where malaria is hyperendemic, and they have acquired a considerable immunity to malarial infection in childhood. This factor makes the interpretation of the observations rather more difficult; however, it could not be avoided, since all the East African tribes who have high sickling rates come from malarious areas, and the acquired immunity should operate with equal force in the groups with and without sickle-cells. The acquired immunity was actually an advantage, since the symptoms were mild and the chances of complication very slight.

In the group with sickle cells, on the other hand, the malaria parasites have obviously had great difficulty in establishing themselves, in spite of repeated artificial infec-

TABLE II

No.	Mode of Infection and Strain	Day after Infection																
		8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
Luo With No Sickle-cells																		
1	M ₁ B ₁	0.03	—	0.07	2.5	5.0	2.5	5.0	1.2	0.4	0.02	0.01	—	—	—	0.1	0.01	—
2	M ₁ B ₁	—	—	—	—	—	—	—	0.03	0.13	0.41	—	—	—	—	0.03	—	ST
3	M ₁ B ₁	—	—	—	—	—	—	—	0.1	0.02	0.20	5.0	2.5	—	—	—	—	ST
4	M ₁ B ₁	—	—	—	—	0.02	0.02	0.5	0.83	0.12	0.2	1.0	1.25	1.67	0.2	5.0	2.0	ST
5	M ₁ B ₁	—	—	—	—	0.05	1.0	1.67	0.25	0.05	0.07	0.25	1.0	0.83	0.25	0.17	—	ST
6	M ₁ B ₁	0.02	5.0	10.0	10.0	1.0	0.1	0.01	ST	—	—	—	1.2	1.0	0.03	—	—	ST
7	B ₁	—	—	—	—	15.0	50.0	ST	—	—	—	—	—	—	—	—	—	—
8	B ₁	—	—	—	—	5.0	—	—	—	—	—	—	—	—	—	—	—	—
9	B ₁	—	—	0.13	5.0	1.67	0.33	—	0.1	0.5	—	—	—	—	—	—	—	—
10	B ₁	—	—	—	—	—	—	0.05	0.05	—	—	—	1.0	0.1	2.5	10.0	5.0	ST
11	B ₁	—	0.05	0.3	—	—	—	—	0.2	—	—	—	—	—	—	—	—	ST
12	B ₁	—	—	0.3	0.3	0.3	0.1	0.3	ST	—	—	—	—	—	—	—	—	—
13	B ₁	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14	B ₁	2.0	1.7	2.0	60.0	5.0	0.6	—	—	—	—	—	—	—	—	—	—	—
15	B ₁	0.05	0.3	—	0.4	0.1	0.3	ST	—	—	—	—	—	—	—	—	—	—
Luo With Sickle-cell Trait																		
1	M ₁ B ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	ST
2	M ₁ B ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	M ₁ B ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	M ₁ B ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5	M ₁ B ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6	M ₁ B ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7	M ₁ B ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8	M ₁ B ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9	M ₁ B ₂	0.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	M ₁ B ₂	—	—	—	—	—	—	—	—	—	—	—	0.03	0.1	0.03	0.03	—	—
11	B ₂ M ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12	B ₂ M ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13	B ₂ M ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14	B ₂ M ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15	B ₂ M ₂	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Figures represent parasite counts in hundreds per mm.³ of blood. ST—Stopped by chemotherapy.

tion. Only two of the cases show parasites, and the parasite counts in these cases are comparatively low. The striking difference in the progress of malarial infection in the two groups is taken as evidence that the abnormal erythrocytes in individuals with the sickle-cell trait are less easily parasitized than are normal erythrocytes.

It can therefore be concluded that individuals with the sickle-cell trait will, in all probability, suffer from malaria less often and less severely than those without the trait. Hence in areas where malaria is hyperendemic children having the trait will tend to survive, while some children without the trait are eliminated before they acquire a solid immunity to malarial infection. The protection against malaria might also increase the fertility of possessors of the trait. The proportion of individuals with sickle cells in any population, then, will be the result of a balance between two factors; the severity of the gene, and the rate of elimination of the sickle-cell genes in individuals dying of sickle-cell anaemia. Or, genetically speaking, this is a balanced polymorphism where the heterozygote has an advantage over either homozygote.

The incidence of the trait in East Africa has recently been investigated in detail (Allison, 1954), and found to vary in accordance with the above hypothesis. High frequencies are observed among the tribes living in regions where malaria is hyperendemic (for example, around Lake Victoria and in the Eastern Coastal Belt), whereas low frequencies occur consistently in the malaria-free or epidemic zones (for example, the Kigezi district of Uganda; the Kenya Highlands; and the Kilimanjaro, Mount Meru, and Usumbara regions of Tanganyika). This difference is often independent of ethnic and linguistic grouping; thus, the incidence of the sickle-cell trait among Bantu-speaking tribes ranges from 0 (among the Kamba, Chagga, etc.) to 40% (among the Amba, Simba, etc.). The world distribution of the sickle-cell trait is bit, etc.). The world distribution of the sickle-cell trait is also in accordance with the view presented here that malarial endemicity is a very important factor in determining the frequency of the sickle-cell trait. The genetical and anthropological implications of this view are evident.

The fact that sickle cells should be less easily parasitized by plasmodia than are normal erythrocytes is presumably attributable to their haemoglobin component, although there may be other differences, not yet observed, between the two cell-types. Sickle-cell haemoglobin is unlike normal adult haemoglobin in important physico-chemical properties, notably in the relative insolubility of the sickle-cell haemoglobin when reduced (Perutz and Mitchison, 1950). The malaria parasite is able to metabolize haemoglobin very completely in the intact red cell, the haematin pigment remaining as a by-product of haemoglobin breakdown (Fairley and Bromfield, 1934; Moulder and Evans, 1946). That plasmodia are greatly affected by relatively small differences in their environment is suggested by their remarkable species specificity. Thus the difficulty of establishing an infection in monkeys with human malaria parasites, and vice versa, is generally recognized.

How far species differences in the haemoglobins themselves, known from immunological and other studies, are responsible for the species specificity of plasmodia it is impossible to say. However, the physico-chemical differences between human adult haemoglobin and monkey haemoglobin appear to be less pronounced than the differences between either type and sickle-cell haemoglobin. It is clear that the natural resistance to malaria among individuals with the sickle-cell trait is relative, not absolute. This is perhaps attributable to differences in the expressivity of the sickle-cell gene, which may be responsible for the production of from nearly 50% to only a very small amount of sickle-cell haemoglobin (Wells and Itano, 1951; Singer and Fisher, 1953). Moreover, the sickle-cell haemoglobin may not be evenly distributed in the cell population; most observers recognize that there are cases in which only some of the red cells are sickled even after prolonged reduction. However, even a relative resistance to malaria may be

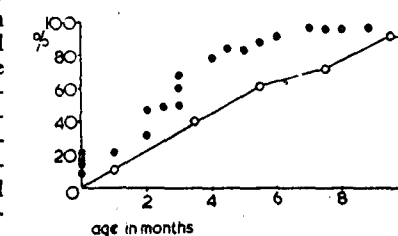
enough to help those with the sickle-cell trait through the dangerous years of early childhood, during which an active immunity to the disease is developed.

The above observations focus attention upon the importance of haemoglobin to plasmodia in the erythrocytic phase. Hence it is worth considering whether erythrocytes containing other specialized or abnormal types of haemoglobin might be resistant to malaria also. Thus, human foetal haemoglobin differs from human adult haemoglobin in many properties. Red cells containing foetal haemoglobin continue to circulate in the newborn for the first three months of life, after which they are quite rapidly replaced by cells containing normal adult haemoglobin. It has long been known that the newborn has a considerable degree of resistance to malarial infection; Garnham (1949), for instance, found that in the Kavirondo district of Kenya at the end of the second month of life only 10% of babies were infected; after this age the percentage affected rises rapidly, until by the ninth month practically all children have the disease. The correspondence between the appearance of cells containing normal adult-type haemoglobin and malarial susceptibility is illustrated in the Chart. The correspondence may of course be fortuitous, but it is striking enough to merit further investigation, even though other factors, such as a milk diet deficient in *p*-aminobenzoic acid (Maegraith *et al.*, 1952; Hawking, 1953) and immunity acquired from the mother (Hackett, 1941) may play a part in the natural resistance of the newborn to malaria.

Finally, it is possible that the explanation offered above for the maintenance of the sickle-cell trait may also apply to thalassaemia. The problems presented by the two diseases are very similar; many homozygotes, and possibly some heterozygotes, are known to die of thalassaemia, and yet the condition remains remarkably common in Italy and Greece, where as many as 10% of the individuals in certain areas are affected (Bianco *et al.*, 1952). Greek and Italian authors have commented that cases of thalassaemia usually come from districts severely afflicted with malaria (Choremis *et al.*, 1951). Perhaps those who are heterozygous for the thalassaemia gene suffer less from malaria than their compatriots: the fertility of the heterozygotes appears to be greater (Bianco *et al.*, 1952). Selective advantage of the heterozygote with the sickle-cell gene, and possibly the heterozygote with the thalassaemia gene also, would explain why such high gene frequencies can be attained in the case of these conditions while other genetically transmitted abnormalities of the blood cells remain uncommon, not very much above the estimated mutation rate—for example, hereditary spherocytosis (Race, 1942).

Summary

A study has been made of the relationship between the sickle-cell trait and subtertian malarial infection. It has been found that in indigenous East Africans the sickle-cell trait affords a considerable degree of protection against subtertian malaria. The incidence of parasitaemia in 43 Ganda children with the sickle-cell trait was significantly lower than in a comparable group of 247 children without the trait. An infection with *P. falciparum* was established in 14 out of 15



The apparent relationship between the appearance of adult-type haemoglobin (dots) and malarial infection (circles) in the newborn. Each dot represents a test on a single individual, using an alkali denaturation technique (Allison, unpublished observations); the circles represent the percentage of Luo children showing malaria parasites (Garnham, 1949).

Africans without the sickle-cell trait, whereas in a comparable group of 15 Africans with the trait only 2 developed parasites.

It is concluded that the abnormal erythrocytes of individuals with the sickle-cell trait are less easily parasitized by *P. falciparum* than are normal erythrocytes. Hence those who are heterozygous for the sickle-cell gene will have a selective advantage in regions where malaria is hyperendemic. This fact may explain why the sickle-cell gene remains common in these areas in spite of the elimination of genes in patients dying of sickle-cell anaemia. The implications of these observations in other branches of haematology are discussed.

This investigation was made possible by a grant received from the Colonial Office at the recommendation of the Colonial Medical Research Committee. Acknowledgment is made to the Directors of Medical Services, Kenya and Uganda, to Dr. E. J. Foley, Nairobi, to the staff of the Mulago Hospital, Kampala, and to the volunteers for their kind co-operation. To Dr. G. I. Robertson, Nairobi, a special debt of gratitude is due for constant help and advice. Drs. A. E. Mourant, R. G. Macfarlane, and A. H. T. Robb-Smith read the manuscript and made valuable comments and suggestions.

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In 1950 a mass-miniature-radiography survey was undertaken in Los Angeles County, California. The population concerned numbered over three million, and more than half—1,736,703—responded and were x-rayed satisfactorily. This was the largest survey undertaken up to that date in the United States. Abnormalities were found in 67,966 individuals, of whom ultimately 2,404 were classified as tuberculosis suspects. 1,857 previously unknown cases of active tuberculosis were discovered—a rate of 1.08 per 1,000. Among 10,899 cardiovascular suspects the diagnosis of heart disease was confirmed in 3,388, but of these only 697 were previously unknown: the discovery rate for cardiac cases was 0.4 per 1,000. Exactly 3,500 lung cancer suspects were registered. Ultimately neoplasms were confirmed in 329 cases, of which 246 or 0.14 per 1,000 were malignant. (Los Angeles County-wide Chest X-ray Survey of 1950, by G. J. Drolet. Published by the Tuberculosis Control Foundation, Los Angeles, 1953.)

THE VARIABILITY OF SICKLE-CELL RATES IN THE TRIBES OF KENYA AND THE SOUTHERN SUDAN

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We have recently completed a survey of the distribution of sickle cells in the blood of 44 tribes and subtribes in Kenya, and 26 in the southern provinces of the Sudan. The results are given in Tables I and II. In a certain number of tribes the ABO blood groups were also done the results being given in Table III.

In the present communication we wish to stress that, while the sickling phenomenon is very widespread throughout Africa, south of the Sahara the most striking

TABLE I.—Sickle-cell Trait (Kenya)

Race	Tribes	Tribal Division	Location	No. Examined	Positive
				No.	%
Bantu (North-East, Coastal)	Kikuyu	Fort Hall	Nairobi	67	1 2
	Teita	Dahida	Wau	127	0 0
	Pare		Taveta	40	2 5
	Chagga		Kibo	75	0 0
	Taveta		Taveta	154	37 24
	Kamba		Machakos	134	2 1
	Nyika	Girirama	Malindi	150	16 11
			Kilifi	39	4 10
			Jaribuni		
			Kaloleni	90	23 26
			Jibanas	119	16 13
			Rabai	48	5 10
			Ribe	50	13 26
			Kambe	78	27 35
Bantu (North-Kavirondo)	Digos		Maambwoni	50	11 22
	Duruma			68	7 10
	Ngatana		Garsen	102	27 27
			Bargoni	81	0 0
			Witu	61	0 0
			Adu	68	8 12
			Majengo	100	9 9
			Kimba	100	6 6
			Kapsengeri	44	2 5
			Bungoma	100	21 21
			Kakamegas	50	6 12
				46	0 0
			Butori	100	10 10
			Mumias	96	19 20
Bantu (South-East, Coastal)	Kisii (Bantu-Nilote?)		Kericho	100	3 3
	Makonda		Porto	100	40 40
			Amelia		
			Vipingo	50	2 4
			Kajiado	100	0 0
			Narok	82	0 0
			Garsen	30	0 0
			Kericho	100	2 2
				14	0 0
				20	0 0
				16	0 0
Nilote-Hamites	Masai	Kuputei			
		Lodokelani			
		Purko			
		Loita			
Mixed Arab-Negro	Boran				
	Turkanas				
	Luo				
	Bajuns				
Swahili					
Arabs					

TABLE II.—Sickle-cell Trait (Southern Sudan)

Race or Language Group	Tribes	Subtribe	Location	No. Examined	Positive
				No.	%
Nilotic	Dinka	Bor	Malek Cattle Post	87	0 0
				77	2 3
				22	0 0
				20	0 0
				38	0 0
				100	1 1
				110	0 0
				56	0 0
				105	18 17
				98	7 7
				54	6 11
				30	1 3
				96	8 8
				71	13 18
Nilote-Hamitic	Bari	Bari (true)	Rejaf	100	7 7
				100	9 9
				39	3 8
				76	6 8
				105	9 8
				71	2 3
				80	13 16
				72	0 0
				70	0 0
				98	5 5
				73	1 2
				38	0 0
				28	3 11
Bongo-Mittu-speaking group	Bari	Bari (true)	Rejaf	100	7 7
				100	9 9
				39	3 8
				76	6 8
				105	9 8
				71	2 3
				80	13 16
				72	0 0
				70	0 0
				98	5 5
				73	1 2
				38	0 0
				28	3 11
Lotuku-speaking group	Moro	Moro	Juba	100	7 7
				100	9 9
				39	3 8
				76	6 8
				105	9 8
				71	2 3
				80	13 16
				72	0 0
				70	0 0
				98	5 5
				73	1 2
				38	0 0
				28	3 11
Didinga-speaking group	Mundu	Mundu	Yei	100	7 7
				100	9 9
				39	3 8
				76	6 8
				105	9 8
				71	2 3
				80	13 16
				72	0 0
				70	0 0
				98	5 5
				73	1 2
				38	0 0
				28	3 11
Western Bantu?	Logia	Logia	Juba	100	7 7
				100	9 9
				39	3 8
				76	6 8
				105	9 8
				71	2 3
				80	13 16
				72	0 0
				70	0 0
				98	5 5
				73	1 2
				38	0 0
				28	3 11
Azande					

TABLE III. ABO Blood Groups (Kenya)

Tribes or Subtribe	No. Examined	Distribution Blood Groups (%)			
		A	B	O	AB
Taveta	56	30	22	44	4
Teita	27	41	7	45	7
Jibanas	22	28	47	73	3
Chonyia	25	5	57	37	3
Kamba	77	25	26	50	2
Olirama	100	22	16	43	16
Duruma	37	24	36	56	—
Kauma	27	8	20	60	6
Rabais	50	14	10	78	2
Ribe	50	10	26	38	7
Pokomo	42	29	50	34	10
Boni	50	6	2	34	0
Sanya (Witu)	61	64	31	37	9
Sanya (Adu)	65	23	16	52	2
Bajan	37	30	46	35	8
Swahili	98	10	10	54	3
Arabs	61	33			

variations are found in its frequency and in that of the ABO blood groups; we also suggest reasons for this variability. Although the rates are based on relatively small samples, the differences noted are statistically highly significant.

any admixture of Caucasian blood as suggested by Lehmann and Raper (1949). We think, however, that the simple homozygous-heterozygous hypothesis may not take into consideration all the known facts, since it is not uncommon to find cases of sickle-cell anaemia, only one of whose parents have the trait, or only one the anaemia. It should, however, be remembered in this connexion that daily variations sometimes occur in the sickling of the same individual, especially in the trait condition, for reasons which at present are not clear. Further, we have noticed in our surveys that some individuals may have large numbers of sickle cells, whilst in others only one or two characteristic sickle cells can be found in the whole film. In view of this, it is possible that internal or external environment has some effect on the manifestation of the condition. However, since wide variations are found between tribes and subtribes occupying apparently similar external environments, this possibility appears to us to be rather unlikely, and, so far as we are aware, external environment has not been shown to effect the frequencies of ABO groups, yet similar variations occur, as with sickling.

2. Inter-marriage of neighbouring tribes with different rates in certain areas might produce groups with rates intermediate between them. If this were an important factor, then one would expect it to operate in the subgroups of the same tribe living under similar conditions and related geographically and culturally. Thus, the Mandari of Tali Post, who might originally have had a high sickling rate, could have intermarried with the low rate Dinkas, yet similar Mandari of Terakeka, also surrounded by similar Dinkas, have a high rate. The Nyika subtribes living in the same location and in the closest proximity have very different sickling rates. For example, the contiguous Durumas and Digos have rates of 10% and 22% respectively, and, similarly, the rates for the Ribe and Jibanas are 26% and 13%.

It is also difficult to imagine how inter-marriage could have caused differences as large as those found. For example, among the Makonda, where the rates in the two subgroups are 4% and 40%, the original racial strain with a high sickling rate must, on this hypothesis, have been diluted, in the low-rate group, to one-tenth by inter-marriage, and have very little "Makonda" left in it.

In addition, if racial or tribal mixtures were the complete explanation of the variability, we would expect differences in the blood-group frequencies to be associated with the sickling rate, but this does not occur, as will be seen from Table III. For example, a low frequency of the B blood group is associated with a high sickling rate among the Chonyis and Ribe, but with a low rate of sickling among the Sanya of Witu.

3. If sickle-cell anaemia often causes death among Africans before the reproductive period, how is it that the trait condition is so common? Our own experience in Kenya is that mortality in the anaemic condition is high, especially in the age group of 0-10 years. This being so, there must be some counteracting factor which prevents reduction in the gene frequency. This maintenance of a high gene frequency may indicate: (1) spontaneous mutations; this would seem unlikely in view of the probable rarity of mutation compared with the rate of mutation necessary to replace the genes lost by death. (2) Heterosis, in relation to reproduction, the heterozygote being more fertile than the homozygote (Boyd, 1950). Although no direct evidence of this is available for the sickle-cell trait, it is perhaps worth while to note that the effect of deaths in young children—or in utero—on the gene frequency might not be as large as would be expected, since the African woman would then be able to bear another child at a shorter interval than normally, this being linked with the custom, almost universal in East and Central Africa, of long periods of lactation, during which coitus is prohibited. If hybrid vigour is a factor in the situation, it might be affected by environment, and this would introduce a further source of variation in the incidence of the trait rate. It seems improbable, however, that these considerations could apply to blood-group variations; and if we are searching for a common cause for the variability in the two characteristics (blood groups and sickling), then this suggestion must be ruled out.

4. Genetic drift may be a factor where small groups of people are virtually isolated genetically—that is, they marry almost entirely within their own small group. In such small groups purely chance factors operating over a long period may cause the gene frequency to change greatly. If the population of such a small group then increases, the changed gene frequency will remain fairly stable unless inter-marriage or other factors are introduced to upset it. The discussion under inter-marriage, above, indicates that inbreeding may have been the rule among the groups examined. Our knowledge of African conditions of living and the effects of famine, epidemics, etc., leads us to

suppose that the present tribes and subtribes may have been very small in number at some period in the past. It seems reasonable, therefore, to suppose that conditions suitable for the action of genetic drift may have existed among these tribal groups, and that the variation thus introduced has not yet been equalized by widespread intermixture of tribes. Such genetic drift would affect the genes both for sickling and for blood groups, but each one independently, so that, while variability would follow in each case, there would be no association between the drift for sickling and that for blood groups. The situation that would develop would be precisely that found to exist in our surveys.

In short, it is evident that there are variations in the rate of sickling (a) among what are generally regarded as the major African races, such as the Eastern Hamites, with rates below 1%, and the Nilotics and Bantu, sometimes with high rates; (b) among individual tribes within the major African races—for example, among the Bantu group of East Africa, such as the Taveta, Kikuyu, Pokomo, etc., which have high rates, and the Teita, Chagga, Pare, Boni, etc., who have almost no sickling; and (c) between subgroups of the same tribe as described above for the Nyika.

Ethnological Significance

In view of our findings, what can be said regarding the ethnological significance of sickle-cell trait in Africa—or, in fact, about the significance of the ABO blood groups?

It would appear from our results that rates taken from only one group of any particular tribe cannot be regarded as characteristic for the tribe as a whole, nor can the overall rates for a tribe represent the situation in a major African race.

If the hypothesis of genetic drift is applicable, then it follows that the present sickling rate in a tribe or sub-tribe may not bear much relationship to the frequency of the trait as originally introduced. Rates for individual tribes would therefore have little significance ethnologically. On the other hand, random drift is as likely to increase as to decrease the rates, and averages over a number of different tribes which originally had much the same sickling frequency would tend to approximate to that frequency. It is possible that widespread and detailed information on the sickle-cell distribution might give important ethnological information. Such detailed information is not at present available.

Nevertheless, we feel that some of the results presented here may be of ethnological significance. For example, the widely distributed Nilotes in Central Africa are divided according to sickling rates into two main groups—namely, the Dinka, Shilluk, and Nuer of the Sudan, with very low rates, and the Jaluo, Lango, Alur, and Acholi of Kenya and Uganda, with medium to high rates. We do not think that these differences can be ignored ethnologically, although the languages of the two groups have close affinities. It may be worth noting that the frequency of sickling in the Dinka, Nuer, and Shilluk resembles closely that of the Eastern Hamitic races, such as the Masai, Galla, Turkhanas, etc., as do their pastoral and dietetic habits. On the other hand, the Luo, Lango, and Alur have high sickling rates, and are a predominantly agricultural people, with dietetic habits that are unlike those of the Eastern Hamites.

Unless it has a selective value, the frequency of a gene, appearing by mutation in an isolated population, has a negligible probability of increasing. The sickle-cell gene may have been introduced into Africa from outside, perhaps from the East, either overland or by sea. The sea route seems to be the more likely, considering the high rate among the riverine Pokomos and the Makua and Makonda, and the very low rate among the Eastern Hamites, through whose forebears, if it came overland, the gene would have to pass; and it would have persisted among their present-day descendants. The high frequencies found in certain tribes indicate that the proportion of invaders carrying the gene to the invaded was high.

This relation between the invaders and the original population probably varied from place to place as communities became established; and the variation, together with the influence of genetic drift, could, we suggest, account for the widely different incidences that we have found from tribe to tribe. These differences would persist only if relative isolation continued, and it is generally believed that intermarriage is now common and probably always occurred to some extent.

With these facts in mind, it is of interest to note the suggestion of Lehmann (1953) that the sickle-cell condition may have been introduced in Africa and the Mediterranean region by migrating Veddic peoples.

Inter-marriage would tend to reduce the variability caused by genetic drift: although variations in A and B frequencies were also found they did not present the sharp contrasts in which were also found they did not present the sickling trait, and this may contiguous areas shown by the sickling trait, and this may suggest that the A and B genes were introduced earlier than the sickling one. The spread of the B gene in Western Europe has been described by Candela (1942), and similar postulates may apply to the diffusion of the sickle-cell trait in Africa.

Conclusion

At present there is little to suggest that the possession of the sickling gene has any selective value, and the A and B blood groups which show similar though unrelated variations to those of the sickling frequency are also believed to have no survival value, although it has recently been shown (Aird *et al.*, 1953) that some correlation exists between carcinoma of the stomach and the A blood group, and between carcinoma of the stomach and group O (Hunt and Lucia, 1953). It is not impossible that sickling may be related to hookworm or malaria or other tropical condition, but so far as our studies have gone we have not been able to show any such relationship. Until some such factor is demonstrated it would seem to us that genetic drift is the most probable explanation of the variations in both sickling and the ABO blood groups in Africans.

Summary

The incidence of sickle-cell trait and the distribution of the ABO blood groups in certain tribes in East and Central Africa are reported.

Considerable variation was found in different tribes and even between subgroups of the same tribe, indicating that surveys done on large heterogeneous groups of Africans are unlikely to give useful information.

Possible explanations for this are considered, and genetic drift is suggested as the most likely.

The question of the introduction, maintenance, and spread of the sickling gene in Africans is discussed.

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ACUTE RESPIRATORY INFECTIONS IN EMPHYSEMA

AN ACCOUNT OF 118 CASES

BY

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The advances in the physiological and pathological understanding of emphysema have not been paralleled by equal success in its clinical management. There may be three reasons for this. First, chronic bronchitis, without doubt the most important single factor in the production of emphysema, is, because of its ubiquity and apparent benignity, regarded as a tolerable evil; secondly, as a result of this the patients are unlikely to consult the physician in the early stages; and, thirdly, as it is a disease which would seem to be both irreversible and progressive, treatment is unrewarding. Because of these considerations the emphysematous patient in a general hospital is usually seen for the first time when suffering from incapacitating dyspnoea, congestive cardiac failure, or an acute respiratory infection. The latter, responsible for about 4% of the total admissions to my wards, may cause sudden and serious illness which is eminently treatable. This paper is concerned mainly with this aspect of emphysema. Similar cases have been studied at necropsy by Spain and Handler (1946) and Scott and Garvin (1941). Fulton (1953) emphasizes that chronic pulmonary disease is an important cause of mortality and morbidity in middle-aged men in the industrial area of Manchester. The diagnosis and treatment of acute respiratory infection in emphysema have been discussed by Cardon *et al.* (1951).

Material

Between March, 1947, and May, 1952, 118 patients with long-standing bronchitis and emphysema have been under my care because of acute respiratory illness. In all but one, progressive dyspnoea was a prominent feature. This one patient, a man aged 63, said that he was not short of breath as a rule, but physical examination, response to oxygen therapy, and respiratory function tests all indicated emphysema.

Of the 118 patients (100 men, 18 women), 48 died—41 as in-patients and 7 within one year of leaving hospital. The remainder were alive and well in the summer of 1952.*

Age Groups.—The ages of the patients were 30-39 years, 3; 40-49, 12; 50-59, 39; 60-69, 49; 70-79, 15.

Previous Medical History

A history of bronchitis of more than 10 years' duration was given by 100 of the 118 patients. There can be no doubt, therefore, of its importance in the evolution of emphysema.

Most patients said that their bronchitis began insidiously in the past and guessed at its duration. Some were more definite and chose as landmarks either the first world war or a previous attack of pneumonia. Sixteen males fixing upon the first world war attributed their bronchitis to gassing, yet only one had been admitted to hospital because of it. Their memory was probably playing them false. The same criticism might be applied to those who dated their bronchitis from a long-distant pneumonia. There were, however, others whose pneumonic illness was more recent, but here again caution must be exercised in relying on the patient's memory, as is illustrated by the following case of

*Since this article was submitted for publication a survey made in December, 1953, reveals that 75 patients are now dead, 25 are alive and well, and 18 have not been traced.

RAISED INTRACRANIAL PRESSURE IN EMPHYSEMA

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The cerebrospinal-fluid pressure is usually normal in emphysema, but during intercurrent acute respiratory infections symptoms and signs of raised intracranial pressure—headache, blurred vision, papilloedema—not infrequently develop (Simpson, 1948). The observations recorded in this paper throw light on the aetiology of the raised intracranial pressure found in these circumstances. The relationship of intracranial hypertension to mental disturbance occurring during oxygen therapy is discussed.

Experimental Subjects and Method

Lumbar puncture was performed in a series of 12 emphysematous patients (including 3 with papilloedema) suffering from an acute respiratory infection: in 8 immediately following admission to hospital, and in 4 after 4 to 80 hours of oxygen therapy in a tent. In these four patients relief of anoxia was maintained during lumbar puncture by inhalation of 100% oxygen via a B.L.B. mask. In view

Raised Intracranial Pressure in Emphysematous Subjects with Acute Respiratory Infections

Case	C.S.F. Pressure	Arterial O ₂ Saturation (%)	Plasma CO ₂ Vols. %	Inspired Gas	Comment
1	500-600	40	91	Air	Papilloedema present on admission
1	160	83	78	"	On recovery 15 days later
2	420-460	—	75.1	"	Deeply cyanosed and disorientated
2	160-180	72	75.4	"	On recovery 12 days later
3	300	52	72	"	Disorientated and restless
4	360	67.4	79.3	"	On admission
5	320-360	68.4	95.8	"	"
6	270-300	—	—	"	Bilateral papilloedema; B.P. 160/100; J.V.P. +6 cm. on admission
6	420-440	—	—	"	27 days after admission
7	220-260	89	83	Air	Moderate cyanosis
8	280	—	85.5	"	Plasma CO ₂ 63 vols. on recovery
8	165-190	69.7	56.2	"	"
9	285-305	94	100	O ₂	L.P. after 80 hours' O ₂ therapy
9	150-160	92.6	64	Air	On recovery
10	300	100	102.5	O ₂	Papilloedema present
11	250	94.8	84.3	"	L.P. after 16 hours' O ₂
12	170-200	—	91.5	"	" " 4 " "

of the observations of Friedfeld and Fishberg (1934) and Pickering (1934) of the effect of increased jugular venous pressure and severe hypertension in causing raised intracranial pressure, none of the patients studied had either of these complications. The C.S.F. pressure was measured in the horizontal position with a glass manometer (internal bore 2 mm.) calibrated up to 700 mm. The effect of muscular tension and apprehension was eliminated so far as possible by recording pressures at intervals of 30 seconds for 10-30 minutes until a stable basal level was obtained. It was found that when the C.S.F. pressure was within normal limits fluctuations were seldom greater than 20-25 mm. (Fig. 1), but when it was elevated spontaneous

*British Medical Association Ernest Hart Memorial Scholar, 1952.

fluctuations of much greater magnitude could occur, and a true estimate of the basal pressure might be obtained only after 30 minutes' recording (Fig. 3). Blood was obtained for measurement of oxygen saturation and carbon dioxide content by arterial puncture immediately before lumbar puncture.

Details of the C.S.F. pressure, arterial oxygen saturation, and arterial plasma carbon dioxide content are recorded in the Table. In 10 of the 12 subjects C.S.F. pressures above the normal upper limit of 200 mm. were observed, with pressures of over 350 mm. in five. Arterial anoxaemia was present in all cases (O₂ saturation 40-89%) and hypercapnia (plasma carbon dioxide content >66 vols.%) in all except one.

Effect of Anoxia and Hypercapnia on C.S.F. Pressure

The exclusion of patients with raised venous pressure and hypertension narrowed the possible causes of raised intracranial pressure. The almost invariable presence of anoxia,

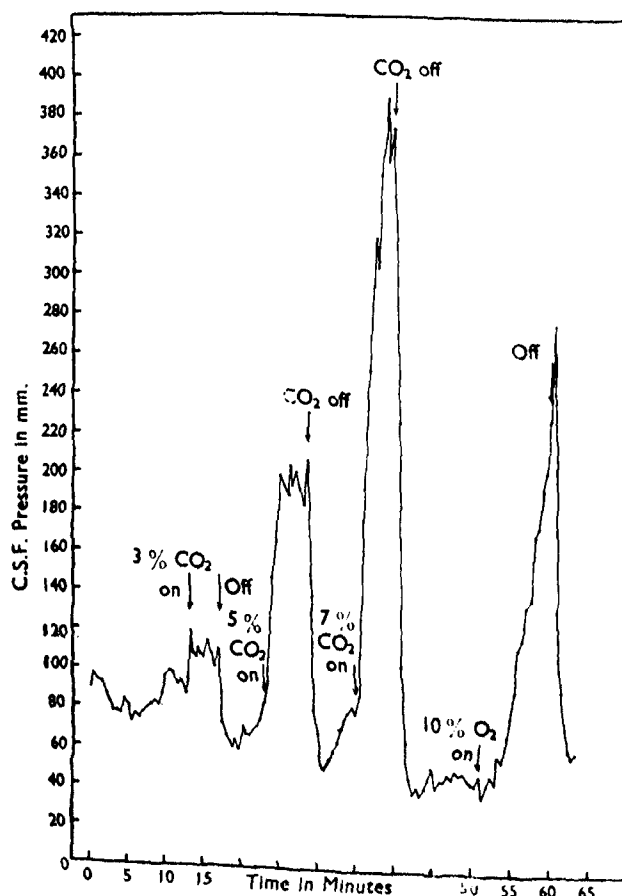


FIG. 1.—Effect of breathing high CO₂ and low oxygen mixtures on C.S.F. pressure in a patient with syphilitic aortitis.

hypercapnia, and dyspnoea suggested that a study of the effects on C.S.F. pressure of breathing pure oxygen, low oxygen and high carbon dioxide mixtures, and of hyperventilation might prove fruitful.

Fig. 1 illustrates the effect of breathing various gas mixtures in a 49-year-old patient with syphilitic aortitis. With 3, 5, and 7% carbon dioxide in oxygen inhaled for five to seven minutes the C.S.F. pressure rose by 27, 133, and 310 mm. respectively. With 10% oxygen in nitrogen the inhalation was terminated before the pressure had finished rising, as the patient became deeply cyanosed and complained of severe headache. Voluntary hyperventilation will consistently produce a fall of 30-50 mm. in C.S.F. pressure (presumably due to washing out carbon dioxide), and if muscular movement has any effect in raising the pressure it is completely outweighed by the effect of hypocapnia and alkalosis. The combined results of inhalation of various combinations of

carbon dioxide in 29 subjects is presented in Fig. 2. The scatter of individual observations is considerable, especially with the higher concentrations of carbon dioxide. For 3, 5, and 7% CO₂ the mean increases in pressure were 50, 130, and 280 mm. There was no correlation between the magnitude of the rise in C.S.F. pressure on inhaling carbon dioxide

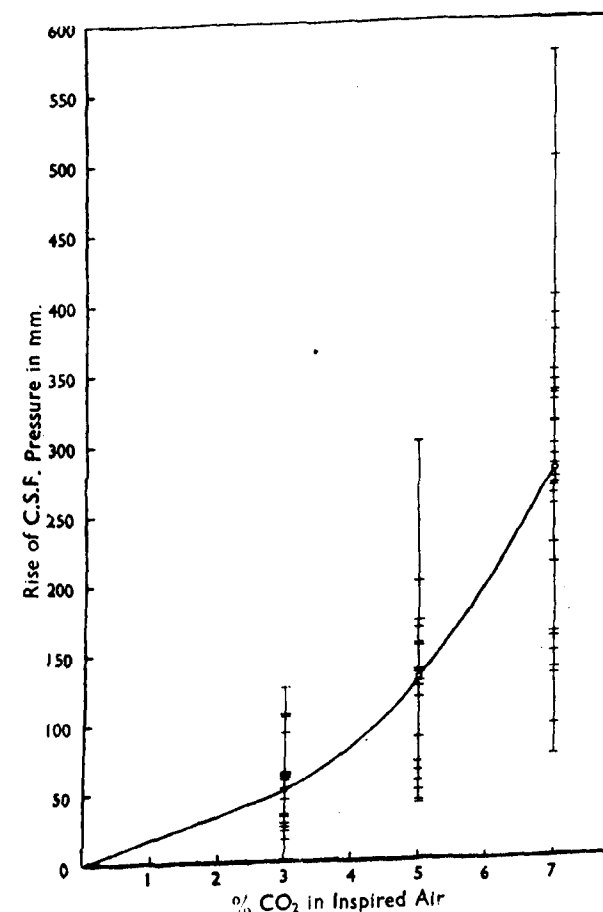


FIG. 2.—Increase in C.S.F. pressure breathing 3, 5, and 7% CO₂ in 29 emphysematous subjects.

and the respiratory response to the same concentration. For example, Case 1, whose ventilation increased by only 4 litres per minute with 7% CO₂, showed an increase of 500 mm. in C.S.F. pressure.

These observations demonstrate that both oxygen lack (low pO₂) and carbon dioxide excess (high pCO₂ and increased H-ion concentration) cause an increase in C.S.F. pressure, and the magnitude of their effect is enough to account for the considerable elevation in intracranial pressure observed in emphysematous subjects during respiratory infections.

Effect of Oxygen on the C.S.F. Pressure in Emphysema

In 10 experiments on normal subjects we have found that inhalation of pure oxygen for 10-15 minutes has no significant effect on the C.S.F. pressure. Davies and Mackinnon (1949) observed that inhalation of oxygen in cases of cor pulmonale with congestive failure caused an immediate and striking increase in C.S.F. pressure. Studies on Case 6 have confirmed their observation and provide an adequate explanation for this phenomenon.

This patient was admitted to hospital in October, 1950, with acute bronchitis. He had been dyspnoeic on exertion for four years and had suffered from severe throbbing headaches for the preceding 18 months. He was found to have advanced emphysema, cor pulmonale with early congestive failure, and bilateral papilloedema with retinal haemorrhages. The blood pressure was 160/100 and the maximum breathing capacity fluctuated between 16 and 30 litres a minute. On the second day after admission the C.S.F. pres-

sure was 270-300 mm. and on the 18th day 420-440 mm. On the 27th day, when the signs of congestive failure had disappeared, the basal C.S.F. pressure breathing air was 220-260 mm. (Fig. 3). The minute-volume of ventilation was 8.03 litres (rate 21 × tidal air 382 ml.), the arterial oxygen saturation 89%, and the plasma carbon dioxide content 83 vols.% (normal level 60 vols.). At the 30th minute pure oxygen was administered via a rubber mouth-tube, and over the next 30 minutes a dramatic rise in C.S.F. pressure occurred, reaching a peak of 670 mm. The respiratory minute volume recorded over the last 5 minutes of oxygen inhalation had fallen by 30% to 5.77 litres (rate 20 × tidal air 288 ml.), the plasma carbon dioxide content had increased by 9 vols. to 92 vols., and the oxygen saturation had risen to 100%. At this point the patient felt drowsy but did not complain of headache. When inhalation of oxygen was discontinued, C.S.F. pressure fell rapidly and the respiratory minute volume rose to its pre-inhalation level of 8.11 litres

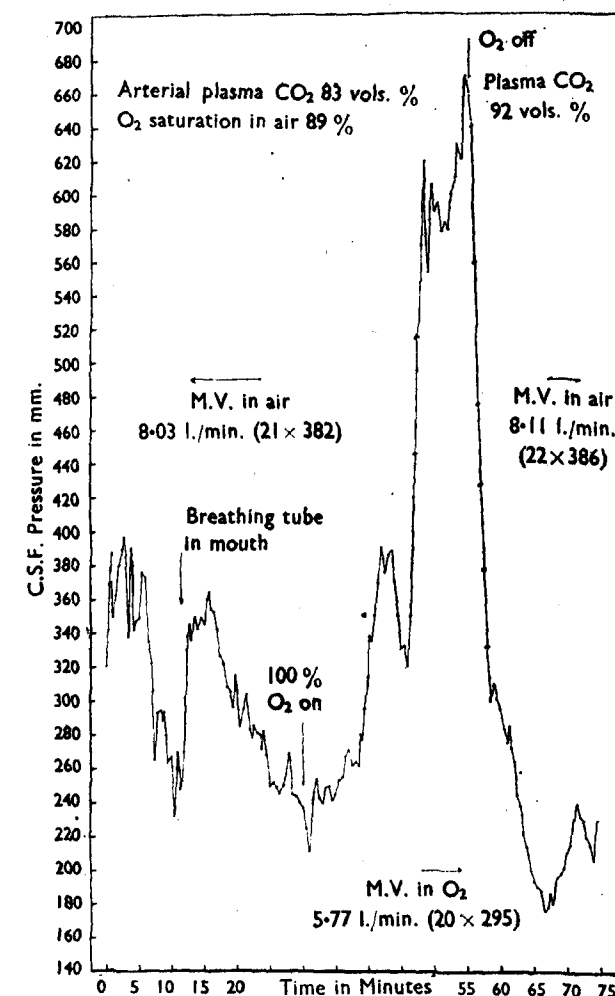


FIG. 3.—Influence of inhalation of oxygen on the C.S.F. pressure, pulmonary ventilation, and arterial CO₂ content in an emphysematous subject.

(22 × 368). Subsequently papilloedema subsided completely without residual visual impairment. The patient was still alive in July, 1953, and, although completely disabled by dyspnoea on exertion, no longer suffered from headaches and the C.S.F. pressure was normal.

Discussion

Anoxia and hypercapnia might increase C.S.F. pressure by any of the following mechanisms: (1) increase in volume of C.S.F. due to more rapid formation or slower absorption; (2) increase in brain volume due to cerebral oedema; (3) increase in intracranial blood volume due to cerebral vaso-

dilatation; or any combination of the three. If the rate of C.S.F. formation was increased during the period of gas inhalation it would be expected that the pressure would remain elevated on discontinuing the gas mixture until absorption of the excess had restored normal volume and pressure. In fact, the pressure falls extremely rapidly—usually to 10–50 mm. below the pre-inhalation value (see Fig. 1). Raised venous pressure is thought to slow the rate of C.S.F. reabsorption via the arachnoid villae, and is the presumed cause of intracranial hypertension in congestive failure due to rheumatic heart disease. Inhalation of carbon dioxide does not, however, cause any significant change in venous pressure (Goldensohn *et al.*, 1951). This leaves mechanisms 2 and 3 as possibilities.

Wolf and Lennox (1930), by direct observation of the diameter of the pial blood vessels and measurement of the cisternal C.S.F. pressure in the cat, showed that inhalation of high carbon dioxide and high carbon dioxide plus low oxygen mixtures caused immediate vasodilatation with rise in C.S.F. pressure. Anoxia alone caused cerebral vasodilatation, but this effect was often offset by hyperventilation causing a fall of blood pCO_2 . White *et al.* (1942) made quantitative studies on changes in brain volume, cerebral blood volume, and C.S.F. volume in cats. With low oxygen inhalation, brain volume increased considerably, but the cerebral blood volume remained unchanged. This was attributed to the effect of anoxia in causing cerebral oedema by increasing the permeability of cerebral vessels. When carbon dioxide was added to the low oxygen mixture vascular dilatation with increase in cerebral blood volume occurred, but there was no further increase in brain volume. The effect of hypercapnia alone was not studied.

Thus it seems probable that raised intracranial pressure in emphysematous subjects with acute respiratory infections is due to the combined cerebral vasodilator action of anoxia and carbon dioxide retention. The antagonistic effect of low pO_2 and low pCO_2 may explain why the C.S.F. pressure in Case 8 was within normal limits—the vasodilator effect of moderate anoxaemia (O_2 saturation 69%) being offset by the lowered level of plasma carbon dioxide (7 vols. lower than the patient's normal level). The rise of C.S.F. pressure breathing oxygen in Case 6 may be explained as follows: in this patient resting ventilation was largely maintained by the stimulus of anoxia—as is shown by the fact that ventilation decreased by 30% on breathing oxygen. Although relief of anoxia *per se* would tend to produce cerebral vasoconstriction and a fall in C.S.F. pressure, this was more than counterbalanced by the increase in blood carbon dioxide content resulting from the fall in pulmonary ventilation. The net effect was a further increase of cerebral vasodilatation and rise in C.S.F. pressure. On breathing air once more ventilation increased, retained carbon dioxide was washed out, and C.S.F. pressure fell to its original (though raised) level.

An increase in blood carbon dioxide content invariably occurs during oxygen therapy in emphysematous subjects (Westlake, 1953) and accounts for the fact that the C.S.F. pressure often remains elevated (cf. Cases 9, 10, and 11) despite relief of anoxia. It is only on full recovery from the acute respiratory infection—when normal or near normal gas tensions are restored—that the C.S.F. pressure also falls to normal.

Is Raised Intracranial Pressure the Cause of Mental Disturbance During Oxygen Therapy?—Oxygen therapy in emphysematous subjects is often complicated by mental disturbance and neurological symptoms—acute mania, disorientation, profuse sweating, salivation, myoclonic twitching, stupor, and coma (Barach, 1937; Davies and Mackinnon, 1949; Coombs, Bahnsen, and Coates, 1950; Westlake, 1953). These symptoms are often attributed to raised intracranial pressure, but careful analysis of the mechanism involved makes this view untenable. In cerebral tumour (or other space-occupying lesion) raised intracranial pressure causes drowsiness and coma by decreasing cerebral blood flow, with consequent cerebral anoxaemia. In the emphysematous subject the rise in C.S.F. pressure that occurs dur-

ing oxygen therapy is due to increased cerebral blood volume from pial vasodilatation. Cerebral blood flow, far from being diminished, is greatly increased (Kety and Schmidt, 1948; Patterson *et al.*, 1952). In the absence of any evidence that raised intracranial pressure *per se* (when unaccompanied by reduced cerebral blood flow) has any deleterious action on the function of cerebral neurones, we prefer to regard mental symptoms as manifestations of the direct action of hypercapnia and acidemia on the brain (carbon dioxide narcosis) and do not believe that lumbar puncture has any therapeutic value.

Summary

Raised intracranial pressure in emphysematous subjects suffering from respiratory infections is attributed to the vasodilator action of anoxia and hypercapnia on cerebral vessels. During oxygen therapy the C.S.F. pressure may remain raised (despite relief of anoxic vasodilatation) owing to further rise in blood carbon dioxide content. Mental disturbance accompanying oxygen therapy cannot be directly related to raised intracranial pressure.

We wish to thank Dr. T. Simpson for permission to study cases admitted under his care, and for his continued encouragement and advice.

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EARLY TREATMENT OF CLEFT-LIP AND CLEFT-PALATE

BY

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The effective closure of congenital clefts of the lip and palate has presented a challenge which has been taken up by most of the great surgeons of the past century, and considerable ingenuity and daring have been evoked. Many lips and palates were closed without anaesthesia of any kind. To-day, with the help of anaesthesia, electric lighting, suction, and fine instruments and sutures, the surgeon works under improved conditions. Fewer babies with this deformity die than formerly, and actual closure of the clefts can be achieved with certainty. Fairly general agreement has been reached in this country on what procedures are desirable, but there is uneasiness concerning their shortcomings. Any surgeon who operates on these conditions realizes that some of his cases do not turn out as well as he would like. He knows that some will improve with the passage of time, but he will also have the fear that some may become worse. Little is known of the effects of operation on the development of the facial skeleton, and these may be serious enough to prohibit procedures otherwise commendable. Investigation along these lines requires the construction in each case, and with unoperated controls, of a series of models of the dental arches covering the period of growth, and no such survey is likely to be available for a number of years.

Bearing the above in mind, and also the inadequacy of any classification based on personal appraisal of cases, it has nevertheless seemed worth while to attempt to assess the effectiveness of treatment in a series of 100 consecutive patients with cleft-lip and/or cleft-palate admitted to Rookdown House, the plastic surgery unit for the eastern area of the South-western Metropolitan Hospital Region.

Causation

As long ago as 1757 Trew mentioned heredity as a factor in the formation of congenital clefts, and since then many writers have pointed out the frequency of a family history of the condition: Muller (1886) and Haug gave 12%. Birkenfeld (1927) 20%, and Hinrichsen (1935) 24%. In 85 cases of the present series the parents had a reasonable knowledge of the child's forebears, and in 16 (18.8%) there was someone in the family with a cleft. Affected relatives were equally divided between the fathers' and mothers' families; they included the father's brother, sister, uncle, and great-aunt, and the mother's brother, uncle, great-uncle, and great-aunt. Few of us know much about our families two generations back, and the true figure would be greater than that given. From an examination of 703 family histories in cleft given. From an examination of 703 family histories in cleft cases occurring in Denmark, Fogh-Andersen (1942) concluded that there was no genetic connexion between isolated cleft-palate and cleft-lip with or without cleft-palate. The positive family histories obtained in our series support this view.

Little is known of the manner of formation of clefts of the lip and palate, but they lie in the line of approximation of the nasal and maxillary processes and are presumably the result of failure in development and fusion of the mesoderm of these parts. Normally this fusion is first seen in the region of the nostril floor, and thereafter successively in the upper and lower portions of the lip. A little later union spreads through the hard and soft parts of the palate to the uvula. Failure to join may be complete, in which case a cleft extends through lip, alveolus, and palate; or incomplete, only part of the line of fusion being open. The nostril floor is the part least often cleft, and partial lesions extend towards this site from the lip border or from the uvula.

Table I shows that in 51 cases the cleft extended through the lip and palate, though in several there were small skin bridges in the region of the nostril and in 10 the alveolus

TABLE I.—Extent of Clefts and Sex Incidence

	No.	Male	Female
Cleft lip and palate	51	38 (41.1%)	13 (16.4%)
Cleft-palates	36	20 (6.9%)	16 (13.6%)
" Lips	13	8 (14.4%)	5 (7.6%)
Total		66 (62.4%)	34 (37.6%)

Figures in parentheses are, for comparison, from Fogh-Andersen's analysis of 703 patients.

was intact. In 36 the cleft was confined to the palate, and in 13 the lip was cleft and the palate intact, though in 4 of these 13 the alveolus was cleft.

The preponderance of the condition in males has been mentioned by numerous writers. Fogh-Andersen remarked on the greater incidence of cleft-palate in girls, among whom in his series it was twice as common as in boys, but in the present series the incidence was greater in boys (5:4).

Table II shows that clefts on the left side of the lip greatly outnumber those on the right and double clefts; this fact has been noted by many observers.

TABLE II.—64 Cases of Cleft-lip: Extent

	Lip Only	Complete Cleft	Lip and Palate
Left	10	22	7
Right	2	8	2
Double	1	11	1
Total	13	41	10

Associated Abnormalities.—Six children had associated abnormalities (Table III). It will be noted that none of these were situated in the extremities, although in the past these have been noted as the sites of most frequent allied

TABLE III.—Associated Abnormalities

Mental deficiency, nystagmus, and optic atrophy	2
Hydrocephalus	1
Otitis media	1
Blindness; right eye absent, left cornea opaque	1

anomalies (v. Vershuer, 1938). Fogh-Andersen estimates the incidence of such anomalies as 10%. This would be in approximate accordance with our figure, which takes no account of neonatal deaths or abnormalities becoming manifest later in life.

Treatment of Cleft-lip

With a large lip a good operative result is more readily obtained, but, in view of the unsightliness of the deformity, delay to allow growth of the parts is unwarranted, and the majority of these babies were operated on between the third and sixth months of life. One complete cleft was closed on the day of birth, and a partial lesion was treated for the first time at the age of 23 years. By the third month the parts have grown sufficiently for the surgeon to be able to make a shapely lip and nostril, and the child has a good enough hold on life to withstand the anaesthetic and the operative hazards.

On the whole, the general health of the children on arrival at hospital has been excellent. It seems now to be recognized that the existence of the widest cleft is no threat to life from the point of view of interfering with feeding or permitting nasopharyngeal infections, and no case has been referred for urgent closure for either of these reasons. Operation has occasionally been postponed because the child had a cold, or was underweight, or because the haemoglobin level was low (under 10.5 g.%), but in no case has operation proved impossible or injudicious. In 15 cases palate closure was carried out when haemolytic streptococci had been grown from the throat swab, and in none were there complications. No transfusions have been given, before or after operation, and in only one case, with post-operative gastro-enteritis, was intravenous fluid required. The absence of any mortality is explainable partly by insistence on absolute fitness for operation and partly by the care given by experienced anaesthetists and nurses.

In treating single cleft of the lip there are two methods of approach. The first is simply to pare the cleft edges at the primary operation, joining the lip in layers with minimal tension so as to spare the maxillary arches from pressure where the cleft is complete. This postulates the necessity for a scar excision in all layers at a later date, when the construction of a lip of normal shape will be facilitated by the growth which has taken place in the interim.

The second method is to attempt at the outset to make the lip and nose perfect. In the minute lip of the infant this is not easy, and any mistakes will be magnified by growth. On the other hand, the scar obtained early in life, even when the gap is wide, can be less noticeable than any made subsequently.

This series includes 10 cases of single cleft which had been closed on the former principle at other hospitals, and a further 17 children were treated similarly at Rookdown House. With varying success, the attempt was made in most of these to adjust the nostril floor and alar base at the first operation.

In 22 others an attempt was made to perfect the lip and nose at the initial operation. Since the deficiency of lip tissue is most marked towards the margin, no simple paring of the cleft can produce a lip which pouts like that of a normal child, and it is necessary to cut into the lip and design complementary flaps. The Barrett Brown (Brown and McDowell, 1945) procedure was used in eight cases,

the Blair (Blair and Brown, 1930, 1931) in five, the Hagedorn in five, the Le Mesurier (1952) in three, and in one concavo-convex incisions as used by Vaughan and others. All of these cases, when reviewed, were found to have some fault which seemed worthy of surgical correction, and in this regard the primary operation failed in its objective. However, all such adjustments were minor, and there was no call to alter the original scars, which proved less obvious than those resulting from the two-stage method. A perfect result, though infinitely desirable, is not to be expected, and the tendency to seek perfection through a series of trimming procedures has been resisted. Even if the particular defect under consideration were corrected, each such operation takes something from the part and leaves it smaller. To quote Veau and Borel (1931), "Les petits détails de la lèvre qui souvent retiennent toute notre attention, n'ont pas la même importance que la forme générale du visage qui nous préoccupe moins."

Double clefts of the lip are usually associated with a serious deficiency of tissue, and their treatment presents the biggest problem in the field of lip and palate surgery. The method used in the 11 cases in this series was to close the lip in stages, first one side and a month later the other. The edges of each cleft were pared with care to preserve as much tissue as possible, closure being effected with three layers of sutures. In this way the soft tissues were draped in front of the prominent premaxilla, which was thereby subjected to a measure of tension and brought nearer alignment with the maxillae. While the appearance is improved by these operations, a number of secondary operations are needed, and a result comparable to that available in single clefts is extremely difficult to achieve.

Where a cleft is complete, closure of the anterior part of the palate at the time of lip closure is a convenience, since this region is relatively inaccessible later. With three

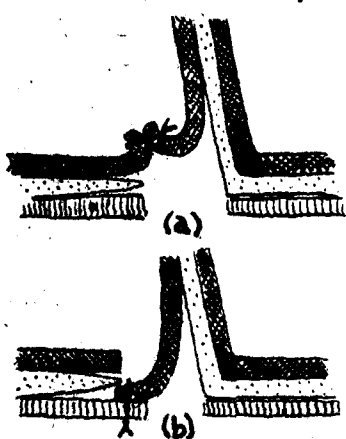


FIG. 1.—Alternative methods of closing the anterior palate.

manner recommended by Dorrance (1933) for closing the hard palate. Closure was successful in four of these. This is easier than direct suture of the nasal mucosa, and the saving in time is important when there is so much to do.

Treatment of Cleft-palate

The primary reason for operating on the cleft-palate is to permit normal speech. The aim is to produce a palate which is long enough to be able to meet the posterior wall of the pharynx when in the elevated position and sufficiently mobile to achieve this with rapidity. Eighty-five operations were performed, six different techniques being used.

1. *Two-flap Method* (Fig. 2) (24 cases).—This resembles the original operation of Langenbeck (1861), but differs in that the nasal mucosa is not divided transversely. Closure is with two layers of sutures—one in the nasal mucosa, the other in the buccal mucoperiosteum. In the soft palate these buccal sutures approximate the muscles. Catgut was used in the first four; thereafter silk (2/0) was preferred

because it seemed less irritating to the mucosa. These sutures do not require removal, since they come away by themselves.

2. *Three-flap Method* (Fig. 3) (33 cases).—This method differs from the above in that the mucoperiosteum is divided obliquely, a step which permits lengthening of the palate.

3. *Four-flap Method* (Fig. 4) (15 cases).—This is similar to the three-flap method, but employs two small flaps based in front for closure of the anterior part of a long cleft as described by Wardill (1933).

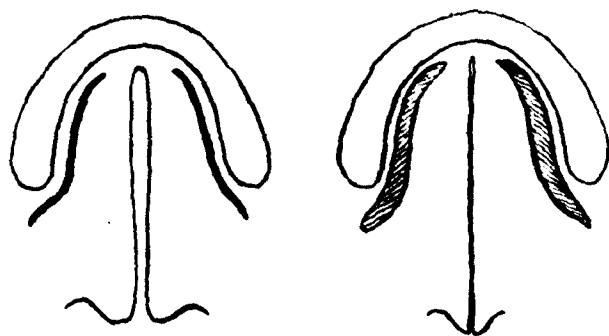


FIG. 2.—The two-flap operation.

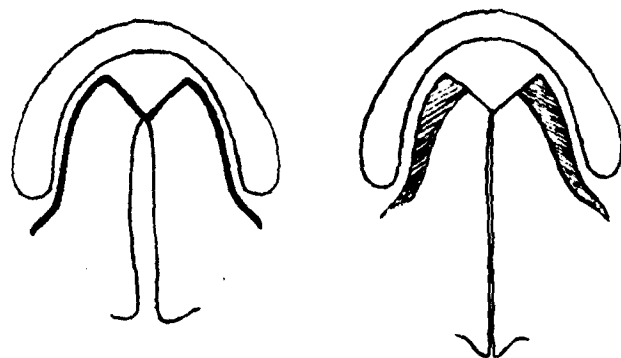


FIG. 3.—The three-flap operation.

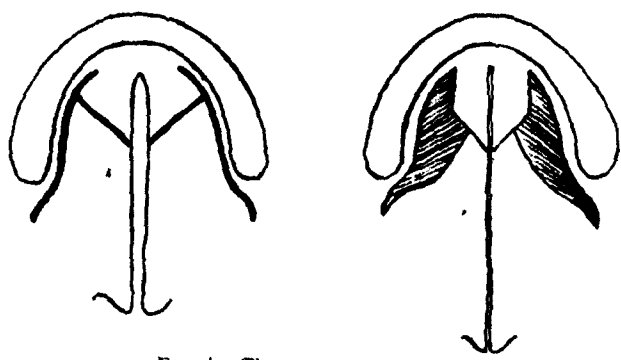


FIG. 4.—The four-flap operation.

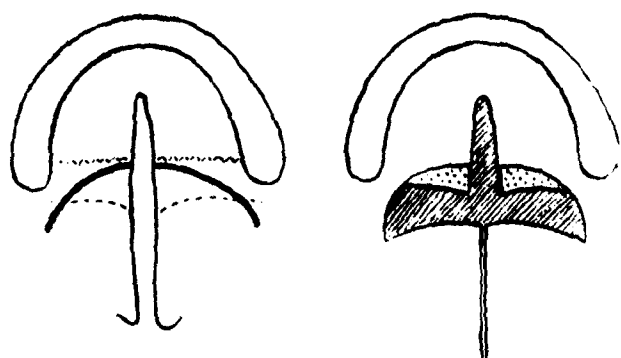


FIG. 5.—The X operation.

4. *X Operation* (Fig. 5) (11 cases).—Here the transverse division of the buccal mucoperiosteum is made further back, over the horizontal plates of the palate bones. As with the above operations, the nasal mucosa is not divided transversely, and is carefully sutured in the midline. This operation has only one advantage: it does not disturb the distribution of the greater palatine vessels and the blood supply of the transverse palatine suture, which may be a growth centre.

5. *Cuthbert (1951) Operation* (Fig. 6) (1 case).—Swinging across the left mucoperiosteal flap breaks the longitudinal suture line, which is an undesirable feature of the above procedures. To allow the flaps to move, the greater palatine vessels must be divided. Transverse section of the nasal mucosa opposite the posterior border of the hard palate favours increase in length.

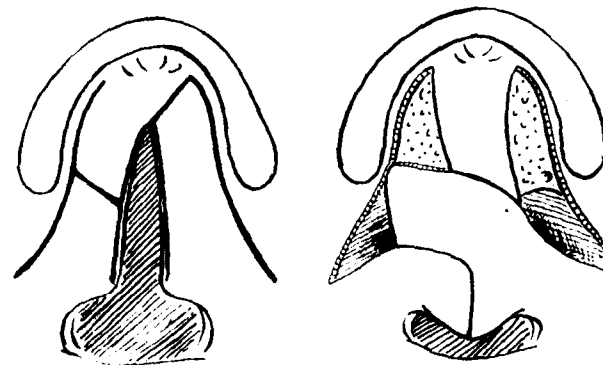


FIG. 6.—The Cuthbert operation.

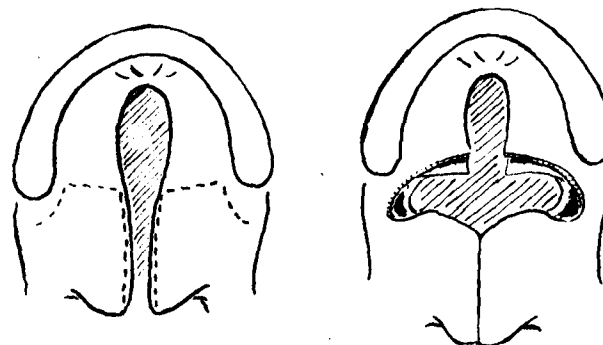


FIG. 7.—The Gillies-Fry operation.

6. *Gillies-Fry (1921) Operation* (Fig. 7) (1 case).—Here the soft palate is united after division of its elements from the hard palate. The latter, along with the aperture created behind it, is covered with an obturator.

In 39 cases, mostly early ones, the greater palatine vessels were divided at the point of emergence from the palatine foramina so as to permit easier approximation of the mucoperiosteal flaps. This step is rarely required, and preservation of the vessels must promote the viability of the flaps.

In 51 cases the pterygoid hamuli were fractured as recommended by Billroth. This permits prolapse of the tensor palati tendons and reduces transverse tension on the suture line. In the majority of cases in which early palate closure fails one of the tensor tendons is found in place and undisturbed, and its action would inevitably jeopardize closure. After fracture this bony process moves medially and dorsally under the influence of the fibres of the superior constrictor which are attached to it. There seems to be a danger that displacement of the hamuli may weaken the formation of Passavant's ridge, a fold of mucosa which forms on the posterior pharyngeal wall at the time of elevation of the palate. This ridge results from the contraction of a band of muscle fibres the majority of which are attached to the hamuli, and it is difficult to see how the muscle can contract effectively if both its bony attachments are mobile.

The ridge is probably an important element in closing off the nasal from the buccal pharynx, as occurs constantly in speaking. In 34 cases, therefore, instead of fracturing the hamuli, tenotomy of the tensor tendons was performed.

Complications.—In two patients the operation failed, in that the entire soft palate broke down. One of these was a two-flap closure in which the hamuli had been fractured and the greater palatine vessels divided. In the other a four-flap closure had been done in conjunction with tenotomy of the tensors, the vessels being preserved. In neither case were haemolytic streptococci grown from the pre-operative throat swab, though in the second there was a staphylococcus. Fifteen cases, including 4 of the 11 X operations, developed small fistulae (Fig. 8) in the median suture line which required surgical closure. The 15 operations for obliteration of the fistulae were successful in all but two, and here the fistulae were close to the alveolus and therefore barely accessible.

In two cases otitis media developed within a week of operation. In both the pre-operative haemoglobin levels were high (13.8 and 11.9 g.%), and in neither were streptococci grown from the throat swab. One occurred in November, the other in April, and both followed three-flap closures.

Results

Many difficulties arise in attempting to interpret speech results, and in this series there is the further obstacle that many of these children are very young and have a lot yet to learn about speaking. In 15 cases no estimate of the result is possible, and for the other 70 the figures given below are published in the realization that subsequent review may indicate inaccuracies.

Speech has been classified as follows: class I, apparently faultless; class II, faults distinctly minor, so that no one has any difficulty in understanding even in moments of excitement; and class III, unsatisfactory.

The results for the various operations are given in Table IV, and, while there is little between them, the four-flap comes out best. It is interesting to note that of the 15 cases

TABLE IV.—Speech Results

	No. of Cases	Class I	Class II	Class III
Two-flap operation	22	46%	36%	18%
Three " "	25	48%	40%	12%
Four " "	12	50%	42%	8%
X operation	9	45%	33%	22%
All methods	68	47%	38%	15%

1 Gillies-Fry operation: speech improved.
1 Cuthbert operation: not yet speaking.

operated on for post-operative fistulae 5 developed first-class speech. The following previously published results are given for comparison.

Ritchie (1937) (100 cases): in 42 the speech was excellent, in 43 good, in 14 fair, and in 1 bad.

Oldfield (1949) (183 cases): in 87 the speech was excellent, in 79 good, and in 17 bad.

Bentley and Watkins (1947) (90 cases): in 46 the speech was perfect, 26 had minor faults, in 15 the speech was imperfect, and 3 were imbeciles.

Table V was made with a view to elucidating the respective merits of fracture of the pterygoid hamulus and tenotomy of the tensor palati. The results favour the latter, and

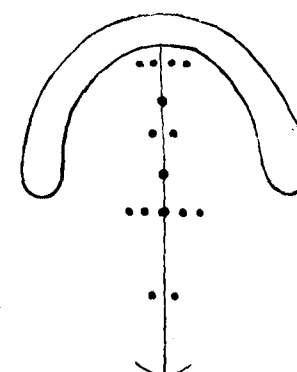


FIG. 8.—Location of post-operative fistulae. (All were in the midline.)

TABLE V.—Comparison of the Speech Results Following Fracture of the Pterygoid Hamulus With Those Following Tenotomy of the Tensor Palati

Speech	Fracture	Tenotomy
Class I ..	16	15
" II ..	18	9
" III ..	10	—
	44	24

of 31 patients who achieved class I, 16 had had fracture and 15 tenotomy, although almost twice as many were treated by fracture.

There has been considerable discussion about the optimal age for operation, with little in the way of statistics to substantiate the various views expressed. Wardill (1933) advocated operation early, in the expectation that the provision of an intact mobile palate before speech was attempted would permit this to develop in the normal way. Dorrance (1933) operated regularly at the age of 3 or 4 years, and claimed that speech was as good as with the early operation.

The results analysed in Table VI suggest that children operated on before the age of 9 months have a much better chance of achieving normal speech than those treated later.

TABLE VI.—Age at Which Palate was Closed

Age	No. of Cases	Class I speech in 77%
6 to 9 months	16	54%
10 to 12 "	17	53%
13 to 15 "	18	53%
16 to 18 "	12	22%
19 to 24 "	7	2 cases
2 years "	5	2 cases
3-4 "	3	—
5 to 10 years "	3	—
11 to 15 "	1	—
Over 15 "	3	—

and it should also be noted that no case operated on after the age of 3 years had a class I result.

Summary

In 100 cases of cleft-lip and/or cleft-palate both lip and palate were affected in 51, the palate alone in 36, and the lip alone in 13.

All lesions were more common in males.

In 18.8% there was known to be a relative of the child with a cleft.

Six children had associated congenital abnormalities, but in none was operation impossible.

Sixty-one operations were performed for primary lip closure and 85 for palate closure. There was no mortality.

Of the children born with cleft-palate, 47% are speaking without detectable abnormality, and a further 38% have only minor faults. Of the patients operated on under the age of 9 months, 77% speak normally.

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PERSISTENT ADULT BED-WETTING TREATED BY SACRAL NEUROTOMY

BY

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Definition and Aetiology

When the wide and varying group of cases loosely termed enuresis has been analysed and from it excluded all instances of precipitancy, defective control, and unintended bladder evacuation, diurnal or nocturnal, in which organic disease of the urinary tract (infections, developmental abnormalities of bladder and urethra) or of the nervous system has been demonstrated, there remains the clearly defined essential enuresis. This is a continuation of the irregular bladder action of infancy, commoner in the male than in the female, tending in most cases to be outgrown before puberty, though persisting in some cases until much later. It consists in bladder evacuation during sleep without awakening: in a great many cases there is an accompanying diurnal precipitate micturition amounting almost to incontinence and almost a strangury when it is attempted to hold back the urine. When in severe cases the enuresis finally ceases by degrees—as a rule with sporadic recurrences—the patient is left with a "weak" bladder with lifelong diurnal precipitate action.

During the years of active and frequent enuresis the life of the young patient is miserable; to go away from home is a recurring terror and shame, particularly as the most recent attitude appears to be that enuresis is a form of juvenile delinquency to be treated by "pep" talks and putting the young patient "on his honour"—the implications of which he greatly resents if he is at all sensitive and intelligent. Psychiatric thought regards it as an Oedipus matter—the boy, right on to adult life sometimes, wetting his bed to spite his mother and father for sleeping together. It is to the good that the time-honoured hunt for exciting causes (phimosis, worms, enlarged tonsils, etc.) has been abandoned, likewise the consequent operations, even as cures by suggestion. It is true that the patient can be "trained" to endure an uncomfortable bladder during the day for fairly long periods. This, however, is no more curative of the underlying condition than is inducing nocturnal anuria by fluid abstinence during the latter part of the day. The exceptionally good results claimed on hospitalization, when the patient is wakened every hour or so during the night, are open to similar criticism. Treatment by belladonna (as a parasympathetic inhibitor) and by amphetamine (partly a mild sympathetic stimulant, but acting mainly by producing light if any sleep) have equally transient effects.

The unsatisfactory position of treatment is reflected in the enormous literature by the vagueness of views expressed regarding the underlying cause. In the agreed absence of identifiable organic disease, recourse is had to mental and psychiatric defects, reflex factors, and so on; the most positive view was the old expression "pelvic neurosis." It is interesting to note that some fifty years ago Cathelin practised the flooding of pelvic nerves with saline or anaesthetic solutions by epidural injection into the sacral hiatus for the treatment of

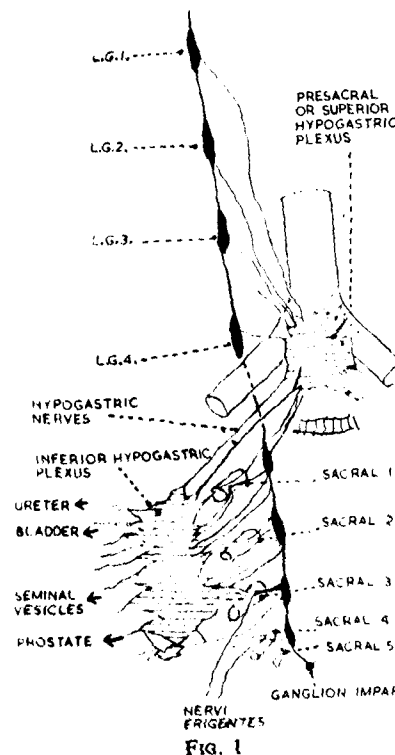
"pelvic neuralgias, sexual neuroses, and incontinence." Development of the view that the condition is an inborn defect of nerve control of the bladder has been greatly hindered by the even now highly controversial opinions on the mechanism of the latter.

Innervation of the Bladder

Even here, though the source, deployment, and final distribution of the vesical and other visceral pelvic nerves are well known, the matter is further complicated by a variable and inconstant nomenclature.

The bladder, seminal vesicles, prostate, and lower ends of the ureters, among other organs, are supplied by numerous filaments of the (inferior) hypogastric plexus, which lies in the lateral part of the true pelvis. The part of it

supplying the bladder is sometimes termed the extrinsic vesicle plexus; it is without any sharp demarcation from the rest of the plexus, however. In the sub-mucous and muscular coats fine intrinsic (vesical, urethral, etc.) plexuses are formed before the final distribution of fibres. On both the intrinsic and the extrinsic plexuses the fibres subserving opposing functions are indistinguishably mixed; no satisfactory inferences may be derived from disease in, or stimulation of, either of these situations.



is formed from: (a) The lumbar sympathetic. Branches from the lumbar ganglia pass to the presacral or superior hypogastric plexus; the innervation ultimately reaching the bladder is derived probably from the first and second ganglia. From the presacral plexus the fibres pass to the (inferior) hypogastric plexus via the hypogastric nerves, some possibly via branches to the pelvic parasympathetic chain. The site of synapse is open to dispute, but does not affect the question of function. (b) The sacral nerves. Filaments pass from the trunks of S2, 3, and 4 immediately on their emergence from the sacral foramina; the major contributor is usually S3, the least S4. Some of the fibres pass direct to the hypogastric plexus, others to the ganglia of the pelvic parasympathetic chain—a continuation of the lumbar chain passing under the common iliac vessels—to lie immediately in front of the sacrum slightly medial to the foramina. The sacral branches—short filaments 4-8 mm. long—pass, therefore, some slightly medially, to join the parasympathetic chain and others laterally to join the plexus. They are best displayed by lifting the cord forwards and outwards. The parasympathetic chain gives numerous branches throughout to the plexus.

Function

(a) Motor.—Since the classic researches of Learmonth there has been little or no doubt concerning the main function of the sympathetic component: stimulation causes con-

traction of the bladder neck of the prostatic and seminal vesicular musculature, and of the ureteral orifices, together with relaxation of the detrusor. This part of the innervation is capable of simulation (hypogastric nerves, presacral plexus) without overflow of stimulus into the sacral part; but a brief consideration of the anatomy shows that the effects of pure stimulation of the latter are practically impossible to obtain. That the function of sacral innervation is antagonistic to the sympathetic is inherent in the term parasympathetic: the nomenclature which applies this term to the cord continuing the lumbar sympathetic into the pelvis is unfortunate and misleading. The evidence comes from several sources: compression of sacral nerves by very low spinal disease; operative removal of parasympathetic trunks; and disease or operative damage—for instance, in abdomino-perineal resection of the rectum with a posteriorly adherent growth—all show that damage or removal of the sacral supply leaves a bladder now solely under sympathetic control, without emptying power, and with an obstinately contracted neck. This confirms the quoted effects of sympathetic stimulation and disproves the view that the sacral supply controls both emptying and retention.

(b) Sensory.—The question of sensation is more under dispute, and in particular whether the sympathetic supply is sensory in addition to motor. Several observations favour such a view. For instance, patients with a transverse cord lesion above the sacral level "have been aware of filling and emptying of the bladder"—the cautious and honest wording is to be noted. Stimulation of the presacral nerve in the conscious patient has caused an accurately localized pain over the bladder. On the other hand, presacral neurectomy gives very little relief of chronic bladder pain. The vesical sensation in cord lesions may well be peritoneal in origin. I incline to the view that it is vasomotor in origin, adducing my experiences with local analgesia of the bladder.

Local Analgesia of the Bladder

During the past 13 years I have performed some 700 prostatic and bladder-base operations under a local analgesic combination. The essential feature is sacral spinal anaesthesia. With the patient sitting, about 0.8 ml. of hyperbaric cinchocaine hydrochloride is injected without barbotage through the lowest interspinal interval, 12-15 minutes being allowed for fixation. The upper level of anaesthesia is S1, shown by paraesthesia of the Turkish slipper area. On the table the hypogastric abdominal wall is anaesthetized by a fan of infiltration with 0.5% procaine*; for vasectomy a further small injection into the cord, supplied from D12 to L1, is required. The method was adopted in order to undertake prostatic operations in even the worst cardiovascular risks: it was developed from the knowledge that transurethral diathermy and resection can be painlessly performed under low spinal analgesia alone, always provided that S1 shows clear signs of anaesthetization. Ordinary sensation—pain of cutting and burning, and, in the enucleation of adenomata, distension of the prostatic bed and the adjacent trigone—therefore travels purely via the sacral nerves.

It was originally intended that the sympathetic element, even in the lumbar region, should be unaffected, in order to avoid the least fall in blood pressure; it was not foreseen that the preservation of the sympathetic supply would result in a most helpful and favourable "fluke"—the removal of sacral inhibition giving virtually a sympathetic stimulation. After enucleation of adenomata the bladder base and prostatic musculature contract down, providing an active haemostasis lasting with cinchocaine some three hours. (This contrasts most favourably with the false haemostasis seen with high spinal analgesia, resulting often in severe reactionary haemorrhage.)

In cystoscopy it is observed that a low spinal analgesic is undesirable when it is necessary to catheterize ureters; the contraction of the bladder base, particularly of the

*Adrenaline should not be employed in elderly patients as there is a great risk of setting up fibrillation.

musculi ureterae, sharply angulates the intramural course of the ureter, making it impossible for the catheter to do more than just enter the orifice. Further, with sacral spinal anaesthesia there is retention as long as the anaesthesia lasts. These various experiences confirm—were it necessary—the retentive sympathetic control described by Learmonth; the effect is clearly not a purely vascular one as is sometimes held.

The Bladder-emptying Mechanism

There is evidence to support the view that two distinct types of sensory impulse derive from the bladder base—first, the discomfort and pain when distension begins to stretch the trigone, and, secondly, that of the prostatic urethra which is associated with the sensation of micturition (this is evoked clinically when the examining finger presses into the prostatic groove and in painful disease amounts to strangury). Physiologically, when urine enters and distends the prostatic urethra the sensory impulse via the sacral nerves sets off the detrusor-stimulating, sympathetic-inhibiting reflex of micturition, which then becomes automatic. The trigonal and the prostatic sensations are distinct and different; for long the increased frequency of "middle lobe" prostatic enlargement has been attributed to the carrying up into the bladder of this "trigger" prostatic mucosa and to its being subjected to urinary contact (better, participation in trigonal stretching).

Mechanism of Enuresis

An enticing explanation of the phenomena of enuresis would be an ectopic distribution of the innervation of the prostatic urethra, overlapping the bladder neck and extending on to the trigone: the upward growth of the prostate would engulf the ectopic area progressively, accounting anatomically for the amelioration in most cases, and particularly in some severe ones about puberty. Confirmation by cystometry is difficult to obtain, for observations made with a catheter in contact with the urethra clearly present fallacies, as would the use of any form of anaesthesia to remove the effects of stimulation by the instrument. The usual cystometric findings in enuresis are that distension of the bladder up to a considerable volume is tolerated normally, but then extreme intolerance, urgency, and precipitancy develop. There is therefore neither a mental basis nor a general trigonal hypersensitivity, for the volume tolerated implies a considerable degree of trigonal stretching; the specific reaction occurs when the stretching affects the bladder neck, the last place to be affected by the process. In the enuretic this seems to behave as if innervated like the prostatic urethra.

The alternative hypothesis is "parasympatheticotonia"—both motor and sensory; the former implying excessive inhibition of the retentive factor, the latter sensory hypersensitivity (that this does occur is shown by the occasional patient who is completely unable to permit even a soft catheter to remain in his urethra). The converse—sympatheticotonia—has been accepted as a cause of sphincter disturbances in, for instance, achalasia of the cardia and hydronephrosis, and it seems reasonable to extend the type of explanation to enuresis, in which it seems more satisfactory than the idea of an ectopic nerve supply. In either case, however, a surgical reduction of the nerve supply to the bladder base and prostatic urethra clearly offers itself as a radical, or at least a permanent symptomatic, treatment of enuresis.

Sacral Neurotomy

There being no information whether the sacral supply has a segmental character—for example, does S 2 supply the trigone and S 3 the prostatic urethra?—as might be expected on developmental grounds, an empirical reduction in the nerve supply should increase sphincter tonus, decrease detrusor tonus and sensitivity, and produce a normal balance. Division of the fibres from S 2 on both sides and crushing of those from S 3 on one side is a likely com-

promise, interfering temporarily only with part of the components of nervi erigentes. In the typical case the scales swing strongly to the side of retention for several days, a balance between the two functions being recovered in ten days or so.

Operation

With the patient in a moderate Trendelenburg position, the abdomen is opened in the midline below the umbilicus and the gut packed conveniently away. The pelvic peritoneum is incised posteriorly from the midline at the sacral promontory down to the right of the rectovesical pouch (Fig. 2). The edges of the peritoneum are lifted gently aside along the whole extent and the presacral fascia is similarly divided (Fig. 3).

Neither procedure is attended with more than the slightest bleeding. The edges of the fascia, held by forceps, are very gently and gradually raised and peeled outward by gauze dissection on the right side; the parasympathetic chain and the sacral foramina come into view. The former is easily seen; the latter are obscured by loose connective tissue, fat, and small veins. No attempt should be made to demonstrate them by dissection laterally to the parasympathetic chain until the latter has been elevated and drawn outwards; their branches are then seen, some going to the chain and some direct to the hypogastric plexus (Fig. 4). The temptation to define the foramina other than by touch must be resisted, for any dissection is almost certain to result in haemorrhage from fragile veins obscuring and staining the fine filaments and rendering accurate section uncertain.

With the chain well raised and drawn outwards, the branches from S 2 and S 3 can be fully defined by gentle open-and-shut forceps-tip movements. All branches from S 2, both to the chain and outwards to the plexus, are divided, and the foramen is covered with a small disk of wax. The branches from S 3 are crushed. The exposure is repeated on the left side, and branches of S 2 are divided and a disk of wax, in later cases a small sheet of aluminium foil, again is applied over the foramen. The presacral fascia, the peritoneum, and the abdominal wall are closed in the normal appropriate way.

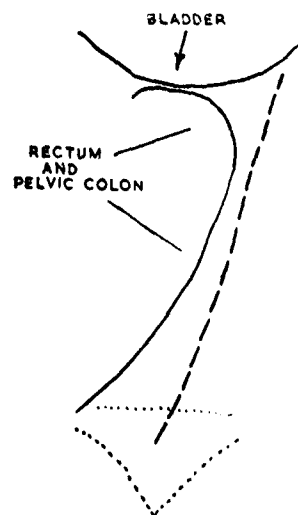


FIG. 2

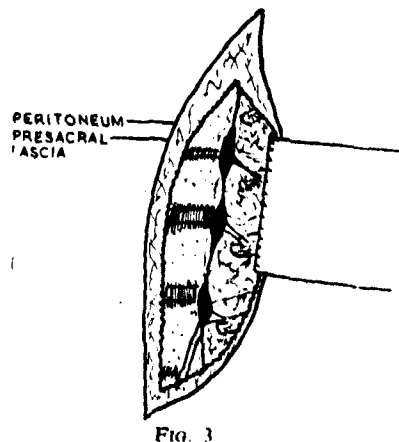


FIG. 3

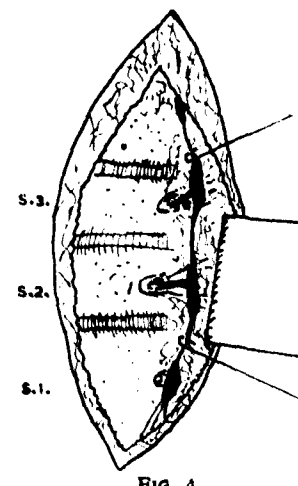


FIG. 4

Case Reports

Case 1.—A man aged 23, admitted for interval appendicectomy; enuresis since infancy, also diurnal urgency; had to rush to leave class at school. Treated by medicines and tablets (amphetamine recently), fluid restriction in latter part of day, micturition very late at night, etc. Had given up all treatment as a bad job. Enuresis about four to six times a week; even in hospital, with very restricted fluid, enuresis occurred two nights in four when awaiting operation. No organic disease of nervous or urinary system. Cystometry: 4 oz. (113 ml.), pressure 16 cm.; 10 oz. (283 ml.), 18 cm.; 16 oz. (454 ml.), 21 cm.; 17 oz. (480 ml.), precipitate emptying of bladder. Admitted for interval appendicectomy, he gladly accepted the chance that a nerve section might at least improve his condition. At operation S 2 divided on both sides; S 3 crushed on the right. Appendicectomy. In this first case the procedure, above recommended, of elevating and drawing outwards the chains was not adopted, and the foramina were exposed and defined by blunt dissection. Exceedingly troublesome bleeding made accurate nerve section difficult and problematic. During convalescence he had complete retention for first 24 hours, and passed a great deal at a time; during the next eight days frequency gradually returned to normal. The urgency by day disappeared. He reported at intervals after discharge; enuresis recurred, but to a far less extent than before—twice a month, three times a month, even five or six times a month. This was without precautions about taking of fluid, getting up last thing at night, etc. The daily urgency has completely disappeared. This is the state at 28 months after operation; clearly only a partial success owing to the uncertainty in the operative procedure, and to regeneration.

Case 2.—Male aged 20; enuresis since infancy, treated with numerous drugs and tablets and restricted fluids with temporary and slight improvement, but always relapsing on cessation of treatment to nightly bed-wetting even with restricted fluid and late waking; enuresis in hospital five times a week (admitted for operation on tendo Achillis). No gross organic disease in nervous or urinary system. Cystometry: 4 oz. (113 ml.), pressure 14 cm.; 8 oz. (226 ml.), 16 cm.; 12 oz. (340 ml.), 21 cm.; 16 oz. (454 ml.), 21 cm.; 18 oz. (510 ml.), precipitate emptying of bladder. Sacral parasympathotomy performed; branches S 2 divided both sides; S 3 crushed on right. During three weeks' convalescence in hospital no enuresis, though none of previous precautions taken. During first four days large quantities passed at wide intervals; micturition, initiated only when bladder contained as much as 18 oz. (510 ml.), was easily controlled and quite effortless. Thirteen months later he reported enuresis now thrice a week since operation. No precautions had been observed; the diurnal urgency had completely disappeared; there was no abnormality of bladder or of sex function.

Case 3.—Female aged 23. Enuresis at least three times a week; daily frequency four or five times, always with great precipitancy. Unaffected by dexamphetamine sulphate or fluid intake. Cystometry: pressure 70 cm., volume 700 ml., intense and precipitate micturition (continuous flow); 40 cm. pressure, intense desire to micturate (interrupted flow). No organic disease of urinary or nervous systems. Operative division branches S 2 both sides, crushing S 3 on right. Post-operatively no precautions taken; during 18 days' convalescence she always woke at night when micturition was needed; had never done this in her life before. Reporting nine months later, stated bed wet thrice in each month without any precautions taken.

Case 4.—Male 22. Enuresis since childhood, now five or six times a week, great diurnal precipitancy. Had had treatment by medicines and tablets, restricted fluid, waking by alarm clock in early morning, etc. No organic disease by urinary or nervous systems. Cystometry: 5 oz. (142 ml.), 14 cm. pressure; 10 oz. (284 ml.), 15 oz. (425 ml.), 20 cm.; 17 oz. (480 ml.), precipitate emptying. Sacral parasympathotomy: S 2 divided both sides, S 3

crushed on right; fine filaments from S 1 on both sides also divided. Normal post-operative course. No enuresis in 16 days; diurnal precipitancy gone. Reported ten months later: no enuresis since discharge, though no precautions taken; still free from diurnal precipitancy.

Case 5.—Male 23. Enuresis six nights in seven. All the usual remedies have been tried. Great daily frequency with precipitancy. Cystometry: 5 oz. (142 ml.), pressure 15 cm.; 10 oz. (284 ml.), 16 cm.; 15 oz. (425 ml.), 20 cm.; 16 oz. (454 ml.), precipitate emptying. This was repeated after administration of a sacral spinal anaesthetic; similar pressures were recorded, but with 20 and 25 oz. (568 and 710 ml.) there were pressures of 24 and 27 cm. still without emptying. Sacral filaments from second divided on the right, from third on both sides; aluminium foil applied over the roots. There was complete retention for 30 hours relieved by catheterization; at the end of a week micturition occurred about every five hours. At the end of five months no recurrence of enuresis; precipitancy of micturition also had not recurred.

Comments

Whether the view taken of the essential nature of enuresis is correct or not, the cases treated by nerve section show one very partial cure over 26 months, no doubt owing to insufficient nerve division and regeneration, two very near cures of 14 and 16 months, and one nine-months cure. In all cases none of the previous restrictions and precautions have been observed; in all, the previous precipitancy had disappeared. The choice of nerve fibres for section is admittedly empirical; it would appear, however, that in the later cases a middle course has been successfully steered between the Charybdis of enuresis (an exaggeration but not entirely inapt!) and the Scylla of retention; the use of crushing only of S 3 was resorted to in case there was, so to speak, over-correction of the enuresis, when nerve recovery would correct this error. On the whole, the amount of nerve division is, if anything, on the timid side. Many more precautions are needed against regeneration. Any mention of an operation on the pelvic sympathetic seems automatically to evoke great concern for the nervi erigentes. There has been no complaint on this score, and, in any case, only a small part of their origin is put temporarily out of action. It might be argued that a temporary damping down of the function concerned in the adolescent male would not be entirely a bad thing.

The cases operated on have been of the severest type; it remains to be seen if the parents of a lad of 10 years or so, with nightly enuresis and the probability of years more of the humiliating condition before a problematic recovery ensues, will not seriously consider the prospect of cure afforded by an operation of little more than interval appendicectomy risk and inconvenience.

The application and extension of the procedure to other conditions is no part of the present communication; it is clearly a necessary adjunct to complete interruption of the sympathetic supply to the pelvis in order to obtain complete denervation for painful conditions, and is simpler than the wide and not entirely satisfactory excisions of hypogastric plexuses that have been used. It should afford at least symptomatic relief in cases of stress incontinence, and even in some cases of inexplicable habitual abortion.

The work of the speech therapist, an occupation open to both men and women but so far followed mainly by women, is described in a booklet recently issued by the Central Youth Employment Executive (*The Speech Therapist*, Choice of Careers Series, No. 51, H.M.S.O., 6d.). Details are given of the work in school clinics, which deal solely with children, and in hospitals, where both children and adults are treated. Information is given on the educational qualifications required, arrangements for training, employment prospects, and salaries. This booklet is one of a series intended primarily for boys and girls who are about to decide the kind of work to take up on leaving school.

CLINICAL APPLICATION OF PORTAL
VENOGRAPHY

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The differential diagnosis and the full clinical assessment of splenomegaly can even to-day be an interesting and at times puzzling task. Conditions are met with in which the aetiology and pathogenesis of an enlarged spleen remain unexplained in spite of exhaustive bedside study and radiological investigations.

Modern advances in vascular surgery alone make it desirable that there should be a clear recognition of those cases of splenomegaly in which some of the symptoms can be remedied by vascular anastomosis for relief of portal hypertension. Attempts to demonstrate the portal system by injection of radio-opaque substances into a branch of the coronary vein, into veins draining the caecum, into the main portal branch, and into the branches of the splenic vein were carried out in recent years (Blakemore and Lord, 1945; De Sousa Pereira *et al.*, 1949; Moore and Bridenbaugh, 1950; Santy and Marion, 1951). The techniques employed were difficult, and not without risk to the patient, and, of course, only possible after laparotomy.

Abeatici and Campi (1951) were the first to describe a method of percutaneous portal venography in a dog via the spleen and splenic vein, and Leger (1951) applied the same technique in man for the first time. Soon afterwards, Boulvin and co-workers (1951) described their technique of portal venography by the same route in great detail. Their first patient suffered from cirrhosis of the liver and the second from an extrinsic obstruction of the splenic vein. These authors pointed out the potential value of the method for the differentiation of intrahepatic and extrahepatic block. Dreyer and Budtz-Olsen (1952) applied splenic venography in 11 patients with palpable spleens and again suggested the clinical application of the method. Milnes Walker and co-workers (1952) were the first in this country to publish their findings of portal venography by intrasplenic injection on 12 occasions, again in patients with enlarged spleens. Of particular interest was their demonstration of the flow from the portal vein into the left inferior vena cava nine months after successful end-to-side anastomosis between the portal vein and the inferior vena cava.

Konar and Sen Gupta (1953) related their experiences of splenic venography in 14 cases, which included cases of portal hypertension and of splenomegaly of unknown cause.

Present Investigation

We have applied the method of percutaneous intrasplenic injection on over 50 occasions, using a similar technique to that described by Boulvin and co-workers. Good contrast was obtained with 50% diodone, and this strength was used in all but one patient, who received a 70% solution. In some patients several films were taken at three-second intervals, but in most cases we were satisfied with the result of a single exposure after an injection of 18 ml. of the solution. A fine flexible lumbar-puncture needle with short bevel was used. The needle was entered in the left posterior axillary line just below the tenth rib with the patient on his

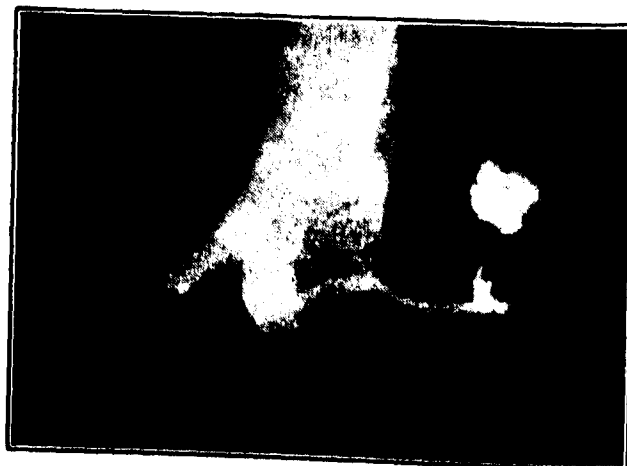


FIG. 1.—Unusual but not abnormal splenogram.



FIG. 2.—Splenogram in pernicious anaemia with splenomegaly.

back, but we have also obtained satisfactory pictures by injection into the tenth intercostal space in the scapular line, with the patient lying face down. The technique in normal people with healthy spleens is naturally far more difficult than in cases of splenomegaly.

Exact location of a healthy spleen by percussion was nearly always impossible, and we therefore had to rely on touch when the needle met resistance on entering the spleen. Several times we failed to hit the spleen and diodone was injected into the peritoneal cavity, and on at least one occasion into the splenic flexure of the colon. No ill effects followed. With growing experience we learned to appreciate the degree of resistance to the injection which is to be expected when the needle has pierced the spleen. We found the spleen a rather mobile organ, which may move about 2 in. (5 cm.) medially before the needle point enters the splenic capsule. In consequence the splenic vein appeared kinked, as shown in Fig. 1, which was the result of an injection into a healthy spleen through the scapular line. Tortuosity of the splenic veins was observed on several occasions in healthy people as well as variations in the size of the splenic and portal veins. In our experience no significant changes are to be expected after diodone injections into enlarged spleens without portal hypertension or extrahepatic obstruction. The dye did not spread to any extent within the spleen, and distinct filling of the splenic and portal veins and its intrahepatic branches was observed using no more than 12–18 ml. of diodone (Fig. 2). The intrahepatic distribution of the portal vein is shown up in a liver grossly enlarged due to melanoblastoma (Fig. 3).

Fig. 4 belongs to a series of eight splenograms taken in a patient with cirrhosis of the liver over a period of 14 months. The degree of portal hypertension as seen on portal venography varied in this patient, corresponding to changes in the clinical picture. A chronic hepatitis was originally confirmed by laparotomy and his liver

was complicated by right lower lobe bronchiectasis. Each acute attack of bronchial suppuration was followed by deepening jaundice and increasing ascites, which improved under streptomycin treatment. We obtained normal splenograms in this patient when the ascites and jaundice subsided, but could demonstrate anastomoses with gastric veins of varying degree during acute exacerbations of hepatitis, of which Fig. 4 is one example. A severe degree of portal hypertension in another patient with appearances of oesophageal veins is demonstrated in Fig. 5. We were able to demonstrate a fine trickle of the dye through an almost completely thrombosed splenic vein in a young male patient with cirrhosis of the liver. The pathology was subsequently confirmed at operation. Fig. 6 was taken in a case of carcinoma of the stomach with secondary deposits in the portal fissure. The abrupt cessation of the flow of diodone along the splenic vein confirmed an extrahepatic block. Similar pictures were obtained in a patient with advanced carcinoma of the head of the pancreas.

Discussion

We have found intrasplenic portal venography a useful help in the diagnosis of splenomegaly of unknown origin, in the differentiation of intrahepatic and extrahepatic venous block, and in the assessment of the degree of portal hypertension and the anatomy of the anastomosis between the splenic vein and gastric and oesophageal vessels.

The technique presents no difficulties in cases with enlarged spleens, in contrast to injections into normal



FIG. 5.—Severe degree of portal hypertension.

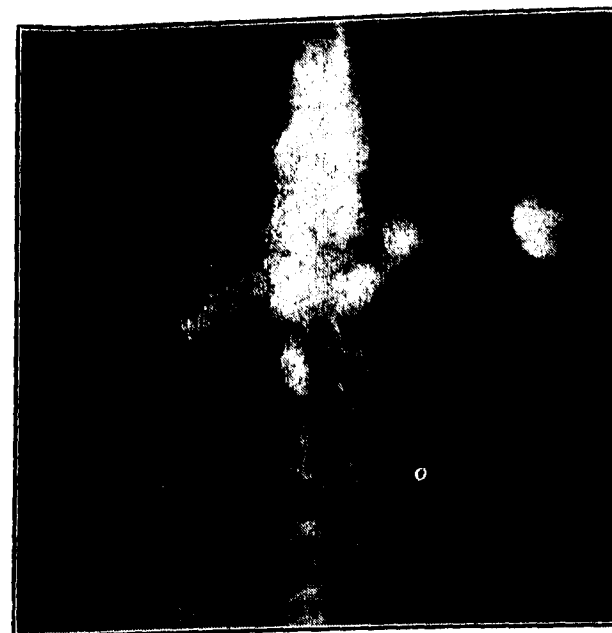


FIG. 3.—Melanoblastoma of liver.

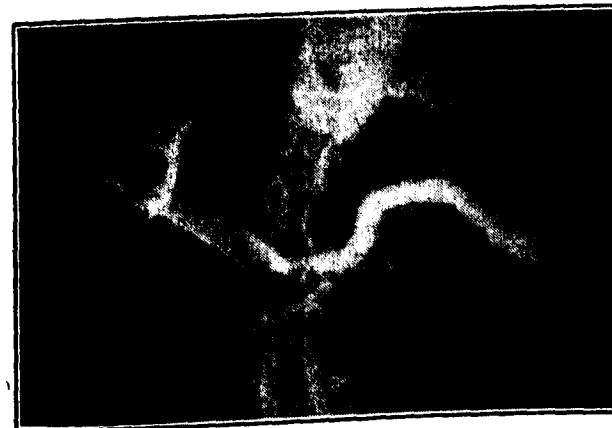


FIG. 4.—Portal hypertension.



FIG. 6.—Carcinoma of stomach with secondary deposits in portal fissure.

spleens, when failure to enter the splenic tissue on account of the mobility of the organ is frequently to be expected.

We are indebted to Professor Charles Wells for permitting us to use the method on three of his patients who were about to undergo shunt operations.

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NEOMYCIN IN PYOGENIC SKIN
DISEASES

BY

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Pyogenic infections are the commonest cause of skin disease, and cure of the acute case can be simple, but even impetigo, when mishandled, may persist for many weeks. Although the local use of antibiotics has considerably shortened the duration of these illnesses, it presents two disadvantages which some have thought contraindicate their use: (1) the danger of sensitizing the patient and thus preventing future systemic treatment with the antibiotic in what might be a serious illness; and (2) the encouragement of antibiotic-resistant organisms.

A stable and effective antibiotic which is not used systemically, which causes little cutaneous reaction, and which has a low incidence of bacterial resistance would overcome the most valid objections to local antibiotic therapy. Neomycin appears to fulfil these requirements in infections with *Staphylococcus pyogenes*.

Neomycin was discovered by Waksman and Lechevalier in 1949. It is produced by a strain of streptomycetes related to *Streptomyces fradiae*. It is water-soluble and thermostable, and maintains its effectiveness in practically any vehicle, including both acid and alkaline aqueous solutions. The drug is bactericidal *in vitro* against a wide variety of Gram-negative and Gram-positive organisms. Toxic effects causing kidney damage and deafness have prevented the parenteral administration of the drug, and its present use is limited to oral administration as an intestinal antiseptic and to local application. The effectiveness of neomycin as a local application in pyogenic skin eruptions has been reported in America (Kile *et al.*, 1950, 1952; Livingood *et al.*, 1952; Kimberly, 1952).

Present Investigation

A series of 93 cases were treated. They included: impetigo, 48; sycosis barbae, 18; ecthyma, 10; infected eczema and dermatitis, 8; furunculosis, 5; infective eczematoid dermatitis, 3; and blepharitis, 1. In none of these cases was irritation or sensitization of the skin caused by the ointment.

Neomycin was used in a concentration of 5 mg. per g. in an ointment base consisting of

White mineral oil	25%
Wool fat	20%
White petrolatum	54.4%

For purposes of comparison of bases, the same concentration was used in a water-miscible base:

Emulsifying wax, B.P.	20%
White petrolatum	20%
Phenoxyethanol	2%
Borax	0.6%
Boric acid crystals	1.2%
Water	to 100%

The two bases were used on the impetigo cases, half the series being treated with the water-miscible base. In contrast to the experience of Forbes (1952), no appreciable difference in the clinical results was found.

The patients were instructed to apply the ointments three times daily, cleaning the affected areas and removing crusts with liquid paraffin. In the few cases of furunculosis the ointment was also applied once daily into the nostrils.

Bacteriology

The organisms were cultured from each case and their sensitivity to penicillin, streptomycin, chloramphenicol, aureomycin, and neomycin was estimated. From practical experience it was found that a *Staph. pyogenes* which was insensitive to less than 25 units of penicillin per ml. or to 50 µg. of chloramphenicol or aureomycin could be regarded as resistant to the respective drug as a local application.

Staph. pyogenes was found in 91 cases—46 were penicillin-resistant, 2 aureomycin-resistant, 18 chloramphenicol-resistant, and 1 was resistant to less than 16 µg. of neomycin. All other staphylococci were sensitive to less than 4 µg. of neomycin; in 70 cases the staphylococci were sensitive to less than 0.015 µg. of neomycin. A haemolytic streptococcus was found alone in two cases and in association with *Staph. pyogenes* in 20 cases. The only other organism isolated was *Pseudomonas pyocyanea* in one case of impetigo. This was resistant to penicillin, aureomycin, and chloramphenicol, but sensitive to streptomycin and neomycin.

In the 48 cases of impetigo a *Staph. pyogenes* was found alone in 37, a haemolytic streptococcus in association with *Staph. pyogenes* in 10, and a haemolytic streptococcus alone in 1. The staphylococci were resistant to penicillin in 34 cases and to chloramphenicol in 11.

The 10 cases of ecthyma yielded a *Staph. pyogenes* alone in three cases; in the remaining seven the infection was a mixture of *Staph. pyogenes* and a haemolytic streptococcus. The staphylococci were resistant to penicillin in one case and to chloramphenicol in two cases.

The 18 cases of sycosis barbae yielded pure growths of *Staph. pyogenes* alone. The staphylococci were resistant to penicillin in eight cases, to aureomycin in two, and to chloramphenicol in five.

The miscellany of eight cases of infected eczema, five cases of furunculosis, three cases of infective eczematoid dermatitis, and one case of blepharitis yielded a haemolytic streptococcus alone in one case, *Staph. pyogenes* in 14, and a combination of these organisms in two cases. Penicillin-resistant staphylococci numbered three and the organisms were sensitive to the other antibiotics.

Results

Impetigo.—Three cases were treated with base alone as a control; as expected, the impetigo spread rapidly. Of the remaining 45 cases treated with neomycin, 27 healed in less than one week, 11 in less than two weeks, and 7 took longer than two weeks, but were quite healed in three weeks. There were no failures. The cases varied in severity and duration. Twenty-one had resisted previous treatments by their own practitioners for over three weeks. Twenty-five cases were definitely known to have been treated with penicillin cream and six cases with chloramphenicol without response.

Sycosis Barbae.—The 18 cases are classified according to the severity and chronicity of the condition, those which had lasted less than nine months being referred to as folliculitis barbae. Eight cases of folliculitis barbae were seen whose duration varied from one week to eight months. Four of these cases are known to have been treated with penicillin cream, two with chloramphenicol cream, and one with aureomycin cream, all without success. On treatment with neomycin ointment four cases healed completely—two in less than one week, and two in a fortnight—and have remained healed for four months. One severe case improved to the extent of having only a few pustules left, and there was no response in three cases. The 10 cases of sycosis barbae varied in duration from two to 31 years. Six cases are known to have been treated with penicillin, five with chloramphenicol cream, and five with aureomycin cream, without cure. Four cases responded well to neomycin ointment, healing in periods ranging from two to four weeks, two of them having slight residual erythema but no pustulation while using the ointment. Two further cases healed in a fortnight, but relapsed

two and four months later while still using the ointment, although the organisms remained sensitive to the antibiotic. Two cases were much improved and two showed no response.

Ecthyma.—Of the 10 cases of pyoderma and ecthyma treated, 3 healed in less than one week; these were all cases in which *Staph. pyogenes* alone was cultured. The remaining seven cases had a mixed infection of staphylococci and streptococci, two healing in less than a fortnight and the other five showing no response.

Miscellaneous.—Eight cases of infected skin conditions, including seborrhoeic dermatitis, contact dermatitis, and eczema, were all treated without any sensitization reactions. Three cases healed in less than one week, four in two to three weeks, and one case showed no response. One case of chronic blepharitis healed in three days. Three cases of retro-auricular infective eczematoid dermatitis healed in less than two weeks. The five cases of furunculosis had resisted a variety of treatments for this condition, and only one case ceased to have boils on treatment with neomycin ointment.

Comment

In the treatment of impetigo contagiosa, neomycin ointment is effective and rapid in action. In view of the advantages of using neomycin as a solely local antibiotic it might with advantage be adopted as a routine treatment for this condition.

In this series 60% of cases of impetigo cleared in less than a week, and many of these took only three to four days. Forbes (1952) treated 67 cases of impetigo with neomycin, 62 clearing in less than a week; he remarks that the type of patient was of high standard, most of them being university students and able to follow instructions. It might be assumed that there is some difference in this capacity between American college students and the industrial population of Sheffield. In the treatment of impetigo, chloramphenicol cream (Newman and Feldman, 1951), aureomycin ointment (Solomons, 1951), and bacitracin (Miller *et al.*, 1949) all give comparable results, most cases healing in less than a week, though Solomons found two cases aggravated by aureomycin cream.

In the treatment of sycosis barbae, aureomycin cream seems to have given the best results. Solomons treated 22 cases, all of which responded, only three being left with a few scattered pustules. Chloramphenicol cream (Newman and Feldman, 1951) cured only one case in five, improved two cases, and gave no result in two. Bacitracin (Miller *et al.*, 1949) cured 5 of 16 cases, the other 11 showing no response. Neomycin ointment in this series cured eight cases, and improved five; there was no response in five. Neomycin therefore seems to be superior to all antibiotics except aureomycin in the treatment of this condition.

Prolonged local application of any antibiotic encourages the growth of resistant organisms, and in this series the only aureomycin-resistant staphylococci were found in two cases of sycosis barbae. The routine use of a purely local antibiotic would therefore seem desirable as the first line of attack in the treatment of this condition.

As a local application to infected skin conditions and infective eczematoid dermatitis, neomycin showed no tendency to irritate the skin. Over a large number of cases this harmlessness is unlikely to continue, but Kile *et al.* (1952) applied neomycin to 869 cases and obtained only one sensitivity reaction. In the same paper the authors remark that some patients with haemolytic streptococcal infections did not respond well to neomycin. This was also found in this series in the cases of ecthyma, though sycosis barbae which did not respond or which relapsed the organisms had not developed resistance to the drug. This state is unlikely to last, although it has been the experience of all other investigators of neomycin. Nevertheless, antibiotic therapy is literally becoming a process of hurrying to use the new drug before it ceases to cure.

Summary

Ninety-three cases of pyogenic skin disease were investigated bacteriologically; *Staphylococcus pyogenes* was isolated and found to be resistant to penicillin in 46 cases, to chloramphenicol in 18 cases, and to aureomycin in 2 cases. None were resistant to neomycin.

The cases were treated with neomycin ointment in a strength of 5 mg. per g. In the treatment of impetigo the drug gave results comparable to those of aureomycin, chloramphenicol, and bacitracin. In sycosis barbae the results were superior to those of all other antibiotics except aureomycin. In other skin conditions, with the exception of the deeper infections with haemolytic streptococci, infection was controlled and sensitization reactions were not encountered.

Neomycin ointment is suggested as a routine treatment for impetigo and as the first line of attack in sycosis barbae.

My thanks are due to Dr. J. Colquhoun for the bacteriological investigations. I am indebted to Dr. H. R. Vickers and Dr. I. B. Sneddon for permission to use their cases for this investigation, and to the Upjohn Company for the supply of neomycin and neomycin ointment.

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STORAGE OF TESTICULAR TISSUE
AT VERY LOW TEMPERATURES

BY

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AND

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The discovery that glycerol has the property of protecting the spermatozoa of certain species (Polge, Smith, and Parkes, 1949; Smith and Polge, 1950) and also red blood cells (Smith, 1950; Sloviter, 1951a, 1951b) against the otherwise fatal effects of freezing and thawing was extended by Smith and Parkes (1951) to ovarian tissue. The latter work was recently recorded in more detail (Parkes and Smith, 1953), and it is clear that rat ovarian tissue, soaked in glycerol-containing media and subsequently frozen slowly and stored in liquid air, suffers only slight loss of its capacity to form an endocrinologically active graft. Moreover, the loss is not increased by prolonging very greatly the period of storage.

Method

Analogous observations have now been made on the preservation and grafting of rat testis tissue. The testes were taken from male rats 7 to 9 days old, at which age the organ is firm and easy to handle. The tunica was slit and the contents were slightly teased out. The capacity of such preparations to form functional grafts, after treat-

Meigs, J. V., Armstrong, S. H., and Hamilton, H. H. (1943). *Amer. J. Obstet. Gynec.*, 46, 19.
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Reviews

BRITISH SURGEONS

Lives of the Fellows of the Royal College of Surgeons of England, 1930-1951. By the late Sir D'Arcy Power, K.B.E., F.R.C.S., and continued by W. R. Le Fanu, M.A. (Pp. 889. 42s. Obtainable from Editorial Secretary at the College.) London: Published by the College. 1953.

Platt's *Lives of the Fellows* has for many years been a valuable work of reference and it is a pleasure to greet this continuation, which contains the lives of those Fellows whose death occurred between 1930 and 1951. Sir D'Arcy Power wrote the lives of those who died between 1930 and 1940, with one exception, and Mr. Le Fanu has written the remainder. Sir D'Arcy felt the loss of his friend Harvey Cushing so deeply that he thought he could not write an adequate life of this great man.

The volume contains the lives of 981 Fellows, among whom will be found the names of many of the most distinguished pioneers of modern surgery—Moynihan, Cushing, Grey Turner, Bland-Sutton, F. T. Paul, Arbuthnot Lane, Wilfred Trotter, James Berry, Tudor Edwards, Robert Jones, Thomson-Walker, G. H. Makins, and D'Arcy Power himself. There are also included a few physicians like Lord Dawson and Sir Humphry Rolleston, upon whom the Fellowship had been conferred.

This volume at once becomes the essential book of reference for most of the important British surgeons who moulded British surgery at a vital period of its growth. It gives the main facts of their lives, a list of their chief publications, and the sources from which further information can be obtained. Not only are their surgical deeds recorded but we are given illuminating details about what they did in their moments of relaxation, and it is interesting to note what were their pastimes. Many were fond of shooting and fishing, others were mountaineers, some were connoisseurs and collectors, some were musicians or photographers, some even worked embroidery, a few were ornithologists, one made a study of basking sharks, and several were yachtsmen, of whom one, Sir Alexander MacCormick, sailed his own craft from Australia to England with a crew whose ages were all over 60. Such activities have served to give relaxation from the surgical work that takes a heavy toll of these men in anxiety.

The reviewer spent the best part of a week-end reading a great number of the biographies and found them of engrossing interest. He had known, admired, and had an affection for many of these great pioneer surgeons, and his feelings of pride in their achievements were mingled with a sadness for their passing. Every Fellow of the College will surely wish to have a copy of this book upon his shelves.

ZACHARY COPE.

DIURESIS

Diuretic Therapy: The Pharmacology of Diuretic Agents and the Clinical Management of the Edematous Patient. By Alfred Vogl, M.D. (Pp. 248. £1 18s. 6d.) London: Baillière, Tindall and Cox. 1953.

An intelligent co-ordination of diuretic measures with proper attention to minor technical details may often restore an extremely dropsical patient to a reasonable state of health and comfort for a long time. Yet, though medical literature abounds in monographs on the pharmacology and therapeutic actions of digitalis, diuretic therapy, which is of almost equal importance, has received rather scant attention. The author of this scholarly but practical treatise was the first to observe the remarkable diuretic properties of the organic mercurials. It is of interest to note, as Dr. Arthur Fishberg points out in a foreword to the work, that the discovery of both digitalis and the organic mercurials was due to the prepared mind of the scientist being fructified by the observations of an attendant on the sick, or, to use the more modern language of bureaucracy, of a medical auxiliary—Withering's

discovery owing much to Mother Hutton's success in the treatment of dropsy, and Vogl's to the accurate coloured charts of intake and output kept by an anonymous nurse on a patient undergoing treatment for syphilis with "nova-surul." While this monograph is mostly concerned with the physiology, pharmacology, and clinical use of the organic mercurials in congestive heart failure, yet other diuretic measures such as treatment by acidifying salts, by low sodium intake, and by the xanthine and osmotic diuretics are not neglected, and the treatment of every type of oedema is discussed. The treatise is up to date, fully documented, and thoroughly readable, being written in good plain English.

D. M. DUNLOP.

PEPTIC ULCER

Peptic Ulcer: Pain Patterns, Diagnosis and Medical Treatment. By L. A. Smith, M.D., M.S. in Medicine, F.A.C.P., and A. B. Rivers, M.D., M.S. in Medicine, F.A.C.P. Foreword by George B. Fusterman, M.D. (Pp. 576; 208 figures. No price given.) New York: Appleton-Century-Crofts, Inc. 1953.

This book covers particularly the pain patterns, diagnosis, and medical treatment of peptic ulcer and is presented as a digest and evaluation of the experience of the Mayo Clinic in a series of 30,400 cases of peptic ulcer, ranging from the oesophagus to the ileum. The emphasis is particularly on the clinical aspects, with special reference to pain, and there are many illustrative diagrams and case histories. In addition, there are sections on the history of peptic ulcer and on the physiology of the stomach.

For those who are especially interested in peptic ulcer there are a number of interesting facets to the book, particularly in relation to ulcer pain, but it is a disappointing publication. It gives the impression that it was a long time on the stocks and was probably held up by the death of one of the editors (A.B.R.). Some of the chapters read as if they had been written some years ago. In the section on the treatment of bleeding, all of the 52 references are more than 10 years old, and in some other chapters too there is a paucity of recent references. Again, it is often difficult to get a clear picture of the personal opinion of the writers, which may become lost in a surfeit of reports from the literature.

Any book on peptic ulcer to-day must stand comparison with the recent monumental work by Ivy, Grossman, and Bachrach. This present publication lacks both the critical commentary and up-to-dateness which were so notable in that book.

F. AVERY JONES

ATLAS OF HISTOLOGY

Pathology in Surgery. By Edwin F. Hirsch, Ph.D., M.D. (Pp. 647; 388 photographs; 2 colour plates. 76s. 6d.) London: Baillière, Tindall and Cox. 1953.

This is one of a number of annotated atlases of morbid histology published in the U.S.A. in recent years. The reason for their compilation is not far to seek, for the useful information provided by the examination of tissue removed at biopsy has gained for histological diagnosis an assured place in the investigation of an increasing number of diseases. The resulting demand for expert morbid histologists was at first impossible to meet, and these books were obviously written to help the increasing number of pathologists who wish to acquire diagnostic proficiency in a rather difficult art. Such proficiency can be gained only by long experience under expert supervision, free access to all kinds of morbid material, and the cultivation of a peculiar sort of visual memory of microscopic structure. There is no satisfactory alternative to this arduous discipline. Morbid histology must be learnt from the actual section, which, during the period of training, can never be replaced by photomicrographs, however good their quality.

These atlases are valuable for reference purposes for those who have enough experience to be able to read and interpret photomicrographs. They are positively dangerous to

the inexperienced morbid histologist, who may be tempted to diagnose the disease process by matching his section against the "picture in the book." Dr. Hirsch's volume is open to this criticism but to no other. It is entirely concerned with surgical diseases. The profuse illustrations are of good quality, well reproduced, and skilfully selected. The text is clearly written, and, although in places almost telegraphic in its brevity, it is packed with sound information and not a little pathological wisdom.

GEOFFREY HADFIELD.

EDINBURGH LECTURES

Edinburgh Post-graduate Lectures in Medicine. Volume 6, 1950-53. Published for the Honyman Gillespie Trust. (Pp. 508; illustrated. 21s.) Edinburgh and London: Oliver and Boyd. 1953.

This is the sixth volume of lectures delivered in the Royal Infirmary, Edinburgh, under the auspices of the Honyman Gillespie Trust. The thirty-four lectures have been evenly distributed over the whole field of medicine and surgery, and it is difficult to pick out any themes for special mention. Tuberculosis and diseases of the chest are best represented, and there are lectures on such new topics as A.C.T.H. and cortisone and the use of isotopes in diagnosis. There are two lectures on genetic subjects and a delightful article by McCrie entitled "Reflections from a Provincial Deanery." The volume is well produced and well illustrated, and contains some coloured plates. From the publishing point of view the price of 21s. is therefore extremely low.

L. J. WITTS.

BALLISTOCARDIOGRAPHY

Ballistocardiography: The Application of the Direct Ballistocardiograph to Clinical Medicine. By Professor William Dock, B.S., M.D., F.A.C.P., Harry Mandelbaum, M.D., F.A.C.P., and Robert A. Mandelbaum, B.A., M.D. (Pp. 293; 153 figures. £3 11s. 6d.) London: Henry Kimpton. 1953.

Ballistocardiography has not received much attention on this side of the Atlantic. This method of studying the action of the heart depends on the sum of several forces, and these may overlap one another or oppose one another. Briefly, three main actions may be distinguished: that of recoil when the blood is being ejected from a chamber; that of the impact of the ejected blood on the peripheral circulation, particularly on such a structure as the arch of the aorta; and, thirdly, the motion imparted to an elastic tube as a wave of pressure moves along it. When the movements which these forces impart to the body, lying horizontally, are recorded by suitable apparatus, several waves appear in the record, some 15 in all for each cardiac cycle. This sounds rather formidable, but it would appear that only five or six are important; others are not concerned with ventricular systole. The physical causes for some of these movements are admittedly hypothetical.

By this method the clinician is seeking to fill an important gap in knowledge which is to some extent filled by the examination of the pulse and of the heart beat itself. But the ballistocardiograph is much more sensitive than the fingers or ears. The reader will find the most interesting chapters are those on the effects of coronary disease on the function of the heart as expressed by the ballistocardiogram. Particularly notable are the sections on infarcts and on the diagnosis of angina pectoris. Striking alterations in the curves are obtained by exercise. Another interesting chapter is on the surprising effect of nicotine on the ballistocardiogram. The authors maintain that these effects may be noticed before any signs of disease appear. They have a number of patients who reacted in this way and later developed frank coronary trouble. The arrhythmias and defects of conduction are not well shown by this method.

The writing of the book is on the whole good; occasionally the expression is obscure, and too many lines pile up without a single stop. The illustrations are clear, but there are two criticisms. First, to the uninitiated it is most important to label the waves, for they are not easily distinguished, and for many of them there is no label at all, which makes

it quite impossible to know which wave is which. Secondly, the timing is often given against pulse-tracings, and sometimes these hardly show up or do not appear on the record. It is much more satisfactory where the timing is done by the cardiogram. Anyone who wants to study this new subject will find the book useful. It is not really difficult, and there is something in it which might be well worth studying; but clearly a good deal of time will be needed to get the information. For instance, the suggestion is that on each occasion at least seven tracings will have to be taken, and some little time is required for the patient to settle down, and must also elapse after a meal. But if the claim is justified that "the ballistocardiogram gives information on the vigor and effectiveness of systole which no other technique can supply," then this information is certainly worth having.

TERENCE EAST.

SURGICAL HANDBOOK

Surgery of the Biliary Tract, Pancreas and Spleen: A Handbook of Operative Surgery. By Professor Charles B. Puestow, M.D., Ph.D.(Surg.). (Pp. 370; 72 plates. 68s. Subscribers to the whole series of Handbooks, 60s.) Chicago: The Year Book Publishers Inc. London: Interscience Publishers Ltd. 1953.

This is essentially a personal book and a practical book. The author addresses himself to surgical residents and to practising surgeons who may require guidance on procedures with which they are unfamiliar. He describes the methods he himself has found satisfactory and gives no bibliography.

It is inevitable that the views of a surgeon practising in another country should differ in some respects from those current in Britain. Dr. Puestow, for instance, favours needle biopsy in the diagnosis of cancer of the liver and of the pancreas. In biliary surgery he advocates division of the falciform ligament and use of the hepatic end as a tractor, and he displaces the liver medially in order to make the hilum more accessible. In exploring the common bile duct he seems to make a much longer incision in the duct than we should. He favours cholecyst-gastrostomy, which we have found unsatisfactory as a means of short-circuiting a biliary obstruction, and in pancreatectomy he seems to implant the gall-bladder rather than the common bile duct into the jejunum.

Common sense and practical experience mark his advice throughout. He points out the dangers of premature interference, and particularly of exploratory aspiration, in the treatment of subphrenic infections. He has found that the use of the bridge or the pillow in gall-bladder surgery does not improve access but is very apt to lead to troublesome backache afterwards. He reminds us that jaundice after an attack of gall-stone colic does not necessarily mean that a stone has entered the common duct. He devotes 150 pages in all to the surgery of the common duct, 40 of them dealing in an admirable manner with injuries and their repair. The surgery of cancer of the pancreas is discussed in a balanced manner, and the author has come to the conclusion, with which any experienced surgeon will agree, that in most cases only ampullary growths offer sufficiently good prospects of cure to justify the severe operation of pancreatico-duodenectomy.

The figures are all line drawings admirably chosen and executed, and showing the author's intention far better than the more elaborate half-tone figures that usually illustrate books on operative surgery. The experienced surgeon for whom this book is intended will find it interesting and useful.

HENEAGE OGILVIE.

In *Humanly Speaking* Dr. Eustace Chesser discusses fluently and provocatively sexual conduct in its social setting. He chooses for some of his main themes problems of adolescence, marriage and divorce, and society's attitude to the homosexual. Sir Cyril Burt contributes a foreword. The book is published by Hutchinson's Scientific and Technical Publications, price 8s. 6d.

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SICKLING AND MALARIA

The sickle-cell phenomenon has almost since its discovery been the subject of controversy. Until recently records of observation had tended to multiply much more rapidly than well-founded theories. Hypotheses were mutually contradictory, and even some series of recorded observations appeared incompatible with others. In the past two years, however, a body of well-established and generally accepted facts has begun to arise and to give a firm basis for theory.

Great numbers of Africans and many persons from other continents in normal health have red cells which, under chemically reducing conditions, form bizarre "sickle" shapes. These persons are said to have the sickle-cell trait. Other persons with similar (usually more severely distorted) red cells suffer from a chronic haemolytic anaemia associated with a high mortality: these are said to suffer from sickle-cell anaemia. It is important that the distinction should be made clinically and not as a result of genetical theories.

The two conditions taken together without distinction between them behave as a Mendelian dominant—every person showing sickling in any form has at least one parent who also shows it in some form. There is, moreover, evidence to show that most or all of the clinically normal persons with the trait are heterozygous for the condition, while most of the persons with sickle-cell anaemia are homozygous. This is the opinion of most workers in America and of many but not all of those who have worked in Africa.

The immediate cause of the sickling phenomenon and of the haemolysis of sickle-cell anaemia is the replacement of part or all of the normal haemoglobin of the red cell by a form of haemoglobin which, in the reduced state, has a very low solubility and crystallizes inside the cell. The sickle-cell-trait carrier (who is usually heterozygous) has less than 50% of this abnormal kind of haemoglobin, while most of the anaemic persons (usually homozygotes) have nearly 100% of it, usually with some of the foetal type of haemoglobin as well.

Whatever view be taken of the precise relation between the chemistry, genetics, and clinical manifestations of sickling, it appears that in many parts of Africa considerable numbers of persons are dying of sickle-cell anaemia. The gene for sickling is thus being eliminated, and unless some compensatory influence is at work the gene should ultimately reach an extremely low frequency. Two main alternative hypotheses have to be considered: either that the gene is maintained by a high rate of mutation from its normal allelomorph, or that heterozygotes for sickling tend to have more children than normal persons. The rate of mutation demanded is, as Dr. A. C. Allison points out in an article appearing elsewhere in this issue, three thousand times as high as that known for any other human gene: this hypothesis is therefore a most unlikely explanation. If sicklers are on the average to have more children than normal persons, then either individual parents must have more children or more sicklers must survive from birth to the reproductive age. The former possibility must be regarded as a reasonable one, for it has been shown for several other congenital diseases that parents tend, where possible, to over-compensate by subsequent replacement for the deaths which take place. Such compensation does not, however, depend solely on biological mechanisms but is largely dependent on cultural traditions. Thus, even if the process has a share in maintaining the incidence of sickling, it may be effective only in certain tribes. Selective survival, on the other hand, being a purely biological process would, if proved, be of more general application.

It was first suggested by Raper¹ that sickling was protective against tropical parasites, and later Brain² made the definite suggestion that heterozygous sicklers might have a greater resistance to malaria than normal persons. If this were so it would, by the operation of natural selection, tend to raise the frequency of sicklers in populations exposed to a high intensity of malarial infection. Impressed by the clinical evidence of Beet³ and of Brain² and by the general correspondence between high malarial incidences in Africa and high sickling frequencies, Allison examined some hundreds of children of one homogeneous tribe for sickling and showed that the non-sicklers had a significantly higher rate of parasitaemia than the sicklers. In the course of the work he found important clues which suggested that sickling probably conferred a resistance which was specific to infection with *Plasmodium falciparum* rather than to malaria in general. He then infected with *Plasmodium falciparum* two carefully paired groups each of fifteen volunteers, one group consisting of sicklers and the other of non-

sicklers. The infection became firmly established in all but one of the non-sicklers, whereas only two of the sicklers became infected and then mildly.

In a problem where so many ill-defined variables are involved it is highly desirable that confirmatory investigations should be made by other workers and on other populations, but there can be little doubt that Allison has demonstrated that the possession of the sickle-cell trait gives considerable protection against *Plasmodium falciparum* infection, and that he has thus made clear the main mechanism whereby high frequencies of sickling are maintained in certain African, Indian, and Greek populations. Lehmann⁴ and Allison have independently suggested that the relative protection against malaria which is enjoyed by newborn infants is due to the foetal type of haemoglobin in their red cells; and Allison has now shown that the progressively increasing incidence of malaria during the first year of life runs parallel to the replacement of foetal haemoglobin by the adult form. It may therefore further be suggested that in the child with sickling, in whom the foetal haemoglobin becomes largely replaced by the sickling instead of the normal adult form, this protection is to a great extent maintained, so that infection, when it occurs, as it almost inevitably will, is modified.

From now on the probability of a relation between sickling and malaria must be considered in investigations into the epidemiology of malaria in all parts of the world. Conversely, malarial incidence must be considered in all studies of the incidence of sickling. There is still a great need for such surveys as that carried out by Dr. H. Foy and his colleagues (see p. 294). While these authors do not regard malaria as an important factor influencing the distribution which they find, there is no doubt that the points which they stress, such as racial ancestry and genetic drift, have an important effect on sickling frequencies. Allison's work would, however, suggest that, provided the sickling gene is present in the population, its frequency will in the long run be determined mainly by the incidence of malaria. Nevertheless the presence or absence of sickling will remain an important anthropological character and a guide in the assessment of such hypotheses as that of Lehmann,⁵ who suggests that the character was introduced into Africa by Veddoid immigrants.

Other widespread congenital abnormalities of haemoglobin synthesis are known—thalassaemia in the Mediterranean area, and the occurrence of haemoglobins C and D in American Negroes.⁶ It is important that the distribution of these too should be studied and their possible relation to malaria and other infections explored.

THE PITUITARY AND CARCINOGENESIS

In 1945 Li, Evans, and Simpson¹ described the isolation of an anterior hypophysial growth hormone, and during the succeeding years, as supplies have become more readily available for research, some remarkable properties have been ascribed to this pituitary extract. The prolonged administration of growth hormone to rats causes more neoplasms to arise than would be expected to do spontaneously. They may affect the pulmonary and lymphatic tissues,² adrenal glands,³ and reproductive organs.⁴ Most laboratory animals, subjected as they are to interbreeding, are apt to produce strains which are particularly liable to develop malignant tumours in certain organs. Thus experimental work on tumour formation carried out in one animal farm may be difficult or impossible to reproduce in another even with apparently identical techniques.

Moon and his colleagues,⁵ of the University of California, injected different strains of young mice for 194 days with up to 2.0 mg. of growth hormone daily. In only one strain did neoplasms arise. An interesting observation was that the females under this treatment grew larger than the controls, and developed larger viscera. Since the prolonged administration of growth hormone to rats produces tumours of various kinds in many different organs, it is clearly of interest to know what happens in such animals deprived of any growth hormone by hypophysectomy. These workers have shown that, after removal of the pituitary, rats do not develop spontaneous tumours, nor will the injection of growth hormone induce them to appear. In further experiments⁶ pellets of methylcholanthrene, which is a potent carcinogen, were implanted into the gastrocnemius muscles of rats which had been hypophysectomized. The removal of the pituitary effectively inhibited the carcinogenic effect of the methylcholanthrene.

Another group of workers, Griffin, Rinfret, and Corsiglia,⁷ studied the effect of hypophysectomy on the liver damage and hepatomas produced in rats by giving an azo dye with the food. They administered 3-methyl-4-dimethylaminoazobenzene to rats for ten to twelve weeks, and this induced a high percentage of liver tumours. Hypophysectomy effectively inhibited their developing. Further work⁸ by these investigators at Stanford University showed that, if hypophysectomized rats fed on the azo dye were given

¹ *J. biol. Chem.*, 1945, **160**, 353.

² Moon, H. D., et al., *Cancer Res.*, 1950, **10**, 297.

³ — *ibid.*, p. 364.

⁴ — *ibid.*, p. 549.

⁵ — *ibid.*, 1952, **12**, 448.

⁶ Moon, H. D., Simpson, M. E., and Evans, H. M., *Science*, 1952, **116**, 331.

⁷ Griffin, A. C., et al., *Cancer Res.*, 1953, **13**, 77.

⁸ — *Proc. Amer. Ass. Cancer Res.*, 1953, **1**, 21.

⁹ *Time*, February 1.

¹⁰ See *British Medical Journal*, 1953, **1**, 924.

¹ *E. Afr. med. J.*, 1949, **26**, 281. ² *J. clin. Path.*, 1953, **6**, 329.
³ *E. Afr. med. J.*, 1952, **29**, 925. ⁴ *Man*, 1953, **53**, 9.
⁵ *E. Afr. med. J.*, 1946, **23**, 75. ⁶ Itano, H. A., *Science*, 1953, **117**, 89.

A.C.T.H. or cortisone, no liver damage or tumour appeared, but, if they were given pituitary gonadotrophin, liver damage and cirrhosis were seen. It is possible that the pituitary factor or factors involved in this carcinogenic process are present in the gonadotrophic fraction. These recent experiments in carcinogenesis suggest very strongly that some pituitary factor must be present before a malignant change can be initiated in the body, though there must also be many other as yet unknown factors. It is striking that a known anterior pituitary fraction, the growth hormone, should induce malignant tumours in so many different organs of the rat when it is administered in excess.

Race, environment, diet, and injury mechanically or chemically induced have all been shown to be important in the causation of cancer in man. In addition, when malignant disease arises in prostate or breast it can sometimes be temporarily controlled by the administration of hormones. This hormone therapy consists in giving large doses of stilboestrol or testosterone, which inhibit the secretion of anterior pituitary hormones and possibly work by performing a "medical hypophysectomy." Since the initiation and also the continued growth of a neoplasm require the presence of a normally functioning anterior pituitary, and since many of the pituitary hormones are now available, hypophysectomy has become a possible method of treatment. This is borne out by a report in the current issue of *Time*,⁹ according to which a Cuban woman seriously ill with recurrence of a breast cancer had her pituitary gland removed just over a year ago. She has had hormone-replacement therapy, and it is now reported that 95% of the outward signs of her cancer have disappeared. A few years ago it would have been considered most improbable that bilateral adrenalectomy would ever be advocated for arresting the growth of malignant disease in man,¹⁰ but the introduction of cortisone has made this a feasible, if somewhat experimental, therapeutic procedure. Even if such drastic techniques as total adrenalectomy and hypophysectomy are restricted in the main to the experimental animal, they should in time help us to understand why malignant tumours grow in the way they do.

RESPIRATORY INFECTION AND EMPHYSEMA

It is an experience common to family doctors and hospital physicians alike that the winter months bring in their wake increasing numbers of patients with chronic bronchitis who, having developed an acute

respiratory infection, suddenly become seriously ill and not infrequently die. These patients have signs of bronchopneumonia, are deeply cyanosed, mentally confused, and suffering from varying degrees of right heart failure: deterioration quickly occurs because they are already afflicted with emphysema, and their respiratory insufficiency is greatly aggravated by the added infection. The outcome in such patients is always difficult to forecast, but clinical impressions strongly suggest that the prognosis has been materially improved by the introduction of antibiotics and the efficient use of oxygen.

Elsewhere in this week's *Journal* Dr. T. Simpson describes his observations on 118 patients with acute respiratory infection complicating emphysema. The patients were mostly men in the sixth and seventh decades of life. The common occurrence of this malady can be judged from the fact that it was responsible for 4% of admissions to the medical wards and its seriousness from the fact that roughly one-third of the patients died while in hospital. Most patients had long-standing bronchitis and showed signs of bronchopneumonia, often complicated by mental confusion and heart failure. Among the notable features of complicated emphysema in this series of patients were a poor temperature response to infection, a fall in the systolic blood pressure on inspiration, and a curious appearance of the optic fundi characterized by darkness of the retina, distension of the veins, and changes in the optic disk sometimes amounting to papilloedema. Simpson believes that any respiratory infection in the emphysematous patient should be treated as an emergency. Antibiotic therapy is of paramount importance: penicillin is usually all that is required, but if that fails and chloramphenicol is also ineffective sputum examination will show to which of the other antibiotics the particular organisms are most sensitive. Hospital treatment will almost certainly be needed for those patients whose fever fails to respond quickly to treatment, or in whom deep cyanosis, mental symptoms, or heart failure supervene.

The administration of oxygen to these patients raises certain difficulties. It is generally agreed that relief of anoxia helps the patient, but it is now also known that mental confusion, myoclonic movements, coma, and even death can follow oxygen therapy.^{1,2} The cause of these nervous symptoms has been investigated by Drs. E. K. Westlake and M. Kaye, whose observations are reported at page 302. They studied the effect of inhaling various

¹ Segal, M. S., and Dulfano, M. J., *Chronic Pulmonary Emphysema*, 1953, New York.

² Davies, C. E., and Mackinnon, J., *Lancet*, 1949, 2, 883.

³ *Physiologic Therapy in Respiratory Diseases*, 1948, Philadelphia.

⁴ *J. Amer. med. Ass.*, 1950, 143, 1047.

gaseous mixtures and found that the cerebrospinal-fluid pressure increased in response to both anoxia and carbon-dioxide retention (hypercapnia), the increased pressure probably being caused by increased cerebral blood flow. In most emphysematous patients with infection both anoxia and hypercapnia are present. The relief of anoxia, though in itself beneficial, also removes one of the stimuli to ventilation, and therefore further carbon dioxide retention takes place to offset the effect of oxygen therapy. Drs. Westlake and Kaye conclude that the adverse effects of oxygen therapy are due to the direct toxic action of carbon dioxide on the brain rather than to the raised intracranial pressure; and they do not believe in lumbar puncture as a method of treatment in patients with mental symptoms.

The use of oxygen in patients with respiratory infection must therefore be approached with a full knowledge of its dangers as well as its value. Simpson believes that Barach's method⁴ of giving oxygen has some merit: here oxygen is given initially by nasal catheter, the rate of oxygen flow is slowly increased, and later the patient is transferred to an oxygen tent. The modern oxygen tent is the most efficient method of giving oxygen, but for this very reason the patient may develop cerebral signs of hypercapnia more quickly. Since respiratory depression will increase the dangers of carbon dioxide retention, morphine is strongly contraindicated in the infected emphysematous patient, and other sedatives must be used with great discretion.

AEROSOL DETERGENTS

The value of a humid atmosphere in the treatment of some forms of respiratory disease has long been recognized. Humidity is usually produced by means of steam or, more correctly, warm water vapour from a bronchitis kettle. In the patient's home a pan of boiling water on a stove may be used. The vapour is often "medicated" with tinct. benzoin co., which probably has little therapeutic effect although it does impart a pleasant smell to the atmosphere. The use of hot water vapour is not without its dangers, and there is some risk of scalding the patient or of producing hyperpyrexia in a sick child. In order to overcome these dangers various forms of "cold steam" humidification were devised in which cold water vapour was atomized by means of a spray,¹ and this method was thought to give a better effect more quickly. Now a recent development has been the use of various synthetic detergents, or wetting agents, in the form of an aerosol mist in order to liquefy viscid secretions.²

Detergents contain two radicals—a hydrophobic or water-repellent group, consisting of a long hydrocarbon chain, and a hydrophilic group. In aqueous solution the

molecules arrange themselves so that the hydrophobic group is on the surface away from the water. The film which is formed lowers the surface tension and reduces the viscosity of the solution. In addition the hydrophobic group has some solvent action on fatty materials. A number of these substances in the form of mists have been tested both in experimental animals and in clinical practice. Hall tested four compounds for toxicity in guinea-pigs.³ He found that if they were used in a concentration of greater than 0.1% dyspnoea was rapidly produced, and with higher concentrations the animals died. Post-mortem examination showed degeneration and desquamation of the alveolar epithelium, invasion of the alveolar spaces by macrophages, and fibroblastic proliferation. In a later clinical study Hall⁴ investigated one compound—sodium lauryl sulphate—and recommended its use in concentration of 0.05% as an aerosol mist in exudative respiratory infections in infants. Small unpublished trials in this country have confirmed the absence of toxicity, but striking benefits have not been observed.

More recently another synthetic detergent—"triton W.R. 1339"—has been the subject of extensive investigation. The substance was first used as an aid to streptomycin inhalation in the treatment of pulmonary tuberculosis, and it was found to have a marked liquefying effect upon the sputum. Subsequently it was tried in various conditions characterized by excessive or thickened secretion from the respiratory tract and was found to be effective.⁴ Ravenel has carried out studies on babies suffering from asphyxia neonatorum and claimed dramatic results.⁵ Eighteen newborn infants suffering from massive atelectasis or from inhalation of liquor were treated, the diagnosis having been made on clinical grounds in most of the cases, only six being x-rayed before treatment; all eighteen recovered completely. Another six babies, four premature and two full-term, did not appear to be helped by treatment, but at necropsy two of them were found to have severe congenital cardiac malformations and another was reported to have "mesenchymal hyperplasia" of the lungs, with thick-walled alveolar septa. It was suggested that the aerosol detergent should be given prophylactically to newborn infants whenever the delivery has been difficult and respiratory complications are expected. Special nebulizers have been devised to deliver a fine dry mist, and Miller⁶ describes a simple apparatus which he claims gives satisfactory results. The chief requirements are that the particles should be small (0.5 to 3 μ) in order to penetrate the alveoli. Larger particles are apt to be irritating to the respiratory mucosa and cause coughing and gagging. Apparatus that has been devised for giving penicillin by inhalation has also been found to give fairly satisfactory results. Ravenel has also given the indications for the use of aerosol detergents.⁵ Among

¹ Nelson, W. E., *Textbook of Pediatrics*, 5th ed., p. 215, Philadelphia, 1930.

² Hall, G. C., *Amer. J. Dis. Child.*, 1950, 80, 408.

³ ———, *ibid.*, 1952, 83, 1.

⁴ Miller, J. B., and Boyer, E. H., *J. Pediat.*, 1952, 40, 767.

⁵ Ravenel, S. F., *J. Amer. med. Ass.*, 1953, 161, 707.

⁶ Miller, J. B., *Amer. J. Dis. Child.*, 1952, 84, 616.

⁷ Craven, J. F., *J. Pediat.*, 1953, 42, 228.

⁸ Limber, C. R., et al., *J. Amer. med. Ass.*, 1952, 149, 816.

⁹ Varga, C., and Wild, J., *Amer. J. Dis. Child.*, 1953, 86, 273.

the conditions he has treated are laryngitis and laryngo-tracheobronchitis, where the results have been very good; asthma and allergic bronchitis; capillary bronchitis; pneumonia with atelectasis; whooping-cough; respiratory or bulbar paralysis in poliomyelitis; laryngeal oedema following bronchoscopy; and, most effectively, neonatal atelectasis.

No toxic effects have yet been reported from the use of triton W.R. 1339, and, unlike other detergents, it does not seem to cause haemolysis even in high concentrations. The product as put up for clinical use is a 0.125% solution combined with a 2% solution of sodium bicarbonate and 5% solution of glycerin. The last two solutions are said to stabilize the aerosol droplets and to assist in the liquefaction of mucus.

A different approach to this problem has been the use of proteolytic agents in aerosol form in order to liquefy tenacious sputum. Streptokinase and streptodornase have been used⁷ with doubtful effect, but excellent results are claimed for the use of trypsin. Limber *et al.*⁸ have used trypsin in the treatment of adults with chronic respiratory disease, and Varga and Wild⁹ report a case of bulbar poliomyelitis in a child in which the use of this agent made the aspiration of secretion from the respiratory tract very much easier and there was considerable improvement in the patient's condition. Because trypsin is a protein there is some danger of sensitization reactions developing from its use, and anti-histamine drugs have therefore been used in conjunction with it in order to minimize possible side effects.

So far there has been little experience in Britain of these forms of treatment. If the claims made for them can be substantiated, they would constitute a real advance in the treatment of acute respiratory disease in childhood.

DANGERS OF INDUCED HYPOTENSION

The effects of a low blood pressure on the reduction of bleeding during operations were known in the pre-anaesthetic era. In that dismal period surgeons hoped that their patients would faint early in the proceedings, not only because their pain would then cease, but also because haemorrhage became more controllable. After anaesthesia became an established practice, and until quite recently, it has been usual to try to maintain the blood pressure within normal limits, and for the surgeon to control the bleeding as he proceeded with the operation; if the blood loss became excessive it was made good by transfusion. In limb surgery a bloodless field could be secured by an Esmarch's bandage or other tourniquet, while in other areas a relatively avascular field could be obtained by infiltration with some vasoconstrictor solution such as 1 in 500,000 adrenaline in saline.

In the last few years, however, the idea of general hypotension to minimize bleeding was revived, and this

was usually obtained in one of three ways. First, arteriotomy and bleeding might be carried out until the desired fall in pressure was obtained, followed by transfusion back of the same blood at the end of the operation; this amounts to induced haemorrhagic shock and is accompanied by vasoconstriction. Secondly, preganglionic sympathetic block might be obtained by high sub-arachnoid or peridural spinal analgesia. Or, thirdly, ganglionic sympathetic and parasympathetic block might be induced by the intravenous injection of a methonium or thiophanium derivative combined with suitable posture. The last two techniques entail vasodilatation. All these methods are effective in producing hypotension, although the adjective "controlled" is open to question. Relatively ischaemic fields were welcomed particularly by plastic and cranial surgeons, and the practice of the technique was spreading rapidly, when it became clear that a heavy price was being paid in fatalities and severe post-operative complications.

The question of the frequency of these unfortunate consequences then arose, and a determined effort to find the answer was made by Hampton and Little.¹ These investigators sent questionnaires to 602 members of the Association of Anaesthetists of Great Britain and Ireland, and received back completed reports from the surprisingly high number of 299 anaesthetists. In brief, this investigation showed that in 21,000 cases of induced hypotension 46 fatalities occurred, of which 42 were probably associated with the technique (one death in 500 cases). Non-fatal complications affecting mainly the cerebral, renal, and coronary circulations occurred on 549 occasions (one in 38 cases). A similar inquiry circulated to diplomates of the American Board of Anesthesiologists showed 50 deaths in 6,805 operations (one death in 136 cases). An interesting result of the latter investigation was that a significantly greater number of complications occurred if the blood pressure was allowed to fall below 80 mm. Hg. Too much must not be deduced from these results in the absence of control cases, but it is evident that induced hypotension does carry a considerably greater risk than normal methods of anaesthesia. Two comprehensive surveys based on all available evidence were made by Armstrong Davison² and Woolmer.³ The general conclusion was that the technique of induced hypotension should not be used except for operations essential to avert death or really serious disability and impossible to perform without a bloodless field.

The general acceptance of the view that hypotension was too risky for general use has stimulated investigators to find out means of making it safer.⁴ The most promising line of research appears to be that of reducing the basal metabolic rate so that a reduced oxygen supply is still sufficient for the vital organs. Delorme⁵ has pointed out that this can be accomplished by hypothermia but that superficial cooling in adults provokes the natural response of shivering, and this must be suppressed either by deep anaesthesia, muscle relaxants, central cooling by means of an arterio-venous shunt, or by one or other of the inappropriately named "lytic cocktails" which contain various

derivatives of phenothiazine such as promethazine and chlorpromazine. These techniques were recently discussed at a meeting of the Section of Anaesthetics of the Royal Society of Medicine and in these columns.⁶ With these varied aids it is possible to reduce the B.M.R. almost to zero for a short time, as with a cut-off cardiac inflow for intracardiac surgery. A few successful cases have been reported in the human subject, but the high degree of cooling and hypotension necessary are undoubtedly dangerous and may lead to irreversible ventricular fibrillation when attempts are made to restart the heart at the end of the operation. In these exceptional cases it is probably better to use a moderate degree of hypothermia (not below 28° C.) and a shunt carried out by means of a heart-lung machine (or pump oxygenator) as described by Melrose.⁶ All this work is unquestionably still in the experimental stage, and individual anaesthetists not connected with a research unit would best rely on well-proved methods, which are suitable for all but very exceptional cases.

MEDICAL AUXILIARIES

Last week we briefly described the regulations¹ which are to come into force on April 1 laying down the qualifications required for medical auxiliaries in the National Health Service. The regulations are stated to be based upon the recommendations made by the Cope Committees in 1951, but, "to avoid certain anomalies and unfairness," those recommendations have not been applied strictly. The question of statutory registration, which was also recommended by the Cope Committees, is to be considered by a working party with a view to "evolving a scheme which will be acceptable" both to the Minister and to the medical auxiliaries.

Many of the qualifications set down as acceptable at present are in accordance with the recommendations of the Cope Committees, but there are important variations in the qualifications of the physiotherapists and the chiropodists. The most important body of physiotherapists is the Chartered Society, which lays down that there shall be a course of training lasting three years. One of the qualifications recognized by the Minister falls short of this standard, and it is to be hoped that after April 1 such lower standards will not be acceptable. A departure from the recommendations of the Cope Committees occurs also in the matter of qualifications required for chiropodists.

Some months ago we emphasized² the need for State registration and for the setting up of a central authority to co-ordinate the various medical auxiliaries. Statutory registration is now the rule for doctors, dentists, nurses, and midwives, and it surely ought to be the rule for medical auxiliaries, who have been growing in numbers and influence during the past decade. There are several groups of professional workers in the National Health Service who are asking for recognition, and a

central council is needed which will be competent to judge whether recognition should be granted to these. At the same time such a council would be the appropriate body to maintain a statutory register of all medical auxiliaries and be the final arbiter on the adequacy of the various curricula. It is to be hoped that the working party to be appointed by the Minister will bear these points in mind. There is now undoubtedly an opportunity for the Minister to achieve a piece of constructive statesmanship which will bring the position of medical auxiliaries into line with the other professions in the National Health Service.

ANTIBIOTICS AGAINST NEOPLASMS

In a search for effective chemotherapeutic agents inhibiting malignant tumours experimentalists have, during the last few years, included antibiotics in their list of substances for screening tests.¹ This was a rational procedure, for Gale² has shown that chloramphenicol, aureomycin, and terramycin inhibit protein synthesis, and bacitracin inhibits protein and nucleic-acid synthesis in *Staphylococcus aureus*—activity that is desirable in a compound to be used against neoplasms. An outstanding problem, however, is to find such a preparation with selective toxicity against tumour cells as compared with normal cells, a difference which fortunately exists so often between the effect on parasites and that on the infected host. The sixth International Microbiological Congress, held in Rome in 1953,³ heard a report by Waksman on the effect of actinomycin C on tumours as observed by Domagk. Now comes the news that American workers⁴ have isolated from another strain of streptomycetes an amino-acid derivative, L-azaserine. The director and some of his colleagues at the Sloan-Kettering Institute for Cancer Research in New York report⁵ that this peculiar product shows a remarkable effect on the transplanted mouse sarcoma 180. Further details of other findings are promised. What does this portend for the treatment of human neoplastic diseases? Will it signify a turning point in the development of therapeutics against cancer and reticuloses such as the discovery of sulphonamides and penicillin did in the treatment of microbial infections? It is hoped that patients suffering from reticuloses might be the first to benefit from the new antibiotic. Its discovery will in any case stimulate further search among fungal products and give a possible lead to the synthesis of suitable agents. The question arises immediately whether the selective action of such material against pathologically proliferating blood elements compares favourably with that of nitrogen mustards, T.E.M., mercaptopurine, "myleran," and other experimental drugs at present in use against lymphatic or myeloid, acute or chronic, forms of leukaemia. Those engaged on this work are well qualified to find the answer quickly to these urgent questions.

¹ Arch. Surg. (Chicago), 1953, 67, 549.

² Anaesthesia, 1953, 8, 255.

³ Lancet, 1953, 2, 190.

⁴ Ibid., 1952, 2, 914.

⁵ British Medical Journal, 1953, 2, 1256.

⁶ Lancet, 1953, 2, 1294.

¹ See British Medical Journal, January 30, 1954, p. 284.

² Ibid., 1952, 1, 1267.

¹ Reilly, H. C., *et al.*, Cancer Res., 1953, 13, 684.

² Gale, E. F., and Folkes, J. P., Biochem. J., 1953, 63, 493.

³ Waksman, S., 6th Internat. Microbiological Congress, p. 3-12, 1953.

⁴ Bartz, Q. R., *et al.*, Nature, Lond., 1954, 173, 72.

⁵ Stock, C. Chester, *et al.*, *ibid.*, 1954, 173, 71.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

THE NORMAL BLOOD COUNT

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A blood count offers figures from which the clinician hopes to confirm his diagnosis. Unfortunately, the errors in even the best-conducted blood count are enormous, and in an expert's hands a determination of haemoglobin and an examination of a stained film are usually more informative.

Haemoglobin Level

Methods.—The estimation of haemoglobin is done by one or other colorimetric method, nowadays usually comparison of dilute (1 in 200) oxyhaemoglobin with a grey screen, viewing both through a green filter (M.R.C. photometer) or photoelectric determination of the absorption of light by a dilution of blood in water (oxyhaemoglobin) or in N/10 NaOH (alkaline haematin). The classical Haldane method is dying out because of its inherent inaccuracy, although it and the M.R.C. photometer are the only methods which can be calibrated by the National Physical Laboratory.

Reproducibility.—The modern methods are about as accurate as are the graduated pipettes used for them. In time past, the errors of calibration of haemoglobin pipettes were great; nowadays they are usually bought to British Standard Specification No. 797 and tolerance is $\pm 3\%$, so that a series of replicates taken from a bottle of blood will vary by no more than this. Unfortunately, replicates taken from a patient at different times vary much more than this, for any individual may show fluctuations of 7% in his haemoglobin level. A convenient estimate is that two estimations of haemoglobin made at different times on the same patient differ significantly if the difference exceeds a tenth of the average of the two determinations. The old Haldane method is much less accurate than are the modern methods mentioned above, and with this method the difference should exceed 15% for it to be significant.

Standards.—It was only during the war that E. J. King in London and R. G. Macfarlane in Oxford discovered that Haldane's original calibration of his "100% = 13.8 g." standard had been inaccurate, and that the 100% Haldane standard actually corresponded to 14.8 g. haemoglobin per 100 ml. This explained a series of observations which had puzzled haematologists—for example, why Americans appeared to average about 1 g. haemoglobin per 100 ml. more than Englishmen. The new Haldane calibration is that 100% = 14.8 g. per 100 ml. The Medical Research Council has recently organized a scheme whereby samples of blood of accurately known haemoglobin content are supplied at regular intervals to large laboratories so that they can standardize their instruments. With this and a secondary standard such as a grey glass or wire mesh screen, a haemoglobinometer can be maintained in accurate calibration for years, even if a photoelectric cell has to be changed at short notice.

Normal Values.—For men these can be taken as 14.8 ± 1.5 g. per 100 ml. (13.3–16.3 g.) or 90–110%, which will include more than 19 out of 20 normal subjects. Occasionally normal subjects have lower or higher figures than this, but such subjects are rare: only about 1 in 300 have values below 12.6 g. or over 17 g. (85%–115%). For women, the level chosen depends on the definition of normal. If "normal" is equated to "optimal," then the level for women is the same as that for men; but many women can maintain this only when their average iron intake is much greater than normal—some 30–60 mg. in place of the usual 10–15 mg. If "normal" is equated to "usual,"

however, the range extends much lower: it is quite common to find apparently healthy women with haemoglobin levels of 85% or even 80% (12.6 or 11.8 g. per 100 ml.). Such women nearly all show a rise to levels within the male range if they receive a supplement of 65 mg. ferrous iron daily for 30–60 days (one ferrous sulphate compound tablet, N.F.), though they often fall again as soon as the iron supplement is withdrawn. In such women the menstrual loss is usually excessive or the diet is poor.

Mean Corpuscular Haemoglobin Concentration

The packed cell volume (P.C.V.) indicates the percentage of the volume of the blood which is occupied by the red cells; it is determined with the haematocrit. The standard practice is to collect venous blood into Wintrobe's anticoagulant (potassium and ammonium oxalate) and centrifuge a sample in Wintrobe's haematocrit tube for 30 minutes at 3,000 r.p.m. The normal range for men is 42–48% (mean 45%) and reproducibility is about the same as for the estimation of haemoglobin. Estimation of the P.C.V. gives the same sort of information as does that of the haemoglobin—in fact, one is often substituted for the other, but usually the haemoglobin is slightly more informative. The two estimations can, however, be combined to yield an index of great value—the mean corpuscular haemoglobin concentration (M.C.H.C.), obtained by dividing haemoglobin concentration expressed in grammes per litre by the percentage of blood occupied by cells (P.C.V.). The M.C.H.C. is a direct indication of iron deficiency. Most normal subjects have M.C.H.C. values between 32% and 35%; patients with marked iron deficiency have values below 30%, while values between 30% and 32% may occur in normal subjects, but are suggestive of mild iron deficiency. Because haemoglobin and P.C.V. can both be determined with high and comparable accuracy, the M.C.H.C. is subject to quite a small experimental error, and is reproducible with a high degree of consistency.

Red-cell Count

The red-cell count is greatly overrated as a diagnostic aid, because the errors inherent in it are immense and the labour required by it is considerable. First, the tolerance on volume in the counting chamber is $\pm 5\%$, and that of dilution pipettes $\pm 3\%$, so that duplicate counts by different workers could be performed with instruments differing by as much as 16%. So extreme a variation would, of course, be rare, but in addition to this error of calibration is the uncertainty due to chance variations in the number of cells which settle on unit area; this random error was computed theoretically as long ago as 1879 and demonstrated practically in 1881: it is enormous.* Thus if a count of 4,000,000 per c.mm. is estimated by counting 400 cells, then there is 1 chance in 20 that the true count is less than 3,600,000 or more than 4,400,000. This range can be reduced only by counting more cells: it is halved whenever the number of cells counted is increased fourfold.

In my own laboratory I deprecate the performance of red-cell counts unless 1,000 cells are counted; my clinical colleagues rarely insist on counts when they appreciate how unreliable they are and how much labour they require.

*One count in every 20 may be expected to lie more than $(200/\sqrt{N})\%$ from the true value, where N is the number of cells counted: if N = 400, then $200/\sqrt{N} = 10\%$.

Colour Index

There are three indices which depend on the red-cell count and share with it its unreliability: (1) The colour index (C.I.) (Hb, expressed as percentage of normal ÷ red cells, expressed as percentage of normal; or, since normal red blood cells approximate 5,000,000 per c.mm., $Hb \div 20 \times$ red-cell count in millions per c.mm.). (2) The mean corpuscular haemoglobin (M.C.H.), which is the average Hb content of a cell (Hb contained in 1 ml. blood ÷ 1,000 × red cells per c.mm.: mean 29×10^{-12} g. or 29 $\gamma\gamma$). (3) The mean corpuscular volume (M.C.V.), the average volume of a cell, computed from P.C.V. and red-cell count, as follows: $P.C.V. \div 10 \times$ red cells in millions per c.mm. The normal M.C.V. lies between 82 and 95 μ^3 . Of these three indices the M.C.V. is the most important.

The colour index and M.C.H. do not discriminate between the volume of a cell and the concentration of haemoglobin therein. For example, a patient's count might be $Hb = 42\%$ or 6.2 g., red cells = 2,000,000 per c.mm., $P.C.V. = 24\%$, when $C.I. = 1.05$ and $M.C.H. = 31.2 \gamma\gamma$, well within the normal range, leading to a diagnosis of simple or aplastic anaemia. When the M.C.V. is found to be 120 μ^3 , considerably increased, and the M.C.H.C. is 26%, a subnormal value, one is led to consider a combination of pernicious and iron-deficiency anaemias—a combination less rare than might be expected and quite clearly shown in the stained film. It is its inherent inaccuracy and inability to discriminate between changes in volume and changes in haemoglobin concentration which has made haematologists spurn the colour index and adopt instead Wintrobe's "absolute indices," which facilitate precise diagnosis by separating volume changes from changes in concentration of haemoglobin within the cell. Personally, I usually reduce labour by estimating Hb and P.C.V., computing the M.C.H.C. to assess the degree of iron deficiency, and examine a film to exclude gross changes of size and shape in the cells: I find that only about one erythrocyte count need be performed for 12 to 15 determinations of haemoglobin.

Price-Jones Curve

An index of great value, which is unfortunately too expensive to perform as a routine, is the Price-Jones curve. This is performed by classifying cells according to their average diameter, and drawing the curve showing how frequent are the cells of different sizes. A normal blood yields a symmetrical narrow-based curve because the variation in size of cells (anisocytosis) is small. Severe iron-deficiency anaemia yields a curve in which the peak has moved to a smaller diameter and the base is wider because cells are more variable (anisocytosis increased): pernicious anaemia yields a relatively flat curve, with a peak shifted to a higher diameter and a very wide base (gross anisocytosis). Price-Jones curves are at present mainly of academic interest, though they may become a routine investigation when a new automatic particle counter and measurer comes into use, because this instrument should allow red-cell counts to be done automatically on several thousand cells, which could also be classified automatically into groups differing in diameter by about 1 μ .

The halometer, introduced by Pijper, of Pretoria, is a convenient instrument by which the modal cell diameter ("peak of the Price-Jones curve") can be measured accurately, and the degree of variation in size can be roughly assessed. There are many instruments available, but the simplest is that of the Association of Clinical Pathologists: it consists of a board on which are fixed two flash-lamp bulbs 28 in. (71 cm.) apart. If a thin blood film is held to the eye while looking at the bulbs in a darkened room, each light is seen to be surrounded by (from within outwards) a yellow halo, a dark zone, and a circular rainbow, the red being outside. The observer moves to and from the lights in a line perpendicular to that joining them until the outer edges of the two circular rainbows just touch. The distance from the

blood film to the midpoint between the lights, measured in feet, is equal to the modal cell diameter (peak of Price-Jones curve) in microns. Three unstained films should be measured. If anisocytosis (variation in size) is marked, the rainbows will be less distinct, and in severe pernicious anaemia anisocytosis may be so great that the rainbow cannot be clearly seen and the halometer cannot yield any measure of cell diameter, though even here it does inform one that anisocytosis is excessive.

The ingenious practitioner can devise his own halometer: in emergency I have made a white mark on brown cardboard, made a pencil hole 14 in. (35.5 cm.) from the mark, and hung the card in front of an electric light: I retire until the red of the rainbow touches the white line; then my eye is N feet from the hole, where N is the modal cell diameter of the specimen of blood.

Appearance of the Red Cell

The measures so far considered permit one to estimate the concentration of haemoglobin in the blood, and the size and haemoglobin saturation of the cell. The shape of the cell has been considered only in relation to the Price-Jones curve, and its functional activity not at all.

The shape of the cell is best assessed by examining a stained blood film which is so thin that the cells are separate. Variation in size is described as anisocytosis; it is slight in normal subjects, moderate in iron-deficiency anaemia, and extreme in pernicious anaemia. Misshapen cells are called poikilocytes, and if they are numerous poikilocytosis is said to be present and is always an indication of serious haematological disorder. An estimate of whether the cell tends to be larger than normal, about normal size, or smaller than normal can be made by eye, and these are described by the terms macrocytosis, normocytosis, and microcytosis respectively. If the film is well stained the peculiarities of staining can be seen: when the normal cell is a pinkish yellow, a few cells of slaty blue colour can sometimes be seen; if the colour is uniformly distributed, the cell is polychromatic (shows polychromasia) and polychromatic cells appear to be the same as reticulocytes. Sometimes the slaty blue colour is due to the presence of dots of blue pigment—that is, of methylene blue or other basic dye from the stain—and this is punctate basophilia, common in marked anaemias but rare in the absence of gross anaemia except in patients with lead-poisoning.

The well-stained normal red cell shows a slight central pallor, where the biconcavity is evident. Sometimes this is absent, when it is usually due to bad staining, though occasionally the cell may have a smaller diameter than usual and show no central pallor—this is described as microspherocytosis and is constantly found in congenital haemolytic anaemia (acholuric jaundice) and during haemolytic crises in haemolytic anaemias. The central pallor may increase (hypochromia) until a narrow pink rim surrounds an unstained centre—the pessary cell of severe iron deficiency. Sometimes the periphery and the centre of the cell stain densely, but there is a zone of pallor between the two; this is the target cell, or Mexican hat cell, found in obstructive jaundice, in the severest iron-deficiency anaemia, in Mediterranean anaemia, and in sickle-cell anaemia; it is an abnormally thin cell, a leptocyte, the opposite of a spherocyte.

Typical mild or moderate iron deficiency shows no such extreme change. Some cells show increase in the central pale area, and such cells are usually rather small, but there are always normally staining cells of normal size present; if the size of the central pale area varies greatly from cell to cell, one may speak of anisochromia; this is a very sensitive indication of iron deficiency even if anaemia is only slight.

Some blood samples show other peculiarities of importance. Reticulocytes may be constantly increased in conditions in which blood cells are being produced more rapidly than normal, particularly in haemolytic anaemia and in

leuco-erythroblastic anaemia. Heinz bodies are refractile bodies detected within the erythrocyte after supravital staining: they appear after administration of haemolytic poisons such as phenylhydrazine, but can be produced *in vitro* by the action of ascorbic acid. Pappenheimer bodies are basophilic bodies seen in the red cells in rare forms of haemolytic anaemia. Siderocytes contain granules in which iron can be demonstrated. Howell-Jolly bodies are basophilic bodies 0.2-0.5 μ in diameter derived from chromosomes which have failed to fuse with either nucleus because they became separated from the mitotic spindle. They are particularly common after splenectomy, and are not rare in pernicious anaemia.

There are a few congenital diseases which must be mentioned. In some patients the erythrocytes are elliptical (elliptocytosis), in others crenated: both conditions may be associated with an increased rate of red-cell destruction. They are of considerable genetic interest and should always be referred to a specialist in genetics. In patients with thalassaemia (major or minor) many cells are target cells, and foetal haemoglobin persists in adult life. In sickle-cell trait or anaemia cells appear in films as target cells, but when reduced *in vitro* or *in vivo* the cell elongates and may throw out long terminal filaments; the change occurs because an abnormal haemoglobin is present and its reduced form is almost insoluble and crystallizes out. Since the Mediterranean trait (thalassaemia minor) may have a frequency of 20% in some populations (Cyprus) and sickle-cell trait 50% in others, such as the East African pigmoids, in certain areas they may come to be regarded as "normal"—that is, usual. There are other congenital anomalies involving leucocytes—hypersegmentation, or Alder's anomaly, and failure of segmentation, the Pelger-Huët anomaly—but these are extremely rare in all populations.

The Normal Blood Count

Haemoglobin	12-17 g. per 100 ml.
Erythrocytes	4.3-6.4 mill./c.mm.
Haematocrit	42-48%
M.C.V.	82-95 μ^3
M.C.H.C.	30-35%
Reticulocytes	0-2%
Total leucocytes	4,000-9,000 per c.mm.
Neutrophil	Juvenile 0-100 per c.mm.
	Staff 0-500 per c.mm.
	Segmented 2,500-6,000 per c.mm.
Eosinophils	0-400 per c.mm.
Basophils	0-100 per c.mm.
Lymphocytes	1,000-3,000 per c.mm.
Monocytes	0-800 per c.mm.
Platelets	250,000-500,000 per c.mm.

The White Blood Cells

There are five or six different types of cell included under the generic term leucocyte, and each appears to have a special function. It is the absolute rise or fall of each type which is important, not the proportion which that type bears to the total. This makes it essential to express the differential count as N cells per c.mm.—the absolute count—and not as a percentage as was once the practice. In this way the analysis of a count is actually simplified. If one blood sample showed a leucocyte count of 20,000 and a second a count of 2,000 per c.mm., and both had differential counts of 20% neutrophils and 70% lymphocytes, one would have to think carefully to realize that in the first blood the neutrophils are normal and the lymphocytes greatly increased (suggesting pertussis) and that in the second the neutrophils are greatly reduced. If one sees the counts expressed as: (1) neutrophils 4,000, lymphocytes 14,000 per c.mm.; (2) neutrophils 400, lymphocytes 1,400 per c.mm.; the difference at once leaps to the eye.

The neutrophil polymorphonuclear cells in resting normal adults range from 2,500 to 6,500 per c.mm. The ordinary neutrophil has a segmented nucleus. Some 10% of neutrophils have, however a nucleus with the form of a bent rod without constrictions: these are the "staff forms" or "stab-

kernige" cells, a slightly less mature form; and about 1% of neutrophils have a kidney-shaped nucleus—the "juvenile" or metamyelocyte stage.

The neutrophils increase (1) on exercise—walking about may cause a rise of 500-1,000 and violent exercise a rise of 20,000-30,000; (2) irregularly during pregnancy, though rarely to above 10,000 per c.mm.; (3) when tissue is breaking down, as a result either of trauma or of necrosis due to infarction or to infection.

The eosinophil polymorphonuclear cells are usually said to range from 0 to 200 in normal subjects. Recently techniques for direct counting in a haemocytometer have been developed, and these are far more precise than the differential count; the new techniques reveal a few counts in normal subjects up to 800 per c.mm., and analysis suggests that there is no definable upper limit of normal,* although counts over 600 per c.mm. are more likely to be abnormal than normal. Eosinophils are increased in a variety of conditions in which foreign proteins enter the body—the allergic diseases (asthma, hay-fever, and some eczemas), infections with trichinellae and ascarides while the larvae are passing through the body, some abnormal antigen-antibody reactions such as exfoliative dermatitis, and collagen diseases in some patients.

The basophil polymorphonuclears number 0-100 per c.mm. and are of uncertain function.

The lymphocytes appear to be involved in the production of antibodies. Normally they number 1,500-3,000 per c.mm. and are increased in infancy to 4,000-6,000 per c.mm.; they are also increased in whooping-cough, acute infectious lymphocytosis, and lymphatic leukaemia. Abnormal lymphocytes characterized by foamy cytoplasm and an immature nucleus are numerous (500-10,000 per c.mm.) in glandular fever, and occur in smaller numbers in a variety of virus infections, notably in infective hepatitis, as well as in normal infants during the first 14 days of extrauterine life.

The monocytes are normally 0-800 per c.mm.; they are increased in the recovery phase of acute infections and in many chronic infections.

The sum total of the leucocytes is very variable, but in young men at rest it varies between 3,600 and 8,000 per c.mm., with a very few as low as 3,100 or as high as 9,300. Diurnal variation averages 1,600, but may reach 2,500. There is a slight rise between noon and 3 p.m., but no true digestive leucocytosis. The neutrophilia of exercise and of other conditions is reflected in the total leucocyte count. In infants of over 3 months and children under 4 years, lymphocytes exceed the neutrophils and may reach 6,000 per c.mm.; these two cell types are equally numerous by the age of 4 years, and thereafter slowly progress towards adult levels.

Platelets range from 200,000 to 500,000, the range varying somewhat according to technique. Increases are common in polycythaemia rubra vera and chronic myeloid leukaemia, decreases in thrombocytopenic purpura, acute leukaemia, and, more frequently each year, as a result of the administration of drugs.

Next article on Clinical Pathology.—"Laboratory Investigations in the Diagnosis of Iron-deficiency and Simple Chronic Anaemia," by Dr. George Discombe.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

*The logarithm of the eosinophil count is normally distributed about a mean.

Nova et Vetera

AN EXTREMELY RARE TREATISE

On February 8 there comes to auction a book so rare that only two other copies are known, one of which is in the Wellcome Museum. This is a treatise by John Banester, published in London by Thomas Orwin for Thomas Man in 1589. The full title of this bibliographical rarity is "An Antidotarie Chyrurgicall, containing great varietie of choise of all sorts of medicines that commonly fall into the Chyrurgions use: partlie taken out of Authors, olde and new, printed or written: partlie obtained by free gifte of sundrie worthie men of this Profession within this Land. By John Banester Master in Chirurgie." This is the first edition of Banester's textbook: only one copy (not the Wellcome copy) has been exposed for auction in London during the past 50 years. In the same sale there is offered also *Epistolae Medicinales*, by Aloisius Mundelle, published in Basle about 1550.

John Banester, or Banister, was born in 1540 and began his professional life as surgeon to the forces sent to relieve Le Havre in 1563. On this expedition he met William Clowes, another surgeon, and they remained lifelong friends. For some years Banester practised at Nottingham. In 1585 he accompanied a military expedition to the Low Countries and afterwards settled in Silver Street, London. He died in 1610 and was buried in St. Olave's Church, Silver Street, but the church, with the record of his death, was destroyed in the Great Fire of 1666.

Preparations and Appliances

A CONSTANT STRENGTH TRICHLOROETHYLENE INHALER UTILIZING A NEW PRINCIPLE

Dr. T. H. S. BURNS, Research Fellow, Department of Anaesthetics, Guy's Hospital, writes: The inhaler described here has been designed primarily for the production of a constant percentage of trichlorethylene vapour in air suitable for general analgesia. The proportion of trichlorethylene vapour is kept between 0.4 and 0.6% (vol./vol.) for all types of respiration likely to be met with in practice. To date, most inhalers producing vapour from a liquid drug depend on the "draw-over" principle. The output of such inhalers is obviously affected by a rise of room temperature and also by any shaking of the liquid, which will increase the surface area exposed to the air. Any draw-over machine attempting to produce a constant output must therefore incorporate a

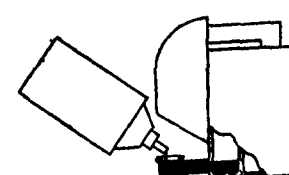


FIG. 1b

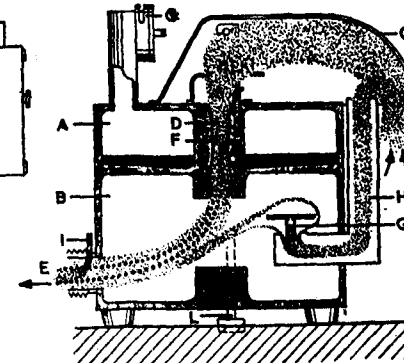


FIG. 1a

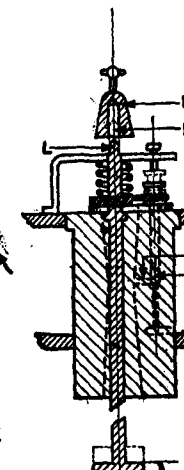


FIG. 1c

FIG. 1a.—Simplified cross-section of inhaler.

FIG. 1b.—Filling position. FIG. 1c.—Safety device.

thermostat or other device to compensate for changes in room temperature. It must also include some system which will minimize the effects of shaking.

This new inhaler works on the principle of delivering a fixed amount of liquid trichlorethylene into every litre of air reaching the patient. The amount of liquid trichlorethylene necessary to produce a vapour strength of 0.5% in a litre of air is of the order of 0.02 ml. This amount is readily vaporizable at the lowest room temperature likely to be met with in practice. Thus, however much the inhaler is warmed, no more than the desired amount of trichlorethylene will be vaporized. The difficulties involved in shaking are met by a needle valve cut-out device which effectively seals off the liquid trichlorethylene in the machine as soon as it is picked up. Trichlorethylene is delivered into the air stream only when the machine is on a flat surface in its working position.

Fig. 1a shows a simplified cross-section of the inhaler. Compartment A is a container which holds roughly 60 ml. of trichlorethylene. The surface area of this container

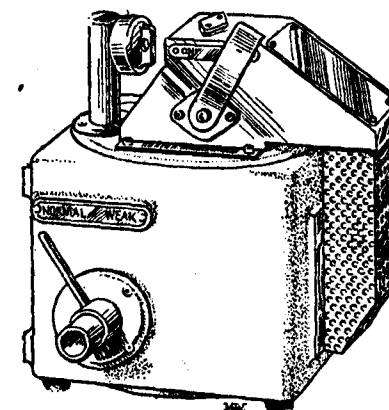


FIG. 2.—General view of the inhaler.

is large, so that the depth of the trichlorethylene is small. This minimizes any change in output due to a fall in level of the liquid. The filler (O) is arranged so that the machine is turned on its side for filling. This simplifies the prevention of overfilling (Fig. 1b). Compartment B is a "capacity" of about 1 litre. Its function is to assist in vaporizing the trichlorethylene and to act as a "damper" to reduce sudden changes of pressure during respiration.

Air is drawn by the patient under the hood (C), through the Venturi tube (D), into the capacity (B), and on to the mask via the breathing-tube (E).

The narrowing of the Venturi tube (D) causes a reduction of pressure as air is drawn through it. A jet (F) opens into the Venturi tube at its narrowest point. This jet communicates with liquid trichlorethylene at the bottom of the container (A). This container is kept at atmospheric pressure, and so trichlorethylene tends to pass via the jet into the Venturi tube when a patient inspires. Here it is mixed with the air to form a trichlorethylene/air mixture. There is a critical air flow, below which the pressure is not reduced enough to draw any liquid into the Venturi tube. The faster the air flows the greater is the amount of liquid drawn into the air stream. The resulting mixture does not remain constant but gets richer as the air speed increases. This is shown in Fig. 3.

It should be pointed out that for a "minute volume" of, say, 20 litres the maximum air speed would be of the order of 60 litres a minute at the height of inspiration.

The inhaler is designed to give an output of between 0.4 and 0.6% trichlorethylene vapour in air (vol./vol.) for types of re-

Since these episodes occur in aphasic patients, it is essential that they be recognized and understood. Misinterpretations suggesting other conditions or irascibility of the patient may result in additional discomfort to the individual.—I am, etc.,

New York.

HAMILTON CAMERON.

Clot Retention

SIR,—The copy of the *Journal* containing an annotation on clot retention (October 24, 1953, p. 928) has just come to hand in this country. No mention is made of a simple method which we have been using in Auckland Hospital for several years now in practically all cases of severe clot retention which cannot be cleared by irrigation through a large whistle-tipped catheter.

The method consists simply in evacuating the clot through a special large direct vision cystoscope (approximately F 30), with the patient anaesthetized and in the lithotomy position. The instrument, by the way, is used purely and simply for evacuation of blood clot (as in clot retention) or of stone fragments. The clot can be clearly seen in the bladder when the irrigating system is turned on. The instrument is plunged into the centre of the clot, the irrigation turned off, window removed, and, with a to-and-fro shake of the shaft of the instrument, clot is easily evacuated in large quantities. The process is repeated till the bladder is empty, the operation being easier if the table is tipped with the patient in the "buttocks low" position for the final stages. A bladder full of clot can be emptied in a few minutes, and haemorrhage usually stops as soon as the bladder is empty. The method avoids an open operation and has the advantage over the Bigelow evacuator (mentioned in the annotation) that the procedure is done under vision, and one therefore knows as soon as the bladder is empty.

I was under the impression that this method was now generally adopted, and was thus surprised to find no reference to it in the annotation.—I am, etc.,

Auckland, C.I.,
New Zealand.

L. I. PARTON.

Reaction to Blood Transfusion

SIR,—Justifiably or not, the physician must frequently bear the onus when severe or fatal transfusion reaction has occurred even though his judgment in transfusion practice is often pitted against the emotions of importunate families which in turn have drawn their impressions of transfusion benefit from television promotional campaigns by national blood-collecting agencies.

Dr. G. Discombe (*Journal*, July 5, 1953, p. 45) suggests that dextran infusion would serve as well in many cases where blood had previously been thought to be the proper infusion medium. As Dr. Discombe points out, dextran is an alternative and does have the merit of not conveying homologous serum hepatopathy, but one must not assume that this material is innocuous. All mucinoids, synthetic as well as natural, have "blocking antibody" propensities, and dextran is no exception. It is, furthermore, a sufficiently powerful "conglutinin" that 3% dextran has replaced 20% albumin in the various compatibility testing techniques where weak, incomplete, or dilute haemagglutinins are sought. Four per cent. dextran, a concentration which could be achieved in the affluent veins of a recipient, will itself act as haemagglutinin in the bloods of 20% of subjects with increased circulating glycoprotein. One per cent. dextran, an accomplished concentration in the circulating plasma of any recipient of one 500-ml. unit, will, by its presence, raise any potential anti-A titre in this recipient four-fold and any potential rhesus-type antibody titre as much as eight-fold; these figures result from actual titration of the conglutinative effect of dextran on bloods of normal subjects and of those with adaptation disease. The inference derived from these titration figures has been borne out by the conversion of a blocking-type auto-antibody in the plasma of blood dyscrasia and neoplastic disease subjects to direct haemagglutinins

through dextran infusion. For this reason, reaction to plain dextran infusion (not to mention combined blood-dextran) comprising any or all the features of incompatible transfusion reactions is to be anticipated as the result if this material is extended. Likewise for this reason an *in vitro* compatibility test of the dextran to be infused with the citrated blood or unwashed erythrocyte suspensions of the prospective recipients, along the lines of ordinary "minor-side" match, should never be omitted. Some patients will then be found as unsuitable for dextran infusion as they are for blood transfusion, and we will get just as much into the habit of characterizing unsuitable recipients as we now characterize unsuitable donors, if we are careful to perform such compatibility tests on all infusion colloids.

In covert transfusion reactors, there is usually an increase in the mucoprotein component of the α and β globulin fractions of their plasma; these glycoproteins are demonstrable panhaemagglutinative "blocking" antibodies, having properties similar to the "rhesus antibodies." Some evidence is available to indicate that they arise from that depolymerization of the mucopolysaccharide (hyaluronate-like) ground substance which accompanies, that depolymerization being an accompaniment of severe decompensatory adaptation reactions.—I am, etc.,

New York.

R. D. BARNARD.

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A Cosmetic Amputation

SIR,—Judged by the experience of those who serve on medical appeal tribunals, there is little doubt that the "cosmetic amputation" is now used as a routine by many surgeons, when the marginal fingers require amputation. Although in agreement with Sir Heneage Ogilvie (*Journal*, December 12, 1953, p. 1322) and Professor B. McFarland (*Journal*, January 16, p. 159) that a mobile intact metacarpal with good skin cover is of considerable functional importance to every working man's hand, it would perhaps be unwise to recommend the more distal level of amputation as a routine practice.

Hand surgery is more concerned with the primary level of finger amputation immediately following major hand injury than with what Professor B. McFarland terms "the second bite at the cherry." By implication the "second bite" condones the old teaching in the treatment of major hand injury—namely, "Save all you can at the primary operation and undertake definitive repair at a later date." There is now abundant evidence that the quality of the functional end-result following major hand injury to workpeople is conditioned by the "first bite"—that is, the primary operation. Further, very few, if any, British workmen benefit from, appreciate, or will agree to a series of hand operations.

Immediately following a major hand injury surgical planning can be definite on two matters. Its first aim is to prevent any degree of infection; secondly, a picture of the final functional end-result attainable (in a given injury) should be clearly in the surgeon's mind. To prevent infection, skin cover of the whole wound must be complete at the end of the first operation. In a working man's hand the palm should, if possible, be covered by palmar skin; no other skin in the body is capable of increasing or decreasing the thickness of its horny layer in response to functional demands, no form of skin graft can fully replace the functional quality of palmar skin. Not infrequently in major marginal finger injury, palmar cover by palmar skin is possible only after sacrifice of part or whole of the marginal metacarpal. Therefore there are some real indications for the high level of amputation even when the metacarpal bone has been left intact.

Sir Heneage Ogilvie has been quite specific in his advice and criticism, but his is quite a small bite of a very big cherry. The economic importance of hand injuries to workpeople and their cost to the community are well known. Surely the full challenge is to the organizing

ingenuity of British surgery to provide a good standard of surgical treatment of all injured hands at the acute stage. Further, in the surgery of hand injury, important surgical principles are involved which could well be taught to all undergraduates on a clinical background they would readily understand.—I am, etc.,

Birmingham, 15.

WILLIAM GISSANE.

Fatal Bronchial Asthma

SIR,—I quote sentences from consecutive articles in the same *Journal*: "In the asthmatic patient with an infective sputum penicillin should be given in anticipation of bacteriological results" (Drs. C. Kelman Robertson and K. Sinclair, *Journal*, January 23, p. 187). "It is important that the acute exacerbations [of acute bronchitis] be treated energetically, with antibiotics..." (Mr. John Fry, p. 190).

I think these two sentences, although unfairly taken from their contexts, should be made an excuse to express a warning against the indiscriminate use of antibiotics, especially the broad spectrum variety, in chronic bronchitis and asthma. I know of one sufferer whose death was hastened by the administration of chloramphenicol which thickened the sputum until it could not be expectorated, plugged the bronchioles, and precipitated right ventricular failure. He might well have lived through another summer with more conservative treatment.—I am, etc.,

Cosham, Hants.

V. H. MARTINDALE.

SIR,—The review of cases from the Edinburgh Royal Infirmary by Drs. C. Kelman Robertson and Kenneth Sinclair (*Journal*, January 23, p. 187) is of great value in recording deaths caused by an attack of asthma as opposed to those caused by secondary effects leading to pulmonary failure, etc.

To my mind, the most important finding in these cases is the 100% marked plugging of the bronchi. It is my experience as a bronchoscopist that some cases of "status asthmaticus" which fail to respond to the usual treatment can be relieved by bronchoscopic suction of gelatinous tenacious mucus, and I submit that, in this type of case, bronchoscopy is the measure which gives the patient the best chance of survival, and should always be tried.—I am, etc.,

London, W. 1.

A. M. ZAMORA.

The Winter Vomiting Disease

SIR,—I was extremely interested in the short article on "The Winter Vomiting Disease," by Dr. J. F. Goodall (*Journal*, January 23, p. 197). This Health Department investigated a quite extensive outbreak of infective hepatitis in the city of Exeter during 1953. This was only made possible, of course, by the willingly extended co-operation of the general practitioners practising in the city.

During the course of our investigation we were faced with the occurrence of quite a number of cases in children of general upset, nausea with or without vomiting, abdominal pain, and diarrhoea with the passage of very pale stools, but these cases showed no icterus. We formed the opinion that we were probably dealing with acute non-icteric cases of infective hepatitis, and in this opinion we were fortified by an article by Capps and Stokes in the *Journal of the American Medical Association*.¹ I am therefore interested in the grounds upon which Dr. Goodall came to the conclusion that infective hepatitis could be confidently excluded in his series of cases.

The syndrome of winter vomiting disease had a personal interest for the writer, for in the middle of a morning clinic at this time he suffered extreme nausea and sharp abdominal colic such as to cause him immediately to take up a strategic position in the small annexe to his clinic. In the event, however, he did not vomit, and by the afternoon was feeling quite well again. It is of interest that he had had a moderately severe attack of infective hepatitis in 1947. I am glad that Dr. Goodall has struck a blow at the facile diagnosis of "gastric flu," which satisfies the layman so easily

and only confuses the epidemiologist, and congratulate him on a most useful and needed piece of research in the true Pickles tradition.—I am, etc.,

Exeter.

J. H. WHITTLES.

REFERENCE

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Death Rate in Singapore

SIR,—Some recent figures received of the crude death rates of the City of Singapore record such an improvement that I think the people in the British Isles should know of them.

In 1911 I was asked by the able Health Officer, W. R. C. Middleton, to advise what could be done to reduce the high death rate by reducing the malaria. At that time Mr. R. J. Wilkinson—later Governor of the Gold Coast—was Colonial Secretary. The population of Singapore was then roughly 280,000 between 1912 and 1919. In 1911 the peak of the death rate was 85.83. The average crude death rate from 1892 to 1911 was 42.33, and from 1912 to 1919 was 34.79. The last report for the year 1951 for the City of Singapore with a population of 747,947 was 12.73. There had been 54 cases of malaria.—I am, etc.,

Peaslake, Surrey.

MALCOLM WATSON.

Training General Practitioners in Psychotherapy

SIR,—The article by Dr. Michael Balint (*Journal*, January 16, p. 115) emphasizes the deplorable state of things which we all know to exist. At least half of the cases seen by the family doctor are in need of psychotherapy, but although he may recognize that need he does not know how to respond to it. At the specialist level the psychiatrist is overwhelmed and can only deal effectively with the more advanced cases. The remedy is undoubtedly to interest and educate the general practitioner. The courses arranged by Dr. Balint for that purpose are admirable in conception and practice, but they cannot do more than influence a very small section of the medical population.

Between the wars the doctor had a much greater interest in medical psychology than he has now, and working in a large city I was able to encourage that interest by sending back full reports on the cases referred to me, and often succeeded in encouraging the practitioner to deal with a proportion of his own cases. That sort of relationship does not now appear to exist between the hospital psychiatrist and the G.P., and the natural interest of the doctor is small. The sweeping victories of biological research have given the education of the medical student a materialistic bias, just as happened in the first half of the nineteenth century when specific germs were found to be responsible for specific diseases. Medicine has to retrace its steps, and the only way to do that is to keep the psychological aspect of man and his *dis-ease* before the student throughout his whole medical course.—I am, etc.,

Scarborough.

R. MACDONALD LABELL.

Medical Needs in the Gold Coast

SIR,—I would like to make a few comments on Professor Ian Fraser's letter (*Journal*, January 23, p. 214). This is a matter in which I am deeply concerned, for I am a West African recently returned to this country, after six years' work on the Gold Coast, to attempt to complete my specialist training.

Facilities on the Gold Coast are poor and conditions are very unattractive especially to doctors who have no permanent interest in the country. The climatic conditions are such that retired practitioners of advancing years are likely to suffer ill-health and be quite unable to maintain any real degree of efficiency. The short-term service, although it would introduce more highly qualified men into the Colony, does not allow for continuity of service or interest.

The solution to me is apparent. It is the provision of an adequate number of well-trained Africans, permanently domiciled in their home country, who, equipped with an intimate knowledge of local problems, and with the real

interests of their country and people at heart, can capably deal with all contingencies. The present difficulty is for these men to obtain specialized training. This cannot be obtained on the Gold Coast, and we look naturally to Britain to help in this matter. It is, however, almost impossible for an African, even though educated in England and a graduate of London University, to obtain any suitable junior post in his chosen specialty. This difficulty almost precludes the African graduate from even fulfilling the requirements for admission to the more important higher qualifications. It is little wonder that with only a handful of basically qualified practitioners the semi-literate population is easily hoodwinked by the unqualified practitioners who flourish in these territories. Unfortunately, there is no adequate legislation on the Gold Coast for dealing with these charlatans.

May I finally make a plea for the more sympathetic approach to the African seeking a suitable house appointment in this country? The Briton who is genuinely interested in the Gold Coast Medical Services can best help us by providing us the opportunity for the first-class training that British hospitals offer.—I am, etc.,

London, W.12.

R. H. BANNERMAN.

The African in Industry

SIR,—I would like to thank Dr. J. H. Jackson for his bold article on the African in industry (*Journal*, January 9, p. 93). The appalling medical and social problems are not sufficiently well known, and public opinion ought to be better informed. In addition to the fearful medical needs of the miners in Southern Africa there exists an increasing moral and spiritual decline which is inevitable in such conditions. It is a burning shame that such chaos can exist in Commonwealth and colonial territories, and everything possible should be done to prevent unplanned exploitation of labour in the development of further industrial resources in these and other African territories. The co-operation of Governments and missions to alleviate and prevent this suffering is very greatly needed.

Dr. Jackson has set a good example in bringing these problems to our notice. Surely it is the duty of our profession, whether as medical missionaries or in Government service, to do so.—I am, etc.,

Cobham, Surrey.

RALPH SCHRAM.

Doctors' Handwriting

SIR,—People do not as a rule boast of their lack of skill in using tools, and a man who habitually takes four putts keeps quiet about it. Parsons and actors who cannot make people hear do not boast of their inarticulate speech, but a great many people speak of their bad writing as if there was something rather clever about it. One would have thought Hamlet had exploded that idea long ago: "I once did hold it, as our statists (statesmen) do, a baseness to write fair." But it is still common for people to believe that illegible writing is a sign of "strong" or in some way desirable character, though it is hard to see how this can be.

Writing is part, and an important part, of a doctor's job. It is idle to say typewriting has superseded it; it has supplemented it—no more. Every medical practitioner carries a pen, even those who never use a stethoscope. If what you see of a man's work—his writing—is careless and slipshod, what reason have you to suppose that his diagnosis and treatment are painstaking and accurate? "Doth a fountain send forth at the same place sweet water and bitter?" There was a time when doctors did not want their patients to know what they were taking, and wrote their prescriptions illegibly on that account. But are we really to believe that every illegible N.H.S. prescription is truly and accurately dispensed? If the chemists sent every patient with an illegible prescription back to the doctor who wrote it to have it made plain, some doctors' surgeries would take about twice as long as they do now, and whose fault would that be?

One of the G.P.'s complaints against the hospitals is not only that they inform him of his patients' discharge or

death about a fortnight after it has taken place (instead of the same day, which would take no longer), but that they cannot read the letter when it comes. Ideally, an examiner should plough quite ruthlessly every candidate whose writing he cannot read; but of course it should also be possible to say of him, as of Chaucer's *povre Persoun*, "he taughte and first he folwed it himselfe."

The writer who tries to save his own time regardless of that of his correspondent is no better than the man who pushes his way first through the door and lets it slam in his neighbour's face. It would be good if some great man were to institute an annual "National Handwriting Week," but, failing that, I ask you, Sir, to lend your authority to the cause of legible handwriting.—I am, etc.,

Norwich.

FREDERICK MOOR.

Hospitals and the Public

SIR,—I was interested in the annotation on this subject (*Journal*, January 9, p. 89). One of the ways in which hospitals could be of much greater service to the public is by providing really adequate accommodation for relatives who have to wait for many hours while a patient is on the danger list. It does not require much imagination to realize that those hours are probably the most distressing that human beings can endure. Anything which can be done to alleviate their distress or add to their comfort at such a time should be regarded as of paramount importance. Unfortunately, in a great many hospitals the accommodation is lamentable; often not more than a draughty corridor with benches or a few hard chairs, or a depressing institution-like room, ill-lit, and without any kind of comfort. No attempt is made to make it cheerful or pleasant. I have tried to find out where the responsibility lies for the provision of such an amenity, but it seems that in many hospitals it is nobody's business. Such an amenity should surely be considered by those who have the handling of amenity funds, or alternatively it could be one of the functions of the voluntary workers who are attached to practically every hospital. It ought to be possible to have such a room properly decorated and furnished, and supplied with flowers and journals, without incurring any great expense.

I feel sure that this is just one of those things that has not been realized, and that once it has been brought to the attention of the hospital committee or voluntary workers there are many people who would be only too glad to help in this way. The pamphlet, *The Reception and Welfare of In-patients in Hospitals*, issued by the Central Health Services Council in 1953 (p. 12, para. 33, H.M.S.O., price 9d.) draws attention to this problem: "Patients who are dangerously ill may have visitors at any time, and a special problem arises when relatives have to attend the hospital for fairly long periods at irregular hours. Provision for their comfort during long waits is difficult with the present restricted accommodation, but the staff should try to ensure that they are made comfortable in accommodation as near the ward as possible during their periods of waiting. Visitors' toilet accommodation in particular is often inadequate." It should also be noted that the relatives are entirely dependent on the good will of the nursing staff for such amenities as a cup of tea or something to eat, since no provision is made for this.—I am, etc.,

London, W.9.

DORIS ODLUM.

Evidence of Gout

SIR,—Dr. Oswald Savage's article on the clinical pathology (*Journal*, December 26, 1953, p. 1424) is very interesting, but the signs and symptoms of gout are so pronounced that the pathologist's aid in its diagnosis is very rarely needed.

Gout, as is known, may occur almost anywhere from tendon sheaths to the knuckles of the fingers, and as a personal sufferer, as also is my brother, I am more than interested when an attack occurs in any of my patients. In my opinion gout is due to auto-intoxication from bowel or liver or kidney; or to a combination of all three not pulling their weight and allowing absorption of excess of

acid into the blood stream. In some cases there is a definite cycle, an acute attack lasting 7–10 days. During this period it may clear up in one place and then attack another. A bilious attack follows with some constipation, and excretion of urine is lessened. A few days, or it may be a few weeks, free and then another attack. An attack may be, and frequently is, started by some slight traumatic injury. It occurs much more often in males, but I have in the last fortnight seen it occur in three females, all of them having passed their menopauses.

What of the cure? Is there anything that will give permanent relief? The colchicum compounds, cinchophen ("atophan"), and the like, eventually, but only temporarily, relieve the condition, but they have the disadvantages of upsetting the digestion, the bowels, and the cardiac rhythm. I have found that "leucotropin" is the least upsetting and most efficient drug, with a tablet of "veracolate" at night. A Scottish doctor friend of mine says he has permanently cured himself by taking daily a tablet of vitamin B, a couple of oranges, and a small whisky with hot water as a nightcap. Another, who used to be a great sufferer, swears by a veracolate tablet every night. A French friend of mine—in France, a wine-drinking country, the incidence of gout is very much less than in England—advises me to drink claret as a specific.

But surely the time has come for concentrated research to find a permanent cure for this most painfully distressing and disabling complaint. Could there be any link between gout, migraine, and narcolepsy—another very prevalent disease?—I am, etc.,

Norwich.

P. B. CORBETT.

Ferrous Sulphate Poisoning

SIR,—In view of the letter by Mr. A. Elliot-Smith and Dr. Pamela Davies (*Journal*, January 16, p. 156) we would like to report another example of ferrous sulphate poisoning, this time a fatal one. In our department we have seen 15 cases in the last seven years, and this is the second fatal one.

A baby aged 14 months swallowed about 50 ferrous sulphate tablets three hours before admission. The child vomited soon after swallowing the tablets. In spite of gastric lavage and intravenous therapy the child died 24 hours later. Necropsy showed the stomach to be denuded of its lining, with considerable blood in the intestines. There were bilateral adrenal haemorrhages. Macroscopically, the liver looked normal.

We hope this further case will strengthen the attempts to force the hand of the manufacturers of "green, sugar-coated ferrous sulphate pills" to do something to prevent these disasters, if only to alter their fatal (literally) attractiveness to small children.—We are, etc.,

Penarth, Glam.

A. G. WATKINS.
P. T. BRAY.
O. P. GRAY.

Sterilization of Ampoules

SIR,—Your correspondents, Professor L. P. Garrod (*Journal*, December 5, 1953, p. 1269) and Dr. D. Reckless (*Journal*, January 9, p. 100), speak of the dangers of storing ampoules of solutions for spinal injections in disinfectant solution.

A considerable deal of discussion has taken place on the various ways of sterilizing these ampoules, each protagonist believing that he is describing the ideal method. Dr. Reckless believes in boiling the ampoule; Professor Macintosh¹ advocates steam sterilization; Dr. Dawkins² believes that the ampoules should be kept in tins in which are placed formalin tablets. "... Doctor and Saint, and heard great argument about it and about..." May I suggest that the real question is not, "How to sterilize," but rather, "Should these ampoules be sterilized at all?"

Some time ago it was pointed out by Hewer and Garrod³ that it is wiser to treat all ampoules with gummed labels as frankly

unsterile and not to attempt to sterilize them. Since this was written it has been my almost invariable practice, and in an attempt at a modicum of standardization I have extended it to the treatment of those ampoules which have their contents etched on the glass. I believe that this procedure has certain advantages. To begin with, the ampoule is under the supervision of the anaesthetist from the moment it is taken from the maker's carton until the time he injects it. There is no risk of contamination by sterilizing fluids: the ampoule is never out of the anaesthetist's sight, and its contents are not liable to the chance (remote, I will agree) of change from boiling or steam sterilizing. The ampoule is opened by a nurse: she then holds it by the base, or puts it on a flat surface. It then behoves the anaesthetist to draw it up into his syringe without touching the neck or the sides of the ampoule. This can quite easily be done, but, should the sides be touched with the drawing-up needle, it and the ampoule should be abandoned.

Of the various ways of sterilizing the ampoule, that by steam appears to be the nearest to perfection. Nevertheless it does entail the ampoule passing out of the anaesthetist's control, and I am further disturbed by the thought that inexperienced anaesthetists may, in the absence of facilities for undertaking this, forget that it is possible and permissible to manage without any sterilization of the outside of the ampoule, and may resort to alternative methods with their consequent hazards.

May I make one point clear? I am expressing here a personal opinion based on experience of this technique and on my own thoughts: no more, no less. I make no didactic claim that steam sterilization is wrong; there should be no such statements in the light of our present knowledge of the subject. I offer an alternative for those not wholly convinced about the wisdom of attempting to sterilize ampoules.—I am, etc.,

London, S.W.15.

G. C. STEEL.

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Senecio Alkaloids and Liver Cancer

SIR,—In a recent paper Hill *et al.*¹ described the occurrence of a liver disease in young children of African extraction in Jamaica. This was characterized by an enlarged sometimes tender liver, varying degrees of ascites, and hepatic cirrhosis in chronic cases. Most of the 150 children examined seemed in quite good nutritional state (particularly those who had asymptomatic liver enlargement), except a group of 11 children in which generalized oedema and other signs of what is known as "kwashiorkor" were present. In the histories of the latter children loss of appetite was recorded for 1–3 months and treatment with "bush tea" as a home remedy. Bush tea is described as an infusion of various unspecified plants, which seems to be a staple supplement of babies' diet among the Jamaican negroes of African extraction. The authors suggested that a low protein diet and possibly a toxic constituent of the bush tea may be the aetiological factors of this liver disease in children.

During the last few years we have been studying the production of primary liver carcinoma in rats by feeding different senecio alkaloids under a variety of conditions. In the course of these experiments many features described by Hill *et al.* as characteristic of "serous hepatitis," as well as those of kwashiorkor² have been frequently observed. These included enlarged liver with fibrosis and haemorrhage into the enlarged sinusoids, pleural and peritoneal effusion of serous fluid, and sometimes subcutaneous or generalized oedema. With larger dosage of alkaloids loss of appetite and stunted growth were seen, even though the animals received the fully adequate normal diet *ad libitum*. These features have been observed in the early stages of treatment with alkaloids of *Senecio jacobaea* L.,³ as well as with isatidine, a senecio alkaloid from South African plants kindly supplied by Professor F. L. Warren, Department of Chemistry, University of Natal, Pietermaritzburg (the details of the latter experiments will be published elsewhere).

Senecio plants are widely distributed throughout the world, and are known to be favourite remedies of the African

negroes, who use them for a variety of disorders, including charming away bad dreams of babies (compare Watt and Breyer-Brandwijk⁴ and Cook *et al.*). It is not unlikely that senecio plants are included in the bush tea or other home remedies for babies used by negroes in Jamaica, who are known to have preserved their old African customs and beliefs. Thus it is possible that senecio alkaloids are the aetiological factor of serous hepatitis and kwashiorkor in children, while malnutrition may develop as a consequence, or be a concomitant factor.

Whether the liver changes seen in children in Jamaica give rise to primary liver carcinoma in adults (as is the case in the experimental rats) is an interesting problem which requires to be investigated.—I am, etc.,

Glasgow, C.3.

REGINA SCHOENTAL.

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- ² Williams, C. D. (1933). *Arch. Dis. Child.*, 8, 423.
- ³ Cook, J. W., Duffy, E., and Schoental, R. (1950). *Brit. J. Cancer*, 4, 405.
- ⁴ *The Medicinal and Poisonous Plants of Southern Africa*, 1932, p. 198. E. and S. Livingstone, Edinburgh.

Whither Anaesthesia?

SIR.—The letter "Whither Anaesthesia?" by Dr. C. Langton Hewer (*Journal*, January 2, p. 42) is most timely. In recent years, new drugs which have not been fully investigated have been used by people who do not possess the necessary facilities for adequate appraisal. One reason why this happens may be due to the impression, particularly amongst junior anaesthetists, that when applying for a post it is to their advantage to produce evidence of original work. When, therefore, a new drug appears, it is liable to be seized upon, tried out on a few cases, and written up as quickly as possible. The fact that a candidate for a post has written an article may impress a committee, but it does not provide evidence that he is a sound and careful anaesthetist. A safer and more efficient method of assessing the value of a new drug would be for it to be distributed to certain groups or individuals who are recognized by their colleagues as reliable investigators. Having made a thorough trial of the drug, each group should draw up a report and all information, together with any necessary warnings, should then be published.—I am, etc.,

Manchester.

CHARLES E. SYKES.

Controlled Hypothermia

SIR.—The use of an antihistamine drug such as promethazine ("phenegan") seems very reasonable before a major operation, as also does the use of chlorpromazine, which reduces metabolism. Patients who have had these drugs pre-operatively come to the theatre somnolent and co-operative—rather as though they had been given a light dose of bromethol ("avertin"). Much less general anaesthesia is required and also smaller doses of relaxants. So far as my limited experience goes they certainly seem to protect the patient from shock—and in the post-operative period the patient's condition is excellent.

If a sense of proportion is maintained in the use of these drugs, I think they will take their place as useful agents in anaesthesia.—I am, etc.,

Hove.

J. H. CRAWFORD.

College of General Practitioners

SIR.—While in England in 1952, I became interested in the formation of the College of General Practitioners. With the establishment of a New South Wales Regional Faculty of the College just completed, I thought a few words on the reaction of practitioners in Australia to the College might be of interest to your readers.

In this country the College has been received with widespread enthusiasm. Following the lead of New South Wales, regional faculties are now being formed in Queensland and Tasmania. In New South Wales requests for nomination forms are being received from all parts of the State. The

New South Wales Faculty sent a cable to the parent body on the occasion of its first annual general meeting, and this expressed the feeling of the vast majority of practitioners here. Congratulations were offered on the successful completion of the first year of operation, and particular pleasure was expressed at the appointment as president of so distinguished a general practitioner—Dr. William Pickles.

It is felt that the activities of the College will make an important and long overdue contribution to medical education in the future, and will go a long way toward improving standards of practice.—I am, etc.,

Cessnock, N.S.W., Australia.

W. A. CONOLLY.

SIR.—At the Old Bailey recently an employee of the College of General Practitioners was convicted of obtaining money from the bank by forgery. We would like it known that the College's bankers have now re-credited the College's account with the whole of the sum involved. We are, etc.,

G. F. ABERCROMBIE,
Chairman of Council.
H. L. GLYN HUGHES,
Hon. Treasurer.
J. H. HUNT,
Hon. Secretary.

London, E.C.4.

Acetone Tests on the Bed-sheets in Diabetic Coma

SIR.—In the diagnosis of possible diabetic coma in an unknown unconscious patient, it is imperative to know at once if ketones are present in the urine. If the patient is inconsiderately incontinent and no sample of urine available, as happened at King's last week, need we be balked? Indeed not. We rubbed some mixed Rothera's crystals in the wet sheet, dropped on a little strong ammonia, and a beautiful purple patch spread out and confirmed the diagnosis. Indeed, the sheet responded to the ferric chloride test with an appropriate red-wine colour. The diagnosis had been complicated by a series of confusing epileptiform fits.

This is just a little tip which may be useful some time. I am, etc.,

London, S.E.5.

R. D. LAWRENCE.

Histology of Acrosclerosis and Allied Conditions

SIR.—Acrosclerosis is of interest to dermatologist, physician, and surgeon. At a recent conference on the subject in Leeds it was felt that more information was required on the histological changes in this and in the allied conditions of Raynaud's disease and generalized scleroderma. Material is being collected for further investigation, and it would be appreciated if colleagues, medical and surgical, making biopsies of skin, gut, lung, or other tissues in this field would send some unstained sections to be added to this collection to the Dermatological Department, The General Infirmary, Leeds.—I am, etc.,

Leeds, 1.

JOHN F. INGRAM.

Foreign Bodies in the Lung

SIR.—I was interested to read Dr. Bernard Laurance's account of a boy of 5 who developed a lung abscess as the result of inhaling an ear of barley (*Journal*, January 16, p. 125). In 1943 a small girl was admitted to hospital with a lung abscess. While on postural drainage she coughed up part of a spike of wild barley. Following this the symptoms completely subsided.

If any of your readers has idly placed a spike of wild barley in his mouth with the base of the seed cluster pointing towards the throat he will appreciate the mechanism of these accidents. With every movement of the tongue the barley migrates backwards at a surprising rate and becomes difficult to extract once it has reached the back of the mouth. It is easy to imagine the barley moving in this way over the back of the tongue and through the glottis. The reason for this migration is that the hairs on the barley grains are barbed and impart to the spike a unidirectional motion. It

is significant that the second of Dr. Laurance's cases had inhaled the fruit of the common agrimony. This has a ring of hooked bristles at the top.

I suggest, therefore, that there is a difference between the mode of entry of these barbed seed clusters and the inhalation of compact objects such as nuts. A nut may be drawn into the trachea by one incoordinate inspiration, whereas it seems probable that barbed seeds creep to their destination.—I am, etc.,

Bridgend, Glam.

A. W. FOWLER.

Medical Museums: Information Wanted

SIR.—The Museums Association is engaged in producing a revised edition of its *Directory of Museums and Art Galleries in the British Isles*, and I shall be grateful if I may appeal through your columns for information about medical museums and teaching collections.

Only those museums and collections to which the public is admitted either freely or by special arrangement will be included in the *Directory*, and it is details of these which I am most anxious to have. It would, however, be of much use to the Association to have in its records a complete list of medical museums and medical teaching collections in the country, including those to which the public is not admitted, and details of all museums and collections would therefore be greatly appreciated. In the first instance, the information requested is limited to the name and address of each museum or collection, the title of the official in charge from whom further details could be requested if required, and whether the public is admitted.

I should be very grateful if those concerned would send this information to me at the Museums Association, Meteorological Buildings, Exhibition Road, London, S.W.7. I am, etc.,

J. A. SIDNEY STENDALL,
Directory Editor.

The Three Hospitals Orchestra

SIR.—In June, 1952, some members of the St. Mary's Hospital Musical Society approached members of similar bodies at St. Bartholomew's and St. Thomas's Hospitals to find out if they were interested in the formation of a combined orchestra. At St. Mary's Hospital there already existed a small orchestra which had survived for just over a year, but which was gradually succumbing to the depredations which approaching examinations, increasing pressures of hospital duties, and movement of the newly qualified staff inevitably impose on an orchestra recruited from a single hospital. Now well into its second year, the Three Hospitals Orchestra, under the conductorship of Mr. Norman Del Mar, can claim to be fully established, and has to its credit four public concerts, in three of which distinguished soloists have given their services.

Some of the difficulties, however, which beset the parent organization still remain, and even the combined resources of the three hospitals concerned have not always been adequate to make good the periodic loss of instrumentalists. My committee has therefore decided that the time has come to cast our net more widely, and we would now welcome players from all London hospitals (teaching and otherwise) who might be interested in the formation of a United Hospitals Orchestra. Might I, Sir, through the medium of your *Journal*, appeal for any hospital instrumentalists who would be willing to join us? The present orchestra comprises consultants, physiotherapists, housemen, nurses, and students, with the addition, from time to time, of a few professional musicians who have helped us out at rehearsals and concerts.

Any amateur orchestral player from any London hospital who would like to join us, or to obtain fuller information, should apply to: Geoffrey Spencer, Esq., Honorary Secretary, Three Hospitals Orchestra, 8, Hill Road, London, N.W.8.—I am, etc.,

London, W.2.

HARRY L. THORNTON,
Chairman.

Obituary

H. F. MOORE, M.D., D.Sc., F.R.C.P., F.R.C.P.I.

Professor H. F. Moore died at his home in Dublin on January 25, after a very short illness, at the age of 66. He was one of the leading medical men in Ireland.

Henry Francis Moore was born at Cappoquin, Co. Waterford, where his father was an engineer engaged in railway construction. He studied in University College, Dublin, where he graduated in medicine, with first-class honours and first place, in 1912. After serving as a house-surgeon in the Mater Misericordiae Hospital he was awarded a travelling studentship and proceeded to Germany in 1913. The outbreak of the 1914 war forced him to return home after about a year. This proved to be a decisive point in his life. He went to the Rockefeller Institute for Medical Research in New York, working there for four years. At this time researches were being conducted into the value of inorganic copper compounds in pneumonia. He was for some time engaged in this work, on which he published his first papers. During this time he made personal contacts and friendships which he maintained throughout his life, and he married Miss Frances L. Thomas, who was his constant support and companion until her death early last summer.

Admitted M.D. in 1917, he was appointed to the staff of the Mater Misericordiae Hospital on his return to Dublin. Academic and other honours came quickly. In 1922 the degree of D.Sc. of the National University of Ireland was conferred on him for his published work. He obtained the M.R.C.P.I. in 1930, and was elected F.R.C.P.I. in 1932. From 1932 to 1934 he was president of the Section of Medicine of the Royal Academy of Medicine in Ireland, and in 1933 and again in 1952 he was president of the Section of Medicine when the British Medical Association held its Annual Meeting in Dublin. In 1938 he became M.R.C.P. and was elected F.R.C.P. in the following year. He was a member of the Medical Registration Council of Ireland and of the Medical Research Council of Ireland, in each case from the foundation of these bodies. In 1927 he was appointed professor of medicine in University College, Dublin, and occupied the chair until his death.

We are much indebted to Dr. EDWARD T. FREEMAN for the following appreciation: Henry Moore returned to Dublin at a very favourable moment. His careful laboratory training in New York and the scientific approach to problems which he had witnessed and taken part in equipped him to be the forerunner in the introduction of these methods to Irish medicine. In the Mater Misericordiae Hospital he was instrumental in setting up and equipping a biochemical laboratory long before such a department was operating in any medical school in Ireland. He was also in the very beginning of electrocardiography and in the treatment of diabetes by insulin, and of the investigation of thyrotoxicosis by observation on the basal metabolic rate. Henry Moore made many contributions to medical journals—to the *Journal of Experimental Medicine*, to the *British Medical Journal*, to the *Quarterly Journal of Medicine*, the *Lancet*, the *Irish Journal of Medical Science*, and others. Two years ago, through his influence, the firm of Merck placed at the disposal of the Medical Research Council of Ireland a supply of cortisone valued at over £10,000, for the purpose of research. Already suffering from hypertension and knowing the need to go more slowly, he threw himself into this activity with all the enthusiasm of his youth. He

The question of putting fluorine into water was a much more difficult one. A great deal of work had been done in the United States which showed that apparently it stopped dental caries. He thought that it was not entirely proved, and he felt sure that if the Government embarked on an experiment they would merely raise the total quantity to one part in a million—which already existed in many of the water supplies in this country. As people had been drinking water with one part of fluorine per million ever since water was first drunk, with no great trouble, he could see no particular danger in that.

The New Truth

LORD WEBB-JOHNSON said that the attitude of the medical profession towards disease had changed radically in the past century. They were no longer agents for the recognition and treatment of disease, but pioneers in the effort to prevent it. The new truth was often opposed by a fixed opinion or by a bias, and it was necessary to find out whether the opposition was based on scientific principles or arose from total conservatism.

Iodine was an essential to the healthy functioning of the thyroid gland. Fifty years ago, when he saw Kocher operating on goitres in Switzerland, there was no idea how its incidence could be prevented or diminished. Thirty years ago, in Cleveland, Ohio, he saw George Crile operate on 20 goitres in a morning. Crile's whole object was to find out why the people were getting goitres, and how to prevent it. Last week Crile's son was over here, and told him that now in Cleveland he operated on possibly one or two goitres a day, and some days none. Lord Webb-Johnson asked, "Is it because you have iodized salt?" The reply was, "It may be, but we do not dismiss other possible factors. For instance, in Cleveland to-day half the vegetables eaten are grown outside the area, which is an area of endemic goitre. They are grown in the West, where the soil is saturated with iodine, and they get their iodine through canned vegetables." These things righted themselves, but that was no reason for condemning the pioneer who first proved that a disease was due to a deficiency of iodine and urged that artificial means should be used to meet the deficiency.

He protested against the suggestion that "mass medication" was contrary to the ethics and traditions of the medical profession. The proposal Lord Douglas had criticized was not mass medication; it was a reinforcement of Nature's supply in a particular district. He objected to Lord Douglas's remarks about "adding drugs to the water supply." All that was being suggested, if it was actually being suggested as a practical proposition at the moment, was the addition in that particular district of something in which Nature had been deficient. There was no limit to which the opponents of sanitary measures would go. From cancer downwards the whole gamut were paraded as dangers.

Government Reply

LORD CARRINGTON, Parliamentary Secretary to the Ministry of Agriculture, replying for the Government, recalled the recommendation of the B.M.A. Committee on Nutrition that the consumption of calcium should reach 0.8 g. per adult per day, and the report of the National Food Survey that in the first half of 1952 the national average intake would have been about 10% below this had it not been for the addition of calcium to flour. The addition did no harm to anyone, and there was a permitted exception for 100% extraction wholemeal flour.

A special committee of the Medical Research Council on Thyroid Diseases reported in 1948 that goitre appeared to be on the increase, and recommended that preventive action on a national scale should be taken by the addition of a trace of iodine to domestic salt. The recommendation was endorsed by the committee on medical and nutritional problems of the Ministry of Health, and was referred to the Food Standards Committee of the Ministry of Food for investigation of the technical problems. These had not been fully solved. The committee recommended favour-

ably in March, 1950. Representations were received from a large number of people, including the medical profession, the trade, medical authorities, and others. These were considered by the Health Departments and the committee, but the committee had not yet made its final report. In a number of countries where goitre was common salt had been iodized for a number of years, and nowhere had there been any resulting harm; in fact, the experience had been that nothing but good had resulted.

On the fluoridation of water supplies, as this was the only measure which so far gave any promise of preventing or reducing the incidence of bad teeth, the Minister of Health had announced on December 3, 1953, acceptance of the recommendation of the medical mission that had visited the U.S.A.¹ There were many areas in Britain where there was already enough fluorine in the water supply, and where no more would be added. There was no scientific basis for the allegation that fluorides in quantities of 1.0 to 1.5 parts in a million had any harmful effect; but there had been some confusion with industrial fluorosis, which was the result of a heavy concentration of fluorides in the atmosphere in the form of dust.

The last question was that, even assuming these measures were medically justified, they should be withheld on the ground that they infringed the liberty of the subject. A balance could be struck only by going fully into each proposal. He agreed that medical justification was not of itself sufficient. Political and philosophical implications must be considered. Nowadays it was believed that Governments had a general responsibility for ensuring the health of the people. When an overwhelming case had been made on scientific grounds, and they were convinced that what was recommended was practical and could not possibly result in anything but good to the public health, then they must consider taking action of the kind that had been described as mass medication. They would be failing in their duty if they did not take into account the great benefit to the public health that would result.

Hearing-aids

MR. IAIN MACLEOD informed Dr. BARNET STROSS on January 21 that the proportion of bone-conduction hearing-aids required, compared with air-conduction models, was estimated at less than 5%. About 7,000 people had been supplied with them in the 12 months since they became available, and supplies were ample. Within a month or two there would be no waiting-list.

Acidity in Soft Drinks

Dr. BARNET STROSS asked the Minister of Food to state the measure of acidity in the mineral drink "Cola" in terms of the hydrogen ion concentration, and what other substances it contained besides caffeine, phosphoric acid, sugar, and water. Dr. CHARLES HILL, the Parliamentary Secretary, told him on January 25 that the pH of Cola drinks sold in the U.S.A. was 2.6, though a sample taken in this country was slightly less acid. He had no information about the ingredients.

Dr. STROSS said the answer showed that the drink was as acid as vinegar even if it were masked by the sugar content. Evidence was given before a U.S. Congress committee in 1950 about the danger of this drink in relation to dental nutrition, in that it caused teeth erosion. He asked the Ministry to check these facts through the Medical Research Council. Dr. HILL replied that the level of acidity was only slightly more than that for soft drinks containing acid generally. The Committee on Food Standards would soon, it was hoped, consider the position generally, including the question of acidity.

Powdered Milk Code

Lieutenant-Colonel M. LIPTON asked the Minister of Food on January 25 what further investigations had been made to prevent a recurrence of food-poisoning in schools as a result of using powdered milk. Dr. CHARLES HILL, Parliamentary

¹ See *British Medical Journal*, July 11, 1953, p. 88.

Secretary, replied that there had been comprehensive bacteriological tests of the milk powder which caused the recent outbreaks, and the conditions and production at the particular factory had been thoroughly investigated. As a result a code of practice for the manufacture of dried milk was being prepared, and this would be issued to all manufacturers soon.

In the House of Lords on January 26, LORD AMULREE introduced the Abortion Bill, and it was read a first time.

Medico-Legal

DOCTOR A "PUBLIC AUTHORITY"

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Although there is no time limit for the institution of criminal proceedings, civil actions of all kinds have to be brought within certain fixed time limits, which vary with the type of action. This is plainly necessary so that there is some end to disputes and so that they can be decided before the evidence on which alone they can be decided has vanished. "Interest rei publicae ut sit finis litium." The periods of limitation are now set out in the Limitation Act, 1939, except in the case of actions against some of the public corporations which run the nationalized industries, for which special periods of limitation are provided in their own nationalizing statutes; and there exist certain other special periods. For ordinary actions for damages for breach of contract or for torts, the period is six years. But when the action is brought against a public authority the period within which it must be brought is one year only. "Public authority" is not defined in the 1939 Act, but bears the same meaning as it did under the Public Authorities Protection Act, 1893, which provided a limitation period of six months. Any person who is sued for any act done or for any neglect or default in doing an act, "in pursuance or execution or intended execution of any Act of Parliament, or of any public duty or authority," is a public authority within the meaning of the statute. Nice questions can arise whether or not a particular person or body falls within this definition on any given occasion.

On January 29 Mr. Justice Pilcher,¹ in the Queen's Bench Division of the High Court, decided that a doctor, who as part-time specialist in charge of the physical medicine department of a hospital was acting in the execution or intended execution of a duty imposed by the National Health Service Act, 1946, was a "public authority." Accordingly he dismissed an action for negligence brought against the doctor by a patient because the writ had been issued more than a year after the cause of action—that is, the alleged negligence of the doctor and the damage resulting from it—had first arisen. A private Member's Bill seeking to make all periods of limitation three years was recently introduced into the House of Commons with the support of the Government.

¹ *The Times*, January 30.

The Services

The *London Gazette* has announced the following awards:

Bar to Air Force Cross.—Wing Commander H. H. S. Brown, A.F.C., R.A.F.

Air Force Cross.—Group Captain D. A. Wilson and Wing Commander G. H. Dhenin, G.M., R.A.F. Surgeon Lieutenant-Commander W. H. B. Ellis, R.N.

Surgeon Rear Admiral R. C. May, O.B.E., M.C., R.N., has been appointed Honorary Surgeon to the Queen in succession to Surgeon Rear Admiral T. Madill, C.B., O.B.E., R.N.

The announcements in the *London Gazette* dated October 30, 1953, and in the *Journal* of November 28, 1953 (p. 1227), concerning the award by the President of the U.S.A. of the decoration of Legion of Merit, Degree of Legionnaire, to Colonel G. Anderton, O.B.E., late R.A.M.C. (now R.A.R.O.), in recognition of gallant and distinguished services during the operations by the United Nations in Korea, should have read Legion of Merit, Degree of Officer.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 16 (No. 2) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng & Wales	Land	Scot	N. Ire	Eire	Eng & Wales	Land	Scot	N. Ire	Eire
Diphtheria ..	21	1	6	0	2	12	1	9	0	2
Dysentery ..	378	81	147	33	6	312	19	96		3
Encephalitis, acute	3	1	0	0		8	1	0	0	
Enteric fever: Typhoid ..	4	0	1	1		1	0	0	0	1
Paratyphoid ..	4	1	0	0		8	1	1 (B)	0	0
Food-poisoning ..	110	12		1		46	0		3	
Infective enteritis or diarrhoea under 2 years ..				7	10				11	16
Measles*	1,150	18	29	14	160	21,383	1777	319	46	114
Meningococcal infection ..	36	6	13	4		45	5	30		2
Ophthalmia neonatorum ..	26	1	3	0		40	2	15	1	
Pneumonia†	963	58	329	14	3	1,204	66	333	32	
Poliomyelitis, acute: Paralytic ..	27	1		1	4	25	0		3	1
Non-paralytic ..	13	0			4	6	0			5
Puerperal fever‡	250	28	11	1	1	212	24	15	3	1
Scarlet fever ..	915	36	207	44	37	1,589	65	332	44	55
Tuberculosis: Respiratory ..	744	90	144	30				128	26	
Non-respiratory ..	113	7	20	4				30	6	
Whooping-cough ..	2,366	97	419	75	93	2,160	99	192	53	80

DEATHS in Great Towns	1954					1953				
	Eng & Wales	Land	Scot	N. Ire	Eire	Eng & Wales	Land	Scot	N. Ire	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0	0	0		0	0	0	0	
Encephalitis, acute	0				0	0	0	0	0	0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	10	1	4	2	1	13	3	2	0	1
Influenza ..	42	4	1	1	0	72	14	2	1	0
Measles ..	0	0	0	0	1	0	0	0	0	0
Meningococcal infection ..		1	1				1	1		
Pneumonia ..	432	51	30	14	9	491	87	36	14	11
Poliomyelitis, acute	6	0			0	2	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	139	15	23	4	10	182	32	17	4	12
Non-respiratory ..		2	3	0	1		1	3	0	0
Whooping-cough ..	2	0	0	0	0	0	0	0	0	1
Deaths 0-1 year ..	272	33	27	10	23	293	34	41	9	14
Deaths (excluding stillbirths) ..	7,079	953	754	133	221	7,697	1300	773	149	207
LIVE BIRTHS ..	7,696	1146	879	231	392	7,548	1113	965	264	419
STILLBIRTHS ..	218	24	38			180	24	25		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Professor H. A. Krebs, F.R.S.—The Friends of the Hebrew University of Jerusalem gave a dinner on January 27 to celebrate the award to Professor H. A. Krebs of the Nobel prize in medicine for 1953. Sir Henry Cohen, who was in the chair, said that really this dinner had its origin 125 years ago, when Wöhler synthesized urea. This was really the beginning of examination by the chemist of living matter. The chair of biochemistry was established in Liverpool in 1903, and Sheffield had followed suit 40 years later when it appointed Professor Krebs professor of biochemistry. There had been many great figures in the history of medicine and science who had been recommended for the Nobel prize, but only a few of them had been chosen. At the same time Professor Krebs had been awarded the Lasker prize of the American Public Health Service, a recognition of the significance of his work to medicine. Tributes to Professor Krebs were then paid by the Ambassador of Israel and by Sir Ben Lockspeiser. In reply he said that what was not rare was certainly his "dose of talent." He had had quite unusual opportunities for doing the work which had led up to the award of the Nobel prize. After qualification he had had the chance of working on a whole-time basis: then he was associated with Otto Warburg and later with Gowland Hopkins. His great advantage had been that he had had time to concentrate on his own work. He was convinced that there were many talented people in universities who would do exceptional work if they were given the essential prerequisite, time—time free from routine duties of teaching, examination, administration, and committee work. Modern research required a lot of time to master new knowledge and techniques. This requirement of time should always be a consideration in the set-up of universities. He believed that the university was a place where major research should be conducted so that the research worker—a biochemist, for example—could get help and stimulus from mathematicians, physicists, chemists, engineers, biologists, and from philosophers and historians. Turning to the other feature of the present occasion, Professor Krebs said he was gratified to know that the Hebrew University was doing much to promote fundamental research, though one heard critical comments on the usefulness of this in a poor country like Israel where so many practical problems wanted attention. After Dr. A. Lerner had appealed for financial support for the Hebrew University of Jerusalem, Dr. Leonard Simpson proposed the health of the chairman, and Sir Henry Cohen briefly replied.

Cost of In-patient Treatment.—The hospital costing returns for the year ended March 31, 1953, were published last week by the Ministry of Health. Expenses have continued to rise, though there is a good deal of variation between the costs in the different regions. The table below shows the average cost of maintaining a patient for a week in various types of hospital, the figures for 1951-2 being given for comparison.

Type of Hospital	Average Weekly Cost per In-patient	
	1952-3	1951-2
Teaching hospitals, London	£24 18 8	£23 13 8
" " Provinces	18 13 9	17 15 8
General hospitals, under 50 beds ..	13 13 5	12 14 9
" " 51-100	15 7 5	17 7 2
" " 101-300	15 10 6	14 13 3
" " 301-900	15 12 1	14 11 7
Maternity hospitals	17 13 1	16 19 2
Tuberculosis	9 19 5	9 6 7
Mental	4 8 6	4 1 1

The Building for the Job.—The Nuffield Foundation has established a Division for Architectural Studies as part of its headquarters organization. This follows the success of

the research team appointed in 1948 by the Nuffield Provincial Hospitals Trust to investigate the functions and design of hospitals. This team completed its work last year and its final report is expected shortly. The new Division is under the direction of Mr. Richard Llewelyn Davies, A.R.I.B.A., who led the former research team, and besides architects the staff includes a doctor, a nurse, a historian, and a statistician. The Division will work closely with the D.S.I.R.'s Building Research Station. Its first assignments are the problem of the care of children in hospital and the design of research laboratories.

Chloramphenicol.—The first British reports of fatal aplastic anaemia in patients who had been treated with chloramphenicol were published in the *British Medical Journal* 18 months ago.^{1,2} Since then there have been many other references in medical journals to the toxicity of the drug. The risk of blood dyscrasia following chloramphenicol treatment cannot be accurately assessed from the figures available, but the Council on Pharmacy and Chemistry of the American Medical Association has recently published a statement³ advising restriction of the use of chloramphenicol "to the treatment of typhoid fever and other serious infectious diseases caused by organisms controlled by chloramphenicol but resistant to other antibiotics or other forms of treatment." The Ministry of Health has also just issued a memorandum on this subject. After stating that it is impossible to determine the frequency with which blood dyscrasia follows chloramphenicol treatment since the total population at risk is not known, the memorandum concludes: "It is apparent that the incidence is low, since the condition is usually fatal and cases would therefore come to notice. When excessive dosage is avoided, the incidence must be very low indeed; thus no cases have arisen during the Medical Research Council's controlled therapeutic trials in pneumonia, whooping-cough, and infantile gastroenteritis. It cannot be too strongly emphasized, however, that the use of chloramphenicol is not without risk, and prolonged or repeated administration (especially of large doses) should be avoided, particularly in conditions such as chronic respiratory and urinary tract infections."

- ¹ Hawkins, L. A., and Lederer, H. (1952). *British Medical Journal*, 2, 423.
- ² Wolman, B. (1952). *Ibid.*, 2, 426.
- ³ *J. Amer. med. Ass.*, 1954, 154, 144.

American Surgeons in London.—A Section Meeting of the American College of Surgeons will be held at the Royal College of Surgeons, Lincoln's Inn Fields, from May 17 to 19. The programme includes symposia on gynaecology, cancer, and cardiovascular surgery, panel discussions on pre- and post-operative care, massive gastro-intestinal tract haemorrhage, and hand surgery, and operating sessions in London teaching hospitals. Further details will be available later.

Travelling Fellowships in Ophthalmology and Otolaryngology.
The Medical Research Council invites applications for travelling fellowships in ophthalmology and otology for the academic year 1954-5, for which special provision has been made by the Alexander Pigott Wernher Memorial Trustees. These fellowships are intended for suitably qualified medical graduates who are likely to profit by a period of work in ophthalmology or otology at a centre abroad before taking up positions for higher teaching and research in these branches of medical science. Candidates will be required to submit an outline of their proposals for work at a selected centre. The awards will normally be tenable for one year: no provision can be made for travelling grants for short-term visits abroad. The fellowships provide for the payment of a maintenance allowance at the rate of £650 per annum for a single Fellow or £900 per annum for a married Fellow, subject to appropriate adjustment in the case of fellowships tenable at centres outside the sterling area; in addition, an allowance is made for travelling and other approved expenses. Forms of application may be obtained from the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1, with whom applications must be lodged by March 31.

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in December, 1953, was 116, compared with 125 (revised figure) in the previous month and 137 in December, 1952.

The number of cases of industrial diseases in the United Kingdom reported during December was as follows : lead-poisoning, 11 ; other poisoning, 2 ; anthrax, 3 ; epitheliomatous ulceration, 11 ; and chrome ulceration, 10 ; total, 37. There were no deaths.—*Ministry of Labour Gazette*, January, 1954.

The infant mortality rate of 35.2 per 1,000 live births was lower than any previously recorded in Scotland. The general death rate of 12.03 per 1,000 population was lower than any previous rate, except for 1948, when it was 11.0. The still-birth rate continued to fall, being 26.2 per 1,000 total births. The ratio of boys to girls born was 1,048, much lower than the average of 1,063 for the years 1946-51. The birth rate was 17.68 per 1,000 population, slightly less than in 1951, and much the same as in 1937-8. These figures appear in the *Ninety-Eighth Annual Report of the Registrar-General for Scotland, 1952* (H.M.S.O., 10s. 6d.).

A comparison of standardized death rates in Scotland and in England and Wales shows the following death rates per million, those for England and Wales being in parentheses: tuberculosis of respiratory system, 282 (211); malignant neoplasms 2,126 (1,979); diabetes mellitus, 103 (75); vascular lesions affecting C.N.S. 1,936 (1,564); heart diseases, 4,104 (3,366); hypertensive disease, 367 (428); pneumonia, 402 (442); and nephritis and nephrosis 117 (133).

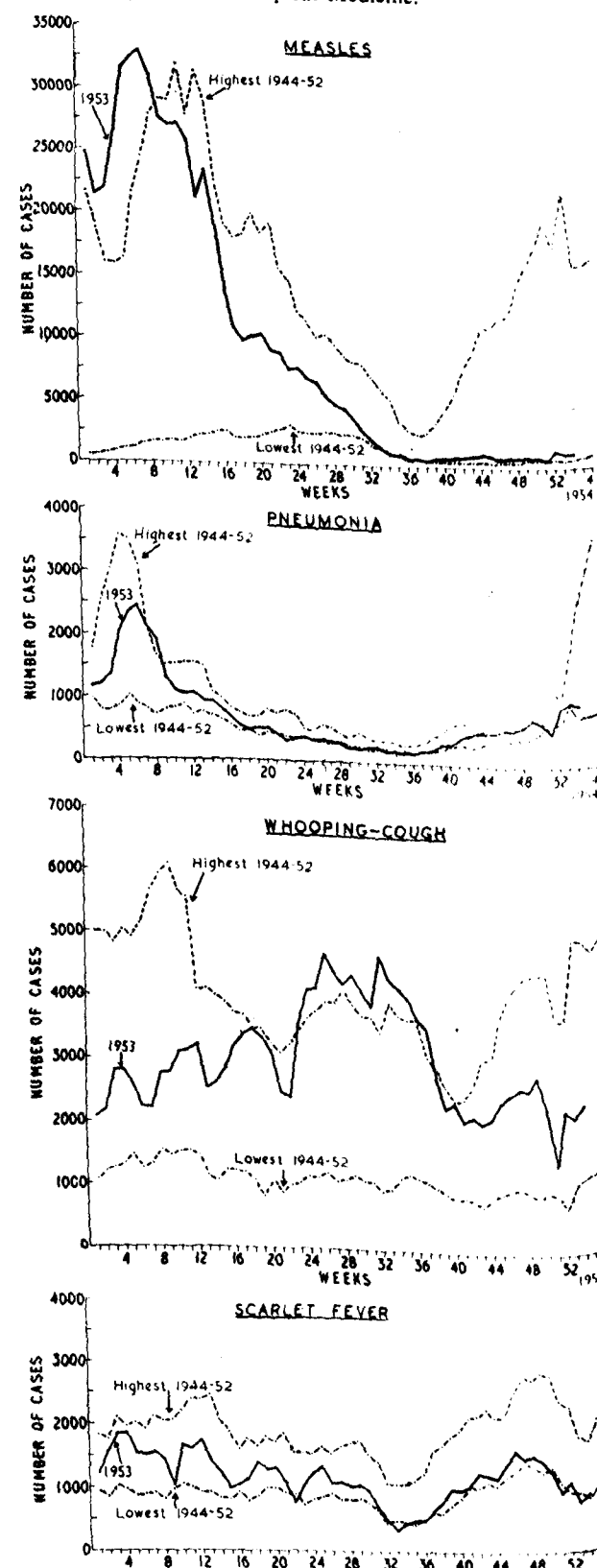
The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,138, whooping-cough 2,357, diphtheria 18, measles 1,106, dysentery 490, acute poliomyelitis 37, paratyphoid fever 4, and typhoid fever 3.

A rise occurred in the incidence of infectious diseases in England and Wales during the week ending January 16. The largest increases in the number of notifications were 210 for whooping-cough, from 2,156 to 2,366, 123 for scarlet fever, from 792 to 913, and 56 for dysentery, from 322 to 378.

The only large variations in the local trends of whooping-cough were increases of 57 in Staffordshire, from 78 to 135, and 55 in Warwickshire, from 132 to 187. A small rise in the incidence of scarlet fever occurred in every region, but no large fluctuations were recorded. 1,150 cases of measles were notified, being 16 more than in the preceding week. The only fluctuations of any size in the local trends of measles were an increase of 64 in Staffordshire, from 140 to 204, and a decrease of 40 in Lancashire, from 346 to 306. 21 cases of diphtheria, the same number as in the preceding week, were notified. The chief feature of the returns of diphtheria was a rise in Lancashire, from 2 to 7, 5 of the cases being notified in Liverpool C.B.

40 cases of acute poliomyelitis were notified. These were 8 fewer for paralytic and 4 more for non-paralytic cases than in the preceding week. The largest returns were Gloucestershire 6 (Mangotsfield U.D. 3), Suffolk 4, Essex 3, Lancashire 3, and Yorkshire West Riding 3.

The increase in the incidence of dysentery was mainly contributed by Yorkshire West Riding, where a rise of 35 was recorded. The largest returns were Yorkshire West Riding 83 (Leeds C.B. 45, Bradford C.B. 17), London 81 (Islington 36), Lancashire 40 (Bolton C.B. 23), Middlesex 33, and Norfolk 20 (Norwich C.B. 20).



Grants and Fellowships for Research on Leukaemia.—The trustees of the Lady Tata Memorial Fund invite applications for grants, scholarships, or fellowships for research on diseases of the blood, with special reference to leukaemia, in the academic year 1954-5. Candidates with programmes of research on any aspect of malignant disease which may throw incidental light on the related problem of leukaemia will be eligible for consideration. Grants of variable amount are made for research expenses or to provide scientific or technical assistants for senior workers. Scholarships are awarded for the personal remuneration of workers carrying out approved research under suitable direction; their normal value will be £600 per annum for whole-time research, with proportional adjustment for work on a part-time basis. In addition, the trustees may award one or more Lady Tata Memorial Research Fellowships to workers with considerable research experience; the stipends of these fellowships will be at the rate of £1,000 per annum. All these awards are open to investigators of any nationality, working in any country in which it will be possible to make payments in the coming academic year. Further particulars and forms of application may be obtained from the Secretary of the (European) Scientific Advisory Committee, Lady Tata Memorial Trust, c/o Medical Research Council, 38, Old Queen Street, London, S.W.1. Applications must be submitted before March 31, and the awards will be announced by the trustees in June.

Research Studentships at Cambridge.—Details of the Elmore Medical Research Studentships are given at page 45 of our advertisement columns. They are open to graduates born anywhere in the Commonwealth (except Scotland) who wish to work in the Department of Medicine at Cambridge, under the direction of the Regius Professor of Physic. The studentships carry a salary of between £400 and £850 a year, and preference will be given to those interested in haematology.

Family Doctor.—The February issue, which is now available, contains medical articles on influenza, twins, coronary thrombosis, and phenobarbitone. Dr. Walter C. Alvarez, professor of medicine at the Mayo Clinic, completes his three-part series "How to Live with Your Nerves." Next month he will be writing on "How to Live with Your Blood Pressure." Evelyn Ford describes a valuable social service in "Invalid Kitchens," and Nicholas Ward, adapting the old nursery jingle, takes "This Little Pig Had Penicillin" as the title for an article on the use of antibiotics for fattening livestock. Fish lens protein, a substance alleged to be a medical cure of cataract and which has received considerable publicity in the lay press, is the subject of unfavourable editorial comment. *Family Doctor* costs 1s. 6d. and can be obtained through any bookseller.

Ministry of Health Art Club Exhibition.—Mr. Iain Macleod opened the annual exhibition of his Ministry's art club and the Hygeia Camera Club on February 1. An interesting feature was the showing of 12 pictures presented by individual members of the club to various hospitals.

COMING EVENTS

Study Circle on Medical Statistics.—A meeting will be held at the Westminster Medical School, Horseferry Road, London, S.W.1, on February 23 at 6 p.m. The subject will be "Medical Statistics in the Services."

Pan-American Congress of Otolaryngology and Broncho-oesophagology.—The fourth congress will be held in Mexico City from February 28 to March 4. It is understood that the organizing committee would welcome representatives of British professional bodies.

Seventh Laboratory Animals Bureau Congress.—The congress will be held at Sheffield University on April 5 and 6. Applications for admission, which is normally limited to animal and laboratory technicians, should be made without delay to the Laboratory Animals Bureau, M.R.C. Laboratories, Holly Hill, London, N.W.3.

NEW ISSUES

British Journal of Venereal Diseases.—The next issue (Vol. 29, No. 4) is now available. The contents include:

SURGICAL ASPECTS OF TABES DORSALIS. Robert Lees.
FAMILIAL INVESTIGATION IN SYPHILIS. W. V. Macfarlane.
THE CONTEMPORARY DEFAULTER IN A V.D. CLINIC—FURTHER OBSERVATIONS. Gordon O. Horne.
TRICHOMONAS VAGINALIS INFECTIONS IN THE MALE. F. Lanczley.
THERAPY OF LYMPHOGRANULOMA INGUINALE WITH 7218. C. D. Alcantara.
RECTAL GONORRHOEA IN WOMEN. Tage Jensen.
RESEARCHES IN NON-SPECIFIC URETHRITIS. II. TREATMENT. R. R. Wilcox.
UNITARY V. PLURAL CONCEPTION OF ANTILIPID ANTIBODY IN SYPHILITIC SERUM. Amal Kumar Mitra, Sudil Kumar Biswas, Sukumar Sen, and Narayan Chandra Bhatnagar.
COMPLEMENT-FIXATION TEST FOR LYMPHOGRANULOMA VENEREUM IN NON-SPECIFIC URETHRITIS. A. D. Macrae and R. R. Wilcox.
STABILITY OF THE ANTIGEN USED IN THE PRICE PRECIPITATION REACTION UNDER DIFFERING TEMPERATURE CONDITIONS. L. R. S. Macfarlane.
V.D.R.L. TUBE TEST. Aida Y. Djanian.
ANNOTATION: RECENT PROGRESS WITH THE TREPONEMAL IMMOBILIZATION TEST.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Abstracts of World Medicine.—The February issue (Vol. 15, No. 2), which is now available, contains abstracts of important papers drawn from medical and other scientific journals published in some 20 different countries and in all five continents. The subjects covered range over the whole field of clinical medicine and include pathology, bacteriology, pharmacology, and chemotherapy; there are also sections dealing with public health, industrial medicine and toxicology, anaesthetics, radiology, and the history of medicine.

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.; a specimen will be sent free on request.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, February 8

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.
LONDON UNIVERSITY.—At Physiology Theatre, University College, 5.30 p.m., special university lecture in biochemistry by Professor C. Fromageot (Paris): Metabolism of Sulphur Amino Acids and the Cycle of Sulphur in Nature.
MEDICAL SOCIETY OF LONDON.—8.30 p.m., Meeting of Fellows. Discussion to be introduced by Mr. L. N. Pyrah and Dr. C. Enrique Dent: Recurrent Urinary Stone.

Tuesday, February 9

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. J. V. Dacie: Congenital Haemolytic Anaemia.
CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel, a discussion on General Practice, to be opened by Dr. John Hunt, Dr. A. Talbot Rogers, and Dr. E. P. Scott.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. J. Wallace: Ano-genital Pruritus.
MANCHESTER MEDICAL SOCIETY: SECTION OF SURGERY.—At Medical School, Manchester University, 5 p.m., Mr. H. A. Haxton: Physics in Surgery.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Milroy Lecture by Dr. D. Long: Pathogenesis of Rheumatic Fever.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Mr. Donald B. Fraser: Ectopic Gestation.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, 5.30 p.m., public lecture by Professor F. Bergel, Ph.D., D.Sc.: Some Chemical Aspects of Abnormal Growth.

Wednesday, February 10

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Practical Aspects of *Trichophyton rubrum* Infections.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. H. P. Winsbury-White: Frequency and Other Disturbances of Micturition.
● LONDON UNIVERSITY: DEPARTMENT OF EXTRA-MURAL STUDIES AND ATOMIC SCIENTISTS' ASSOCIATION.—At Beveridge Hall, Senate House, 7 p.m., Dr. J. F. Loubit: Radiation Hazards of Atomic Energy.
MANCHESTER MEDICAL SOCIETY: SECTION OF PATHOLOGY.—At Medical School, Manchester University, 4.30 p.m., Dr. T. H. Blench: The Law Looks at Medicine.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Finlayson Memorial Lecture by Professor Alan Moncrieff: Marasmus.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. R. A. J. Asher: Lecture-demonstration in psychiatry.

Thursday, February 11

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chancery Street, W., 8 p.m., Mr. J. E. M. Ayoub: Mental Reactions to Visual Abnormalities.
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor H. B. Maitland: Anti-virus Immunity.
GLASGOW UNIVERSITY MEDICO-SURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Mr. R. B. Wright: Management of Thrombophlebitis of the Lower Limb and its Sequelae.
● HUNTERIAN SOCIETY.—At Savoy Hotel, London, W.C., annual dinner.

● INSTITUTE OF CHILD HEALTH.—5.30 p.m., Dr. K. Soddy: The Invalid Child.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Blood and Bone Marrow in Skin Diseases (with colour film: Marrow Puncture).
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—5 p.m., Professor F. C. Ormerod: Malignant Disease of the Oesophagus.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Accidental Extra-venous Thiopentone

Q.—What treatment is advised if thiopentone escapes outside a vein during an intravenous injection?

A.—The treatment of accidental extra-venous injection of thiopentone is by no means decided. Injection into perivenous tissue is usually small in amount and generally requires little or no treatment. If there is much pain the application of heat gives some relief. An immediate infiltration of the area with a solution of 1% procaine with hyaluronidase might prevent tissue damage. In the case of inadvertent arterial injections, characterized by immediate severe pain in the hand and by the obvious flushing or blanching of the hand and forearm, an immediate intra-arterial injection, through the same needle, if possible, of, say, 10 ml. of 1% procaine is advocated, followed by a block of the stellate ganglion or brachial plexus on that side. In addition to this, the intra-arterial injection at the site of the original one of arterial dilators like papaverine and tolazoline is advised. Some have gone further and insist that heparinization of the patient should be started immediately, the operation postponed, and heparinization maintained for some days to avoid intra-arterial thrombosis. The limb should be carefully watched for the ensuing 24 hours, and any evidence of circulatory impairment or nerve involvement demands immediate consultation with surgical colleagues as to the advisability of exploring the brachial artery and the antecubital fossa. Prophylaxis against extra-venous injections, and particularly of the dire consequences of intra-arterial injection, lies in the use of dilute solutions of thiopentone—certainly never stronger than 5%—and in the use of veins other than those which overlie the bend of the elbow. Good veins are usually found near the radial side of the wrist, on the back of the hand, and on the outer side of the biceps muscle and tendon.

Exercises for Hernia

Q.—A lay practitioner claims to be able to cure hernia by abdominal exercises. Has such a claim ever been submitted to controlled investigations, and if so what was the result?

A.—Such a claim has not, so far as the writer knows, ever been submitted to controlled investigation. Bulging of the abdominal wall due to lax muscles can clearly be "cured" by exercises. Certain types of direct herniae, especially that variety sometimes spoken of as Malgaigne's bulgings, will respond to rehabilitation of this kind. An indirect hernia, unless very small, is unlikely to disappear with abdominal exercises alone; and, even if the swelling did go, the sac would still be present with the likelihood of later recurrence. It must be conceded, however, that the wearing of a truss by a young person with a small, narrow sac and a good internal ring, combined with the maintenance of good abdominal muscle tone, can result in apparent cure. The best-authenticated example of this is in the case of Sir Astley Cooper's inguinal hernia. This was first noticed in his late teens, and he wore a truss for about five years night and day. No further swelling was seen after this, and when Sir Astley died at the age of 72 a detailed post-mortem examination was conducted at Guy's Hospital by John Hilton. It is notable that a minute serous canal was found on the affected side. Umbilical, femoral, and incisional herniae will not be cured by abdominal exercises alone, but all sufferers from hernia benefit from maintaining the abdominal muscles in good condition.

APPOINTMENTS

LIVERPOOL REGIONAL HOSPITAL BOARD.—B. M. Sedzimir, M.D., F.R.C.S. Ed., Consultant Neurosurgeon; N. O'Brien, M.B., B.Ch., T.D.D., Assistant Chest Physician to St. Helen's area; G. V. Osborne, M.Ch.Orth., Assistant Chest Physician to St. Helen's area; G. V. Osborne, M.Ch.Orth., F.R.C.S. Ed., Part-time Consultant Orthopaedic Surgeon to Southport Promenade Hospital; G. L. Shatwell, M.Ch.Orth., F.R.C.S., Part-time Consultant Orthopaedic Surgeon to Ormskirk County Hospital and Rainhill Hospital.
MACARTHUR, PATRICK, M.D., F.R.F.P.S., D.C.H., Consultant Paediatrician to Scottish Northern Regional Hospital Board.
MANCHESTER REGIONAL HOSPITAL BOARD.—C. A. Borland, M.B., Ch.B., F.F.A.R.C.S., Consultant Anaesthetist, Lancaster and Kendal Hospitals; P. B. Kunkler, M.D., M.R.C.P., D.M.R.T., and Dorothy Pearson, M.B., Ch.B., D.M.R.T., Assistant Radiologists, Christie Hospital and Holt Radium Institute; A. Clark, M.B., Ch.B., D.P.M., Assistant Psychiatrist, Whittingham Hospital; L. Parker, B.M., B.Ch., Consultant Pathologist, North Manchester Hospital; Group Laboratory; R. S. Savidge, M.D., M.R.C.P., Consultant Physician, Bury and Rosendale Hospitals; S. M. Laird, M.D., F.R.F.P.S., D.P.H., Consultant Venerologist and Director of St. Luke's Clinic, Manchester, and the Venereal Diseases Clinics of Manchester Royal Infirmary, etc.; S. Falk, M.D., D.P.M., Consultant Psychiatrist to Bury and Rochdale Hospital Centres; G. M. Colson, B.M., B.Ch., M.R.C.P., Consultant Physician, Bolton and District Hospital Centre; S. G. McComb, M.D., M.R.C.P.I., Consultant Physician (Geriatrics), Bolton and District Hospitals; K. A. Rowley, M.B., Ch.B., F.F.R., D.M.R.D., Consultant Radiologist-in-charge, Blackpool and Fylde Hospitals.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Burn.—On January 1, 1954, at Guy's Hospital, London, S.E., to Peggy (formerly Bird), wife of Robert Burn, F.R.C.S., a son—Richard William.
Martin.—On January 20, 1954, at Bentley, Hants, to Audrey (formerly Dealer), M.B., B.S., D.A., wife of Peter Martin, a brother for Gillian, Nicholas, and Robert.
Sudbury.—On January 31, 1954, at Swindon Maternity Hospital, Wilts, to Mary, wife of Squadron-Leader J. R. Sudbury, B.M., M.R.C.P., D.R.C.O.G., R.A.F., a son.

DEATHS

Elliott.—On January 6, 1954, in hospital, James May Elliott, M.B., B.Ch., Colonel, R.A.M.C., retired, of Highclere, Hutton Mount, Brentwood, Essex.
Elwin.—On January 8, 1954, at Ashted, Surrey, George Richard Elwin, M.D.
Fraser.—On January 5, 1954, at the Royal Infirmary, Edinburgh, Thomas Lochhead Fraser, O.B.E., M.B., Ch.B., Colonel, late R.A.M.C., retired, of Elie, Fife.
Fuller.—On January 6, 1954, at his home, Kensington, London, W., Francis Frederick Fuller, M.B., Ch.B., formerly of Harley Street, London, W.
Hacker.—On January 4, 1954, at 28, Torrington Square, London, W.C., Henry Pollard Hacker, M.D., D.Sc., D.T.M.&H.
Hale.—On January 9, 1954, at Midhurst, Sussex, Robert Eugene Vaughan Hale, M.B., B.Ch., late of Harpenden, Herts.
Jameson.—On January 3, 1954, at St. Leonards-on-Sea, Sussex, William Ernest Jameson, M.B., Ch.B., C.M., J.P.
Mackenzie.—On January 5, 1954, at 22, Queen's Gate, Glasgow, Alister Thomas Mackenzie, M.D., D.P.H.
Sutherland.—On January 9, 1954, at Edinburgh, Donald Sage Sutherland, T.D., M.D., of 2, Craiglockhart Terrace, Edinburgh, late of Manchester.
Thompson.—On January 6, 1954, at Christchurch Hospital, Bournemouth, Arthur Thompson, M.R.C.S., L.R.C.P., of 997, Christchurch Road, Bournemouth, Hants, late of East Drive, Brighton, Sussex, aged 81.
Tomlinson.—On January 3, 1954, the result of a road accident, Dorothy Sylvia Tomlinson, M.B., B.S., of 20, Eastwood Gardens, Newcastle-upon-Tyne, aged 25.

Clotting Time in Coronary Occlusion

Q.—Is there any change in the blood coagulability of patients suffering from coronary thrombosis? If so, has it prognostic value?

A.—In patients suffering from acute myocardial infarction some workers have detected a change in the heparin-clotting-time, but there is no consistent change demonstrable in ordinary clotting time. Thus in one series¹ of 19 patients with acute myocardial infarction 14 showed rapid heparin-clotting-time (i.e., the blood samples were "resistant" to the action of heparin) compared with only one of 14 controls suffering from other heart diseases. On the other hand, other workers² have found no consistent change in the so-called heparin-tolerance test. On the whole I think it would be fair to say that no great value can be placed on the results of blood coagulation tests in prognosis which in the long run must depend on the state of the myocardium and of its blood supply, especially with regard to the likelihood of further damage, and on complications like thrombo-embolism.

REFERENCES

- ¹ Rosenthal, R. L., and Weaver, J. C. (1952). *Circulation*, 6, 257.
² Hittco, J. H. B., Cameron, W. M., Mills, E. S., and Townsend, S. R. (1948). *Canad. med. Ass. J.*, 59, 447.

Sympathetic Ophthalmia

Q.—Under what conditions is sympathetic ophthalmia a possibility? Can it occur without a penetrating wound of either eye? What is the mechanism of its causation?

A.—Perforating injury is the commonest cause of sympathetic ophthalmia, and this disaster is particularly to be feared when irritation is prolonged by incarceration of iris tissue or ciliary body in the wound. The next important cause is intraocular operation, especially cataract extraction and other procedures implicating the lens.

Sympathetic ophthalmia without any antecedent perforating injury or operation is exceedingly rare. Probably some of the recorded cases were not genuine, and in others there may well have been an inconspicuous and painless small wound of entry. I would not like to say that the condition is impossible without a perforation, but it probably does not occur.

The mechanism of causation is still not known for certain. Various organisms have been blamed. Some authorities believe that sympathetic ophthalmia is brought about by a virus conveyed by the optic nerve sheaths. Others regard the disease as an allergic outburst.

Treatment of Vitiligo

Q.—What treatment is recommended for vitiligo? I have found autohaemotherapy helpful. Is this the general experience?

A.—Although from time to time cases have been recorded in which vitiligo has healed following some form of local or systemic treatment, such cases are quite exceptional and it may even be doubted whether the treatment has really had any effect at all. The general consensus is, in fact, that no treatment is at all reliable. In recent years El Mofty¹ has recorded successful treatment by the internal and local use of "méladinine." This is a plant extract which has the property of sensitizing the skin; after it is applied the skin is exposed to ultra-violet light and the resulting erythema is followed by a return of normal pigmentation. El Mofty's patients have all been in Egypt; the treatment has also been used in France, apparently with success. Only in recent months have small supplies been available in the United Kingdom, and it is as yet too early to assess results.

In the absence of curative treatment a good deal can be accomplished by the skilful use of concealing creams. It is also sensible to protect the normal skin from sunlight so that it does not present such a contrast with the pale areas.

REFERENCE

- ¹ *Brit. J. Derm.*, 1952, 64, 431.

Will the Eyes Change Colour?

Q.—At what age can one assume that the colour of a baby's eyes will not change from blue to brown? Is it true that the colour change only goes in this direction, i.e., never from brown to blue; if so, why?

A.—At no age can one safely assume that the colour of a baby's eyes will not change from blue to brown, except when both parents are of blue-eyed stock. However, if the change has not occurred by the age of 15 years, gross alteration in colour is unlikely, although I have seen a yellow margin appear in grey- and blue-eyed people after this age. Changes in the reverse direction, from brown to blue, occur only in pathological or senile conditions.

There is some evidence to suggest that little spots or masses of pigment may appear in the later decades of life, and that this tendency towards darkening of the iris is more marked in women than in men.

Renal Glycosuria and Hypoglycaemic Attacks

Q.—Does renal glycosuria ever account for hypoglycaemic attacks?

A.—It is doubtful whether renal glycosuria is ever the cause of true hypoglycaemic attacks. However, it is possible that in those cases in which there is a heavy loss of sugar associated with a very low threshold and an inadequate intake of carbohydrate a mild degree of hypoglycaemia may occur and possibly give rise to a sensation of weakness, etc. Even this must be very uncommon.

Cyanosis after Tattooing

Q.—Is a transitory (24 hours) but very obvious cyanosis a recognized complication of tattooing? If so, what is the explanation? I have seen this in a healthy boy of 17.

A.—Tattooing is performed by introducing colouring matter into fine punctures of the skin. The pigments most generally used are indigo, vermilion, and cinnabar. Indigo is an organic compound, while both vermilion and cinnabar are essentially sulphide of mercury, vermilion being the purest form. None of these materials is likely to cause transient cyanosis. The nature of the cyanosis is not stated, but it is reasonable to assume that it was due to methaemoglobin formation. In place of the usual pigments, it is possible that a tattooer might employ less inert colours, such as indian ink alone or combined with aniline black. In this connexion attention can be drawn to the report of an outbreak of cyanosis (methaemoglobinemia) in newborn babies due to the use of unlaundered napkins marked with a marking ink of aniline black in aniline.¹ Cyanosis of this type is transient.

REFERENCE

- ¹ Howarth, B. E. (1951). *Lancet*, 1, 934.

"Any Questions?" Book.—The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 13 1954

THE LIVER AS A SITE AND SOURCE OF CANCER*

BY

G. R. CAMERON, D.Sc., M.B., F.R.C.P., F.R.S.

Professor of Morbid Anatomy, University College Hospital Medical School; Pathologist, University College Hospital, London.

The subject of my lecture may well seem to you to be ill chosen, since primary cancer of the liver is uncommon in this country and secondary carcinoma presents few problems to the clinician because of its ill omen as the harbinger of death. My excuse lies in the belief that both the natural history and the experimental study of liver cancer afford precise information from which we may derive hints about the cancerous state and thereby acquire some guidance in the planning of future work.

With the idea of orientating myself to the pathological aspects of the discussion I asked two of my research colleagues, Dr. V. Udall and Dr. Basu Mallick, to analyse the post-mortem records of University College Hospital over the last twenty years for the occurrence and distribution of cancer metastases. During this period it is safe to say that necropsies have been performed with standardized technique, that the type of case admitted to our hospital has not varied greatly, apart from some disequilibrium during the earlier war years, and that careful microscopical search of the main tissues in all instances has been steadily maintained. The results are given in Tables I and II.

TABLE I.—Metastases in Liver and Lungs Grouped According to Relation of Primaries to Circulation. 910 Cancers from 6,047 Necropsies at U.C.H. over 20 Years

Necropsies			
Site of Primary Cancer	No. of Primary Cancers	Percentage Showing Metastases in	
		Lungs	Liver
<i>Blood Flow Passes to Lungs First</i>			
Breast	49	45	64
Uterus	37	11	24
Ovary	27	11	48
Kidney	19	31	40
Thyroid	10	70	20
Prostate	23	17	9
<i>Blood Flow Passes to Liver First</i>			
Lung	302	15	38
Stomach	144	12	68
Large intestine ..	129	12	40
Pancreas	48	15	58
Gall-bladder and bile ducts ..	31	19	45
Small intestine ..	6	—	33

They show that, whatever may be the immediate relationship of a primary tumour to the systemic or portal circulation, the liver becomes involved in secondary spread in a high proportion of cases. With cancer of the portal tract hepatic metastases regularly and convincingly outnumber secondaries within the lungs. The position with cancers elsewhere, with a

*Florence Blair-Bell Memorial Lecture delivered at the Liverpool Medical Institution on November 24, 1953.

TABLE II.—Distribution of Metastases from Cancer of Alimentary Canal and from Cancer of Lung

Metastases in	Cancer of A.C. (290)		Cancer of Lungs (302)	
	No. of Cases	%	No. of Cases	%
Liver	136	48	114	38
Adrenals	5	2	115	38
Brain	—	—	56	19
Kidneys	—	—	42	14
Bone	9	3	37	12
Pleura	8	3	24	8
Pericardium ..	3	1	18	6
Pancreas	26	9	16	5
Spleen	5	2	11	4
Peritoneum ..	49	17	8	3
Lung	38	14	—	—

All other organs under 1% for metastases.

venous blood flow in the first instance to the lungs, is paradoxical. Indeed, in many cases metastases are less frequent in the lungs, where they would have been expected, than in the liver. In other cases, however, lung dissemination predominates over liver. We are thus confronted, at the very outset, with observations suggesting that the liver occupies a special place in the order of metastasis. It will be my endeavour to find out what lies behind this arresting fact.

Sooner or later all pathologists interested in cancer realize the limitations of human studies, and some of them turn to experiments on animals in the hope of achieving a more dynamic and perhaps direct attack on the problem. Since everyone does not agree about the value of animal studies it is worth while considering for a few moments some of the reasons given by cancer workers for this choice.

In the first place, they are quite sure that cancer behaves in animals in much the same fashion as in man, so that some, at least, of the lessons learnt from animal work may be applied with safety to human affairs. Secondly, it is possible to plan experiments whereby the fate of the main tumour or its metastases is influenced by treatment of various kinds. Another matter of some practical importance is the decision whether manipulations adopted during physical examination or surgical operation on the primary tumour increase or diminish the incidence of metastases. This concern certainly lies open to experimental test. Again, they would like to know if there are rules of behaviour shared by metastases and the parent tumour: here may be considered the possibility of an association between the type of tumour on the one hand and its speed of growth, resistance to local conditions, susceptibility to treatment with radiation or operation, and the likelihood of dissemination on the other. Into this category comes, too, the urgent question whether parent tumours

control the life of daughter tumours. And, finally, they wish to understand why certain tissues of the body are picked out with regularity or frequency by metastases. No doubt other equally good reasons could be added to the list, but I am sure you will agree that I have defined a programme which must convince any reasonable person of the need for experiments on cancer.

Without any more ado I shall pass to the experimental study of metastasis, especially as it concerns the liver, and endeavour to show you that progress is being achieved in this fascinating field of endeavour.

1. Invasion of Blood and Lymph Vessels by Cancer Cells

The first and most important step leading to the distant spread of a malignant tumour is invasion or infiltration of a blood or lymph vessel, the natural precursor to the process of embolism. Growth by contiguity may result in invasion of near-by tissues, and if this form of spread is ignored or defences fail there may be infiltration over an extensive territory. In no such case, however, can there be involvement of a far-distant organ; some motive force is necessary for the carriage of malignant cells to the new site of growth. Morbid histologists have long been aware of intrusion into blood and lymph vessels, for by means of serial sections cells can be traced from the outskirts of a tumour along more or less pliant and yielding tissue spaces to the environs of all kinds of vessels. Indeed, in some instances they have been followed through the wall of such vessels to the endothelial lining, where they have been caught in the very act of bursting through this limiting cellular membrane into the fluid contained within the tube. Histologists also recognize a not infrequent precursor of break-through in the form of thrombosis, which for a time seems to hold up the further progress of malignant cells. But all too frequently it encourages distant spread, since such a thrombus may be the breeding ground of tumour cells until it becomes overweighted and snaps off as an embolus. In this way a small mass of living tumour cells can be whisked away if the near-by circulation is still brisk, and the embolus is finally brought to rest where the blood stream is narrowed down to a set of capillaries with diameters smaller than the largest dimensions of the embolus.

But how do such tumour cells progress from their site of origin to vessels? Once again histologists have helped us by tracing columns or sheets of cells between the two focal points. However, this is not always possible, and we have to fall back upon the supposition that tumour cells possess powers of movement whereby they may cover not inconsiderable distances. Indeed, experimentalists have given us evidence of such motility. As long ago as 1863 the great German pathologist Rudolf Virchow stated that cancer cells as well as leucocytes dodge about like amoebae, and many tissue culturists have confirmed this observation (Carrel and Burrows, 1911; Lambert, 1916; Russell and Bland, 1933; Ludford, 1934). This movement actually has been photographed with the cinecamera, and the speed of movement calculated in some cases.

Enterline and Coman (1950) give average velocities for breast cancer cells of 0.7μ per minute, or about 1 in. (2.5 cm.) in 10 hours, for carcinoma of the kidney up to 4.4μ per minute, and for a mouse fibrosarcoma as high as 6.2μ per minute. They have also observed that tiny clumps of carcinoma cells can move about as an amoeboid unit, in a fashion which recalls the astonishing progression of bacterial colonies studied some years ago by Cruickshank. Coman (1944) and his associates (de Long *et al.*, 1950; McCutcheon *et al.*, 1948) make out a case for the importance of adhesiveness between tumour cells in deciding infiltration. Break-away of single cells or tiny clusters of cells depends upon reduction of adhesiveness, which seems to be related in some fashion to deficiency in calcium content of the cells, particularly of their membranes. Here is a field of investigation for the biologist which is certainly related to the fundamental one of movement of cells in general.

The migration of tumour cells in living tissues now can be watched and photographed by means of ingenious techniques, chief among which is the Clark-Sandison and Algire chambers, applicable to the rabbit and the mouse. Before long it should be possible, by their use, to define with precision the factors which favour or prevent the local spread of neoplasms.

2. Carriage of Tumour Emboli in the Blood and Lymph Streams

The demonstration of tumour emboli within the circulating blood or lymph is the next step in the build-up of a theory of metastasis. It has presented many difficulties, since the perceptible growth of even the most active malignant tumour takes many days, weeks, or months, and, so far as we can tell, discharge of tumour cells into vessels is haphazard and on a relatively minute scale. To obtain samples of blood in which tumour cells are demonstrable is a matter of chance, with the odds well against the observer who aims at positive evidence. Success has come the way of several workers who injected blood from tumour-bearing animals into members of the same species (rats, mice especially) and obtained new tumours of the same type at the sites of injection (Blumenthal, 1929; Jonescu, 1931; Gross, 1932). In this way Flaks (1932) confirmed the presence of living tumour cells in lymph nodes receiving the lymph from a sarcomatous area, and could show that such cells were present in the lungs of the affected animals before metastases had made themselves known to the naked eye. From a careful study and review of the subject by Wagner (1938), it appears that the transfer to animals of tumour cells by the injection of heart blood or extract of lung vessels is successful only when such cells are demonstrable microscopically in these fluids. I can recall the excitement that I experienced as a young man when I found cancer cells in smears made from centrifuged blood obtained from a man with a rapidly spreading melanotic carcinoma.

We have no information about the number of tumour cells that must enter the blood of human beings, for instance, in order to produce metastases, but if facts obtained from animal experiments are applicable to man, then the effective number may not be very large. Kahn and Furth (1938) were able to transmit to inbred strains of mice a sarcoma, induced by the carcinogen benzpyrene, with 50 cells. Even more astonishing is the claim of these workers that certain strains of mouse leukaemia can be propagated by injection of a single leukaemic leucocyte into a vein. Obviously many variables come into the story, and a great deal will depend on the growth potentialities and resistance to changed conditions possessed by the tumour cells. Here again is a promising topic for investigation.

We do not know whether metastasis requires the continuous invasion of the blood or lymph stream by small or large numbers of tumour cells or whether discontinuous showers of cells suffice, provided conditions for survival and new growth of the metastasizing cells in their new surroundings are suitable. Some experiments on the influence of massage suggest that the cascading of cells may be important. In Japanese waltzing mice inoculated subcutaneously with a mouse carcinoma by Tyzzer (1913) manipulation and massage of the implanted tumour for a short period over several consecutive days increased the speed with which lung secondaries developed, and in some experiments greatly increased the number of metastases in that organ. These experiments were carefully controlled. Confirmation of Tyzzer's experiments has come from Knox (1921, 1922) and Marsh (1927). We may well believe that the periods of rough handling of these tumours led to vascular invasion on a scale sufficient to induce successful implantation in distant organs. So, too, experiments on incision or partial removal of primary tumours (Clunet, 1910; Tyzzer, 1913) and on the increase of susceptibility induced by haemorrhage (Gaylord and Simpson, 1916) hint at the same sort of phenomenon, although the results are not so convincing as with massage. I agree very strongly with Professor R. A. Willis in his plea for careful experiments on this and allied matters.

But the most persuasive evidence comes from the demonstration (1) that deliberate inoculation of the circulating blood with living tumour cells is often followed by the manifestation of tumours of the same type in various organs of the inoculated animal, and (2) of the need for a break-through into the blood stream of cells from the primary tumour. In support of the first thesis we have the old experiments of Cohnheim and Maas (1877), which showed that finely minced periosteum from rabbits, dogs, and hens injected into the jugular vein lodges as emboli in the lungs and for a time grows there, only to disappear in a few weeks. Cohnheim saw in these observations support for the origin of cancer metastases. Some years later Levin and Sittenfeld (1910) and Gussio (1912) carried out with increasing care, as the pitfalls were realized, inoculation experiments which gave convincing support to the embolic theory of secondaries. Modern work has confirmed the pioneers' results. Even more illuminating are the experiments of Weil (1913) with the Flexner-Jobling rat sarcoma. This actively growing neoplasm can be transmitted from one animal to another by means of subcutaneous inoculation but fails to metastasize spontaneously. If suitable emulsions of the sarcoma be injected intravenously into rats with large subcutaneous tumours then a high proportion of these animals develop lung tumours. In other words, when tumour cells gain access to the veins of tumour-bearing animals metastasis follows. Weil concluded that the absence of spontaneous secondaries is due to failure of the primary growth to effect vascular invasion. We now know that this is an over-simplification of the story; nevertheless blood invasion is indispensable if a tumour is to spread to distant parts.

3. The Development of Metastases

For the development of metastases in an organ such as the liver there must be: (1) the impaction of living tumour cells within the blood vessels, especially the capillaries, of that organ; (2) the initiation of a new focus of tumour growth at the site of impaction; (3) the invasion of the perivascular tissues of the organ by new tumour cells breaking through impacted vessels. Each of these stages has been established by means of animal experiments, and there is equally impressive evidence from human experience.

The frequent impaction of tumour cells in various organs, especially the lungs, was convincingly established by Schmidt (1903) and confirmed by a host of pathologists. In the course of a careful microscopic study of 45 cases of abdominal cancer he found 15 with lungs either free from metastases or showing at the most minute white rice-shaped thickenings, which proved on microscopic examination to be blood vessels obstructed with cancer cells. In all such cases small collections of tumour cells were discovered within the smallest arteries or in the capillaries, either free or enclosed within thrombi. Some of these collections displayed indistinct broken-up nuclei and fused, homogeneous, poorly stained masses of cytoplasm—signs that the cells no longer survived. Others presented mitotic figures and were certainly growing. Occasionally tumour cells entirely filled vessel lumina and formed long columns extending from arteries to capillaries and even to veins. Spread through vessels to perivascular tissues could also be made out and from these areas could be traced the origins of true metastases. Schmidt concluded that the transportation of tumour cells to small lung arteries occurs with great frequency, but that only a small proportion of these passengers are transformed into secondaries. The bulk are killed off by encapsulation with red corpuscles and leucocytes or by the organization of the thrombi which rapidly enclose them.

I would repeat that the studies of Schmidt are exemplary and have never been surpassed. Though chiefly concerned with tumour emboli in the lungs they are applicable to other organs, with certain slight reservations. In the case of the liver, for instance, it is my experience that thrombi around impacted tumour masses are by no means common—an event not altogether unexpected when one recalls the part played by the liver in the prevention of blood coagulation

by its synthesis of heparin. As an instance of the extraordinary fashion in which tumour cells may grow within blood vessels before breaking through the endothelial barrier let me recall a case described by the Canadian pathologist Horst Oertel (1935). A primary pyloric carcinoma came to necropsy without any obvious signs of metastases. Many organs, but especially the liver and the lungs and to a less extent the right adrenal, bone marrow, and bodies of some dorsal vertebrae, and the dura mater, showed widespread, microscopic cancerous masses confined wholly to the blood vessels. The tumour cells had been growing alongside the circulating blood in these localities without displaying any aggressive tendencies for the closely associated tissues.

A further instance of the same sort of event, but this time deliberately induced in animals, are the experiments of the Japanese investigator Takahashi (1915-16) carried out at the Imperial Cancer Research Laboratories, London, during the first world war. White mice were inoculated intravenously with 0.2 g. suspension of various mouse tumours and killed after the lapse of three weeks. In a number of animals no tumours were found within the lungs despite most careful search, but tumour emboli in various stages of degeneration and thrombosis were numerous. Leucocytes were present in considerable numbers around the tumour cells, but the endothelium of the enclosing blood vessels showed no evidence of proliferation. In those mice with lung secondaries after intravenous inoculation, degeneration was certainly not obvious in the tumour emboli and signs of tumour proliferation became apparent after three days. Both carcinoma and sarcoma were equally capable of producing lung metastases, but tumour strains differed widely in their ability to survive intravenous implantation. The majority of the strains used in these experiments grew when inoculated subcutaneously, but no relation existed between success on subcutaneous implantation and tumour take in viscera after intravenous injection. Takahashi concluded that variation in production of metastases is not so much the failure of neoplastic cells to make their way into the blood stream as their inability to survive and grow after arrest in the vessels of an organ.

Modern studies of dissemination in general are worth noticing before we consider special problems of liver metastasis. American investigators have been particularly active in recent years in the design of quantitative studies. Fresh confirmation has come for the belief that the number of emboli reaching a tissue is important in determining the success or failure of spread. Since the mortality of embolic cells is very high, a great number of these cells fail to establish themselves in the organs preliminary to initiating a locus of growth (Warren and Gates, 1936; Zeidman *et al.*, 1950). Zeidman *et al.* determined the number of living cells by means of vital staining with trypan blue, in suspensions of mouse sarcoma, injected such suspensions in serial dilutions intravenously into mice, and counted the pulmonary tumours 18 days later. Table III shows that the number of metastases is directly proportional to the number of viable embolic cells.

These investigators, too, maintain that the number of metastases is proportional to the duration of the primary growth; the longer the primary tumour exists, the greater is the number of metastases. This is not a matter of chance of invading blood vessels, for there is no reason to believe that the final size—that is, the amount—of a primary tumour is a measure of the likelihood of metastasis. Such factors as motility of cancer cells and their power of destroying and overcoming natural defences must play an important part,

TABLE III.—The Number of Metastases is Directly Proportional to the Number of Viable Embolic Tumour Cells. Mouse Sarcoma (Zeidman *et al.*)

No. of Mice	No. of Viable Cells Injected Intravenously	Average No. of Pulmonary Tumours
10	104,400	11.5
10	19,800	2.5
8	5,400	1.7
10	900	0.3

My survey of the position of the liver in the hierarchy of metastasis has led us through a veritable icefield of disappointments and uncertainties heavily littered with crevasses of ignorance. But we need not

despair, since there is, I believe, a perceptible upward trend in our journey towards the goal of enlightenment. Comfort springs invariably from the labours of defining what we know and what we do not know, and many gloomy fears vanish in facing up to the unknown. My endeavour has been to define some of the problems of tumour spread which I believe would repay further investigation. I would plead, especially, for a change in attitude towards matters which are dismissed as insoluble. Why should we throw aside the problem of metastasis as hopeless? Why not strive to find ways of circumventing the growing tumour, by inhibiting or suppressing its powers of growth, by turning it aside into less innocuous channels, perhaps by throwing obstacles in its pathways of spread or even sacrificing healthy tissues in order to hold up the neoplastic invader by means of a "burnt earth" policy?

The search for effective chemotherapeutic measures must go on with the same enthusiasm and imagination displayed by Dr. Blair-Bell throughout his pioneering efforts in this great city of Liverpool. Ideas must be sought after and cultivated. We must not be afraid to attempt the impossible; no device or technique that holds out the faintest hope of discovery can be put aside without proper reference to the work in hand. Above all, I maintain that we teachers have a special duty to perform in firing the imagination and carefully fanning the flame of enthusiasm so that our young men and women may demand an entrance into the domain of cancer research. Perhaps it will be a supreme, audacious flight of youthful genius that will bring the answer to the riddle of neoplasia.

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TOXIC REACTIONS AFTER INTRAVENOUS SACCHARATED IRON OXIDE IN MAN

SUGGESTIONS FOR IMPROVED PREPARATIONS

BY

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It is six years since saccharated iron oxide was introduced for intravenous administration in patients refractory to or intolerant of oral iron (Nissim, 1947). Saccharated iron oxide may be said to have gone through the first critical years of its life with greater success than expected, and as regards the incidence of serious reactions following its administration it compares favourably with blood transfusion. Mild or moderate side-effects, however, have been reported rather too frequently. Holt (1953) made a plea for an assessment of the general toxicity of saccharated iron oxide. It is the object of this paper to give an account of my clinical experience with this preparation, albeit limited, and to submit the findings of various authors to careful analysis in the hope of shedding light on the type, incidence, and possible causation of these reactions. This is followed by suggestions of possible procedures to eliminate or minimize the incidence of such reactions.

Toxic Reactions in Animals

Toxicity studies of intravenous saccharated iron oxide in four species—namely, mice, rats, rabbits, and guinea-pigs—have shown conclusively that the observed toxic effects are associated with precipitation (Nissim, 1949, 1953a; Nissim and Robson, 1949). This iron preparation does not precipitate when mixed in any concentration with plasma or blood *in vitro*, but undoubtedly precipitation occurs *in vivo* above threshold doses, depending on the species. In the mouse and rabbit this threshold is around 45 mg. Fe per kg. body weight, above which gradual precipitation of the compound occurs. The iron precipitates in fine particles rather than clumps as occurs after colloidal ferric hydroxide (Nissim, 1949, 1953b). For this reason the toxic effects of saccharated iron oxide after such doses occur only after an interval when enough iron has precipitated. Precipitation occurs particularly in the lung capillaries.

Plasma iron and histological studies show that at a second and higher threshold—namely, 180 mg. Fe per kg. in the rabbit—saccharated iron oxide is followed by abrupt but partial precipitation, and is therefore capable of producing toxic reactions immediately after the injection of unusually large doses—for example, 360 mg. Fe per kg. The toxic effects are those of multiple embolism. No toxic reactions have been noted which could not be explained on the basis of pulmonary or systemic precipitation.

Types of Toxic Reactions in Man

My experience with saccharated iron oxide includes 28 patients, 19 in the first series (Nissim, 1947) and 9 in the second (Nissim, 1949). The total number of injections was 90, and the dose per injection varied from 10 mg. to 1 g. Fe. Two samples of saccharated iron oxide were used, one with an LD₅₀ in white mice of 180 mg. Fe per kg. body weight, the other with an LD₅₀ of 300 mg. Fe per kg. With the latter sample, which was used in the second series doses of 200–300 mg. were given on 20 different occasions without toxic reactions of any kind. Only four mild or moderate reactions were encountered, all of which were in

the first series and followed doses of 1, 0.5, 0.5, and 0.25 g. Fe respectively. All these reactions came on 15 minutes to several hours after the injection, the interval being shorter with the larger doses. The reactions consisted of pyrexia with headache, pain in the back with weakness, or some degree of collapse with shivering and diarrhoea.

A review of papers on the clinical use of intravenous saccharated iron oxide, however, shows that toxic reactions fall into two groups, early and late. Early reactions usually occur immediately after injection, and certainly within the first ten minutes, while late reactions occur usually one-half to six hours after the injection. The reactions so far reported by the various authors are listed in Table I under the headings of early and late. A number of observations regarding the two types of reaction can be made.

TABLE I

Early Reactions	Late Reactions
Symptoms of pain:	Dizziness, lightheadedness, vertigo, and difficulty in standing upright
Headache	Weakness
Pain in arms and shoulders	Cold feeling, chilliness, rigors
Pain in chest (anginaloid)	Temperature—103° F. (39.4° C.)
Pain in lumbar regions	Sweating
Pain in sacral regions	Nausea, vomiting, anorexia
Pain in front of thighs or back of legs	Diarrhoea
Symptoms suggestive of sympathetic stimulation:	Generalized urticaria or papular rash (in children)
Tachycardia and palpitation	Vague discomfort, tight feeling of skin all over body
Pallor	Tightness in chest
Faintness	Headache
Symptoms suggestive of para-sympathetic stimulation:	Pains over stomach
Feeling of heat or intense burning all over body	Pain in abdomen: may be associated with rigidity
Sweating	Pain in chest (pleuritic)
Lacrimation	" " lumbar regions
Nausea	" " arms
Irritation of throat and coughing	" " legs and feet
Bronchospasm	Collapse, with grey colour, tachycardia, pulselessness, and subnormal temperature in severe cases
Symptoms of circulatory collapse:	
Cyanosis	
Low blood pressure	

Early Type

Reactions of the early type are by far the more common, and occur even after relatively small doses—under 100 mg. Fe (Kartchner and Holmstrom, 1950). The late reactions are infrequent and occur particularly after large doses, their frequency increasing with the size of the dose (Ramsey, 1950). Only once was a delayed reaction reported after a dose of 100 mg. Fe (Mooney, 1950). From publications which record the time of onset of reactions, the incidence of early toxic effects varies from 0 to 10% of all injections

(Govan and Scott, 1949; Briscoe, 1952) and seems to depend on the sample used. Thirteen cases of delayed reaction have so far been reported in this country (Table II), only three of which occurred after doses of less than 300 mg. Fe. Nine were reported by Ramsey, who attempted massive single injections of 300–900 mg. Fe. One delayed reaction occurred after a slow infusion of 1 g. Fe (Slowik, 1950). In America, Briscoe reported only "a few" reactions of delayed onset out of a total of 57.

It is of interest that in both my series of cases (Nissim, 1947, 1949) and that of Slack and Wilkinson (1949) the incidence of reactions was far less than that reported by later authors using commercial samples. In all three series "analar" sucrose was used in the preparation of the iron-sucrose complex, and the samples were fresh—that is, the period of time from manufacture to injection was short. It seems quite possible that both factors are responsible for increase in incidence of reactions, but the purity of sucrose seems to be a particularly important point (see below).

A woman who was treated at Guy's Hospital with 100 mg. Fe of one commercial sample of saccharated iron oxide responded with a typical anginous type of pain in the chest, down the arms, and also in the small of the back after each injection. The pain came on immediately at the end of the injection and lasted two to three minutes. When the same dose of saccharated iron oxide prepared from "analar" ingredients was given on a following day, there was no toxic reaction whatever. On the third day the patient was given another commercial preparation, prepared in the same way as the second sample (Nissim and Robson, 1949), except that the sucrose was not this time of "analar" standard. Exactly the same reaction supervened, and this painful effect thus appears to be due to impurities present in commercial preparations.

Precipitation of Iron Oxide

As already pointed out, toxic reactions in animals are accompanied by precipitation of the compound in capillaries, a precipitation which may be abrupt or gradual. Although no histological evidence of precipitation is available in man, it seems reasonable to presume that the delayed toxic reactions occurring after large doses are due to precipitation, particularly as the clinical superiority of samples possessing high LD₅₀ and high threshold of precipitation (Nissim, 1949, p. 138) seems to be established. Further, this type of delayed reaction (Table II) appears to be in no way different from that described by Goetsch *et al.* (1946) and

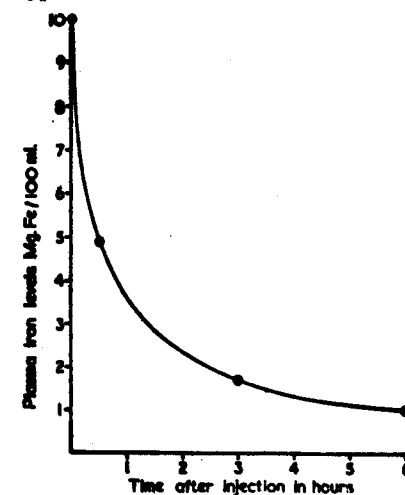
TABLE II.—Incidence and Type of Reactions Following Intravenous Saccharated Iron Oxide

Author	Preparation	No. of Cases	No. of Injections	Systemic Reactions			Doses in mg. Fe	Doses Causing Reactions in mg. Fe
				Early	Late	Total		
Briscoe (1952)	Feojectin	94	660	Most of 57 reactions	Few	57	30–200	—
Mitchell (1949)	Ferrivenin	Several	50	—	1	1	—	100
Mooney (1950)	—	24	—	—	1	1	150–400	200 and 400
Nicholson and Asali (1952)	Feojectin	16	203	72	21	2	300–500	300–500
Ramsey (1950)	Ferrivenin	11	16	3	9	12	1,000	1,000
Slowik (1950)	—	1	1	—	—	1	100	100
Barritt and Swain (1953)	Ferrivenin	1	1	10%	—	10%	30–100	30–100
Govan and Scott (1949)	—	25	—	3 pts. on several occasions	—	3	20–100	—
Hawkins <i>et al.</i> (1950)	—	6	130	—	—	—	—	—
Horrigan <i>et al.</i> (1950)	Feojectin	18	146	13	—	13	100–600	100–600
Kartchner and Holmstrom (1950)	Ferrivenin and neo-ferrum	26	193	Most	—	35%	100–1,000	100–1,000
Librach (1953)	—	2	—	Several	—	Several	5–100	5–100
Scott and Govan (1951)	Ferrivenin and 2 other preps.	125	—	10–20%	—	10–20%	30–100	—
Sinclair and Duthie (1949)	Ferrivenin	23	—	1	—	1	50–200	200
Brown <i>et al.</i> (1950)	Feojectin and 2 other preps.	10	—	—	—	—	40–200	100
Cameron <i>et al.</i> (1951a)	Feojectin, ferrivenin, and 1 other prep.	6	52	—	—	0	50–200	—
Sinclair and Duthie (1950)	Ferrivenin and iiron	28	—	—	—	Occasional	50–400	—
Slack and Wilkinson (1949)	Own prep. and ferrivenin	60	—	—	—	1	25–200	200
Dickstein <i>et al.</i> (1952)*	Feojectin	80	198	—	—	21	25–100	25–100

* In children.

by Nissim (1947) after colloidal ferric hydroxide, a preparation known to precipitate in the plasma. If these toxic reactions following doses of 0.3-1 g. Fe (Nissim, 1947; Ramsey, 1950) are assumed to be due to precipitation, then the threshold of precipitation in man is considerably smaller than in the mouse and rabbit—namely, about 4-10 mg. Fe per kg. in the former as compared with about 45 mg. Fe per kg. in the latter.

The common early reactions in man described by many authors are largely different in type from late reactions and are not believed to be due to precipitation. Plasma iron levels in a 60-kg. patient following the injection of 300 mg. Fe gave figures of 10, 4.9, 1.7, and 1 mg. Fe per 100 ml. at 0, 1, 3, and 6 hours (see Chart), and conformed to the type of curve obtained in rabbits.



Plasma iron levels in a 60-kg. patient after intravenous injection of 300 mg. Fe as saccharated iron oxide.

perhaps occur in certain conditions—for example, severe reduction of the pulmonary capillary bed. Those factors present in certain samples which give rise to early toxic reactions in man cause no detectable toxic effects in animals, so that the superiority of samples regarding these early toxic reactions are not shown by their LD₅₀ or by the absence of some typical toxic response.

The anginal type of pain as well as the pain in the back seen among the early reactions, particularly in elderly patients, suggest ischaemia of poorly supplied viscera. The ischaemia may be caused directly by spasmodic action of the material on the coronary or renal vessels. Alternatively, it may be caused by dilatation of vessels in the splanchnic area with diversion of the blood thereto. The list of early reactions shows that sometimes the responses suggest sympathetic stimulation, at other times parasympathetic stimulation. It is of interest, however, that the injection of tetraethylammonium chloride in one case simultaneously with saccharated iron oxide did not prevent this painful type of reaction, but the injection of calcium gluconate in another diminished its intensity (Horrigan *et al.*, 1950). Only a proportion of people (10-20%) seem to be susceptible to these early reactions.

Perhaps the strongest support for the dual mechanism of the reactions is obtained from the paper of Ramsey, who gave doses of 300-900 mg. Fe to 11 patients. Delayed reactions, which are extremely rare in doses under 300 mg., occurred here in 9 out of 16 injections (56%). Early reactions, on the other hand, occurred only in three out of 16 injections (19%), a frequency not much higher than that reported after the usual smaller doses. More interesting still is the fact that two of the latter three patients, having recovered from their transient early reactions, showed the delayed type of reaction several hours later, after a period entirely free of symptoms between the two episodes.

Toxic Reactions in Tuberculous Patients

Librach (1953) described two cases of toxic reactions to intravenous saccharated iron oxide in patients with pulmonary tuberculosis and discussed the possible mechanisms of iron intoxication in detail. It is pointed out here, however, that a different mechanism may have operated in these two cases, both of which had a severe involvement of the lungs with the tuberculous process. One was described as a case of chronic pulmonary tuberculosis complicated by amyloid disease and massive albuminuria; the other had tuberculous bronchopneumonia. In both cases severe limitation of lung capacity was likely, with marked diminution in the lung capillary bed. This may be an important point in the consideration of the mechanism of toxicity of intravenous saccharated iron oxide. Animal studies show that saccharated iron oxide is most likely to precipitate in the lung capillaries after intravenous injection (Nissim, 1953a), since it is through these capillaries that the iron passes before being adequately diluted in the blood. Another favourite site of precipitation is the kidney (Nissim, 1953c), because of the increase in iron concentration following plasma filtration through the glomeruli. Saccharated iron oxide can precipitate both immediately and gradually above certain threshold concentrations, and it seems reasonable to suppose that such precipitation is more likely to occur with small doses when there is severe diminution in lung reserve. This is a point worth bearing in mind when intravenous iron is considered for such cases. Although in Librach's cases the early reaction may have been due to impurities, as discussed previously, the epileptiform fit and pain in the chest lasting for 24 hours in Case 1 and the dyspnoea and cyanosis in Case 2 are compatible with reaction of the second type, in this case due to abrupt precipitation. The restriction in the lung capillary bed may have been made worse by the previous two injections given without untoward effects.

Librach invoked the iron transport mechanism of the β -globulin-fraction iv-4(8) of Cohn, or siderophilin, as being partly responsible for the occurrence of iron reactions in these subjects. The work carried out on plasma iron following saccharated iron oxide throws doubt on this hypothesis. Klopfer (1951) found that toxic effects arose only when the iron-binding capacity is exceeded in the individual injections. It is pointed out here that siderophilin cannot be involved in the transport of the iron of saccharated iron oxide to any extent, since calculation shows that the iron-binding capacity of the total plasma in an adult is only about 16 mg. Of this total a third is already bound to iron, so that doses in excess of 10 mg. should give rise to toxic reactions. This is evidently not so, as shown by the plasma iron levels of 5-10 mg. Fe per 100 ml. maintained for a period of hours without the slightest toxic manifestation.

Saccharated iron oxide is a colloidal compound the iron of which is not split off easily. Its estimation in plasma requires the use of much larger quantities of HCl than is usually employed (Nissim, 1953b), and this accounts for the much lower plasma iron figures obtained by previous workers following intravenous saccharated iron oxide (Cameron *et al.*, 1951b). The proportion of plasma iron estimated by the usual methods—for example Laurell's (1947) method—after injection of saccharated iron oxide is not greater than the proportion before injection (20%), suggesting that little splitting of the compound, if any, takes place *in vivo*. It is possible that certain preparations of saccharated iron oxide contain a small proportion of diffusible or ionic iron as impurities, but until this is shown to be the case toxic reactions due to oversaturation of siderophilin remain hypothetical. Cameron *et al.* (1951a) found that following injections of saccharated iron oxide the total iron-binding capacity of serum was reduced but never approached zero, so that the belief that saccharated iron oxide remains unsplit in the plasma finds additional support here.

Allergy

Librach further believed that the question of allergy is important. Evidence for natural hypersensitivity to impurities in certain commercial samples exhibiting itself in the early and usually transient type of reaction has already been presented. These impurities may have the nature of histamine releasers, as suggested by the bronchospasm reported in some patients (Sinclair and Duthie, 1949). Acquired allergic hypersensitivity to a component or impurity in the preparation, however, is another matter. The repeated injection of saccharated iron oxide in animals has never resulted in allergic manifestations (Cappell, 1930; Nissim, 1953). In man the incidence of reactions of the early type is not greater after later injections than after first injections. The incidence of the delayed type of reactions decreases if anything with repeated injections (Ramsey, 1950) apparently owing to hypertrophy of the reticulo-endothelial system following an injection of saccharated iron oxide when previous doses were well tolerated may possibly be due to differences in batches of the preparation (Dickstein *et al.*, 1952). However, the occurrence of isolated instances of acquired hypersensitivity—for example, the case of Sinclair and Duthie (1949) and the two cases of Librach—cannot be ruled out, but on account of their rarity other possible causes must be considered—for example, change of batch—before such a hypothesis is accepted.

The suggestion put forward by Ramsey for the late reactions is interesting. He noted that they resembled in a striking manner those symptoms of paroxysmal haemoglobinuria from cold, and believed that they "may well be caused by sudden increased activity of the cells of the reticulo-endothelial system." To what extent overactivity of the reticulo-endothelial cells is by itself capable of producing toxic symptoms is a problem difficult to answer. The injection of colloidal dextran in relatively large doses or of vital dyes which are taken up by the reticulo-endothelial cells seems to be devoid of toxic effects. Saccharated iron oxide is certainly taken up by the reticulo-endothelial system, but it is also known that, in animals, saccharated iron oxide precipitates above a threshold level, and this seems the obvious mechanism responsible for the toxic effects in man after large doses. Other hypotheses lack experimental evidence.

Librach (1953) discussed "iron poisoning" in rather general terms, and included in his discussion cases of toxicity after intravenous saccharated iron oxide and after oral ferrous sulphate (Prain, 1949) without adequate distinction. It cannot be too strongly emphasized that, apart from completely ionized ferrous and ferric compounds, many iron preparations are in fact non-ionized complexes with entirely different mechanisms of toxicity, mechanisms which depend on the chemical reactivity and other properties of the whole molecule (Nissim, 1953d). Indeed, some preparations show different mechanisms in the causation of death at different dose levels. Discussion of toxicity must therefore be confined to the compound in question, unless it is shown that the compound is ionized either partly or wholly, when the mechanisms of toxicity for either ferric or ferrous ions may be invoked.

Reaction in a Fatal Case

In the fatal case reported by Barritt and Swain (1953) it seems fairly clear that the reaction was of the early type without evidence of precipitation. The absence of multiple emboli at necropsy and in the toxicity tests carried out on samples before and after injection seems to rule out this possibility satisfactorily. It seems likely that the mechanism of ischaemia discussed previously was responsible for the fatal outcome, especially on account of the post-mortem evidence of calcification of both coronaries with complete occlusion of the right artery. It is difficult, however, to assess the seriousness of the part played by intravenous iron, as such a patient may succumb to an attack of coronary occlusion even after a relatively mild reaction. It becomes

obvious, nevertheless, that particular care should be observed with such cases.

Infants and children seem to tolerate saccharated iron oxide in relatively large doses—25-100 mg. Fe (Bramham, 1952; Dickstein *et al.*, 1952), in contrast to elderly patients, who tolerate it less well than normal adults (M. R. Jeffrey, 1952, personal communication). Reactions in children are mild. In a series of 198 injections in 80 infants and children, Dickstein *et al.* reported three cases of generalized papular rash, which suggest an allergic response. The rash lasted only for one day. All of nine febrile reactions were associated with one sample of the preparation and ceased when a fresh batch was used. Although these febrile reactions were delayed in onset (appearing in about two hours) and lasted some two to three hours, it is difficult to attribute them with certainty either to allergy-producing impurities or to precipitation.

Conclusions

Sucrose and other substances used in the preparation of saccharated iron oxide should be of high standard.

There is evidence from histological studies in animals injected with two- to three-year-old solutions of saccharated iron oxide that the character of the compound undergoes slow alteration in solution with increase in diffusibility, and its uptake by fibrous-tissue elements becomes marked. This change may be associated with increase in toxicity or allergy-inducing properties in man and may be prevented by keeping the compound and ampoules in powder form just as practised with intravenous barbiturates. If this reduces the incidence of toxic effects the additional cost of the procedure would be justified.

It may prove possible to separate impurities from solutions of saccharated iron oxide by dialysis. Further, saccharated iron oxide may consist of colloidal particles of various sizes, and fractional ultrafiltration may give a more uniform preparation of reduced toxicity.

The extent to which these suggestions are compatible with the cost of manufacture can be decided only by the various firms engaged in the preparation of saccharated iron oxide. The use of analar ingredients seems to be the easiest step, and this is believed to have been already adopted by some drug firms.

Summary

The frequency and type of toxic reactions following intravenous saccharated iron oxide are discussed. A review of the incidence of these reactions in the hands of various workers is presented.

Reactions are of two types, early and late; a list of the toxic effects in the two types is given. Early reactions are believed to be due to individual hypersensitivity to impurities apparently present in commercial (B.P.) sucrose and may be allergic in type. Particular care should be taken in patients with arteriosclerosis, as the frequent transient anginal type of pain and back pain suggest ischaemia of the myocardium and kidneys.

The majority, at least, of delayed reactions are believed to be due to the gradual precipitation of the compound as occurs in animals following large doses. Some precipitation of saccharated iron oxide may possibly occur immediately after injection if the capillary bed in the lungs is greatly reduced by disease or the preparation injected too rapidly.

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MANAGEMENT OF THE COMMON VARIETIES OF SCALP RINGWORM*

BY

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The differential diagnosis of the various types of scalp ringworm is of importance, since good treatment follows accurate mycological diagnosis. It is not necessary to have the result of mycological culture before treating any individual case. Considerable accuracy in clinical diagnosis can be achieved when one has, as a background, full knowledge of the various types of fungi which are endemic or epidemic

TABLE I.

Fungus	Animal	Inflam-matory Reaction	Wood's Light	Outbreaks	Treatment
<i>M. audouini</i>	None	None	Green fluorescence	Large epidemics often occur	X-ray epilation
<i>M. canis</i>	Kitten	None or moderate	Green fluorescence	Usually small outbreaks affecting about 5-15 children	Fungicidal ointments
<i>T. sulphureum</i>	None	None	Nil	No very large outbreak so far reported, but general incidence is apparently increasing	X-ray epilation
<i>T. discoides</i>	Calf	Severe	Nil	Individual cases or 3-4 in a family	Starch poultices; extraction of loose hairs with forceps; soothing local applications

in the area. One can simplify diagnosis and arrive at sound practical treatment by concentrating on the three, four, or five fungi which occur in the locality (Table I). In the North of Ireland there are four important fungi (Beare and Cheeseman, 1953), which accounted for 99% of 1,157 cases of tinea capitis seen between May, 1948, and December, 1952, and

*Based on a paper read in the Section of Dermatology at the Annual Meeting of the British Medical Association, Cardiff, 1953.

from which the responsible organisms were identified. These four fungi are *Microsporum audouini* (889 cases), *M. canis* (178 cases), *Trichophyton sulphureum* (55 cases), and *T. discoides* (24 cases). Three other fungi were encountered during this period—namely, *T. mentagrophytes* (8 cases), *T. equinum* (2 cases), and *T. schönleini* (1 case).

An easy and useful practical classification of the four common types of tinea capitis is by division into Wood's-light-positive and Wood's-light-negative cases, and subdivision of each of these two groups into human and animal types of fungi, as follows. Wood's-light-positive: human, *M. audouini*; animal, *M. canis*. Wood's-light-negative: human, *T. sulphureum*; animal, *T. discoides*. These four main groups are discussed in turn.

M. audouini Infections of the Scalp

Recently there has been considerable discussion regarding the possible effectiveness of local ointment treatment for cases of tinea capitis due to *M. audouini*. Among the best results are those obtained by Schwartz *et al.* (1946), who, in a carefully conducted and very practical trial, claimed 274 cures out of 445 children treated with local medications within a 16-months study period (61.6%). Similar results were obtained by Barlow *et al.* (1950). It would be fortunate indeed if we could cure this type of scalp ringworm by local application of a simple ointment, but the conservative treatment of this variety requires certain ancillary measures which the average general practitioner or school medical officer would find extremely difficult to carry out.

Treatment with Ointment.—The disadvantages of local ointment treatment for this condition, even assuming that this treatment is really effective and that cure is not spontaneous—and this is still in debate—include the following. (1) Treatment has to be carried out by reliable trained persons and not left to parents or friends. (2) During the time that the child is having treatment, unless supervision is very close, he will be infectious. (3) The failure rate over a reasonable period, such as six months, is considerable, as can be seen from an examination of the various clinical trials so far reported. (4) Some of the cures seem to have acted by producing local kerion-like reactions. I have seen these "artificially produced kerions" leave permanent scarring. (5) It is usually necessary to shave the children's scalps. (6) X-ray therapy centres are still required to deal with those children who fail to respond to ointment therapy.

Advantages of X-ray Epilation.—(1) X-ray epilation for this form of scalp ringworm offers an almost 100% certain cure within a period of four to six weeks. The treatment can be carried out in less than an hour, it is completely painless, and from all practical points of view it is safe if used by people who have been thoroughly trained in this method of treatment. Hair regrowth in boys is complete in six months. (2) The amount of co-operation required between hospital staff and parent is reduced to a minimum. One has only to get written consent, have the child for an hour, and then, no matter what the parents do subsequently, that child will almost certainly be free of infection in a month. (3) Unruly and obstreperous children can be conveniently managed under a light general anaesthetic.

Steps Taken in a Series of Cases

In 1948 it was estimated that there were about 1,000 cases of *M. audouini* scalp ringworm in the North of Ireland. The following steps were taken to deal with this campaign. (1) Examination of all schoolchildren within the affected areas by a nurse using Wood's light. In Belfast 50,000 such examinations were made and 225 cases found; 100 further cases were discovered among relatives of non-school age. (2) General practitioners and school medical officers were encouraged to refer their cases to a ringworm centre. (3) Wall maps were made out and coloured pins inserted to denote the homes of infected children. (4) An adequate

follow-up system was started. Infected children were regarded as a danger to the community. (5) Infected children were kept from school, mainly because it was felt that this gave control of the case. If a child is not allowed to go to school then most mothers, however obstinate, will eventually yield and have whatever treatment is advised.

One amusing but troublesome difficulty was encountered over this decision to keep infected children away from school. So many children were away from school—in some cases all the children living in a street had ringworm—that a child who was not infected felt "out of it all." A market in ringworm was started by the more enterprising sufferers from this condition, and infection was sold at a price which at the height of the market reached sixpence a rub. To solve this problem the school authorities opened a special ringworm school: this allowed us to retain control of the case.

Results

About the summer of 1951 a very appreciable drop in the incidence of infection was noted, and by August or September of that year the falling off of cases was considerable. Only two cases from the Belfast and Newtownards areas were seen in 1952, and only one isolated case in 1953.

There is undoubtedly some as yet unknown factor which determines the virulence of *M. audouini*, and therefore the incidence of tinea capitis due to this fungus. Kligman (1952) found great difficulty in inoculating experimentally the scalps of children maintained in an institution in Philadelphia. He expressed the opinion that this disease was not so infectious as had had sometimes been claimed. I cannot agree with this, and the following data indicate the high degree of infectiousness in practice. The incidence of ringworm during the epidemic period in the town of Newtownards was 12%, 368 children from a total child population of 3,000 under the age of 17 years being affected between January, 1948, and August, 1949 (27.2% of the male school population were infected). In another epidemic in the North of Ireland which occurred in a residential school, 31.6%—or 116 children out of a population of 367—were affected (Walby, 1952).

M. canis Infections of the Scalp

During recent years we have carried out few x-ray epilations for cases of tinea capitis due to this fungus. Various authors in the past have stated that the majority of *M. canis* infections of the scalp clear spontaneously, and that x-ray epilation is not always necessary (Lewis and Miller, 1934; Lewis, 1935). When all the non-epilated children who had been seen in 1948 with scalp ringworm at the Royal Belfast Hospital for Sick Children were recalled during the early months of 1949 none were found to be infected by *M. canis*. These children represented a very mixed group of infections, and it can be safely assumed that some of them were originally cases of *M. canis* infection. It was therefore apparent that the great majority of these infections must clear quite quickly and spontaneously. However, during the time when we were primarily concerned with *M. audouini* it was felt that, from the point of view of the welfare of the community, all cases of non-inflammatory scalp ringworm should be subjected to x-ray epilation. Consequently a large number of cases of *M. canis* infection were epilated during 1949-51.

It is possible to make a clinical differentiation between *M. audouini* and *M. canis* infections in the majority of cases (Beare and Cheeseman, 1951).

Treatment

So far as I am aware, no properly controlled experiment estimating the time saved by subjecting children with the *M. canis* variety of scalp ringworm to x-ray epilation has been carried out. Useful information can be obtained by comparing the duration of infection in groups of children presenting with different inflammatory reactions. The in-

flammatory varieties cause no undue worry, and if it can be shown that the non-inflammatory cases, if not epilated, clear as quickly or nearly as quickly, then this would seem to be a strong indication not to use x-ray therapy with its attendant troubles and subsequent temporary alopecia for any case due to this fungus.

In 1949-50 there were 90 cases of *M. canis* scalp infection, and of these 42 were epilated. For the most part these were the non-inflammatory cases. In 1951-2 there were 88 cases and 5 were epilated (4 in 1951 and 1 in 1952). There was no special selection of these five cases for epilation. Of the 83 non-epilated cases the attendances of 61 were regular enough to allow of analysis (the other 22 did not re-attend just when requested, though all were eventually re-examined). These 61 cases were analysed from the point of view of duration of infection, and it is possible to divide them into two groups according to the severity of the inflammatory reaction present.

All patients were treated simply by local application of Whitfield's ointment. Inflammatory reaction was absent in 27 patients and slight or severe in the remaining 34.

Duration of Infection

Table II shows the average duration of treatment, measured from the date when the patient was first seen to the date when judged to be clear of infection. In the group

TABLE II.—Analysis of Average Duration of Time Between Date Patient First Seen and Date Infection Cleared

	No Reaction	Slight to Severe Reaction
Number of patients ..	27	34
Mean duration (first seen—clear): days ..	57.00	47.99
Standard deviation of duration: days ..	22.33	26.83
Standard error of mean: days ..	4.30	4.60
Difference between means: days ..	9.41	
Standard error of difference: days ..	6.75	
Difference + standard error ..	1.4	

with no inflammatory reaction the average duration of treatment was approximately 57 days, while in the group with slight to severe reaction it was 48 days. Although these averages do suggest that the condition takes longer to clear in patients with no reaction than in patients with reaction, the average difference is only about nine days, and, moreover, could quite easily have arisen by chance. (The table shows that the difference is less than twice its standard error and would be described as "not significant" at the conventional 5% probability level.)

Since the two averages are not significantly different, it is legitimate, for these data, to pool the two reaction groups to arrive at statistics for the complete group of 61 patients. When this is done the average duration of time between the date when the patient was first seen and the date when the infection was cured is approximately 52 days, and the series has a standard deviation of approximately 25 days. The latter suggests considerable variation between individual patients.

The absence of a real difference in duration of infection in the two groups from the time the patients were first seen implies that, if both types of case react similarly to the treatment given, there is no evidence, from these data, of a significantly longer duration in the patients with no inflammatory reaction compared with those with slight to severe inflammatory reactions.

Table III is an attempt to arrive at average durations of infection from time of onset—estimated at history taking—to time infection was clear. There is a marked similarity between the durations so obtained in the two reaction groups. Where reaction was absent the average duration of the condition was only four days (approximately) greater than where reaction was present. Again the difference is insignificant at the 5% probability level. When the two groups are pooled it is found that the average duration of

TABLE III.—Analysis of Estimated Average Duration of Infection Between Estimated Date of Onset and Date Infection Cleared

	No Reaction	Slight to Severe Reaction
Number of patients ..	27	34
Mean duration (onset—clear): days ..	72.81	68.38
Standard deviation of duration: days ..	27.87	24.17
Standard error of mean: days ..	5.36	4.15
Difference between means: days ..	4.43	
Standard error of difference: days ..	6.78	
Difference ÷ standard error ..	0.7	

infection from the time of onset to the time cleared for the 61 patients was about 70 days, and the standard deviation about 26 days.

It must be pointed out that in Tables II and III the longer average duration is, in fact, found in the group which experienced no inflammatory reaction. In these data, however, the excess could easily be attributed to chance, but the numbers involved are admittedly small. In view of the results of this tentative examination it seems wrong to accept at this stage the suggestion that, other things being equal, there is a real difference in the duration of the condition between groups of patients with different inflammatory reactions.

One could expect to clear all cases of *M. canis* scalp ringworm with x-ray epilation in approximately four weeks, certainly six weeks (28 to 42 days). This would imply that probably a little over half of the children in the present series (irrespective of the intensity of inflammatory reaction) would have been rendered free of infection more quickly had they been epilated with x rays. Against this, however, must be balanced the fact that these children would have been bald for some four months, long after they would have been free of infection had they been treated conservatively, and the epilated girls, of course, would actually be socially unacceptable for longer than four months.

It is of some interest that the number of new cases seen each year showed little variation (1949, 42 cases; 1950, 48 cases; 1951, 42 cases; 1952, 46 cases), which is further support for the thesis that x-ray epilation is not necessary in this infection. Thomas (1953) also supports this view. One might advocate x-ray epilation for cases of *M. canis* infection in which there is a complete absence of inflammatory reaction. The longest duration one has seen of this variety of tinea capitis is 149 days (about five months). This was exceptional, and if this long duration could be predicted in any individual case x-ray epilation would probably be justifiable.

Many of the non-inflammatory *M. canis* cases which clear within six weeks or so are probably the result of a third or fourth transfer of the organism. Duncan (1948) has pointed out that *M. canis* infections undergo a limited number of transfers; for example, kitten to child A—to child B—to child C, and then the organism probably becomes avirulent.

Our routine now for *M. canis* scalp infections is local treatment with a fungicidal ointment. The advantages of using a rather sticky ointment such as Whitfield's probably lie in the fact that this prevents loose hairs and spores from falling in all directions, not only on to the child's environment, but also on to other parts of the child's scalp.

T. sulphureum Infections of the Scalp

Fifty-five patients with tinea capitis due to this fungus have been seen during the period 1949–52. This variety of ringworm has recently attracted considerable attention. Howell *et al.* (1952) have described 37 cases seen in Texas and California. Under Wood's light there is complete absence of fluorescence, but clinically these infections are often very much like those caused by *M. audouini*.

In the present series 36 of the 55 cases showed little or no inflammatory reaction. Eleven were classified as kerions. It is curious that these kerions were seen for the most part during the last year of the present four-year survey. Forty-one cases were seen within two months of

onset of infection, but four had had the infection for more than one year, and one had had an infection for over two years. Two boys were affected to every one girl. The average age was 7, but there was a fairly even spread throughout the first 14 years of life. No adults with this infection of the scalp were seen.

In the North of Ireland the infection is practically confined to Belfast, and in general is probably a disease of large centres of population. There is no animal reservoir, and infection passes from patient to patient. There was a steady rise in the number of new cases seen each year (1949, 10 cases; 1950, 11 cases; 1951, 13 cases; 1952, 21 cases).

It has usually been extremely difficult to establish the source of infection, and indeed only once, when brother and sister were infected, was this possible. Extensive scalp infections were seldom seen, and the most usual picture was that of a single small scaly non-inflammatory patch, often like a mild seborrhoeic dermatitis, but with some broken-off hair stumps. Thirty-four of the 55 cases had only one patch.

In addition to the cases of tinea capitis, 16 cases of tinea corporis due to this fungus were seen. The areas most often involved were the face and neck.

Local epilation was used in preference to total epilation because so many cases had only one patch, but of 31 cases so treated 6 were failures. In these particular cases the infection appeared in the adjacent non-epilated hair. Eight cases had total epilation, and in one of these it was a failure. A few cases cleared without epilation, including the 11 with kerions. Treatments used when x-ray epilation was avoided included Whitfield's ointment locally and manual epilation of hair stumps. Since the infection is non-fluorescent under Wood's light this is a very tedious and unreliable procedure.

The treatment of choice for non-inflammatory infections is probably a whole-scalp epilation even when only a single patch is present.

T. discoides Infections of the Scalp

This fungus is the common cause of cattle ringworm in the United Kingdom. It causes an extremely severe local reaction which sometimes progresses to a chronic granuloma that may persist for six months or more and often leads to scarring and areas of permanent baldness.

Most Ulster patients first seek cure from the local charmer, and have a smouldering twig waved three times round the affected area on the night of a full moon. This procedure does much less harm than tincture of iodine, and the results are probably just as good. It is extremely doubtful whether anything we do can actually shorten the duration of a *T. discoides* infection. A possible exception to this statement is manual epilation of the loose affected hairs, using a small pair of forceps. For patients who can be admitted to hospital this procedure should certainly be carried out. Sticky starch poultices and removal of the affected hairs by this method are also of value. Symptomatic treatment is, of course, appreciated, since the condition is uncomfortable or even painful.

T. discoides infections can usually be differentiated from *T. sulphureum* infections by (a) the degree of reaction, which is so much greater with *T. discoides*; (b) a history of contact with infected cattle, which is always given for *T. discoides* infections; and (c) in the North of Ireland finding out where the patient lives: a non-fluorescent scalp ringworm from Belfast is *T. sulphureum* and from outside Belfast is *T. discoides*.

Conclusions

It is possible to differentiate the four chief varieties of scalp ringworm by simple clinical inspection and Wood's-light examination.

The presence of *M. audouini* represents a danger to the child community and a challenge to the doctor.

It should be possible to eradicate completely this variety of ringworm from a community. X-ray epilation should ideally be carried out at the child's first attendance at a dermatological clinic. All contacts in the home and school should be examined with Wood's light.

The importance of *M. canis* ringworm lies in its differentiation from the *M. audouini* variety. X-ray epilation is seldom indicated.

T. sulphureum is likely to cause great anxiety and trouble in the near future, since diagnosis of the non-inflammatory varieties is difficult, and the disease may last for years if untreated. X-ray epilation of the whole scalp is probably the best treatment in most cases.

It is very doubtful whether any procedure can actually shorten the duration of *T. discoides* infections, but symptomatic treatment is appreciated by the patient.

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ATELECTASIS AS A COMPLICATION IN ARTIFICIAL PNEUMOTHORAX

BY

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Since 1920 therapeutic pneumothorax has had a vogue which was certainly excessive at first, but lately the balance has swung the other way and some authorities seem to regard it as a dangerous procedure which should be used only in exceptional cases (Harris *et al.*, 1952; Jackson, 1952; Simmonds *et al.*, 1952).

Young (1949) believes that the cause of this trend of opinion is the fact that the technique seems so easy that it has been carried out by workers inexperienced in the proper selection of cases or in the finer points of its conduct. In the management of artificial pneumothorax (A.P.) cases the physician must be experienced enough to recognize the circumstances that demand the immediate termination of the pneumothorax treatment. Also, to give the best chance to his patients who need the help of an A.P., he must know what "complications" may be disregarded with reasonable safety. One such complication often appearing in an otherwise perfect pneumothorax is the occurrence of an area of atelectasis; and the object of the present investigation is to try to decide whether or not such an occurrence is an indication for suspending this type of collapse therapy.

Some writers have associated atelectasis occurring in an A.P. with such sequelae as progressive tuberculous disease (Rafferty and Shields, 1943), with relapse (Maher-Loughnan, 1950), and with tuberculous pleural effusions and empyemata (Houghton, 1950). On the other hand, Scadding *et al.* (1952), Foster-Carter *et al.* (1952), and Beric Wright (1952) have recorded satisfactory results in small groups of cases with atelectatic lobes or segments, while earlier writers (Brooks, 1938; Erwin, 1939) regarded its occurrence as a favourable event.

At the Cheshire Joint Sanatorium the clinical impression has long been that the occurrence of lobar or segmental atelectasis does not of itself warrant the interruption of the course of an A.P. Adequate material is therefore available at this institution for the numerical examination of the prognostic effects of such atelectasis.

Data

Data for this investigation were obtained from consecutive cases of A.P. induced at the Cheshire Joint Sanatorium between early 1935 and the end of 1945. That all these cases were finally complete was shown by thorascopic examination as well as by x-ray films. In all cases sputum was either negative throughout or converted to negative by effect of the A.P.

The collecting of data from earlier sanatorium cases has the advantage of allowing a long period of follow-up—of five years in all cases and of ten years in about half of them. Also, in earlier years case selection for therapeutic pneumothorax, and the subsequent management, were less informed than at the present day. We are thus able to collect for assessment groups of cases which would not be seen in current practice, such as those in which there is a persistent cavity in an anatomically complete A.P. One disadvantage of collecting data from earlier cases is the absence of information from routine bronchoscopic examinations.

Where disease in the contralateral lung was regarded as a possible factor in life prognosis the case was excluded—for instance, if on the contralateral side there was an incomplete A.P., or if an attempt at induction of an A.P. had failed on the contralateral side. With regard to contralateral disease, the cases included had (a) no radiological evidence of disease; (b) disease controlled by an uncontroversial A.P.; or (c) disease of moderate extent, healing, and not sufficient to warrant active intervention and not producing a positive sputum.

Disease in the pneumothorax lung, as it appeared prior to A.P. induction, was classified according to its type and its extent.

The type of disease was dealt with under three headings. (1) Cavitated disease: the cavity was at least 5 cm. in diameter, or multiple cavities had a total diameter of at least 5 cm. (2) Exudative disease: the disease was predominantly of a type with a confluent and ground-glass radiographic appearance. (3) Productive disease: cases not classified under (1) or (2) appeared under this heading, so that a variety of radiographic appearances of tuberculous infiltration are included.

The extent of the disease was classified according to the total number of zones in the P.A. x-ray film of the chest which showed infiltration of tuberculous infection. The zones are demarcated by two horizontal lines passing through the second and fourth costal cartilages, thus dividing each lung field into three zones. This classification of disease extent was used by Hartley *et al.* (1935).

Atelectasis is recorded only if it persisted for three months or more. Transient atelectasis following thoracoscopy (Hess, 1951; Penman and Miller, 1952) is thus excluded. In regard to the extent of atelectasis, the cases were classified into four groups—total, lobar, segmental, and nil. Lobar atelectasis includes that of an upper or a lower lobe, there being

no case of a solitary middle-lobe atelectasis. Segmental atelectasis includes cases in which a recognizable segment is collapsed, but cases with more than one atelectatic segment are also included under this heading.

Pleural effusions were recorded only if they were large enough to cover the diaphragm, and if persistent enough to require aspiration. Small or transient effusions are thus excluded. A proportion of these effusions occurred in the later course of the artificial pneumothorax, and some of the data of this complication were obtained from a questionnaire sent to the chest physicians of clinics. Details of survival and duration of the pneumothorax were also available from this source.

Data concerning the occurrence of contralateral spreads, and the activity of disease in the pneumothorax lung, or the degree of re-expansion of the pneumothorax lung after termination of the A.P., were less readily obtained. This part of the investigation entailed use of records and x-ray films at many clinics, and in some cases these records were inadequate for the purpose. For this and other reasons, only 159 cases of the original 266 were available for this part of the inquiry.

Results are tabulated and analysed according to the four groups of atelectasis, and are considered under the following headings: pleural effusions; re-expansion of the A.P. lung, and re-aeration of the atelectatic area; reactivation of disease in the A.P. lung at the termination of pneumothorax; contralateral spread of disease; and mortality rates.

Pleural Effusions

As already stated, only persistent effusions are recorded. They are classified according to whether purulent or non-purulent and according to culture reports into T.B.-negative effusions, T.B.-positive effusions, and empyemata. All the empyemata were positive for the tubercle bacillus. As in the tables below, it is usually convenient to group all three types of effusion together as "persistent effusions," and the last two types together under the heading of "all positive effusions."

A comparatively high death rate has been associated with groups of A.P. cases having persistent pleural effusions (Edwards *et al.*, 1944; Morriss, 1942). Brock *et al.* (1937) believe that in such cases of pleural effusion the active disease in the underlying lung is the detrimental factor rather than the effusion itself. In considering the subject of the prognosis of atelectasis, however, it is obviously important to note any association between atelectasis and pleural effusion.

Houghton (1950) believes atelectasis in the A.P. to be a direct causative factor of T.B.-positive effusions. In his own words, "atelectasis of a grossly diseased lobe with or without cavitation will be followed almost inevitably by pleural effusion, tubercle bacilli will appear in the fluid and sooner or later an empyema will develop." In support of this view he quotes 50 consecutive A.P. cases in which tubercle bacilli had been demonstrated in the pleural fluid—many cases were empyemic. In 86% of these 50 cases a black

lobe or lung was prominent in the x-ray picture. A corresponding group of T.B.-negative effusions did not show such atelectasis, or showed it only as a transitory phenomenon.

In Table I the occurrence of effusions among the cases of the present investigation is shown. The cases having a persistent cavity in the pneumothorax lung are dealt with separately, and effusions of the three types are shown in relation to the extent of atelectasis. Of the 28 cases with T.B.-positive and the 20 cases with T.B.-negative effusions, 25 (90%) and 12 (60%) respectively had some degree of atelectasis. The former finding is similar to the one quoted from Houghton. However, there seems good reason to analyse the matter further before accepting the view that atelectasis is the causative factor of such pleural effusions.

First of all, the persistent cavity group, which includes atelectatic and non-atelectatic cases, has a significantly higher incidence of effusions than the group of cases without persistent cavitation (Table II).

TABLE II.—Persistence of Cavitation and Effusion Incidence

Cases	No.	T.B.-positive Effusions	All Persistent Effusions
Persistent cavity	20	8 (40%)	9 (45%)
No persistent cavity	246	20 (8.1%)	39 (15.8%)
Difference		31.9% ± 11%	29.2% ± 11%

It is therefore justifiable to omit for the time being the cases with persistent cavitation and inspect the incidence of effusion in the remaining cases. Among the latter it is seen (Table III) that a positive correlation exists between incidence of persistent effusions or of T.B.-positive effusions, and extent of atelectasis. A similar correlation is observed between extent of disease by zones in the A.P. lung and the incidence of persistent or T.B.-positive effusions (Table IV).

TABLE III.—Atelectasis and Effusion Incidence (Persistent Cavity Cases Omitted)

Atelectasis	No.	T.B.-positive Effusions	All Persistent Effusions
Total	13	4 (31%)	7 (54%)
Lobar	44	8 (18%)	12 (27%)
Segmental	102	6 (6%)	11 (10.8%)
Nil	87	2 (2.3%)	9 (10.3%)
	246	20 (8.1%)	39 (15.8%)
	χ^2 :	$p < 0.01$	$p < 0.01$

TABLE IV.—Extent of Homolateral Disease and Effusion Incidence (Persistent Cavity Cases Omitted)

Zones of Disease	No.	T.B.-positive Effusions	All Persistent Effusions
1	45	0	1 (2.2%)
2	154	9 (5.8%)	22 (14.2%)
3	47	11 (23.4%)	16 (34%)
	246	20 (8.1%)	39 (15.8%)
	χ^2 :	$p < 0.01$	$p < 0.01$

On the other hand, between the type of initial disease in the pneumothorax lung and the incidence of pleural effusions there is little or no correlation. Indeed, the differences of incidence of effusion among the three types of disease (Table V) are no greater than could occur by chance.

TABLE V.—Type of Homolateral Disease and Effusion Incidence (Persistent Cavity Cases Omitted)

Type of Disease	No.	T.B.-positive Effusions	All Persistent Effusions
Cavitated	85	8 (9.4%)	17 (20%)
Exudative	36	5 (14%)	7 (19.5%)
Productive	125	7 (5.6%)	15 (12%)
	246	20 (8.1%)	39 (15.8%)
	χ^2 :	$p = 0.25$	$p = 0.25$

TABLE I.—Effusions and Atelectasis

Atelectasis	No.	T.B.-negative Effusions	Non-purulent T.B.-positive Effusions	Empyemata
Persistent Cavity Cases				
Total	1	—	—	—
Lobar	8	—	3	1
Segmental	6	—	1	2
Nil	5	1	1	—
	20	1	5	3
Non-cavity Cases				
Total	13	3	4	—
Lobar	44	4	6	2
Segmental	102	5	3	3
Nil	87	7	2	—
	246	19	15	5

It should be noted that the χ^2 test quoted in the tables above does not measure the strength of an association or indicate whether or not a correlation is statistically significant. It serves to show, however, where differences are no greater than might occur by chance.

The findings in Table V seem to disagree with the views of Rafferty (1947), who states that there is a higher incidence of pleural effusions where the pneumothorax lung originally showed pneumonic tuberculosis or giant cavitation.

The extent of the initial disease and the extent of atelectasis are both correlated with the incidence of pleural effusions. That the first-named two variables are themselves associated is demonstrated in Table VI. The question therefore arises, Which of the two variables is primarily associated with the occurrence of pleural effusion?

TABLE VI.—Distribution of Extent of Disease and of Atelectasis (Persistent Cavity Cases Omitted)

Atelectasis Extent	One Zone Infiltrated	Two Zones Infiltrated	Three Zones Infiltrated
Total	0	4	9
Lobar	1	28	15
Segmental	16	71	15
Nil	28	51	8
	45	154	47

It should be possible to deduce the answer, given sufficient cases. The cases under consideration should be grouped according to the extent of atelectasis, and each such group should be examined to find if the incidence of effusion is still proportional to the extent of the disease by zones and vice versa. With the present number of cases the best that can be done is to analyse the subgroups containing the greatest numbers—that is, "segmental atelectasis" (Table VII) and "two zones of disease" (Table VIII)—for the incidence of persistent effusions.

TABLE VII.—Incidence of Effusion Related to Extent of Disease (Cases with Segmental Atelectasis Only)

Incidence of persistent effusions	Extent of Disease in Zones			
	1	2	3	Total
	0 (16)	8.5% (71)	33.3% (15)	10.8% (102)
	χ^2 : $p < 0.01$			

Table VII demonstrates a positive correlation between effusion incidence and extent of disease, but in Table VIII (with a larger number of cases included) there seems to be no association between effusion incidence and degree of

TABLE VIII.—Incidence of Effusion Related to Degree of Atelectasis (154 Cases with Two Zones of Disease Only)

Incidence of persistent effusions	Degree of Atelectasis				Total Incidence
	Nil	Segmental	Lobar	Total	
	15.7% (51)	8.5% (71)	21.4% (28)	50% (4)	14.3% (154)

atelectasis. This analysis, so far as it goes, suggests that extent of initial disease in the pneumothorax lung is the primary factor in the causation of effusions rather than atelectasis *per se*.

It should be remembered that the classification of the extent of disease in a lung according to the number of zones seen to be infiltrated in a P.A. x-ray film is not an exact method. No allowance is made for the density of involvement of each zone.

Cuthbert and Nagley's (1948) description of the radiological "black lobe" when it is seen at thoracoscopy is of a mixture of collapsed and aerating tissue. The pathological finding associated with this x-ray appearance was of multiple small foci of parenchymal and bronchiolar infection. To

produce the homogeneous radiological appearance of the "atelectatic" lobe or segment, such an infiltration would be expected to be dense in character within the related lobe or segment.

Erwin (1939) notes that lobes which collapse in an A.P. and fail to expand early are extensively diseased ones; and Morland and Price Thomas (1952) state that when atelectasis appears in an A.P. the lobe or segment so affected is usually the part of the lung most seriously diseased.

The extent of the disease as seen in a P.A. film is one factor in the incidence of pleural effusions, and it is logical to assume that the density of infiltration might also contribute to its causation. Both extent and density of infiltration are apparently associated with the occurrence of atelectasis in a pneumothorax. An incidence of effusions in proportion to the extent of atelectasis in the A.P. (Maher-Loughnan, 1950; Farquharson, 1951) may well be accounted for by the extent and density of parenchymatous infiltration initially present in the lung.

Re-expansion of the Pneumothorax Lung

Re-expansion of the pneumothorax lung was noted from its radiological appearance at least one year after cessation of refills. The appearance of the lung and also of the adjacent structures—diaphragm, chest wall, and mediastinal organs—was then observed. Cases were classified into three groups. (1) Full re-expansion. The lung appeared expanded and normal apart from healed disease; no atelectasis was apparent; and there was no displacement of adjacent structures. (2) Incomplete re-expansion. This group included cases in which the lung itself was not fully expanded—commonly an apical space remained. Also included are a few cases in which the lung was expanded except for a persistent atelectatic lobe or segment. Cases in which the lung seemed to be expanded but in which moderate displacement of the mediastinum or other chest structures occurred also appear in this group. (3) Unexpandable lung. In this group either the lung failed appreciably to re-expand and a dead space remained or there was gross displacement of mediastinal structures and contraction of the chest wall and diaphragm.

Of the original 20 in the persistent cavity group and the 246 in the non-cavity group, only 3 of the former and 156 of the latter are available by which to assess re-expansion. These are the numbers of cases which can be followed up radiologically until at least one year after termination of the pneumothorax. Of the 246 cases, 90 are thus excluded for various reasons—A.P.s not abandoned at the time of assessment, adequate records not available, patients moved to inaccessible areas, etc. That the 156 cases are, practically speaking, an "unselected" sample of the original consecutive group of cases is, however, indicated by the fact that the incidence of mortality and of pleural effusion occurs at approximately the same rates as in the original group of 246.

Only six cases which left the sanatorium with a total atelectasis and only three that were discharged with persistent cavitation in the A.P. have been followed up. There was no case with a full re-expansion among these nine, and it is thought reasonable to consider them separately from the main group of 150 cases.

Among these 150 cases a full re-expansion of the A.P. lung occurred in approximately half, while an unexpandable lung was seen in 10%. The distribution of expansion in relation to atelectasis is seen in Table IX.

TABLE IX.—Re-expansion and Atelectasis (Persistent Cavity and Total Atelectasis Cases Excluded)

Atelectasis	Total	Full Re-expansion	Partial Re-expansion	No Re-expansion
Lobar	33	15 (45%)	15	3 (9%)
Segmental	63	31 (50%)	23	9 (14%)
Nil	54	32 (60%)	19	3 (6%)
	150	78	57	15

Table IX shows that a diminished proportion of full re-expansion occurs in relation to the extent of atelectasis. On the other hand, atelectasis is not associated with unexpandable lung.

TABLE X.—Re-expansion According to Effusion Present (Persistent Cavity and Total Atelectasis Cases Excluded)

Pleural Effusion	Total Cases	Full Re-expansion	No Re-expansion
T.B.-positive	12	1 (8%)	5 (42%)
T.B.-negative	11	4 (36%)	2 (18%)
No effusion	127	73 (57%)	8 (6%)
	150	78	15
	χ^2	$p < 0.01$	$p < 0.01$

Two factors which could be expected to restrict the proportion of cases showing full re-expansion in a group of atelectasis cases (Jackson, 1952), as compared with a group with no atelectasis, are: (a) persistence of atelectatic lobe or segment; and (b) a higher incidence of pleural effusions which accompany (though, as previously reasoned, are not caused by) atelectasis.

A lower incidence of full re-expansion among cases having effusions, particularly effusions positive for tubercle bacilli, is shown in Table X.

The importance of effusion, especially empyemata, in hindering lung re-expansion is well known, and has been mentioned, among others, by Mitchell (1951) and Heaton and Ogden (1950).

Persistence of an atelectatic lobe was seen in only two of the 150 cases and of an atelectatic segment in only four cases. So that persistent atelectasis is not here a factor of any great importance in limiting the proportion of cases having a full re-expansion. Incidentally these six cases were not associated with any untoward final result. Erwin (1939) reports that the few lobes which fail to re-expand are always extensively diseased, and permanent atelectasis is to be regarded as a selective collapse maintained automatically; this coincides with my own impression of these six cases.

The duration of the pneumothorax has been shown (Heaton and Ogden, 1950; Mitchell, 1951) to influence pleural thickening, and therefore lung re-expansion. It is worthy of note that 11 out of the 15 cases of unexpandable lung had had an A.P. for over six years. In fact, all of the unexpandable lung cases had either an over-prolonged A.P. or a T.B.-positive pleural effusion, or both. This suggests that pleural thickening is the cause of this undesirable sequel—which is the view of Rafferty (1947)—rather than a possible bronchial factor (Farber, 1942; Mitchell, 1951).

Duration of the A.P. in the cases of this investigation has a "chance distribution," being largely dependent upon the preference of the various physicians working at 15 different clinics.

It may be that a bronchial factor limits re-expansion in the total-atelectasis group, for in four out of six such cases followed up a persisting partial atelectasis was the reason for failure of full expansion. The other two cases exhibited an unexpandable lung. Of the persistent-cavity group only three cases were followed up completely, and these showed partial re-expansion.

Groups of cases with lobar or segmental atelectasis (with no persistent cavitation) may therefore be expected to have a smaller proportion of cases exhibiting a complete re-expansion. This is chiefly on account of the incidence of pleural effusions in such groups. It has already been reasoned that the extent and density of the original lung disease, and not the atelectasis itself, is the underlying factor in effusion incidence.

Reactivation of Disease

The occurrence of active tuberculous disease in the re-expanded pneumothorax lung was investigated in the 156 cases without persistent cavitation which were followed up until one year after the termination of pneumothorax.

Activity of disease was determined by sputum reports and other clinical evidence, as well as by the radiological appearance of the re-expanded lung. Three out of the six cases with total atelectasis showed reactivation. The remaining 150 cases are grouped separately, and in Table XI the in-

TABLE XI.—Reactivation and A.P. Duration (Total Atelectasis Cases Excluded)

A.P. Duration	Cases	Reactivation Cases
Less than 1 year	5	4 (80%)
1 to 2 years	16	1 (6.2%)
2 to 3	14	1 (7.3%)
3 or more years	115	9 (7.8%)

cidence of reactivation is shown according to the duration in years of the pneumothorax. It is apparent that the incidence of reactivation in these cases is independent of A.P. duration if those of under one year are first excluded. For this reason, in examining the incidence of reactivation in relation to lobar and segmental atelectasis, cases in which the A.P. is of longer duration than one year are grouped together (Table XII). It is apparent that there is no association between lobar and segmental atelectasis and the incidence of reactivation.

TABLE XII.—Incidence of Reactivation According to Atelectasis (Total Atelectasis Cases and Cases with A.P. Duration Under One Year Excluded)

Atelectasis	Cases	Cases with Reactivation
Lobar	32	3 (9%)
Segmental	60	4 (6.6%)
Nil	53	4 (7.5%)
	145	11 (7.6%)

It is worth noting that the total incidence of reactivation is of the same order as that found by some other observers of A.P. series—Potter (1942) gives 7%, Morris (1942) 6%, Aycock and Keller (1942) 5%, and Hurst and Schwartz (1942) 10%.

In the persistent-cavity group there is insufficient data for consideration from the point of view of reactivation or of contralateral spread of disease.

Contralateral Spread

The occurrence of a bronchogenic spread of disease into the contralateral lung in A.P. cases is given a varying incidence by different observers. Potter (1942), for instance, noted an incidence of 6%, while Morris (1942) found it in 30% of his cases. In the present 156 cases, followed up in detail, the total incidence seems to be 12%. How this is distributed in relation to atelectasis is shown in Table XIII.

TABLE XIII.—Incidence of Contralateral Spread and Atelectasis

Atelectasis	Total Cases	Cases with Spreads
Total	6	2 (33%)
Lobar	34	2 (6%)
Segmental	62	9 (14.5%)
Nil	54	5 (9%)
	156	18 (11.5%)

With the possible exception of the cases with total atelectasis, the number of which is too small for assessment, the incidence of contralateral spread is not associated with atelectasis (Table XIII).

Mortality Rates

Cedric Shaw (1933) discusses prognosis in artificial pneumothorax cases and says, "The one real ponderable in pulmonary tuberculosis is mortality." But to each death from tuberculosis, sociological and immunological as well as clinical factors make their contribution. Deductions therefore cannot be made from differences in mortality rates

between one group of tuberculous subjects and another unless such differences are obvious and significant. In Table XIV such a significant difference in mortality rates is seen when the cases with and without persistent cavitation are compared.

TABLE XIV.—Mortality Rates in Relation to Persistence of Cavitation

Cases	No. at Risk, 5 Years	Dead at 5 Years	No. at Risk, 10 Years	Dead at 10 Years
Persistent cavity	20	8 (40%)	13	11 (85%)
No persistent cavity	246	13 (5.25%)	122	19 (15.6%)
Difference		34.75% ± 11%		69.4% ± 11%

Farquharson's (1951) results of survival among A.P. cases with atelectasis are in accordance with those of Table XIV. Of 25 cases with cavitated and 75 cases with non-cavitated atelectasis, she reports 19 (76%) and 13 (17.3%) respectively as ill or dead. Also, among the good A.P. cases in the series of Foster-Carter *et al.* (1952) 7 out of 10 with persistent cavitation died within eight years.

In non-cavitated atelectatic cases, evidence of a mortality rate in relation to the extent of atelectasis might well be expected. The association between the extent of atelectasis and that of disease by zones has already been demonstrated (Table VI); and a remarkable correlation between life expectation and disease extent by zones has been demonstrated by Hartley *et al.* (1935) and more recently by Foster-Carter *et al.* (1952). The latter investigators show that the law "Expectation of survival in pulmonary tuberculosis varies inversely as the radiological extent of the disease" applies equally to groups of collapse or non-collapse cases.

In fact, there seems to be a slight trend of association between extent of atelectasis and mortality rates (Table XV). So small a trend, however, argues against atelectasis *per se* being a factor in life prognosis, having regard to the influential factor of disease extent by zones.

TABLE XV.—Mortality Rates in Relation to Atelectasis (Persistent Cavity Cases Omitted)

	Atelectasis			
	Total	Lobar	Segmental	Nil
Dead in 5 years	15.4% (13)	6.8% (44)	5.9% (102)	2.3% (87)
" " 10 "	28.6% (7)	18.5% (27)	14.3% (49)	12.8% (39)

The figures in parentheses show the number of cases followed up.

Foster-Carter *et al.* also note the mortality in 45 of their A.P. cases with lobar or segmental atelectasis but no persistent cavitation. The survival rate in this group was exactly the same as that of the group of A.P.s as a whole.

Discussion

In the group of cases having persistent cavitation in the pneumothorax lung, the comparatively high rates of death and incidence of pleural effusions are striking. It is instructive to note that these mortality and effusion rates are quite similar to those reported in some series of pneumothoraces in which there was demonstrable endobronchial tuberculosis (Chamberlain and Gordon, 1942; Tuttle *et al.*, 1942; Rafferty and Shields, 1943). Most of the cases of the present investigation were treated before routine bronchoscopy became available, but these findings suggest that where there is persistent cavitation in a pneumothorax lung there is concomitant endobronchial tuberculosis.

On the other hand, in the group without persistent cavitation, judging by the course and prognosis, the presence of lobar or segmental atelectasis would not appear to indicate an underlying endobronchial disease. The prognosis regarding life and the occurrence of effusions, as well as the incidence of contralateral spread and ipsilateral reactivation of disease, are no worse than among cases with no atelectasis.

The small number of cases with total atelectasis, however, seem to share the grave prognosis of the persistent-cavity group.

As a result of the work of Coryllos (1933) atelectasis in adult pulmonary tuberculosis was for a long period believed to be synonymous with endobronchial tuberculosis (Pinner, 1945). More recently, alternative mechanisms of lobar and segmental atelectasis have been described—for example, by Cuthbert and Nagley (1948) and Coello and Nagley (1948). According to these writers the aetiology of atelectasis (as defined in the present investigation) can lie peripheral to the major bronchi. Moreover, observance of the recognized tenets in prescribing A.P. therapy, such as withholding it in the presence of "hot" disease, of a "wheeze," or of a tension cavity, will serve to avoid many cases in which tuberculous bronchitis might be present. The fact of sputum conversion by the A.P. also serves to exclude from this series cases of endobronchial tuberculosis (Davies, 1943).

Lobar and segmental atelectasis may thus be observed radiologically in the pneumothorax lung in the absence of endobronchial tuberculosis, and in such cases its occurrence seems to be a benign circumstance.

Summary

Consecutive anatomically complete A.P. cases with sputum conversion were followed up for at least five years. They were grouped according to the presence of persistent cavitation (20 cases) and, in those without persistent cavitation (246 cases), according to the presence of total, lobar, segmental, or no atelectasis in the A.P. lung.

Cases with persistent cavitation showed significantly higher mortality rates and incidence of pleural effusions than the remaining group.

Cases without persistent cavitation showed an incidence of pleural effusion which was in proportion to the extent of atelectasis. There is evidence, however, that this was because of the concomitant extent of initial disease in the pneumothorax lung rather than a result of atelectasis *per se*.

In 156 of the cases without persistent cavitation it was possible to evaluate the incidence of contralateral spreads, of disease reactivation in the A.P. lung, and the completeness of re-expansion after termination of the A.P.

The great majority of atelectatic lobes and segments (excluding cases with total atelectasis) re-aerated at the termination of the A.P. Full re-expansion depended largely on whether or not pleural effusion had been present.

If cases with total atelectasis are excluded there was no connexion between the presence of atelectasis and the occurrence of contralateral spreads or the occurrence of disease reactivation in the A.P. lung.

Mortality rates in the group with no persistent cavitation showed no significant relationship with the occurrence of lobar or segmental atelectasis.

In the light of these findings, alternative aetiologies of atelectasis in a pneumothorax lung are discussed.

It is concluded that the occurrence of persistent cavitation or of total atelectasis in an A.P. lung carries a grave prognosis. The occurrence of lobar or segmental atelectasis, however, does not, of itself, appear to worsen prognosis.

This paper was suggested by Dr. A. C. Penman, and I am also indebted to him for going over all the case records and x-ray films with me, and checking the data at each stage. I am grateful to Dr. Peter Edwards for advice from his great experience, and for permission to make use of the records of the Cheshire Joint Sanatorium. The follow-up section of the latter

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FATAL CASE OF MARROW APLASIA AFTER TREATMENT WITH CARBIMAZOLE

THE EFFECT OF A.C.T.H.

BY

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Carbimazole ("neo-mercazole"; 2-carbethoxythio-1-methylglyoxaline) must now be added to the long list of drugs that may cause marrow aplasia with depression of all the blood-forming elements.

The incidence of marrow depression due to anti-thyroid drugs is relatively low and is still decreasing as less toxic preparations become available. A report on the treatment of 150 patients with carbimazole by Doniach (1953) stresses the absence of any toxic effects in her cases, and only mild toxic reactions were found to follow treatment of 14 patients with this drug by Lawson and Barry (1951). Poate (1953), in a survey of nine cases, states that carbimazole in therapeutic doses does not interfere with the leucocytes. In a recent study on the clinical effects and toxic reactions of carbimazole, Bartels (1953) found that 3 of his 52 patients treated with this drug developed toxic manifestations. Two of these were skin reactions, the third had agranulocytosis, which however, cleared up within 14 days after discontinuation of the drug.

Rosenbaum and Reveno (1953) reported a case of agranulocytosis and toxic hepatitis secondary to methimazole ("mercazole"), the forerunner of carbimazole, and referred to two instances of agranulocytosis due to this drug (Croke and Berry, 1952; Specht and Boehme, 1952). In the experience of Davidson (1953), who discusses the use of methimazole in 44 patients, this drug is definitely less toxic than methylthiouracil, and, although slightly more toxic than propylthiouracil, the incidence of severe toxic reactions is of the same order of magnitude as with the latter drug. The overall incidence of toxic reactions with methimazole is given by various workers as 4.5-6%, that of agranulocytosis as 0.15%.

The following case is, we believe, the first example of a fatal marrow aplasia following the use of carbimazole.

Clinical History

A married woman aged 23 was admitted to hospital on June 8, 1953, suffering from severe thyrotoxicosis. Her B.M.R. was 74%. As she had suffered from extensive bilateral bronchiectasis for several years, surgical treatment for her thyrotoxicosis was considered undesirable, and she was put on carbimazole, 10 mg. three times a day, on June 19. She was discharged from hospital a fortnight later and continued as an out-patient with carbimazole in the same dosage as her sole medication. When seen a month after discharge her thyrotoxicosis was under control and she felt much better.

On August 12, just under eight weeks after beginning carbimazole she noticed red patches on her skin and was coughing up more blood from her bronchiectatic cavities than ever before. The drug was discontinued and she was admitted to hospital. Purpuric haemorrhages were found over most of her body and on her mucous membranes. There was no soreness of her throat, but she had a pyrexia of between 101 and 103° F. (38.3 and 39.4° C.). Hess's test was strongly positive. A blood count on the day of admission showed: haemoglobin, 64%; red cells, 4,110,000; white cells, 4,000, with a normal differential count; platelets, 61,000; bleeding and clotting times, normal.

Four days later her haemoglobin had fallen to 54%, her white count to 1,000 cells with 29% polymorpha, and her platelets to 25,000. She was transfused with 2 pints (1,140 ml.) of fresh blood. Her bone marrow taken at this time showed marked agranulocytosis and only one megakaryocyte in three films. Electrophoretic examination of the serum, both before and after the first transfusion, failed to reveal the presence of any α_2 -globulin such as may be present in certain cases of purpura (Bernfeld and Stefanini, 1951).

Treatment directed to the control of infection consisted of penicillin for one week, which was then replaced by aureomycin, 500 mg. six-hourly, and this was continued throughout the rest of her illness. She was given approximately 2 pints (1,140 ml.) of fresh blood at weekly intervals for the next eight weeks.

Cortisone was begun on August 23, 11 days after the onset of purpura, the initial dose being 100 mg. six-hourly, followed on the next and subsequent days by 50 mg. six-hourly. As she made no detectable response the cortisone was replaced by adrenocorticotrophic hormone (A.C.T.H.) with a dosage of 40 mg. six-hourly. After starting cortisone the patient's condition was reasonably satisfactory and her temperature settled on aureomycin, but she continued to get crops of petechiae, although Hess's test had become negative before cortisone was started. Her blood picture, which was examined daily, remained unchanged. The platelets were virtually absent, her haemoglobin was maintained in the region of 50% with transfusions, and her white cells remained round about 1,000, with 20 to 30% polymorpha.

This state of affairs continued for 17 days, during which time the dose of A.C.T.H. was gradually reduced from 40 mg. six-hourly to 15 mg. twice daily, as supplies were running out. Her temperature rose to 101° F. (38.3° C.) and she had a haemoptysis of 12 oz. (340 ml.). A fresh supply of A.C.T.H. was obtained and her condition improved, but the drug was running short by October 3, and was tailed off and discontinued on October 7. Three days later her temperature, which had been rising, reached 102° F. (38.9° C.); she had a haemoptysis of 16 oz. (450 ml.), and several smaller ones. Her condition became critical. Her pulse rate rose to 140 a minute, and her blood pressure fell from its normal level of 130/80 to 90/50. The bleeding from her lungs was stopped by two transfusions of 2 pints and 1 pint (1,140 and 570 ml.) of blood respectively, but she remained desperately ill.

The next day A.C.T.H. was again obtained and 30 mg. was given intramuscularly with a further pint (570 ml.) of fresh blood. Two hours later her general condition was better, her colour improved, and her pyrexia began to settle. The A.C.T.H. was continued in doses of 15 mg. six-hourly, and a week later, on October 19, her blood count showed the first sign of improvement; haemoglobin, 72%; red cells, 3,890,000; white cells, 3,000 (60% polymorpha); 60 nucleated red cells per c.mm.; platelets 10,000.

The figures of her blood count remained round about the same level and on November 6 A.C.T.H. was stopped. On this occasion after withdrawal of A.C.T.H. her temperature did not rise or her condition deteriorate and her blood count had remained substantially the same, although transfusions of 2 pints (1,140 ml.) were required every two to three weeks instead of weekly. Her bone marrow on November 9 appeared completely aplastic, but the drop in cells was mainly in the red-cell series, her white blood count being constant at 2,000-3,000 and her platelets 10,000-50,000 per c.mm. Her condition appeared to improve for a time, but remained precarious throughout. The haemorrhagic incidents became more frequent. She was admitted for a further transfusion, developed a cerebral haemorrhage, and died before any effect of a new supply of cortisone could take place. She died on December 28—that is, 139 days after the onset of her blood disorder.

Post-mortem examination revealed a pale and fatty bone marrow, the presence of petechial haemorrhages in most organs, and a cerebral haemorrhage on the right side. Bronchiectasis, fatty degeneration of the liver, and deposition of haemosiderin in the liver and spleen were found. No significant histological changes were present in the endocrine organs.

Discussion

It is the experience of several workers that marrow function usually returns spontaneously in about a week after discontinuing the offending drug (Hutt and Lee, 1953). We felt at first that both cortisone and A.C.T.H. were of no value in the management of this case, but, as the aplastic condition of her marrow persisted and she did not deteriorate clinically, we began to think that it might be having a life-saving effect. Coincidentally with the reduction in the dose of A.C.T.H. to an ineffective level she developed on two occasions a pyrexia and severe haemoptysis, and on the second was desperately ill. On both occasions when an effective dose of A.C.T.H. was restarted her general condition improved in a matter of hours.

We found no evidence that cortisone and A.C.T.H. had any effect in hastening recovery of normal marrow function. Sternal marrow puncture was not used throughout as a guide to the amount of regeneration, as daily blood counts showed no signs of recovery and the patient was having to endure many but inevitable needle pricks and discomforts. We felt, however, that we were giving cortisone and A.C.T.H. a proper trial, as they were not begun until 11 days after the onset of purpura and the discontinuation of carbimazole. We suggest that these drugs would have produced signs of regeneration of the marrow after a course lasting 72 days if they were capable of bringing about such an effect.

Summary

A fatal case of marrow aplasia secondary to carbimazole is reported. It is believed that this is the first recorded example due to this drug.

Cortisone and A.C.T.H. were given for 72 days, and on two occasions when the dose was reduced the patient immediately became extremely ill with pyrexia and haemoptysis. A third attempt at withdrawal of the drug was achieved without untoward effects, but only after the peripheral blood picture had shown some improvement over a period of 18 days.

It is believed that cortisone and A.C.T.H. kept this patient alive while they were being administered, but no evidence was found that either of them assisted in the regeneration of the marrow.

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PRURITUS AND ITS MANAGEMENT*

BY

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Pruritus implies the peculiar uncomfortable sensation of itching, which leads to the physical response of scratching but is not associated with any inflammatory changes of the skin. As with love, it is difficult to know where it is bred, in the skin or in the head; whether in the nerve endings or in the accelerated appreciation of the sensation. It may even originate in the cerebral cortex.

Whether one itches may depend on the degree of attention paid to somatic sensation. We know that if we are obliged to keep still at attention, within a few minutes an intolerable itch is likely to develop, often near one of the orifices.

Itching is very easily suggested. The sight of a head infested with crawling lice will induce in the novice a crawling itching feeling over the skin, which might even be localized to the same area.

The pleasurable element of itching is a matter of common experience. According to Jowett, Socrates dilates in his dialogues on the sensual pleasure of itching and scratching. The back scratcher of the Chinese, so finely carved in the shape of a hand or a claw, indicates the artistic appreciation of the instrument and equally the pleasure it gives when used.

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Allergic Reactions

The peripheral nerve endings are stimulated by the histamine-like and other substances (Feldberg, 1953) produced by allergic reactions. Itching also occurs as a manifestation of physical allergy to heat, cold, and friction. Allergy to roundworms and threadworms can occasionally lead to general itchiness as well as to anal and vulval pruritus. Allergies to foods may be responsible for a generalized or localized pruritus as a manifestation of a specific sensitivity. The itching over the face and elsewhere felt after the consumption of beverages is associated with reflex vasodilatation and may be cholinergic.

Pruritus is an early and valuable warning sign of allergy or of intolerance to many drugs—for example, to heavy metals, mepacrine. Other drugs, such as cocaine, owing to their cerebral action, may give rise to hallucinations of tiny living animals under the skin.

Diabetes and chronic renal insufficiency may present first as a pruritus. The fact that no instance of these diseases was noted in the series of 64 consecutive cases of pruritus (Table I) is no indication of the relative frequency of their occurrence, for the urinary findings lead the diabetic and nephritic patient to the general physician.

TABLE I.—Age Distribution of 64 Consecutive Cases of Generalized Pruritus Without Physical Signs, and the Significant Associations

Age	No. of Cases	Associations
0-19	2	Mother with anxiety state—overtreated . . . 1 case Allergic, hay-fever, and asthma . . . 1 "
20-39	15	Xeroderma (congenital) and cold . . . 2 cases Xeroderma (congenital) . . . 1 case Hodgkin's disease . . . 1 " Pregnancy . . . 3 cases Drug: atropine, codeine . . . 1 case Cardiac insufficiency (severe mitral stenosis) . . . 2 cases Obsessive . . . 2 " Anxiety state . . . 2 " Parasitophobia . . . 1 case
40-59	13	Anaemia . . . 1 case Cardiac insufficiency . . . 2 cases Acquired xeroderma . . . 1 case " " ? thyroid insufficiency . . . 1 " Anxiety . . . 2 cases Depression—testicular atrophy . . . 1 case Manic depressive . . . 1 " Menopausal depression . . . 1 " Parasitophobia . . . 1 " Undetermined . . . 2 cases
60-74	34	Anaemia . . . 1 " Hypertension . . . 3 cases Xeroderma (1 with anaemia, 1 with hypertension) . . . 5 " Deficiency (gastroctomy) . . . 1 case Cardiac insufficiency (right-sided) . . . 1 " Cardiac insufficiency . . . 3 cases Carcinoma—bronchus . . . 1 case Reticulosarcoma . . . 1 " Delusional . . . 1 " Obsessional . . . 10 cases Anxiety state . . . 1 case

It will be noted in Table I that a congenital or acquired dry skin, a deficiency of iron, circulatory insufficiency, psychoneurotic or psychotic mental disorders, and malignancy occur in the age groups above 20 years.

The Deficiency Group

The nutritional disorders due to deficiencies of iron, vitamin A, vitamin-B₂ group, vitamin C, and other essential elements may lead to a loose hyperkeratosis, with a degree of atrophy causing discomfort, and an itching skin.

The associated diminution of sweat and sebum, with their emollient and plasticizing constituents, will also encourage the exposure of terminal nerve endings within the epidermis. Cold weather and friction of clothing will the more readily provoke the sensation of itching under these circumstances, and this also applies to the dry thin skin of old age (see Table II).

TABLE II.—Incidence of Dry Skin, Cardiac Insufficiency, and Hypertension

Age	No. of Cases	Dry Skin	Cardiac Insufficiency	Hypertension
20-39	15	3	2	
40-59	13	2	2	
60-74	34	5	4	7

An example of this deficiency group was the case of a woman aged 43 with a three-years history of generalized itching and a haemoglobin of 45%. When the anaemia was successfully treated with iron and vitamin C her pruritus improved.

The menopause in both sexes may be associated with an itchy skin. In the female the itching and flushing occur together, and the itching is due either to alteration of the skin tension or to increased production of choline-like substances in the skin. The work of Grant *et al.* (1936) suggests that an undue sensitivity or reactivity to acetylcholine occurs in heat and exercise urticaria, and pruritus may be the first and only symptom of this sensitivity.

The alleviation of the itching by the administration of testosterone and/or oestrogen would, I believe, be more readily ascribed to a central effect, for the result of treatment is so rapid. However, testosterone is known to increase by as much as 50% the amount of oxygenated blood in the skin, and the effect of this on enzymic activity and nutrition of the skin is readily appreciated.

The skin may become anoxaemic as a result of circulatory insufficiency, and this may lead to pruritus.

Two examples of severe itching with much excoriation in young adults with well-developed mitral stenosis were observed, and cardiac insufficiency was seen in six other cases (see Table II).

A well-recognized but rare cause of pruritus is that associated with the reticuloses, particularly Hodgkin's disease. This simple itching in one patient aged 38 was present for a period of 16 months. She had a tiny gland above the clavicle which, when removed at a second attempt, showed the histology of Hodgkin's disease. It has been suggested that there is a sensitization to the malignant glandular tissue. Again, pruritus has been associated with carcinoma of the stomach and prostate. Cardon (1943) records the case of a man aged 89 with a generalized pruritus for three years. The haemoglobin was 43%. A large pyloric carcinoma was found; this was removed, with immediate relief of the itching.

A man of 65 years with generalized itching of three years' duration, not included in Table I, without change in the texture of the skin, was found to have rarified areas in the left scapula strongly suggestive of secondary carcinomatous deposits: biopsy of the scapula revealed an adenocarcinoma. Thus the possibility of a visceral cryptic carcinoma must be considered in a patient of mature age with pruritus, with or without any xerodermatous change in the skin.

The fibres transmitting the sensation of itching pass along the spinothalamic track and have cell stations in the thalamus. The character of itching, with its liability to spread, poor localization, and the production of tension, anger, and restlessness, is distinctive.

In reverse, mental fatigue, tension, and anxiety seem to be able to potentiate the cell station in the thalamus and to lower the threshold of sensation of itching, to encourage its intensity, and to facilitate its spread over the body.

Using histamine to excite itching by intracutaneous injection, Cormia (1952) was able to demonstrate that the threshold value was lowered in normal subjects towards the evening. It was also lowered by psychic trauma, and the itching then became more persistent. Reassurance restored the threshold value to normal.

Emotional Reaction

Thus with every pruritus, if at all sustained, there is an element of emotional reaction, and at the end of the scale are those cases of pruritus in which the emotional, psychoneurotic, or psychotic status is the most important causative factor in the pruritus (see Table III).

TABLE III.—Incidence of Psychological Factors

Age	No. of Cases	Psychological Factors and Mental Disorders—i.e., Disorders of Reception and Interpretation
20-39	15	In 5 cases
40-59	13	" 6 "
60-74	34	" 12 "

One sign which is a guide to this group is the degree of excoriation that the patient presents. The deep biopsic scratch marks over the face, shoulders, and arms indicate the exaggerated psychological and physical response to the sensation of itching. The investigation of these cases has shown, besides the more common anxiety and tension states, patients with hysterical or obsessive personalities, with paranoia, delusions, or involutional depression. The hysterics use their dramatic ravelled skin to gain their unexpressed desire for comfort and relief from a situation which for them is an intolerable one, physically or emotionally.

One obsessive with severe pruritus was a man who had complained since joining the Army. In civilian life he had always worked hard, all day long. He was unable to do so while in the Army. A similar case was that of a man of 22 who excoriated his face to escape from nasty thoughts and compulsions.

Patients with acarophobia or parasitophobia will present excoriations on the skin, and are convinced that the rolled-up fragments of horn and epidermis which they bring for inspection are living animals which they have felt crawling under the skin and which are responsible for the itching.

A female schoolteacher aged 57, with a two-years history of itching which had begun on the chest and hands and had persisted around the hips, said that she saw flea-like bodies on her skin and thought that they came from the vagina. Other delusions and hallucinations may follow, when the prognosis, especially in the elderly case, is bad, and the patient may need institutional treatment.

If one is dealing with the hysteric and psychotic individual the treatment must be undertaken by a psychiatrist. On the other hand, most cases of psychogenic pruritus occur in those who are amenable to explanation by the practitioner or dermatologist and are capable of insight into the motivation of their disorder. Reassurance and a discussion of business or family worries is often all that is necessary in many cases of anxiety states and tensions. The family practitioner is well able to undertake this task and to offer suitable advice.

Treatment

Treatment with A.C.T.H. or cortisone is not advised for generalized pruritus without inflammatory changes in the skin. Occasionally, in the severe pruritus associated with the reticuloses, these hormones may be indicated and may be the sole means of controlling a most intractable itching.

The antihistamines are widely, perhaps too widely, applied locally to the skin and by mouth. An attempt to be logical in the use of the antihistamines to control generalized itching would include consideration of the aetiology of the pruritus. Thus, if associated with allergy of the mucous membranes to dust, animal hair, or pollen, then diphenhydramine hydrochloride would be valuable. It is recognized that the antihistamines are, in general, powerful sensitizers when applied to the skin and may rarely by mouth give rise to an urticaria or blood disorder—for example, leucopenia. In most cases, apart from serum sickness, the relief of itching is due, one suspects, to the powerful

anaesthetic, central depressant, and sedative effects of many of the antihistamines. They are unreliable therapeutic agents in the treatment of pruritus.

The use of sedatives is of value only in those cases of pruritus in which there is an important element of anxiety or tension. Small doses of barbiturate or chloral at night might then be helpful. To attempt to suppress itching by the use of sedatives, particularly in elderly patients, is likely to be a failure. Patients have been seen confused, drowsy, and incoherent, but scratching as vigorously as ever.

The principles of topical therapy are simple. When the skin is dry, hyperkeratotic, or atrophied it should be protected by a greasy application—for example, simple toilet lanolin over limited areas, or a mixture of wool alcohol, hard paraffin, soft paraffin, and liquid paraffin (unguentum alcoholium lanae, B.P.). When combined with water up to 50% it is more easily applied and more cooling. Another easily applied base contains emulsifying wax, soft white paraffin, and liquid paraffin (unguentum emulsificans, B.P.), to which varying amounts of water can be added to allow of easier spread.

The addition of small amounts of phenol ¼%, menthol ¼%, and of tar (liquor picis carbonis, 5 to 10%) may be indicated for short periods to satisfy a demand for active therapy in a patient with a prolonged distressing symptom. Bathing is restricted to avoid maceration and separation of horn, the alkaline irritant effect of soap, and the trauma of towelling. In the elderly, one bath a week is adequate, the emulsifying effect of the bran bag being relied on to cleanse the skin. The skin is partially dried by patting with smooth soft towels and then powdered.

When the texture of the skin is not abnormal the antipruritic agents mentioned above, incorporated in lotions or liniments for their cooling and decongestive effect, may give relief.

The underwear should be loose, of smooth cotton, and the bed warmed at night. Sheets should be smooth and a cradle ensures minimum contact with the body.

The diet should be a non-stimulating one. Tea and coffee are best taken cool and weak, and spices and meat extracts used with care.

Hypnosis

Finally, a word on the treatment of pruritus by suggestion while in the hypnotic state. There is no doubt that the symptom of itching in certain individuals can be kept in check by this method, and both in simple pruritus and in the pruritic dermatoses considerable relief has been obtained.

The best-known exponent of hypnotism (or in the use of animal magnetism, as he called it) was Mesmer, who, Gilbert Frankau (1948) recalls, was born in 1734, twelve years after the last witch was burnt at Leith. A century later Mesmer's activities were described as Satanic when the morality of the subjugation of one man's will to another's was discussed.

The dependence and relationship between the practitioner of hypnotism and his subject is one that can scarcely be described as healthy, particularly in a hysteric. However, there is no doubt that the method can be temporarily effective in pruritus associated with anxiety or tension states.

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The *Medical Journal of the South-West* is the new name of an old friend, the *Bristol Medico-Chirurgical Journal*, which first appeared in 1883. Under the National Health Service Bristol has become the focal point of the South-west Region, and it is considered that the new title will more accurately designate the field from which the *Journal* hopes to glean its sustenance.

AN ACCOUNT OF 2,500 INFANT B.C.G. VACCINATIONS

BY

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The subject of this paper is the personal experience of 2,500 cases of infant vaccination with B.C.G. The material has been drawn from babies born in the Royal Maternity Hospital, Belfast, and the Malone Place Maternity Hospital, Belfast, and has been carried out under the auspices of the Northern Ireland Hospitals Authority and the Department of Child Health, Queen's University of Belfast.

Compared with the recent literature on vaccination against tuberculosis in older age groups, there is little information about infant B.C.G. vaccinations. This is largely due to the fact that vaccination of the infant age group has not been included in the mass vaccination campaigns sponsored by the World Health Organization. In Great Britain, also, vaccination in the younger age groups has hitherto not been extensive.

Selection of Cases

The cases quoted in this study were all vaccinated personally between March, 1952, and March, 1953. Vaccination is offered to every mother for her baby during the lying-in period. The vaccination is optional, but the medical and nursing staffs use their helpful influence, and explanatory literature is freely available. A personal interview is given to any mother who desires it, and to almost every case in which there is a family history of tuberculosis or liability to exposure. Isolation is provided in the hospitals for the babies from birth and throughout the post-vaccinal period when this is indicated.

The live births in the hospitals for the period in question numbered 2,750, and the vaccinations for the same period 2,500, giving an acceptance rate of 92.59%.

Queries Arising During Course of Investigation

As occurs in most investigations, various small problems arose which had not been anticipated and which necessitated some alterations in the original scheme. For example, it became apparent that many of the premature babies had been one, two, and even three months in hospital before being considered fit for discharge. When this fact was realized pre-vaccinal tuberculin skin-testing was instituted if four or more weeks had elapsed between birth and vaccination, instead of omitting all preliminary testing, as is the usual procedure with infant vaccinations.

In addition, having had doubts aroused about the validity of the current belief in the extreme rarity of congenital tuberculosis, a routine tuberculin test is now done on the infants of all tuberculous mothers. It is hoped, at a later date, to publish a report on congenital tuberculosis as a result of an investigation which is now being carried out in these hospitals.

Technique of Dosage and Administration

With regard to technique, dosage, and administration, the recommendations of Winge and Sigrid Holm, of the Central Tuberculosis Clinic, Copenhagen, and of Tolderlund, of the State Serum Institute of Denmark, have been adhered to throughout the survey (Personal communications). There is a tendency in some centres to reduce the recommended dosage in view of the increased liability of infants to develop regional adenitis and abscess formation following B.C.G. injections. This has not been accepted in the present investigations, for two reasons: in the first place

the majority of these infants (93.36%) had no known tuberculous contact at the time of vaccination and are unlikely to meet tuberculosis in the first few years of life; secondly, it is admitted (Gaisford, 1953) that the percentage of cases giving a positive tuberculin reaction one year after vaccination falls off enormously if a smaller initial dose of vaccine is given. In this series, in which more than 350 cases have already had the first annual test, there has been no single case in which the post-vaccinal conversion had not been maintained. It is probable, also, that it will not be possible to ensure annual tuberculin testing on a large proportion of these children who hail from all over Northern Ireland, and with the smaller dose the immunity may lapse very soon, while the parents continue to harbour a feeling of false security.

The observation that adenitis is due to an injection which is too deep rather than to too large a dose of vaccine (Palmer and Edwards, 1953) has been confirmed in the present series. Adenitis is almost always due to failure in technique, and the reason that it is more frequent in the infant age group is that it is technically more difficult to get a true intradermal injection in these subjects.

The infants in this series therefore received 0.1 ml. of vaccine—that is, 0.075 mg. of B.C.G. intradermally in each deltoid region.

With the exception of premature babies, or some ill babies, or those with birth injuries or congenital abnormalities, all were vaccinated between the first and the eighth day from birth. It is desirable that the infant be removed from its cot for the purpose and that the top part of the trunk and arms should be bared. Before these precautions were taken a few babies were vaccinated too high in the arm, and the adenitis, when it occurred, affected the cervical glands rather than the axillary ones, which is unfortunate for cosmetic reasons and also because these glands are more likely to suppurate through being subjected to frequent nasopharyngeal infective onslaughts.

Post-vaccinal Examination

Post-vaccinal testing is carried out at the Royal Belfast Hospital for Sick Children eight weeks after vaccination, at a special clinic reserved for these babies. The attendance rate at this clinic is about 85% of the original number vaccinated. I am indebted to physicians of the chest clinics throughout Northern Ireland, and most particularly to the health visitors of the Northern Ireland Tuberculosis Authority, for carrying out the tuberculin skin tests on babies whose parents live a great distance from Belfast, and also on the defaulters nearer home.

On the occasion of the visit to the hospital for post-vaccinal testing, mothers are invited to bring older children for preliminary testing if they so desire. The facility is made use of to a considerable extent, and it is interesting to record that a definite, albeit small, proportion of siblings of 3 years and under are Mantoux-positive at this examination. By this means some cases with a definite primary tuberculous complex have been revealed, though in the majority there was no known source of exposure, and the parents and other household inmates were radiologically free from tuberculosis. Two of these cases were from farms, and the children in question had been reared on unboiled milk from untested cows; the infection may therefore well have been bovine in origin.

At the post-vaccinal examination routine questions are asked about neonatal health. In no case has there been reason to suspect any constitutional disturbance as a result of the vaccination, although whooping-cough, bronchopneumonia, gastro-enteritis, operations for congenital pyloric stenosis, and transfusions for erythroblastosis have all been experienced during this period. In spite of advice to the contrary, many of the babies have already had their smallpox vaccination when they return to the clinic, and apparently without adverse effect.

The vaccination sites are examined and a search is made for evidence of regional adenitis. The conversion rate at

the time of post-vaccinal testing is 99.69%. Only seven cases gave a negative result to the tuberculin skin test. In one of these there was no local evidence of vaccination, and it is probable that the child was not vaccinated, but that a card was filled in and filed in error. In the case of the remaining six, four were reported on by local practitioners and two by health visitors; it has not been possible to see the babies in question personally or to repeat the test or confirm the negative findings with a Mantoux 1/100. Table I gives an analysis of the results in this series.

TABLE I.—Analysis of Findings

Vaccinations		2,500
Complete:		
With post-vaccinal control	2,331 (93.24%)	
Successful, with positive P.V. test	2,324 (99.69%)	
Unsuccessful, with negative P.V. test	7 (0.31%)	
Incomplete:		
Without post-vaccinal control	169 (6.76%)	
Untraced	145	
Dead	24	

Premature Babies, or Babies with Congenital Illnesses or Abnormalities

Approximately 12% of the vaccinated babies are premature and inhabit the nursery wing of the Royal Maternity Hospital. A birth weight of under 5½ lb. (2.5 kg.) is accepted as the criterion of prematurity. As already stated, some of these babies have been a considerable time in hospital before vaccination. Discharge takes place when they are 5½ lb. if otherwise thriving and the home conditions are reasonably good. Consequently, the premature babies are vaccinated when they are in or about this weight. There has been no difference in the post-vaccinal behaviour of these infants as compared with full-term ones, and no greater incidence of adenitis.

Babies with congenital abnormalities or diseases—for example, spina bifida, hydrocephalus, mongols, cretins, infants with retrolental fibroplasia, or haemolytic disease—are all included in the vaccination programme, provided that the physician in charge considers that they are likely to survive the first few months of life. This perhaps is a mistake from the statistical point of view, as it follows that the overall death rate of these infants will be higher than the average infantile mortality rate; but this is offset by the fact that it impresses on the parent the idea of the vaccination being a normal routine procedure. It also ensures that the handicapped child, if it survives, will not be at any disadvantage compared with its more fortunate brother when and if exposed to tuberculosis.

Table II gives the number and percentage of deaths in our series of cases and the cause when this could be ascertained.

TABLE II.—Deaths

Belfast City death rate (1952) under 1 year—44 per 1,000 live births	
Deaths in present series of 2,500	24 (0.96%)
Infanticide	1
Haemolytic disease	2
Virus infection	1
Gastro-enteritis	3
Bronchopneumonia	2
Congenital abnormalities	2
Premature, within two weeks of discharge	2
Unknown cause; neighbour's report	11

Tuberculous Contacts

There was either a tuberculous contact in the household or a family history of tuberculosis in 166 (6.64%) out of 2,500 vaccinations. Table III gives a summary of these. Where required isolation was carried out (a) by keeping the infant in hospital till tuberculin conversion occurred; (b) by keeping the infected relative in hospital or away from the home; or (c) by arranging for the baby to be kept,

TABLE III.—Contact of Family History

No. of contacts	166 (6.64%)
Relationship of contact:	
Parent	97 (58.5%)
Grandparent	17 (10.2%)
Aunt or uncle	29 (17.4%)
Sibling	12 (7.2%)
Other	11 (6.7%)
Isolation required in 64 (2.56%)	

for the post-vaccinal period, in an uninfected household or child hostel. Many of the mothers concerned came from the sanatorium for their confinement, returning there afterwards. They do not handle the baby at any time.

Four infants had contact with active though hitherto unsuspected sources of infection during the post-vaccinal period. These have been the subject of two-monthly review, but no signs of tuberculosis have yet been discovered in any of them, and chest x-ray films have all been normal.

Regional Adenitis and Abscess Formation

Regional adenitis or abscess occurred in 46 cases (1.84%) of this series of 2,500 infants. This is a minimal estimate, as no doubt there have been other cases which have been treated elsewhere and are not personally known at the clinic. Table IV summarizes the incidence, treatment, and also the bacteriological report where available.

TABLE IV.—Incidence of Regional Adenitis Among 2,500 B.C.G. Vaccinations in Infants

Cases of regional adenitis	46 (1.84%)
Single	27
Multiple	19
Simple adenitis	28 (1.12%)
Adenitis with abscess formation	18 (0.72%)
Spontaneous rupture	3
Incision required*	15

*Bacteriology of pus: B.C.G. recovered, 4; other organisms, 4; sterile, 4; no information, 3.

As previously mentioned, it is considered that in most cases this complication occurs as a result of faulty technique, where a greater or less amount of vaccine is injected subcutaneously instead of intradermally, and this is especially apt to occur in babies well endowed with subcutaneous fat.

In qualification of this statement with regard to technical failure, it should be noted that the strength and viability of the organism in the vaccine culture are not as constant as assurances would lead one to believe. In this series covering 13 months, in which 56 weekly batches of vaccine have been used, adenitis occurred in 14 different or consecutive batches of vaccine, whereas without this factor being involved one would expect a more even distribution of the complication.

Experience shows that if abscess formation occurs in the first eight weeks after vaccination it is usually due to secondary infection of the vaccination site; if it occurs within six months B.C.G. organisms are almost invariably recovered from the pus; whereas if it occurs after this period the pus is usually sterile.

Treatment of the adenitis is conservative. If an abscess is red, tense, and points on the skin it is dealt with by simple incision and evacuation, and the application of a sterile dressing. Formerly these abscesses were aspirated as recommended by the Danish authorities, but this practice has been abandoned in favour of incision and would appear now to be more generally acceptable. No abscess has had to be reopened, though a second abscess in the same child at a different site has occasionally required incision. Even in cases with multiple abscesses there has not been any case in which the infant's general health has suffered or in which the hilar glands have been involved. A few cases have been reported at the clinic after spontaneous rupture; these have been treated with ultra-violet light and have dried almost immediately, and healed after half a dozen exposures. In a small proportion of cases in which superficial ulceration at the site of the local lesion has discharged for more than a week it has almost invariably been found that an occlusive elastic dressing has been applied at home. This tends to produce a weeping eczematous area around the vaccination, and should be replaced by a loose piece of sterile gauze or lint. The discharge then ceases and the lesion heals.

Summary and Conclusions

This study presents the findings in 2,500 consecutive cases of infant vaccination against tuberculosis with B.C.G. vaccine. The normal procedure with uncompli-

cated cases is discussed, and also the different procedures involved in contact cases and with premature infants.

The complications of vaccination have been estimated and the methods used for combating them are described. A personal view is submitted regarding the desirability of adhering to the recommended dosage. The infant mortality in this series is compared with the death rate in infants under 1 year for Belfast city.

In conclusion it is shown that since the introduction of infant vaccination with B.C.G. no anxiety has arisen and no major problems have had to be overcome. In addition, it is an admirable and simple way of further propagating information about the prevention of tuberculosis in a population which is already very conscious of the problem. There has been an excellent and increasing response to the introduction of B.C.G. among parents, and it has, in general, been warmly welcomed by practitioners and health authorities alike. It will be for posterity to judge the ultimate value of this preventive measure. A most careful follow-up of these cases is indicated.

I have to thank all my colleagues, obstetrical and paediatric, for their co-operation in this work, and particularly Professor F. M. B. Allen for his unfailing support and encouragement in the use of B.C.G. vaccine in Northern Ireland.

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CHANGES IN SKIN RESPONSE IN ASTHMA

A SKIN-TEST FOLLOW-UP OF ASTHMATICS

BY

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The use of skin-testing as a method of diagnosis in asthmatic patients, while generally accepted and more or less implicitly relied on by specialists in allergic disease, is still a controversial topic among general physicians and general practitioners. The idea of determining the sensitivity of the bronchial mucosa by applying the suspected agent in one way or another to the epidermis is to many somewhat fantastic. It is, of course, now generally recognized that allergic sensitivity is only one of the aetiological factors in the asthmatic reaction, but it seems to be equally widely agreed that it is an important one.

The disagreement comes when an attempt is made to assess just how important it is. The unbiased observer who nevertheless has some experience of the investigation and treatment of asthmatic persons would probably sum up the position by saying that it all depends. In some patients allergic sensitivity is the major cause of the symptoms; in some it is one among several equally important factors; and in others it is of no importance at all. In the present article this view is accepted as probably correct.

The survey and analysis presented are an attempt to contribute towards the answers to two questions: (1) What changes, if any, occur in skin reactions over

the years? (2) What is the significance, if any, of such changes (or, alternatively, the absence of any changes) in relation to the clinical progress of a series of asthmatic patients?

From a personal study of the literature, as well as from a careful search kindly made for me by the Library of the Royal Society of Medicine, it seemed that such a combined follow-up of a series of cases had not, so far, been carried out.

For some years I have conducted a special out-patient session, to which I can refer those persons suffering from bronchial asthma who attend my general out-patient morning session. This originated from experience of the chaos caused in a general out-patient clinic by an attempt to investigate and advise the asthmatic patient on the spot. Inevitably clinical material accumulates in such circumstances, and one is faced with the obligation to analyse it.

Skin-test Method

An early problem confronting anyone who attempts to do more than pacify the asthmatic and his relatives is the skin-test method. How important is it? What does it mean? At first I took the view that it probably had a place in the confirmation of allergic sensitivities suggested by the history of the case. I was warned that most people would show reactions, and that I would either be deceived or merely confused by the high proportion of positive results. It was therefore with some surprise that I found my difficulty to be the large number of negative results in patients with strongly "positive" histories. The potency of the solutions used seemed to be proved by the intensity of the reactions when they did occur.

Confidence in the method as a valuable aid to diagnosis naturally declined, and for a number of years relatively few patients were investigated in this way. However, clinical experience forced one to the conclusion that allergic sensitivity was a most variable quality, appearing, disappearing, and varying in an inconsequential manner, for which the skin-testing method could not be blamed; and it seemed worth while to see if this was clearly shown in the records of those cases which were available. About six years ago, therefore, a number of energetic skin testers, armed with a battery of syringes, were assembled, and those patients previously tested were summoned. The response was so poor that the survey did not yield any significant results.

It was therefore determined to carry out a minimum routine number of skin tests on every adult patient attending, and to repeat the follow-up testing on a larger series at a later date. This has just been done, and the results, though not as numerically valuable as was originally hoped, are interesting enough to warrant publication.

The actual testing was carried out by two independent observers, who also noted the patient's own assessment of his symptoms over the intervening years since the previous testing. I did not see the patients at all when they attended for this special purpose, and the observers who did see and test them took no part whatever in the original assessment, the original testing, or in the analysis.

The tests carried out in this series were group mixtures for the most part, including the common inhalant allergens (household dusts, clothing materials, pollen dusts, etc.), but excluding foodstuffs. Friedewald (1952), in a study of 1,900 cases, came to the convincing conclusion that skin-testing with solutions or other preparations of foods was so much waste of time. No apology is therefore made for the policy adopted in this connexion, nor is it thought necessary to go into all the arguments for and against the testing of foods by any method other than that of dieting.

The survey comprises only a small proportion of the total number of cases attending the special out-patient session, and indeed not many of those in whom skin tests had been

at one time made. Many patients did not attend the skin-testing sessions, which were arranged for the purpose of this investigation, saying that they were now well, did not require any further attention, and were afraid that any injections might cause a recurrence. A few complained that they were no better, and did not believe that they would receive any benefit from a repetition of the tests. The attendance of the "unimproved" group was generally good, however. There is thus some bias in favour of the unimproved cases as a whole; but this bias is not important for the present purpose.

Results

It is possible to survey the results in 209 cases, followed up over varying periods up to 17 years, the shortest period being two years, and the average seven years. This period is long enough to allow any variations in skin sensitivity to manifest themselves, and the number, though not large, has been found adequate for the immediate purpose.

Some general figures may be given before the general analysis is described. Of the 209 subjects available for analysis, 31 were under the age of 15, mostly between 12 and 14 (Table I).

TABLE I

Condition	No.	No. Under 15
Improved	138	25
Unchanged, or slightly improved	55	6
Worse	16	0
Total	209	31

It should perhaps be stated that improved means a very considerable change for the better—one quite outside the normal shift of symptomatic emphasis so often shown by the asthmatic person. For example, a patient must have been free of attacks for over a year, or have reached a state in which attacks of moderate or slight severity occur only occasionally. Lesser degrees of improvement are placed among the unimproved group, the changes being regarded as within the limits of normal variation.

Of the 209 cases, 21 had received "desensitizing" injections, 5 being under the age of 15. These 21 patients all showed a change in skin reactions from positive to negative shortly after the injections. It is of interest to note that the reactions had reverted to the original state in eight.

Thirteen of these cases were improved and eight unchanged or only slightly improved. These eight patients included five in whom the skin reactions had reverted to the original state.

In five cases a "combined" reaction was observed. By this is meant changes in both directions. Four of these were improved, and the remaining patient was unchanged. These five patients have been excluded from the analysis, leaving 204 cases to be classified. In 21 patients the result was difficult to place. In these, a change in one direction or the other occurred in some of the tests, but not in all. For example, a patient in whom the test was completely negative on the first occasion would yield a strong positive reaction to one or more pollen solutions at the final follow-up test, the other tests still showing negative results. In such a case the change in the pollen reaction was regarded as significant, and the case was placed in group 3 (-to+).

Another problem was presented by patients who yielded several positive reactions at the first test and who at the final test showed negative results to all except one of the formerly positive solutions. This type of change was somewhat of a puzzle as regards classification, and each case was judged separately on its merits. If the remaining positive reaction was a really strong one, then the patient was placed in the "unchanged" group, but if it was less convincing he would be placed in group 2 (+to-).

All tests were carried out by the intradermal method, using a dose of 0.1 ml. A positive reaction means a definite weal of at least the size of a silver threepenny-piece, with pseudopodial irregularities and surrounding erythema. Any "weal" of smaller size, or one without pseudopodia or erythema, was disregarded.

TABLE II

Group	Results of Skin Tests	No. Tested	Clinical Progress		
			Improved	No Change	Worse
1	No change	114	74 (65%)	31 (27.2%)	9 (7.0%)
2	+ to -	40	26 (65%)	13 (32.5%)	1 (2.5%)
3	- to +	50	34 (68%)	10 (20%)	6 (12%)
Totals		204	134	54	16

Table II shows the similar composition of the three groups when analysed according to clinical progress. There are, it is true, minor variations. For example, the percentage of patients whose condition had deteriorated over the period of study is highest in group 3 (12%) and lowest in group 2 (2.5%). The small total number of these worsening cases (16 in 204) makes any conclusion based on percentages of very doubtful validity, however. It will be noted that in this group, although the difference is slight, the improved cases also are relatively numerous.

The improved cases are of almost exactly the same percentage in each group, and those showing no significant change in either direction do not differ significantly from one group to another, although in group 3 there is the natural reflection of the higher numbers of improved and worse cases, in the lower relative proportion of the unchanged.

Discussion

It seems permissible to draw certain conclusions from the evidence that is here presented. In the first place, it is clear that the skin-test response is a variable quality, former skin sensitivity disappearing and new sensitivities arising as time goes on. This is in general accord with clinical experience in allergic conditions, although the correspondence between the clinical variations and the skin reactions is often far from close. The most common example of this divergence is the persistence of seasonable asthma long after the skin reactions to all pollens become negative. It is nevertheless evident that skin sensitivity is not a static quality.

Secondly, it is apparent that negative skin reactions may alter to positive in association with no corresponding clinical change, with well-marked improvement, or with deterioration; and that the chances of each of these variations occurring is about the same as it would have been had the skin reactions altered in the opposite direction or not at all. Skin-testing on the whole, therefore, seems to be an unreliable indication of clinical progress, and of little or no prognostic value.

The two questions posed at the beginning have therefore been answered by the survey and analysis which has been made.

It seems natural, and possibly useful, however, to consider briefly the relationship between allergic sensitivity in asthma and the skin-test response. It is recognized, as has already been stated, that allergic sensitivity is but one of the factors which influence the clinical progress of the asthmatic. The exact role of allergic sensitivity in this or, indeed, in any similar series cannot be stated with real accuracy, unless it may be assumed that the skin-test response is of pathognomonic significance in every case. Without such a "yardstick" the classification becomes too much a matter of personal opinion for reliable statistical analysis.

If skin sensitivity is accepted as the criterion it would seem that allergy was a dominant or important feature in a small minority of the cases in the present series; otherwise the

results would have been expected to show at least some significant correlation with the clinical condition of the patients.

It is true that this study does not provide enough evidence to enable one to judge the reliability of the skin-test response as an indication of allergic sensitivity in asthma; and the literature, vast as it is, does not give us a clear and unequivocal answer. It would, however, seem fair at least to say that the absence of any significant relationship of change in skin sensitivity to clinical progress in this series of asthmatic patients may not necessarily indicate that allergic sensitivity was an unimportant factor in the series as a whole, and that the skin response is perhaps not a completely reliable indication of allergic sensitivity. On the other hand, it must be said that in a number of cases skin-testing may give valuable and helpful information—always provided that its significance is judged in relation to all other available information.

Summary

The skin-test responses to the common inhalant allergens were followed in 209 asthmatic patients (of whom 31 were under the age of 15) over an average period of seven years, with extremes of 17 and 2 years, and were compared with the clinical progress of the patients.

The series was, as a whole, somewhat biased against the "improved" cases by the reluctance of asthmatic persons who were well to submit themselves to "repeat" skin-testing. This was not found, however, to affect the purposes of the survey and analysis.

Of the 209 cases, 138 were improved (no asthma for at least one year, or only occasional or moderate attacks at infrequent intervals), 55 were unchanged (or slightly improved), and 16 were worse.

The skin-test responses were found to have altered widely or significantly in 90 of the 209 cases.

These changes in skin sensitivity were found, however, to bear little or no relation to the clinical progress of the patients.

Skin-testing may not be a completely reliable indication of allergic sensitivity in general, but in the individual case it may give valuable information if used with discretion.

I am grateful to Dr. Christopher Strang and Dr. Michael Evans, who carried out the follow-up skin tests; to the Librarian of the Royal Society of Medicine and his staff, who kindly conducted a detailed research of the literature; and to Mr. Campbell, of the Department of Industrial Health in the University of Durham, who kindly checked the statistical analysis.

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The new neurosurgical theatres and extensions to the department of neurosurgery, which Sir Geoffrey Jefferson, F.R.S., opened at Frenchay Hospital, Bristol, last October, are now in commission. The theatres embody many modern improvements. Full air-conditioning on a plenum system has been installed, which provides 16 changes of air per hour, the intake being high above the roof and the air filtered. Glass-screened galleries help reduce aerial contamination by spectators, and allow a 70° angle of view on to the operation field. Communication with the galleries is by throat-microphone. The twin operating theatres share a common instrument store and sterilizing rooms; in the latter there are special arrangements to prevent excessive humidity. The department, which is the base for the neurosurgical service of the South-western Hospital Region, will ultimately have accommodation for 72 patients, including children.

INVESTIGATION OF AN OUTBREAK OF BOVINE TUBERCULOSIS IN A RURAL AREA IN LEICESTERSHIRE

BY

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The *British Medical Journal* (1953) again drew attention to the importance of tuberculosis of bovine origin when it summarized in a leading article a survey undertaken by the Medical Research Council on this problem (Wilson *et al.*, 1952). The survey showed that tuberculosis of bovine origin still remains a serious problem. It was estimated that in 1944 there occurred 550 deaths in Great Britain from tuberculous meningitis and 1,050 deaths from other varieties of non-pulmonary tuberculosis due to infection by the bovine type of bacillus. It is realized that a survey at the present moment would not show such a high mortality, on account of the effects of streptomycin and P.A.S., but it is logical to assume that the amount of illness and disability from infection by the bovine bacillus still remains a very great problem. The survey showed that such infection occurred more often in children between the ages of 5 and 9 years. It was suggested that this could be explained by the fact that, whereas infants had previously been fed on cows' milk when breast-feeding failed, now, largely through the efforts of welfare clinics, they are fed on dried or other safe forms of milk, and it is when the child goes to school and moves around in other households that the possibility of infection from raw milk may arise. That leading article has stimulated us to report a recent survey which was undertaken in a rural Leicestershire area where there seemed to have been an abnormal incidence of tuberculosis associated with a known source of infection from a single cow in an otherwise healthy herd.

In January, 1952, notifications were received of two cases of non-pulmonary tuberculosis in children aged 9 and 5 living in the same village (Cases 1 and 2). Abdominal glands were evident in one and cervical glands in the other. The occurrence of these two cases in the same village at the same time led us to inquire from the chief county sanitary officer about the milk supply for these two households. It was found that both children were obtaining milk from the same source, and it was reported that on December 20, 1951, a routine biological sample of milk from this source contained tubercle bacilli. On December 22 a clinical examination of the herd was carried out by the divisional veterinary officer, and this revealed that a cow in the herd was suffering from tuberculosis of the udder. This cow was slaughtered under the Tuberculosis Order of 1938.

Since most of the children in this area were obtaining their milk from this known infected source, inquiries were made to find other children who might be suffering from tuberculous glands of the neck and other tuberculous conditions, and at the same time it was thought

advisable for a tuberculin survey to be undertaken of all children in the area. In addition to the two original cases of tuberculosis a further three children were found to have tuberculous glands of the neck which required treatment.

Case Reports

Case 1.—A case of tuberculous glands of the abdomen in a boy aged 9 was notified on January 18, 1952. Six weeks before examination he had erythema nodosum and later abdominal pain. He was seen by Dr. J. V. C. Braithwaite, who diagnosed tuberculous abdominal glands.

Case 2.—A girl aged 5 developed a gland on the right side of her neck in October, 1951, and was later admitted to the Leicester General Hospital, where the gland was excised and found to be tuberculous. The child was subsequently treated with streptomycin and P.A.S., making an uneventful recovery. This case was notified on January 21, 1952.

Case 3.—As a result of our inquiries a boy aged 14 with an enlarged gland in the neck was referred to the Leicester County Chest Clinic by his general practitioner on February 6, 1952. His history was that in September, 1951, he developed a gland at the right side of his neck which at first settled down. When he was first seen at the clinic the Mantoux test was strongly positive, but the gland itself did not seem to require any active treatment, although his tonsils were somewhat enlarged. These were removed and found to be tuberculous. In January, 1953, the gland increased in size, and after a preliminary course of streptomycin and P.A.S. it was excised.

Case 4.—A girl aged 4 was referred to the Chest Clinic on April 2, 1952, with a history of repeated sore throat for the past five months. She had a gland at the left side of her neck and an enlarged tonsil on that side. The tonsils were removed and culture revealed tubercle bacilli of the bovine type. The gland has since settled down without any further treatment.

Case 5.—A child aged 2 who was tuberculin-positive when we undertook the survey developed a gland in the right side of the neck two months later. This increased in size and was treated with streptomycin and P.A.S., and finally by excision. This case is interesting because it is the only one of the five which presented no clinical signs at the time of the survey but subsequently developed clinical evidence of tuberculous adenitis.

Commentary

At the time of writing we have these five clinical cases of tuberculosis arising in children, all of whom had been obtaining milk from the same source and whose infection can, in our opinion, be directly attributable to a tuberculous cow.

We decided that the problem should be investigated as soon as the first two cases were notified from the same village. The population of the area is 9,660 people, scattered in 31 villages over an area of 45,000 acres. Two of these villages have a population of about 1,600; two have between 600 and 900; 12 have 100 to 500; and 15 have fewer than 100. In the area there were 154 milk producers, of whom 38 retailed their products. For two years prior to this outbreak all raw milk sold in this district had been sampled quarterly and subjected to examination for living tubercle bacilli by guinea-pig inoculation. By this means four infected milks had been discovered and the appropriate action taken. In the particular herd with which we are concerned one of us (R. W. K.) found that the customary veterinary inspection due in July, 1951, had not been carried out and that the infected cow had been under treatment for at least four weeks before its detection in December, 1951. It therefore seemed likely that the milk from this herd, which was bulked together, had contained tubercle bacilli for several weeks before bacteriological confirmation was available, and that the consumers in this area had been exposed to the risk of infection for a period of several months. The producer

made available to us his register of customers, which showed that he supplied 106 families in five villages, including 63 children under school-leaving age.

The five villages catered for by this particular supplier, together with seven other villages, send their children between the ages of 5 and 11 years to one central primary school, and from there, at the age of 11 plus, they pass to an adjacent secondary modern school, where they are joined by children of a similar age from a further 32 outlying villages. It was administratively easy to investigate the entire child population of these 12 villages, but the whole of the older children's school was included in the survey, in order to distract attention from the local nature of the real investigation. Since the majority of the older children attending the secondary modern school lived in villages too far away from the area at risk for their tuberculin results to be of any statistical significance in this survey, they are not included in any of the tables in this paper.

The county medical officer circularized all parents in the area, pointing out the desirability of such a survey, and at the same time he advised the general practitioners that such a survey was to be undertaken and asked for their co-operation. The co-operation of the parents and general practitioners was readily given and was universal in the villages at risk. The refusals received were from parents of older children coming from outside the infected area. It is interesting to see how much co-operation can be obtained in a survey of this nature; the response is shown in Table I.

TABLE I.—Parent Co-operation

Age Group	Total No.	Refusals	Absentees from Testing	No. Tested
Under 5 years	123	—	5	118
5-7	61	—	—	61
8-11	63	—	—	63
12-15+	37	—	—	37
Total	284	—	5	279

The high response in the age group under 5 was largely due to the fact that the health visitor personally visited many of the houses to carry out the tuberculin test. The method of tuberculin testing was that in children under the age of 10 Allen and Hanburys' tuberculin jelly was used in the routine manner—that is, the skin was cleaned with acetone and rubbed gently with flourpaper. In children over the age of 10 we contented ourselves with a single dose of 1/1,000 of old tuberculin. The results of the survey are shown in Table II. All children who were tuberculin-positive were x-rayed by the mass radiography unit; no abnormalities were found. The outstanding points in Table II are the variations between groups A and C, which

TABLE II.—A Summary of Test Results

Village Group	Under 5 Years			5-7 Years			8-11 Years			12-15+ Years		
	Pos.	Neg.	% Pos.	Pos.	Neg.	% Pos.	Pos.	Neg.	% Pos.	Pos.	Neg.	% Pos.
A (infected)	18	10	64.2	10	6	62.5	11	0	100	8	0	100
A (other)	3	11	21.4	1	7	12.5	9	11	45.0	9	6	60.0
A Total	21	21	50.0	11	13	45.8	20	11	64.5	17	6	73.9
B	14	23	37.8	7	12	36.8	3	9	25.0	5	3	62.5
C	3	36	7.6	4	14	22.2	1	19	5.0	3	3	50.0

Group A—Five villages at risk—subdivided into group A (infected), those children known to have been supplied from the infected source; and group A (other), the remaining children in these villages not receiving milk from the infected source.

Group B—Five adjacent villages; no known source of infection.

Group C—Two adjacent villages; milk supply known to be safe.

clearly demonstrate the beneficial effects of a milk supply which is known to be safe (group C). Group A indicates what may occur when there is a known infected supply. We do not intend to introduce any discussion on the alleged

value of drinking raw milk as a means of immunization, but merely mention it in order that we may dismiss it as a tragic form of immunization.

The Medical Research Council (1952) published the results of a national tuberculin survey which was undertaken in 1949-50, and, while no figures are given for those under 5, the figures for a rural area in the age groups indicated showed a tuberculin sensitivity rate as follows: 5-7 years, 26.5%; 8-11 years, 35.6%; 12-15 years, 50%. Compare these with our figures, which were also taken from a rural area but which are not unnaturally boosted up by this known source of infection. Hall (1950) did a similar survey on children in a village where there was a proved source of infection associated with a tuberculous gland; his results are shown in Table III. In this particular outbreak the

TABLE III.—Results in Hall's Survey

	Children Tested	Positive	Negative
Age 0-1 ..	60	41 (68.3%)	19
1-4 ..	7	1	6
5-15 ..	15	12 (80%)	3
1-15 ..	38	28 (74%)	10
1-15 ..	53	40 (75%)	13

milk supplier had served the school as well as the village. In the Leicestershire survey the milk supply to the school was from an outside approved source.

As most of us in the tuberculosis service feel we are approaching the possible end of tuberculosis as a major problem in the community, it does seem more evident than ever that there is absolutely no justification for bovine tuberculosis playing such an important part in the incidence of tuberculosis. Not only may the bovine type cause a mortality of well over 1,000 a year in Great Britain, but it produces many crippling forms of tuberculosis. John Francis (1947) states that, according to the most reliable estimate, 20% of cattle in England are tuberculous, 7.5% in Wales, and 14% in Scotland. The incidence in dairy cows is probably 30 to 35%, but there is a great deal of variation in incidence in various parts of the country. It is lower in Wales, the North and South-west of England, and the North of Scotland. The Midlands of England are the most heavily infected. Furthermore, he states that complete healing of lung lesions is much less common in cattle than in man. He estimates that probably 0.5% of all cows in Great Britain have tuberculosis of the udder, and it is this type of tuberculosis which is the most important from the point of view of milk-borne infection. The result of infection in a small community by a single cow such as we have described emphasizes the need either for ensuring that the milk supply throughout the country must eventually come from accredited tuberculin-tested herds or for the general pasteurization of milk.

Conclusion

This survey demonstrates the following facts as well as the statistical data outlined.

(a) The importance of close liaison between the chest services and the local authorities in the prevention of tuberculosis. The chest physician can deal with a problem such as this only by obtaining the fullest assistance from the county medical officer and the staff of the county health department and the district medical officer of health.

(b) The desirability of a tuberculin test in all cases of glands of the neck. In our opinion this should become a routine: it is a very simple procedure, and any chest clinic would willingly undertake the necessary investigation. It must be borne in mind that only about 50% of cases of tuberculous adenitis are, in fact, bovine in origin. The tonsil is the recipient of the human bacillus

by inhalation and the tonsillar glands are subsequently involved. This fact was proved by the classical work of A. S. Griffith (1937, 1938).

(c) The high response of such a survey can be obtained only if the parents, general practitioners, and school authorities are all acquainted with the problem, and it is hoped that this article will show the willingness of both the local authority and the chest service to investigate any such similar outbreak and will again prove that the notification of a case of tuberculosis may have much wider ramifications than at first supposed.

We wish to acknowledge the help given to us by Dr. G. H. Gibson, County Medical Officer of Health for Leicestershire, Mr. S. A. Gregory, Chief County Sanitary Inspector, and all the other members of the County Health and Education Department who assisted us in making this survey as complete as possible. We also thank Dr. J. V. C. Braithwaite, Mr. T. M. J. d'Offay, and Mr. N. E. Kendall.

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DIAGNOSTIC DIFFICULTIES IN CONSERVATIVE TREATMENT OF PERFORATED ULCERS

BY

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It was only 60 years ago that Hastings Gilford treated a case of perforated peptic ulcer by operative closure—the first case so treated in this country. Since then this has become the accepted method and, until recently, the only method; but for some time a conservative regime has been advocated by a few authorities (notably Hermon Taylor, 1946, 1951).

The prerequisite of any form of treatment is accurate diagnosis, a problem which, in this matter, troubles us to-day almost as much as it did Mikulicz at the end of the last century. He indeed, before performing laparotomy, confirmed his diagnosis by puncturing the distended abdomen with a trocar.

Gastro-duodenal perforation causes the clinical syndrome of acute peritoneal irritation, hence the problem of accurate diagnosis consists first in eliminating the various extra- and intra-abdominal conditions which may simulate peritoneal irritation—for example, tabetic crisis, diaphragmatic pleurisy, coronary infarction, acute cholecystitis—and, second, in eliminating the other conditions which also cause peritoneal irritation.

If the treatment be conservative a misdiagnosis of one of the first group of conditions is not likely to be a tragic error, but a misdiagnosis of one of the second group may well be. On the other hand, if the treatment is to be operative a misdiagnosis of one of the first group will lead to an unnecessary and possibly dangerous procedure, whereas a misdiagnosis of one of the second group will automatically be corrected at operation.

Present Investigation

It is with the second group of conditions that this paper is concerned. Seventy consecutive cases of "widespread peritoneal irritation" are presented: "widespread" because the term "generalized" is regarded by many as synonymous with impending death, and "irritation" because that is a clinical term, and "peritonitis" is an inflammatory reaction generally, though not accurately, believed to be associated with infection.

The 70 cases fall into the following groups:

1. Gastro-duodenal perforations	34
Duodenal ulcer	22
Gastric ulcer	7
Stomal ulcer	1
Carcinoma	4
2. Appendicitis	17
Without abscess	13
Intraperitoneal rupture of abscess	4
3. Haemoperitoneum	9
Tubal pregnancy	4
Ruptured liver	2
Ruptured spleen	1
Ruptured left gastric artery	1
Ruptured ovarian cyst	1
4. Perforated small bowel	2
Jejunal diverticulum	1
Multiple chromaffinoma	1
5. Perforated large bowel	6
Spontaneous perforation of pelvic colon	1
Carcinoma of caecum	1
Carcinoma of descending colon	2
Diverticulitis of pelvic colon	1
Radionecrosis of pelvic colon	1
6. Lesions of female genital tract	2
Salpingitis	1
Intraperitoneal rupture of tubo-ovarian abscess	1

The purpose of this investigation is as follows. (1) An attempt is made to derive from a study of the clinical features of the gastro-duodenal perforations a "diagnostic screen," to be applied to all cases diagnosed as "acute peritoneal irritation." (2) The diagnostic screen is applied to those cases of "acute peritoneal irritation not of gastro-duodenal origin" which were pre-operatively considered as probably or possibly suffering from gastro-duodenal perforation. The persistent diagnostic error is noted. (3) The results of treatment of all cases by laparotomy are considered, to find out how many of those with gastro-duodenal perforations succumbed because of the operation, and how many of the other patients with peritoneal irritation survived when laparotomy was not delayed by a mistaken initial diagnosis. (4) In the light of these findings, the advisability or otherwise of the non-operative method of treating gastro-duodenal perforations is considered.

Main Features

The principal features of the cases of perforation were as follows:

Of the 34 cases, 27 were male. The average age was 49 years, with extremes of 17 and 73 years. The temperature averaged 98.1° F. (36.7° C.), ranging from 97° F. (36.1° C.) to 100.2° F. (37.9° C.); the pulse averaged 80 (48 to 120); and the respirations averaged 22 (18 to 40).

Previous Dyspepsia.—Twenty-nine cases had a previous history of dyspepsia. One case had had a previous perforation closed and a gastro-enterostomy performed. Four cases had had previous perforations with simple closure only.

Exacerbation of Symptoms immediately before Perforation occurred in 28 of the cases; there was increased dyspepsia for one to several days before the actual perforation occurred.

Sudden Onset.—All patients were able to state the exact time of onset—for example, "I had just laid down the newspaper, when suddenly . . ."

Time of Onset.—All but five cases occurred during waking hours.

Duration of Acute History.—The average time was five and a half hours, with extremes of one and fourteen hours; these times do not show the delay in "calling the doctor," but the delay from onset to examination in hospital.

Trauma.—In only one case was trauma present. This patient walked into the casualty department and stated that he "strained the abdominal muscle lifting a heavy weight and it has given way."

Easing of Pain.—In only seven cases had the pain eased off.

Site of the Pain.—In 18 cases the pain was indicated as epigastric, in 15 cases generalized, and in one case in the right hypochondrium.

Vomiting.—Eighteen of the patients had vomited, some excessively; 16 had not.

Bowels.—There were no cases of diarrhoea. Six cases had constipation, and 28 had normal bowel function.

General Condition.—Twenty-five cases were classed as "ill" or "very ill"; nine had a good general condition.

Tongue.—In 28 cases the tongue was dry.

Tenderness and Rigidity.—This was maximal in 33 cases.

Site of Tenderness and Rigidity.—Generalized in 19 cases, epigastric only in nine cases, right hypochondrium and right iliac fossa in three cases, epigastrium and right iliac fossa in one case, right iliac fossa only in one case, and right hypochondrium only in one case.

Liver Dullness.—This was lost in 15 cases, impaired in 10, and normal in nine.

Bowel Sounds.—These were present in 21 cases and absent in 13.

Evidence of Other Acute Disease was absent in all cases.

From these findings the following points might be considered as being those in whose absence nothing more than a tentative diagnosis of gastro-duodenal perforation should be postulated: male patients only; temperature, pulse, and respiration not far from normal; previous history of dyspepsia; recent exacerbation of dyspeptic symptoms; sudden onset; onset during waking hours; duration of less than 12 hours; no history of trauma; epigastric or generalized pain; no history of diarrhoea; dry tongue; maximal tenderness and rigidity; generalized, epigastric, or right-sided tenderness; no evidence of other disease.

The value of many of these clinical features is well known. Strang and Spencer (1950) found that more than 90% of their cases gave a history of dyspepsia and over 70% had an exacerbation of symptoms immediately before the perforation. Jamieson (1947) found that in his series of cases perforation at night was rare. He further reports that "severe exertion plays little part in precipitating perforations."

The longest acute history of this series was fourteen hours. Cases of much longer duration have been reported. Beattie (1951) describes four cases with an acute history of over 20 hours, but it seems that since the National Health Service, with the financial anxiety of illness removed, patients call their doctor far more readily.

X-ray diagnosis has not been considered in this series, as in many instances it was not available, and often the patient had too much pain to co-operate sufficiently if it had been available. Stead (1951) discusses the difficulties encountered in x-raying patients before reaching a diagnosis. He demonstrated free gas in 38 out of 47 cases, and in 10 cases treated conservatively radiography was either not available or failed to demonstrate gas.

In diagnosing the cases of "acute peritoneal irritation not of gastro-duodenal origin" nine of them closely resembled gastro-duodenal perforations. These case histories are summarized below.

Case Histories

Case 31.—Male aged 15. No previous dyspepsia; sudden onset of epigastric pain, persisting for 12 hours. No vomiting; constipated. Examination: General condition very ill. Tongue dry. Abdomen tender and rigid all over; normal liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 100° F. (37.8° C.), 100, 25. Diagnosis: Widespread peritonitis due to a perforated appendix, the caecum being completely undescended and in the midline. Differential diagnosis: Distinguished from gastro-duodenal perforation by absence of dyspepsia.

Case 33.—Male aged 56. No previous dyspepsia, but abdominal discomfort for seven days, followed by sudden severe generalized abdominal pain, persistent for 48 hours.

No vomiting; normal bowel function. Examination: General condition—very ill. Tongue dry. Abdomen tender and rigid all over; normal liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 97.6° F. (36.4° C.), 120, 24. Diagnosis: Intra-peritoneal rupture of appendix abscess causing widespread peritonitis. Differential diagnosis: Distinguished from gastro-duodenal perforation by absence of dyspepsia; a duration of acute history of 48 hours.

Case 38.—Female aged 38. No previous dyspepsia. Sudden onset of generalized abdominal pain while pushing a garden roller. Pain had persisted for 48 hours. No vomiting; normal bowel function; no upset of menstruation. Examination: General condition—good, but slight pallor. Tongue moist. Abdomen tender and rigid all over; normal bowel sounds; normal liver dullness. P.R. and P.V.: No abnormality. T., P., R.: 98° F. (36.7° C.), 100, 20. Diagnosis: Haemoperitoneum due to ruptured tubal pregnancy. Differential diagnosis: Differentiated from gastro-duodenal perforation by sex, no previous dyspepsia, duration of acute history, trauma.

Case 44.—Female aged 36. No previous dyspepsia. Sudden onset of generalized abdominal pain when her husband and she fell and he landed on her abdomen. Pain had persisted for four hours. No vomiting; normal bowel history; normal menstrual history. Examination: General condition—ill. Tongue dry. Abdomen tender and rigid all over; normal liver dullness; normal bowel sounds. P.R. and P.V.: N.A.D. T., P., R.: 99.7° F. (37.6° C.), 94, 30. Diagnosis: Intra-peritoneal rupture of serous ovarian cyst. Differential diagnosis: Distinguished from gastro-duodenal perforation by sex, no previous dyspepsia, trauma.

Case 41.—Male aged 21. Previous dyspeptic history suggestive of chronic duodenal ulcer. Slight abdominal pain for 24 hours following a kick while playing football. Sudden onset of severe epigastric pain after this, persistent for 12 hours. No vomiting; bowels constipated. Examination: General condition—ill. Tongue dry. Abdomen tender and rigid in upper part; liver dullness normal; absent bowel sounds; slight abdominal distension. P.R.: N.A.D. T., P., R.: 100° F. (37.8° C.), 110, 20. Diagnosis: Haemoperitoneum due to rupture of liver (lacerated concave surface). Differential diagnosis: Distinguished from gastro-duodenal perforation only by the presence of trauma.

Case 45.—Female aged 48. Several attacks of epigastric pain at intervals of about one month or more, each lasting several days and then subsiding. She had suffered from this form of dyspepsia for several years. Sudden onset of epigastric pain, persistent for 12 hours. No vomiting; normal bowel function. Examination: General condition—ill. Tongue dry. Abdomen tender and rigid all over; normal liver dullness; normal bowel sounds. P.R. and P.V.: N.A.D. T., P., R.: 98.4° F. (36.9° C.), 88, 24. Diagnosis: Widespread peritonitis due to perforated jejunal diverticulum situated 2 ft. (60 cm.) from duodenal-jejunal junction. Differential diagnosis: Differentiated from gastro-duodenal perforation only by sex.

Case 67.—Male aged 57. Indigestion for four months—epigastric pain and vomiting. For seven days symptoms much worse and accompanied by sensation of food sticking at lower part of chest. Sudden onset of generalized abdominal pain eight hours before admission; persistent. Vomited since onset. Bowels constipated. Examination: General condition—ill, with marked weight loss. Tongue dry. Abdomen tender and rigid all over; no mass palpable; diminished liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 99.8° F. (37.7° C.), 120, 24. Diagnosis: (1) Widespread peritonitis from perforated appendicitis. (2) Carcinoma of cardia of stomach. Differential diagnosis: Indistinguishable from perforated peptic ulcer.

Case 68.—Male aged 51. Partial gastrectomy 15 months previously for peptic ulcer. Recurrent attacks of epigastric pain for three months. Sudden onset of severe generalized abdominal pain three hours before admission; persistent. Vomited since onset. No bowel upset. Examination: General condition—ill. Tongue dry. Abdomen tender and

rigid all over; no mass palpable; no loss of liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 100.2° F. (37.9° C.), 106, 18. Diagnosis: Peritonitis due to perforated carcinoma of descending colon. Differential diagnosis: Indistinguishable from perforated stomal ulcer.

Case 69.—Male aged 75. Vomiting for about one month before admission; no previous abdominal pain. Recent loss of weight. Sudden onset of abdominal pain 12 hours before admission; pain persistent; vomited once. No bowel upset. Examination: General condition—very ill; marked weight loss. Tongue dry. Abdomen tender and rigid all over; distended; no mass palpable; loss of liver dullness; no bowel sounds. P.R.: N.A.D. T., P., R.: 100° F. (37.8° C.), 90, 20. Diagnosis: Widespread faecal peritonitis due to spontaneous perforation of the pelvic colon. Differential diagnosis: Indistinguishable from perforated peptic ulcer.

Comment on Above Cases.—It will be seen that, after rigidly applying the diagnostic screen already described, three cases remain that might easily be diagnosed wrongly as gastro-duodenal perforation (Cases 67, 68, and 69). Case 45 is distinguished only by sex, Case 41 only by the history of trauma, and Case 31 only by the absence of dyspepsia.

Results

Although this paper is primarily concerned with diagnosis, it is obvious that a diagnosis confirmed by laparotomy is worthless if the laparotomy adversely affects the patient's survival. On the other hand, a laparotomy delayed by a mistaken diagnosis in a case in which its necessity is urgent is equally undesirable.

The results in the cases of gastro-duodenal perforation and in those of acute peritoneal irritation from other causes are dealt with. Among the perforations there were no deaths attributable to the laparotomy, but three subsequent deaths were noted (see below).

With the following exceptions all cases made satisfactory recovery after simple closure of the perforation.

Case 18.—Male aged 70. Perforated pre-pyloric ulcer, immediate subtotal gastrectomy; section later proved to be non-malignant. Alive and well, having been followed for three years.

Case 21.—Male aged 54. Perforated carcinoma of the stomach: unfit for immediate gastrectomy; simple closure only. Laparotomy 14 days later revealed peritoneum full of metastases. He died four weeks later.

Case 22.—Female aged 50. Perforated carcinoma of the stomach infiltrating transverse mesocolon; immediate subtotal gastrectomy and transverse colectomy. Died at home suddenly three months after her discharge from hospital (? cerebral thrombosis).

Case 23.—Female aged 29. Perforated carcinoma of stomach, immediate subtotal gastrectomy. Patient alive and well, having been followed up for 12 months.

Case 54.—Male aged 73. Perforated duodenal ulcer. Died on seventh post-operative day from myocardial degeneration and uraemia (300 mg. per 100 ml.) following a violent haematemesis on the fourth post-operative day.

Case 55.—Male aged 70. Perforated carcinoma of pyloric antrum (inoperable). Perforation closed and gastro-enterostomy performed. Alive and well, having been followed up for 6 months.

Among the other cases there were four deaths.

Case 42.—Male aged 79. Ruptured spleen. Died on the table from cardiac arrest.

Case 43.—Male aged 77. Ruptured left gastric artery. Died seven days later from purulent bronchopneumonia.

Case 46.—Male aged 60. Multiple chromaffinoma of small bowel (perforated). Died from leaking anastomosis at the suture where enterectomy had been performed.

Case 47.—Male aged 73. Inoperable perforated carcinoma of caecum. Died five days later from peritonitis, drainage only having been done.

Discussion

Comment on this investigation is centred on four points. (1) Despite careful screening of 36 cases of acute peritoneal irritation from non-gastro-duodenal causes, three remain indistinguishable from gastro-duodenal perforations. In this series, which is too small to be statistically significant, for every 11 true perforations there occurred one case requiring immediate laparotomy, the clinical features being exactly similar to those of a perforated peptic ulcer. Therefore the conservative method of treatment applied to this series would have suffered from a 10% diagnostic error despite rigid selection, and a correspondingly greater error with rigid selection.

(2) It must be considered that the results by the non-operative method may be so vastly superior to those by the operative method that this small diagnostic risk should be accepted. This is not so. Hermon Taylor (1951), Stead (1951), and Beattie (1951) all quote at least one death in their respective series which would not have occurred under operative approach. There were no deaths among the small series of perforations reported here that were attributable to the laparotomy.

(3) The "poor risk case" must be considered. The above authors all report a satisfactory outcome to such cases, which would almost certainly have been fatal if subjected to laparotomy. Here they are on very firm ground in accepting the small risk of a mistaken diagnosis in a patient whose clinical features are typical of gastro-duodenal perforation, but who is a poor risk for laparotomy.

(4) The results of the cases of non-gastro-duodenal origin show that the fatality rate is nowadays small when laparotomy is not unnecessarily delayed. It is wrong to assume that a case will benefit by the delay which results from the mistaken application of the conservative measures for perforations, although some pre-operative treatment is often desirable in these cases. It is also wrong to assume that a patient with perforation of the large bowel would have died in any case.

The final conclusion must be that when a case is diagnosed as a gastro-duodenal perforation it should be treated by laparotomy unless the risk of the operation is thought to be greater than the risk of a mistaken diagnosis.

Summary

Seventy cases of acute peritoneal irritation are presented.

The clinical features of perforated gastro-duodenal lesions are evaluated, and a "diagnostic screen" is described.

The case of peritoneal irritation from all causes are tabulated, and details are given of those non-gastro-duodenal cases in which differential diagnosis was a problem.

The results of treatment are given.

It is suggested that laparotomy be performed on all cases diagnosed as gastro-duodenal perforation if the patient is fit for the operation, and the conservative method be reserved for those cases in which laparotomy would be a serious ordeal.

I am indebted to Mr. E. G. Dingley and Mr. G. C. C. Taylor for permission to treat and publish those cases admitted under their care at the Warneford Hospital, Leamington Spa, and to Surgeon Rear-Admiral J. A. Maxwell for those cases admitted to St. Mary's Hospital, Portsmouth.

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Medical Memoranda

Weber-Christian Disease: Relapsing Febrile Nodular Non-Suppurative Panniculitis

Panniculitis by definition means inflammation of adipose tissue. Parkes Weber (1925) reported one case in which this happened in various areas of the body and caused pain and discoloured swellings of the skin. He examined a nodule microscopically, and reported his case under the heading of "Phagocytosis of subcutaneous fat cells by macrophages." There was no enlargement of the lymph nodes. Christian (1928) reported a similar case in greater detail, adding that fever also occurred. No organisms were found in either case. Despite intensive investigations no cause was discovered for this condition. Alice Carleton (1949) added a further example of this interesting disease to the fifty or so cases in the literature. A further case is now reported, showing the characteristic lesions, relapses, and histopathology.

CASE REPORT

A married woman aged 65 was admitted to hospital as a case of coronary artery thrombosis. A history of breathlessness on exertion, choking sensation, and swelling of the ankles was given, which had been intermittently present in the previous six years. An electrocardiogram revealed no definite myocardial infarction. Concurrently, the patient stated that she had been troubled with small painful swellings of the legs. These became red, did not break down, and after three weeks disappeared. These swellings had appeared in both legs and in both arms. The pain had been severe enough to cause loss of sleep. At the time of admission several such swellings were present, one of which, at the region of the right elbow, was removed for histopathological examination. The swellings recurred at irregular intervals, affecting the legs and arms indiscriminately. After recovery from particularly large and painful swellings a dimple resulted in the skin (see illustration).



The patient has been seen over a period of 18 months, and in that time has had several recurrences of nodules. On May 19, 1952, she was again examined and a large crop of lesions was seen, affecting both lower legs, three smaller lesions being present in the left forearm, and one on the palmar aspect of the right wrist. The lesions were variable in size, some were visible as purplish-red areas which on palpation could be identified as discrete nodules. Others

were palpable only. The distribution of the lesions was asymmetrical. There were none on the face, back, or neck, and there has been no evidence of suppuration. A low-grade pyrexia was present during each observed attack, but the general health has been moderately satisfactory.

The history, together with the typical lesions and characteristic microscopical appearances, confirms the diagnosis. Photographs were shown to Dr. Parkes Weber, who considered the appearances to be consistent with this diagnosis.

Histological examination revealed necrosis of the subcutaneous fat. The epidermis was intact and normal. The subcutaneous fat showed extensive foci of necrosis of the fat cells, these areas being replaced by groups of lipid-filled phagocytes. Some giant-cell reaction was seen, together with lymphocyte infiltration.

I am indebted to Dr. Alexander Smith, medical superintendent, Stonehouse Hospital, for permission to publish this case.

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Lymphosarcoma of the Appendix

Since Kundrat (1893) first described lymphosarcoma of the appendix many different names have been used to describe this condition. Ewing (1939) endeavoured to clarify the position by stating that lymphoid tissue contained three cellular elements—namely, lymphocytes, reticulum cells of the pulp and follicles, and endothelial cells of the pulp and cavernous sinuses. Thus he maintained that there were two possible types of sarcoma—a malignant lymphocytoma and a reticulum-cell sarcoma.

Lymphosarcoma can appear in the tonsils, lymph nodes, spleen, and thymus gland, and to a less extent in the lymph follicles of the gastro-intestinal tract. Geschlechter (1935) stated that sarcoma comprises 3% of all malignant growths of the gastro-intestinal tract—mostly lymphosarcoma. In his series of 46 lymphosarcomata 13 were in the stomach, 20 in the ileum, 10 in the caecum, 2 in the rectum, and 1 in the duodenum.

Our patient had a lymphosarcoma of the appendix, and we record the case to draw attention to the possibility of misdiagnosis as chronic appendicitis, which is so frequent and which may give rise to a false sense of security.

CASE REPORT

A man aged 38 was seen on May 17, 1950. He had a 10-year history of intermittent diarrhoea and vague abdominal discomfort, which during the last 12 months had become a more definite pain localized to the right iliac fossa. Examination revealed no abnormal finding except tenderness localized to the lower pole of the distended caecum. A magnesium sulphate barium meal examination on May 24 showed that the appendix failed to fill.

He was admitted to hospital on August 30. Routine questioning revealed that the pain in the right iliac fossa was a sporadic dull ache which occasionally radiated to the left side of the abdomen. During the previous month his appetite had diminished and his abdomen had become "swollen and tender." His bowels were regular, with a slight tendency to loose motions, during which the pain was accentuated. The pain was relieved by rest and codeine. His only relevant past history was migraine since the age of 16 and glandular fever at 32. His weight was 8 st. 8 lb. (54.4 kg.) and his temperature and full blood count were normal. Chest radiography revealed only a calcified focus at the left apex. On the day before admission the symptoms of pain and nausea became prominent, and it was thought that an acute attack might be supervening.

An operation was performed on September 1. Through a gridiron incision a bulbous-ended pear-shaped appendix 2½ in. (5.7 cm.) long was found lying retrocaecally, with a

hyperaemic base and a similarly hyperaemic caecum. The appendicular mesentery was thick, contained much firm fat, and was extremely vascular. On the serous surface of the organ there was a purplish discoloration close to the base, which was attributed to the local necrosis in the appendix. Post-operative convalescence was uneventful, and the patient was discharged on September 10. Section of the appendix showed replacement of the mucosa and submucosa by masses of lymphoid cells with penetration of the muscle coat in one area. The appearances were those of lymphosarcoma.

During the following 10 months he was seen on eight occasions by both of us. In November, 1950, his weight was 9 st. 4 lb. (58.9 kg.). His appetite has been good, his bowel action normal, and he has been in full active employment. The only clinical finding has been a slightly tender boggy caecum, without any lymphatic glandular enlargement. A barium meal examination and blood count were normal at this time and also in February, 1951. It is significant that tenderness in the right iliac fossa over what might be described as a thickened caecum and a fatty mesentery was still present. This tenderness does not seem to alter. In November, 1953, the patient was still in good health.

COMMENT

Charache (1934) reported a case of primary leiomyosarcoma of the appendix. He summarized 22 reported cases of sarcoma of the appendix. Every one of these cases was diagnosed only on histological section. Clinically the diagnosis was an appendicitis of one kind or another, and the cases were reported only because of the rarity of the lesion. Most of these 23 patients were in the first or third decade of life. The symptoms in all instances were referable to the right iliac fossa, but their duration varied between four weeks and a year, although in two cases there had been symptoms for 10 and 13 years. The occurrence of "attacks" was noticeable in seven cases, whilst in all but two of the remainder the attack persisted for several weeks or presented as acute appendicitis. One case was an incidental finding at necropsy in a man aged 55 who had died of cerebral haemorrhage. Bizard *et al.* (1938) recorded a case of a 27-year-old man who had a lymphoblastic sarcoma; a three-year follow-up showed that the patient was still well. Knox (1945) described a further case in a boy aged 4, a 15-months follow-up recording that the patient was then essentially asymptomatic.

In our patient an interesting feature was the 10-year history of vague and repeated abdominal upsets. Is it that the repeated subacute attacks of appendicitis had slowly altered the structure of the lymphoid tissue and that a gradual change took place from an inflammatory reaction to a state of malignancy? The attack of glandular fever is of particular interest: had it any influence on the presumed development of the sarcomatous change? Other questions may be asked. How many appendices are removed and never sectioned? What is the true incidence of sarcoma in the organ? Is a right hemicolectomy the correct treatment, or local excision followed by radiotherapy?

The prognosis seems to be about seven months. Three years is the longest period of freedom from recurrence that has so far been recorded.

Our grateful thanks are due to Mr. R. Vaughan Hudson, senior surgeon, Middlesex Hospital, for permission to publish this case; to Professor R. Scarff, director of the Bland-Sutton Institute of Pathology, for the section report; and to Sir Harold Graham Hodgson, director of the X-ray Diagnostic Department.

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Reviews

JOSEPH BARCROFT

Joseph Barcroft, 1872-1947. By Kenneth J. Franklin. (Pp. 381; 61 plates. 37s. 6d.) Oxford: Blackwell Scientific Publications. 1953.

Your reviewer took this book with him on a visit to the United States and Canada. Wherever it went (and it will do the same in many other countries) it recalled affectionate memories and stories of J. B., of his humanity, gaiety, and wit, of his scientific skill, persistence, and imagination. Dr. Franklin had special qualifications for writing it, not only by his facility in historical studies (physiologists the world over are grateful to him for his history of the physiological congresses, prepared for the Zurich meeting in 1938), but also by his long association with Barcroft's work on foetal circulation. Franklin has tapped many sources and drawn on memories or photographs by many friends for his material; but largely also on the diaries and records of Lady Barcroft, J. B.'s perfect partner, to whom "with admiration and affection" the book is justly dedicated. It is faithful in fact and emphasis, as befits its author's scholarship, but it is a tribute also of world-wide admiration and affection for its subject.

Starting with the Barcroft family in Lancashire in the thirteenth century and in Northern Ireland from the seventeenth, Franklin brings us in Chapter II to The Glen at Newry, Co. Down, where J. B. was born, and from where he learnt his love of boats, sailing in sight of the Mourne Mountains in Carlingford Lough. Thence in Chapter III we are led to Cambridge, where for fifty-five years his life was based. Chapter IV deals with the fruitful period which includes his first expedition to high altitude (Teneriffe). Chapter V covers the second such expedition (Monte Rosa) and the publication (1914) of *The Respiratory Function of the Blood*. It contains the story of J. B.'s part in the first German war, starting with the use of chlorine in the second battle of Ypres in 1915, and mentions the characteristic reply to Quaker friends, "I thought of the parable of the Good Samaritan and obviously I did not want to pass by on the other side." The side he took led to courageous experiments on himself and to a continuing association, lasting into the second German war, with methods and problems of chemical warfare and defence. Could not a Quaker be an Irishman, too?

Chapter VI contains the account of J. B.'s experiments at Cambridge under reduced oxygen pressure and of his third expedition to high altitude (Peru). Few achievements are due to one man only, but the knowledge which gave conviction that oxygen should be used in the final assault on Everest can be attributed as much to J. B. as to any other man. How glad he would have been to hear of its success. Chapters VII and VIII deal with the period of his professorship at Cambridge, Chapters IX to XI with the 10 years, no less fruitful, after he had "retired." Then comes a list of his publications (some 400 of them) mostly jointly with colleagues. He had a remarkable capacity for setting other people to work.

The book is illustrated with many attractive photographs, most of them informal, of J. B. and his colleagues, including a supremely good one of him lecturing in 1935 (Plate 49). These may mean less to those who did not know him personally, but they will add very greatly to the pleasure and interest of his friends.

A reviewer would not be treated seriously if he found no mistakes. In what sense (p. 286) had Japan been "our enemy" since July, 1941? And it is well known to his friends how Dr. D. P. O'Brien celebrated the attack on Pearl Harbour at the Athenaeum Club, not in America; while Houssay's initials are B. A. and not A. E. Apart from these, your reviewer has no complaints.

A. V. HILL.

THE CANADIAN MEDICAL SERVICES

Official History of the Canadian Medical Services: 1939-1945. Edited by W. R. Feasby, B.A., M.D. Volume 2: Clinical Subjects. Published by Authority of the Minister of National Defence. (Pp. 537; illustrated. \$5.) Ottawa: Edmond Cloutier. 1953.

The official history of the Canadian Medical Services is to comprise two volumes, the administrative and the clinical. Though issued first in time, this account of the clinical subjects is to form the second of the two volumes. It is published earlier because, as the editor wisely states, "If any useful medical knowledge were to be shared with others as a result of a war, it was felt that it should be set forth as quickly as possible."

This volume not only deals with both medicine and surgery, but it gives four chapters to research carried out in the Services, and no less than a quarter of the book is devoted to statistics. In order to cover such a wide field within a relatively small compass "the accounts leave out the usual details and touch only on the subjects which were new and in which advances were made." This has the advantage that the reader can quickly learn the main lessons of the war, but probably many would have liked a little expansion of some of the articles. Some articles are signed, some unsigned; in the latter the opinions expressed are for the most part authoritative and the result of consultation between experts. It is interesting to note that orthopaedic surgery was not recognized as a separate specialty by the Canadian Army, and a statement is made which might well provide matter for discussion: "No one can say that it would have been better if this specialty had been recognized." There is a good account of the discovery and development of penicillin and of the important part played by the Connaught Research Laboratories in the large-scale manufacture of that substance. We should have liked to see the pioneer work of Guttman mentioned in the section on rehabilitation of spinal cord injuries. The editor is to be congratulated on the way in which he has marshalled the material at his disposal. The book is well produced.

ZACHARY COPE.

LONG-TERM DIABETES

Long-Term Diabetes: The Clinical Picture in Diabetes Mellitus of 15-25 Years' Duration, with a Follow-up of a Regional Series of Cases. By Knud Lundbaek. Ophthalmological Section in collaboration with Professor V. A. Jensen, M.D., Copenhagen. (Pp. 197; illustrated. 32 Danish crowns.) Copenhagen: Ejnar Munksgaard. London: Lange, Maxwell and Springer. 1953.

Since the discovery of insulin in 1922, diabetics have lived longer, and it is only in recent years that it has been possible to assess the various complications which may develop in diabetics of many years' standing. "Long-term diabetes," as Knud Lundbaek calls it, is an important syndrome, and by its study much can be discovered and a greater understanding obtained about the fundamental disorders in the syndrome of diabetes.

This book enumerates the findings of exhaustive examination in a follow-up of 165 live and 69 dead diabetics, who had had diabetes 15 or more years, and who had resided in a Danish municipality of about 115,000 people some time during the years 1924 to 1950. Every abnormality and complication occurring in this series of cases has been carefully recorded and discussed under its appropriate heading of disorder or system affected. Each has been preceded by a very complete review of the world literature on the subject, with no fewer than 309 references, covering the whole field of research in these subjects.

Such a detailed analysis must, of necessity, make for heavy reading, but the completeness of the work compensates for this. The bibliography alone is useful, quite apart from the extremely interesting results, which are much in accord with the views of other workers elsewhere. The observations are sound and the conclusions fair and reasonable, none being extravagant. Although not for the student,

this book should prove of value and interest to all those interested in the study of diabetes. Every possible long-term complication of diabetes is carefully described and its incidence recorded. The book is an excellent, painstaking piece of work.

JAMES ROBERTSON.

CONGENITAL HEART DEFECTS

Congenital Abnormalities of the Heart and Great Vessels. By Maurice A. Schnitker, M.D., F.A.C.P. (Pp. 306. £3 3s.) London: Oxford University Press (Geoffrey Cumberlege). 1953.

There is much to commend here. But one may first of all deplore the small number of illustrations. Some of those which should enliven the development of the heart are sure to obscure it, particularly figures 5 and 6; the formation of the interatrial septum should be well and clearly shown. To make up for this the pictures of aortic abnormalities are good, and the lack of diagrams showing development of the heart is not felt so much because the account is so clear; it is indeed one of the best I have read. There is a very good chapter on cyanosis and also finger-clubbing. The section on the use of the cardiac catheter is clear and practical, the objects and the risks being well set out. The author describes the various types of lesion in the traditional three groups of acyanotic, late cyanotic, and cyanotic; perhaps it is time for a new and better classification, but in any case many would question whether defects of the aorta should come under the cyanotic type.

The bronchial arteries get very little attention and are not listed in the index. There is not one x-ray photograph. This is a serious fault, for the evidence given by the skiagram on the flow of blood to the lungs is important. Pulsation of the hilar vessels needs more consideration. The point that will interest most readers is the part played by surgical measures in alleviating these defects. This is well and sensibly described. Apart from the omissions mentioned above, this book reads well and provides a clear and up-to-date presentation of the subject.

TERENCE EAST.

MONGOLISM

Mongolism: A Clinicogenetical Investigation Comprising 526 Mongols Living on Seeland and Neighbouring Islands in Denmark. By Jakob Øster. (Pp. 206. Danish Kr. 21. U.S. \$3.) Copenhagen: Danish Science Press. 1953.

This monograph is one of the series of clinical and genetic studies of individual abnormalities that are coming from the Institute of Human Genetics at Copenhagen. Like all these monographs, it is a thorough study based on large numbers. In this case over a thousand mongols were ascertained in three counties of Denmark between 1929 and 1949, and 562 were still alive. No definite new conclusions about mongolism emerge from the study, but even so the work has considerable interest.

The incidence of mongolism is put at about 1 in 600 births. The diagnosis can be made only by finding that a child has several of the signs which are common in mongolism. The author's table of the frequency with which different signs were found is most instructive. He notes, however, that even if one takes the ten best signs there are still children with only two or three of them who are indubitably mongols. The book appears to have been written in 1951, and the author did not use Penrose's useful contribution of a precise method of measuring the abnormality of the dermal ridges of the palms. The author includes mental deficiency in his criteria for diagnosis and so side-steps the interesting point whether an occasional mongol may have average or even above-average intelligence.

It is agreed that there is no specific treatment but that every effort must be made to educate the child to make the best social adjustment it can. In discussing aetiology the author notes the usual finding that mongols become

commoner as the mother gets older. He also found that the interval before and after the birth of a mongol child is unduly long when compared with intervals before and after births of the same order in other families where there is a mongol. But he does not appear to have allowed for the effect of maternal age on fecundity or the natural reluctance of a mother to start another pregnancy after the birth of a mental defective. There was no consistent history of maternal disease early in the pregnancy which gave rise to a mongol. There was, too, only a low incidence of mongolism among the brothers and sisters of mongols. Unfortunately, in contrast to the usual practice in monographs from the Copenhagen Institute, the sibships are not set out in detail except for the five in which a sib is also a mongol and the one in which a half-sib is also a mongol; and the section discussing the sibships is confused and perhaps mistranslated. It appears that 6 of the 354 children born alive after a mongol were also mongols. It is not stated which was the index case in these sibships, but, even if the first mongol in the sibship was always the one ascertained, this gives a low proportion of subsequent children affected, perhaps not significantly greater than the chance expectation. The references given at the end are very comprehensive up to 1951, and the list will be welcome to all who study mongolism.

C. O. CARTER.

CLASSICS IN DERMATOLOGY

Classics in Clinical Dermatology: With Biographical Sketches. By Walter B. Shelley, M.D., Ph.D., and John F. Crissey, M.D. Introduction by John H. Stokes, M.D. (Pp. 485; 111 illustrations. 75s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

It is always pleasant and profitable to live with the masters both old and new. This is particularly true for the clinician, whose masters are those men whose ability, curiosity, and observations, combined with lucid exposition, have done most to advance the art of clinical medicine. The authors of this volume present pertinent extracts from about 150 original papers from 90 eminent dermatologists past and present. They divide the contributions into four periods, the early and middle periods, a golden age from Dühring to Caesar Boeck, and finally more recent observations from such masters as Brocq and Darier, Jadassohn and Bloch, Fox and Parkes Weber. A brief but adequate biographical note on each master precedes the extracts from original contributions, and it is not difficult to get a picture of the man as well as an accurate account of his observations. The abstracts are meant to reflect the enthusiasm and temperament of the authors. The book starts with the observations of Robert Willan, a Yorkshireman and the father of dermatology, and ends with those of John O'Brien, an Australian and perhaps dermatology's youngest son.

Dr. Shelley and Dr. Crissey must have derived great satisfaction as well as instruction from these researches, and dermatologists will be grateful for this easy and useful work of reference. The authors do not pretend that it is a complete account of all the great names in dermatology, as indeed it is not, though it is well proportioned and a valuable addition to the history of dermatology.

It is to be hoped that further editions may enlarge the work. It would be interesting to read Civatte's description of poikilodermie beside the excellent report of Riehl's melanosis, and to find such names as Sabouraud, Rasch, Haxthausen, and Whitfield in the list, to name only a few who would further enrich the book.

It is well and attractively produced on good paper, with hardly a printing error. There are more than 100 illustrations of dermatologists and of the affections they describe. The literary value of the contributions, especially of the older masters, is in such contrast to that of much modern medical literature that students might well be directed to the book for this as much as for its historical interest.

I. T. INGRAM.

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CORTISONE AND INFECTION

Cortisone has moved with astonishing speed from pharmacological curiosity to therapeutic stand-by, and much is now known about its secondary ill-effects. In the course of treatment they need constant attention. The most important of them in practice is the drug's tendency to promote infections. This action is as difficult to understand as some of its therapeutic actions. Now a useful review of the evidence comes from Lewis Thomas,¹ of the University of Minnesota, and not the least important part of it is his demonstration that several apparently obvious explanations fail to fit the known facts. The most notable fact is the width and non-specificity of the action. We are used to antibiotics of wide range, but no drug has a range of favourable action at all comparable to cortisone's range of unfavourable action. It seems that, whenever cortisone has been administered to a vertebrate host parasitized by an invertebrate, the course of events has been altered to the detriment of the host. This may be obscured by the symptom-masking effect of the drug, so much so that some of the earlier publications reported clinical improvement.^{2,3} These were soon shown to be illusory, and it is now fairly well established that all the common bacterial infections are enhanced, including those with spirochaetes and the tubercle bacillus. The effect is the same with viruses, a fungus,⁴ and protozoa. The effect on helminths remains slightly doubtful, though a clear answer to the disputed effect⁵ in trichiniasis seems to have come from Stoner and Godwin,⁶ who found

increased susceptibility in mice. So far as the host is concerned, cortisone has been shown to promote infections of one sort or another in man and all the ordinary experimental mammals, though the only non-mammalian host for which any data are available is the chick embryo.

This striking breadth of effect might be compared to that of gross malnutrition or of sublethal doses of whole-body irradiation, but these both produce many diverse changes in the host: cortisone enhances all infections in an otherwise fit animal. This suggests that the defence mechanisms of the body, which often seem so diverse in combating different parasites, all have something in common—that the tree has a single trunk to which cortisone lays the axe. Thomas examines six mechanisms by which cortisone might possibly act, on the worthwhile assumption that only one is needed to account for all the various manifestations. He first considers the possibility of a direct action on the organisms. For this there is no experimental evidence, and *a priori* it is improbable that any single substance would directly stimulate the growth of so exceedingly diverse a group of organisms. Secondly, he considers the possibility of a direct effect on polymorphs, and this it seems can be as quickly dismissed, for they are not concerned in the defence against most fungus, virus, and protozoal infections. It may be difficult to deny to cortisone some effect on polymorphs, but evidence from many independent studies (Rebuck and Mellinger's⁷ is worth special notice) shows that they are the least affected of all the better-known elements of the inflammatory reaction. A third possibility seems plausible at first. The capacity of cortisone to suppress, reduce, or delay the formation of antibodies is well established and applies to a wide variety of antigens.⁸⁻¹² Certainly there must be circumstances under which this is important. Yet cortisone enhances virus infections in the chick embryo, in which no antibodies are produced. Again, the effect is often so rapid as to preclude any possibility of involvement of antibody reaction. If, fourthly, we consider the local defence mechanisms, we find ourselves in similar difficulties. Local inflammatory responses are hindered by cortisone,¹³ and no doubt this action must sometimes be important, but it cannot account for cortisone's capacity to enhance all infections. Most specifically, it cannot account for the promotion of septicaemia after intravenous injection of organisms, where no local inflammation has occurred. There are several naturally occurring generalized infections in which no stage of local reaction at the point of entry or elsewhere can be

¹ Thomas, L., *Ann. N.Y. Acad. Sci.*, 1953, **56**, 799; see also *Ann. Rev. Med.*, 1952, **3**, 1.

² Finland, M., et al., *Proc. First Clin. A.C.T.H. Conf.*, 1950, p. 529.

³ Snadell, J. E., et al., *Ann. Intern. Med.*, 1951, **34**, 10.

⁴ Cavallero, C., and Sala, G., *Lancet*, 1951, **1**, 175.

⁵ Rosen, E., *Amer. J. med. Sci.*, 1952, **223**, 18.

⁶ Stoner, R. D., and Godwin, J. T., *Amer. J. Path.*, 1953, **20**, 943.

⁷ *Ann. N.Y. Acad. Sci.*, 1952, **56**, 715.

⁸ Germuth, F. G., and Ottinger, B., *Proc. Soc. exp. Biol. (N.Y.)*, 1950, **74**, 815.

⁹ Fischel, E. E., et al., *ibid.*, 1951, **77**, 111.

¹⁰ Billingham, R. E., et al., *British Medical Journal*, 1951, **1**, 1157.

¹¹ Robinson, H. J., and Smith, Amelia L., *Ann. N.Y. Acad. Sci.*, 1952, **56**, 756.

¹² Carrère, L., and Roux, J., *Ann. Inst. Pasteur*, 1952, **83**, 26.

¹³ Duke-Elder, S., and Ashton, N., *Brit. J. Ophthalmol.*, 1951, **35**, 695.

traced, and yet cortisone enhances them. Fifthly, various serum components are known or suspected to take part in defence against infection—complement, preformed antibodies, C-reactive protein, hyaluronidase inhibitor, and others. Little relevant is known of most of them, but it is unlikely that any are of importance here.

Finally we come to the sixth hypothesis—a direct effect on the cells of the reticulo-endothelial system. The R.E. system clears particulate matter from the blood, and there is no doubt it plays some part in practically all infections. Critics may object that the details of the local effect remain vague; and it seems, at least to the histologist, that the brunt of the action of cortisone on the lymph nodes and spleen falls on the lymphoid elements rather than on the phagocytic. But here Thomas presents some interesting experiments. If this sixth hypothesis is true, other methods of damaging the R.E. system should have the same effect as cortisone. The only available method—that of “blockade” by overloading the system with injected material—is of doubtful value, but in this case it seems to have been used effectively. Thorotrast and saccharated iron were used as blocking agents. In animals treated with them three close parallels with the effect of cortisone were found. First, both blockade and cortisone interfere with the clearance of particulate matter from the blood, whether the particulate matter is colloidal gold or streptococci. Secondly, both promote the dissemination of streptococci and pneumococci, injected intradermally in doses normally giving rise only to localized infections. Thirdly, both promote the absorption of meningococcal toxin injected intradermally. The first of these effects might well have been expected, but that R.E. blockade should have so striking an effect on local defences and on toxin absorption was *a priori* unlikely and affords strong evidence that cortisone and blockade are acting in the same way. While these experiments seem convincing, independent confirmation is needed. The effect of cortisone on the host-parasite relationship may after all prove to be simply the summation of a number of independent mechanisms concerning antibodies, tissue permeability, phagocytosis, and others, all of which happen to work in the same direction. On the other hand, it may be something more fundamental—a differential effect, perhaps, on the protein metabolism of vertebrates and invertebrates. Even if its effect on the R.E. system is the explanation, many questions remain to be answered. To most people the practical therapeutic problem will seem of chief importance, for a method of preventing the infection-

promoting action of cortisone, other than the blunderbuss one of combining it with antibiotics, would be a major advance. Thomas's work opens up at least the possibility of an approach to this.

THE SPREAD OF CANCER

In both Britain and North America, in spite of modern methods of treatment and intensive efforts to secure early diagnosis, breast-cancer mortality rates for defined age groups maintain an almost constant level.¹ The reason for this is that with few exceptions the early dissemination of tumour cells which later produce metastases defeats all forms of local therapy, even when this is applied promptly and efficiently. Metastasis is indeed the sinister shadow hanging over the treatment not only of mammary cancer but of many other kinds of cancer also. The thorough study of metastasis by every possible means—morphological, experimental, and chemical—should therefore be a major part of cancer research. Willis² has stressed this view in these words:

“Elucidation of the chemical and other factors which determine the success or failure of disseminated tumour cells to survive and grow in new sites might assist in the search for effective chemotherapeutic agents. The great series of grafting experiments already performed for us in the dissemination and metastasis of tumours is thus worthy of close study; this should be supplemented by experimental investigations of metastasis.”

In the opening pages of this issue we publish Professor G. R. Cameron's Florence Blair-Bell Memorial Lecture. In this he discusses recent work and speculation on the subject of the spread of cancer, with special attention to the high incidence of metastatic tumours in the liver. These are, for most kinds of primary growths, not only more frequent and abundant than metastases elsewhere, but they grow more actively and show higher proportions of cells in mitosis. Abortive tumour embolism, which is often seen in the lungs, is very uncommon in the liver. The “seed-soil” concept of tumour metastasis is thus particularly germane here. Before turning to the liver as a site of metastasis, Professor Cameron broadly reviews the known facts about the invasive properties of tumour cells, and then discusses the various hypothetical factors which may be concerned in rendering a given tissue a fertile or a poor soil for neoplastic growth—blood supply, oxygenation, nutritional properties, possible defence mechanisms.

¹ McKinnon, N. E., *Lancet*, 1954, 1, 251.

² Willis, R. A., *Pathology of Tumours*, 1953, 2nd ed., London, p. 206.

³ Paget, S., *Lancet*, 1889, 1, 571.

metabolic qualities of host and tumour cells, and competition between tumour cells and organ parenchyma.

If, as seems certain, chemical factors are important in the development of blood-borne secondary growths from disseminated tumour cells, the explanation of these will probably come from a study of metastasis in the liver; and to this study histopathologists, experimentalists, and chemists have each their essential contribution to make. There has been a tendency in recent years for some experimentalists to belittle the value of morbid anatomy—“dead-meat” pathology—and to suppose that little remains for it to contribute to knowledge of disease processes. Professor Cameron, himself an expert morbid anatomist as well as an experimentalist, provides here a timely reminder of the mistakenness of this view. His arguments embrace and depend on morphological and experimental data in equal measure and clearly exemplify their interdependence and complementary character. It was morbid anatomical observations, like those early ones of Stephen Paget³ in 1889, which first pointed to the anomalous distribution of metastatic growths in the body; and it is similar more thorough observations, aided by improved microscopical and staining techniques and by phase-contrast and electron microscopy, which can provide the essential structural basis for progress in our understanding of the fate of disseminated tumour cells in various tissues. It may well be true that pure morphological pathology, unilluminated by controlled experiment, may not be capable of solving these problems, but it is also true that the pure, experimentalist may be equally incapable of their solution. It is by a well-balanced union of both disciplines, so well exemplified in Professor Cameron's exposition, that light will be gained on these and many other obscurities in tumour pathology.

SHIVERING

The cold spell has led to embittered reflections on the deficiencies of British thermal engineering, and consoling thoughts about the perfection of the physiological mechanisms that are brought into play when the body is submitted to thermal stresses have brought little comfort. If a naked man lies at rest in a cold environment, certain acts of “physical thermoregulation” immediately come into play, all with the function of reducing the loss of heat from the surface of the body to a minimum. For example, as a result of the constriction of the cutaneous vessels the skin temperature falls and the rates of evaporative, convective, and radiation losses are minimized. The

remarkable feature of this response, where man is concerned, is that there is no increase in heat production, so that if these physical adjustments are inadequate to prevent a sustained negative heat balance the whole body cools. When the temperature of the blood has fallen by about 0.5° C., further cooling is arrested by the onset of shivering, a rhythmical, well-coordinated contraction of the voluntary musculature that may increase the total heat production of the body by as much as 400%.

A cat's love of warmth is only too obvious, yet its owner who remorselessly lifts it from the hearth and turns it out for the night in the coldest weather is never worried whether it will catch a chill; his confidence is fortified, moreover, by observing, on its return in the morning, that it is not shivering but only very hungry. The cat, in common with other lower animals and birds, possesses, in addition to its powers of regulating heat loss—physical thermoregulation—a so-called mechanism of “chemical regulation” whereby its metabolism is very delicately adjusted to the thermal demands of its environment. It is presumably this chemical regulation, acting together with restricted heat loss through pilo-erection and vasoconstriction, that permits a cat to withstand such a sudden drop in external temperature without shivering. Man, as we have said, does not exhibit this nice adjustment of his metabolic rate to the environmental demands; instead, mechanisms to restrict the loss of heat (both physiological and artificial, such as the wearing of clothes) have been brought to a high degree of efficiency, and only as a last resort is an increase in metabolic rate invoked—that is, with the onset of shivering.

Shivering therefore appears as a delayed mechanism, only being brought into play when the physical mechanisms restraining the loss of heat from the body have failed to establish a balance of heat production and heat loss at the normal blood temperature; it is thus only one of several physiological mechanisms at the disposal of higher reflex centres concerned with the function of thermoregulation. The neurological aspects of these centres have not been completely elucidated; in lower animals a heat-sensitive centre, stimulation of which leads to vasodilatation, panting, and sweating, has been described in the anterior hypothalamus; stimulation of the lateral hypothalamic area, on the other hand, causes vasoconstriction and pilo-erection, but no shivering. There would thus appear to be two separate reflex centres in the hypothalamus, the one evoked by heat and the other by cold.

The nervous control of shivering, which is not evoked by stimulation of the hypothalamus, is not entirely clear; the other responses to cold are essentially visceral, and it is not surprising that they are under the control of the hypothalamus, a region so closely associated with autonomic function. Shivering is a reflex involving the voluntary musculature, and might be expected to be controlled by centres concerned with somatic activity; according to Beattie and Kerr the centre lies in the caudal half of the medial portion of the thalamus. That the cortex is also involved is

suggested by the work of Aring, who found that primates with lesions in area 4—the somatic motor area—began shivering long before there was any drop in rectal temperature. A lowered blood temperature would appear to be the usual effective stimulus to evoke the shivering reflex; but it may also be evoked by locally applied cold insufficient to lower the blood temperature, and this is presumably mediated by a reflex arc involving, as sensory pathway, the cold receptors and spinothalamic tracts.

The usual concomitants of fear—such as sweating, pilo-erection, vasoconstriction, etc.—may be described as a hypothalamic syndrome released by higher activity, presumably in the frontal cortex. It is interesting that shivering is associated in this complex, because, although it is not a form of autonomic activity, it is released at the same time, thereby showing the close relationship that must exist between the hypothalamic centres of thermoregulation and the thalamic centre controlling shivering. The shivering of fever is only an apparent anomaly: the body temperature is high, but this is a purposive response to an invading pyrogenic agent and would be defeated if the thermoregulatory cooling mechanisms were called into play; instead the warming mechanisms are invoked, among which the most effective is shivering.

THE HAND

In these days of increasingly complex and specialized techniques it is refreshing to be reminded from time to time that good medical practice still depends largely on careful clinical observation. Silverman and Littman,¹ reviewing the value of examination of the hand from the point of view of the cardiologist, have drawn attention to the excessive palmar sweating so often seen in patients with the effort syndrome. Increase in the secretion of sweat from the hand is one of the most constant physical manifestations of emotional tension, a fact made use of in the construction of "lie-detector" machines and similar apparatus used in psychological investigations, and it is a common clinical finding for example in thyrotoxicosis. Pallor of the palm is regarded by many clinicians as more reliable than mucosal pallor as a sign of anaemia, and Wintrobe² states that absence of redness in the palmar creases indicates a haemoglobin level below 7 g. per 100 ml. The orange-yellow pigmentation of carotinaemia may be almost confined to the palms and may direct attention to bizarre dietary habits. The cold, harsh, dry hand of myxoedema is well known; more easily missed perhaps is the palmar hyperkeratosis which may reveal chronic arsenical poisoning, particularly when it is accompanied by the typical pig-

mentation. Of particular interest is the condition sometimes seen in pregnant women and in patients with chronic liver disease—namely, a bright red colour of the palms, usually most intense in the hypothenar eminence and central part of the thenar eminence but sometimes seen also on the palmar surface of the finger-tips, in association with arterial "spiders" over the upper half of the body. It is attributed to the high oestrogen levels which occur in these two conditions.

Cirrhosis of the liver is also one of the less common causes of clubbing of the fingers, one of the oldest of physical signs but still one of the most obscure. An increased peripheral blood flow was found by Mendlowitz³ in patients with clubbing; and Lovell⁴ believes that this leads to an increase in connective tissue, the localization in the distal finger segment being attributed to the predominance there of arterio-venous communications. But the cause of the increased blood flow remains unexplained. The full syndrome of pulmonary osteoarthropathy, which in its early stages is occasionally mistaken for rheumatoid arthritis, is seen most often in patients with bronchial carcinoma and undergoes regression after successful resection of the affected lung. One of the most helpful signs in the fingers is koilonychia, which was shown by Waldenström⁵ to be usually a direct effect of iron deficiency. Osler's nodes in the pads of the fingers are almost pathognomonic of subacute bacterial endocarditis, but splinter haemorrhages occur quite often also in other diseases, being seen for example in most patients with trichinosis.^{6,7} Another disease associated with Osler's name, hereditary telangiectasia, may be suggested in a patient with mucosal bleeding by purplish, round, sharply circumscribed lesions in the finger pads or nail bed; microscopically these are seen to consist of tortuous coils of tiny aneurysmal vessels. Finally, the familiar Heberden's node has recently been given more precise significance by Kellgren and Moore,⁸ who regard it as forming part of a constitutional syndrome they have called primary generalized osteoarthritis, which mainly affects middle-aged women and can be distinguished clinically from the degenerative arthropathies.

VIOMYCIN

No antibiotic hitherto discovered is the equal of streptomycin in activity against the tubercle bacillus, but there are certainly two with somewhat less activity which may be turned to practical account. Terramycin has been used in combination with streptomycin on the principle that combined therapy delays the development of resistance, one object in view being to substitute it for P.A.S. in patients intolerant of that drug. The findings of Des Autels¹ in a limited number of cases encourage this policy; after a 120-day course of streptomycin given twice weekly, streptomycin-resistant bacilli were found in 17% of patients also given P.A.S. and in only 5% of those also given terramycin. The other antibiotic of secondary usefulness is viomycin, earlier studies of which have previously been referred to in these columns.² This drug has chiefly been used

in a different way—namely, as a substitute for streptomycin when bacillary resistance to the latter has developed. In the very unfavourable cases in which it was first tried little benefit was obtained, and a rather forbidding triad of toxic effects was observed—disturbances of the eighth nerve, the kidney, and the plasma electrolytes.

Despite these unfavourable initial findings, and because they could be discounted by the unpromising nature of the clinical material and perhaps by the excessive dosage used, a trial of viomycin was instituted in the Veterans' Administration (U.S.A.) study of the chemotherapy of tuberculosis, the results of which have been described in two reports.^{3,4}

It was decided in the first place to reduce the dose of viomycin to 2 g. twice weekly in the hope of minimizing toxic effects, and on the basis that streptomycin given as infrequently as this has proved effective. The three regimens adopted were viomycin alone and together with either 1 g. streptomycin twice weekly or 12 g. P.A.S. daily, the duration to be at least four months. Of the patients chosen for treatment the great majority had had previous streptomycin treatment and had streptomycin-resistant bacilli: 93% were classified as far advanced and the remainder as moderately advanced; all had cavities and all were sputum-positive at the start of treatment. The drug caused toxic effects in 24% of patients, and in 13% the treatment had to be discontinued on this account. Some clinical improvement was produced in 34%, and moderate or marked improvement in 17%, of the patients on combined regimens. The corresponding figures for viomycin alone were 14% and nil. Combination with another drug thus gave clearly superior results, and this difference is also reflected in the numbers of patients whose condition deteriorated during treatment, which were 24% of those on viomycin alone and only 7% on combined treatment. Sputum conversion did not show this difference, occurring in about 15% of each group. Acquired bacillary resistance to viomycin developed to a maximum of about 40% of cases after longer periods of treatment, and was rather commoner in patients receiving this drug alone.

These are not impressive results, but they must be interpreted with due regard to the unpromising clinical material on which they are based. Patients in whom treatment with streptomycin has failed to arrest the disease can naturally not be expected to respond invariably to another and somewhat less potent drug. On the other hand it clearly has a place in the treatment of such patients, provided the disease is not too far advanced. A recent communication from the Ministry of Health states that limited quantities of viomycin will soon be available for use in N.H.S. hospitals only. It is accompanied by a memorandum of instructions for use, advocating the bi-weekly 2-g. dose used in the

American study, combined with streptomycin, P.A.S., or isoniazid "as dictated by the drug resistance position."

THE ORGANS OF ZUCKERKANDL

The medulla of the adrenal gland, which contains adrenaline and also a small proportion of noradrenaline, is described as chromaffin tissue because it stains with potassium dichromate. This stain depends on the formation of brown pigments by the oxidation of the adrenaline, and other oxidizing agents give the same stain. It has long been known that chromaffin tissue occurs in the body outside the adrenal gland, and in 1901 Zuckerkandl¹ described the presence of a mass of cells of this kind on the anterior surface of the aorta near the origin of the inferior mesenteric artery. Two years later Kohn² showed that these cells originated, like the cells of the adrenal medulla, from the neural crest. This collection of cells on the aorta has since been known as the organ or organs of Zuckerkandl. They are normally not present in the adult, and in 1925 Ivanoff³ stated that they reach their greatest development in children aged 12–18 months, after which they become fibrosed and atrophic.

West, Shepherd, Hunter, and Macgregor⁴ have recently compared the changes which take place during foetal life and after birth in the organs of Zuckerkandl with those in the adrenal medulla, making both pharmacological and histological examinations. Their general conclusion is that the organs of Zuckerkandl are the main site of formation of noradrenaline in foetal life, during which the adrenal medulla is immature. They examined the organs of Zuckerkandl and the adrenal medulla collected from a series of subjects 6–48 hours after death. Histologically the organs are mature at about twenty-two weeks of gestation, and from then do not change until some months after birth. At about 8 months after birth there is a decrease in vascularity and in the size of the cells and an increase in fibrous tissue. The adrenal medulla, on the other hand, begins to develop only after birth. The pharmacological investigation showed that the amount of noradrenaline increased steadily in the organs of Zuckerkandl from 15 weeks up to 2 months after birth, the total being appreciably greater than that in the adrenal medulla during this period. Thereafter the amount in the organs declined and that in the medulla shot upwards.

Perhaps the most important aspect of this work is the indication that tumours of the organs of Zuckerkandl may occur and lead to repeated hypertensive crises in the same way as tumours of the adrenal medulla. These can be successfully diagnosed by the amount of noradrenaline present in the urine. The surgeon who then fails to find an adrenal tumour should inspect the area of the organs of Zuckerkandl. Engel and Euler⁵ have already reported one case.

¹ *New Engl. J. Med.*, 1953, 249, 839.

² *Clinical Haematology*. Philadelphia. 1951.

³ *J. clin. Invest.*, 1941, 20, 113.

⁴ *Clin. Sci.*, 1950, 8, 299.

⁵ *Acta med. scand. Suppl.*, 1938, 90, 380.

⁶ McNaught, J. B., *Amer. J. trop. Med. Hyg.*, 1939, 19, 181.

⁷ Houston, J. C., and Ross, L., *Lancet*, 1941, 2, 397.

⁸ *British Medical Journal*, 1952, 1, 181.

¹ *Transactions of the 12th Conference on the Chemotherapy of Tuberculosis*, p. 304. Veterans' Administration, Washington. 1953.

² *British Medical Journal*, 1951, 1, 686.

³ *Transactions of the 12th Conference on the Chemotherapy of Tuberculosis*, p. 300. Veterans' Administration, Washington. 1953.

⁴ *Quarterly Progress Report on Chemotherapy of Tuberculosis*, p. 84. Veterans' Administration, Washington. October, 1952.

¹ *Anat. Anz.*, 1901, 19, *Erganzungsh.* 95.

² *Arch. mikr. Anat.*, 1903, 62, 263.

³ *Z. Anat. EntwGesch.*, 1925, 77, 234.

⁴ *Clin. Sci.*, 1953, 12, 317.

⁵ *Lancet*, 1950, 2, 387.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

LABORATORY INVESTIGATIONS IN THE DIAGNOSIS OF IRON-DEFICIENCY AND SIMPLE CHRONIC ANAEMIA

BY

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Iron-deficiency anaemia occurs when the body gains iron more slowly than it should to provide for the needs of growth or to compensate for loss by haemorrhage. Only this factor of iron balance is of importance, so that nutrition enters into consideration only in so far as the food contains iron. Once iron deficiency has been demonstrated the laboratory tests to be used will be those which detect imperfect absorption of iron or loss of iron—that is, bleeding. It is easy to demonstrate iron deficiency, but not so easy to demonstrate its precise aetiology. The diagnosis of iron deficiency is complete only when the relative importance of growth, iron absorption, and blood loss have been assessed and when the site of blood loss is known. Every pathologist has performed necropsies on patients with carcinoma of the colon who had been treated for months for their iron-deficiency anaemia—treated without investigation until their resectable carcinoma had metastasized. It would be, of course, impossible to investigate exhaustively every patient, so the choice of investigation must depend on knowledge of the natural history of iron-deficiency anaemia.

Iron deficiency occurs during the first six months of life in premature infants, whose parasitism on their mother is cut short before they have obtained all the calcium and iron they need: the anaemia is more severe the more premature the birth. Childhood is usually free from iron deficiency, unless nose-bleeds are very severe, or bleeding occurs from peptic ulcer in a Meckel's diverticulum, or a peptic ulcer develops in a hiatus hernia. The menarche may lead after a few years to chlorosis in a young woman whose dietary fads are more extreme than usual; each pregnancy costs the mother at least 300 mg. of iron—a year's absorption from food (and bleeding from peptic ulcer in a hiatus hernia is commoner in pregnant women than in other subjects); and an abortion may cause even greater losses. In the fourth and fifth decades fibroids cause menorrhagia and absorption of iron is less because achlorhydria becomes common. Throughout adult life, in men as well as women, peptic ulceration and piles contribute to anaemia, and from the fifth decade malignant disease of the gastro-intestinal tract must always be considered. There are other causes of blood loss, such as ulcerative colitis, Crohn's regional ileitis, diverticulitis, and tuberculous ileitis, but in these anaemia is rarely the presenting symptom.

Iron deficiency is usually accompanied by some reduction in haemoglobin level, to 12.4 g. (80%) or below, but one occasionally sees anaemic polycythaemia with haemoglobin levels of 100% (14.8 g.) or more, though iron deficient.

Recognition of Iron Deficiency

Estimation of haemoglobin and of packed cell volume allows the calculation of the mean corpuscular haemoglobin concentration (see last week's article in this series, February 6, p. 326); if below 30% this indicates iron deficiency, between 30 and 32% iron deficiency may be present, but it is slight, while over 32% it is absent. The

stained film will show anisochromia, and if the anaemia is moderate or severe the cells will tend to be small, misshapen, and to vary excessively in size (microcytosis, poikilocytosis, anisocytosis) while they will contain less haemoglobin than normal (hypochromia). In severe anaemia target cells are often present, and they may lead to confusion with thalassaemia (Mediterranean anaemia or trait), found in Cypriots, Italians, and Greeks, or sickle-cell anaemia or trait, found in Africans and a few tribes of India or Persia, in neither of which congenital peculiarities does iron have any therapeutic value. If it is possible to estimate serum iron, it will be found to be lowered in iron deficiency and normal in the congenital anaemias.

Having established the presence of iron deficiency, one must consider aetiology; and if the history given by the patient clearly indicates a simple cause, such as menorrhagia or addiction to eccentric foods, treatment can be started without delay. If, however, there are no leading symptoms or signs one must first exclude bleeding from the gut.

Gregerson's benzidine slide test is here very useful. Powders of 25 mg. of benzidine and 200 mg. of barium peroxide are dissolved in 5 ml. of glacial acetic acid; a smear of faeces is made on a slide and two or three drops of the reagent added: a blue colour appearing within 30 seconds is presumptive evidence of blood, though this should be confirmed by the standard benzidine or orthotolidine tests after the patient has been on a meat-free diet for three to four days. A positive Gregerson test is not proof of bleeding, but it establishes a *prima facie* case for further investigation. One should, of course, exclude the presence of bleeding piles before using it, and this necessitates proctoscopy, while in older persons a digital examination may reveal a carcinoma.

Refractory Iron Deficiency

Once the diagnosis is made and the patient given iron and ammonium citrate mixture or ferrous sulphate compound tablets improvement should be rapid: the haemoglobin should rise by 4–20% weekly. If this rise fails to occur, it may be because the patient is not taking the iron or because it is not being absorbed.

Patients, especially women, often fail to take iron tablets because they claim that the tablets give them indigestion, diarrhoea, or constipation. This can be avoided by instructing them to take for one week one tablet in the middle of the main meal of the day; in the second week to add a second tablet in the middle of the next meal; and, thereafter, a third tablet in the middle of the third meal. Alternatively one of the preparations of ferrous gluconate may be prescribed, for there is no doubt that these cause less digestive disturbances than does ferrous sulphate. However, some patients take their tablets religiously without in any way affecting their anaemia, and this is an indication for the administration of iron by vein; it is also an indication for examination of the stools, for many patients who fail to respond to iron by mouth can be shown to have steatorrhoea. The classical method of Holt, Courtenay, and Fales for the estimation of faecal fat, which was performed on an isolated dried specimen, is now less used and is being replaced by methods in which an aliquot of the 24-hour stool is analysed without drying. This change in method reflects the interest in fat balance rather than fat excretion. To-day one expects over 90% of ingested fat to be absorbed and but 10% excreted; any greater excretion is considered evidence of steatorrhoea. If steatorrhoea is present, iron absorption virtually ceases, and steatorrhoea is the com-

monest cause of the finding that an iron-deficiency anaemia fails to respond to iron by mouth but responds rapidly to intravenous iron. Steatorrhoea causes iron deficiency far more often than it does megaloblastic anaemia.

Anaemias Secondary to Other Diseases

The production of red cells may be slowed or their destruction made more rapid by a number of diseases which have no direct association with the blood or bone marrow. Red-cell production is diminished by infection, by nitrogen retention (chronic uraemia) as in chronic nephritis, and by other disease states such as rheumatoid arthritis and myxoedema. That an anaemia may be due to one of these causes should be suspected when a steady or slowly progressing anaemia, usually of moderate severity (haemoglobin over 10 g.) is not due to iron deficiency (normal M.C.H.C.), and the cell volume is near or slightly below the lower limit of normal (M.C.V. 70–85 μ^3), though in myxoedema the cells may be slightly enlarged (macrocytosis, M.C.V. 95–115 μ^3).

In all such anaemias, if the blood count gives no clear indication for therapy a series of investigations may be initiated, each designed to exclude one or other cause. Adequate history-taking and physical examination should exclude the grosser forms of disease such as bronchiectasis, diverticulitis, osteomyelitis, or ulcerative colitis, but a differential leucocyte count showing neutrophilia and a raised erythrocyte sedimentation rate would suggest that a further and more intensive search for a site of infection might be desirable. Some infective processes show minimal changes in leucocyte counts, and of these tonsillitis and subacute bacterial endocarditis are very important; in these the count may be quite normal or there may be slight neutrophilia and lymphocytopenia, usually with some monocytosis, though such changes are inconstant. In typhoid fever (though not in the paratyphoids) and in brucellosis there are neutropenia and monocytosis. Brucellosis occasionally becomes very chronic, causing anaemia with only occasional bouts of fever; in such patients the monocytes may be mistaken for lymphocytes and a diagnosis of lymphatic leukaemia entertained. Fortunately, brucellosis is fairly uncommon in Britain, but agglutination reactions may be worth performing in a patient with an obscure anaemia and some fever. Pulmonary tuberculosis is a much more common cause of moderate anaemia, especially in young adults, and now that facilities for chest radiography are available almost everywhere it should be recognized easily.

An important cause of simple chronic anaemia is nitrogen retention, chronic uraemia. If a patient has a very slowly progressing renal lesion he may have no complaints until his blood urea exceeds 100 mg. per 100 ml., and his haemoglobin has sunk to, say, 60%. In such cases the haemoglobin level and blood urea are reciprocally related, so that if the blood urea can be lowered the haemoglobin level will rise. Such patients usually have an acidosis secondary to the renal lesion, and if this is present, as shown by a diminished alkali reserve (plasma bicarbonate), then administration of alkali (sodium bicarbonate) in quantities sufficient to raise the alkali reserve to, and to maintain it at, the middle of the normal range (68 vols. per 100 ml. or 30 mEq per litre) will result in a reduction in the blood urea and an increase in haemoglobin level. By this means a patient with nitrogen retention due to polycystic kidneys may be kept alive and useful for several years after he would have died from uraemia had he not been treated. This may be of great importance to the family of such a man, in whom death usually occurs during the fifth decade, when his children still need him; it is equally important for the child or young adult with renal rickets, whose bony lesion may be healed by precisely the same procedure. It is always desirable to estimate the blood urea in a patient with unexplained simple chronic anaemia, and, if it is raised, examination of the urine for cells and casts, careful palpation of the abdomen for polycystic kidneys, adjustment of the alkali reserve to the optimal figure, and perhaps an excretion pyelogram may be reasonable procedures.

There are other unrelated conditions which diminish red-cell production: some simulate an infective process—for example, rheumatoid arthritis; others appear to be neoplastic, such as Hodgkin's disease and other reticulososes, but in these the anaemia is rarely the presenting symptom, as it is often in uraemia and sometimes in infection, rather is it a symptomatic epiphenomenon. Occasionally one encounters a simple chronic anaemia in an obese woman, usually slow witted, who feels the cold very severely, who snores or who speaks slowly with a nasal intonation, and whose hair and eyebrows are greying and scanty. In such patients one can but suspect myxoedema, and a raised serum cholesterol would support that diagnosis and warrant further investigation, including a B.M.R., though photographs before and after a month's course of thyroid extract offer more convincing diagnostic evidence than does the B.M.R. One form of myxoedema can be caused by absorption of resorcinol from ointments or suppositories containing it, usually in middle-aged women with varicose ulcers.

Drug-induced chronic anaemia or chronic anaemia resulting from poisoning are both rare. Benzene inhaled from rubber solutions, dry-cleaning fluids, paints and varnishes, motor spirit, or from solvents may cause a hypoplastic anaemia, with leucopenia and thrombocytopenia developing during exposure or months or years thereafter, but this is rare in Great Britain. A similar anaemia may develop after the administration of chloramphenicol, though little is known of its frequency. Lead-poisoning is usually accompanied by a moderate anaemia with punctate basophilia, but should not be diagnosed merely because the blood cells show excessive punctate basophilia; one cannot say that a patient has been poisoned unless he develops symptoms or suffers organic damage. Not rarely a subject absorbs and excretes some lead without developing any symptoms, and if on the discovery of punctate basophilia he is said to have lead-poisoning he may well develop a compensation neurosis and manufacture symptoms. If lead absorption or even poisoning is suspected from the blood count, one should not suggest that the patient is "suffering from lead-poisoning" but should suggest that, "since he has been exposed to lead, it would be wise to discover how much he has absorbed" and arrange for an analysis of a 24-hour specimen of urine. If he has wrist-drop or abdominal colic and his lead excretion is excessive one has no alternative but to make the diagnosis of poisoning.

Unusual Blood States

There remain a few conditions which should be regarded as physiological aberrations, or necessary consequences of disease. Chronic retention of carbon dioxide is found in emphysema, and is accompanied by an increase in mean cell diameter up to 8.8 μ without increase in variability—a change also seen occasionally in congestive cardiac failure.

Unexplained macrocytosis without anisocytosis and without anaemia is rare and may be ignored if haemolytic anaemia and carcinomatous deposits in the bone marrow can be excluded. In obstructive jaundice the red cells become excessively thin and target cells are common, even though there is no iron deficiency; rarely, obstructive jaundice can thin the cells of acholuric jaundice (congenital spherocytosis) so much that fragility becomes normal. Occasionally, ovalocytosis, in which the cells are ellipsoidal disks, may be seen and must be differentiated from pernicious anaemia; in ovalocytosis anaemia is slight or absent and anisocytosis minimal. If necessary, a sternal puncture would show megaloblastic erythropoiesis in pernicious anaemia and normoblastic erythropoiesis in ovalocytosis.

It may be noted that no anaemia has been ascribed to vitamin deficiency. In Britain to-day such anaemias are so rare that no haematologist would consider such a diagnosis without a clear history of dietary deficiency and the symptoms of scurvy, beriberi, or pellagra. On the other hand, dysphagia with stomatitis, the so-called "Plummer-Vinson syndrome," may occur in elderly women who are not anaemic, and is then due to riboflavine deficiency.

THE WILLIAM BUDD HEALTH CENTRE

THE FIRST YEAR

BY

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The William Budd Health Centre in Bristol, one of the first to be provided under the National Health Service Act, 1946, was opened officially on September 16, 1952, by the Minister of Health, Mr. Iain Macleod.

A full description of the buildings has been given elsewhere (*Lancet*, 1952), but a brief résumé may not be out of place here. It is a prefabricated single-story building of "Orlit" construction containing six general-practitioner suites, each with its own waiting-room, surgery, and examination-room; a main waiting-hall; a large office; a staff room; a medical treatment room; and the usual offices. The practitioners were not in group partnership, and the centre was to cover their branch practices. All rooms were to be used either by general practitioners or by the local health authority, but in general the former used the centre mornings and evenings, the latter in the afternoons. The centre was provided to serve a housing estate covering some 1½ square miles, with a population of 30,000, on which there lived no medical practitioner, although the periphery of the estate was well served with general medical and dental practitioners, pharmacists, and two local authority clinics.

It is a matter of some importance that all those who are interested in the health services of this country should be kept informed of the progress made in the few experimental health centres which have been set up. This article contains the substance of the first annual report of the House Committee.

Throughout the past 12 months the centre has been visited by legislators, administrative, health, and social workers from all parts of the British Isles, Europe, the Americas, Scandinavia, and South-east Asia. Almost without exception the visitors' reports have been very favourable.

The period under review has been one of rapid evolution of the health services in the area served by the centre. It is now true to say that in no other district in Bristol, and possibly in the whole of the country, is there such close co-ordination of medical services or such excellent co-operation between the medical and ancillary staffs employed in the field by various health and welfare administrative bodies.

The original staffing arrangements to cover both practitioner and local authority work within the centre included a sister-in-charge, a deputy sister, and three nurses; two secretary-typists, one general clerk, two porters, and two part-time sisters. Experience has enabled us to effect some economy, and the staff has now been reduced by one nurse and one secretary-typist, although the doctors' evening surgeries necessitate the additional employment of part-time sessional clinic nurses. It should be noted that because of the special circumstances in the area full nursing cover for a day and night service had to be provided (*Lancet*, 1952). The nurses live in a near-by hostel.

Time-table

Although there was some apprehension at first that the accommodation at the centre might not be fully used for large parts of the day, Table I shows that, in fact, almost every room is in full use from 9 a.m. to 8 p.m., Monday to Friday, inclusive.

Adhering to the original plan, the practitioners use the suites in the mornings and evenings and the local authority in the afternoons. This arrangement has proved highly satisfactory, and the fact that the practitioners' surgery hours are staggered (this was purely chance and not planned) has helped to prevent congestion and overloading of staff, and has facilitated the cleaning of rooms. The rooms are prepared by the centre staff for the next user.

TABLE I.—Surgery Hours

Firm of Doctors	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
D	9-10	9-10	9-10	9-10 (I.W. by appt. 10-10.30)	9-10	9-10
B	9.30-10	9.30-10	9.30-10	9.30-10	9.30-10	9.30-10
A	10.30-11 Dr. a	10.30-11 Dr. b	10.30-11 Dr. a	10.30-11	10.30-11 (I.W. by appt. 11.30-12)	10.30-11 Dr. a
F	11-11.30 Dr. c	11-11.30 Dr. d	11-11.30 Dr. c	11-11.30 Dr. d	11-11.30 Dr. c	11-11.30 Dr. d
E	11.15-12	11.15-12	11.15-12	11.15-12	11.15-12	11.15-12
C	12-12.30	12-12.30	No surgery	12-12.30	12-12.30	12-12.30
C	Inf. welfare 2.30-4.0					
A, D B, F			Wednesday Afternoon A.N. clinic by appt.			
D	5.0-5.45 Dr. e	5.0-5.45 Dr. e	5.0-5.45 Dr. e	5.0-5.45 Dr. e	5.0-5.45 Dr. f	No surgery
A	5.15-6.0 Dr. a	5.15-6.0 Dr. a	5.15-6.0 Dr. a	No surgery	5.15-6.0 Dr. g	No surgery
F	6.0-6.30 Dr. d	6.0-6.30 Dr. d	No surgery	6.0-6.30 Dr. c	6.0-6.30 Dr. d	No surgery
E	6.30-7.0	6.30-7.0	6.30-7.0	No surgery	6.30-7.0	6.30-7.0
B	7.0-7.30	7.0-7.30	No surgery	7.0-7.30	7.0-7.30	No surgery
Local authority clinics Session 1.30-4.30 p.m.	Mids., A.N.C., school med. sess.	Inf. welfare	Inf. welfare	Relaxation; mothercraft	A.N.C.C.	
			Nutritionist	Sch. med. sess.	A.N., P.N., B.C.C. clinic	

During the period under review 10 doctors attended the centre at some time or other, but the bulk of the work was done by one or other of the principal partners of the six firms mentioned. It should be noted that four of the doctors are now using the centre in the afternoons for the purpose of carrying out antenatal and infant welfare clinics for their own patients. School medical sessions in the charge of a medical officer engaged for the purpose by the local authority have been held on two afternoons a week since January, 1953. A consultant obstetrician session, a nutritionist's session, and relaxation and mothercraft sessions have also been in operation from an early stage.

General-practitioner Work

Statistics are appended of the volume of work undertaken in the centre from August, 1952, to July, 1953.

Patients Registered at the Centre.—Although there is a population of about 30,000 at risk, Table II shows that only just over 10,000 people on the lists of the general practitioners concerned attend there for examination or treatment.

TABLE II.—Total Patients Registered at the Centre

1952	1953
Nov. 9,473	Jan. 9,732
Dec. 9,565	Feb. 9,850
	Mar. 9,993
	April 10,153
	May 10,248
	June 10,332
	July 10,354

Between 20 and 30 practitioners other than the health centre doctors have patients on the estate, and these people, living mostly on the periphery, find it more convenient to attend these doctors or the main practice premises of the participating doctors, which are just outside the area. Two local authority clinics also serve the periphery of the health centre area. Moreover, before the centre came into operation a busy minor ailment school clinic was in operation within the grounds of one of the schools on the estate, and this has remained for continuation treatment. For these and other reasons it cannot be claimed that the health centre is, in fact, serving the main medical needs of 30,000 people.

Patients' Attendances at the Centre.—Table III shows the quarterly attendances of patients to each practitioner firm. On average, 8,261 patients attended each quarter; the busy winter quarters November to January and February to April are noteworthy.

TABLE III.—Quarterly Attendances for Each General-practitioner Firm

Firm of Doctors	1st (Aug.-Oct.)	2nd (Nov.-Jan.)	3rd (Feb.-Apr.)	4th (May-July)
A	2,735	3,419	3,734	2,699
B	135	412	472	365
C	135	591	488	402
D	340	2,054	2,348	1,717
E	1,477	1,271	1,450	1,109
F	1,092	1,222	1,419	1,105
Total	6,768	8,969	9,911	7,397

An average of 8,261 patients were seen by G.P.s at the centre each quarter.

Practitioner Special Clinics.—Table IV relates to the recently started maternity and infant welfare clinics operated by the practitioners. This development is very promising, as the doctors see their expectant mothers in association with the district municipal midwives and health visitors; the hospital specialist obstetrician is also available for consultation if required. Thus the patient, instead of having to visit midwife, general practitioner, local authority doctor, and hospital specialists on separate occasions in different places, has only one place and visit, at which all her antenatal care is given, including mothercraft teaching and relaxation. Only one, instead of four, sets of notes is in existence for each patient. Similarly, the doctors conducting their own infant welfare clinics have the advantage of the co-operation of the health visitor in general health education and special teaching in infant care. A fuller description of this service will be given elsewhere.

TABLE IV.—Attendances During 1953

Firm of Doctors	At G.P.s' Antenatal and Post-natal Clinics	At G.P.s' Infant Welfare Clinics
A	205 (27 sessions)	310 (28 sessions)
B	79 (18 ")	296 (28 sessions)
C	— " —	112 (27 ")
D	239 (28 sessions)	— " —
E	106 (26 ")	— " —
Total	629	718

Work in the Medical Treatment Room.—Table V shows the number of "treatments" given by the nurses for each practitioner firm. The treatments include dressings, injections of penicillin, insulin, liver preparations, and so on. The number of "casuals" given treatment—that is, patients not on the health centre doctors' lists—is also given for each quarter. For the first few months the purpose of the centre was misunderstood; the population regarded it as a casualty out-patient department and used it, often for trivial complaints; a few outside practitioners thought they could refer their patients for treatment to the centre. By personal instruction and group talks to local organizations the purpose of the centre is now better understood. There has been a falling off in the number of casuals until the summer months, when the lighter evenings put local children at longer risk. However, no genuine emergency is turned away from the centre. Arrangements are made to call the appropriate doctor or to order an ambulance to send the patient to hospital, or initial treatment is given and the patient is referred with a note to his or her own doctor.

TABLE V.—Treatments Given for Each General Practitioner (Quarterly)

Firm of Doctors	1st (Aug.-Oct.)	2nd (Nov.-Jan.)	3rd (Feb.-Apr.)	4th (May-July)
A	980	1,334	1,236	948
B	21	80	54	59
C	180	201	153	79
D	666	767	542	380
E	211	126	57	49
F	465	469	344	308
Total	2,523	2,977	2,386	1,823
Casuals	120	48	63	98

The quarterly average of patients treated, apart from casuals, is 2,425.

Night Calls.—Table VI shows the night calls (8 p.m.-8 a.m.) dealt with at the health centre. Here we should explain that the estate residents asked in the planning stage that some form of night service should be made available. At one stage serious consideration was given to the provision of sleeping quarters for a practitioner within the centre. For various reasons this idea was rejected and night cover is now provided by having a porter on duty each night, during which he attends to night inquiries and also cleans the centre. The nursing staff, who live in the vicinity, work a night rota and are on call when needed by the porter. It should be noted that the doctors had estimated the need to cover between 10 and 12 calls a night. It will be seen from Table VI that, in fact, calls have averaged 1 to 2 a night, and in the light of this experience a doctor's flat would have been needless. How far the fewness of the night calls is the result of the psychological reassurance of an ever-open health centre it is difficult to say. Out of 543 "out of hours" calls a nurse had to be called on 150 occasions—that is, an average of 12.5 per month.

TABLE VI.—Night Calls (All Types)

Aug. 19	Sept. 36	Oct. 34	Nov. 30	Dec. 47	Jan. 52	Feb. 35	Mar. 47	Apr. 52	May 51	June 69	July 71
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Average per month, 45+.

Use of and Reference to Specialist Services.—(1) The centre consultant antenatal clinic:—From an early stage an obstetric specialist from the professorial unit has held a

regular consultant session at the centre. His services have been freely available to general practitioners and to the local authority doctor and midwives; personal contact with him has been most valuable. Twenty-four sessions have been held, at which 374 patients were seen, an average of 15 per session. (2) Reference of patients to hospital and specialist services:—Table VII shows the number of patients referred

TABLE VII.—Patients Referred to Hospital Diagnostic Units (All Doctors and Local Authority)

	Routine Chest X-ray Exams.	Haemoglobin	Complete Blood Count	Microscopical Exam. of Urine
Total (Jan.-Sept.)	328	356	79	63

to hospital diagnostic units by practitioners and local authority doctors for some of the more important special investigations. Table VIII shows the number of patients referred to hospital consultants by general practitioners. It should be noted that in accordance with the practice in

TABLE VIII.—Patients Referred to Hospital Consultants (All Doctors)

	Orthopaedic	Paediatric	Physicians	Surgeons	E.N.T.
Total (Jan.-Sept.)	55	41	253	224	45

all Bristol local health authority clinics every expectant mother is encouraged to have a routine chest x-ray examination, which is provided by the local authority at the central clinic; this practice is being followed at the William Budd Health Centre.

Local Authority Work

Antenatal Clinics.—The medical officers hold one session a week at the centre in order to give antenatal care to expectant mothers living in the area whose doctors do not work in the centre. At 24 sessions there have been 403 attendances—an average of 17 patients a session. The district midwives hold two sessions a week, and at 26 sessions have had 371 attendances—an average of 14 a session.

Infant Welfare Clinics.—At 44 sessions 1,992 children were examined or advice was given to the mother:

Under 1 year old	1,237, average 28 a session
1 year old	384 " 9 " "
2-5 years old	371 " 8 " "

Pre-school children on the lists of the health centre doctors are now not seen by the local authority doctor, although the latter's past knowledge and records of the child are useful to the health centre doctors.

School Medical Clinics.—There are two school medical officer's sessions a week. At 57 sessions there have been 1,215 attendances, an average of more than 21 a session. Schoolchildren on the lists of the health centre doctors do not attend these clinics.

Physiotherapy: Antenatal and Post-natal Exercises (Relaxation Classes).—At 21 sessions 105 patients attended—an average of 5 a session. This includes both local authority doctors' patients and those of the health centre doctors.

Nutritionist's Clinic.—The local authority nutritionist attends the centre for one session a week, in order to give dietetic advice to general-practitioner patients. The "gastric ulcer," "diabetic," "reducing," etc., diets prescribed by the doctors have been translated into practical daily diets worked out in accordance with the patient's financial means. There were 127 attendances.

Repercussions on General Practice in the Area

New Patients at the Health Centre.—By agreement, any new patient expressing preference is put on the list of the doctor of his choice. Unattached new patients attending the centre and with no special preference for any one doctor

have been allocated to each doctor in rotation. The number of such new patients on each doctor's list has been reviewed each quarter so as to keep a fair allocation.

Transfer of Patients in the Area ("Drift").—The additions to and deletions from the lists of all doctors working at the centre (including their partners, if any) for the first year were:

Total counts of the lists of the doctors concerned on July 1, 1952	29,206
Additions during the year	3,460
Deletions during the year	32,666
Total counts on July 1, 1953	2,840
Net increase	29,826
	620

It is probable from these figures that there has been no abnormal drift to or from the lists of the doctors connected with the centre during the year.

Co-operation of Health Workers. One of the most important and significant developments in this area has been the tremendous improvement in co-operation between the general practitioner and the local authority health and welfare workers in the area. Mention has already been made of the greatly improved co-ordination of maternity services in the area and of the developing interest of the general medical practitioners in orthodox preventive medicine, as evidenced by their starting infant welfare clinics for their own patients as part of their general medical service. Further extension along these lines would lead to the exclusion of the local authority doctors without any loss in the efficiency of the preventive health services. In addition, there is now excellent co-operation between the three district health visitors based on the centre and the practitioners. The doctors appreciate that the health visitor can be as valuable to them as the midwife and district nurse, and many misunderstandings on both sides have been removed.

Standard of General Practice in the Area. It is difficult to assess the standard of any general practice, and it would be invidious in this report to make extravagant claims about general practice at the William Budd Health Centre. However, the secretarial and nursing assistance has given the doctors more time to examine and advise their patients. The treatment room, in which an increasing volume of work has been undertaken, has enabled many patients to be treated who would otherwise have gone to hospital out-patient departments.

Agreements.—The official machinery set up to deal with the health centre is as follows: (1) The Joint Advisory Committee with no executive functions. On it sit members of the local health authority, the executive council, the local medical committee, and the house committee. It gives advice on policy matters to the two parent bodies—the local health authority and the executive council—and was set up to ensure fair representation of the views of each authority and of the health centre workers as well as the doctors who work in the area but not in the centre itself. (2) The House Committee, consisting of the health centre doctors, the representative of the medical officer of health, the sister-in-charge, and the secretary of the executive council. It deals with domestic matters. The Joint Advisory Committee has met on five occasions—three of them before the centre was opened—and the House Committee on five occasions. No formal agreements have been in force either between the executive council and the local health authority, or between the council and the doctors, or between the doctors themselves. At an early stage the question of rent was informally agreed by all concerned, and as the centre has evolved the various parties have honoured the decisions of the two committees.

Finance

The gross cost of operating the centre for both local authority and practitioner services is within £65 of the estimate made two years ago—namely, £10,000 per annum, or £200 a week. This covers loan charges, salaries, uniforms and laundry, local authority drugs and dressings, equipment, upkeep of nurses' hostel, maintenance and repairs, rent,

rates, heating, lighting, water, printing and stationery, telephone, but does not include capitation fees, the proportion of the salary of the local authority doctor, the regional board specialist, and the cost of the drugs prescribed.

Discussion

No doubt it would be interesting to discuss the first year's experience at the William Budd Health Centre in the light of the Hadfield Report (1953), the Review of General Practice by the General Practice Review Committee of the B.M.A. (*British Medical Journal*, 1953) and the articles by Joseph Collings (1953) on group practice. Space does not permit this, but we would point out that all these reports, in their references to health centres, are discussing a theoretical conception, as none of those authorities have had the opportunity of first-hand experience of the functioning of a health centre under the National Health Service Act. We must limit our discussion to our own experience and try to give answers, albeit provisional, to some of the questions that have been asked.

Let us say at the outset that, so far, the health centre has provided many advantages to the patients, doctors, and other health workers in the area, and few if any disadvantages that we have been able to discover.

The two most promising developments are the relief of the doctors from "unproductive" work by the provision of clerical and nursing assistance, thereby enabling them to devote more care and attention to their patients, and the greatly improved co-ordination of health services and co-operation of health workers in this area.

The theoretical conception that co-operation and co-ordination would be improved by allowing health workers of all types—general practitioners, local authority doctors, district midwives, and health visitors—to work under one roof has been borne out in practice. Reference has already been made to the closely knit maternity services in this centre with the attendant advantages to all concerned, and not least to the expectant mother. The staff room has proved to be the most important room in the building, for it is there that all medical, nursing, and social workers in the district (including probation officers, children's officers, district voluntary case workers, and the like) forgo their families the doctors to discuss particular patients or their families over a cup of tea or coffee. With greater rapidity than had been expected, the health and social workers in this area are welding themselves into a team which has the interest of the patient and family at heart, and each member of the team is now in the favourable position of being fully informed on all known factors operating in each case.

Nevertheless we would not say that such a happy development would necessarily follow in every health centre. Two main factors have helped at the William Budd Health Centre. The relatively small size of the centre, together with the joint use of rooms by general practitioners and local authority staff, instead of resulting in disagreements as might theoretically be expected, has resulted in closer co-operation. Secondly, we feel that our early decision that a nursing sister should be in overall charge of the centre rather than a lay manager was the right one. Much has depended on her in achieving co-operation; her qualifications and experience enable her to smooth out day-to-day difficulties in a manner which could never have been achieved by even the most charming of lay administrative officers.

The original objective in this health centre was to provide suitable premises for general practitioners, and in the planning stage the local authority services were of secondary importance. As time has gone on we have found the need for, and proved the advantage of, other services. For example, the specialist obstetrician has been brought in, relaxation classes for expectant mothers have been started, and the advice of the local authority nutritionist has been made available to the doctors. This nutritionist's clinic is proving a unique and valuable undertaking and will be reported on more fully at a later date. The general practitioners are

unanimous in their belief that the provision of x-ray and minor pathological investigational facilities would be a great advantage to the patients and to themselves, and this is the direction in which they would like to see future developments.

One of the frequently expressed fears about health centres was that there would be local authority interference and dictation in their management. Such fears have proved groundless. Apart from the good will displayed by all concerned, we think the machinery set up, which includes a house committee and a joint advisory committee, has done much to facilitate the smooth running of the centre.

Fears were also expressed that health centre practice would be too remote and impersonal and would interfere with the doctor-patient relationship. This has not happened at the William Budd Centre. We believe that the provision of a separate waiting-room for each doctor's suite has helped to preserve the doctor-patient relationship. But the attitude of the secretarial and nursing staff is just as important. In this we have been fortunate. Most of the patients attending are now well known to the staff not merely as human beings but as human beings who are being attended by Dr. A, B, or C as the case may be.

It is difficult to canvass the opinion of patients attending the centre, but none have complained of an impersonal service or have deliberately transferred to a non-health-centre doctor. The patients have an undoubted sense of security in that they know the health centre is always open and they can always get service if they need it.

It should be noted that so far there has been no move towards a group practice in the sense of financial partnership. In other ways, however, the relationships of the doctors have become a good deal closer; for example, seeing and treating emergency patients on behalf of each other is now customary and relief in other ways is developing. Collings (1953, p. 611), the great advocate of group practice, has written: "The aims of basic group practice are identical with those of ordinary general practice. The primary aim is to provide patients with the highest level of diagnostic and therapeutic service attainable outside hospital, to inconvenience the patients as little as possible, and to preserve the best elements of personal service—all at a cost the patient (or better, the community or nation) can afford."

We think this is being achieved at the William Budd Health Centre without formal financial partnership but with the advantage that each practitioner firm maintains its individuality and that the patient can indeed be sure that he will see the doctor of his choice and not any one of half a dozen or more different members of a group practice.

Collings was careful to qualify these aims by reference to what the nation or community can afford, and here we should like to comment on the financial aspects of this health centre. It is true that it is costing £10,000 a year, but this is for fairly extensive local health and education authority services for 30,000, together with general medical services for some 10,000 people. This is a lot of money, but let us keep a sense of proportion. Even if the general medical practitioners had not participated in this project there would have been a need for, and statutory duty to provide, local authority services. The capital cost for the building would have been about the same and the maintenance may have been halved, but the centre would have been lying idle for many sessions a week. Indeed, there must be many hundreds of good local authority clinics which could be used with advantage by general medical practitioners without necessarily curtailing the local authority services. The sooner arrangements of this kind can be made the sooner many local authority doctors will relinquish their "clinical duties" in maternity and child welfare and minor ailment clinics. Moreover, the practitioners, relieved of non-productive work, can then turn their attention to the preventive and promotive aspects of health work. One other word on finance—and we say

this in no carping spirit—the cost of all the principal activities in the centre is no greater than buying part of the services of two consultants in receipt of a special merit award.

It is already apparent that many patients have been treated who, but for the health centre, would have gone to hospital out-patient departments. With further aids, such as a small laboratory and the help of a laboratory technician and facilities for simple radiography, there can be little doubt that not only will the patients benefit but the practitioners' interest and standard in general practice will be further stimulated and, not least important, the overworked hospital out-patient department must be still further relieved.

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Nova et Vetera

RICHARD MEAD: PIONEER AND PATRON

Before Barry built the vast brick and terracotta Hospital for Sick Children at Great Ormond Street, there existed at the corner of Powis Place a fine old Queen Anne mansion where for the last twenty-four years of his life Dr. Richard Mead lived, as Dr. Johnson said, "more in the sunshine of life than any other man." He was pre-eminently great in an age of great practitioners—the epitome of accomplishment in the fullest meaning of that word. For Mead enjoyed the best of both worlds, basking, like Sloane, in the approval accorded to generous patrons, and esteemed, like Cheselden, as a reliable physician. Pope has caught both qualities with his lines:

And Books for Mead, and Butterflies for Sloane

and

I'll do what Mead and Cheselden advise,
To help those limbs and to preserve those eyes.

His life illustrates the rich leaven which Nonconformity brought to English scientific and medical thought in the seventeenth and eighteenth centuries. Born at Stepney in 1673, he was first educated at home by his father, an eminent Nonconformist divine, then by two successive tutors until, at the age of 16, since Oxford and Cambridge were barred to him by the Test Acts, he proceeded to Utrecht, where he studied classics and philosophy for three years. He spent a further three years at Leyden, where he worked alongside Boerhaave, and then, with his brother and two others, he toured Italy, taking his doctor's degree in philosophy and physic at Padua at the age of 22.

At Stepney, too, began his professional career, where his father assisted, even to the extent of recommending him from the pulpit. His first published work showed that he had assimilated the teaching of Archibald Pitcairne at Leyden. Entitled *A Mechanical Account of Poisons* (1702), it accounted for the effects of several poisons by their admixture with the blood. An abstract of this, published in the *Philosophical Transactions* of the Royal Society for 1703, not only secured his election to that body but appointment as physician to St. Thomas's Hospital in the same year.

Moving as he did in wider circles, he took up residence in Crutched, and later in Austin Friars, adding further appointments *en route*—the readership in anatomy to the Company of Barber Surgeons, the vice-presidency of the Royal Society, and the doctorate of medicine of the University of Oxford. This last honour enabled him to be admitted to fellowship of the Royal College of Physicians, of which he subsequently became a Censor, Harveian Orator, and lived to refuse the presidency.

"Mead, I love you," said the irascible but generous John Radcliffe, "and I'll tell you a secret to make you a fortune—use all mankind ill." Though Mead took over Radcliffe's house and practice in Bloomsbury Square in 1714, he did not take his advice. On the contrary. When Watteau, the distinguished painter, came especially from the Continent

to secure his help in arresting his consumption, Mead commissioned him to paint two pictures, and this generous patronage was extended to a variety of others. He secured the liberation of Dr. Freind from the Tower of London, where he was imprisoned, and pardon for the Reverend G. Kelly. He was without a rival as a practitioner, making an average of from £6,000 to £7,000 a year. He attended the King, the Prime Minister, Sir Isaac Newton, and Bishop Burnet among others. A pioneer in public health, his *Short discourse concerning Pestilential Contagion and Methods to be used to prevent it* was first published in 1720 and ran to seven editions in twelve months and more afterwards. In it he recommends, as a first step, the establishment of a Central Council of Health, armed "with such powers as might enable them to see all their orders executed with impartial justice." He urged that the sick should be isolated in "clean and airy habitations" sustained at public expense.

After 1720, when Mead removed to Great Ormond Street, he built a large gallery at the bottom of his garden to house his treasures. Here he would entertain Richard Bentley, the formidable Master of Trinity College, Cambridge (over whom he possessed great influence), and Martin Foulkes, the antiquary. It was here, too, on February 16, 1754, that Richard Mead died, surrounded by over 10,000 books and numerous *objets d'art*. Unlike his great contemporary and friend, Sir Hans Sloane, no steps were taken to acquire his collection, and it was dispersed by auction. Sir Hans Sloane's name lives on both at Chelsea and at the British Museum. John Radcliffe's by the museum and observatory which bear his name at Oxford, but Mead's links with the present are more tenuous if equally binding. For it was he who persuaded the bookseller Thomas Guy to erect a new hospital at a cost of £18,793, increased by an endowment of £200,000 on Guy's death in 1724.

W. H. G. ARMYTAGH.

Preparations and Appliances

A REST CHAIR FOR ARTHRITIS

Dr. H. F. WEST, physician-in-charge, Sheffield Centre for Investigation and Treatment of Rheumatic Diseases, writes: Patients with painful and stiff hips or knees usually find great difficulty in getting in and out of ordinary rest chairs.



Being dependent on others in this matter they often spend too long at rest, stiffening up, or on their feet, developing oedema of the legs. The chair illustrated has been designed for such patients and is made in varying heights. A patient should have the highest chair he can manage to swing himself on and off. These chairs were made by Messrs. Shortall Ltd., Maltravers Street, Sheffield.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Intra-arterial Transfusion

SIR,—Substantial claims have recently been made concerning the life-saving properties of blood transfusion into an artery, and many cases have been reported in which this form of treatment has apparently been instrumental in saving a patient's life. It is difficult to assess from the available evidence how successful intravenous transfusion would have been in these cases, and there must be many who believe that the latter procedure will always be adequate, provided the vein is large enough and not in spasm and adequate pressure is available. There must also be many obstetricians who, in common with myself, have served on an emergency obstetric service ("flying squad") and have seen patients recover with intravenous transfusion following the most calamitous haemorrhage. I am recording the following case because prior to that experience I had believed that arterial transfusion was seldom, if ever, required and I have now changed my mind.

An apparently fit woman aged 35, with two children, delivered her third child to pubes after an exhausting second stage. There was an inert uterus and the placenta was expressed by her own doctor, who called for the "flying squad" after a loss of 40 oz. (1.1 l.). On my arrival the patient, who had continued to bleed, was in poor condition but apparently no worse than many others whom the service had treated successfully. Four pints (2.3 l.) of blood were given into the junction of the right saphenous and femoral veins, but there was steady deterioration of the patient, who continued to bleed slowly, and death occurred while the last pint (0.6 l.) was being run in. Necropsy showed that death had been due to heart failure and there was gross distension of the vena cava and great veins with the blood that had been transfused and which had not been passed on by the failing heart. It appeared that the continued loss had been due to a direct flow from the external iliac vein into the hypogastric and uterine veins on the right side.

There was nothing to suggest that this patient had any myocardial deficiency prior to her pregnancy, and there was no toxæmia. Her cardiac failure was presumably due to inadequate coronary blood flow following severe exertion and considerable haemorrhage. I felt in retrospect that an arterial transfusion might have delivered enough blood to the coronary vessels to save the failing heart, which was being embarrassed still further by the intravenous transfusion. I shall be interested to hear whether similar cases have arisen in the practice of other obstetricians.—I am, etc.,

Birmingham.

W. G. MILLS.

Intra-arterial Thiopentone Injection

SIR,—Dr. M. Swerdlow's medical memorandum (*Journal*, January 30, p. 258) prompts me to describe a case which I encountered three weeks ago. The patient, a man aged 40, was having bouginage for stricture. It was intended to give about 0.7 g. thiopentone, followed by nitrous oxide/oxygen with a little trichlorethylene if needed. The patient's right forearm was covered with a network of very prominent veins, and injection was made into the median cephalic vein. After 0.5 g. of thiopentone had been injected, there was a slight leak, and the needle was withdrawn. It was intended to complete the injection into the median basilic vein, which appeared, as it often does, to consist of two parallel channels, both prominent under the skin. The needle was inserted into the more lateral of the two vessels, approximately at the spot marked X in the photograph in Dr. Swerdlow's article. Only 1 ml. had been injected here when the patient (by this time asleep) responded with a violent spasm of the flexor muscles of the arm; the medial side of the forearm and hand quickly blanched. The pulsation from this artery, which was a subcutaneous aberrant

ulnar, was not transmitted to the syringe, which was immediately disconnected from the needle. Blood came from the hub of the needle in spurts. A syringe containing 5 ml. 1% procaine was immediately connected to the needle and its contents injected. By this time the blanching had passed off, and been replaced by mottling, which soon gave way to normal colour. Pulsation in the limb was normal then and subsequently, and the aberrant vessel could easily be felt pulsating under the skin, and on close inspection could even be seen to pulsate. The operation and anaesthetic were completed without further incident, and there were no untoward signs or symptoms in the arm thereafter. The patient stated subsequently that he had been anaesthetized twice before, but in each case the injection was made into his left arm. His attention was drawn to his abnormality, which was present in one arm only, and it was simply explained to him. He was told that he should draw the attention of anyone about to make an injection in his right arm to the pulsation in this vessel.

Accidents like this can only be avoided by palpating every vessel before injecting thiopentone into it, no matter how like a vein it may look.—I am, etc.,

Manchester, 21.

T. D. CULBERT.

Renal Complications after Using Sulpenin

SIR,—We were interested to read Mr. J. G. Callanan's account of renal complications developing in a patient during treatment with "sulpenin" (*Journal*, January 16, p. 138). We have had a similar experience with this preparation in a child, and believe that the following brief account may be of interest.

A girl of 5 developed a respiratory infection. From the fourth day of her illness and for two days before admission to hospital she had been treated with "sulpenin." She had been given four tablets initially, followed by two tablets every four hours (total dose 20 tablets and 10 g. sulphonamide). On the morning of admission her urine was noticed to be blood-stained, and shortly afterwards she passed several large clots of blood unaccompanied by urine. On examination in hospital she was complaining of central abdominal pain although there was no tenderness in this region or in the renal areas. She had signs of mild bronchitis. Blood pressure was normal. The urine was heavily blood-stained and sulphonamide crystals were seen microscopically. The urinary output was adequate and the blood urea normal. She was treated with a high fluid intake and alkalis. The next day she was better and the urine contained less blood. She was discharged home after eight days, when laboratory examination of the urine was normal.

Fortunately anuria was not a feature in our patient and she recovered rapidly. Mr. Callanan thought that the sulphadiazine fraction of "sulpenin" was responsible in his case, but we have seen similar cases of renal complications caused by sulphamerazine, and many other cases are recorded in the literature (e.g., Dr. E. C. Atkinson, *Journal*, September 15, 1951, p. 674, and subsequent correspondence). We therefore felt more inclined to implicate the latter drug, but the matter is debatable and obviously "sulpenin" is a preparation to be used with caution.—We are, etc.,

Sheffield, 10.

T. COLVER.

J. C. HAWORTH.

Methylpentynol

SIR,—I was interested in your annotation (*Journal*, August 22, 1953, p. 435) on the use of methylpentynol as an alternative to the barbiturate hypnotics. I have tried it on a number of patients in hospital for this purpose, but without notable success. Those who were used to the barbiturates found it ineffective in doses up to 1 g., and, though it sometimes secured sleep rapidly in new patients who were anxious, they were usually awakened several hours later by the customary nocturnal noises of a hospital ward. I have not used it for patients in their own homes, where it might well be effective for insomnia associated with anxiety.

I would, however, like to draw attention to its use for premedication. I have used it successfully in a number of cases

before ward procedures such as paracenteses, biopsies, and lumbar punctures. The patient was given 500 mg. of methylpentynol (two capsules of "oblivon") about 10 minutes before the procedure began. In no case was anxiety marked, though in several of the patients similar procedures, previously performed, had been associated with considerable apprehension. In an endeavour to reduce the suggestion factor, some patients were not told the purpose of the drug; in those cases the drug seemed no less effective. In one case where anxiety was severe, 10 minutes after giving 500 mg. of methylpentynol it was possible to proceed with a patient in a state of calm co-operation. In no instance were there any complaints of side-effects or after-effects, and I observed none. No patient went to sleep as a result of administering the drug, nor was there any complaint of drowsiness at the time.

I have not attempted a controlled therapeutic trial, and I am well aware that it is easy to persuade oneself that an anticipated reaction to a drug has in fact occurred. I believe that methylpentynol is being used in dental practice, which should provide opportunities for just such a trial, and I shall be interested to hear what impressions are gained in this field.—I am, etc.,

London, N.19.

A. G. BOAG.

Piperazine in the Treatment of Threadworms

SIR.—The article by Dr. R. H. R. White and Mr. O. D. Standen (*Journal*, October 3, 1953, p. 755), in which piperazine is recommended for the treatment of threadworms as being a harmless drug without side-effects, has surprised me. The authors have added in their letter (*Journal*, December 5, 1953, p. 1272) that in giving piperazine the weight of the patient should be taken into account in measuring the dose, but this seems to me insufficient, because piperazine is a drug which can paralyse the respiratory centre. I once gave piperazine by mouth to rats and I found it quite toxic. At 4 to 5 g. per kg. there was laboured breathing and twitchings, and some of the animals died. If not enough attention is drawn to the toxicity of this drug there is a risk that mothers, if there is no therapeutic effect, will increase the dose or repeat it at short intervals.

The reason for my letter is to call attention to the danger of this preparation and to recommend that it should be given only under direct medical supervision and not to outpatients.—I am, etc.,

Berne.

T. GORDONOFF.

Inquiry about Anaesthetics

SIR.—At one hospital in which I work, and presumably in other hospitals, a few duplicated foolscap forms have been received under the heading "Ministry of Health. Anaesthetics in Hospitals. January 21 (9 a.m.)—28 (9 a.m.)." In the brief instructions which follow it is stated that details should be inserted on the opposite side of the form of every anaesthetic given during the above week. After explaining how this is to be done on the opposite side of the form, the instructions continue, "If during the week a death has occurred which has been thought to be due to an anaesthetic, information about this case should be given; also details should be supplied of any fire or explosion which has occurred in an operating theatre during the same week. . . ."

The forms in question were not sent to any of the doctors who might be concerned in the giving of anaesthetics, they are not marked "Confidential," and it has apparently been left to the group and hospital officials to see that the forms are completed.

I have written to the Ministry of Health asking for further information about this matter, but it may not be out of place to suggest that the publication of this letter would enable others to comment on this method of inquiry. Quite apart from the many other implications of this form, it does seem most improper that information is asked for about deaths which may be due to anaesthesia. Surely there are already

properly established and legal methods of investigating such cases, and no hospital or individual should be asked to disclose details to the Ministry.—I am, etc.,

Radlett

R. S. MURPHY.

A New Oral Diuretic

SIR.—May I be permitted to comment on your annotator's remarks (*Journal*, January 16, p. 144) on "a new oral diuretic"? His assumption that general practitioners fight shy of administering medicaments parenterally is mistaken. In fact, they are given freely and for as long as they are indicated, provided they are of proven value. In our own practice, as in other practices, patients with congestive heart failure and other conditions requiring diuretic therapy, are given mersalyl regularly. Indeed, two of our patients have had mersalyl weekly for 15 years, with only occasional interruptions.

Your annotator's argument in favour of "mercioran" is surely self-destructive. Does he expect a general practitioner to submit his patient to a treatment which in two-thirds of the cases can produce such violent symptoms as "abdominal cramps, nausea, vomiting, diarrhoea, and bloody stools," and in the remaining one-third, to be discovered "by trial and error," the effectiveness of the oral diuretic is only one-quarter of the standard dose of mersalyl? I am, etc.,

London, E.17.

MYER COHEN.

Atomic Weapons and the Medical Profession

SIR.—President Eisenhower's recent appeal and the Russian reply have again raised hopes of the control or abolition of atomic weapons. Such a hope must be universal, and the need for agreement has been recognized by the Governments of all the big powers. Yet stockpiling increases, and on January 1 the *Daily Telegraph* stated: "One of the achievements (sic) of the New Year is expected to be the explosion of the first true hydrogen bomb."

The medical profession would be outstandingly involved in the event of an atomic war. Is there anything that we can do to help in the present situation? Here is one suggestion: The leaders of the profession could send an independent statement to their respective Governments stating the disastrous effects, in any country, of a hydrogen bomb attack upon the medical services (to which Governments and people alike look for aid in an emergency). This of course must be known to the Governments concerned, but the bald statement from a non-political source would serve to underline the urgency for agreement, and the document might just possibly strengthen their hands in discussion. Are there any other suggestions?

As stated in my previous letter (*Journal*, March 11, 1950, p. 610), any help, however small, that we can give would surely be preventive medicine of the greatest prophylactic value.—I am, etc.,

Hove.

W. V. CRUDEN.

Variation in Human Milk

SIR.—I do not think that the conclusions reached in your leading article on "Variation in Human Milk" (*Journal*, January 30, p. 264) should pass without comment. You say that "if an infant is not gaining satisfactorily the explanation should be sought promptly. First, the possibility of infection or of constitutional disturbance should be considered. Either of these is, in general, more likely to be responsible than faulty or insufficient maternal milk. But if no such evidence is found additions to the diet in the form of complementary feeds should be given."

Surely before complementary feeds are given to babies with a weight gain which is not seriously defective the correct procedure is to try to increase the amount of breast milk which the baby takes—by giving him more frequent feeds if they are rather infrequent, by giving him longer on the breast if he needs it, by trying to ensure that the mother has more rest, and by stimulating her breasts to produce more milk by emptying them fully by manual expression after every

feed, giving the baby milk which has been expressed. Your advice, if taken, would cause a very large number of babies to be put quite unnecessarily on to the bottle.—I am, etc.,

Sheffield, 10.

R. S. ILLINGWORTH.

The Unsaturated Fatty Acids

SIR.—I was very interested to read Dr. John H. S. Pettit's article (*Journal*, January 9, p. 79). During the past 12 months I have used on a number of eczematous patients, infants and adults, (a) the ointment alone, and (b) the ointment in conjunction with the capsules. No outstanding results were obtained, although some cases did respond to one dressing and one capsule daily, the treatment being carried out as well as possible in home surroundings.

From a general practitioner's point of view I agree that this treatment is in no way preferable to the already established ones—in fact, I have obtained quicker and better results from ointments containing coal tar, zinc oxide, etc. However, using the unsaturated fatty acids in cases of gravitational ulcer (predisposing causes established), I have had some very interesting results, mostly favourable—for example, a patient who has had a large and infected ulcer, resistant to all types of treatment for years, has responded well, the lesion now being almost healed. In this particular case one capsule is being taken and the dressing applied twice daily.

It would be very interesting to know if any of my colleagues have had similar results.—I am, etc.,

Leicester.

ERIC LODGE.

The Feeble-minded

SIR.—There are two points arising from the correspondence which followed the publication of our survey of 12 mental deficiency institutions (*Journal*, January 2, p. 16) on which we should like to comment.

It has been suggested by Dr. G. McCoull (*Journal*, January 23, p. 214) that mental deficiency institutions in the London area may not be typical of those in the country as a whole. Fortunately we were able in April of last year to obtain material bearing on this point from Dr. W. Rees Thomas, Senior Medical Commissioner of the Board of Control, and with his permission this is given below. At that time the latest, and, in fact, the only, information possessed by the Board of Control with regard to division of patients by grade was that concerning long-stay patients for the year 1949 (i.e., those who were in institutions vested in the Ministry of Health on January 1, 1949, and who were remaining in them on December 31 of that year). These represented approximately 93% of all patients on the books of those hospitals in December, 1949.

The classification upon which the Board of Control figures are based is the sevenfold one contained in the International Statistical Classification of Diseases, Injuries and Causes of Death (1948). The categories are as follows: idiocy, imbecility, moron, borderline intelligence, mongolism, other and unspecified types, all other diagnoses. This classification is a mixed one, being based partly on the grade of the patient—idiocy, imbecility, and feeble-mindedness (or moronity), partly on clinical type (mongolism), and partly on extraneous and what sometimes appear to be irrelevant considerations.

Dr. Rees Thomas writes of the data: "In the category 'Mongolism' we have no information beyond the diagnosis given. The category 'Other and Unspecified Types' is equally unsatisfactory; of the 219 cases (20 male, 22 female age 0-15) 216 are returned as mental deficiency N.O.S. (not otherwise specified). The heading 'All other Diagnoses' (1,408 patients including 152 male and 120 female age 0-15) has 41 separate categories, none of which relate to grading. Examples are: head injuries, convulsions, encephalitis, epilepsy, asocial personality, and cerebral spastic infantile paralysis. In none of these cases can we find any information which will permit us to give you a grading." The categories "Other and Unspecified Types" and "All other Diagnoses" make up 3% of the total count. Dr. Rees Thomas also points out that the count of heads was made when the new G.R.O. cards were introduced, primarily to deal

with admissions from January 1, 1949. The diagnoses "may or may not have a high degree of accuracy."

The most useful comparison between our London survey data and the Board of Control census figures is probably that between the proportions of adults in each of the three main categories by grade. This is given in the table below. Here mongols have been included among the imbeciles and the categories "other and unspecified types" and "all other diagnoses" have been grouped together under a separate heading.

Percentage of Adult Patients by Grade as Obtained in London Survey, 1951-2, and by Board of Control Census of Long-stay Patients

Grade	Board of Control Census		% of Patients by Grade Found in London Survey
	No. of Cases	% of Patients by Grade	
Idiot	1,721	4	3
Imbecile	14,809	33	39
Feeble-minded	27,122	60	58
Other	1,313	3	
Total	44,965	100	100

Allowing for sampling errors and difference in the manner in which the data were collected, the agreement between the two sets of figures is as close as could be expected. It thus seems very likely that the London data are comparable with what is to be found elsewhere in the country as far as grade of patient is concerned.

We do not wish to take up here in any detail the question of intelligence quotients. We would point out, however, that we did not claim that half the total number of defectives of all grades and ages had I.Q.s above 70 points on the matrices test, but merely that it seemed likely that the average intelligence quotient of adult feeble-minded defectives—that is, excluding idiots and imbeciles—aged between 16 and 29 years of age was above 70 points. The data obtained in the survey merely confirmed findings obtained by ourselves and others who have tested larger samples at individual hospitals on both the matrices and other intelligence tests.¹

What is important, however, is not the average I.Q. of patients in mental deficiency institutions, but that three-fifths of the adult patients are "feeble-minded." Few will disagree that the feeble-minded present radically different problems in management from imbeciles and idiots.—We are, etc.,

N. O'CONNOR.

J. TIZARD.

London, S.E.5.

REFERENCES

- ¹ Tizard, J. (1950). *J. ment. Sci.*, 96, 889.
- ² — and O'Connor, N. (1952). *Lancet*, 2, 620.

SIR.—Although I am sure that Drs. N. O'Connor and J. Tizard intended "A Survey of Patients in Twelve Mental Deficiency Institutions" (*Journal*, January 2, p. 16) to be unbiased, its presentation immediately gave rise to false conclusions and implications in the press (the *Star*, leader, January 4). I think that your own annotation (p. 35), Sir, was also not blameless. The general behaviour of mental defectives in hospital is quite good, but this is no criterion of social competency. The average intelligence quotient of young adult feeble-minded patients is 70 or more as stated, but I.Q., as we all know, is no index of social adjustment. Is the implication that we are not to have these people in mental deficiency hospitals at all, or that we do not supply suitable treatment to bring about social adjustment? Eighteen per cent. of our admissions last year were Section 8 or 9 cases. I consider that if these patients find a regime here, orientated towards social rehabilitation (as they do), they benefit far more by our efforts than by other treatment or punishments available.

To quote Section 8 and 9 cases as the problem groups is quite false. All feeble-minded people present some social problem, either of inadequacy or aggression, and a patient admitted under Section 6 for prostitution and incestuous behaviour in a family where all the members have visited prison, approved or special schools is, although polite and well-behaved here, a graver social problem than many a slight case of larceny. To say that half of our patients need no special nursing or supervision depends on how you look at it. One might as well say that all the boys in

a boarding-school need no special care or supervision. You cannot put untrained people in general charge of high-grade patients, and the good trained nurse who lives with them is worth his weight in gold. Epileptic patients may have no fits, or very rare attacks, but the case papers must show them to be epileptic. Otherwise we will be sending them out to risk falling off scaffolding or into machinery. Whether they are on or off the "live" list in the hospital is a different matter. The bald statement in the survey implies that they are detained in the hospital only because they are epileptic. The term "wages," even in inverted commas, is most unfortunate, and to include 73 children, 15 idiots, and an unspecified number of low grade imbeciles in a "wages" group is inadmissible. The group of patients in outside employment receives adequate spending money in any well-run hospital and many other perquisites besides. The long-stay cases have cinema, concerts, dances, television, outings, etc., in addition to any sum granted to them, and to speak of "wages" is ludicrous. The deduction from the facts that only one hospital sends patients out to factory work may be nearly true, but cannot emerge from the survey. I know the one referred to by the authors. This is another.

Finally, Sir, I think the accompanying table will show your annotator that we do our best not to detain young adults who may become difficult. These are difficult boys, irrespective of what Section of the Mental Deficiency Act they are admitted under.

Distribution of 53 Hospitalized Male Patients Aged 16-30 Years, I.Q. 70+, by Admission Category and Occupation

	Section of M.D. Act		
	6	8	9
Inside the hospital:			
Maintenance work	6	1	0
Vocational training	9	11	3
Outside the hospital:			
"Protected" daily work ..	5	1	0
Normal daily work	5	6	1
Licence	2	2	1
Total	27	21	5

This accounts for nearly the whole of this group within the hospital. The seven on maintenance work have had to be written off for gross physical or psychological disabilities. The 23 on vocational training are passing through to daily employment and licence. The other 23 are already out at work. Although they all have I.Q.s of over 70, I can assure you that the height of that I.Q. is not directly related to the social value of that work.—I am, etc.,

Chertsey, Surrey.

J. M. CRAWFORD.

Appendix in Hernial Sac

SIR,—I would like to add one further case of an appendix in a hernial sac to the several already published in your journal recently.

A woman aged 40 was admitted to hospital complaining of a painful swelling in the right groin. She stated that the swelling had been present intermittently for the previous six years—that it appeared on coughing and straining but was easily reducible. One week prior to admission the swelling reappeared but could not be reduced. On examination she had a round swelling about the size of a hen's egg in the right groin below the inguinal ligament and lateral to the pubic tubercle overlying the saphenous opening. The lump was diagnosed as an early strangulated femoral hernia.

At operation the lump was freed from the surrounding tissues and the sac opened, it then being noticed that the content of the sac was a gangrenous appendix. The inguinal canal was then opened and the neck of the sac freed from above; at the same time the constriction ring in the neck was also divided. The sac was then brought up into the inguinal canal and the appendix and caecum delivered into the wound. The constriction ring in the sac had compressed the appendix about 1 in. (2.5 cm.) from its tip and caused gangrene of its distal one inch. The appendix was removed in the usual manner and the sac ligated and removed.

The patient made an uninterrupted recovery. She was seen recently, and had no recurrence of the hernia.—I am, etc.,

Dublin.

WILLIAM A. L. MACGOWAN.

The Lithotomy Position in Obstetrics

SIR,—There is undoubtedly a danger that students in this country may gain the impression that the lithotomy position is best for all operative deliveries by forceps, and still worse that they may be taught to apply forceps only in that position. The reason for this is not far to seek. It is probably true to say that most teachers of obstetrics do at least 10 gynaecological operations to one forceps delivery, and they naturally feel more at home (if such an expression is seemly) with the patient in the lithotomy position. This does not mean that it is wise to teach the general-practitioner obstetricians of the future that it is the safest position for forceps delivery.

Professor T. N. A. Jeffcoate states (*Journal*, October 31, 1953, p. 951) that "the greatest danger of forceps delivery at the present time is anaesthesia, and this danger has, if anything, increased with the introduction of modern anaesthetic agents." He goes on to quote "six maternal deaths associated with forceps delivery in the Liverpool Maternity Hospital during the 15 years preceding 1950," and states that no less than half of these were the result of inhalation of vomit during the induction of general anaesthesia. In the *Journal* of December 12, 1953 (p. 1324), I ventured to ask "whether these patients were in the lithotomy position, which we know Professor Jeffcoate favours for all operative deliveries" (*Journal*, June 10, 1950, p. 1359). As no answer has been forthcoming, it seems reasonable to suppose that the assumption was probably correct. If fatalities from this cause can occur in a well-equipped theatre replete with suction apparatus, oxygen, and all the refinements, how much more dangerous would it be if the same kind of emergency occurred to the general practitioner working, perhaps shorthanded, in an ordinary bedroom without such facilities. There is, too, the undeniable fact that indications for forceps delivery frequently arise unexpectedly and often there has been no time to give the same careful attention to the preparation of the patient for anaesthesia as is possible in a planned operation. It is often not possible, or even desirable, to withhold food from a patient during a prolonged labour.

After more than 30 years of experience of the lateral position (which, as I have pointed out before, becomes semi-prone on an ordinary bed) it is quite inconceivable to me that fatalities from this cause would occur in that position, and virtual freedom from this very real risk far outweighs the minor disadvantages of the lateral position, for they are largely theoretical and in practice do not amount to much. I would grant, of course, that if only local anaesthesia is used there is no objection to the lithotomy position, but it is at least questionable whether this form of anaesthesia will become widely adopted for forceps delivery, at any rate in domiciliary midwifery, and I venture to doubt whether the patient at the end of a long and tiresome labour would be too pleased about it.—I am, etc.,

MILL HILL, N.W.7.

A. H. MORLEY.

Dysgerminoma of the Ovary

SIR,—Mr. Maurice Hershman (*Journal*, January 23, p. 198) gives an interesting account of a dysgerminoma of the ovary which had undergone torsion, which he states is the first recorded case of such a condition. In view of its apparent rarity I would like to briefly record a similar case which has recently been under our care.

The patient, an unmarried girl of 21, was admitted to hospital on January 13, 1954, complaining of severe colicky lower abdominal pain and vomiting. She was sweating profusely, temperature 103° F. (39.4° C.), pulse rate 100. A clearly visible, tender swelling was found arising out of the pelvis. Previous menstrual history was normal. On catheterization the bladder was found to be empty. A diagnosis of torsion of an ovarian cyst was made and laparotomy performed through a lower right paramedian incision. Almost the whole of the lower abdomen and pelvis was filled with a solid, lobulated tumour arising from the right ovary. The pedicle had undergone torsion and a commencing area of necrosis was apparent on the superior pole of the tumour to

which great omentum was attached. The tumour was removed without difficulty, the patient making an uninterrupted recovery. Histological examination of the tumour showed it to be a dysgerminoma.

There were no signs of pseudohermaphroditism in this case, and the menstrual history prior to operation had been normal. No signs of intraperitoneal metastasis were evident at operation, and subsequent radiography of the chest revealed no abnormality.—I am, etc.,

Sheffield, 6.

BRYAN ROWLANDS.

Fatal Bronchial Asthma

SIR,—I was interested to read the article by Drs. C. Kelman Robertson and K. Sinclair (*Journal*, January 23, p. 187). Sudden death may also occur in an emphysematous patient who has an acute respiratory infection or even on recovery from the infection, and post-mortem examination may not be helpful in deciding the exact cause of death. In some cases, however, I have noticed the presence of a marked cerebellar pressure cone which may, of course, in itself cause sudden death. The cerebellar pressure cone is in keeping with the high C.S.F. pressure seen in these cases. Since long-continued asthma may lead to emphysema I think that this is worth considering as a cause of sudden death in asthma. The difficulty, however, lies in deciding whether a cerebellar pressure cone is abnormal or not, and we are now investigating this.

I should like to issue a word of warning in giving an oxygen-CO₂ mixture to the old-standing asthmatic subject who is suffering from acute anoxia and who will have some degree of CO₂ retention. The inhalation will cause further rise of CO₂ and the production of carbon dioxide narcosis.—I am, etc.,

Enfield, Middlesex.

THOMAS SIMPSON.

SIR,—With reference to the article by Drs. C. Kelman Robertson and Kenneth Sinclair (*Journal*, January 23, p. 187), the following five cases of sudden death at the onset of an attack of asthma may be of interest. They occurred in a series of 700 necropsies, two-thirds of which were hospital cases and one-third coroners' cases. In four instances the only clinical history consisted of the policeman's report stating that the patient was a known asthmatic. The fifth case died suddenly in hospital, having previously been brought round from status asthmaticus. Some particulars of these five cases are shown in the following table.

Case No.	Sex	Age	Month of Death	Evidence of Infection	Drugs Taken Soon Before Death
1*	F	31	December	—	—
2*	F	45	September	—	—
3*	F	60	February	+	—
4*	M	33	September	—	—
5	F	36	September	—	+

* Coroners' cases.

All showed characteristic sticky mucus plugging the bronchioles and ballooning the lungs. Though probably of no significance, two of the cases occurred soon after the administration of drugs (Case 2, two aspirins; Case 5, a barbiturate tablet). Case 3 showed an unusual nodule of pneumonic consolidation about 3 cm. in all diameters, close to the hilum of the left lung, which sectioning showed to be a patch of haemorrhagic bronchopneumonia. The speed at which death can occur is remarkable. Case 1 said she felt an attack of asthma coming on, and sent her young son up to the bedroom to get some ephedrine tablets. On his return he found his mother lying dead on the floor.

Regarding the mode of death, I would favour the authors' first suggestion that the heart fails due to increased resistance in the pulmonary bed. The relative infrequency of petechiae of the lung and heart surfaces implies to me that a respiratory struggle against obstruction did not occur.—I am, etc.,

Braintree, Essex.

A. I. D. PRENTICE.

Symptoms of Dracunculiasis

SIR,—I have just received my *Journal* of December 12, 1953, and have read "A Case of Dracunculiasis (Guinea-worm) in Nairobi," by Dr. A. L. Ribeiro (p. 1310), with interest. Dr. Ribeiro thought it remarkable that his patient did not show the "usual clinical symptoms such as fever, diarrhoea, vomiting, and urticaria" which are associated with the arrival of the worm to the surface. Before I became a medical student I suffered several times from dracunculiasis, and now I am in practice in an area where the disease is endemic. It was only once, and that was my first attack, that I developed a sudden fever and urticaria before the worm made its shocking appearance. On all other occasions all I had was a dull ache followed by intense itching on my leg. This was followed by a blister over the area of itching and soon this burst and I saw one end of the worm.

From experience some of my patients who recognize the aching control their fingers and anxieties, allow the blister to form and burst, and the worm makes its appearance with as little interference as possible. But those who scratch and irritate the area and pull prematurely on the worm, which at first is thin and very delicate, are calling for trouble. The part gets swollen, hot, and tender, with development of fever and, particularly if having the disease for the first time, urticaria; if the patient was foolish enough to get the worm broken then he would have many sleepless nights from a big abscess. My people here, who have had the disease with them for centuries, know all these, and hence "the usual symptoms" expected by Dr. Ribeiro are unusual.—I am, etc.,

Irrua, Nigeria.

XTO. G. OKOJIE.

Unwrapping the "Journal"

SIR,—I second the motion made by Dr. H. Lyndhurst Duke (*Journal*, December 12, 1953, p. 1326) that the *Journal* reinstate that "ingenious old wrapper" which many a reader cherished and librarians adored.—Hopefully, I am, etc.,

Philadelphia.

CATHERINE DELSORDO.

What is a Psychopath?

SIR,—I have noted with interest the discussion which has been carried on in your correspondence columns regarding the definition of a psychopath. May I call your attention to the definition given in the *Psychiatric Word Book*, which was written by the late Dr. Richard H. Hutchings, and which is published by the New York State Hospitals Press? Their definition is as follows: "Psychopathic Personality.—A type of personality afflicted with diminished volitional [sic] control and heightened emotional response to stimuli."

I am quite sure that this definition could not be improved upon. It is very clear, simple, and practical.—I am, etc.,

Fort William, Ontario.

JOHN R. HOWITT.

Weight of British Children

SIR,—The article by Dr. E. M. B. Clements (*Journal*, October 24, 1953, p. 897) concerning heights and weights of schoolchildren, together with the letter by Dr. W. T. C. Berry, Mr. E. R. Bransby, and Mr. W. H. Hammond (*Journal*, December 12, 1953, p. 1324) on the same subject, has been of considerable interest to us. We have recently used data on the heights and weights of over 7,000 Birmingham children attending local authority schools in 1952 to obtain comparisons between children drawn from good, medium, and poor neighbourhoods. The children were of three age groups, the ages at their last birthdays being 6, 11, and 14. The smallest group drawn from any type of neighbourhood was 103 (boys aged 11, from good neighbourhoods). Whilst fairly consistent differences were found in the average heights and weights of both boys and girls coming from the different type of neighbourhoods in each of the three age groups, yet in only certain cases were these differences statistically significant, when a difference of twice the standard error was taken as a level of significance. One

of us (H. M. C.) whilst in Sheffield in 1947 found similar differences, using the same criterion for significance, in a survey amongst schools classified into the three groups. The question of significance seems to be of importance and may account to some extent for the apparent differences in the results of various surveys. Where numbers in the samples are small a greater observed difference is necessary to achieve any conventional level of significance. Other factors accounting for contradictory results are, no doubt, type of school considered and classification system. The classification according to catchment areas of schools is theoretically of very doubtful validity, but in practice seems to yield useful data.

Our results showed significant differences in the heights and weights of both boys and girls at age 6, coming from good and medium neighbourhoods. At the age of 11 only the heights and weights of the girls from these districts were significantly different, and at 14 differences were not significant. In comparing children from medium and poor neighbourhoods, differences in height for both boys and girls at age 6, and in weight at age 14, were significant. There was also a significant difference in the height of girls at age 14. No other differences were significant.

In his article, Dr. Clements states that "to-day, average children of the same age in the middle- and lower-income groups are the same height, while the average child in the upper-income group is about 2 in. taller." If by the term "average child" Dr. Clements requires us in this context to understand "a child of average height," then we should be glad to discover the basis for his statement, since, using the figures given by him in Table 1, the mean of the difference in height between boys of average height and age 5-13 from upper- and middle-income groups was found to be 0.64 in., and for girls this difference was 0.65 in. Also, the mean difference in height between boys of middle- and lower-income groups was found to be 0.46 in. and between girls 0.1 in. These figures are more in agreement with our own.

Similarly, while in disagreement with the statement that "weight differences between comparably aged boys of the three income groups have now been eliminated," we do not find our figures to be very different from those given by Clements. The range of differences in weight between comparably aged boys of the upper- and middle-income groups obtained from Table 11 is 6 lb. to 13.6 lb., while the mean difference is 1.75 lb. Thus the range is greater than that of 1-6 lb., quoted by Bransby *et al.* for boys aged 5-15 in Sheffield. We find, however, neither in our figures nor in Clements' any progressive increases in weight differences with age to correspond to those quoted for boys of 5, 8, and 12 in Liverpool, attending schools in good and poor neighbourhoods.

Because of the conflicting results obtained by surveys in different towns, and even within the same town with a different system of classification and a different size of sample, it seems important to stress the point that at present any results obtained by surveys such as those considered above provide estimates which relate with certainty only to the local community sampled. To treat that community as a sample of a more widely defined population involves assumptions which have yet to be validated.—We are, etc.,

H. M. COHEN,
K. E. GALES.

Birmingham, 15.

"Status Lymphaticus"

SIR,—Dr. H. B. Dodwell (January 16, p. 149) states that no reference to this syndrome can be found earlier than 1850; it seems, however, that Kopp in 1830 first drew attention to thymic asthma and "thymic death."¹ While one can agree with Dr. Dodwell that status lymphaticus is a hotch-potch of all kinds of cases with low resistance and sudden death, and while thymic compression or "thymic dysendocrinism" as a cause of death most probably does not exist, the syndrome should perhaps not be regarded as a myth in the light of modern medical knowledge. On the contrary, it seems remarkable that this syndrome was conceived as a clinical entity so long ago and on purely anatomical grounds. It would not be the first time that science has detected some truth in an old "myth."

The anatomical findings indicating hyperplasia of lymphoid tissue and persistence or enlargement of the thymus gland appear in an interesting light if one remembers that injection of pituitary corticotrophic hormone and/or adrenal cortical glucosteroids rapidly causes involution

and depletion of lymphoid follicles and of the lymphatic and thymus glands. This conspicuous change is accompanied by an increase in the number of circulating lymphocytes and in the urinary excretion of uric acid which is presumably formed by the breakdown of lymphatic nuclei. Other pertinent changes which occur simultaneously are not important for the present argument. However, it seems certain that the amount of lymphoid tissue and its rate of breakdown is regulated by the adrenal cortex via the pituitary. This breakdown occurs as an important physiological response to stress, in the sense of Selye, and seems to form part of the mechanism by which the body is protected against injury and for which an adequately functioning pituitary-adrenocortical system is necessary.

As I have previously suggested,² the assumption seems close at hand that decreased resistance to stress in connexion with lymphoid and thymic hyperplasia i.e., the status thymolymphaticus—is an expression of (constitutional?) pituitary-adrenocortical deficiency in respect of corticotrophin and/or adrenal glucocorticoid secretion, the anatomical findings merely being a consequence of the deficiency but not the cause of the syndrome. This assumption would explain the association of lymphoid hyperplasia with lack of resistance to stress which is known from other endocrine diseases with adrenocortical deficiency (e.g., Addison's, Simmonds's, and Graves's disease). The hypothesis could easily be verified by investigations into the adrenal cortical reserve of cases with suspected status thymolymphaticus. I am, etc.,

London, W.1.

REFERENCES

- Quoted by T. Brunsch (1937). *Lehrbuch der Inneren Medizin*. Berlin and Vienna.
- Endocrine Diagnosis*, 1951, pp. 198 and 304. London.

Penicillin-resistant Gonococci

SIR,—In view of the question which must be exercising the minds of many venereologists whether there is any near danger of gonococci becoming penicillin-resistant, the following case may be interesting.

X.Y.Z. attended the V.D. Department, Central Middlesex Hospital, on the evening of October 23, 1953, with a slight urethral discharge and a history of having been treated the same morning with 600,000 units of penicillin in the form of "distaquine." No gonococci were found in the discharge and the patient was treated with potassium permanganate irrigations. On November 5 he reattended with a profuse urethral discharge containing gonococci as seen in slide and culture. I personally injected 600,000 units of penicillin in the form of "prolophen."

When he was next seen on November 12, the discharge had disappeared, but on November 19 when he reattended he reported that the discharge had reappeared on November 15; on his reattendances the discharge was profuse, with myriads of gonococci in the smear, more than I have ever seen in a slide in my thirty years' experience. The culture was positive and the gonococci there were reported as sensitive to penicillin. I gave him a mega unit of penicillin in "prolophen" and the discharge again disappeared, but it had returned by December 7.

When I saw him on December 10 gonococci were profuse in smear and the culture was again positive. There was no evidence of infection in the prostate, and, as far as I was able to see later when under local treatment, the inflammation had died down. There seemed to be no closed focus in the anterior urethra.

Under very close cross-examination the patient denied any fresh exposure to infection after the first sign noted above, and I believe him. Is this the writing on the wall? I am, etc.,

London, N.W.10.

P. A. CLEMENTS.

Carcinoma of Colon and Salmonella Infection

SIR,—This male patient, aged 62 years, was admitted to the hospital on October 24, 1953, with a medical history and diagnosis of a possible subacute intestinal obstruction. In addition, however, he had inflammatory congestive chest symptoms for one week previous to admittance which had not responded well to penicillin.

On admittance he had definite signs of bilateral basal congestion and there was some abdominal distension. He was put on

500,000 units of intramuscular penicillin six-hourly, but his pyrexia continued although his chest symptoms improved. Blood was sent for agglutination reaction on October 30, 1953. A barium enema was done on November 2, 1953, and this confirmed the clinical diagnosis of obstructed large bowel (obstruction was present in mid-third of transverse colon). On November 3, 1953, a laparotomy was performed by me under general anaesthesia, and the patient was found to have a string carcinoma in the mid-third of the transverse colon. There were multiple secondaries in the surrounding glands and the liver was full of nodular secondary growths. A side-to-side anastomosis above and below the obstruction was performed to relieve symptoms of obstruction. Following the operation signs of ileus developed, but these resolved within a day or two. The bowels were functioning normally within three days.

The final pathological report dated November 13, 1953, was: "The organism isolated from this patient's clot culture has been identified by the salmonella reference laboratory as *Salmonella anatum*." Following the diagnosis of a salmonella blood infection the patient was treated by chloramphenicol and he eventually responded quite well. When he was discharged home on November 28, 1953, his bowels were functioning satisfactorily, his abdominal wound was well healed, and he was able to get about. Since discharge home, however, he has developed further pyrexia and has required a further course of chloramphenicol.

The interesting point here, however, is the association of salmonella infection with carcinoma of bowel with multiple secondaries. In the past I think that most of us have been of the opinion that the temperature often met with in patients suffering from a carcinoma with multiple secondaries was due to absorption of the breakdown protein products, but this case probably indicates that in some cases, at least, normal protective mechanisms to combat blood infections are thrown out of gear, and it may well be that if blood cultures were performed on such cases some at least might yield a positive blood culture.—I am, etc.,

Oswestry.

A. LUTTON.

Disease and the Pig Bin

SIR,—Dr. Kathleen Vaughan's biting fly (*Journal*, January 30, p. 279) is almost certainly *Stomoxys calcitrans* L., the "biting house fly" or "stable fly." Their habits are consistent with their being able to breed in pig bins, and there is some evidence that they may be able to transmit pathogenic organisms.

These insects have, however, always been common on farms, where they breed on soiled vegetable matter, and one would have expected that their role in disease transmission in country districts would have been uncovered by now. It would be very interesting if Dr. Vaughan could substitute an entomologist's net for her fly-swatter and see if she could recover any pathogens from the stomachs of these flies.—I am, etc.,

London, E.C.1.

EDWIN R. NYE.

Student International Clinical Conference

SIR,—The British Medical Students' Association has undertaken once again to organize a Student International Clinical Conference in Great Britain from July 15 to 30, 1954, as an activity of the International Federation of Medical Student Associations. It will be divided into three sections: First, there will be seven days in London, when at least five of the teaching hospitals will give lectures and demonstrations, and visits will be made to places of interest; secondly, three days in Birmingham with visits to hospitals, factories, a film show, and a visit to Stratford-on-Avon; and, finally, four days in Edinburgh, where similar activities are being planned. Our greatest difficulty in organizing an attractive programme is to make it sufficiently cheap to enable foreign students to attend, taking into account the expense of travelling to this country. We are therefore appealing for financial support for the Conference. We hope to raise at least £500, so that we can organize a Conference worthy of what Britain has to offer, and within the student's purse, at the same time repaying in some

measure the generous hospitality which British students receive on going to similar courses abroad.

This Association was one of the founder members of I.F.M.S.A., which was set up in 1951 to promote international co-operation between medical students, and at its foundation we were careful to ensure that it would be free of any political activities which seem to predominate in other international student bodies. Its present member countries are Austria, Denmark, Eire, Finland, France, Great Britain, West Germany, Holland, Israel, Norway, South Africa, Spain, Sweden, Yugoslavia. B.M.S.A. was the first chairman nation, and continues to give lead in many fields. The B.M.A., the World Medical Association, and the World Health Organization have expressed sympathy with its ideals. Its aims are strictly limited to promoting and organizing conferences, visits, and exchanges, with some research into student health and education.

There are many foreign students wishing to obtain an insight into British medicine, and we are therefore particularly anxious to make a success of this Conference. I do earnestly hope that your *Journal* can support in this object, and any contributions, however small, will be gratefully received.—I am, etc.,

B.M.A. House, Tavistock Square,
London, W.C.1.

ALAN B. GILMOUR,
President, British Medical Students' Association.

POINTS FROM LETTERS

Polite Surgery

Dr. W. A. J. DONALD (Monifieth, Angus) writes: I am tired of reading about surgical "trauma," surgical "interference," and surgical "aggression." The term surgical "intervention" is more polite and restful to my sensitive, surgical ear.

Requirements for D.T.M.&H. and D.P.H.

Dr. L. R. FLOWERS (Doom Dooma, Assam) writes: By analogy with postgraduate diplomas, such as F.R.C.S., M.R.C.P., D.C.H., D.A., etc., candidates for which are not required to attend a special course but do the requisite amount of work in the respective specialty, I submit that those who have been working for a specified period in the Tropics, dealing with all aspects of tropical medicine and hygiene, should be exempted from the necessity of attending the course for the D.T.M.&H., or the D.P.H., and should be permitted to sit the examination without these preliminaries. This would bring these diplomas into line with all the others, and would eliminate the present factors of time and money spent on a compulsory course, and the resulting unfairness to those who cannot afford these pre-examination requirements.

Measles and Appendicitis

Dr. D. S. BADENOCH (Inverness) writes: Measles is not the only zymotic liable to show up appendicitis in its course. A similar emergency often arises during or following influenza A and B, and indeed many bad colds. The damaging entity common to all is the severe biliary congestion lasting from two to four days. Pathologists have explained, as long ago as thirty years, how the chemistry of the liver comes to a partial standstill, and, in addition, how the flora of the bowel multiplies enormously in the absence of a normal bile flow. If, during the phase of biliary congestion, the patient is fed on converted food, few noticeable sequelae arise. If, on the other hand, he is given fat and starches, he may expect a variety of complications, appendicitis included. Biliary stasis, to my mind, is the commonest cause of acute appendix.

Anaemia and Purchase Tax

Dr. A. PINEY (London, W.1) writes: The only treatment needed in simple iron-deficiency anaemia is administration of an adequate amount of ferrous salt; and the addition of vitamins, folic acid, liver, etc., serves no therapeutic purpose. There seems to be general agreement that ferrous gluconate is less liable to cause gastro-intestinal upset than are other iron compounds. It is therefore amazing that tablets consisting entirely of ferrous gluconate are more expensive than those which contain vitamins in addition to this compound. It appears that H.M. Customs and Excise regard such mixtures as essential drugs, which are therefore exempt from purchase tax, whereas, in fact, this is a stupidity that adds to the size of the drug bill of the N.H.S. and penalizes those patients who prefer to retain their freedom by remaining "private" and paying for their own medicines.

Obituary

O. WYNNE GRIFFITH, O.B.E., L.R.C.P.Ed., J.P.

Dr. O. Wynne Griffith, who died at Pwllheli on January 17 at the age of 97, was one of the oldest medical men in Wales.

Owen Wynne Griffith was born at Nevin, Caernarvonshire, on November 16, 1856. After leaving Bottwnog Grammar School he served as an apprentice with Dr. Evan Roberts, of Penygroes, Caernarvonshire. In his later years he was fond of relating his experiences in those early days, and in 1939 he broadcast some of his recollections. At the age of 17, in 1874, he entered Guy's Hospital as a medical student, and qualified L.R.C.P.&S.Ed. four years later at the age of 21. After qualification he was warned that his health was weak and he took an appointment as a ship surgeon. After two years he returned to Wales and began practice in the Llyn peninsula of Caernarvonshire, living for most of the time at Pwllheli, where he quickly developed a very large country practice. For the first 25 years of his professional life he travelled many thousands of miles on horseback or in an open gig. He addressed nearly all his patients by their Christian names, and was interested in every aspect of their lives. He had great personal charm and a most lovable nature, and it is doubtful if any man in the district has ever had a warmer place in the hearts of those who knew him. For a long time he was known affectionately all over the district as "the old doctor." Although he officially retired from practice about 20 years ago, he was frequently consulted by his colleagues to the end. When interviewed in 1946 on the occasion of his 90th birthday, Dr. Wynne Griffith was asked for his recipe for longevity. "I'll tell you," he said. "Avoid jealousy: always keep an optimistic view and practise moderation in all things." A member of the British Medical Association for 62 years, he was chairman of the South Caernarvon and Merioneth Division in 1907 and president of the North Wales Branch in 1910-11. He also served on the executive committee of the Division and on the Branch council. In his presidential address to the North Wales Medical Association many years ago he emphasized the need for a ministry of health, and he saw it come into being.

In the life of the community in which he lived Dr. Wynne Griffith was an important figure. He was a member of the Pwllheli town council for over 60 years, an alderman of the borough for 55 years, and mayor for 12 years—a record for the office. He was a founder of Pwllheli Grammar School, and until recently chairman of the governing body. As an appreciation of his services to the town he was given the freedom of the Borough of Pwllheli in 1931. He was also a member of the Caernarvonshire County Council for nearly 60 years, an alderman for nearly 50 years, and chairman of the council in 1921. In his early years he took a keen interest in politics, and at one time was chairman of the Caernarvonshire Liberal Association. He was a personal friend and supporter of Mr. Lloyd George, and had presided at a number of the meetings at which Lloyd George made some of his famous speeches before audiences of about 10,000 people at Caernarvon. Religion played a very important part in his life: he was an elder of the

Presbyterian Church for 60 years, moderator of the South Caernarvonshire Presbytery for two years, and a senior deacon of Penmount Church, Pwllheli. In recognition of his public services over many years he was appointed O.B.E. in 1937.

Dr. Wynne Griffith lived a full and happy life, and except for the brief period in his early twenties enjoyed good health until the last two or three months of his life. His cheerful presence will be missed by a large number of friends and acquaintances. He is survived by a daughter and a son, who is a solicitor.

A. E. COOPER, M.D.

Dr. A. E. Cooper, who was for many years consultant anaesthetist to the London, the West London, and the Royal National Orthopaedic Hospitals, died on January 19 at the age of 84.

Austin Edwin Cooper was born at Dublin on February 8, 1869, and was educated at Leeson School and at Trinity College, Dublin. He took the L.M. while at the Rotunda Hospital in 1894, and the degrees of M.B., B.Ch. in the following year, proceeding to the M.D. in 1896. After graduation he held house appointments at the Adelaide Hospital, Dublin, and then came to London to act as resident medical officer at the Pimlico Dispensary. Dr. Cooper was keenly interested in anaesthesia from the start of his professional career. In the controversy which took place in England towards the end of the nineteenth century on the comparative safety of chloroform and ether he was a whole-hearted supporter of the use of ether, and so skilled in its use did he become that a certain deep type of anaesthesia was, and still is, named after him by being referred to as "Cooperization." He became anaesthetist to the Royal National Orthopaedic Hospital and assistant anaesthetist to the West London and other hospitals. Later he was appointed anaesthetist and assistant instructor in anaesthesia at the London Hospital and anaesthetist to Poplar Hospital. During the war of 1914-18 he worked in a number of special hospitals for officers, and at the outbreak of the second world war, although retired for some years, he returned to full active work, dividing his time between the London and Whipp's Cross Hospitals. An active member of the Chelsea Clinical Society, he had held office as treasurer and vice-president.

At the hospitals to which he was attached he took an important part in the teaching of anaesthesia, and his willingness at all times to help and instruct students, his unfailing punctuality, and his efficiency and quietness in his work and manner were all admirably unobtrusive qualities which led to his being accepted without full appreciation of his worth until too late—when it was found that an invaluable colleague had gone and a vacancy remained which could never be filled again with the same old-world courtesy and companionship. He was keenly interested in all forms of sport, particularly racing and fishing. In 1898 he married Miss Mary Hunter, and she died in 1946. There were two sons and one daughter of the marriage.

Dr. H. LINCOLN HATCH, who died on November 16, 1953, at the age of 84, was for many years in practice at Pinner. Herbert Lincoln Hatch was born on February 4, 1869, and studied medicine at St. Mary's Hospital, London, qualifying M.R.C.S., L.R.C.P. in 1892. He took the D.P.H. of the English Royal Colleges in 1894, and in the following year

obtained the Durham degrees of M.B., B.S., having passed the intermediate and final M.B. examinations with honours. After qualifications he held house appointments at St. Mary's and at the Hospital for Sick Children, Newcastle-upon-Tyne, and then went to live at Johannesburg, where he was in general practice for a few years. At that time he was particularly interested in the use of x rays in medical practice, and in 1897 read papers on the subject before the Transvaal Medical Society, of which he was the honorary secretary, and the South African Medical Congress: both papers were published in the *South African Medical Journal*. He served as a civil surgeon with the South African Field Force in the Boer War, and then returned to England in 1902, settling in practice at Pinner, where he was for many years a member of the honorary medical staff of the Northwood, Pinner, and District Hospital. A member of the British Medical Association for 58 years, he was chairman of the Harrow Division in 1925-6, and represented his Division at 16 Annual Representative Meetings from 1920 to 1939. He also served on the Central Ethical Committee and its standing sub-committee from 1930 to 1937, the Committee on the Medical Aspects of Abortion from 1934 to 1936, and the Tests for Motor Drivers Committee from 1929 to 1931. During the first world war he served as a captain in the R.A.M.C. from 1914 to 1916, later becoming ophthalmic specialist at No. 4 General Hospital. Dr. Lincoln Hatch had the confidence and affection of his patients and his colleagues, and his presence will be much missed for a long time to come.

Dr. A. P. PIGGOT, formerly deputy medical superintendent of St. James's Hospital, Balham, died on January 6 at the age of 75. Born of an Essex family on April 24, 1878, Allen Pledger Piggot was a medical student at Guy's Hospital and qualified M.R.C.S., L.R.C.P. in 1903. Until 1915 his main interest lay in psychiatry, and he worked in several mental hospitals. Eventually, however, his growing taste for morbid anatomy led him back into the stream of general medicine, and he became an assistant medical officer at St. James's Hospital. From 1916 to 1919 he served as a temporary captain in the R.A.M.C. After demobilization he returned to St. James's, where he became deputy medical superintendent. During the last war he remained at work while the younger doctors joined the Forces, and acted for several years as medical superintendent of the hospital. During his period at St. James's, first under the old board of guardians and later under the auspices of the London County Council, Dr. Piggot saw a gradual transition from old-fashioned Poor Law medical care to modern specialized medicine and surgery. He played a decisive part in gaining for the hospital the outstanding reputation which it now has. He remained mentally active and alert and keenly interested in every new development. His official duties were mainly clinical, in charge of certain medical wards, but, unofficially, he made morbid anatomy his hobby, and performed over 10,000 post-mortem examinations between 1920 and 1950. Overdue to retire in 1946, he was requested by the London County Council to take part in a scheme of research initiated by the Nuffield Foundation on the pathology of old age. Thus it came about that his closing years were spent in placing his vast experience at the service of others, and he was teaching postgraduate students right up to the onset of his last illness. It was during this period that most of his published work appeared. He had previously been joint author of papers on silicosis and on haemopneumothorax. Later he worked up his records on the morbid anatomy of old age, and under his guidance a series of articles dealing with various aspects of the subject were published in the American journal *Geriatrics*. Based as they were on over 2,500 necropsies of subjects over the age of 65, they represent a treasure house of pathology. Cardiovascular disease, new growths (in particular carcinoma of the bronchus), the arteriosclerotic kidney, chronic bronchitis, rheumatoid arthritis—on all these he shed new light. Piggot was always quiet, modest, and unassuming. He sought for no recognition nor expected

any reward. Always ready to help a younger colleague, he was the kindly friend of hundreds of doctors and nurses who came in contact with him. Equally at home by the bedside and in the post-mortem room, he was one of the last of those physician-pathologists for whom Guy's is so justly famous. He is survived by a widow, a son, and a daughter, who is following her father's profession.—T. H. H.

Colonel J. M. ELLIOTT, who was for many years consultant venereologist to the Essex County Council, died in London on January 6 at the age of 67. James May Elliott was born on March 16, 1886, and came of a medical family. His father, who was Dr. Haslett Elliott, of Rathfriland, Co. Down, had four sons, three of whom became doctors and the other a dentist. James was the third son. He graduated M.B., Ch.B. at Trinity College, Dublin, in 1910, and after two years in an uncle's practice he joined the Indian Medical Service, later transferring to the R.A.M.C. He served in India, Egypt, and the United Kingdom, retiring in 1937 to take up an appointment as venereologist with the Essex County Council. At the outbreak of the last war he was recalled to the Army and was appointed adviser in dermatology to the British Expeditionary Force in France in 1939-40. After Dunkirk he continued to serve in England until being posted to the Gold Coast, where he became ill and was invalided home. When he ceased to belong to the Regular Army Reserve of Officers in October, 1945, on reaching the age limit, he was granted the rank of colonel. After the war he returned to his position with the Essex County Council, holding the appointment until 1952, when he retired. In the subsequent two years he declined in health very rapidly, and it became apparent that he had never fully recovered from the severe illness contracted on the Gold Coast. His charm of manner and infinite courtesy and kindness to patients and colleagues gave him a large circle of friends, to whom his recent loss of health and his death so soon after his retirement have been a great grief. Colonel Elliott married in 1919 and leaves a widow, a son, and a daughter.—R. H. B.

By the death on January 9 at the age of 79 of Dr. W. J. SUSMAN, Henley-on-Thames has lost a prominent resident and one who played a big part in the public life of the borough for over 40 years. Walter James Susman was born on June 10, 1874, and was educated at Rugby and Caius College, Cambridge, where he obtained a Blue for hockey and narrowly missed a Blue for Rugby football. Even so, he was one of the members of the first English fifteen to play against a French international side. He qualified M.R.C.S., L.R.C.P. from St. George's Hospital in 1900, and took the degrees of M.B., B.Chir. three years later. Among the hospitals at which he held resident appointments were the Middlesex Hospital, the Victoria Hospital for Children, Chelsea, and the Westminster Hospital. In 1903 he entered a partnership at Henley, where he practised until his retirement in 1947. In 1919, after his return from service in the R.A.M.C., he was elected a member of Henley Borough Council and was chairman of the housing committee when an important slum clearance scheme was carried out. The public appointments which he held made an impressive list. In 1925 he became mayor of Henley for the first time. He served a second term as the town's chief citizen during the difficult years of 1945 and 1946. A keen member of the Council for the Preservation of Rural England, he was in addition chairman of the Henley, and South Oxfordshire Area Planning Committee from 1935 to 1948, and was a member and vice-chairman of the Henley Area Planning Committee from the time it was formed in 1949 until his retirement from the Council in 1952. He was also chairman of the Henley and District Technical Institute Committee and of the Henley Further Education Committee. He took a close interest in the Henley War Memorial Hospital, to which he was consulting physician, and was a member of its management committee until the introduction of the National Health Service in 1948, when he

became a member of the Reading and District Hospital Management Committee and of the Henley Area Committee. He was a past president of the Reading Pathological Society, chairman of the Reading Division of the British Medical Association in 1919-20, and president of the Oxford and Reading Branch of the Association in 1931. For some years he was deputy coroner for South Oxfordshire. A prominent freemason, he was a member of the Thames Lodge, of which he had been three times master, one of the founders of the Thames Chapter, and a past officer of the supreme grand chapter of England. One of the first members of the Henley Golf Club, he had held the office of captain. In 1914 he married Lena, only daughter of the late Dr. and Mrs. Bransby Brooks, of Sonning, and she survives him. By his death his colleagues have lost the benefit of the experience of a shrewd general practitioner and Henley one who devoted much of his time to the welfare of his fellow townsmen.—N. R. C. L.

Dr. J. W. CRERAR died at Snape, Suffolk, on January 7 at the age of 86. He had been in practice in his home town of Maryport, Cumberland, until eighteen months ago. John William Crerar, the eldest son of Dr. John Crerar, was born at Maryport on November 29, 1867. From Carlisle Grammar School he went on to study medicine at Edinburgh University, where he graduated M.B., Ch.B., with first-class honours, in 1889, having gained the Vans Dunlop scholarships in physiology and in pathology and surgery in 1887. He became resident surgeon at the Edinburgh Royal Infirmary and demonstrator of anatomy in the university. Owing to the state of his father's health he relinquished his work in Edinburgh and entered the practice at Maryport in 1895. He was a fellow and former president of the Royal Medical Society of Edinburgh, and in 1905 he became a fellow of the Royal College of Surgeons of Edinburgh. During the course of his long life he published several interesting papers in this and other journals. In 1911, for instance, he described in this *Journal* a visit to the Mayo Clinic. A lecture he gave before the Edinburgh Pathological Society in 1918 on the subject of the training of medical students for general practice was later published in the *Edinburgh Medical Journal*. In collaboration with the late Professor J. Lorrain Smith he did some of the experimental work which ultimately resulted in the general use of eusol as an antiseptic during the first world war. Less than a year ago the *British Journal of Ophthalmology* published some historical notes on congenital colour blindness which he wrote jointly with Dr. J. A. Ross. A member of the British Medical Association for 62 years, he played a notable part in local medical affairs. He acted as one of the honorary secretaries of the Section of Pathology and Bacteriology when the Association held its Annual Meeting at Carlisle in 1896. He was also president of the Border Counties Branch in 1912-13; chairman of the English Division in 1910-11, and again from 1924 to 1926; and he represented his Division at a number of Annual Representative Meetings. When he could find time to take part in lay affairs his presence could always be felt in deliberation and decision, and all educational and cultural movements could count on his support. A good deal of his affection was centred upon the Victoria Cottage Hospital, Maryport, from its establishment over half a century ago right up to the time of his death, for he had engaged to be present at the opening of the new out-patient department this month. Always a true son of Maryport, he found great pleasure in collecting material in the form of photographs, maps, and slides showing the history and development of the old port. He traced the home of Isabella Harris, mother of Lord Lister; and in the course of his researches he was able to disprove what had previously been claimed to be a historical fact, that the *Alfred*, the first warship commissioned in the United States Navy, was converted from *The Black Prince*, which was built in Maryport. He discovered that the *Alfred* had been converted from a Philadelphia-

built vessel originally called *The Black Prince*, a ship much larger and thirty-two years older than the Maryport vessel. Dr. Crerar was commissioner of the Maryport harbour board, being vice-chairman until his retirement. He was also a justice of the peace for the county of Cumberland for many years. His younger brother, Dr. Charles Crerar, died in Silloth, Cumberland, in 1937.

F. W. C. writes: Dr. J. W. Crerar was the doyen of Cumberland practitioners and only relinquished the chair of the West Cumberland Medical Association after he had given up practice. The parting with him by his colleagues, patients, and the community was very reluctant, and the meeting in his home town, on his going from it after a lifetime's devotion and service, permitted tangible expression by way of a testimonial spontaneously and gladly subscribed, and admitted of things being said in his presence that normally only find their way into an obituary notice. Although he remained unmarried, Dr. Crerar was essentially a family man, the premature death of his father having entirely altered his outlook and the course of his career, bringing him home to his mother, brothers, and sisters. His mother lived to a ripe old age, and it was ever a joy to behold the affection between mother and son. What the lecture room and operating theatre of the larger sphere lost cannot be imagined, but the gain to the home, the general practice, and the community of the small town and countryside was superlative. He slipped quietly out of life without trouble to anyone, just as he would have wished, and we can only express gratitude for a long life lived in altruistic service, and treasure a memory of one who, knowing the struggle of life, ended it as he had always faced it, serenely and with good courage.

Dr. J. M. AHERN, whose death at his home at Kew Gardens on January 12 at the age of 78 will be deeply regretted by his old friends and colleagues, was a member of the prison medical service for nearly 34 years. John Maurice Ahern was born at Glenbrook, Co. Cork, in 1875 and was educated at Belvedere College and at the Royal University of Ireland. He qualified L.R.C.P. & S.I. in 1898 and took the degrees of M.B., B.Ch. three years later. He joined the prison service as deputy medical officer at Liverpool in 1902 and then served successively in that capacity at Parkhurst, Birmingham, and Wakefield until 1917, when he left to enter the R.A.M.C. and saw service in Salonika in the first world war. He returned to his prison duties in 1919, being posted to the Borstal Institution at Rochester, where he acted as deputy governor in addition to his work as medical officer. Within a few months he was promoted to medical officer, class I, and two years later assumed medical charge of the prison at Liverpool. There he soon became a well-known figure in the courts, and his opinion on the mental condition of the prisoners under his care was regarded with respect. In 1930 he left Liverpool to become medical officer at Parkhurst and Camp Hill, where he remained until he retired in 1936. Ahern, however, was still an active man, and in the earlier part of his retirement undertook further medical work, including that of assistant medical officer at various mental hospitals. He was an able clinician and a man of considerable learning and acumen. He had, perhaps, a slightly eccentric personality, but this quality, with his irrepressible witticisms, only served to endear him the more to his colleagues and patients alike. He was for some years a member of the Royal Medico-Psychological Association, and among the papers he wrote were "An Inquiry into the Mentality of Juvenile Adult Delinquents" (1920) and "Certification as a 'Moral Imbecile'" (1925). He was a versatile man who enjoyed his family life and was in his younger days an enthusiast over his hobbies, such as poultry keeping and carpentry. Some of the furniture from his bench was very well made. He married Evelyn, daughter of the Hon. Edwin Reed, and there were two sons of the marriage. Mrs. Ahern died in 1949.—H. K. S.

Dr. ROBERT TINDALL, who was in practice at Hurworth, near Darlington, for over twenty-five years, died at Croft-on-Tees on January 12 at the age of 68. Robert Tindall was born on October 21, 1885, and studied medicine at Aberdeen University, where he graduated M.B., Ch.B. in 1909. After holding house appointments at Aberdeen Royal Infirmary and at Birmingham General Hospital, he was in general practice for two years, first with his uncle, Dr. F. M. Tindall, at Bedlington, and then at Stanhope. In the first world war he served in France for four years with the 27th Field Ambulance, 9th Scottish Division, retiring with the rank of major. He was mentioned in dispatches three times and in 1918 was awarded the Military Cross. In 1919 he settled in general practice at Hurworth-on-Tees, where he made many friends over a wide agricultural and residential district. He was soon accepted as an able, painstaking, and kindly doctor. An excellent diagnostician, he did invaluable work in the community he served and will be long remembered. He also took a prominent part in the life of the village, being chairman of the local district nursing association and of the village hall committee for many years, besides being an active member of the local branch of the British Legion. In the last war he served as medical officer to the 20th battalion of the Home Guard, with headquarters at Darlington, where he was also chairman of a medical board. He was chairman of the Darlington Division of the British Medical Association in 1929-30, and again from 1945 to 1948. While still apparently a robust and tireless man he was struck down in 1946 by a sudden illness, which compelled his retirement, to the great regret of all who knew him. Crippled as he was, he settled quietly at Croft-on-Tees and accepted his enforced idleness with more philosophical calm than could have been expected from one who had always been a man of action. He had always been keen on outdoor sports, especially golf and fishing, but he was now condemned to inactivity. He read widely, and constantly fell back on the Waverley novels, which he devoured completely in the first year of his illness. He was a man of decided views, and, though very outspoken, his comments were always enlivened with humour and a racy wit which endeared him to his friends. During his long illness the constant devotion and cheerfulness of his wife were a great solace to him. His elder son, Maxwell, was a major in the Gordon Highlanders and gained the Military Cross in the last war, but was killed at the crossing of the Seine. The only surviving son is Captain Angus Tindall, who is serving in the same regiment in the Regular Army. To him and to Mrs. Tindall we extend our deepest sympathy.—G. G. F.

Dr. LINA MARY POTTER, who died in the German Hospital, London, on January 15, was for something like 40 years a general practitioner in inner North London. She was a woman of marked personality, enthusiastic in a number of causes, and hail-and-well-met to a wide company of friends. In the 'twenties and 'thirties she was prominent in the affairs of the British Medical Association, reaching the chairmanship of the City of London Division and serving as a representative for many years. She was born in 1875, the daughter of a well-known physician in his day, John Baptist Potter, who was on the staff of Westminster Hospital. On her mother's side she was related to the late Dr. Lancelot Burrell, senior physician to the Royal Free. She received her medical training at the London School of Medicine for Women, qualifying in 1910, and she undertook some further studies at the University of Geneva. In the first world war she served with a women's medical unit which went out to Serbia, and seemed to have enjoyed the improvisations and emergencies which such an expedition entailed. She returned with a love for the Balkan country, and only a year or two ago revisited what is now Yugoslavia. She also went to Russia in 1916, and of medical work there on the eve of the revolution she had many strange tales to tell. After her war experiences she settled in general practice in one of the lovely old houses over-

looking Highbury Fields, and there, on the fringe of the city, she cultivated a big country garden. She carried out an astonishing amount of work in one form and another. She was on the panel of lecturers for the L.C.C.; she was attached as medical adviser for special cases to Scotland Yard; at one time she was director of the section of child welfare of the League of Red Cross Societies, a work very near her heart; she had great enthusiasm for the St. John Ambulance Brigade, giving lectures and attending committees and parades. At one time she was medical officer to the old Greenwich Union Infirmary. She also found time to contribute to medical literature, mostly on the subject of nutrition and child care. In the British Medical Association Lina Potter was a well-known and respected figure. She had been a member for just over 30 years. In the centenary year of the Association, when the principal gatherings were held in London, she was one of the four vice-presidents of the Metropolitan Counties Branch and vice-chairman of her own City Division, becoming chairman the following year. She was also a keen member of the Medical Women's Federation, and the meetings of the Hunterian Society were not quite complete without her presence, and the more Bohemian they were the better she fitted in. She was a friendly soul as well as something of a "character." To younger women starting practice she was constantly encouraging. She served on the council of Byng Hall, the hall of residence for women students of the University of London. Her circle of friendship included all dogs and cats in her neighbourhood, and her love of animals extended beyond the domestic hearth; she was an active Fellow of the Zoological Society. In recent years she had given up continuous general practice but helped her colleagues as locumtenent. At many medical gatherings in and around the City of London her hearty greeting and veteran gaiety will be sadly missed.

Medico-Legal

ANTIHISTAMINES AND ALCOHOL

A warning about the effects of antihistamine drugs coupled with alcohol was given by Mr. Victor Durand at London Sessions on January 26. He was appearing for Donald Charles Shuter, 49, company director, who pleaded guilty to being under the influence of drink or a drug when in charge of a car. Shuter was fined £15 with 15 guineas costs, and his licence was endorsed, but he was not disqualified from driving.

Mr. Durand said that Shuter, who had been driving for 35 years and had no previous convictions, was allergic to tinned crab, and after eating some developed a skin complaint. His doctor had prescribed antihistamine capsules for Shuter. They were delivered straight from the doctor's surgery. No warning, no qualification, was made save as to the number he should take and the rate at which he should take them. He said that Shuter was a gentleman who did partake of alcohol in moderate quantities, and on this particular night he had taken these capsules between 11 and 11.30 p.m., having already partaken with his wife and a friend of a bottle of wine and before that one pink gin. Although there was no immediate effect, it seemed now quite certain that there was disorientation as a result of the capsules affecting the alcohol.

The doctor said in evidence that the drug magnified considerably the effect of alcohol. He had given Shuter no warning, but he realized now it would be as well to give one, particularly to a motorist.

Mr. Durand, submitting that there were "special circumstances," said that the doctor was rather shaken after Shuter's arrest to find he had landed his patient in a predicament.

Mr. Henry Elam (Deputy Chairman) agreed with the submission and said Shuter would not be disqualified from driving.

Medical Notes in Parliament

A.C.T.H. and Cortisone

In the House of Lords on February 3 Viscount SAMUEL asked the Government whether a patient requiring treatment by A.C.T.H. or cortisone could obtain it if he was registered under the Health Service but not otherwise, and, if so, whether the regulation controlling the supply of these drugs would be altered to remove that discrimination.

Viscount WOOLTON, Chancellor of the Duchy of Lancaster, said the answer was "No," but the Minister of Health was glad of the opportunity to remove any uncertainty. The supply of A.C.T.H. and cortisone was controlled, but there was no question of having to be registered under the Health Service to obtain them. They were recent drugs which could have harmful effects, and experience in them was limited. For that reason they were supplied only to hospitals which had the necessary laboratory facilities and experienced medical staff. That staff enjoyed full discretion in the use of the drugs, which might be given to private or other patients at the hospital. In addition, other doctors or hospitals could obtain supplies from those selected hospitals if the drugs were required to treat one of the conditions in which they might be necessary to save or prolong life. Supplies were available to private patients on payment.

Viscount SAMUEL commented that the information might bring some reassurance to private patients. Viscount WOOLTON added that if Lord Samuel would give him particulars of any specific case he was certain the Minister of Health would be glad to follow it up.

Mortality in Amputees

Brigadier F. MEDLICOTT asked the Minister of Pensions and National Insurance what progress was being made by the investigation into the problem of increasing disablement suffered by limbless ex-Service men as they get older. Brigadier J. G. SMYTH, Parliamentary Secretary, stated on February 1 that the vast majority of the medical examinations requested by the Rock Carling Committee (see *Journal*, March 28, 1953, p. 717) had been concluded, and it was hoped to clear the small remainder in the next fortnight or so. The clinical findings relating to over 5,000 concluded cases were being collated, and the results would be sent to the committee for consideration as soon as possible. The Minister would prefer not to prophesy when the investigations, which were of international importance, would be completed. When the final report of the committee was available he proposed to study it in consultation with his principal medical advisers and subsequently with his Central Advisory Committee.

Amputation and Arteriosclerosis

Mrs. B. CASTLE on February 1 asked the Minister of Pensions and National Insurance why, in view of the independent and responsible medical opinion submitted to him in support of the application by Mr. Aaron Barnes, of Blackburn, for an increased war pension in respect of the amputation of his second leg, he had failed to give this applicant the benefit of the reasonable doubt which existed in his case. Brigadier J. G. SMYTH, the Parliamentary Secretary, stated that the consensus of expert medical opinion left no room for reasonable doubt that the amputation of Mr. Barnes's right leg in 1953 was not connected with the loss of the left leg in 1917. Mrs. CASTLE said that she had sent the Minister a report by an independent specialist of high repute that the degeneration of Mr. Barnes's right leg might have been associated with the first amputation. Brigadier SMYTH said he had read the reports of the two medical men Mrs. Castle had sent, and they were very

indefinite, just indicating that it was worth making a claim. During the past seven years the Ministry had heard of only two cases in which it was claimed that arteriosclerosis arose in a sound limb as a result of wearing an artificial limb. One of these cases, exactly similar to that of Mr. Barnes, was referred to two independent medical experts, both of whom confirmed the wealth of medical opinion in the Ministry on these cases, that the wearing of an artificial limb would not cause, aggravate, or precipitate the onset of arteriosclerosis in the sound limb, and that the incidence of arteriosclerosis was certainly no greater among amputees than among civilians who had no wounds.

Nutritional Value of Margarine

Mr. R. W. SORESENSEN asked the Minister of Food what were the main oils used in the manufacture of margarine; what were their respective food values; to what extent vitamins were added in the course of manufacture; and the respective nutritional merits of one pound of standard margarine and butter. Major LLOYD-GEORGE gave him the following information on February 1: The main oils used in the manufacture of margarine are coconut, palm kernel, palm, and groundnut oils, which are of similar food value. Margarine sold for domestic purposes contains 450,550 international units of vitamin A and 90 international units of vitamin D per ounce. Vitamins are not added to margarine used for manufacture. The fat content and energy value of butter and margarine are almost the same. The vitamin content of butter varies with place of origin and season of production. An average vitamin A value is 14,000 international units per lb. compared with 8,000 in special margarine, and an average vitamin D value is 270 international units per lb. compared with 1,440 in special margarine.

Mr. SORESENSEN asked what was likely to be the standard form of margarine available, and if the Minister would consider placing on the labels of margarines some indication of their nutritional value. Major LLOYD-GEORGE said that after de-rationing better-quality margarine would be available, and there would also be a margarine the same as the standard margarine used to-day. He would look into the point about labels.

Acidity in Soft Drinks

Dr. BARNET STROSS returned to his charge that the acidity of "Cola" drinks was harmful (see *Journal*, February 6, p. 340), and supported it with the results of American investigations. Dr. McCay, who was professor of nutrition at Cornell University, New York, had stated in evidence before a Congress Committee in 1950 that human teeth immersed for two days in Coca-Cola became very soft. That, Dr. Stross said, he had proved for himself, with teeth provided for the experiments by two other M.P.s. Professor McCay had also deplored the use of carbonated drinks which were so acid, not only because of damage to teeth, but also because of peptic ulceration, and in the case of children because of the caffeine content. Dr. Stross said that he had not picked out Coca-Cola to make any specific attack on it alone. Other drinks—for example, apple juice, grape juice, sweetened grapefruit juices—had a high acidity, pH 3.1, which meant there was a risk of teeth erosion if they were taken in excess over a long period.

Dr. CHARLES HILL, Parliamentary Secretary, Ministry of Food, said that evidence had been produced that extracted human teeth left in Coca-Cola for 72 hours had lost weight due to the attack on the calcium. They were expected to infer that in the swift passage of acid drinks through the lips and down the throat there was likely to be comparable danger. Had the fluid used been fresh lemon juice the loss of weight would not have been 5 to 10%, but 35%. Had it been grapefruit juice, orange juice, a neutral solution of citrate, or even distilled water, there would have been a loss of weight. These teeth were extracted; there was no protective layer of mucin, no washing by alkaline salivary

juices. Such experiments were of little value either in determining the fortitude of the teeth or the power of the solution. As for the experiments on rats, to make a comparison with an adult one would have to conceive that an adult man drank 25 bottles of Cola a day.

The lower the pH below 7 the higher the acidity, and the assumption was that because the pH was 2.6 there was particular danger from this kind of drink. The Government chemist had worked out for him the pH values of other drinks. Orange barley was 3 in a dilution of one in three, lime juice cordial 2.8, lemon squash 2.75, grapefruit 2.7, orange squash 2.95. After investigations in this country it was reported to the Food Standards Committee in 1951 that British fruit cordials and squashes diluted with four parts of water as usually drunk had a greater erosive action than phosphoric acid drinks.

Dr. Hill did not exclude the possibility of publishing the formula of Cola drinks on the label, although when that was demanded for patent medicines the chemical formula on the labels conveyed nothing to the public except a sense of importance that was aroused in some people when they believed they were taking an unusually complicated medicine. The Food Standards Committee were going to scrutinize the ingredients and acidity of soft drinks generally, not from fear of danger to people's teeth but as a matter of routine because the Food Standards Order was out of date.

Byssinosis Experiments

Mr. H. BOARDMAN asked the Minister of Labour on February 2 how far progress was being made towards the prevention of byssinosis among workers in cotton mills. Mr. HAROLD WATKINSON, the Parliamentary Secretary, informed him that extensive research had been carried out for some years into the problem of preventing the emission of dust in cotton mills which might cause byssinosis. This had been done under the auspices of a joint committee appointed by the Chief Inspector of Factories, with assistance from the Shirley Institute and individual cotton mills. Some progress had been made, though the problem had not been finally solved. Improved methods of dust exhaustion were the subject of further experiment to determine their suitability for general application.

Mental Patients.—The numbers of persons detained in mental hospitals, homes, and hostels at December 31, 1952, were: voluntary 31,402 (10,518), temporary 332 (484), certified 117,407 (152,624). The equivalent figures for 1939 are shown in brackets.

The Acute Rheumatism Regulations, 1953.—In reply to a question about these regulations the Minister of Health explained that their purpose was to assess the value of notification of acute rheumatism and of other procedures of medical interest in the prevention and management of rheumatic heart disease. The areas selected for notification constituted a sufficient sample for this purpose.

Occupational Health Service.—When asked if the Minister of Labour had considered the views received from the National Joint Advisory Council on the subject of a comprehensive occupational health service Mr. Harold Watkinson, the Parliamentary Secretary, said the Minister had received separately from the parties on the council their views on matters arising out of the Dale report on the industrial health services. In the course of these observations proposals had been put forward relating to the development of a comprehensive occupational health service, and this was under active consideration.

Old Age Pensioners' Prescriptions.—The Minister of Health, replying to a question about the cost of supplying medicines to old age pensioners free of the prescription charge, said that many old age pensioners were already entitled to have the charges for prescriptions refunded. It was estimated that the additional cost of relieving all old age pensioners of these charges would be of the order of £900,000 a year.

Agene.—Asked when a decision was likely to be reached on a substitute for agene in flour, Major Lloyd-George stated that everything was being done to expedite the matter. Experiments were involved which had to be watched with great care.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 23 (No. 3) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire	Eire	Eng. & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria ..	18	0	9	0		19	2	9	0	
Dysentery ..	490	100	178	18	2	419	33	128		
Encephalitis, acute ..	4	1	1	0		7	1	0	0	
Enteric fever: Typhoid ..	3	0	0	1		3	0	1	0	
Paratyphoid ..	4	0	0	0		8	1	2(B)	0	
Food-poisoning ..	148	17		0		62	5		0	
Infective enteritis or diarrhoea under 2 years ..				17	19				5	11
Measles* ..	1,106	12	43	31	132	21,882	1,349	232	75	
Meningococcal infection ..	43	5	12	2	3	38	2	18	3	2
Ophthalmia neonatorum ..	28	0	2	0		28	0	5	1	
Pneumonia† ..	809	44	323	3	5	1,349	95	242	26	3
Polio-myelitis, acute: Paralytic ..	30	1		6	0	15	2		0	
Non-paralytic ..	7	1		0		9	0		0	
Puerperal fever‡ ..	257	24	12	1	2	265	50	14	2	0
Scarlet fever ..	1,138	51	181	44	29	1,832	103	297	50	55
Tuberculosis: Respiratory ..	741	72	145	19				145	32	
Non-respiratory ..	92	6	20	3				24	3	
Whooping-cough ..	2,357	85	404	49	68	2,792	143	200	28	139

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire	Eire	Eng. & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..				0		0	0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	6	1	1	0	0	7	1	3	1	1
Influenza ..	31	4	5	1	2	132	25	2	0	1
Measles ..		0	0	0	0		1	1	0	0
Meningococcal infection ..		2	0				1	1		
Pneumonia ..	356	52	37	14	13	548	116	23	11	12
Polio-myelitis, acute ..	5	0			0	4	0			1
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	123	17	13	1	5	161	29	20	1	7
Non-respiratory ..		0	3	0	2		1	2	0	0
Whooping-cough ..	2	0	1	0	0		1	0	1	1
Deaths 0-1 year ..	279	34	41	17	12	280	32	40	12	10
Deaths (excluding stillbirths) ..	6,568	970	734	133	189	7,878	1,433	699	129	191
LIVE BIRTHS ..	7,632	1,148	918	214	370	7,508	1,110	919	183	345
STILLBIRTHS ..	206	21	17				192	28	24	

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Vital Statistics

Food-poisoning in England and Wales

An analysis¹ of reports obtained from medical officers of health and bacteriologists shows that 5,797 cases of food-poisoning were reported to the Registrar-General's office in 1951 and 5,885 in 1952. But the reports show that there were in fact over 11,000 cases in each of the two years; it seems likely that the true numbers are much higher. During the two years there were 715 outbreaks (two or more related cases in different families), 627 family outbreaks (two or more cases in one family), and 5,524 unrelated or sporadic cases. *Salmonellae* were isolated from 57% of the sporadic cases, from 34% of the outbreaks, and from 62% of the family outbreaks. The source was unknown in 43% of the sporadic cases, in 47% of the outbreaks, and in 28% of the family outbreaks. *Salmonella typhi-murium* was responsible for 2,804 (41%) of the incidents and had a peak incidence in the third quarter of each year. In the two years 69 deaths were reported, 65 due to salmonella infections, 2 probably due to *Cl. welchii*, and 1 to *Staph. aureus*; in one the causal organism was not found.

In only 509 of the 1,342 outbreaks and family outbreaks was the vehicle of infection reported, so that conclusions on the relative importance of different foods cannot be made. The percentage distribution of the various foods concerned in the 509 outbreaks was 66.4 for meat, 9.0 for sweetmeats, 7.9 for fish, 7.1 for eggs (mainly duck eggs), 2.9 for milk, 2.4 for vegetables, 2.4 for fruit, 1.0 for cheese, 1.0 for other forms of food. Processed and made-up meat foods were responsible for 76.3% of the cases attributed to meat.

The largest outbreaks due to milk were as follows: 600 children in Chard U.D., unpasteurized tuberculin-tested milk infected with *Salmonella dublin*; 200 children in Stoke Newington M.B., unpasteurized tuberculin-tested milk infected with *Staph. aureus*; 126 children in Lincolnshire, accredited milk and causal agent not found, but staphylococcal contamination suspected; 75 people in Whitby R.D., *Staph. aureus*.

In 243 of the 636 outbreaks in which the general public were involved the place where the food was obtained or eaten was given. Of these outbreaks 129 originated in canteens (85 of them school canteens); 39 in restaurants, hotels, cafés, etc.; 31 in various institutions; 28 in food shops; and 16 in private parties, hostels, etc. *Salmonella* infections were the causal agent in 14% of these outbreaks. In the 79 hospital outbreaks salmonellae were responsible for 73% of the cases.

The review of the 1951 and 1952 reports on food-poisoning shows that little or no headway has been made in the campaign for clean food. Processed and made-up meat foods account for more than one-half of the outbreaks, and the report suggests that manufacturers and caterers might respond to practical demonstrations better than to theoretical advice in lectures and publications. Duck eggs present a problem that needs some consideration, and it is suggested that they should be used only in foods which are submitted to a temperature of 100° C. for 10 minutes, or boiled for this length of time.

Infectious Diseases

The number of notifications of infectious diseases in England and Wales during the week ending January 23 increased by 223 for scarlet fever, from 915 to 1,138, and 112 for dysentery, from 378 to 490, and decreased by 154 for acute pneumonia, from 963 to 809, and 44 for measles, from 1,150 to 1,106.

The largest variation in the local trends of scarlet fever was a rise of 35 in Lancashire, from 125 to 160. 2,357 cases

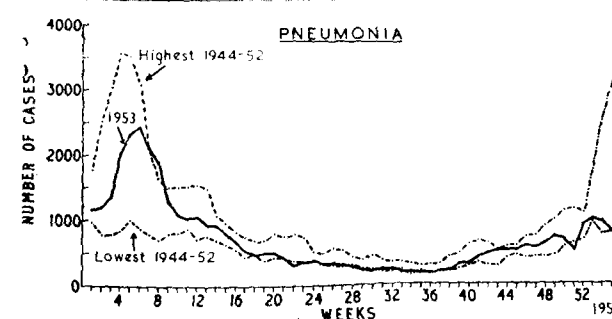
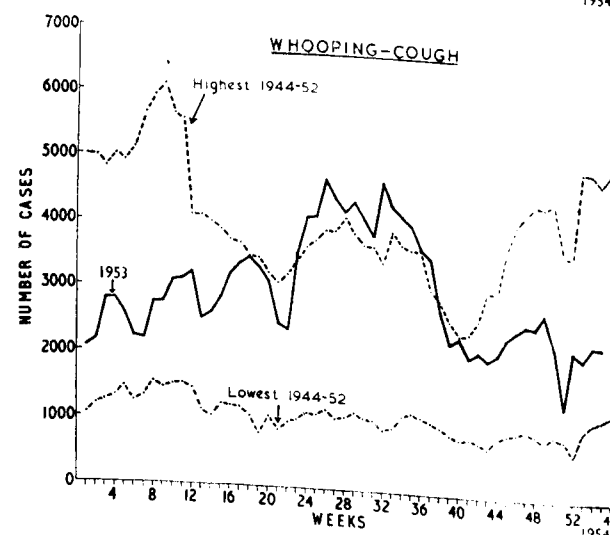
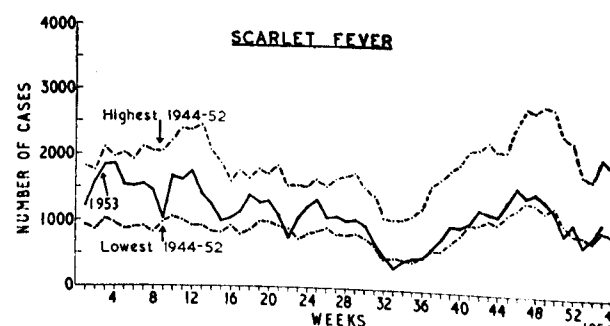
of whooping-cough were notified, being 9 fewer than in the preceding week. The largest rises were 40 in Leicestershire, from 29 to 69, and 32 in Kent, from 93 to 125, and the largest falls were 44 in Warwickshire, from 187 to 143, and 36 in Hertfordshire, from 55 to 19. 18 cases of diphtheria, 3 fewer than in the preceding week, were notified: 9 of these cases were notified in Lancashire (Liverpool C.B. 8). Other areas with multiple notifications were Birmingham C.B. 3, West Ham C.B. 2, and Middlesbrough C.B. 2. The largest fluctuations in the incidence of measles were a rise of 89 in Cumberland, from 107 to 196, and falls of 76 in Staffordshire, from 204 to 128, and 33 in Surrey, from 76 to 43. The chief centres of measles in Cumberland were Whitehaven M.B. 93 and Ennerdale R.D. 72.

37 cases of acute poliomyelitis were notified. These were 3 more for paralytic and 6 fewer for non-paralytic cases than in the preceding week. The largest returns were Gloucestershire 8 (Bristol C.B. 3), Cornwall 3, Durham 3, Essex 3, and Lancashire 3.

The large rise in the notifications of dysentery was due to increases in existing outbreaks rather than to new centres of infection. The largest returns were Lancashire 121 (Swinton and Pendlebury M.B. 42, Bolton C.B. 20, Liverpool C.B. 11), London 100 (Islington 30, Shoreditch 12), Yorkshire West Riding 70 (Bradford C.B. 22, Leeds C.B. 14), Middlesex 62 (Hendon M.B. 16, Enfield U.D. 10), Sussex 17 (Hailsham R.D. 15), and Warwickshire 16 (Birmingham C.B. 16). The 178 cases in Scotland were notified in 16 areas: the largest returns were Glasgow 101 and Edinburgh 20.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus ————, the figures for 1953-4 thus ————. Except for the curves showing notifications in 1953-4, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending January 30

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,058, whooping-cough 2,240, diphtheria 16, measles 1,190, dysentery 572, acute poliomyelitis 22, paratyphoid fever 3, and typhoid fever 1.

Medical News

General-practitioner Research.—An investigation into the value of prophylactic antibiotics or sulphonamides in measles is the first piece of group research being undertaken by the College of General Practitioners, according to the College's "Research Newsletter No. 2" in the current issue of the *Practitioner*. Participation in this research is open to all those on the College's research register. In September an outbreak of an unidentified P.U.O. at Shere, in Surrey, allowed a trial of the "epidemic observation scheme." Those on the register were put on the alert, with the result that similar outbreaks were reported from other parts of the country and the progress of the epidemic was mapped. The Public Health Laboratory Service co-operated by carrying out virus studies on serum and faeces from some of the cases. In order to define the types of illness most likely to repay study by co-ordinated general-practitioner research, with the help of the Registrar-General's Department a survey of the nation's health is being planned. The idea is to analyse a representative sample of morbidity statistics collected over a year or more by general practitioners. In addition to these major schemes, the research register, in which the research interests of each member are recorded, is bringing together doctors with the same problems, and study groups are being formed. Three subjects are noted as particularly appropriate for group study—respiratory tract diseases, hereditary diseases, and psychosomatic disease. A recorder has been appointed to each group: Dr. John Fry (Beckenham), Dr. R. S. Yager (Scunthorpe), and Dr. K. M. Hay (Birmingham), respectively.

Darling Foundation Prize.—At the seventh World Health Assembly later this year Professor George Macdonald and Dr. G. Robert Coatney will receive jointly the Darling Foundation Prize (1,000 Swiss francs and a bronze medal) for their work on malaria. Professor Macdonald is director of the Ross Institute of Tropical Hygiene in London and is distinguished for his work on the epidemiology of malaria. Dr. Coatney, from Bethesda, U.S.A., is noted for his researches on antimalarial drugs.

H. M. Vernon Prize.—Dr. N. H. Mackworth, director of the Medical Research Council's Unit for Research in Applied Psychology at Cambridge, has become the first recipient of the H. M. Vernon Prize. The prize, which is from funds bequeathed by Dr. H. M. Vernon—himself a well-known worker in the field of industrial psychology—is to be awarded biennially by the council of the National Institute of Industrial Psychology for the most valuable research work in industrial psychology and physiology done by a British worker under 45 years of age. Dr. Mackworth is particu-

larly noted for his studies on the effects of climatic conditions on human behaviour.

Medical Press Congress.—The first congress of the Union Internationale de la Presse Médicale will be held in Turin on May 30 under the presidency of Professor T. Oliaro, director of *Minerva Medica*. Among the subjects already chosen for discussion are the question of abstracts of scientific papers, relations between the Press and the medical profession, the place of the film and microfilm in spreading medical knowledge, and the provision of medical news for the lay public. Papers will be presented by Professor L. Justin-Besançon (*Semaine des Hôpitaux*), Dr. A. Pichet (*Presse Médicale*), and Dr. H. Fiessinger. Other subjects will be announced later. Five prizes of 100,000 lire (£57) each will be presented during the congress for the best original papers to have appeared during the years 1952 and 1953 in journals belonging to the Union. Entries for these prizes must be sent in duplicate to Segretaria Generale del Congresso Internazionale della Stampa Medica, Corso Bramante, 83, Turin, Italy.

Rebuilding of St. Giles' Hospital, Camberwell.—The Minister of Health, Mr. Iain Macleod, opened a new operating suite at St. Giles' Hospital, Camberwell, on February 4. The hospital was severely damaged by bombing during the war, so that its pre-war complement of 800 beds is now barely 350. The first stage of the rebuilding, costing £75,000, is the erection of the new operating theatres and the complete renewal of the administration block. It is expected that a further £75,000 will be needed to replace the other damaged buildings.

Royal Commission on Mental Certification and Detention.—Three weeks ago we announced the appointment of Lord Percy of Newcastle as chairman of the Commission (January 23, p. 221). Now the Prime Minister has given the names of the members. The medical members are Sir Russell Brain, P.R.C.P.; Dr. T. P. Rees, medical superintendent, Warrington Park Hospital; Dr. D. H. H. Thomas, medical superintendent, Cell Barnes Hospital, St. Albans; and Dr. J. G. Wilson, M.O.H. of Cardiff. The lay members are Mrs. E. D. Adrian (wife of Dr. E. D. Adrian, P.R.S.); Mr. Claude Bartlett, president of the Confederation of Health Service Employees; Mrs. Braddock, M.P.; Mr. H. Hylton-Foster, Q.C., M.P.; Mr. R. M. Jackson, LL.D., Reader in Public Law, Cambridge; and Sir Cecil Oakes, member of the Central Health Services Council. The secretary of the Commission is Miss H. M. Hedley, Ministry of Health, 23, Savile Row, London, W.1.

French Government Exchange Scholarships.—Under the terms of a reciprocal arrangement with the Centre National de la Recherche Scientifique, the Medical Research Council invites applications from British workers in medical science, excluding clinical medicine, for two scholarships tenable at research institutions in France during the academic year 1954-5. The scheme is intended for young graduates in medicine or science who have already had some experience in a branch of medical science. Further details and forms of application may be obtained from the secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1. The last date for applications is March 31.

Chesterfield Medal.—Inquiries about the examination for the Chesterfield Medal (in dermatology) should be made to the Dean, Institute of Dermatology, Lisle Street, Leicester Square, London, W.C.2, without delay. The closing date for entries is February 28.

Sir Macfarlane Burnet, F.R.S., director of the Walter and Eliza Hall Institute of Medical Research, Melbourne, has left Australia to take part in the Paul Ehrlich and von Behring centenary celebrations at Frankfurt. While there he will receive a von Behring Medal and prize for his work on virus diseases.

Professor John Yudkin has been appointed to the University Chair of Nutrition tenable at Queen Elizabeth College, London.

¹ *Monthly Bull. Minist. Hlth (Lond.)*, January, 1954.

Mr. William Doolin, Editor of the *Irish Journal of Medical Science* and of the *Journal of the Irish Medical Association*, has been appointed Professor of the History of Medicine in University College, Dublin.

Mr. G. A. Mason, Lecturer in Thoracic Surgery at King's College, Newcastle-upon-Tyne, has gone to Germany for a few days, under the Foreign University Interchange Scheme, to lecture at the Justus Liebig-Hochschule, Giessen.

COMING EVENTS

Professor A. W. Woodruff will deliver the Goulstonian Lectures on February 23 and 25 at 5 p.m. at the Royal College of Physicians. His subject is "The Natural History of Anaemia associated with Protein Malnutrition."

Dr. T. Cecil Gray will deliver the Joseph Clover Lecture at the Royal College of Surgeons, Lincoln's Inn Fields, on March 17 at 5 p.m. His subject is "Disintegration of the Nervous System."

Fourth International Course in Criminology.—This course, organized by the International Society of Criminology with the support of Unesco, will be held in London from March 24 to April 13 under the direction of Dr. Denis Carroll and Dr. Hermann Mannheim. The subject will be "Recent Advances in the Study and Treatment of Offenders." Applications to attend the course should be made at once to "Fourth International Course in Criminology," c/o I.S.T.D., 8, Bourdon Street, Davies Street, London, W.1. The fee is £7.

Week-end Course on the Rheumatic Diseases.—A course with lectures, ward rounds, and practical demonstrations will be held at the Rheumatism Unit of St. Stephen's Hospital, Fulham Road, London, S.W.10, on March 27 and 28. Further particulars may be obtained from the secretary, Fellowship of Postgraduate Medicine, 60, Portland Place, London, W.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, February 15

LONDON UNIVERSITY.—At Physiology Theatre, University College, 5.30 p.m., special university lecture in Biochemistry by Professor C. Fromaget (Paris): Metabolism of Sulphur Amino Acids and the Cycle of Sulphur in Nature.
MEDICAL SOCIETY OF LONDON.—8.30 p.m., First Lettsomian Lecture, by Mr. N. C. Tanner: Surgery of Peptic Ulceration and its Complications.

Tuesday, February 16

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. C. C. Chesterman: Antimalarial Drugs—Their Action in Different Stages of the Malaria Parasite in Man.
EUGENICS SOCIETY.—At 26, Portland Place, W., 5 p.m., Galton Lecture by Professor F. A. E. Crew, F.R.S.: Eugenic Appraisal of the Welfare State.
ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., Dr. James H. Cyriax: Lumbar Disk Lesions.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. J. Wallace: Ano-genital Pruritus.
MANCHESTER MEDICAL SOCIETY.—At Medical School, Manchester University, 4.30 p.m., university lecture on the History of Medicine by Dr. Hugh Sinclair: Importance of Boerhaave in the Development of Medical Science.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Mr. R. K. Bowes: Clinical Significance of Amenorrhoea.
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.30 p.m., Dr. J. Barrie Murray: Chronic Dyspeptic.

Wednesday, February 17

● **HARVEIAN SOCIETY OF LONDON.**—At Hammersmith Hospital, 8 p.m., clinical meeting.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Benign Tumours of the Corium.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. F. J. F. Barrington: Indications for the Treatment in Enlarged Prostate.
● **LONDON UNIVERSITY: DEPARTMENT OF EXTRA-MURAL STUDIES AND ATOMIC SCIENTISTS' ASSOCIATION.**—At Beveridge Hall, Senate House, 7 p.m., Dr. E. E. Pochin: Medical Uses of Atomic Energy.
MIDDLESEX COUNTY MEDICAL SOCIETY.—At Ashford Hospital, 3 p.m., clinical meeting; 4.45 p.m., Dr. K. D. Keele: Pain Sensitivity in Relationship to Clinical Syndromes.
MIDLAND MEDICAL SOCIETY.—At Queen Elizabeth Hospital, Birmingham, 8.15 p.m., clinical meeting.
OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Sir Geoffrey Jefferson, F.R.S.: Neurology of the Trigeminal Nerve.
ROYAL MICROSCOPICAL SOCIETY.—5.30 p.m., Dr. R. G. White: Microscopy of Antigens and Antibodies within Tissues by the Use of Fluorescent Antibody.

Thursday, February 18

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Dr. W. M. Levitt: Large Volume Radiotherapy; Dr. R. Bodley Scott: Large Volume Irradiation: A Physician's Assessment.
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. P. M. D'Arcy Hart: Chemotherapy of Tuberculosis.
CAMBRIDGE UNIVERSITY.—At Zoological Laboratory, Downing Street, Cambridge, 5 p.m., Dr. R. R. Race, F.R.S.: Blood Groups and Their Inheritance.
EDINBURGH CLINICAL CLUB.—At 7, Drumsheugh Gardens, 8 p.m., Mr. G. A. Pollock: Surgical Osteoarthritis of the Hip Joint.
● **INSTITUTE OF CHILD HEALTH.**—5.30 p.m., Dr. Barbara Woodhead: Advice in the Infant Welfare Clinic.
LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Dr. J. D. Hay: Diagnosis of Congenital Heart Disease; Dr. H. G. Farquhar: Congenital Heart Disease in Infancy.
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Professor W. C. W. Nixon: Physiological and Clinical Aspects of Uterine Action.
LONDON UNIVERSITY.—At Wright-Fleming Institute Lecture Theatre, St. Mary's Hospital Medical School, 5 p.m., special university lecture in medicine by Professor L. J. Witts: Changes in the Alimentary Tract in Anaemia.
NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Manchester Royal Infirmary, 5 p.m., Professor F. R. G. Heaf: Present Position of B.C.G. Vaccination.
OXFORD UNIVERSITY.—At Southfield School, Glanville Road, Cowley Road, Oxford, 8 p.m., Dr. A. G. M. Weddell: Science and Medicine.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At 26, Portland Place, W., 7.30 p.m., Dr. M. G. P. Stoker and Dr. B. P. Marmion: Clinical Picture and Epidemiology of Q Fever. A discussion will follow.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. R. Coope: Tuberculous Enlargement of Intrathoracic Lymph Nodes.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Dr. D. Curran.

Friday, February 19

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members.
FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 4 p.m., Radiotherapy Section Meeting. Dr. T. P. Fox: The Art of the Article.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. S. C. Gold: Lupus Erythematosus.
KENT AND CANTERBURY HOSPITAL.—8 p.m., clinical meeting.
LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.—Sir Geoffrey Jefferson, F.R.S.: When Has Headache a Special Significance?
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. J. C. R. Hindenach: Congenital Dysplasia of the Hip.
● **ROYAL INSTITUTION.**—9 p.m., Dr. Karl T. Compton, D.Sc., Ph.D., LL.D. (Massachusetts): High Voltage for Cancer Therapy and Food Sterilization.
ROYAL MEDICAL SOCIETY. Edinburgh.—8 p.m., Dissertation by Mr. J. A. Stewart: Mitral Valvotomy.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, 5.30 p.m., Public Lecture by Dr. W. S. Feldberg, F.R.S.: On Some Physiological Aspects of Histamine.

Saturday, February 20

BIOCHEMICAL SOCIETY.—At London School of Hygiene and Tropical Medicine, 11 a.m., symposium: Chemical Pathology of Animal Pigments.

APPOINTMENTS

NORTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD.—A. S. Crawford, M.D., F.F.A.R.C.S., D.A., Part-time Consultant Anaesthetist, A. Nelson-Jones, M.D., M.R.C.P., Part-time Consultant Physician, and F. R. Sutton, M.B., B.S., F.R.C.S., Part-time Consultant Surgeon, all at Rush Green Hospital, Romford; D. P. Choyce, M.B., B.S., F.R.C.S., D.O.M.S., Part-time Consultant Ophthalmic Surgeon, Southend General, Rochford General, and Runwell Hospitals and Southend Eye Clinic; H. W. Holland, M.B., B.S., M.R.C.P., D.M.R.D., Part-time Consultant Radiologist, Chelmsford Group of Hospitals.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Ostlere.—On February 3, 1954, at Oxford, to Mary Ostlere (formerly Pattern), M.B., M.R.C.P.Ed., D.A., wife of Gordon S. Ostlere, M.B., B.Chir., D.A., a son.

DEATHS

Ahern.—On January 12, 1954, John Maurice Ahern, M.B., B.Ch., of 10, Ennerdale Road, Kew Gardens, Surrey, late of Liverpool, and Parkhurst, Isle of Wight.
Boyd.—On January 6, 1954, in hospital, James Wood Boyd, M.B., C.M., of 7, Carwinshoch View, Ayr, late of Fallowfield, Manchester, aged 84.
Brims.—On January 13, 1954, Donald Brims, M.B., Ch.B., of 106, West Savile Terrace, Edinburgh.
Edwards.—On January 15, 1954, at Huntington Court, Kington, Herefordshire, Charles Derwent Edwards, M.C., M.D., D.P.H.
Evans.—On January 14, 1954, at Green Hill, Carmarthen, Walter Stuart Evans, M.R.C.S., L.R.C.P., Lieutenant-Colonel, R.A.M.C., retired, aged 64.
Ferguson.—On January 14, 1954, at St. David's Wing, Royal Northern Hospital, London, N., Thomas Ferguson, D.S.O., M.B., Ch.B.
Fielder.—On January 11, 1954, at Cranwell, Rushall, Tunbridge Wells, Kent, Frederick John Fielder, M.D., late of Lockerbie, Brixton Hill, London, S.W., aged 83.
Geoghegan.—On January 15, 1954, at the Churchill Hospital, Oxford, Basil Geoghegan, M.R.C.S., L.R.C.P., Surgeon Lieutenant-Commander, R.N.
Glanville.—On January 15, 1954, at North Street House, Emsworth, Hants, Llewellyn Stanley Howard Glanville, M.D.
Hill.—On January 16, 1954, at the War Memorial Hospital, Selby, Yorks, William Bertram Hill, M.D., D.P.H., of 14, Leeds Road, Selby, aged 74.
Salter.—On January 5, 1954, in hospital, Mombasa, Charles Edward Salter, M.D., F.R.C.S., of Nairobi, Kenya, late of Scarborough, Yorks, and Exmouth, Devon, aged 85.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Blackheads

Q.—A girl of 12 suffers from severe and persistent blackheads on the face. What are the predisposing factors, and how is the condition best treated?

A.—Blackheads at the age of 12 years are caused by the character and amount of sebum excreted by the sebaceous glands under the influence of hormonal activity. This provokes a hyperkeratosis affecting the whole of the epidermis of the affected parts, but naturally most marked at the orifices.

Presuming that the patient is normal in other respects, local treatment is probably the most important and should consist in regular and frequent washing with soap and hot water, and perhaps the occasional use of a weak solution of a detergent such as 1% cetrimide. The application at night of a paste containing sulphur and resorcin, starting with 2% of each and gradually increasing to 6%, will facilitate the shedding of the blackheads by exfoliation. Exposure to ultra-violet light to produce erythema and peeling is also effective, or small fractional doses of x-rays may inhibit the activity of the glands, but such treatment should be prescribed only under expert supervision.

If expression of blackheads is attempted by means of a comedone extractor it should be done with care, otherwise trauma in the region of glands may provoke inflammation or infection.

The taking of vitamin-B complex (on empirical grounds) and small doses of thyroid extract (½ gr.—16 mg.), and the avoidance of chocolate and cocoa, are sometimes desirable.

Abdominal Testicles and Fertility

Q.—Is there any treatment for a man of 29 with abdominal testicles who has on two occasions shown azoospermia on examination of the seminal fluid? He was born with undescended testicles, but by puberty they had reached the inguinal canals. An operation at 18 showed that the testicles, although apparently normally developed, had too short vessels for them to be brought into the scrotum. They were therefore returned to the pelvic cavity extra-peritoneally. He now wants to have children.

A.—With exceptions which are so few as to be of no significance, it may be accepted as an axiom that, unless the testes are within the scrotum at the time spermatogenesis should commence, irreparable damage is done to the germinal epithelium, so that placing them within the scrotum at a later date will not lead to spermatogenesis. Even had the length of the cord allowed the testes to be placed within the scrotum at the age of 18, no hope of a successful outcome from that operation could have been entertained. The view which is becoming generally accepted now is that treatment for undescended testicles should begin at an early age, perhaps at 3 to 5 years. If treatment with chorionic gonadotrophin fails to bring about testicular descent, surgical correction of the condition should be considered without undue delay. In any event, the usual effect of gonadotrophin treatment is to cause growth of the spermatid cord, which, should surgery become necessary, makes the operation easier.

One final point: it is quite probable that in many cases the congenital anomaly manifested as cryptorchidism often includes intrinsic testicular defect, so that even after successful correction of the maldescent spermatogenesis may be less than adequate.

Drugs for Hypertension in Pregnancy

Q.—What place have hypotensive drugs, such as the methonium compounds, in the treatment of hypertension in pregnancy?

A.—Many substances such as hexamethonium tartrate and bromide and tetraethylammonium chloride and bromide have been tried, and the general experience is that the results are very disappointing. They have a negligible effect on hypertension which is part of eclampsia and pre-eclampsia. In cases of chronic hypertension complicated by pregnancy the fall in blood pressure which results from their intermittent use is very short-lived, and side-effects usually prevent repeated or continued administration. For all practical purposes, therefore, they are of little value in pregnancy hypertension.

Assali and Suyemoto¹ have discussed this subject at some length, and they also report on trials of hydrazinophthalazine and thiophanum compounds. They conclude that a single intravenous injection of 30 to 40 mg. of the former produces a significant fall in blood pressure in true pregnancy toxæmia, and the effect may last as long as 24 hours. It is not, however, very effective in essential hypertension. Thiophanum compounds have a similar but stronger action than tetraethylammonium salts, and in essential hypertension they cause a fall in blood pressure which is sustained for 3 to 10 minutes after a single intravenous injection. A continuous intravenous infusion is necessary to produce a prolonged effect, but there are difficulties in employing this technique. Thiophanum compounds have little effect on hypertension associated with pre-eclampsia and eclampsia, no matter what method of administration is used.

It may be added that the alkaloids of veratrine, previously out of favour, are being used again in certain clinics and encouraging results are recorded, especially in eclampsia and severe pre-eclampsia.

REFERENCE

¹ *Amer. J. Obstet. Gynec.*, 1952, 64, 1021.

Pica in Pregnancy

Q.—What accounts for perversion of the appetite during pregnancy? I have a patient who eats coal when pregnant. Is any treatment likely to be effective?

A.—There is no known anatomical or functional change in the alimentary tract or sense organs to account for bizarre tastes developed by some women during pregnancy. The usual explanations have a psychological basis. It is said, for example, that such women may be found to have shown similar traits at an earlier stage in life and that during pregnancy, and possibly because of some inward conflict or sense of insecurity, they change places with their baby and revert to infantile behaviour. Some authorities invoke a regression to the "oral stage" in development, and a craving for certain articles such as bananas, slate pencils, berries, or caviar is said to reflect ideas of oral impregnation—the particular article representing male or female genitalia. Others, however, point out that perversion of the appetite during pregnancy has been recognized throughout the ages in all parts of the world, and that its origin may lie far back in the ancestry of the mind. It is a common belief amongst primitive peoples that failure to satisfy "longings" results in miscarriage and physical or mental defects in the child. From this it can be argued that the eating of strange articles is blindly purposeful, and that it has as its basis the desire to supply a special need to the foetus or even to give it life. Sometimes an attempt is made to draw an analogy with the habit of a carnivorous animal which occasionally instinctively eats grass or other substance outside the range of its ordinary tastes when it suffers from dietetic deficiency.

These are the sort of views which have been expressed from time to time, and the reader may or may not find them acceptable, or applicable to certain cases. One of the difficulties in accepting them is that a woman some-

times shows perversion of appetite before she has any suspicion that she is pregnant.

There is no specific remedy for pica during pregnancy, nor is any treatment necessary unless the taste is for something which is obviously harmful.

Threadworms and Ammoniated Mercury Ointment

Q.—In the treatment of threadworms I have applied ammoniated mercury ointment (N.F., 1952) to the perianal region and been dismayed to see threadworms actively wriggling across the anointed area. Is this ointment ovicidal, since it is not vermifugal? Is an alternative vermifugal ointment available?

A.—The ointment is used for two purposes: in an effort to kill worms as they deposit their eggs on the perianal skin, and to immobilize eggs and prevent their being disseminated into the clothing and elsewhere. The questioner possibly comes to the conclusion that the ointment is not vermifugal on evidence which is too slender, in that it is not stated for how long the worm was observed to live after wriggling across the anointed area. No alternative vermifugal ointment has as yet been shown to be of value.

White Cell Count in Appendicitis

Q.—What is the value of the white cell count in cases of acute appendicitis? Is it true to say that a rising white count indicates deterioration and that a falling white count shows resolution?

A.—The white cell count is of limited value in the diagnosis of appendicitis. The experienced surgeon usually places little reliance on this investigation, and the inexperienced is not uncommonly seriously misled by it. In nine out of ten cases a diagnosis of appendicitis can be confidently made by clinical means, and in those cases where there are difficulties in diagnosis they are unlikely to be resolved by the white cell count. To take but one example, acute non-specific mesenteric adenitis is clinically similar to appendicitis and commonly gives rise to a leucocytosis of 15,000 or 20,000 with 80% neutrophils.

A rising white cell count is by no means indicative of deterioration and may be seen in a patient who is forming an abscess and whose general condition is improving. On the other hand, in the patient who starts with a leucocytosis, a falling white cell count usually means resolution.

In conclusion, it should be remembered that many a patient with a gangrenous appendix has a normal or but slightly raised white cell count, and in the aged or the very young the count may be especially misleading.

Chlorbutol and the Nose

Q.—What is the action of chlorbutol on the nasal mucosa, and its value in the treatment of nasal disease?

A.—Chlorbutol is a mild sedative and analgesic, and has local analgesic properties. It is also a fungicide. A 1% solution in mineral oil has formed the basis of many popular nasal sprays, though in recent years both chlorbutol and mineral oil have declined in popularity as nasal medicaments. It is used in the nose for its antiseptic, sedative, and analgesic properties; though it is possible that in acute rhinitis the nasal mucosa is further irritated by the volatile preparations, such as menthol and camphor, which are so frequently incorporated with oily solutions of chlorbutol for nasal use.

Deafness from Streptomycin

Q.—What is the prognosis in the deafness caused by streptomycin therapy? For how long may improvement be expected? Is a hearing-aid useful in these cases?

A.—Prolonged treatment with streptomycin, particularly if the di-hydro compound is used, may result in deafness. The original calcium compound of streptomycin was found to be vestibulo-toxic, but only in very large doses or over a prolonged period was it cochleo-toxic. In order to avoid this undesirable property the di-hydro compound was developed, but unfortunately this has a selective affinity for the

cochlear apparatus. As a rule, it has this effect only if more than 1 gramme daily is given over a period of at least three weeks. Any improvement in hearing following deafness due to streptomycin therapy usually takes place within a few weeks of the withdrawal of the drug. After six months it is most unlikely that any further improvement will occur. The amount of help that can be expected from a hearing-aid will, of course, depend upon the quantity and quality of the hearing which remains. Where the hearing has been seriously affected, there often seems to be some recruitment, which means that the patient will not readily tolerate amplification, and so a hearing-aid may not be of great help. Nevertheless, it should be tried in combination with speech reading, for which special lessons will be needed.

Splenectomy for Leukaemia

Q.—Is splenectomy ever indicated as a palliative measure in cases of leukaemia? If so, does it have any effect in prolonging life?

A.—Although splenectomy has been explored for the treatment of leukaemia it has no therapeutic value and does not even serve as a palliative measure. The reason for its trial was probably the extremely satisfactory response in this disease to low-dose splenic radiation. Irradiation of the spleen remains, therefore, the standard treatment for this disease, although various chemotherapeutic agents are now also used, some of equal but certainly of no greater value.

NOTES AND COMMENTS

"Stripping" for Varicose Veins.—Mr. R. ROWDEN FOOTE (London, W.1) writes: In the controversy as to the value of the stripping of varicose veins ("Any Questions?" December 12, 1953, p. 1334), your expert, when criticizing the method, asks, "... How often does deep thrombosis actually occur ... ?" This is something which we are fortunately able to tell him. Among the very numerous reports the following are typical: Linton¹ had one case of deep vein thrombosis in a series of 500 patients. Fenney² obtained an 86% excellent result in a series of 150 limbs without complication. In a series of 250 limbs I have had one case of severe deep vein thrombosis, which reacted to anticoagulant therapy with full recovery. The method cannot be blamed in this case, however, since the instructions regarding immediate mobilization of the limb post-operatively had not been carried out. Finally, Warren, of West Roxbury, in a personal letter tells me that he has had one mild case of deep vein thrombosis in a series of 300 limbs, while using a technique in the main similar to my own. A careful technique is all-important, and I have brought out these points in a film of this method which I made in 1952.³ Sclerosants at the time of operation are more likely to produce deep vein thrombosis than the stripping technique. The performance of local ligations merely spoils the field for the eradication of the varices by stripping.

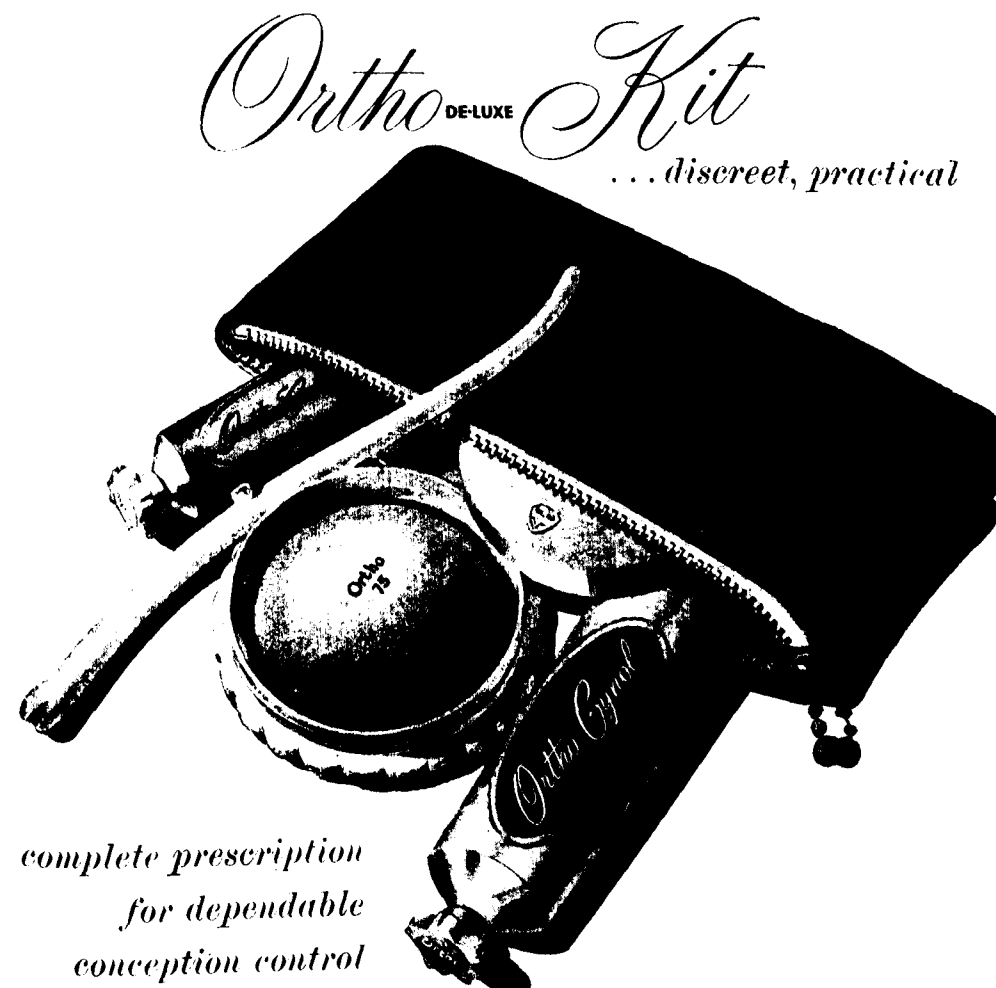
REFERENCES

- ¹ *Min. Med.*, 1949, 32, 38.
- ² *Ann. Surg.*, 1951, 133, 386.
- ³ *Lancet*, 1953, 1, 858.

Correction.—In our leading article about erythromycin (January 30, p. 261) we mentioned two of its manufacturers—Eli Lilly & Co., Ltd., and Abbott Laboratories Ltd. Upjohn of England Ltd. also market this antibiotic.

"Any Questions?" Book.—The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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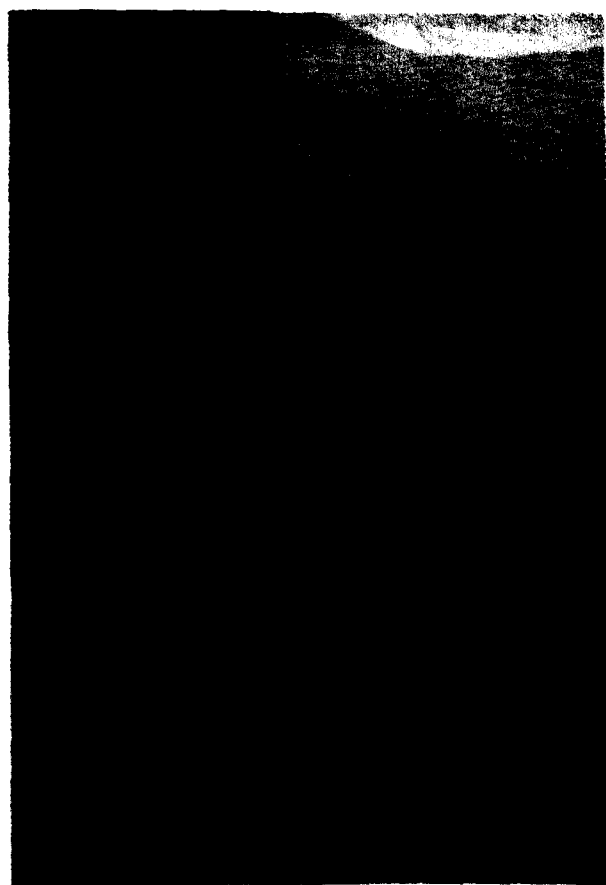
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 20 1954

THE DIAGNOSIS OF THYROTOXICOSIS*

BY

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Parry first described an association between thyroid enlargement and cardiac disease in 1825, and in 1835 Graves published his account of three cases of "violent and long-continued palpitations in females in each of which the same peculiarity presented itself, viz., enlargement of the thyroid gland." Each cited a case in which exophthalmos was present. It is, however, to Basedow, in 1840, that we owe the first complete clinical description of the disease which, in Europe, still bears his name. All the symptoms except tremor and most of the physical signs were described so vividly and accurately that little of importance has been added since. By comparison Sattler's book, published in 1908, though invaluable in providing information about the progress of the disease before any effective treatment was available, gives a picture which is out of perspective.

Perhaps I should apologize for retreading in this lecture much well-trodden ground. I hope, however, to deal in particular with the problem of diagnosis in the doubtful case and to discuss the value of modern laboratory tests, especially those which make use of radioactive iodine. I shall also consider some of the manifestations of thyrotoxicosis in more detail, especially where recent work has shed light on their mechanism.

Thyrotoxicosis is a relatively common disorder. It occurs in all parts of the world, but is especially frequent where endemic goitre is prevalent. Derbyshire has for long been recognized as such a district, and many of our cases have come from this region. It was this local concentration of patients that aroused my interest and provided the clinical opportunities for these studies.

The importance of suspecting the presence of thyrotoxicosis and of carrying out full clinical and laboratory investigations to establish the diagnosis cannot be over-emphasized. The advance in therapeutic measures to deal with this disease has been exceedingly rapid. It is now ten years since Astwood (1943) first treated thyrotoxicosis successfully with thiourea, and the drugs in this series have given us a powerful tool with which we can almost always confirm or refute the diagnosis without subjecting the patient to forms of therapy which permanently destroy a large portion of the gland. Once the diagnosis has been firmly established other forms of treatment are available and we can offer our patients an

excellent prospect of permanent recovery. Improved surgical and anaesthetic techniques have greatly reduced the risks of operation, and no patient is too ill to drink a therapeutic dose of radio-iodine. These rich opportunities in the therapeutic field impose a duty on the physician not to overlook any case in which thyrotoxicosis may be present.

In a florid case the diagnosis is obvious and can be made by the junior clinical clerk who has spent only a few weeks in the ward. On the other hand, some cases of thyrotoxicosis do not present all the classical features of the disease, and in them the diagnosis may be overlooked. This especially happens when the more prominent facial signs are lacking and there is no gross enlargement of the thyroid gland. In such circumstances the diagnosis may be difficult, for it is common knowledge that many of the clinical features associated with thyrotoxicosis may occur in a wide variety of disorders. I refer to such non-specific features as, for example, loss of weight, "nervousness," and tachycardia. Furthermore, the more definite manifestations which are often clearly associated with thyrotoxicosis may occasionally be seen in persons with normal thyroid function. Signs such as goitre, exophthalmos, and lid lag fall into this category.

Grouping of Patients

As the suspicion of the presence of thyrotoxicosis must first be assessed by the presence of some of these signs and symptoms, their incidence and diagnostic significance have been investigated more fully. This has involved dividing the patients with suspected thyrotoxicosis into two definite categories, "toxic" and "non-toxic." Such a distinction may be difficult to make and yet is essential for the practising physician. The former group essentially comprises those who will be benefited by specific therapy for thyrotoxicosis, while in the latter it is clearly not indicated. It is also of interest and importance to inquire into the prevalence of some of the clinical features often associated with thyrotoxicosis amongst people not suspected of having any thyroid disorder. We have accordingly studied the following three groups of subjects.

Group 1.—Patients referred to the thyroid clinic and shown after full investigation to be indisputably thyrotoxic. Some of these patients had clinically obvious thyrotoxicosis, but the majority had presented diagnostic difficulties to at least one clinician. The diagnosis was based on at least two radio-iodine criteria—namely, the four-hour uptake by the gland

*The Bradshaw Lecture delivered before the Royal College of Physicians of London on November 12, 1953.

and the 48-hour protein-bound activity in the plasma. If these were inconclusive or if the patient had received previous therapy, the cases were further investigated before a final decision was made. There were 90 patients in this group.

Group 2.—Patients referred to the thyroid clinic as possible cases of hyperthyroidism but finally shown to be non-toxic—72 patients fell into this group.

Group 3.—This comprised 90 normal individuals drawn so far as possible from the same social class and with the same age and sex distribution as the thyrotoxic cases. None was receiving medical attention.

The individuals in these three groups have been asked a standard set of questions and the presence or absence of certain physical signs has been recorded. Only two clinicians carried out the investigation. Fig. 1 shows

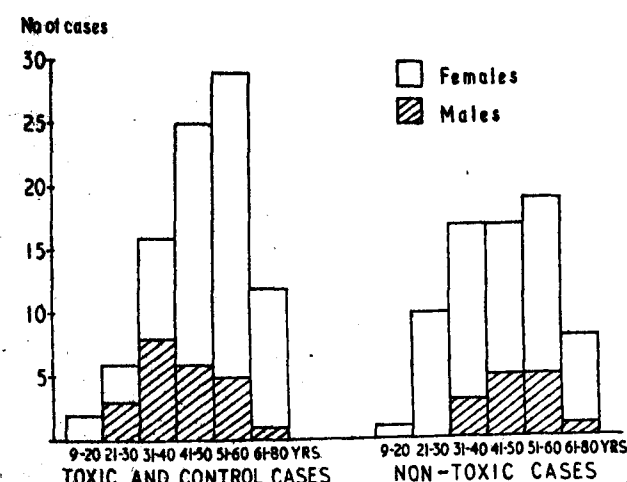


FIG. 1.—Age and sex distribution in non-toxic, and toxic and normal cases.

the age and sex distribution in the normal controls and the thyrotoxic cases and in the non-toxic group. The distribution follows the usual pattern in thyrotoxicosis. Details of the investigation will be published elsewhere (Weetch, 1954) and I shall give only a selection of the figures and a summary of our conclusions. Table I

TABLE I.—Incidence of Signs and Symptoms in Thyrotoxic (T.), Non-toxic (N.T.), and Control (C.) Cases

Symptoms	T.	N.T.	C.	Signs	T.	N.T.	C.
Dyspnoea on exertion	81	61	40	Goitre	87	56	11
Palpitation	75	75	26	Diffuse enlargement	49	37	11
Tiredness	80	68	31	Nodular	32	14	0
Preference for cold	73	53	41	Single adenoma	4	3	0
Excessive sweating	68	54	31	Exophthalmos	34	11	2
"Nervousness"	59	54	21	Lid lag	62	24	16
Appetite:				Hyperkinetic	39	22	9
Increased	32	1	2	Finger tremor	66	54	26
Diminished	13	14	3	Hands:			
Weight:				Sweating	72	54	22
Loss	52	27	2	Hot	76	40	44
Gain	4	7	16	Auricular fibrillation	19	8	0
Bowels:				Regular pulse rate over 90/min.	68	47	19
Diarrhoea	8	2	0				
Constipation	15	20	21	Average pulse rate, Beats/min.	100	85	78
Menses:							
Excessive	3	12	6				
Scanty	18	9	3				

shows a selection of the results of the analysis of symptoms and signs in the different groups. The signs recorded are necessarily only those which could be elicited without a full physical examination on the normal control group.

History-taking

It should be emphasized that this investigation was not made in an attempt to discover the commonest symptoms and signs in obvious cases of thyrotoxicosis, but to try to find out why there had been difficulty in separating doubtful cases into toxic and non-toxic groups on purely clinical grounds. It was decided to include a group of normal individuals when it became apparent that with some symptoms there was often remarkably little difference in the replies given by the toxic and non-toxic groups. The questions were asked in the form, "Do you become unduly breathless on exertion?" "Do you tire easily?" "Do you prefer hot or cold weather?" and it is the answers to these questions which are recorded in the tables. Patients could usually give a date of onset of their symptoms, but the answers of the normal controls to the same questions varied, some having "always been like that" and others stating that "it has come on recently."

An incidental illuminating feature of this investigation was the light it threw on the art of history-taking. I can strongly recommend to any physician with a special interest in some disease, as, for example, pulmonary tuberculosis, that he put his usual questions to a group of patients with chronic anxiety or to women at the menopause. He will be surprised at the number of positive answers he receives. Yet I do not think that the experienced physician would misinterpret these replies. It is, however, this problem which confuses our clinical clerks and house-physicians, who find it far more difficult to know whether a positive answer to a question is significant. They also have less skill in framing the appropriate supplementary questions, and little experience in assessing the patient's personality as a whole. My experience in completing the forms which were used has confirmed my suspicion that methods of history-taking which involve the use of a set list of symptoms are inherently unsatisfactory.

The two surprising features of the analysis are the high incidence of many symptoms in both the non-toxic and the control groups. We believe the explanation lies in the large number of women, and especially of women at or not far past the menopause, that are present in both groups, and in the high proportion of patients with anxiety states in the non-toxic group. We have analysed separately the figures for males and females, and Figs. 2, 3, and 4 illustrate the relative frequency of three symptoms in the toxic, non-toxic, and control groups when they are broken down in this way. In the control group positive answers were given much less frequently by males. In the non-toxic group this was true of most but not of all symptoms. In thyrotoxicosis, on the other hand, the proportions of males and females with symptoms were roughly equal. This was true of all symptoms except hot flushes, which were, as would be expected, much commoner in females in all the groups. A separate analysis of the answers of women over the age of 50 showed with most symptoms a still greater difference from the males, but the numbers were too small to be able to show a statistically significant difference between women of different ages.

I shall discuss the significance of the various signs and symptoms individually, indicating those which have the greatest diagnostic value, but it may be helpful to emphasize again that the comparison is essentially between a group of thyrotoxic patients, many of whom were not severely ill, a cross-section of the community of similar age and sex distribution, and a group of patients, usually with goitre, exophthalmos, auricular fibrillation, or persistent tachycardia, many of whom had in addition the symptoms of chronic anxiety or of the menopause.

Clinical Manifestations of Thyrotoxicosis Considered Separately

I now propose to discuss the clinical aspects of thyrotoxicosis so far as they illustrate points of special diagnostic value.

Family History

There is an undoubted familial tendency to thyrotoxicosis (Rundle, 1941), but this is also true of simple goitre (Brain, 1926). The disease has been reported in identical and in dissimilar twins (Neff, 1932; Bowers, 1948; Bartels, 1953). Martin (1945) and Bartels (1953) conclude that Graves's disease is inherited in a dominant manner. Martin and Fisher (1951) could, however, find no evidence of a hereditary influence in toxic nodular goitre, but Bartels disagrees with this conclusion. Occasionally the presence of thyroid disease in a relative may direct the physician's attention towards a correct diagnosis, but usually little help is derived from the family history.

Psychological Features

In his Bradshaw Lecture last year Bomford (1953) drew attention to the importance of studying disease by psychological as well as by physical methods. Thyrotoxicosis would certainly seem to qualify as a disease with psychological aspects. Sitting in a clinic devoted to the supervision of treated cases, one can hardly fail to be impressed by the unusual temperament of those who have been cured of the somatic side of their disorder. Moreover, a previously thyrotoxic patient who has developed hypothyroidism tolerates the condition far less well than one who has developed the disease spontaneously and becomes irritated with a body which refuses to carry out efficiently the dictates of a still relatively active mind. A psychosomatic theory of thyrotoxicosis has been developed by Ham *et al.* (1951). They find that the condition tends to occur in individuals frustrated in early life who make continued efforts towards premature self-sufficiency, and when these fail develop chronic anxiety. However sympathetic one may be to the psychosomatic approach one cannot help feeling that its exponents would strengthen their case if they could foretell, even occasionally, which of the many patients with early frustration and anxiety will develop thyrotoxicosis and which are more likely to develop some other psychosomatic manifestation such as peptic ulcer, colitis, or asthma. In the few people I have known personally before they developed thyrotoxicosis I certainly would have ventured no prophecy.

A history of mental shock or emotional strain is relatively common in this disease, although patients who develop anxiety states may have been subjected to equally severe stress. It is said that the disease tends to occur at the landmarks in a woman's sexual life—puberty, engagement, marriage, pregnancy, and the menopause—but few women are far removed from one of these events. Some acute cases are clearly associated with physical trauma or pregnancy, but in many the history of a direct emotional stimulus is absent.

It is clear that though the psychological features may be of considerable importance in the management of a case of thyrotoxicosis they are of little or no assistance in the establishment of a diagnosis.

Goitre

The high proportion of our cases in the non-toxic group who are recorded as having a goitre indicates that this is the commonest sign which gives rise to the suspicion of thyrotoxicosis. It must, however, be remembered that Sheffield lies at the tip of an area in which goitre is known to be common (Campbell, 1927), and this presenting feature may not be so common in other parts of the country. A bruit over the gland is frequently heard in severely thyrotoxic individuals but is often absent in milder cases and in toxic nodular goitres. The 11 patients in the control group recorded as having diffuse enlargement of the thyroid gland were all women, and though the abnormality was slight it might have been regarded as significant if they had presented other features of toxicity.

The problem of the distinction between thyrotoxicosis with diffuse glandular enlargement, with multiple nodules, or with a single adenoma is a difficult one. Cope *et al.* (1947) have produced evidence that some single adenomata may take up

most of a tracer dose of radio-iodine while the remainder of the gland takes up very little. It is suggested that such tumours are analogous to the physiologically overactive adenomata of the islets of Langerhans or of the parathyroids, and function independently of the pituitary gland. They are rare, constituting, as in the present series, about 5% of all goitres. The common toxic multinodular goitre, on the other hand, contains nodules which have usually lowered functional activity, and the thyrotoxicosis arises from overactivity of the paranodular tissue. It is, moreover, not unusual to find adenomata in the apparently diffusely enlarged gland of Graves's disease. There is often no clear distinction, and the manifestations of thyrotoxicosis, apart from a few such as the eye signs and muscular weakness, are the result of an excess of circulating thyroid hormone and can be imitated in the normal individual by heavy dosage with thyroxine. Crile (1949), writing from a surgeon's point of view, concludes that the "fundamental issue is the age of the patient rather than the presence or absence of nodules in the thyroid." I feel sure that this is the correct approach and that the distinction between thyrotoxicosis with diffuse goitre and exophthalmos, on the one hand, and toxic nodular goitre, on the other, is worth making only when it affects the management of the case.

Eye Signs

Exophthalmos was present in about a third of our thyrotoxic cases, and, though present in 11%, was found in equal degree in only 8% of the non-toxic group, which included some cases of previously treated thyrotoxicosis. Two members of the control series showed exophthalmos of slight degree, and it should be remembered that this may be a family characteristic. We have not recorded lid retraction separately, but the distinction between lid retraction and exophthalmos, which was first pointed out by Pochin (1938), is important, since the former is much more likely to disappear after therapy (Eden and Trotter, 1942).

It has long been clear that exophthalmos is not caused simply by excess of circulating thyroid hormone, since it is absent in many cases of severe thyrotoxicosis and may be present in its most virulent form in persons with normal thyroid function. It was pointed out by Russell Brain (1945) that males are far more liable than females to develop severe exophthalmos, especially after thyroidectomy. In our series exophthalmos was twice as common in males as in females. So far as the mechanism of exophthalmos is concerned it has been suggested that the thyroid-stimulating hormone of the anterior pituitary (T.S.H.) exerts an influence not only on the thyroid gland but also on the retro-orbital tissues. Rawson *et al.* (1946) have shown that T.S.H. is normally inactivated but not destroyed by the cells of the thyroid gland and that in thyrotoxicosis the degree of inactivation is increased. Some patients, however, are thought to have thyroids less capable of effecting this oxidation, and the excess of active T.S.H. is then capable of affecting the retro-orbital tissues. No simple explanation can cover all the cases nor explain in particular why patients with intact pituitary function developing myxoedema do not exhibit exophthalmos. The possibility that two separate hormones are involved has been greatly strengthened by the recent observations of Dobyns and Steelman (1953), who have been able to obtain from extracts of anterior pituitary two hormones, one of which stimulates the thyroid gland of chickens and another which produces exophthalmos in *Fundulus*, a type of minnow. If further work confirms these separate effects in mammals, much that is at present obscure will be explained.

The tendency for exophthalmos to become progressive in a case of thyrotoxicosis seems to be related to the speed with which the concentration of circulating thyroid hormone is reduced. In our cases orbitonometric observations of the degree of exophthalmos have shown that after radio-iodine treatment, which produces its effects slowly, there is less tendency for exophthalmos to increase than after methylthiouracil or thyroidectomy (Ferguson, 1951).

Lid Lag

This was present in all our toxic and non-toxic cases with exophthalmos, but was also seen in an equal number of patients without exophthalmos. We have therefore confirmed Jackson's (1949) observations that at least 10% of normal people exhibit this phenomenon. If exophthalmos and lid retraction cannot be recognized by simple inspection of the patient it is doubtful if special signs, such as lid lag or failure of convergence of the eyes on accommodation, yield any further information of value.

Nervous and Mental Symptoms

Severe cases of thyrotoxicosis almost always show emotional instability, and milder cases may have phobias and swings of emotional tone. It is probable that the biochemical disturbance unmasks a basic personality defect. It is easy to regard some patients as primarily psychotic unless the physician or psychiatrist has the possibility of thyrotoxicosis in mind.

In our series we asked the questions, "Are you a nervous person?" and "Are you irritable?" and, if the answer was positive, inquired whether this had always been so. About a quarter of the normal controls answered "yes" to

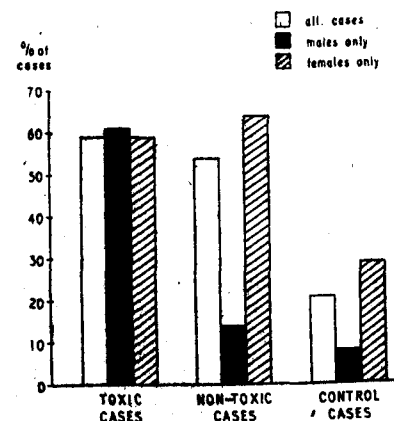


Fig. 2.—Incidence of nervousness in all cases, in males only, and in females only.

both questions, and several members of the older age groups declared that the symptoms were of comparatively recent onset. Females gave a positive answer much more often than males (Fig. 2). In the non-toxic group as many females gave a positive answer as in the toxic group, but the complaints were usually long-standing except in females at or about the menopause. Neither of these symptoms therefore carried much weight diagnostically except in males. Hyperkinetic movements were significantly more frequent in toxic cases, and this sign has some diagnostic value when it is present. Finger tremor was recorded whether it was fine or relatively coarse. It is very common in apprehensive persons and in the older age groups. A fine rapid tremor was much more often seen in the thyrotoxic group, but may occur in normal people. Jackson (1949) found it in about 2% of his series. Unfortunately, this type of tremor, usually considered to be characteristic of thyrotoxicosis, tends to grade imperceptibly into the slightly coarser types seen in anxiety states, and is of little diagnostic help in separating the two groups.

Muscular System

Muscular weakness and easy liability to fatigue are frequent accompaniments of the thyrotoxic state. The muscles may show histological changes which are probably due to excess of T.S.H. rather than of thyroxine (Dobyns, 1946). About a third of the control series said that they tired easily, and as large a proportion of the non-toxic as of the toxic patients had the symptom. Here again a positive answer to the question is of value in the male but of little help in the female unless there has been a definite alteration of recent date.

Cardiovascular Manifestations

I have recently discussed the circulatory adjustments which take place in thyrotoxicosis (Wayne, 1952), and I shall not deal with them in detail here. They are all due to excess of circulating thyroid hormone and can be reproduced in animals. It is, however, still uncertain whether there is a

specific type of heart disease caused by thyrotoxicosis or whether an excess of thyroid hormone acts merely as a precipitating factor in hearts already predisposed to failure from other causes. Levine (1951) takes the former view, but the balance of evidence is in favour of the latter. A distinction between thyrotoxicosis and thyrotoxic heart disease is worth making, since auricular fibrillation or congestive failure, when it occurs in thyrotoxicosis, becomes more important than the purely metabolic effects of the hormone. This is, however, one of the few forms of heart disease which can be treated by removing the cause.

Cases of thyrotoxic heart disease may present with established auricular fibrillation or attacks of paroxysmal fibrillation. Clinical examination of the heart sometimes gives rise to the suspicion that mitral stenosis is present, since the first sound at the apex may be accentuated and so roughened as to suggest a presystolic murmur; systolic murmurs are also often heard. It is in such cases and in cases with congestive failure that tracer tests with radio-iodine may be the only method of making a diagnosis without subjecting the patient to a prolonged therapeutic trial. One feature which may suggest that auricular fibrillation is secondary to thyrotoxicosis is its not infrequent failure to respond by a fall in rate to the administration of digitalis in full doses.

In our series of cases the average pulse rate in patients with regular rhythm was significantly higher than in the non-toxic and control groups, but there was considerable overlap between individual cases. We have, however, seen cases of undoubted thyrotoxicosis with resting pulse rates below 80 beats a minute. A slowing of the pulse rate during sleep occurs in normal and neurotic individuals but not in thyrotoxic patients. This is one of the most valuable

differentiating features after admission to hospital. Breathlessness on exertion and palpitation occur so frequently in anxiety states and in normal women that they have little differential diagnostic value (Fig. 3).

The Skin

Because the metabolic rate is high and excess heat must be eliminated, the skin of the thyrotoxic patient is typically hot and moist. Patients often say that they dislike the heat, and they may complain of hot flushes. A surprisingly large proportion of our group of normal individuals expressed a preference for cold weather, but, as Fig. 4 shows, it is chiefly women who dislike a hot environment. Thyrotoxic patients in general expressed their dislike of hot weather much more

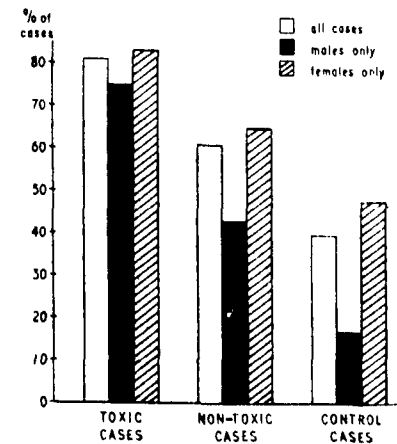


Fig. 3.—Incidence of dyspnoea on exertion in all cases, in males only, and in females only.

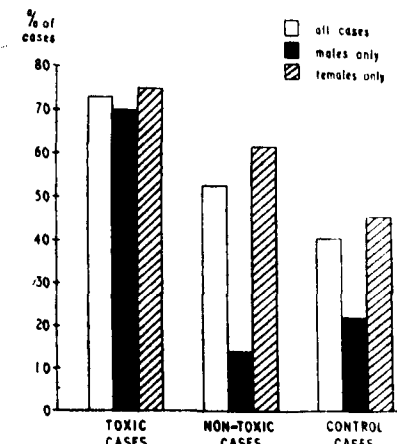


Fig. 4.—Incidence of preference for cold weather in all cases, in males only, and in females only.

vehemently than the non-toxic and control groups and complained more convincingly of excessive sweating. These two symptoms have a diagnostic value even in the female if the questions are properly framed.

Although hot and sweating hands are a characteristic feature of the florid thyrotoxic case, they may, of course, be seen in normal persons, and the nature of the environment must be taken into account. If the atmosphere is relatively dry and cool and the hands are sweating they may be cool to the touch. It is very rare for them to be cold except occasionally in cases with severe congestive failure, although we have noted cold feet, especially in elderly patients.

Appetite and Loss of Weight

Although only a third of the patients with thyrotoxicosis said that their appetite had increased, this symptom is so uncommon in the other groups that it has special diagnostic value. Patients with anxiety state usually have diminished appetites. No fewer than 14% of toxic cases, however, said that their appetite was diminished, and these were often the severer cases. Loss of weight is also a valuable differential diagnostic feature, although 4% of toxic patients gave evidence of gain of weight. We adopted the arbitrary figure of a loss of 7 lb. (3.2 kg.) or more. Greene (1953) has recorded a loss of weight in 44% of patients and a gain in weight of 10% of patients with goitre, not all of whom, however, were toxic. Conway (1950) investigated the weights of 50 cases of active Graves's disease and found that 7 were heavier and 33 lighter than the expected weight. Appetite was increased in 38 of the cases and poor in 1. The combination of loss of weight with increased appetite when present is diagnostic of thyrotoxicosis and was not found in any of our non-toxic or control groups.

Bowel Function

Diarrhoea occurred in about 8% of the patients with thyrotoxicosis. Very rarely it may be the presenting symptom. Constipation, on the other hand, is by no means uncommon. It is of some interest that 20% of the normal controls and of the non-toxic group were constipated and most of them took purgatives regularly. This no doubt explains the preponderance of advertisements for purgatives among the medicaments offered to the public in the popular press.

Menses

Irregularity of menstruation was found in about one-fifth of the premenopausal patients in both toxic and non-toxic groups, but scanty periods were more common in the former. The numbers of patients are, however, small. Riisfeldt (1948), in a series of 340 women, found menstrual abnormalities in 31% of cases of toxic diffuse goitre, 21% of toxic nodular goitre, and 10% of patients with non-toxic goitre. Diminution in the menstrual loss was more common than increase.

The Spleen

We have been unable to confirm the belief that clinically determinable enlargement of the spleen occurs in thyrotoxicosis, although Williams (1946) found it in 10% of 247 cases. In the few instances in which it has been present in cases of thyrotoxicosis which have passed through our hands there has always been some other cause, such as chronic microcytic anaemia.

General Conclusions

We had hoped, when we began this survey in our three series of cases, that we might be able to discover some signs or symptoms which would enable a distinction to be made between thyrotoxic and non-toxic cases on purely clinical grounds. In fact, we discovered that most of the classical signs and symptoms are a reliable guide in thyrotoxic males, but that the problem was far more difficult in females. Women, especially women at the menopause, will often say they have symptoms such as breathlessness on exertion or fatigue even if they are carrying out a full

day's work. When in addition they have an anxiety state it is impossible to distinguish thyrotoxic from non-toxic cases on symptoms alone. The problem, however, becomes difficult chiefly when these symptoms are associated with some objective feature usually associated with the thyrotoxic state, such as goitre, exophthalmos, auricular fibrillation, congestive failure, or persistent tachycardia. The most helpful diagnostic features when they are present are increased appetite, loss of weight, preference for cold weather, hot and sweating hands, persistent tachycardia especially during sleep, and hyperkinesia. The value of any diagnostic feature is greatly enhanced if it is of relatively recent onset.

It is clear that in the doubtful case laboratory help is needed, and I shall now discuss the various tests which have been devised to assist the clinician.

Special Tests of Thyroid Function

Further evidence that it is not always easy to arrive at a diagnosis of thyrotoxicosis on clinical evidence alone is provided by the variety of laboratory methods which have been used to assess thyroid function. Some of these are now only of historical interest, but I shall review briefly those which are still in vogue, devoting, however, most of my time to a discussion of the help which may be afforded by tests using radio-iodine.

Estimation of the Basal Metabolic Rate.—This is still the standard laboratory investigation used by most clinicians in an attempt to confirm or refute a diagnosis of thyrotoxicosis. It has the merit that it is comparatively easy to carry out, and it gives some idea of the severity of the thyrotoxic state in clear-cut cases. It is essentially a measure of hypermetabolism, and a raised basal metabolic rate is therefore found in a variety of other conditions, as, for example, leukaemia, pheochromocytoma, cardiovascular disease, and anxiety states. In the last two conditions it may be impossible to achieve truly basal conditions without heavy sedation (Rapport *et al.*, 1951). Thyrotoxic patients may, moreover, have basal metabolic rates lying within the statistically acceptable "normal" range. In our experience (Goodwin *et al.*, 1951) as many as 33% of patients with proved thyrotoxicosis may have basal metabolic rates lying below +20%, and Foote *et al.* (1952), who took special care to obtain reliable estimates, found that 23% of thyrotoxic patients had basal metabolic rates lying within the normal range. Werner and Hamilton (1951) also report 15 cases of hyperthyroidism without hypermetabolism. Robertson (1952) has pointed out that a specially careful technique and standards derived from normal persons in Great Britain should be used, and Robertson and Reid (1952) emphasized the value of carrying out further tests after the administration of iodine in doubtful cases. An estimation of the basal metabolic rate is of undoubted help in a suspected case of thyrotoxicosis, but conditions must be truly basal and observations on out-patients are often unsatisfactory. Duplicate determinations on two or more days are desirable, and in border-line cases further investigation after the administration of iodine may be necessary.

Estimation of Serum Protein-bound Iodine.—This estimation measures the amount of circulating iodine bound to protein molecules, and is generally regarded as an accurate index of the amount of circulating thyroxine. Several groups of workers in the U.S.A. (Salter *et al.*, 1941; Starr *et al.*, 1950; and Hallman *et al.*, 1951) regard a raised level as the most reliable laboratory evidence of thyrotoxicosis. De Mowbray and Tickner (1952), on the other hand, in this country found that the level was raised in only two-thirds of cases of proved hyperthyroidism, and regard the estimation as inadequate in itself as a test of thyroid function. The previous administration of iodine-containing compounds produces a spurious increase in the serum protein-bound iodine figures. We have encountered serious technical difficulties with the method of Barker *et al.* (1951). It is doubtful if this estimation, which is in any case time-consuming, will ever become generally available to the clinician. It is chiefly of interest because it may give a

more complete picture of iodine and thyroxine metabolism when the results of simultaneous studies with radio-iodine are available (Riggs, 1952).

Estimation of Serum Cholesterol.—The serum cholesterol is lower than normal in the majority of cases of thyrotoxicosis. There is an increased rate of hepatic synthesis of cholesterol, but this is accompanied by an even greater rate of destruction and intestinal excretion. The changes are not related directly to changes in metabolic rate (Rosenman *et al.*, 1952). The fall in blood cholesterol level is small in degree, but under treatment a steady rise occurs (McGavack and Dreker, 1945). We have found the estimation of serum cholesterol of little diagnostic help in thyrotoxicosis although it is valuable in suspected cases of myxoedema. Our experience thus agrees with that of Peters and Man (1950) and Bartels (1950).

Estimation of Serum Creatinine.—Creatinuria undoubtedly occurs in all patients with thyrotoxicosis, but its degree bears no relation to the severity of the disease. Griffiths (1951) has suggested that a knowledge of the height of the fasting serum creatinine is of diagnostic value in thyrotoxicosis, especially when considered in conjunction with the basal metabolic rate. Unfortunately, however, he appears to have accepted a level of 0.6 mg. of creatine per 100 ml. as the upper limit of normal in spite of the observation of Tierney and Peters (1943) that normal women often have a serum creatinine higher than this figure. Because of the high degree of overlap which exists between thyrotoxic and normal men and women it is unlikely, even if a more sensitive method of estimating serum creatinine could be devised, that the differences would be clear-cut enough to be of diagnostic value. Similar considerations apply to creatine-tolerance tests.

Blood Picture.—"Leucopenia is fairly common, and it has been claimed that relative or absolute lymphocytosis is a constant finding in hyperthyroidism" (Whitby and Britton, 1950). If this were true an examination of the blood would clearly be diagnostically helpful. My colleague Dr. E. K. Blackburn (1953, personal communication) has studied the peripheral blood in 51 of our proved cases of thyrotoxicosis. In none of these was there a leucopenia or an absolute lymphocytosis, taking the respective normal ranges as 4,000–11,000 per c.mm. and 1,000–4,500 per c.mm. (Osgood *et al.*, 1939). In his view the concept of relative lymphocytosis should be abandoned. The bone marrow has, however, shown a lymphocytic reaction in some cases. This is probably a manifestation of the general tendency to hyperplasia of lymphoid tissue in this disease. Anaemia, when it occurs, is usually of iron-deficiency type unrelated to the thyrotoxicosis, except in so far as the latter predisposes to achlorhydria.

Use of Radio-iodine in Diagnosis of Thyrotoxicosis

Pochin (1950), in his Oliver-Sharpey Lectures, described the ways in which radio-iodine may be used to investigate fundamental problems of iodine metabolism, and Myant (1952) has described and critically reviewed the different types of test which may be used to assess thyroid function. These tests fall into two main groups: they either measure directly or indirectly the capacity of the thyroid gland to take up radio-iodine, or they attempt to measure the output of radioactive thyroxine from the gland. The avidity of the thyroid for iodine, which is greatly increased in thyrotoxicosis, can be estimated by determining the proportion of a given dose taken up by the gland at a fixed time or the maximum amount taken up by the gland. Alternatively, the rate at which the dose is taken up at a given plasma concentration of radio-iodine may be measured, a figure which is termed the thyroid clearance rate by analogy with renal clearance rates. Theoretically this should be a more reliable index of thyroid activity than the total radio-iodine uptake. Since the administered radio-iodine is shared between the thyroid and the kidneys, an estimation of the amount of radioactivity in the urine will give an indirect measure of the capacity of the thyroid to absorb iodine. Samples of urine taken at various times after the test dose are usually analysed separately.

The thyroid converts the radio-iodine into radiothyroxine at a rate and to a degree which is determined by its functional activity. Twenty-four to forty-eight hours after a tracer dose has been given the plasma of normal individuals shows little or negligible radioactivity. On the other hand, the plasma of the thyrotoxic patient contains a significant amount of radioactive material, of which a high proportion is bound to protein. Tests of this type involve the examination of a blood sample at a fixed time after the administration of the test dose, and an estimation of the relative amount of radioactivity in inorganic and organic forms.

Many groups of observers have carried out investigations on normal individuals and on patients with thyrotoxicosis, using one or more of these methods. We (Goodwin *et al.*, 1951) compared seven different criteria in normal persons, in patients with definite thyrotoxicosis and in patients in an "intermediate" but non-toxic group with goitre, treated thyrotoxicosis, or anxiety state. We came to the conclusion that the index which correlated best with the final clinical diagnosis, arrived at independently of the results of radio-

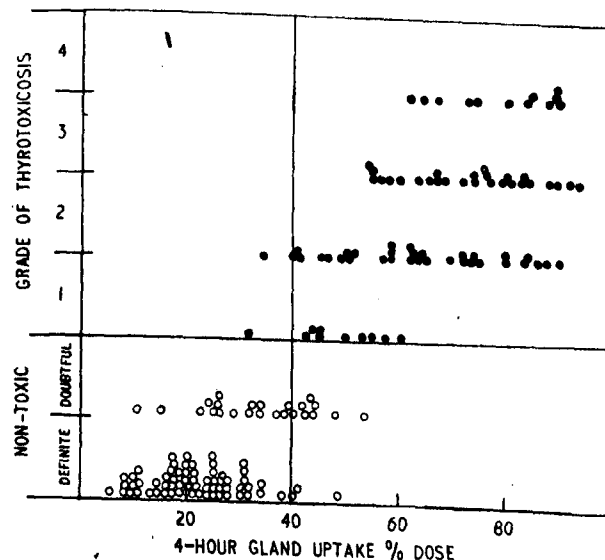


FIG. 5.—Relation of level of thyroid function to uptake of radio-iodine after four hours.

iodine tests, was the protein-bound plasma activity measured 48 hours after the administration of the dose. We thought, however, that, whenever possible, more extensive studies should be carried out. Subsequently we (Ansell *et al.*, 1953) selected three radio-iodine tests and applied them to a group of 179 persons, all of whom had been carefully and independently assessed clinically. These tests were the proportion of the dose taken up by the gland four hours after administration, the clearance rate of radio-iodine from the plasma one hour after administration, and the protein-bound plasma activity 48 hours after administration. Figs. 5 and 6 show the results which we obtained.

All thyrotoxic cases were classified into one of four grades of severity, and the non-toxic group was divided into those cases in which there was no clinical doubt that the patient had normal thyroid function and those about which there had initially been some doubt that the patient might be thyrotoxic. It is this group which any satisfactory test must separate accurately from cases of mild thyrotoxicosis. It will be seen from Fig. 5 that if a 40% uptake by the gland four hours after the radiation had been given was taken as the dividing line it separated fairly well non-toxic from thyrotoxic individuals, and that the results ran roughly parallel with the degree of severity of the disease. High uptakes did, however, occur in non-toxic individuals. If we took a clearance rate of 80 ml. a minute as the dividing line between toxic and non-toxic persons we found that several thyrotoxic patients had clearance rates well below this level. The protein-bound plasma activity, however

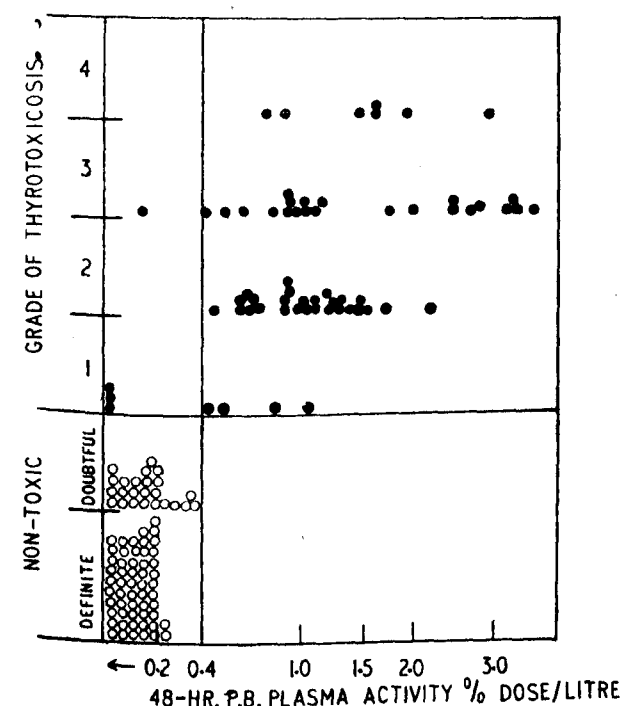


FIG. 6.—Relation of level of thyroid function to 48-hour protein-bound plasma activity. (Scale not strictly logarithmic below 0.2%.)

(Fig. 6), showed a fairly sharp division between the two groups, although thyrotoxic patients occasionally had levels well below our normal limit of 0.4% of the dose per litre. We concluded that the tests of four-hour uptake by the gland and protein-bound plasma activity at 48 hours would usually give consistent results and separate toxic from non-toxic cases.

We have now carried out more than 750 tracer tests of this type, and our conclusions, based on the smaller number of cases shown in Figs. 5 and 6, must be modified. Dr. Miller and I have correlated these figures with the clinical findings where they were available. Fig. 7 shows the results plotted so as to emphasize the cases of agreement or disagreement between the four-hour gland uptake and the 48-hour protein-bound plasma activity. Rectangles B and D contain cases in which both tests gave results which were in agreement. When this is so, it is quite exceptional to find a discrepancy between the clinical diagnosis and the radio-iodine tests, and we would place the error at less than 1%. It should be stated, however, that some cases were referred from other clinicians, and we cannot be sure that in some cases the tests have not been taken into account in arriving at a conclusion. A large proportion were, however, patients under our own care, and we can say with certainty that when the diagnosis is clear on clinical grounds the two radio-iodine criteria are always concordant and confirmatory.

We have ourselves examined the records of all the available patients in which the results of the two tests were discordant, that is to say, of cases falling in rectangles A and C. Black points appearing in rectangle A and white ones in rectangle C are examples of correct results by the plasma-activity test but incorrect as judged by the four-hour gland uptake. White points in rectangle A and black points in rectangle C indicate the

converse. It will be seen that the black points fall about equally in rectangles A and C, but the white ones are mainly in rectangle C. The protein-bound plasma activity is therefore a more accurate index than the four-hour gland uptake. It is, in fact, about twice as reliable, but only because it agrees with the clinical diagnosis better in non-toxic cases. A similar analysis of the figures for the thyroid clearance rate shows that they correlate better with the clinical diagnosis than the four-hour uptake, but less well than the protein-bound plasma activity.

There are certain important circumstances in which radio-iodine tests give results which must be interpreted with reserve. These are the previous administration of iodine or iodine-containing compounds, the administration of drugs of the thiouracil series, previous treatment by thyroidectomy or radio-iodine, and in cases of myxoedema or cretinism. We have examined the records of 47 cases which gave discordant results in the two tests and in which one or other of these factors had to be taken into account. These are not plotted in Fig. 7.

The administration of inorganic iodine or iodides diminishes the amount of radio-iodine taken up by the gland, and it is wise to wait for three weeks after stopping these drugs before carrying out tracer tests (Keating *et al.*, 1950). Plasma activity is also reduced (Ansell and Miller, 1952). We therefore carry out a simple test described by Foote *et al.* (1952) for iodides in the urine. The organic iodine compounds used in diagnostic radiography also affect radio-iodine criteria, but do not yield enough iodine to give positive readings in this test. We have found that individuals with normal thyroid function may show complete suppression of radio-iodine uptake 18 months after they have been given iodized oil for bronchography. They should be specifically questioned about previous x-ray investigations.

Drugs of the thiouracil series administered over a period of time may cause an increased uptake of radio-iodine by the thyroid which can persist for as long as three years (Foote *et al.*, 1952). In our series plasma activity was a much more accurate index in such cases.

After thyrotoxicosis has been treated either by thyroidectomy or by radioactive iodine the 48-hour plasma activity tends to be higher than would be expected from clinical estimates of thyroid function. In general, it can be said that the uptake or clearance is a more reliable index than plasma activity in assessing the results of these two forms

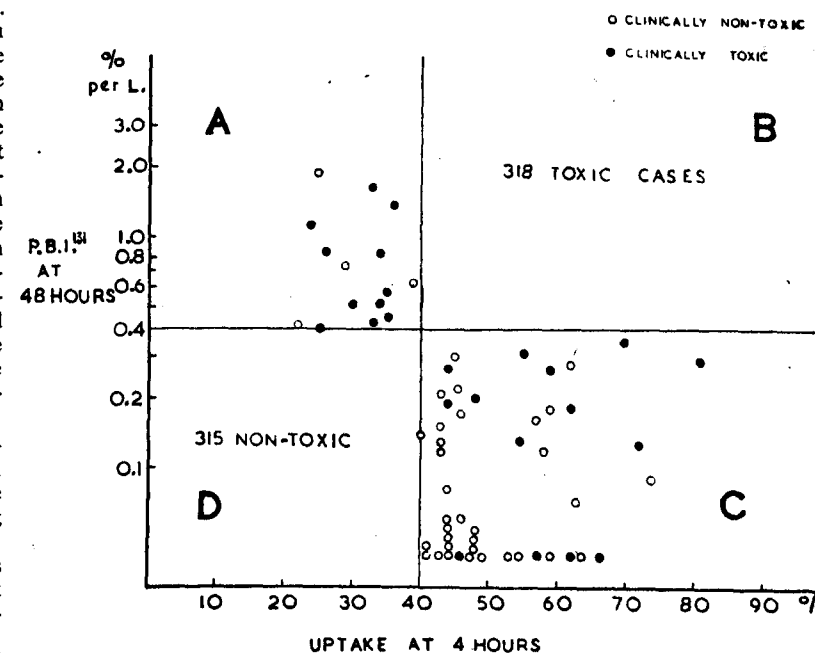


FIG. 7.—Relation of four-hour gland uptake to 48-hour protein-bound plasma activity levels.

of treatment (Ansell *et al.*, 1953). Similarly in hypothyroidism not amounting to complete myxoedema, high protein-bound plasma figures may be obtained in spite of clinical evidence of diminished thyroid function. The explanation of these exceptional results is not clear, but it seems probable that in these cases the specific activity of the circulating thyroxine is increased. The thyroid gland is working to the maximum of a diminished capacity to synthesize thyroxine and is turning over the iodine presented to it at an unusually rapid rate, so that a relatively large proportion of the circulating thyroxine molecules contain radioactive atoms. This hypothesis has been shown to be correct in two cases of hypothyroidism in which simultaneous estimations of circulating non-radioactive protein-bound iodine were carried out (Blom and Terpstra, 1953). In familial cretinism, in which hypothyroidism is associated with both a high uptake by the gland and high protein-bound radio-iodine activity, it seems more likely that there is a more fundamental disturbance in iodine or thyroxine metabolism (Hubble, 1953; McGirr and Hutchison, 1953).

We have no doubt that it is always preferable to carry out at least two and preferably three of these tests, and at Sheffield these are always done. An estimation of the 48-hour protein-bound plasma activity alone may, however, be of great diagnostic value. Since the patient need not come into contact with electronic apparatus it is possible to provide a diagnostic service for hospitals far removed from the centre at which the actual estimations are carried out. Doses of radio-iodine are dispatched weekly and a single sample of plasma is returned from each patient. Macgregor *et al.* (1953) have recently reported the results of such a co-operative effort between our centre and Nottingham. The patients were seen by two physicians, and in doubtful cases the final diagnosis was made only after therapeutic trials and follow-up.

Similar tests have been carried out at Derby and Scunthorpe, but the conditions were less rigorously controlled and the final clinical diagnosis may in some instances have been influenced by the results of the test. The correlation between the clinical and laboratory results at the three centres is summarized in Table II. It will be seen that an incorrect conclusion was given by the radio-iodine criterion in about 8% of cases, the test mainly tending to show non-toxic results in clinically toxic cases. This is especially true of borderline or doubtful cases.

TABLE II.—Correlation Between the Final Clinical Diagnosis and the Conclusions Based on a Single Estimation of the 48-hour Protein-bound Plasma Activity

	No. of Cases	Clinical Diagnosis	Correct	Incorrect
Nottingham ..	50	Toxic	25	2
		Non-toxic	22	1
Derby ..	77	Toxic	22	2
		Non-toxic	51	2
Scunthorpe ..	43	Toxic	13	6*
		Non-toxic	24	0
Total ..	170		157	13†

* 5 "mild" or "doubtful."

† 3 clinically non-toxic cases returned as toxic; 10 clinically toxic cases returned as non-toxic.

General Conclusions on Plasma Activity Tests

When we consider together the 1,000 tests of protein-bound plasma activity which we have carried out we arrive at the following general conclusions. The test alone has an error of about 10%, assuming the clinical diagnosis to be correct, but it must be remembered that this itself is not 100% accurate. When the results are supported by simultaneous estimations of clearance rates or uptake figures, great confidence can be placed in the results. If uptake and plasma activity figures are discordant the latter is more likely to be correct. It is unlikely to suggest that a patient is thyrotoxic without this being the case. It is better, how-

ever, in such instances to carry out a therapeutic trial. Little help is gained by repeating the tests, which almost always give the same results. Uptake clearance and plasma activity figures must be interpreted with reserve in patients who have received previous therapy.

All radio-iodine tests have certain drawbacks, and the ones which we use are not immune from criticism. It is possible by using a scintillation counter to determine the uptake of radio-iodine by the gland with as little as 5 microcuries of I^{131} , but to determine with reasonable accuracy the lower levels of plasma activity at least five times this amount must be used. Even so, the radiation hazard is less than that of some common diagnostic x-ray procedures, and the dose is less than a hundredth of that used in the treatment of thyrotoxicosis. Nevertheless, it is desirable to reduce to the absolute minimum the amount of radiation to which the gland is subjected. One way of achieving this result is to administer a drug of the thiouracil series an hour before the radio-iodine is given (Stanley and Astwood, 1948), or, alternatively, sodium iodide may be given together with the radio-iodine intravenously (Newsholme, 1952). Either the clearance rate (Newsholme) may be used or the maximum uptake of I^{131} by the thyroid together with a factor acting as an index of the initial slope of the curve (Foss and Herbert, 1952). These tests also have the advantage of being relatively unaffected by an increase in the iodine intake.

The avidity of the thyroid gland for iodine is most simply measured by determining the proportion of a dose excreted in the urine. The advantages of this method are its applicability to out-patient cases, the small dose of radio-iodine used, and the relative simplicity of the physical measurements. One disadvantage is the difficulty of ensuring that the whole of the urine output has been preserved for analysis, a difficulty which we have experienced with female patients even when they have been in our wards. We found that the excretion of radio-iodine in the urine during the 24 hours after it had been administered was a relatively poor index of thyroid function (Goodwin *et al.*, 1951). Fraser and his co-workers (1953) have, however, shown that by collecting the urine separately during the periods 0-8 hours, 8-24 hours, and 24-48 hours three indices of thyroid function could be derived. These were used to check for errors of collection and technique, and to correct for the presence of renal disease. The deductions made from them usually correlated well with the presence or absence of hyperthyroidism, and could be used to confirm the existence of myxoedema. The method appears to suffer, however, from the general defect of uptake measurements which we have also found since it tends to place non-toxic nodular goitres in the toxic range.

Fraser (1953) has recently shown that a method described by Berson *et al.* (1952) yields satisfactory results in both hyperthyroidism and hypothyroidism. The method has the disadvantage of requiring the intravenous administration of the radio-iodine, but the test, which is essentially a clearance test, can be completed in an hour.

Choice of a Radio-iodine Test

It will be seen, then, that all the tests which are at present available have both advantages and disadvantages. Our experience leads us to believe that it is best to determine both the iodine uptake of the gland and the protein-bound plasma activity. The latter measurement alone is simpler, and can be completed without the patient attending the diagnostic centre. The urine-excretion test as modified by Fraser is technically simple if appropriate samples can be delivered to the centre, and is of especial value in assessing hypothyroid states. Those who contemplate setting up a radio-iodine diagnostic service would be well advised to concentrate on one or two of the available tests, and to establish their own ranges of normal and abnormal values. We have some evidence that there are differences in the levels indicating abnormality in different countries and even in different parts of the same country. Most of our patients

come from an area which is known to be relatively iodine deficient (Murray *et al.*, 1948), and our criteria may not be generally applicable.

Relative Value of Different Tests of Thyroid Function

Each of the available tests measures a different aspect of thyroid function. Those using radio-iodine indicate either the capacity of the thyroid gland to concentrate iodine or its ability to turn out radioactive thyroxine, but they do not measure the absolute rate of iodine metabolism. The former test is affected by the variation in the plasma iodide level, and the latter by the thyroxine content of the thyroid. Both must be interpreted with reserve when the patient has received iodine-containing compounds or has been subjected to any therapeutic procedure. The basal metabolic rate, even after a hypnotic, measures hypermetabolism which may be due to a variety of "extra-thyroid" causes (Meckstroth *et al.*, 1952). It does, however, give some indication of the degree of severity of the condition. The estimation of the non-radioactive serum protein-bound iodine should theoretically give the most direct measurement of circulating thyroxine, but is technically difficult. But even if we knew with certainty the absolute level of circulating thyroxine we should have to take into account the general biological phenomenon of the variability of the response of different individuals to the same stimulus.

Myant (1952) has said, "However we define normality, the limit we set between normal and pathological is an arbitrary one, and no test can tell us what this limit should be." From the point of view of the biologist this is true, and with sufficiently sensitive tests we should probably find a graded response to increasing doses of thyroxine. It is even possible that some of the symptoms of those who have an anxiety state are produced by a slight excess of the thyroid hormone. On the basis of blood iodide studies Brody (1949) has produced evidence that this may be so, and Fraser *et al.* (1953) noted a tendency for his "neurosis" group to have a relatively high gland uptake of radio-iodine. The possibility is intriguing. Yet such persons do not respond to therapeutic tests which diminish the activity of the thyroid gland. Our correlations are ultimately based on this response, and it is this aspect in which the clinician is primarily interested. Our preference for radio-iodine tests is founded on the fact that by their use we are able to make a decision quickly on whether or not specific treatment shall be instituted, and they are of minimum inconvenience to the patient. We believe that they will be widely used in the future.

Conclusion

I hope I have been able to convince you that, while it may be very easy to make a diagnosis of thyrotoxicosis from the history and physical examination alone, it is often very difficult and there will always be patients about whose thyroid function the physician remains in doubt. Some symptoms and signs have greater diagnostic value than others; diagnosis is relatively easy in the male, but difficult in the female, especially if she is in a state of chronic anxiety.

When there is any question about the diagnosis, therapeutic tests should be carried out, but much time may be saved by studies of iodine metabolism, using isotope techniques.

I wish to thank my clinical colleagues at Sheffield who have referred cases to me, and Dr. D. V. Hubble, of Derby, and Dr. J. H. D. Millar, of Scunthorpe, for detailed information about cases at these centres. The work on radio-iodine was made possible through the collaboration of Mr. G. W. Blomfield, the Director, and Dr. H. Miller, the senior physicist of the Sheffield National Centre for Radiotherapy. Figs. 5 and 6 are reproduced by permission from *Radioisotope Techniques*, Proceedings of the Isotope Techniques Conference, Oxford, Volume I. H.M.S.O., 1953.

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The Wellcome Trust has set aside a further £10,000 for whole-time Research Fellowships in Schools of Pharmacy in Great Britain. The Trustees made their first grant of £5,000 for Research Fellowships in 1947. They added a further £1,200 last year, when five Fellowships were awarded, and the value of each was raised from £350 to £400 a year. The awarding committee, nominated by the Wellcome Trustees and the Pharmaceutical Society of Great Britain, has discretion to award a senior Research Fellowship at a somewhat higher rate. Fellows must be registered pharmaceutical chemists in Great Britain, or graduates in pharmacy of a University in this country. A Fellowship is tenable for two years on annual award and is renewable in exceptional circumstances for a third year.

IODOTHIOURACIL IN TREATMENT
OF TOXIC GOITRE

BY

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In 1948 Barrett, Goodman, and Dittmer synthesized several organic combinations of halogens with thiouracil, of which 5-iodo-2-thiouracil proved most suitable for clinical trial. Because of the avidity of the hyperthyroid gland for iodine, the concentration of thiouracil in the gland might be expected to be greater after administration of iodothiouracil than after an equivalent dose of uniodinated thiouracil; a lower dosage could then be used, and the frequency of toxic effects would thus be reduced. It was also thought that the concurrent administration of iodine might diminish the hyperplasia and vascularity of the thyroid gland otherwise induced by the thiouracil; a reduction in the duration of pre-operative treatment would thus be possible and the technical difficulties of excision would be minimized.

Animal Experiments.—Experiments on rats and chicks have shown that the reduction in metabolism produced by iodothiouracil was quantitatively the same as that produced by thiouracil with or without the concurrent administration of potassium iodide (Barrett and Gassner, 1951). The thyroid histology of animals treated with iodothiouracil resembled the normal more closely than did that of animals treated with iodine and thiouracil singly or in combination (Barrett, Gassner, and Dittmer, 1951). Gassner *et al.* (1950) have also shown that iodothiouracil was less goitrogenic than thiouracil with and without iodide, and that it inhibited the goitrogenic action of exogenous thyrotrophic hormone, whereas thiouracil, alone or with iodine, augmented it.

Previous Clinical Trials

Reports on the use of this drug in over 190 patients have already been made from North America (Williams *et al.*, 1949; McClintock and Lyons, 1951; Catz *et al.*, 1951; Goldner and Kirschenfeld, 1952; Catz and Starr, 1953). The initial daily dosage varied from 50 to 800 mg., the optimum dosage appearing to lie between 200 and 400 mg., and the maximum clinical response was obtained in from eight to twenty-two days. Most workers found that some patients responded poorly; McClintock and Lyons (1951) believed that full remission was rarely produced. Definitive long-term therapy with iodothiouracil did not appear to be satisfactory owing to the incomplete and erratic control which was obtained; therefore the drug was mainly used in the preparation of patients for subtotal thyroidectomy. All these reports agree that the results obtained were from the surgical point of view satisfactory, the gland being less friable and vascular than after the usual preparation with a thiouracil derivative and iodine. Histologically, the glands appeared to be well involuted, and Catz and Starr (1952)

reported that "in hyperthyroid patients prepared for operation with iodothiouracil, the thyroid epithelium has a lower average mean acinar cell height than in all the other treatment groups," which included groups treated with iodine alone and with iodine and a thiouracil drug together; in other words, the histology most closely resembled that of the normal gland in the group treated with iodothiouracil.

Present Investigation

Twenty-three patients with hyperthyroidism have been treated with sodium iodothiouracil ("itrimil"), 100 mg. of the drug containing 46 mg. each of iodine and thiouracil and 8 mg. of sodium. Eighteen patients were subsequently treated by subtotal thyroidectomy. The first seven patients were given 200 mg. of iodothiouracil daily, but as the condition of the glands at thyroidectomy was not so consistently satisfactory as had been expected the remaining patients were given 300 mg. daily. All patients were admitted to hospital and observed for seven to fourteen days before starting drug therapy; during this period of observation the diagnosis was confirmed clinically, by radio-iodine studies and by estimations of the basal metabolic rate (B.M.R.). The latter test was repeated on three successive mornings, the lowest of the three readings providing a more accurate indication of the level of thyroid activity than a single reading. During the periods of observation and treatment the pulse rate (including the sleeping rate) was noted, the patients were weighed twice weekly, and exophthalmometer readings, measurements of neck circumference, and white blood cell counts were made weekly.

A further group of six hyperthyroid patients admitted thereafter for preparation for subtotal thyroidectomy was observed in a similar way and was treated with methylthiouracil and potassium iodide concurrently in daily doses equivalent to those of the thiouracil and iodine in 300 mg. of iodothiouracil.

Clinical Effects

In most patients, between the third and eighth days of treatment, and usually on the fifth day, a change in the pattern of the pulse chart could be noted, the lowest pulse rate of the day (often the sleeping pulse rate) having fallen by about 10 beats, and the daily range of the pulse rate being also reduced, although to a less extent. This change commonly coincided with an improvement in the general condition of the patient and accompanied, or immediately preceded, an increase in weight. In almost all cases the increase in weight continued until the end of the three weeks' treatment which preceded operation or discharge from hospital. A further fall in the pulse rate was not so common, and in many cases the lowest level and the range of the daily pulse rate rose slightly towards the end of this period of observation; this phenomenon was probably associated with the increase in the patient's physical activity, which was encouraged before operation or discharge, although it may represent an escape from control by the antithyroid drug.

All but one of these patients gained weight during treatment with iodothiouracil, and during the first three weeks of treatment the average daily gain in weight was 5 oz. (140 g.), the gain being higher in those with diffuse goitre than in those with nodular goitre, and higher in those given 300 mg. of iodothiouracil daily than in those given 200 mg. daily.

Estimations of the B.M.R. provide a less reliable means of assessing progress, owing to the difficulty of producing a basal state in hyperthyroid patients. The average daily fall in B.M.R. during the first three weeks of treatment was about 1.5%, and again the average daily fall was greater in the patients with diffuse goitre than in those with nodular goitre, and greater in those treated with 300 mg. of iodothiouracil daily than in those treated with 200 mg. daily.

In none of the six patients treated for two months or more did an increase in the size of the goitre become obvious. Increase in exophthalmos did not occur during treatment in

any patient, but in two, following thyroidectomy, there was a temporary increase of 2 to 3 mm. accompanied by slight ocular discomfort. A transient maculo-papular rash developed in one patient, but disappeared without treatment being stopped. Agranulocytosis, leucopenia, or any other toxic effect was not observed.

Surgical and Histological Findings

All thyroidectomies performed on these patients were done by one surgical team. The surgeon was of the opinion that the glands of patients prepared for operation with iodothiouracil were firmer, less vascular, and less friable than the glands of patients who receive the usual preparation of a thiouracil drug followed by iodine. Particularly was there a reduction in the size of the surface veins of the gland, though periglandular adhesions seemed more dense. In half of the patients the condition of the gland was comparable to that found after preparation with iodine alone. The post-operative course in no case caused anxiety, and was usually uneventful.

Although in four of the seven patients treated with 200 mg. of iodothiouracil daily ideal technical conditions were found at thyroidectomy, in the others the results were not so satisfactory—the gland in one patient who received 200 mg. daily for only twelve days being as vascular and friable as the glands found in patients treated with thiouracil without iodine. It was on this account that the daily dose of iodothiouracil was increased to 300 mg.

Evidence of involution, with good colloid content, was found in most of the excised goitres. In two-thirds of the cases there was, however, some degree of hyperplasia, which was never extreme and was usually slight or moderate. In the remaining third the epithelial cells were cuboidal or flattened (Table I).

TABLE I.—Summary of 18 Cases of Toxic Goitre Prepared for Surgery with Iodothiouracil

Case No.	Age and Sex	Goitre	Lowest B.M.R. before Treatment	Iodothiouracil		Surgeon's Impression*	Histological Evidence of Hyperplasia
				Daily Dose	Duration in Days		
1	38 F	D	+16%	200 mg.	24	A	None
2	34 F	D	+54%	200 "	17	A	"
3	46 F	N	+68%	200 "	12	C	Moderate
4	33 F	D	+45%	200 "	23	B	Marked
5	30 F	D	+53%	200 "	25	A	"
6	34 F	D	+80%	200 "	30	A	None
7	33 F	D	+50%	200 "	27	B	Slight
8	47 F	N	+26%	300 "	22	A	Marked
9	51 F	D	—	300 "	60	A	None
10	28 F	D	+54%	300 "	25	B	Moderate
11	48 F	D	+50%	300 "	30	A	Slight
12	37 F	D	+46%	300 "	23	A	"
13	55 F	N	+48%	300 "	23	B	"
14	42 M	D	+48%	300 "	19	A	"
15	46 F	D	+34%	300 "	19	B	Moderate
16	48 F	N	+17%	300 "	20	B	None
17	48 F	N	+55%	300 "	18	B	"
18	50 F	D	+56%	300 "	18	B	Moderate

D=Diffuse, N=Nodular.
* Classification of surgeon's impression of condition of thyroid gland: A=comparable with glands after preparation with iodine alone; B=comparable with the more satisfactory glands after preparation with thiouracil followed by iodine; C=unsatisfactory—excessive vascularity and friability.

Long-term Treatment

One patient with hyperthyroidism complicated by auricular fibrillation and congestive heart failure was treated with 300 mg. of iodothiouracil daily for 60 days, during which time clinical improvement was continuous; at operation the condition of the thyroid gland was ideal, there being little increase in vascularity and no increase in friability or periglandular adhesions. Five patients have been treated with iodothiouracil for four months or more; in one patient with mild hyperthyroidism and exophthalmic ophthalmoplegia, although treatment was continued for nine months, good control of the hyperthyroidism was maintained, decrease in exophthalmos occurred, and there has been no relapse in the three months since treatment was stopped. In the four other patients who have been treated for from four to seven

months control has not been so satisfactory, and iodothiouracil has been replaced, with benefit, by methylthiouracil in two patients.

Comparison with Patients Treated with Methylthiouracil and Iodine

The average daily gain in weight and the fall in B.M.R. were identical in the group of patients treated with equivalent doses of iodothiouracil and iodine. The condition of the thyroid at operation, from the point of view of vascularity and technical difficulty, was a little less satisfactory in the latter than in the iodothiouracil group, and histological evidence of hyperplasia was more frequent and more obvious (Table II).

TABLE II.—Summary of Six Cases of Toxic Goitre Prepared for Surgery with Methylthiouracil and Potassium Iodide Concurrently, in Dosage Equivalent to 300 mg. Iodothiouracil Daily

Case No.	Age and Sex	Goitre	Lowest B.M.R. before Treatment	Duration of Treatment in Days	Surgeon's Impression*	Histological Evidence of Hyperplasia
19	46 F	D	+28%	19	B	Moderate
20	39 F	N	+50%	25	C	"
21	39 F	D	+26%	28	A	None
22	34 F	D	+10%	16	B	Moderate
23	33 F	D	+50%	22	B	"
24	58 F	N	+26%	20	C	"

* See footnote to Table I.

Discussion

In our experience iodothiouracil in daily dosage of 300 mg. for at least 17 days is a very satisfactory preparation for thyroidectomy in hyperthyroidism. A definite improvement in the clinical state occurs within a week of the start of treatment, there being thereafter a steady rise in weight of over 2 lb. (0.9 kg.) a week and a fall in B.M.R. of about 1.5% daily. The majority of patients are therefore fit for surgery within four weeks of starting iodothiouracil, and the field provided for the surgeon is technically satisfactory. It is thus possible to give all patients the advantage of an anti-thyroid agent in preparation without increasing the difficulties of the subsequent operation and without increasing appreciably the period of incapacity.

It is not so certain, however, that iodothiouracil possesses any new or distinctive features as a drug for the specific treatment of hyperthyroidism. The early clinical response, the tendency to escape from control after two to three weeks' treatment, and the difficulty in maintaining control in long-term treatment are suggestive of an iodine action, and it has yet to be shown that the iodine and thiouracil fractions of iodothiouracil act in the body in the organically combined form. It has been suggested that the studies of Plummer (1950) on the urinary excretion of the iodothiouracil are in favour of such an action, but the implications of these findings are doubtful.

Comparing the results of iodothiouracil treatment with those of methylthiouracil and iodine, we have been unable to show any significant difference beyond the impression that in the iodothiouracil group the operative field showed less excessive vascularity and the histological appearance was more commonly that of complete involution. Catz and Starr (1953), however, found that a shorter period of treatment was necessary to control hyperthyroidism with iodothiouracil than with thiouracil and iodine, that increase in goitre size occurred in the majority of patients treated with thiouracil and iodine but in none of those treated with iodothiouracil, and that the mean acinar cell height was lower in those treated with iodothiouracil, this signifying greater involution.

Astwood (1944) suggested that the actions of iodine and thiouracil in hyperthyroidism might be antagonistic, and that these drugs should therefore not be given simultaneously; it is in fact common practice in this country, when preparing

hyperthyroid patients for surgery, to discontinue the thiouracil two to three weeks before operation and to administer iodine alone for the remaining period (Rundle, 1951; Lange, 1953). However, Maxwell *et al.* (1946) and Williams (1946) reported satisfactory results with the concurrent administration of thiouracil and iodine. Rawson *et al.* (1945) believed that the iodinating and involuting actions of iodine are separate, and that, although the administration of the iodine does not result in the synthesis of thyroid hormone when iodine and thiouracil are given together, it does cause involution of the gland.

Conclusion

Although the number of cases observed in the present series is small we believe that the use of concurrent thiouracil and iodine (whether given as iodothiouracil or as methylthiouracil with potassium iodide) is a most satisfactory method of preparing for operation patients with moderate or severe hyperthyroidism. Those patients with mild hyperthyroidism who require operation are adequately prepared with iodine alone. Preparation with concurrent thiouracil and iodine is more rapid and produces a more satisfactory surgical field than does preparation with thiouracil followed by iodine. In cases of moderate severity the relatively slight increase in the duration of pre-operative treatment, compared with the duration of pre-operative treatment with iodine alone, is fully justified by the increased degree of safety obtained.

Summary

The literature concerning iodothiouracil, an organic combination of iodine with thiouracil, is reviewed, and a further clinical trial of this drug is reported.

Twenty-three patients suffering from hyperthyroidism, 18 of whom had subsequent thyroidectomies, were treated with iodothiouracil in doses of 200 to 300 mg. daily for periods of 12 days to 7 months.

The reduction in hyperthyroidism and the involution produced in the thyroid gland of patients prepared for surgery were most satisfactory; the results of prolonged medical treatment with iodothiouracil were variable.

It is doubtful whether the pharmacological properties of iodothiouracil differ from those of the constituent iodine and thiouracil fractions when the latter are administered at the same time.

Our thanks are due to Ciba Laboratories, Ltd., for the generous supplies of ituramil and to the Pathological Department of St. Bartholomew's Hospital for the preparation of the microscopical sections.

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The National Gastroenterological Association announces that the name of its official publication, established in 1934, has been changed from *The Review of Gastroenterology* to *The American Journal of Gastroenterology*. There has been no change in the editorship. An earlier journal of this name was published from 1911 to 1914 by the American Hospital for Diseases of the Stomach, Philadelphia.

LONG-TERM THERAPY OF THYROTOXICOSIS WITH THIOURACIL COMPOUNDS

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Now that the treatment of thyrotoxicosis by thiouracil compounds has been in use for a number of years, it is becoming possible to determine its long-term effects and, in particular, the conditions under which this therapy is likely to be most successful. Most of the earlier contributions to this aspect of the subject have been reviewed by Astwood (1949), and accounts of more recent investigations have been published by Himsworth (1948), Williams (1949), Dunlop and Rolland (1950), Trotter (1950), Poate (1950), Wing and Asper (1952), and Douglas and Kennie (1952).

The present report is a summary of observations which began in 1944 at the Sheffield Royal Infirmary on the effects of treating thyrotoxicosis by means of thiouracil compounds. The inquiry was planned with a view to throwing light on three main questions which are of special interest to the medical practitioner: (a) How successful are these drugs in initially controlling the signs and symptoms of this disease? (b) To what extent can control be maintained over long periods by continuous administration of maintenance doses of the drug? (c) What are the chances of relapse after maintenance treatment is withdrawn? In particular, is length of remission after withdrawal related to such factors as the age of the patient, length of his illness, and the duration of his treatment before withdrawal?

Procedure

A total of 126 patients with typical signs and symptoms of thyrotoxicosis were treated for varying periods of up to six years with thiouracil, methylthiouracil, or propylthiouracil, according to the scheme already described in previous communications (Wilson, 1946; Wilson and Goodwin, 1947). As was pointed out previously, we have found that, though propylthiouracil was not superior to methylthiouracil, both compounds were less apt than thiouracil to produce toxic effects, and that the therapeutic response was favourable in either type of thyrotoxicosis. For the purpose of the present analysis no attempt is made to distinguish patients with primary from those with secondary thyrotoxicosis, or to differentiate between them according to severity of the disease, presence or absence of specific symptoms, the particular thiouracil compound and dose used, and the length of treatment needed before initial control was achieved. "Initial control" was assessed by the criteria previously described (Wilson, 1946). All patients who were controlled initially were given maintenance treatment, and from 94 of these it was subsequently withdrawn

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after varying periods of treatment. The decision to withdraw it from individual patients who were satisfactorily controlled was made arbitrarily and without regard to their age and previous history.

Results and Discussion

Initial Control.—Fig. 1 shows that of the 126 patients treated with thiouracil compounds 113, or 90%, were initially controlled, usually after three to six weeks of treatment.

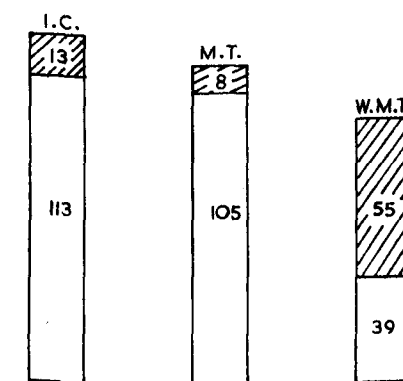


FIG. 1.—Results of treating 126 patients with thyrotoxicosis by thiouracil compounds. White columns=Satisfactory. Cross-hatched columns=Relapsed. I.C.=Initial control. M.T.=Maintenance therapy. W.M.T.=Withdrawal of maintenance therapy.

From the remaining 13 patients (10%) the drug was withdrawn without initial control having been established: 6 of these showed no signs of responding to the drug, 3 developed leucopenia, and 4 developed drug fever and nausea.

Maintenance Therapy.—Of the 113 patients who had been controlled initially, 105 were treated with maintenance doses for periods ranging from 3 to 62 months (mean=18.0, S.D.=12.9). Treatment of the remaining eight patients had eventually to be discontinued because two developed leucopenia five and fifteen months respectively after beginning treatment, one became drug resistant after two years, and five were referred for thyroidectomy on account of increasing thyroid enlargement.

Withdrawal of Maintenance Therapy.—Treatment was withdrawn from 94 of the 105 patients who had been on satisfactory maintenance for periods ranging from 2 to 55 months (mean=17.1, S.D.=12.2). Of these, 55 eventually relapsed at various months after withdrawal (relapsed group), while 39, at the time of the last interview, were still in remission after periods which ranged from 3 to 47 months since withdrawal of therapy (satisfactory group).

Factors Influencing the Incidence and Onset of Relapse

In an attempt to determine what factors might influence a patient's response to withdrawal of maintenance therapy, the two groups (satisfactory and relapsed) were compared with respect to four characteristics which a survey of the literature had suggested as relevant. These were: (1) age at first interview; (2) length of illness; (3) length of treatment before drug withdrawal; and (4) length of remission after withdrawal. It will be appreciated, however, that our satisfactory group includes patients who have been observed for only short periods and therefore may yet relapse.

In Table I it will be seen that the two groups were equally matched in respect of the patient's age and length of treatment before withdrawal of the drug. The mean length of

TABLE I.—Summary of Age, Length of Illness, of Treatment, and of Remission of 94 Patients from Whom Maintenance Therapy had been Withdrawn

	Satisfactory (39)			Relapsed (55)		
	Range	Mean	S.D.	Range	Mean	S.D.
Age at interview (years)	13-73	45.48	14.31	19-69	44.02	11.58
Length of illness (months)	1-44	23.41	29.96	1-240	42.22	58.15
Length of treatment (months)	2-55	16.13	10.97	2-54	17.75	12.97
Length of remission after withdrawal of treatment (months)	3-47	25.54	13.56	1-35	8.67	7.54

previous illness in the relapsed group, however, was approximately double that of the satisfactory group, but the scatter is very wide and the difference between the means is not statistically significant.* It is of interest to note that the standard deviation of length of illness in the relapsed group is also double that in the satisfactory group, indicating that the relapsed group has included a greater proportion of patients with illness of very short and of very long duration. The mean length of remission—that is, relief from signs and symptoms after withdrawal of maintenance therapy—is much less in the relapsed group (8.7 months) than in the satisfactory group (24.5 months). The difference between these two means is highly significant ($P<0.001$). This suggests that if relapse is to occur it tends to do so fairly soon after treatment is withheld. This is confirmed by Fig. 2, which shows the distribution of

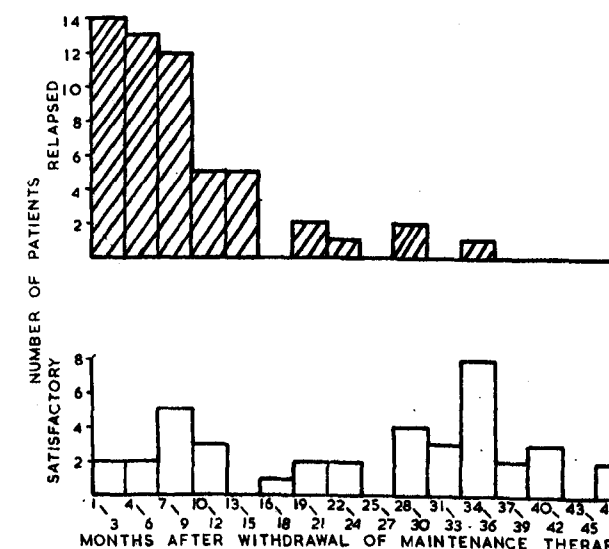


FIG. 2.—Distributions of relapsed and satisfactory patients in relation to time after withdrawal of maintenance therapy.

length of remission following withdrawal of treatment. It will be seen that 49 out of 55 relapses occurred within the first fifteen months after withdrawal and, further, that of 33 patients with remissions of between 15 and 48 months only 6 have so far relapsed.

The liability to relapse after the withdrawal of treatment can be determined more precisely by arranging the data in the form of a life-table and calculating the probability of an individual relapsing within any given period after withdrawal (Fig. 3). It will be seen that the risk of relapsing is greater within 15 months or so from withdrawal of treatment, and thereafter does not increase greatly. The shape of the curve suggests that not many more relapses are likely to occur after the end of the 36th month following withdrawal. On the basis of our data, the overall probability of relapsing within 48 months after withdrawal of treatment (the maximum time that any of these subjects have been observed) is about 0.66; in other words, the odds are 2 to 1 that a patient will relapse within this period. These results are similar to those of Trotter (1950), except that he found the overall chances of relapse to be about 0.5—rather lower than ours. As he has pointed out, however, since the number of patients studied becomes progressively less, the later parts of this kind of probability curve are less reliable than the earlier. In view of this and the relatively small number of cases involved in each investigation (about 100), the difference between his figure and ours is probably to be attributed to sampling fluctuations.

*In view of the non-normality of the distributions and the discrepancy between the standard deviations, the proportions of satisfactory and relapsed patients above and below the median were compared by a χ^2 test. The results were in agreement with the tests on means.

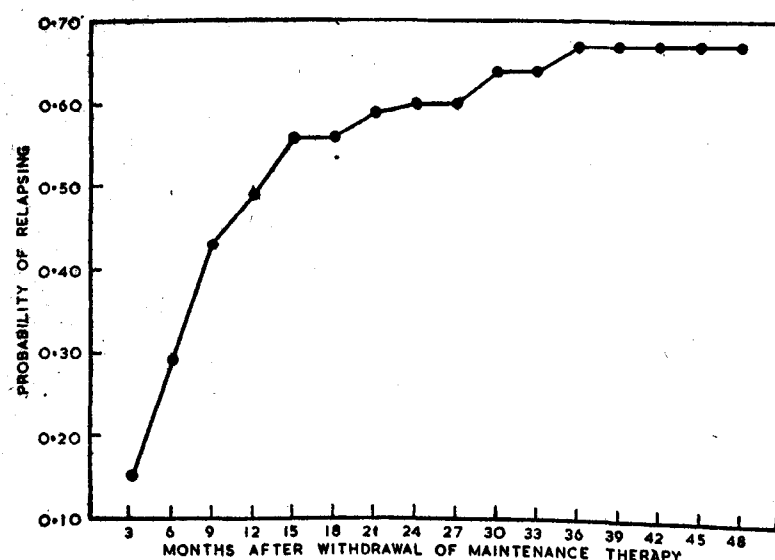


FIG. 3.—The probability of relapsing in relation to time after withdrawal of maintenance therapy. In calculating the probabilities, allowance has been made for the fact that the satisfactory patients who had been in remission for only a limited period when the observations ended could subsequently be expected to relapse. To fail to make an allowance of this kind would bias the table. It has, furthermore, been assumed that all satisfactory cases were "at risk" for half the three-months period in which they ceased to be observed.

In order to examine further whether length of remission was related to the age of the patient, length of his illness, or length of treatment, correlations were calculated between these four variables for the relapsed group (Table II).

TABLE II.—Correlations Between Age, Length of Illness, of Treatment, and of Remission for 55 Patients who Relapsed After Withdrawal of Maintenance Therapy

	Length of Illness	Length of Treatment	Length of Remission
Age of patient			
Length of illness	+0.064	-0.040	-0.208
" " treatment		-0.144	-0.058
			-0.264

There was no point in calculating similar correlations for the satisfactory group, because for them the length of remission could not be finally determined. As a result, information concerning a number of patients with long and possibly permanent remissions, who from the practitioner's point of view are perhaps the most interesting of all, could not be taken into account. For this reason the correlations we have calculated, using data from the relapsed group only, do not give a complete picture.

It will be seen from Table II that the correlations are all very small. The only one which approaches statistical significance at the 5% level is between length of treatment and length of remission. The correlation is negative, suggesting a possible tendency for longer treatments to be associated with shorter remissions. This is contrary to what might be expected on the basis of previous reports that, if treatment was maintained for longer periods, the patient tended to take correspondingly longer to relapse (Himsworth, Morgans, and Trotter, 1947; Himsworth, 1948; Dunlop and Rolland, 1950). Douglas and Kennie (1952) have shown that the proportion of patients who relapse is much greater among those who have had treatments of less than one year before withdrawal than among patients who have been treated for one to two and a half years or more. However, inspection of their figures also suggests that, of the patients who do relapse, those who have had treatments of one year or longer tend to relapse sooner—in half the time, on an average—than those who have been treated for periods of less than one year. Our own observations provide some striking examples of patients with long remissions following

short treatments; seven patients, for instance, whose treatments were nine months or less were still in remission more than three years after treatment had been withdrawn. Furthermore, out of 12 patients treated for two and a half years or longer, only 2 have not yet relapsed, and in every case the relapse occurred well under twelve months after withdrawal of treatment.

Himsworth (1948) found that in patients with remissions of over two years after withdrawal of the drug the average duration of treatment had been 15 months (S.D.=6.3). This agrees well with our own figures, where the corresponding average for 23 patients with remissions of over two years is 17.6 months (S.D.=8.8). But since this figure is almost identical with the average length of treatment for the whole of our relapsed group (17.8 months, S.D.=13), length of treatment in our sample of patients, at any rate, clearly cannot be used to discriminate between short and long remissions.

The correlation between age of patient and length of remission, though not statistically significant, is negative—suggesting a possible tendency for longer remissions to be more common in younger patients—which is probably what one would expect.

The length of the patient's illness before treatment does not seem to be significantly associated with the length of his remission after withdrawal of treatment. This, however, may not be the case with thyrotoxicosis of several years' standing; for example, out of 13 of our patients who had been ill for more than four years only one had not relapsed at the time of the last recorded interview, and 10 of the 12 who relapsed have done so after remissions lasting only a few months. This high relapse rate among the patients with very long illnesses seems to be the main reason for the discrepancy between the mean length of illness of the relapsed and that of the satisfactory group (Table I).

That there should be no correlation in our sample of patients between length of treatment and age or length of illness is, of course, what might be expected, since length of treatment for each patient was determined at random.

In view of the relative lack of association between length of remission and the three factors which we have examined above, it seems reasonable to conclude that other influences, such as intercurrent infection and social maladjustment (Douglas and Kennie, 1952), may be more relevant in determining a patient's response to withdrawal of maintenance therapy with thiouracil compounds.

Summary

Of 126 patients with thyrotoxicosis who were treated by thiouracil compounds 90% were initially controlled.

Of 113 patients who were continued on maintenance therapy for periods from three to sixty-two months, 105 remained in remission during such treatment.

Maintenance therapy was withdrawn from 94 of the patients after periods of treatment ranging from 2 to 55 months, and 55 relapsed. It has been shown that the probability of relapsing is greatest within about 15 months after withdrawal of treatment. After 36 months the chances of relapsing are slight. On the basis of these figures it has been calculated that approximately two out of every three patients will eventually relapse after withdrawal of treatment.

No consistent relation has been found between the length of the patients' remission and their age, the

duration of their illness, and the duration of treatment. It is concluded that other factors may determine a patient's response to withdrawal of maintenance therapy with these drugs.

We wish to thank Professor E. J. Wayne for the opportunities of studying the cases under his care and the physicians of Sheffield Royal Infirmary for their valuable co-operation. We also wish to thank Dr. A. G. MacGregor for his help and for supplying data on the follow-up of some of the patients, and Mr. Arthur Summerfield for helpful advice on the statistical analysis. Part of the expenses of this research were defrayed by a grant from the Medical Research Council to one of us (A.W.) and to another (H.S.) who is in receipt of a whole-time personal grant.

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MILK, *p*-AMINO BENZOATE, AND MALARIA OF RATS AND MONKEYS

BY

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This paper describes investigations concerning the effect of milk diets upon the course of malarial infections, and the supplementation of such diets by *p*-aminobenzoate, which is a growth factor for many species of plasmodia.

In 1952 Maegraith, Deegan, and Jones reported that infections of *Plasmodium berghei* do not develop properly if the hosts (rats) are maintained on a milk diet. A preliminary communication from this laboratory (Hawking, 1953) pointed out that a milk diet was deficient in *p*-aminobenzoate, which is apparently needed by many plasmodia. It was shown that if *p*-aminobenzoate was added to the milk diet the infection of *P. berghei* developed normally, and it was concluded that *p*-aminobenzoate (or some derivative) is a growth factor for *P. berghei*. According to our conception the body fluids of animals usually contain very little *p*-aminobenzoate (otherwise sulphonamides would not be therapeutically effective against so many bacteria); *p*-aminobenzoate is present in many diets; when ingested in the food it raises the blood concentration sufficiently for malaria parasites to grow; and it is rapidly excreted or destroyed, so that constant renewal is necessary. The interrelationship of growth factors and malarial infections raises so many questions, both practical and academic, that several years will be needed to investigate them adequately. As, however, the subject is of interest to other workers, the results obtained to date are presented here.

Plasmodium berghei in Rats

The animals employed were obtained from the strain of piebald rats maintained at this institute. After preliminary experiments it was found that rats weighing 200 g. were

preferable to those of 100 g. or 50 g., because with the smaller weights suppression of the infection by milk diet was more difficult to demonstrate. The normal diet of these rats is a stock laboratory one which has been described by Bruce and Parkes (1949). Briefly, it contains wholemeal flour 46%, Sussex ground oats 40%, white fish meal 8%, dried skimmed milk 3%, dried yeast 1%, cod-liver oil 1%, and salts 1%. The milk employed was obtained from the ordinary dairy, and had been pasteurized. One sample of it was found by bioassay (kindly performed by Dr. A. T. Fuller) to contain 3.1 μ g. free and 19 μ g. total *p*-aminobenzoate per ml. The rats were housed three in a cage over a grid to allow escape of faeces. They were supplied with milk from a bottle. The bottles were changed morning and evening, and they were autoclaved in between each change. The quantity of milk was limited to the amount which the rats would probably consume in four to five hours, and all other possible steps were taken to prevent the milk going sour. The rats were placed on the diets for two to four days before inoculation. The strain of *P. berghei* was the RSVP strain obtained from Professor P. C. C. Garnham. The inoculum usually contained about 2 million parasitized cells per rat, and it was injected intraperitoneally. The degree of infection was expressed as the number of parasitized red blood corpuscles in a thin stained film per microscope field; this usually contained about 200 corpuscles.

The result of a typical experiment is shown in Fig. 1, in which the intensity of infection in each cage of three rats is shown as the mean of the logarithms of the number of

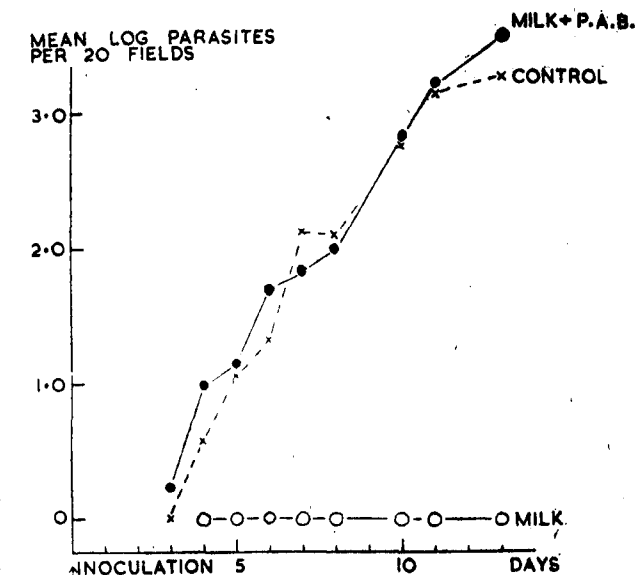


FIG. 1.—The development of *P. berghei* in rats on milk diet, milk plus *p*-aminobenzoate (P.A.B.) 1/40,000, and stock diet. Each line represents the mean of the logarithms of three rats, the infections being expressed as the number of parasitized cells per 20,000 erythrocytes. Inoculation intraperitoneally on Day 0 with 100,000 parasitized cells per rat. Weight of rats, 190–220 g.

parasitized erythrocytes per 20,000 cells in a thin blood film. (For this calculation, animals which showed no parasites were deemed to have 1 per 20,000 cells; animals dying of the infection towards the end of the experiment were deemed to have 8,000 parasites per 20,000.) This figure shows that the infection of *P. berghei* does not develop in rats on a milk diet (confirming the report of Maegraith *et al.*), but that if *p*-aminobenzoate is added to the milk the infection develops as well as in the control rats on the complete laboratory diet.

In order to obtain suppression of the infection on milk diet various precautions are necessary. Thus the rats employed should be fully adult—that is, weighing 200 g.—in younger rats the suppression is more difficult to obtain. The

milk must not be allowed to become sour; presumably souring is accompanied by increase of the *p*-aminobenzoate content. Prolongation (beyond three to four days) of the period on the diet before inoculation did not seem greatly to improve the results.

Probably this suppression of infections of *P. berghei* by milk diet is a marginal phenomenon, and a small alteration of the conditions may make the difference between success and failure. The composition of milk, including its content of *p*-aminobenzoate, is not uniform, but will vary according to the season and diet of the cows; at some seasons it was difficult to demonstrate suppression of parasitaemia by milk diet. It was sometimes observed that in two of a group of rats on milk there was complete suppression of parasitaemia, while in the third rat the infection was as great as in the controls; such a result suggests some individual factor present in certain rats, possibly different bacterial flora or syntheses in the intestine.

In some experiments chloramphenicol 1/20,000 was added to the milk in the hope of reducing bacterial growth in the intestine and thus diminishing a factor which might interfere with the effect of the milk diet; in such experiments, however, the malarial infection developed almost as well as in the control rats on a complete diet—that is, the suppression of the malaria by milk diet was reversed. This result was surprising, until it was learnt that chloramphenicol can be decomposed by *Bact. coli* and other bacteria into various derivatives which include *p*-aminobenzoate (Smith, 1953).

The minimum concentration of *p*-aminobenzoate in milk required to permit growth of *P. berghei* as good as in the controls seemed to be about 1/40,000; concentrations of 1/100,000 and 1/1,000,000 were sometimes effective and sometimes not. Assuming that each 200-g. rat consumes 150 ml. of milk a day, a concentration of 1/40,000 corresponds to a daily intake of approximately 20 mg. of *p*-aminobenzoate per kg. body weight.

Rats on a milk diet sometimes get diarrhoea, indicating modification of the intestinal flora. Rats on the control diet lost on an average 5% of weight in two weeks during the experiments, presumably owing to the malaria; on a milk diet they lost 2–3%. Pteroylglutamic (folic) acid 1/10,000 added to the milk promoted the growth of *P. berghei* as well as an equimolar solution of *p*-aminobenzoate—that is, 1/40,000; accordingly, these two compounds seem to be interchangeable, but it is not clear which of them is converted into the other. The suppression of *P. berghei* by milk diets could not be reversed by adding methionine (1/2,000) or *p*-hydroxybenzoate (1/3,000) to the milk or by injecting vitamin B₁₂ (150 µg. per kg. daily).

Infection by *P. berghei* could also be prevented from developing by placing the rats on other deficient diets—for example, a grossly deficient one consisting only of 10% glucose. Rats live well on this diet for over two weeks (end of experiment), with a loss of weight averaging 6–24% in different experiments. Addition of *p*-aminobenzoate 1/1,000 plus methionine 1/500 to this diet was not enough to allow the infection to develop.

Suppression of *P. berghei* infection by milk diet could also be demonstrated in mice, but often the suppression was less complete than that observed in rats.

Plasmodium knowlesi in Monkeys

The suppression of *P. berghei* infections by the administration of a *p*-aminobenzoate-deficient diet—for example, milk—can be correlated with the great susceptibility of this parasite to sulphonamides (which antagonize *p*-aminobenzoate). Accordingly experiments were made to ascertain whether the same phenomenon (suppression by milk diet and reversal by *p*-aminobenzoate) could be demonstrated with other malarial infections known to be sensitive to sulphonamides. The first study was made with *P. knowlesi*, which is known to respond readily to sulphonamide treatment. The strain was derived from the new and virulent strain recently isolated

by Edeson (Edeson and Davey, 1953). Four small *Macaca mulatta* monkeys weighing approximately 1.5 kg. were placed as follows:

Monkey 224 on the normal complete laboratory diet, as used for rats.

Monkey 225 on milk.

Monkey 226 on milk plus *p*-aminobenzoate 1/10,000.

Monkey 227 on milk plus *p*-aminobenzoate 1/1,000,000.

After three days, each of them was inoculated intramuscularly and intraperitoneally with 5×10^7 parasitized blood corpuscles. The course of the resultant infections is shown in Fig. 2. (The infection in Monkey 226 was indistinguishable from that in Monkeys 224 and 227 and has been omitted.)

Briefly the control Monkey 224 showed parasites in the blood five days after inoculation, and the next day it was treated with mepacrine and sulphadiazine to save its life. Monkey 225 (on milk) never showed any parasites during five weeks while it was fed only on milk; four days after it had been transferred to a normal diet its blood contained one parasite in every microscope field. Clearly the infection had been kept at a level too low for recognition while the monkey was on the milk diet, but the parasites multiplied rapidly when a complete diet was given. Monkey 227 (on milk plus *p*-aminobenzoate 1/1,000,000) and also Monkey 226 (milk plus *p*-aminobenzoate 1/10,000) showed the development of parasitaemia indistinguishable from that of the control monkey (224). Monkey 227, weight 2 kg., consumed about 1 litre of milk a day, so that it received about 0.5 mg. of *p*-aminobenzoate per kg. daily; this small amount was apparently enough to make it fully susceptible to infection with *P. knowlesi*. As the supply of monkeys was limited and the results formed such a striking confirmation of expectations, the experiment was not repeated. Possibly with a larger group of monkeys on milk diet the suppression of parasitaemia would not always have been so complete.

Similar experiments were made with *P. cynomolgi* in monkeys and yielded similar results; they are described later in this paper. Preliminary attempts were made to keep chickens on diets of liquid milk or dry milk so as to test *P. gallinaceum* (which is also sensitive to sulphonamides). The chickens did not take well to the diets, and the effects upon the infection were not clear. Further experiments with *P. gallinaceum* were postponed.

Malaria in Baby Animals

As pointed out by Macgrath *et al.*, the suppression of malaria infections in laboratory animals by milk diet raises the interesting question whether a similar suppression may occur in human babies in the Tropics while fed exclusively on breast milk. Certainly *P. falciparum* and *P. vivax* are sensitive to sulphonamides, and so presumably they require *p*-aminobenzoate. Model experiments were made on young laboratory animals.

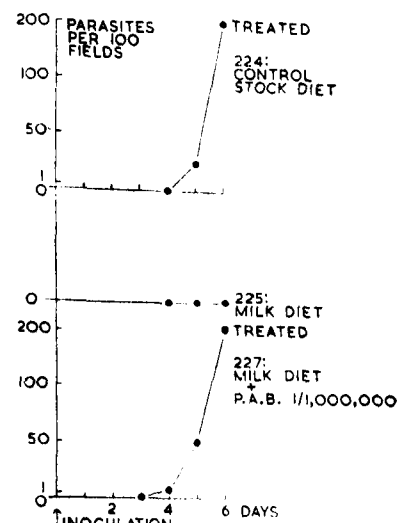


FIG. 2.—The development of *P. knowlesi* in monkeys on milk diet, milk plus *p*-aminobenzoate 1/1,000,000, and stock diet. The infection is expressed as the number of parasites per 100 microscope fields each containing approximately 200 erythrocytes.

(a) Suckling Rats Inoculated with *P. berghei*

Litters of rats about one week old were taken when the baby rats weighed about 10–15 g., and were tested as shown in the Table. In this experiment the babies (eight in each cage) were inoculated intraperitoneally each with 1 million parasitized cells (Day 0). The mothers were placed on a

Development of *P. berghei* in Suckling Rats Receiving *p*-aminobenzoate (P.A.B.) by Different Routes

Cage	Contents	Mean Parasitaemia			
		4 Days	5 Days	6 Days	7 Days
1	Controls	4.6 (3.8)	13 (4.8)	51 (6.8)	126 (8.8)
2	Babies inoculated with 0.1 mg. P.A.B. i.p.	2,000 (8.8)	3,400 (8.8)	—	2,800 (8.8)
3	Mother smeared with P.A.B.	1,250 (8.8)	2,400 (8.8)	—	3,100 (8.8)
4	Mother inoculated with 10 mg. P.A.B. i.p.	2,000 (8.8)	4,000 (8.8)	—	3,500 (8.8)
5	Young rats (50 g.) on stock diet	—	1,000 (4.4)	3,000 (4.4)	—

Mean parasitaemia is expressed as the geometric mean of the number of parasitized erythrocytes per 20,000 cells. The figures in brackets indicate the proportion of animals showing parasites.

diet of 4 parts starch plus 1 part casein, beginning on the day before the experiments in order to diminish the amount of *p*-aminobenzoate in their diet. In cage 2 the baby rats were inoculated intraperitoneally twice daily with 0.1 mg. of *p*-aminobenzoate each; in cage 3 a mixture of 10% glucose plus 1% *p*-aminobenzoate was smeared on the nipples of the mother twice daily, so that the babies would receive the compound when they sucked; in cage 4, 10 mg. of *p*-aminobenzoate was injected intraperitoneally twice daily into the mother (200 g. weight) with the expectation that some would be excreted in the milk. Cage 5 contained four young rats (50 g.) on stock diet as an extra control. When the blood of these baby rats was first examined four days after inoculation, only three out of the eight controls (cage 1) showed scanty parasites. By seven days all the controls showed parasites, but their numbers were few. Cage 5 (weaned rats on stock diet) showed the usual acute infection developing. In all the three litters which received *p*-aminobenzoate by any route (cages 2, 3, and 4), the infection was already almost at its maximum level even on the fourth day. The fact that this occurred even in the babies of the mother receiving *p*-aminobenzoate by injection (cage 4) confirms the expectation that *p*-aminobenzoate (or a derivative) is excreted in the milk.

This experiment (which is typical of others) shows that infections of *P. berghei* in suckling rats develop much more rapidly and intensely if *p*-aminobenzoate is supplied by some route or other: from which it may be concluded that in normal circumstances the malarial infection is held back by a deficiency of this subject. Theoretically, suckling rats on a diet completely deficient in *p*-aminobenzoate would be insusceptible to infection; in practice suckling rats probably receive a small amount of *p*-aminobenzoate in their mother's milk, derived from her diet or perhaps from her intestinal bacteria, and this is sufficient to account for the low-grade infection which develops. The more stringent the precautions taken to exclude *p*-aminobenzoate from the diet of the mothers, the greater the suppression of parasitaemia in the babies. Thus in some experiments the mother rats were placed on *p*-aminobenzoate-deficient diet (starch 80%, casein 20%), beginning three days before parturition, and the babies were inoculated with malaria three days after they were born: babies of mothers which received *p*-aminobenzoate by twice-daily injection developed a parasitaemia of about 1% in five days, and the parasitaemia rapidly increased; babies of mothers not receiving *p*-aminobenzoate remained free from parasitaemia for 13 days and many of them never developed infection. If, on the other hand, the laboratory diet of the mother rats was rich in *p*-aminobenzoate, it might probably be impossible to demonstrate the above insusceptibility of sucklings to malaria.

(b) Baby Monkeys and *P. cynomolgi*

A few young *M. mulatta* monkeys were available from breeding at this institute. Two of these were about 1 month old, receiving milk from the breast or a bottle, and the others were 5 to 14 months old and had been weaned on to ordinary diet.

In the first experiment there were four monkeys as follows:

Monkey 217, weighing 3.8 kg., fed on the normal laboratory diet (food cubes as for rats and also occasional cabbage).

Monkey 221, weighing 3.5 kg., on milk diet.

Monkey 222, over 1 year old, weighing 2.5 kg., placed on a diet of milk plus *p*-aminobenzoate 1/1,000.

Monkey 223, 4 weeks old, weighing 0.75 kg. It had been brought up on milk from a bottle because its mother had refused to feed it. It had also received 9 ml. daily of a vitamin preparation called "haliborange." (This contains 75 µg. of *p*-aminobenzoate per ml.; Dr. A. T. Fuller.)

After Monkeys 217, 222, and 223 had been on their diets for one week, and 223 was 4 weeks old, all were inoculated intraperitoneally and intramuscularly with blood containing

about 2×10^7 parasites of *P. cynomolgi*.

The infections in 217, 221, and 222 are shown in Fig. 3. Monkey 217 (control on full diet) showed a typical infection with this parasite. Monkey 221 (on milk diet) showed no parasites for 10 days; it was then placed on milk plus *p*-aminobenzoate 1/1,000, but no parasites appeared during the next nine days; it was then inoculated with blood containing *P. cynomolgi* (to demonstrate its susceptibility), and a typical infection developed. Monkey 222 (on milk plus *p*-aminobenzoate 1/1,000) developed a typical infection, similar to that of the control (217) but rather more severe. Monkey 223 showed no parasites until the

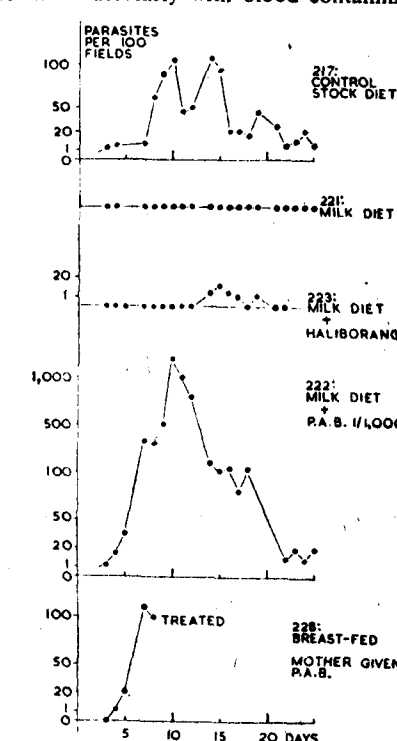


FIG. 3.—The development of *P. cynomolgi* after inoculation with infected blood of monkeys on various diets, as described in the text. The infection is expressed as the number of parasites per 100 microscope fields, each containing 200 erythrocytes; for numbers above 100 the scale is greatly reduced for convenience.

fourteenth day, when two rings were discovered in 50 fields; on the fifteenth day the infection was six per 50 fields; on the sixteenth day it was three per 50 fields, and on the seventeenth it was one per 100 fields. On the fifteenth day it was discovered that the monkey had received 9 ml. of haliborange daily from the sixth day onward, which would contribute 0.6 µg. of *p*-aminobenzoate per day; this was stopped. On the nineteenth day one parasite was seen in 50 fields. The monkey ceased to gain weight, and put its hand to its head as though it had headache. On the twenty-second day it was put on chloroquine treatment (15 mg. per kg. daily intramuscularly for three days) and no further evidence of malaria has been seen.

The results with Monkeys 217, 221, and 222 show that a milk diet suppresses blood-induced infections of *P. cynomolgi* and that this suppression is reversed by *p*-amino-

benzoate. In the baby monkey (223) suppression was incomplete, although the parasitaemia was very much later and lower than in the control (217). This incompleteness of suppression may have been due to variation between different animals, or it may have been due to the halib-orange preparation.

Fig. 3 also shows an experiment with another monkey (228) which was performed on a later occasion but which is added here for ease of comparison. This was a baby rhesus monkey, 10 weeks old, which was being nursed on its mother's breast. (In a previous experiment—see below—it had been inoculated twice with sporozoites of *P. cynomolgi* and no infection had developed.) The mother was inoculated intramuscularly twice daily with *p*-aminobenzoate, 0.03 g. per kg.

After this had been done for six days the baby (228) was inoculated intraperitoneally with approximately 3×10^4 parasites of *P. cynomolgi*. Parasites appeared in the blood after four days and reached the stage of two parasites per field seven days after inoculation (after which the monkey was treated). As shown in Fig. 3, the development of infection in this monkey was similar to that of the previous control monkey (217) and of the monkey receiving *p*-aminobenzoate as well as milk (222). This experiment confirms the previous experiments with rats, demonstrating that when *p*-aminobenzoate is administered to nursing mothers it (or a derivative) passes via the milk to the offspring and renders them susceptible to malarial infection.

In the second type of experiment, infection was induced by means of sporozoites of *P. cynomolgi*. There were four *M. mulatta* monkeys:

Monkey 218, was kept on normal diet as a control.

Monkey 229, weight 3.8 kg., was placed on milk diet.

Monkey 230, weight 2.2 kg., was placed on milk plus *p*-aminobenzoate 1/5,000.

Monkey 228, a baby on the breast (mentioned above), was 4 weeks old when inoculated.

After 229 and 230 had been on their diets for five days all four monkeys were inoculated intraperitoneally with a suspension containing the glands of one infected mosquito—that is, each monkey received one-quarter of this amount; 20 days later this inoculation was repeated for each monkey. The results with three of the monkeys are shown in Fig. 4. Briefly, 218 first showed parasites 14 days after the first inoculation, and the infection reached a peak of 10 parasites per field on the twenty-second day; this is a typical infection following the inoculation of small numbers of sporozoites of *P. cynomolgi*. Monkey 228 (breast-fed baby) showed no parasites during eight weeks from inoculation, after which it was used for another experiment. Monkey 229 (on milk diet from a bottle) showed no parasites for five weeks. It was then placed on the normal diet again. Eighteen days after this change it began to show parasites, and mild parasitaemia (maximum 19 parasites per 50 fields) persisted for five days. (As the graph of this monkey was indistinguishable from

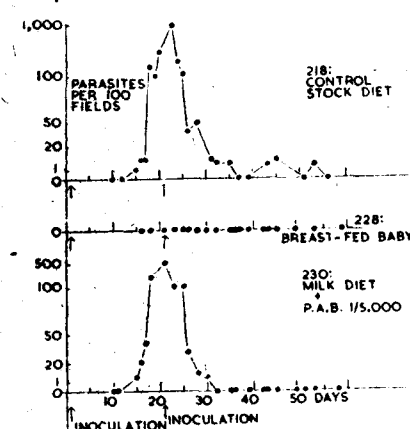


FIG. 4.—The development of *P. cynomolgi* after inoculation of sporozoites (on two occasions) in monkeys on diets of breast milk, cow's milk plus *p*-aminobenzoate 1/5,000, and stock food cubes. The infection is expressed as in Fig. 3.

that of 228 it has been omitted from Fig. 4.) Monkey 230 (milk plus *p*-aminobenzoate) showed parasites 14 days after the first inoculation and experienced an infection indistinguishable from that of the control (218).

This work shows that infections of *P. cynomolgi* induced by sporozoites are suppressed by a milk diet, and that again this suppression is reversed by *p*-aminobenzoate. Bray and Garnham (1953) have previously shown that the pre-erythrocytic forms are not abolished by the milk diet; they persist in a latent form, and the infection breaks out again when the animal is returned to a normal diet. The absence of parasitaemia in the breast-fed baby (228) is particularly suggestive as an explanation of the partial insusceptibility of human infants to malaria.

Discussion

In the above work and the papers already quoted it is shown that milk (and other) diets render rats and monkeys insusceptible to infection with malaria, and that this insusceptibility may be due to a deficiency of *p*-aminobenzoate (sometimes together with other factors), which is apparently a growth factor for these species of plasmodia. It has long been known that the course of infections can be modified by the diet of the host. According to a review by McKee (1951), the growth of various plasmodia has been reported at different times to be depressed by feeding the host on diets deficient in *p*-aminobenzoate, methionine, ascorbic acid, vitamin A, riboflavin, or pantothenate, but to be increased by diets deficient in biotin, folic acid, nicotinic acid, choline, or protein.

In particular, Geiman and McKee (1948) found that if monkeys were starved they were not susceptible to infection with *P. knowlesi*, but they became susceptible if given *p*-aminobenzoate or methionine. There is a striking parallelism between their experiment and the ones described above, in which monkeys were not susceptible to this infection when kept on a milk diet, but became susceptible if given *p*-aminobenzoate. Previously, workers of their group had shown that *p*-aminobenzoate was necessary for the growth of *P. knowlesi* in vitro (Anfinsen et al., 1946).

Further evidence for the relation of this compound to the growth of malaria parasites is given by the sensitivity of many species of plasmodia to sulphonamides (which antagonize *p*-aminobenzoate). Thus *P. knowlesi* and *P. berghei* are very sensitive to sulphonamides (and their growth is prevented by a milk diet but promoted by *p*-aminobenzoate); *P. gallinaceum*, *P. cynomolgi*, *P. falciparum*, and *P. vivax* are moderately sensitive to sulphonamides (the growth of *P. cynomolgi* is inhibited by a milk diet, etc.); while *P. relatum* is insensitive to sulphonamides (its response to a *p*-aminobenzoate-free diet has not yet been elucidated). It may be noted, however, that the amount of *p*-aminobenzoate which has usually to be added to the milk diet of rats to promote the growth of *P. berghei*—namely, the equivalent of 20 mg. per kg. of rat per day—is much greater than the amount which is probably provided by the normal stock diet.

Relation to Proguanil and Pyrimethamine

The recognition that *p*-aminobenzoate is a growth factor for the malaria parasites helps to elucidate the antimalarial action of proguanil and pyrimethamine, since (1) under suitable conditions the antimalarial action of proguanil and pyrimethamine upon *P. berghei* can be antagonized by *p*-aminobenzoate (Thurston, 1950, 1954); therefore these drugs probably interfere with the utilization of *p*-aminobenzoate (or some derivative like folic acid); (2) there is often cross-resistance between proguanil and pyrimethamine on the one hand and sulphonamides (which antagonize *p*-aminobenzoate) on the other; (3) pyrimethamine inhibits the growth of *Lactobacillus casei* and of *Str. faecalis* in vitro, and this inhibition can be overcome by folic or folinic acid (Hitchings, 1952).

Functions of *p*-aminobenzoate

The need of many malaria parasites for *p*-aminobenzoate is of particular interest because so much work has been done by microbiologists in elucidating the role of this compound in cell metabolism. Attention was first drawn to it because it antagonized the antibacterial action of sulphonamides (Woods, 1940). The exact details of its action are still the subject of controversy; but, briefly, (1) much (but not all) of the *p*-aminobenzoate absorbed by bacterial cells is built up into pteroylglutamic acid (folic acid), folinic acid, or some similar compound; (2) *p*-aminobenzoate and/or a folic acid derivative acts as a catalyst in various important synthetic reactions, by which (usually) an extra carbon atom is added to some molecule such as an amino-acid; thus homocysteine is converted into methionine, glycine into serine, etc.; (3) *p*-aminobenzoate or its derivative is necessary as a catalyst for the synthesis of purine and pyrimidine rings (probably by the addition of another carbon atom); these are fundamental for the synthesis of nucleic acids and nucleoprotein, and so for the growth and multiplication of nuclei and cells.

In the case of the malaria parasite, morphological evidence for this relation between the supply of *p*-aminobenzoate and the division of the nucleus is provided by the following facts. The utilization of *p*-aminobenzoate by the parasite is antagonized by sulphonamides, proguanil, and pyrimethamine. If malaria parasites—for example, *P. falciparum*, *P. cynomolgi*, or *P. berghei*—are exposed in vivo to the action of one of these drugs the early development of the parasite inside the erythrocyte—that is, from ring to trophozoite—proceeds apparently unaffected. But when the chromatin (nucleus) begins to divide to form the schizont, morphological evidence of profound disturbance becomes manifest; division of the chromatin is arrested or takes place abnormally; and then the parasite gradually degenerates and disintegrates (Black, 1946; McFadzean, 1951; Thurston, 1951). Thus interference with the utilization of *p*-aminobenzoate prevents normal division of the nucleus (chromatin), perhaps because the synthesis of new nucleoprotein has been interrupted. The development of the gametocytes does not involve the need for so much new nucleoprotein, and it is not noticeably disturbed by sulphonamides and similar drugs. However, there is disturbance and suppression of the subsequent development of the gametes after conjugation—that is, the development of the oocyst—during which much nuclear division normally takes place.

Human Malaria

Finally, the application of this work to human malaria may be considered. It is said that there is a widespread belief in Arab countries that a milk diet protects against attack by malaria; on the supposition that this milk diet was not supplemented by other foods containing *p*-aminobenzoate, this belief would seem to possess biochemical justification. Further information of such folk-beliefs relating to milk and malaria would be welcome, even though such situations are of interest rather than of importance. Much more practical is the question of babies and malaria. It has long been recognized that babies in West Africa and similar hyperendemic regions do not contract malaria as early or as intensely as would have been expected from the degree of their exposure to infected mosquitoes (cf. Bruce-Chwatt, 1952; Reed, 1952). It has previously been considered that such early insusceptibility might be due to immunity inherited or acquired from the mother. In view of Macgrath's discovery and of the work reported above, it seems quite possible that their insusceptibility might rather be due to their milk diet—that is, their deficiency of *p*-aminobenzoate. The common human malaria parasites, *P. falciparum* and *P. vivax*, are susceptible to sulphonamides, and therefore they presumably require *p*-aminobenzoate as a growth factor.

Babies in Africa, and presumably most other parts of the Tropics, are at first fed exclusively on the breast; during this period, which may last for five or more months, they

would theoretically be insusceptible to malaria. After this period their diet is supplemented with various pastes or porridges of ground grain, etc.; if these contain *p*-aminobenzoate (as will often be the case) the increased malaria rate in babies at this age group is easily explained. Some babies, however, do get malaria at 3 months or earlier, when it is improbable that their diet is supplemented by solid food. In such cases it is possible that the mother may have absorbed increased quantities of *p*-aminobenzoate (either from her own diet or from unusual bacterial synthesis in the intestine) and she may have passed it via the milk to the baby. All these hypotheses are well supported by the experiments with suckling rats and monkeys described above, but extensive and circumspect observation in the field will be required before they can be proved or disproved.

Summary

Rats fed on a milk diet are insusceptible (or only slightly susceptible) to infection with *Plasmodium berghei* (Macgrath, Deegan, and Jones, 1952). This insusceptibility can be reversed by the addition to the diet of *p*-aminobenzoate, which seems to be a growth factor for many species of malaria parasite. The insusceptibility can also be produced by maintaining rats on other diets deficient in *p*-aminobenzoate.

The addition to the milk diet of 20 mg. of *p*-aminobenzoate per kg. of body weight per day was sufficient to permit normal multiplication of the malaria parasite.

The deficiency in the milk could also be corrected by adding folic acid (in molar amounts corresponding to the amount of *p*-aminobenzoate needed), but not by adding methionine, vitamin B₁₂, or *p*-hydroxybenzoate.

Monkeys maintained on a milk diet were insusceptible to infection by *P. knowlesi* or *P. cynomolgi*, but they became fully susceptible when *p*-aminobenzoate was added to the milk in amounts of 0.5 mg. per kg. of body weight per day.

Baby rats and baby monkeys, while exclusively breast-fed from their mothers, are (almost or completely) insusceptible to infection with *P. berghei* or *P. cynomolgi* respectively, provided that their mothers are fed on a diet deficient in *p*-aminobenzoate. If this substance is administered either to them or to their mothers they become fully susceptible.

It is suggested that the relative immunity to malaria shown by infants under 6 months in many parts of the Tropics may be due to a deficiency of *p*-aminobenzoate in their diet of mother's milk.

Grateful acknowledgments are due to Dr. A. T. Fuller for the estimations of *p*-aminobenzoate by bioassay, and to Mr. K. Broomfield and Miss J. P. Selby for invaluable technical assistance throughout these experiments.

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CANCER OF THE TONGUE, MOUTH,
AND PHARYNXSEX DIFFERENCES IN PROGNOSIS FOLLOWING
RADIOTHERAPY*

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In the presentation of morbidity and mortality surveys of malignant disease in sites affecting both sexes it is customary for the sex incidence rates to be stated separately. This principle is rarely observed, however, in the presentation of treatment results. Omission of the sex factor, in a series of cases large enough to render separate analyses practicable, may well have the effect of concealing real differences in prognosis. The object of this survey is to demonstrate, by separate sex analysis of the comparative results of treatment of cancer of the tongue, mouth, and pharynx, that such results not only can exist but may be substantial.

It is shown that in females the overall treatment results are much higher, and that post-operative mortality, recurrence rate, and incidence of secondary lymph nodes are lower.

Basis of the Survey.—The data analysed are from 673 cases of cancer of the tongue treated by radium implantation, 916 cases of cancer of the mouth, and 550 cases of cancer of the pharynx—a total of 2,139 cases treated by radium or deep x rays at the Christie Hospital and Holt Radium Institute, Manchester, during the years 1932 to 1942 inclusive. Evaluation of differences in response has been conducted in relation to the state of affairs ten years after treatment.

Criteria of Classification

The primary sites conform to International List Nos. 141-6, with the exception of soft palate, which is excluded from the sites covered by No. 144, and fauces and tonsil, which are excluded from No. 145, for reasons which are explained later.

For the purpose of presenting the findings in concise form, subdivisions in tables have been kept to a minimum, although the data have actually been analysed first in greater detail to ensure that no bias would be introduced by this procedure.

Although this survey is not concerned with the evaluation of particular treatment methods, it is necessary to state—again in the interests of eliminating possible bias—that no sex discrimination was exercised in the application of particular techniques. For tongue cases radium implantation was used; for mouth and pharynx the techniques employed were (a) radium used by intracavity, interstitial, or surface applicator method; (b) deep x-ray therapy. Where technically and physically practicable, cervical lymph node involvement was dealt with by block dissection; in a proportion of cases no form of treatment was deemed useful; in others, radiation was used as an alternative. No significant difference was found between the sexes in the proportions of the various techniques or between the four clinical stages of advancement.

The term "node-free" implies that in the cases so described there was no clinical evidence of cervical lymph node involvement at the time of treatment; the group

*This paper, confined to cancer of the tongue, was read at the 7th International Congress of Radiology held in Copenhagen, July 19-25, 1953. Mouth and pharynx cases have since been investigated on similar lines, and the results are now embodied in the paper.

represents summation of stages I and II according to the convention devised at the Christie Hospital and Holt Radium Institute, and, since its adoption elsewhere, known as the Manchester staging. Full details of the staging convention were given by Paterson, Tod, and Russell (1950). The term "nodes involved" indicates the presence of clinically palpable lymph nodes at the time of treatment, and represents summation of stages III and IV. Distant metastases rarely occurred, and almost invariably there already was cervical invasion. No useful purpose seemed to be served, therefore, by reporting them in this particular study.

Statistical Method

In the tables relating to 10-year survival the description "age-corrected rate" means that the crude rate has been corrected by age as a factor in the assessment of treatment results, this rate having been calculated by application to the crude survival rate of a weighted probability designed to correct for deaths due to intercurrent causes with no evidence of residual or recurrent cancer at the time of death. If any realistic picture of 10-year results is to be obtained such a correction is essential. The crude survival rate is included for purposes of comparison, although it under-evaluates the long-term effect of cancer treatment. A detailed account of the age factor method of correction was discussed and applied by Paterson *et al.*

Percentages are shown rounded off to the nearest whole digit. Statistical tests of significance have been applied to the results, and in commenting on the differences the following convention is adopted: the term "significant" is in general used when the observed differences exceed the conventional level of twice the standard deviation to a limit of 2.57. The probability of the difference in results being due to chance would thus range from 1 in 20 to 1 in 100. Where the differences meet even more stringent tests they are referred to as "highly significant." In some instances, where the distributions indicate the desirability of a different statistical method of evaluation, the same criterion of significance obtains.

Section I. Cancer of the Tongue and Mouth

Sex Differences in Distribution and Response

Table I gives the distribution in terms of sex incidence and primary site of the data for analysis. The sex ratio male to female on the total cases in tongue and buccal cavity respectively is almost identical, but there are marked

TABLE I.—Data for Investigation

Primary Site	Cases	Males	Females	Ratio Males to 1 Female
Tongue:				
Anterior two-thirds	522	422	100	4.2
Posterior one-third	151	138	13	10.6
Total	673	560	113	5.0
Buccal cavity:				
Floor	427	395	32	12.3
Cheek	215	160	55	2.9
Lower alveolus/gum	177	144	33	4.4
Upper	34	20	14	1.4
Hard palate	63	49	14	3.5
Total	916	768	148	5.2

differences between individual sites. It is noticeable, for example, that comparatively few women have lesions arising in the posterior third of the tongue. It is equally noticeable from the distribution of the anterior buccal cavity cases that, in men, lesions arising in the lower part of the mouth predominate, although this is not so in women. The word "incidence" in this context is, of course, used in the restricted sense of describing the relative frequency of the treated cases for investigation. Incidence rates and their changing pattern, based on a defined population, are the subject of a separate survey in course of preparation.

Reference has already been made to the exclusion of the soft palate. Technically and aetiological this site seems to be more suitably grouped with the posterior buccal cavity (or faucial) region. During the years under review 656 cases arising in fauces, tonsil, and soft palate were treated, distributed as follows:

	Males	Females	Ratio Males to 1 Female
Fauces	368	15	24.5
Soft palate	161	2	80.5
Tonsil	100	10	10.0
Total	629	27	23.3

These figures indicate the futility of investigating sex differences in prognosis in this particular region. When the hard-palate and soft-palate cases are grouped together—in the present instance giving a sex ratio male to female of 13.1:1—the great disparity in the ratios for hard and soft palate separately (3.5:1 and 80.5:1) is obscured.

This characteristic of very low incidence in women is, as is well known, also common to the lip—a site which is sometimes included in mouth surveys, but which again is rendered impracticable in this context by the paucity of female cases.

The age distribution by sex, expressed as a percentage, is shown in quinary groups in Fig. 1. In women the disease manifests itself at an earlier age than is the case in men. Thus, in the tongue cases the modal age group occurs a decade earlier, and in the mouth cases five years earlier. Reference is made later to the need for taking into account these disparities in age distribution.

In Table II the 10-year results for the two groups of cases are shown separately by sex. Crude survival and age-corrected rates reveal considerable differences between males and females. Although, as previously stated, age-corrected rates offer a better assessment of the efficacy of treatment, the differences between the crude survival rates are of much the same order and are highly significant.

If the overall survival rate is considered in relation to cervical lymph node involvement at the time of treatment

TABLE II.—Comparison by Sex of 10-Year Survival Rates

Sex	Tongue			Buccal Cavity		
	No. Treated	Crude	Age-corrected	No. Treated	Crude	Age-corrected
Male	560	13%	23%	768	18%	32%
Female	113	31%	42%	148	34%	47%
Total	673	16%	26%	916	20%	32%

(a) $P < 0.0001$. (b) $P < 0.0001$.

TABLE III.—Comparison by Sex and Clinical Findings of 10-Year Survival Rates

Clinical Findings	Sex	Tongue			Buccal Cavity		
		No. Treated	Crude	Age-corrected	No. Treated	Crude	Age-corrected
Node-free	M	352	20%	35%	416	25%	46%
	F	85	38%	51%	91	46%	71%
Nodes involved	M	208	2%	4%	352	9%	16%
	F	28	11%	13%	57	12%	18%

(a) $0.0001 < P < 0.001$. (b) $P < 0.0001$. (c) $P = 0.08$. (d) $P = 0.40$.

of the primary lesion (Table III), the analysis is seen to yield the same trend of a higher rate in women, although, not unexpectedly, the differences in the later stages of the disease are not statistically significant. In the node-free group, however, the differences are highly significant.

It is pertinent to examine next the various factors contributing to the overall differences already demonstrated. The factors for investigation are: post-operative mortality; incidence of recurrence; incidence of cervical lymph nodes before treatment; subsequent cervical involvement.

Post-operative mortality is the first major hazard to be encountered after treatment. It is logical to deal with it first from a statistical point of view also, since its impact somewhat reduces the number of cases available for in-

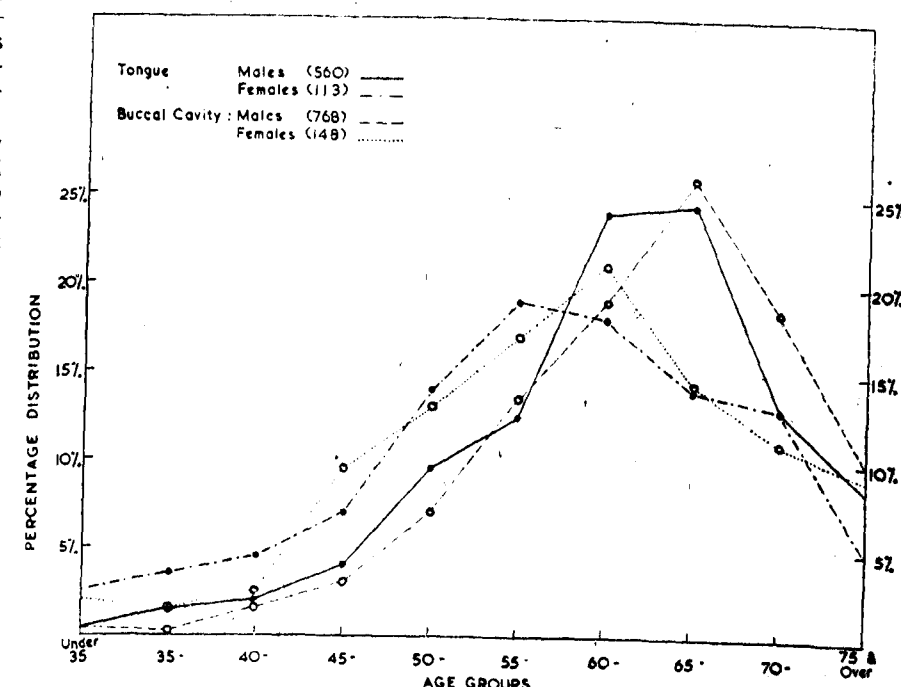


FIG. 1.—Age distribution of cases of cancer of the tongue and buccal cavity given radiotherapy during 1932-42.

vestigation of other phenomena. Table IV shows that, whereas the post-operative mortality rate for men with cancer of the tongue is 15%, the corresponding rate for women is only 4%—a difference which is highly significant. In the buccal cavity, where there is an apparently lower risk

TABLE IV.—Comparison by Sex and Age of Post-operative Mortality

Age Group	Tongue		Buccal Cavity	
	Males	Females	Males	Females
	No. Treated	P.O. Rate	No. Treated	P.O. Rate
Under 50	38	0%	20	0%
50-59	124	17%	37	0%
60-69	273	16%	36	8%
70+	125	17%	20	10%
Total	560	15%(a)	113	4%(a)

(a) $0.001 < P < 0.01$. (b) $P = 0.20$.

to men, the difference between male and female rates of 7% and 4% does not reach the conventional level of statistical significance, the probability of chance occurrence being 1 in 5. The fact that there is a heavier weighting of men in the higher age groups has already been shown. Nevertheless, the analyses in both tongue and buccal cavity groups reveal a male excess mortality in most age groups.

Having observed striking sex differences in the post-operative mortality rate, it is worth while to look at these

further in relation to the effects of lymph node involvement. The figures for node-free tongue cases show (Table V) a significant difference in the rates of 10% and 2%. Node-free mouth cases provide the only instance of an equal rate for men and women. This is apparently due to the combined effect of known cardiac disease and old age in two

TABLE V.—Comparison by Sex and Clinical Findings of Post-operative Mortality

Clinical Findings	Tongue				Buccal Cavity			
	Males		Females		Males		Females	
	No. Treated	P.O. Rate	No. Treated	P.O. Rate	No. Treated	P.O. Rate	No. Treated	P.O. Rate
Node-free	352	10%(a)	85	2%(a)	416	4%	91	4%
Nodes involved	208	25%(b)	28	11%(b)	352	11%(c)	57	4%(c)

(a) $0.04 < P < 0.05$. (b) $P = 0.15$. (c) $P = 0.12$.

of the four deceased women in this group. Where lymphatic spread had occurred, appreciable differences exist between men and women in the respective rates of 25% and 11% for tongue and 11% and 4% for mouth, although they do not reach the significant level owing to the fact that the female groups are comparatively small. It should be borne in mind, of course, that these mortality rates were experienced in the years before antibiotics were in general use. Substantial reductions in post-operative mortality have been achieved since their introduction. Despite this beneficial effect, it is interesting to observe that an advantage still lies with females.

The next comparison to be made is the important one of recurrence rate of the primary lesion. This is evaluated more clearly by confining analysis to cases originally classified node-free. The term "recurrence rate" is a convenient one to use, but it has a wider application in this context than it has when used in relation to radical surgery. As the post-treatment phase for tumours treated *in situ* is one of regression at varying rates, apparent quiescence of a residual lesion or—in tumours of a completely radio-resistant character—steady advancement of the malignant process, recurrence rate actually implies apparent failure of the primary to resolve completely as well as recurrence after an interval of freedom from sign or symptom.

It has been necessary to deduct the post-operative deaths from this group, since these cases were no longer available for observation. In Table VI, which for tongue cases shows

TABLE VI.—Comparison by Sex of Incidence of Primary Recurrence in Node-free Group (After Deduction of 98 Post-operative Mortality Cases)

Sex	Tongue		Buccal Cavity	
	No. Observed	Primary Recurrence Rate	No. Observed	Primary Recurrence Rate
Male	318	41%(a)	360	36%(b)
Female	83	21%(b)	85	22%(b)

(a) $0.0001 < P < 0.001$. (b) $0.01 < P < 0.02$.

TABLE VII.—Comparison by Sex of Incidence of Cervical Lymph Nodes Before Treatment

Clinical Findings	Tongue		Buccal Cavity	
	Males	Females	Males	Females
	No. Treated	P.O. Rate	No. Treated	P.O. Rate
Node-free	352	10%	416	4%
Nodes involved	208	25%	352	11%
Total	560	11%	768	4%
Proportion with nodes involved	37%	25%	46%	39%

(a) $0.01 < P < 0.02$. (b) $P = 0.10$.

a primary recurrence rate of 41% in men as opposed to 21% in women, a highly significant difference is demonstrated. The rates of 36% and 22% for mouth cases similarly disclose that recurrence is much less frequent in women than in men, the observed difference being significant.

Sex differences in cervical lymph node involvement at the time of original examination are shown in Table VII. In both tongue and mouth lesions a higher rate exists in males than in females: in the former group the difference is near to high significance; in the latter it is not significant at the conventional level, the probability of chance occurrence being 1 in 10. Nevertheless, these trends suggest the desirability of investigating the incidence of lymph nodes after treatment of the primary lesion in the group of cases originally classified as node-free.

The results of the analysis of the final factor investigated are shown in Table VIII. For tongue lesions the greater susceptibility of men to subsequent cervical involvement is

TABLE VIII.—Comparison by Sex of Development of Cervical Lymph Nodes in Cases Originally Node-free (After Deduction of 98 Post-operative Mortality Cases)

Sex	Tongue		Buccal Cavity	
	No. Observed	Lymph Node Incidence Rate	No. Observed	Lymph Node Incidence Rate
Male	318	60%(a)	360	49%(b)
Female	83	47%(b)	85	27%(b)

(a) $P \approx 0.03$. (b) $0.0001 < P < 0.001$.

indicated by the male and female rates of 60% and 47% respectively, and is statistically significant. The same trend is disclosed in the mouth group, in which the difference between the rates of 49% and 27% is highly significant.

Section II. Cancer of the Pharynx

Difficulties implicit in dealing with cancer in this site are inevitably encountered in attempting to investigate sex differences in prognosis according to the pattern adopted in Section I. In a site of such unfavourable prognosis clinical and technical handicaps are unavoidably reflected in any statistical evaluation, and consequently less precision is attainable in the assessment of certain characteristics. The same trends of better prognosis in the female are nevertheless demonstrable, and seem to be worth recording in somewhat condensed form.

TABLE IX.—Data for Investigation

Primary Site	Cases	Males	Females	Ratio Males to 1 Female
Nasopharynx and oropharynx	287	208	79	2.6
Hypopharynx and post-cricoid	263	141	122	1.2
Total	550	349	201	1.7

Sex Differences in Distribution and Response

The data for analysis are divided into two broad groups, as shown in Table IX. In the nasopharynx and oropharynx the frequency ratio indicates much less disparity between the sexes than is the case for the tongue and mouth, and scarcely any for lesions arising in the hypopharynx and post-cricoid region.

Figure 2, giving the age/sex distributions, shows no difference in the modal age group for males and females in the nasopharynx and oropharynx. As there were more patients in the younger age groups than was the case in tongue and mouth lesions, the range of quinary age groups has been expanded. The distribution for hypopharynx and post-cricoid region shows a sharp rise to the modal age of 65–69 for males, the corresponding peak for females being 60–64.

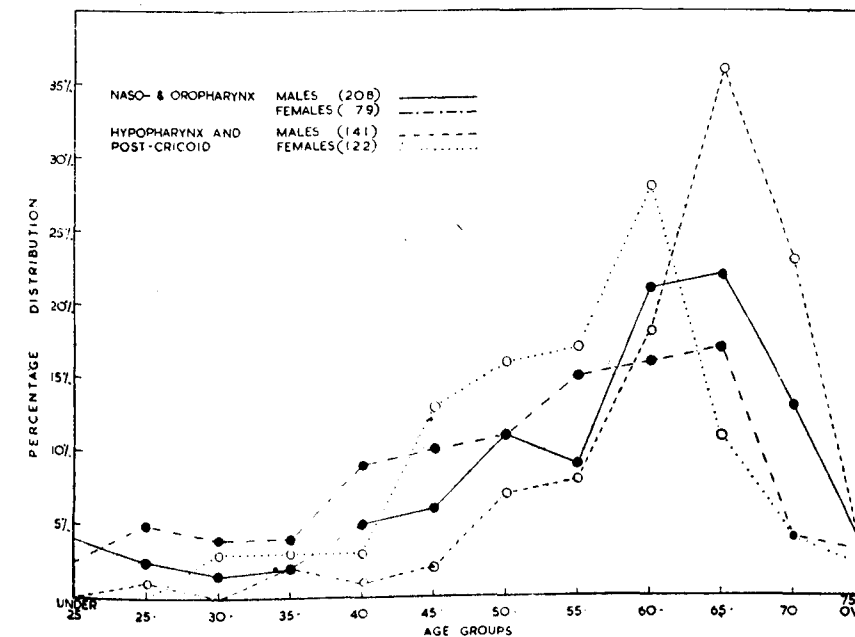


FIG. 2.—Age distribution of cases of cancer of the pharynx given radiotherapy during 1932-42.

Comparison by Sex of 10-Year Survival Rates

A highly significant difference between males and females is shown for the nasopharynx and oropharynx group (Table X). It may also be observed that the 10-year results for women are as good as the survival rates experienced by men with cancer of the tongue. On the other hand, the long-term results for hypopharynx and post-cricoid region cases reveal uniformly poor prognosis.

TABLE X.—Comparison by Sex of 10-Year Survival Rates

Sex	Naso- and Oropharynx			Hypopharynx and Post-cricoid		
	No. Treated	Crude	Age-corrected	No. Treated	Crude	Age-corrected
Male	208	6%	8%	141	3%	5%
Female	79	19%(a)	23%	122	2%	3%
Total	287	9%	12%	263	3%	4%

(a) $0.0001 < P < 0.001$.

TABLE XI.—Comparison by Sex and Clinical Findings of 10-Year Survival Rates

Clinical Findings	Sex	Naso- and Oropharynx			Hypopharynx and Post-cricoid		
		No. Treated	Crude	Age-corrected	No. Treated	Crude	Age-corrected
Node-free	M	28	7%	12%	39	5%	9%
	F	19	16%(a)	21%	48	4%	6%
Nodes involved	M	180	6%	7%	102	2%	4%
	F	60	20%(b)	24%	74	1%	2%

(a) $P = 0.65$. (b) $0.0001 < P < 0.001$.

TABLE XII.—Comparison by Sex and Age of Post-operative Mortality

Age Group	Naso- and Oropharynx				Hypopharynx and Post-cricoid			
	Males		Females		Males		Females	
	No. Treated	P.O. Rate	No. Treated	P.O. Rate	No. Treated	P.O. Rate	No. Treated	P.O. Rate
Under 50	44	9%	27	0%	8	13%	26	12%
50-59	41	5%	21	5%	21	38%	41	17%
60-69	90	23%	26	12%	76	21%	48	13%
70+	33	15%	5	0%	36	17%	7	14%
Total	208	15%(a)	79	5%(a)	141	22%(b)	122	14%(b)

(a) $0.02 < P < 0.05$. (b) $P = 0.09$.

Analysis according to the presence or absence of cervical lymph node involvement (Table XI) is not very profitable in view of the low numbers in the node-free group of nasopharynx and oropharynx cases and the poor results already seen in Table X for hypopharynx and post-cricoid region cases. Nevertheless, the trend in the former again shows an appreciably higher rate for women, which might well prove to be a significant one if more cases were available for study. Where cervical involvement had taken place the higher survival rate for women is highly significant.

Table XII reveals the overall post-operative mortality rates for cancer of the nasopharynx and oropharynx to be almost identical with those for cancer of the tongue, and significantly higher in males. Unlike the tongue and mouth cases, however, the heaviest rate for each sex occurred in the decade 60-69. The difference of 8% between the male and female rates for hypopharynx and post-cricoid, although not great enough to be statistically significant, follows the same trend.

Analysis of the cases according to cervical lymph node involvement also shows a similar trend throughout of a higher rate for men, but the consequent decrease in numbers in each group results in none of the differences being significant. No useful purpose seemed to be served, therefore, by the inclusion of a table in this form.

It is not practicable in this section to include a table dealing with recurrence of the primary lesion in node-free cases, as was done in Section I. Complications such as oedema and stenosis encountered in the hypopharynx and post-cricoid region result in any attempt at assessment being highly presumptive, even with an endoscopic examination and biopsy, and consequently undesirable as a basis of statistical evaluation. In the nasopharynx and oropharynx the same difficulties exist, but in a lesser degree. It seems probable here that 57% of men and 42% of women experienced recurrence in the primary site, but this assessment must be regarded as being less reliable than that quoted for the tongue and the mouth.

TABLE XIII.—Comparison by Sex of Incidence of Cervical Lymph Nodes Before Treatment

Clinical Findings	Naso- and Oropharynx		Hypopharynx and Post-cricoid	
	Males	Females	Males	Females
	No. Treated	P.O. Rate	No. Treated	P.O. Rate
Node-free	28	19%	39	5%
Nodes involved	180	6%	102	2%
Total	208	9%	141	4%
Proportion with nodes involved	87%	76%	72%	61%

(a) $P = 0.03$. (b) $0.04 < P < 0.05$.

Cervical lymph node involvement prior to treatment of the primary lesion, which is the subject of analysis in Table XIII, occurs in both sexes to a far greater extent when the primary is situated in the pharynx than is the case when it is in the tongue or mouth. In each pharyngeal subgroup the rate for males is shown to be significantly higher than that for females.

Assessment of the risk of cervical lymph node involvement developing after treatment of the primary lesion is, of course, influenced by the response to treatment of the latter.

Where the prognosis is poor, the opportunity for observation of various characteristics is correspondingly limited. Furthermore, the node-free groups are small (Table XIII). It suffices to say, therefore, that the respective rates of 22% for males and 16% for females in nasopharynx and oropharynx cases, and 24% for males and 13% for females in hypopharynx and post-cricoid cases, follow the same trend as was observed for cervical invasion before treatment. The fact that these rates are so much lower than the comparable ones shown for the tongue and mouth cases is attributable to the shorter average duration of life. In the event of any future development of more effective methods of controlling the primary lesion they could not be regarded as an authentic estimate of potential lymph node involvement.

Discussion

Summarizing the findings, then, it would seem that in the treatment of cancer of the tongue, mouth, and pharynx female patients may be expected to respond much better than males and to resist lymphatic spread more successfully. In none of the aspects investigated—namely, long-term survival, incidence of post-operative mortality, primary recurrence, secondary lymph nodes before and after treatment of the primary lesion—has any evidence against this thesis emerged.

The fact that such sex differences in prognosis are demonstrable makes it obvious that, in the presentation of the results of treatment, omission of the sex and age distribution may well affect the deductions to be made from survival rates. Failure to keep this in mind may conceivably be the cause of some misinterpretation, since, in making comparisons, a higher survival rate attributed to improved technique may be due merely to differences in the sex ratio in the sample.

Furthermore, the need for the incorporation of an age-factor correction cannot be too strongly emphasized, particularly in countries where there is a rapidly increasing proportion of old people in the population. The consequent rising proportion of deaths from intercurrent diseases invalidates the crude mortality rate for purposes of treatment evaluation.

Revelation of differences in behaviour inevitably arouses speculation regarding the causes. Three obvious lines of inquiry seemed to be: (a) the possible effect of oestrogen changes; (b) the comparative incidence of syphilis; and (c) the respective standards of oral hygiene. Analysis of the results on a pre- and post-menopausal basis failed to reveal any real difference. The cases in which a Wassermann test had been made were invalidated for statistical purposes by the policy of clinical selection. Investigation of dental sepsis could not be undertaken in a survey of retrospective character, but there is a strong suggestion from various sources that the standard of oral hygiene is appreciably higher in women than in men.

It may be that investigation of possible local influences would yield only a partial solution, and that the differences now demonstrated are merely a cogent example of the fact that the female, although lacking equal physical strength, is nevertheless fundamentally possessed of greater stamina than the male. In a comparison of male and female mortality trends, Martin (1951) showed that the disadvantage experienced by males has been increasingly enhanced during the past few decades. An analogy is to be found in various other species in which there is an excess mortality of males over females.

Despite the fascination of speculation, the initial function of the statistician is to indicate where such sex differences in prognosis exist, in the hope that medical research workers from other fields may be induced to explore some of the by-ways.

Summary

Three groups of cancer cases—673 in the tongue, 916 in the buccal cavity, and 550 in the pharynx—treated by radium or deep x rays at the Christie Hospital and

Holt Radium Institute, Manchester, during the years 1932 to 1942 inclusive are analysed separately by sex ten years after treatment, for the purpose of demonstrating a marked difference in prognosis.

Survival rates are given in terms of the whole group irrespective of the degree of clinical involvement at the time of treatment, and also in relation to the presence or absence of extension of the disease to cervical lymph nodes. Relevant factors, including post-operative mortality, incidence of recurrence, and incidence of cervical lymph nodes before and after treatment of the primary lesions are investigated.

In all the directions explored the same trend emerges in support of the thesis that a much better response to treatment is manifest in women than in men. Women are also less prone to develop metastases. Some possible influences are considered.

The opinion is expressed that, in the presentation of the results of treatment of malignant disease, failure to state the sex and age distribution may result in fallacious deductions when comparisons are being made between different series of cases. Attention is also directed to the inadequacy of the crude survival rate for purposes of long-term evaluation, and the necessity for incorporating an age-factor correction is emphasized.

I am indebted to Dr. Ralston Paterson, from whose criticism of my original draft I derived much benefit; to Dr. Edith Paterson for helpful suggestions; to Professor Victor Lambert for useful advice; and to my assistants in the medical statistics department for their aid with the analyses, graphs, and typing of the paper. I wish to record, too, my appreciation of the encouragement and courageous interest of the late Dr. Margaret C. Tod during her terminal illness.

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CANCER OF UTERUS: RELATIVE INCIDENCE OF TYPES

BY

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Carcinomas of the uterus are commonly divided into three groups: (1) epidermoid carcinoma of the cervix; (2) adenocarcinoma of the cervix; and (3) endometrial carcinoma of the "body." The first and third groups together account for over 90% of uterine carcinomas.

Cases under Review

During the past four years 1,612 uterine specimens have been examined in this hospital. These were composed of endometrial curettings, 1,135; uteri, 286; and cervical biopsies, 191. During this period carcinoma of the body has been diagnosed in 34 cases, epidermoid carcinoma of the cervix in five cases, and adenocarcinoma of the cervix in one case.

The age distribution of the cases of adenocarcinoma of the endometrium is shown in the Table. The mean age

was 55 years. The marital status was 26 married and 9 single. The age distribution of the cases of epidermoid carcinoma of the cervix is also shown in the Table. The mean age was 45 years. Three were married and two were single.

Age Distribution of 34 Cases of Adenocarcinoma of the Endometrium and Five Cases of Epidermoid Carcinoma of the Cervix

	31-	36-	41-	46-	51-	56-	61-	66-	71-	76-80
Adeno-carcinoma										
Epidermoid carcinoma	1	3	2	3	13	4	3	3	2	1

The relative incidence of cases of carcinoma of the body and the cervix is 7:1. This ratio is so different from the textbook figures that the following points must be noted.

Firstly, the patients are drawn from a selected portion of the community, as this hospital deals almost entirely with the upper- and middle-income groups of Cork City and surrounding country. Secondly, the cases considered to be carcinoma of the endometrium are only those showing frank histological evidence of carcinomatous change; any case showing only atypical hyperplasia was excluded. The fact that the cases were collected over a period of four years would seem to exclude any chance selection in a short period. It would also exclude, to a large extent, the possibility of a number of cases of carcinoma of the cervix having been "missed." To bring the figures to accepted proportions over a hundred cases of cervical carcinoma would have had to escape notice, and so far as we are aware, no patient in this series who was not diagnosed as carcinoma of the cervix has returned with this condition. Lastly, the age distribution and mean age of both groups are atypical. It would thus seem reasonably certain that in this series there is an actual and well-marked reversal of the usually accepted frequency of carcinoma of the body and of the cervix.

To determine whether the atypical distribution was due to an increase in the number of cases of endometrial carcinoma or to a decrease in cases of cervical carcinoma a comparison was made with the figures of the Dublin maternity hospitals (*Irish Journal of Medical Science*, 1949, 1950, 1951). The incidence of endometrial carcinoma occurring per hundred operative gynaecological cases in the Dublin maternity hospitals was compared with that occurring in this hospital, and was found to be very similar. This fact indicates that the variation in our figures is due to an absolute decrease in the number of cases of epidermoid carcinoma of the cervix.

The Dublin reports also show that their relative incidence of the two types of uterine carcinoma is that generally accepted—that is, a preponderance of cervical carcinoma.

Discussion

Figures quoted for the relative incidence of the different types of uterine carcinoma vary, "but broadly it may be said that cervical carcinoma is three or four times as common as endometrial, and that cervical epidermoid carcinoma is at least ten times as common as cervical adenocarcinoma" (Willis, 1948). Novak (1952) gives the proportion as one endometrial carcinoma to eight cervical carcinomas.

It is becoming generally acknowledged that uterine carcinoma has socio-economic and racial distinctions. Stock (1947) has shown uterine carcinoma to be more common among the lower social class in England. He does not, however, distinguish between carcinoma of the endometrium and cervix. Clemmesen and Nielsen (1951) bring evidence to show that cervical carcinoma is more common in the lower socio-economic group, and that its incidence in rural areas approximates to the wealthier areas in the towns. The opinion that cervical carcinoma is more frequent in

the lower-income group is also expressed by Lombard and Potter (1950). They state that "in a sample obtained from a gynaecologist who permitted a study of the records of his wealthy patients . . . the sample was small . . . owing to the fact that only a very small percentage of his private patients had carcinoma of the cervix." Again, Hall *et al.* (1950) found that, while the usual accepted relative incidence of the types of uterine cancer was valid for ward cases, in their private patients endometrial carcinoma was more frequent in the ratio 2:1. Corscaden and Gusberg (1947) also noted that in the private-patient group carcinoma of the endometrium was more common than carcinoma of the cervix.

While showing a much higher proportion than in any of the series quoted, our figures do agree in demonstrating that the usually accepted relative incidence of carcinoma of the endometrium to the cervix does not hold good for all sections of the community. They can also be used to show that in the socio-economic group concerned the disproportion observed is due to an absolute decrease in cases of cervical carcinoma rather than to an increase in endometrial carcinoma.

From the findings of the authors quoted and from our admittedly small group of cases it seems that one definite fact arises—that cancer of the cervix is more common in the lower socio-economic group. Our figures can do little more than suggest that the incidence of endometrial carcinoma may be much the same in all groups.

The reason for this low incidence of cervical carcinoma is obscure. Lombard and Potter (1950) list five factors which they claim have definite significance in the development of cervical carcinoma: marriage before the age of 20 years, unrepai red lacerations, last child born to women before the age of 25 years, syphilis, and individuals divorced or separated at any time. We considered these factors in relation to the class of patient dealt with in this hospital, and it was found, from a sample of married women, that the average age of marriage was 27 years; thus two factors—marriage before the age of 20 years and the last child born before 25 years—do not apply. Divorce and separation are exceptionally rare, as is syphilis. Of all these factors it is only unrepai red laceration of the cervix which might operate.

The relationship of cervical lacerations to cervical carcinoma is still undecided. An interesting contribution in this field is that of Gagnon (1950). This author investigated the medical histories of a large number of nuns, "women whose social state and mode of life protect them from the usual causes of cervicitis or chronic irritative lesions." He found that the ratio of endometrial carcinoma to that of cervical cancer was 6:1, and uses this fact among others to indite cervical lacerations as a factor in cervical carcinoma. In the discussion following this paper, McKelvey objected that the recognized low incidence of cervical carcinoma in the Jewish race still remained to be explained. Weiner *et al.* (1951) indicated that cervical carcinoma in Jewish women is becoming more common, and suggest that the Mosaic laws, which would tend to lessen the incidence of chronic cervicitis, are not now observed as rigidly as formerly. They, however, quote Davidsohn as believing that the difference in incidence of cervical carcinoma may be due to the practice of circumcision, a theory which is supported by the demonstration of the carcinogenic action of smegma.

Ovarian oestrogens have been suspected as a factor in carcinogenesis, and genuine carcinoma of the cervix has been produced in mice by Gardener, Li, and others (Novak, 1951). Ayre (1947) suggests that cervical carcinoma may be due to an abnormal response to cervical infection associated with excessive oestrogen, the latter being due to failure of a liver damaged by vitamin deficiency to inactivate oestrogen. Of interest in this connexion is the fact that Brunelli (1935) showed that in rabbits oestrogen in the blood becomes concentrated and fixed in inflamed tissues. Ayre's suggestions are criticized by Greene and Peckham (1947),

who point out that the previously accepted fact that vitamin-B deficiency, as such, decreases the inactivation of oestrogens by the liver has been shown to be untenable. Drill and Pfeiffer (1946) have shown that "the effect of acute vitamin-B-complex deficiency in producing a failure of the liver to inactivate oestrone seems to be due to the concomitant inanition."

If we may assume that cervical carcinoma is comparatively infrequent in the better-nourished members of a community, then there must be some factor or factors which lessen its occurrence in this group. Alternatively, in the undernourished group there must be some factor or factors which tend to cause this lesion. As cancer is an active condition it would seem more logical to suppose that poor economic conditions in some way produce this disease. Our present knowledge would suggest that cervical carcinoma may be produced in the poorer economic class by some unknown hormonal imbalance or by an unsatisfactory reaction, associated with poverty, to irritative lesions of the cervix.

Summary

Figures are given for the relative incidence of endometrial and cervical carcinoma as seen in a selected population.

These figures are at variance with the incidence usually accepted, and it is suggested that the incidence of the various forms of uterine cancer vary with the socio-economic group.

The possible implications of these findings are briefly discussed.

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The National Research Development Corporation exists primarily to develop and exploit in the public interest inventions (including medical ones) resulting from public research. It also has other powers. In June this year the Corporation's borrowing powers come to an end, and if the Corporation is to continue its normal activities, new legislation will be necessary. The chance is therefore taken in the annual report for 1952-3, published recently, to review the results of the Corporation's first four years of trading. Starting in 1950 with costs of a little over £20,000 and a return by way of royalties of less than 1%, by 1953 the accounts showed 23% earnings on operating costs of £120,000. Several of the inventions being developed by the Corporation have a direct bearing on medicine. The pilot scale production of hecogenin from sisal juice in East Africa provides a starting material for the synthesis of cortisone. Prototypes of the Burns analgesic inhaler, designed for trilete and other volatile analgesics, have been prepared for clinical trial. The Corporation has underwritten the costs of the initial manufacture of an aural microscope and chick sexer. Other projects range from large electronic digital computers ("electronic brains") to a new machine for liquefying atmospheric gases.

DIABETES INSIPIDUS ASSOCIATED WITH PULMONARY DISEASE

BY

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Spillane (1952) described four cases in which diabetes insipidus was associated with pulmonary disease. The case here reported falls into the same category and exhibits diabetes insipidus and lung lesions as the only discoverable abnormalities.

Case Report

A housewife aged 57 was first seen in January, 1952, having been referred for further investigation after attending a mass x-ray session. She had suffered from increasing dyspnoea on exertion for about four years, with morning cough and the expectoration of a small amount of yellowish sputum. For several years she had passed large amounts of pale urine at frequent intervals during the day and night. She was also troubled by excessive thirst and said that she could drink a pint of soda-water at a time and still be thirsty. Her sleep rhythm was unchanged and there was no somnolence by day.

Before her present illness she had been healthy and had when younger often cycled 50 miles (80 km.) a day without distress. Until seven years previously she had worked as a waitress in addition to looking after her home, but she had had to discontinue this in order to look after her husband, who was becoming severely disabled owing to post-encephalitic Parkinsonism. She had had pneumonia on three occasions, at the ages of 23, 29, and 37; erysipelas at 14; and scarlet fever in childhood. There was no history of skin disease.

She was the second oldest of a family of 13 of whom five of six brothers had died in infancy, the other being killed in adult life. Of her six sisters, five were healthy and one had died 48 years previously, the cause of death being unknown. The patient had had two children, both of whom were healthy; her son was 34 and her daughter 28.

Examination revealed a rather pale middle-aged woman, weighing 134 lb. (60.8 kg.), an excellent witness, though inclined to make light of her complaints. Her skin was somewhat dry and wrinkled but otherwise showed no abnormality. No lymphatic glands were palpable and there was no enlargement of the salivary glands. Venous congestion, ankle oedema, and finger-clubbing were not present. She was somewhat dyspnoeic at rest, but no other clinical abnormalities were detected in the chest or heart. The blood pressure was 150/100. The abdomen showed no abnormality and the liver and spleen were not palpable. The optic disks were normal and neurological examination was negative.

Further investigation showed that she passed 12 to 16 pints (6.8 to 9.1 litres) of urine daily and drank roughly equal amounts. The specific gravity of the urine was in the neighbourhood of 1005; there was no glycosuria or albuminuria and no casts were present. X-ray films of the chest showed a mixture of reticulation and miliary mottling throughout both lung fields without enlargement of the hilar lymph nodes. No cysts were detected and there was no pneumothorax. X-ray films of the hands, feet, and skull showed no bony abnormalities. The pituitary fossa was radiologically normal.

Sputum tests for tubercle bacilli were repeatedly negative. The Mantoux test was positive to 1:1,000 O.T. Blood examination showed: Hb, 66% (9.8 g.); erythrocytes, 5,000,000. The E.S.R. was 12 mm. in the first hour (Wintrobe). The blood Wassermann and Kahn reactions were negative and the glucose-tolerance curve was normal. The

serum cholesterol was 305 mg. per 100 ml.; serum albumin 5 g. and globulin 3.5 g. per 100 ml.; albumin/globulin ratio 1.43:1. Liver-function tests showed serum colloidal gold reaction 3+, gamma globulin (zinc sulphate) 8 units, thymol turbidity 4 units, and thymol flocculation +.

Pituitary snuff immediately controlled her polyuria and allowed her to sleep well at nights. After starting this treatment, however, she stated that her breathlessness was somewhat increased. Because of the hypochromic anaemia she was given iron, which resulted in some amelioration of the dyspnoea.

A year later her condition was unaltered and a further x-ray film of the chest showed no substantial change.

Comment

The diagnosis of diabetes insipidus cannot be in doubt, there being adequate evidence to exclude other causes of polydipsia and polyuria—that is, diabetes mellitus, renal disease, and hysterical polydipsia. The only other discoverable lesions were those in the lung, manifested by exertional dyspnoea and radiographic changes.

Spillane (1952) summarized fully the literature relating to this combination of lesions. Following him the diagnoses to be considered are sarcoidosis, tuberculosis, xanthomatosis, tuberous sclerosis, syphilis, honeycomb lungs, and bronchogenic carcinoma.

The first of Spillane's four cases was an undoubted example of sarcoidosis, and this diagnosis could not be excluded in his Case 4. The other two cases were considered clinically to be examples of xanthomatosis. Necropsy in Case 3 later showed, in the hypothalamus and the lungs, the changes of eosinophilic granuloma which shares a morphogenesis in common with Hand-Schüller-Christian and Letterer-Siwe diseases, all three being secondary xanthomatoses associated with progressive reticular hyperplasia. It is therefore interesting to note that one of Cates and Garrod's (1951) cases of diabetes insipidus occurred in a patient with xanthomatosis and honeycomb lungs who also developed an eosinophilic granuloma of bone.

Dennis and Rosahn (1951) reported the case of a man aged 30 with diabetes insipidus and cystic lungs. They concluded from the necropsy findings that it represented a granulomatous disease involving the reticulo-endothelial system.

In the present case sarcoidosis does not appear to be the most likely diagnosis. Spillane (1952) collected from the literature 18 cases of sarcoidosis associated with diabetes insipidus. In none were the lesions confined to the pituitary region and the lungs. Similarly his own Case 1, which was an example of sarcoidosis, had an initial characteristic uveo-parotitis with facial palsy. His Case 4, in which no certain diagnosis was reached, and in which sarcoidosis could not be excluded, showed lesions in these two situations only. In this respect it is similar to the present case in which the Mantoux test (positive to 1:1,000 O.T.) is rather against the diagnosis of sarcoidosis. In addition, the dyspnoea was more intense than might be expected in a case of sarcoidosis with similar radiographical findings.

If we adopt a histological definition of sarcoidosis, as does Scadding (1950), diagnosis must await confirmation by biopsy. In the present case no superficial glands were available for biopsy and, owing to her commitments at home, the patient was unwilling to accept admission to hospital for liver biopsy.

Although, therefore, it is not possible definitely to exclude sarcoidosis, a granulomatous or xanthomatous process seems by exclusion to be a more likely diagnosis.

It is possible that when lung changes and diabetes insipidus occur together as the only discoverable disease they constitute a syndrome the pathological basis of which is a granuloma of some as yet undetermined and possibly variable type. The two conditions may, however, occur as a part of more widespread pathological processes such as those indicated in the papers cited.

Summary

The case is described of a woman aged 57 who had diabetes insipidus associated with a combination of reticulation and miliary mottling throughout both lung fields. A granulomatous or xanthomatous process is thought to be the most likely diagnosis, though sarcoidosis cannot be definitely excluded.

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PULMONARY ACARIASIS IN SPAIN AN ILLUSTRATIVE CASE REPORT

BY

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Considerable interest has been created in many parts of the world by the association that has been postulated by workers in Ceylon between hypereosinophilic respiratory disorders and pulmonary acariasis. Carter Wedd, and D'Abrera (1944) were the first to detect mites (Acarina) in the sputum of asthmatic patients with high eosinophilia. This discovery was confirmed by Soysa and Jayawardena (1945), who also suspected that the syndrome might result after exposure to inhalation of airborne mites. Further investigations in Ceylon by Carter and D'Abrera (1946) and by Soysa (1949, 1952a) have verified the previous findings. The conclusions of the Ceylonese workers that pulmonary acariasis may be associated with respiratory symptoms and massive eosinophilic reaction have been supported by reports from England (Hall, 1946), the Netherlands West Indies (Van der Saar, 1946), East Africa (Wilson, 1947), etc.

Since 1946 my attention has been engaged by the occurrence of mites in the sputum of certain patients with respiratory disorders associated with eosinophilic leucocytosis, and cases have been reported in Spain (Figueroa Taboada, 1946). I have been able, in my studies of this curious syndrome, to verify the ideas that have been so carefully and clearly presented by Soysa, and the results of my investigations are in complete agreement with his views concerning the three-stage clinical course discernible in many cases; the remarkable eosinophilic leucocytosis that is the most prominent and constant pathological feature of this syndrome; the variability of the pulmonary radiological appearances; the presence of mites in the sputum; the possibility of bronchial infestation by airborne mites; the ambient air importance of environment in relation to the acquisition of the disease; and the dramatic response to arsenical therapy, which is often associated with a Herxheimer reaction.

As an example of our findings in Madrid I cite a typical case history.

Case Report

A male clerk in a food store, aged 39, was investigated for asthma of seven months' duration. His personal and family history revealed no indication of any allergic antecedents. A blood count showed a total leucocyte count of

TRICHLORETHYLENE POISONING WITH PARANOID PSYCHOSIS AND LILLIPUTIAN HALLUCINATION

BY

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There are few published reports of psychosis resulting from poisoning with trichlorethylene ("trilene"). Eichert (1936) recorded two cases and Rickles (1945) one case. All three arose from the excessive use of trichlorethylene inhalations to assuage the pain of tic douloureux. The opportunity to study the effects of orally ingested trichlorethylene has rarely arisen. However, Stephens (1945), Naish (1945), and Kallenback (1947) have between them described the toxic manifestations of swallowed trichlorethylene in four cases. In general, the symptoms consisted of prolonged inebriation, with vomiting, dizziness, deafness, or numbness of the limbs. The following case has some unique features.

Case Report

An Irish labourer aged 40 was admitted to Littlemore Mental Hospital on April 11, 1953. On April 5 he had accidentally swallowed a quantity of trichlorethylene contained in a beer bottle. The precise quantity ingested could not be ascertained, but was described as a "good swig." Realizing his mistake, he succeeded in vomiting up some of the liquid by swallowing an emetic mixture of salt and water. Nevertheless, his breath reeked of trichlorethylene and he was grossly inebriated on arrival at the casualty department of the Radcliffe Infirmary less than an hour after the accident. Despite stomach washouts (and other treatment), he passed into a deep coma lasting 36 hours. At times he was frankly cyanosed. The pupils varied in size from pin-point to wide dilatation with brisk light reaction. The B.P. varied between 90/50 and 140/70. On April 8, consciousness having returned the previous day, he developed a system of paranoid ideas to the effect that he was going to be "beaten up" during the night by two patients in league with the nursing staff. That night he awoke in a state of delirium which he described as follows:

"The next thing I remembered was awakening to find myself soaked in sweat and strapped in a kind of long leather sack. I could hear the two patients who had spied on me during the day talking with the night nurses. One of them said, 'Let's give it to him now.' I opened my eyes, struggled free from the sack, and shouted for help. I then saw that the ward was its usual length, but only about 2 ft. high; the beds were about 18 in. long. In response to my cries a little nurse, 12 in. high, ran to my bed. I told her I was afraid, so she tried to reassure me, and went away to get a hot drink. While she was away, other nurses came to my bedside and were later followed by a doctor. They were all about 12 in. tall. I recognized all of them as the nurses and doctor I had seen before. The only other person besides myself who seemed the normal size was a patient in the bed next to mine. I thought he was a negro who was also being persecuted, but later found that he was white. I felt terribly afraid while all this was going on. They changed my shirt and gave me an injection. The next morning everything was back to its usual size."

During the next few days he continued to show evidence of a paranoid psychosis. For example, he complained that people were saying he had V.D., and that a nurse had "framed" him with a 10s. note introduced into his locker. His transfer to a mental hospital became necessary as a result of marked restlessness.

He was examined on his arrival at Littlemore Mental Hospital, with the following results. *Psychiatric condition:* During the first 48 hours he was unduly loquacious and

lacking in insight. He still harboured delusions of a persecutory nature. The family and personal psychiatric histories were negative. *Physical condition:* He showed no physical abnormality with the exception of a coarse tremor of his extended fingers and a few persistent sibili at both lung bases. He was discharged in excellent mental and physical condition on April 25.

Special Investigations at Radcliffe Infirmary.—April 5: Hb, 100%; white cells, 20,000 per c.mm.; a neutrophil leucocytosis was present. April 8: Normal plasma proteins. No abnormal constituents of any kind in the urine.

Special Investigations at Littlemore Mental Hospital.—April 15: Blood urea, 30 mg. per 100 ml.; blood bilirubin, 0.2 mg. per 100 ml.; prothrombin level, 100%; plasma proteins, 7.1 g. per 100 ml.; urine testing showed no abnormal constituents. April 16: Hb, 115%; white cells, 10,000 per c.mm. April 20: Blood urea, 27 mg. per 100 ml.; blood bilirubin, 0.3 mg. per 100 ml.; prothrombin level, 100%; plasma proteins, 6.5 g. per 100 ml.; the urine contained no abnormal constituents.

Discussion

A noteworthy feature of this case is the fact that at no time was there any evidence of hepato-renal damage, despite the ingestion of enough trichlorethylene to produce a coma lasting 36 hours. This demonstrates a highly selective action of the substance on the central nervous system. Hunter (1949) showed that trichlorethylene has no serious toxic effect on the kidneys or liver of healthy mice. Ostlere (1953), after reviewing the literature, arrived at the conclusion that "the evidence of animal experiments, industrial toxicology, laboratory tests, and clinical practice clearly indicates that the toxic effects of trichlorethylene on the liver are negligible." The sparing of the liver cells by trichlorethylene is surprising, as the chemically related chloroform, carbon tetrachloride, and tetrachlorethane are notorious hepatotoxins.

The adjective "Lilliputian" was first used by Leroy (1909) to describe a rare form of visual hallucination consisting in the perception of imaginary objects, persons, or animals of diminutive size. These tiny animals or personages are usually seen as brightly coloured mobile creatures strongly reminiscent of those described by Swift in *Gulliver's Travels*. The perception of the colourful midgits tends to produce in the subject an agreeable emotional reaction, whereas the more usual forms of visual hallucination often engender a feeling of terror. The real environment does not usually participate in the Lilliputian contraction. In the case described, the microptic hallucinations took an exceptional (if not unique) form in that they represented real personages, were not coloured, produced a feeling of fear in the patient, and the ward was involved in the Lilliputian effect. In his delirium, the patient would appear to have experienced microptic illusion in addition to hallucination. Lilliputian hallucinosis has been described as a result of intoxication from alcohol, chloral, ether, cholera, and typhoid (Leroy and Rogués de Fursac, 1920). It has also been reported in the course of scarlet fever (Hall, 1922) and cocaineism (Henderson and Gillespie, 1927). It is tempting to wonder if Dean Swift (or one of his friends) experienced the phenomenon at some time or another.

Summary

A case of accidental poisoning with trichlorethylene is described. An acute paranoid psychosis with Lilliputian hallucination followed a 36-hours coma. There was no evidence of hepato-renal damage at any time. In this case the microptic hallucination differed in many ways from the classical descriptions in the French literature.

My thanks are due to Dr. R. W. Armstrong, physician-superintendent of Littlemore Mental Hospital, Mr. W. A. McDougall, laboratory technician, and to the doctors of the Radcliffe

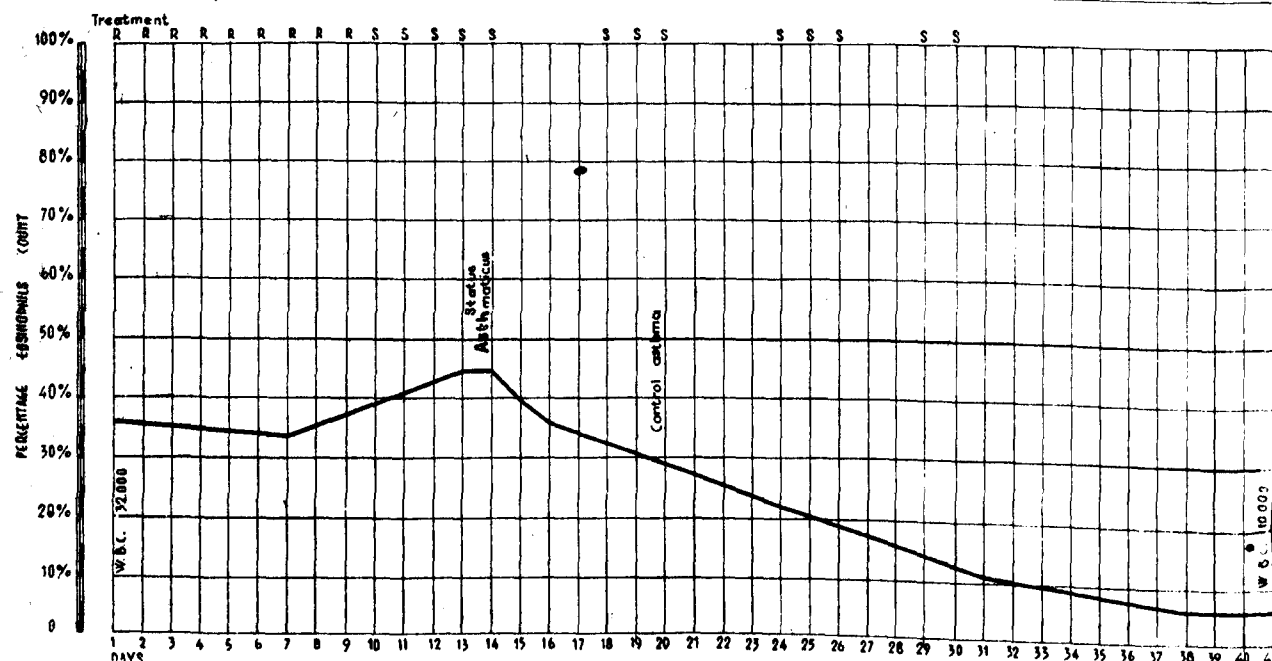


FIG. 1.—Eosinophilic reaction in a case of pulmonary acariasis. R=Routine treatment. S=Acetarsol treatment.

32,000 per c.mm., with 36% eosinophils. X-ray examination of the lungs showed fine linear striations superimposed upon the pathognomonic "ground-glass haze." Examination of the sputum by the special technique of Carter *et al.* revealed the presence of *Carpoglyphus* mites (Fig. 2).



FIG. 2.—*Carpoglyphus*.

to prevent cumulative effects. The patient developed status asthmaticus on the fourth and fifth days of arsenical treatment. Clinical control of the asthma was affected by the tenth day. The leucocytes gradually declined to 12,500, with eosinophils 11% on the twenty-second day, and to 10,000, with eosinophils 6%, on the thirtieth day after starting acetarsol therapy (Fig. 1). The patient has had no recurrence of asthma for fourteen months.

Comment

This case conforms in all its features to the typical cases recorded by Soysa and confirms his observations as regards the symptomatology, pathogeny, and therapy of this syndrome. I believe that pulmonary acariasis is a perfectly delimited pathological entity which should be separated from allied respiratory disorders.

Though generally regarded as a tropical disease, this syndrome may be much commoner than it may seem to be in temperate zones, such as Europe, where the causal Acarina are widely distributed—for instance, in stored food products. In England have been found the mites of the genera *Carpoglyphus*, *Glyciphagus*, *Cheyletus*, *Tarsonemus*,

and *Tyroglyphus* (Hughes, 1948). It seems possible, therefore, that careful examination of sputum in cases of eosinophilic respiratory disorders may disclose the presence of mites in countries that are not circumscribed within the tropical zone.

The laboratory procedure required for this purpose is long and laborious. Strict precautions have to be taken against accidental contamination of the specimens of sputum that have to be collected over a 24-hour period. The mass of material to be examined is so large that the work demands much patience and perseverance. The relatively small number of mites found in this quantity of sputum may appear insignificant, but it should be remembered that a few mites can cause disproportionate clinical disturbances in other acarine infestations, such as scabies. It may be argued that airborne mites may be prevalent in the respiratory passages without causing clinical or haematological manifestations. This objection has been met by the careful examinations made by Soysa (1949) of 44 control specimens of sputum taken from healthy persons and from patients suffering from non-eosinophilic respiratory diseases: not a single mite was found in any case, though 17 of these subjects were definitely exposed to the risk of inhaling airborne mites.

In a recent review of the aetiology and pathogeny of eosinophilic pneumonitis Soysa (1952b) discussed the various conditions that may present with somewhat similar clinical manifestations, and has suggested that, of the pathogenic agents that have been alleged to be responsible for eosinophilic pneumonitis, mites, metazoa, and fungi seem to come most under suspicion at the present time. He holds with the view that, despite the multiple aetiology and diverse pathological conditions that have been observed or suspected, the manifestations are linked by a common anaphylactoid pathogeny which is probably related to vascular allergy.

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Infirmity. I am grateful to the medical and technical staff of Imperial Chemical Industries, who took a great interest in the case and analysed the parent liquid from which the beer-bottle sample was derived.

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Medical Memorandum

Traumatic Retroperitoneal Rupture of Duodenum

In view of the rarity of traumatic retroperitoneal rupture of the duodenum the following case is worthy of record.

CASE REPORT

A window-cleaner aged 17 was admitted on October 16, 1951, at 4.30 p.m. with a history of having fallen from a window-sill, a height of 20 ft. (6 metres), one hour previously. No one had seen him fall and he had been picked up by his workmate a few minutes later. He was quite conscious, but had no memory of falling. He was complaining of severe pain in his abdomen and was bleeding from his nose.

On examination his temperature was 98° F. (36.7° C.), pulse 92, respirations 20, and blood pressure 110/70. He was bleeding from both nostrils and he had a 1-in. (2.5-cm.) laceration of the chin. There was no obvious fracture of the nose or mandible. He complained of severe abdominal pain, mostly in the umbilical and hypogastric regions. He vomited twice during examination, and blood-staining of the vomitus was noticed, but the possibility of blood swallowed from his epistaxis was considered. Abdominal examination revealed abrasions and some bruising in the right iliac fossa. He was very tender, with some guarding over the whole abdomen, especially in the left iliac fossa. There was no rigidity. Bowel sounds were not heard. Dullness was not elicited in the flanks, and rectal examination caused no undue discomfort. A soft rubber catheter was passed to exclude bladder injury. It passed easily and 6 oz. (170 ml.) of clear urine was obtained. A diagnosis of ruptured abdominal viscus was made, and laparotomy was performed by one of us (W.P.C.) two hours after admission.

Operation.—Under thiopentone, cyclopropane, curare, and oxygen anaesthesia the abdomen was opened through a long right paramedian incision. A small quantity of free blood was present in the peritoneal cavity. By palpation no tear was found in either spleen or liver. Further inspection revealed a large left-sided retroperitoneal haematoma behind the descending colon and extending forwards between the layers of the pelvic mesocolon. The haematoma extended upwards and towards the right, and was continuous with a haematoma behind the hepatic flexure and the duodenum. The right kidney felt normal. Blood and extensive bile-staining were present in the lesser omentum. A laceration of the biliary tract was considered. The gall-bladder was normal and contained bile. The lesser omentum was incised and no lesion was seen in the common bile duct. Bile-stained fluid was coming upwards from behind the first part of the duodenum. The peritoneum along the right border of the duodenum was divided and the

duodenum mobilized to the left. A 1-in. (2.5-cm.) linear tear was found on the posterior wall of the first part of the duodenum across the long axis of the bowel. Bile-stained contents were emerging. The tear was closed with two layers of continuous catgut. Examination of the whole bowel revealed no further lesion. Abdominal toilet was performed and the abdomen closed in layers with a stab drain to the duodenum. Extraperitoneal drainage of the left-sided retroperitoneal haematoma was carried out.

After operation 2 pints (1.1 litres) of blood was given by intravenous drip followed by alternating normal saline and 2½% dextrose. Gastric suction was instituted.

His progress was stormy. On the fourth post-operative day the stab drain to the duodenum discharged bile-stained fluid which digested the surrounding skin. Although not analysed, this was doubtless due to associated pancreatic trauma. It cleared up on the ninth day. The abdomen gradually distended and there were signs of paralytic ileus by the sixth post-operative day. Gastric suction and intravenous fluids were continued until the tenth day, when the bowel action returned. The drains were removed on the ninth day and the sutures on the eighteenth day, when the wound was soundly healed and the patient was eating normally.

He reported four weeks after discharge, and was symptom-free and on a full diet. A barium-meal examination on December 7 revealed a slight narrowing of the first part of the duodenum, probably as a result of the operation.

COMMENT

Closed traumatic retroperitoneal rupture of the duodenum is a rare injury. Johnson (1944) collected 52 cases from the literature between 1910 and 1943. The causative force may not necessarily be great, and the diagnosis of intestinal abdominal injury may therefore be delayed until signs of retroperitoneal sepsis or haemorrhage develop. When the parietal peritoneum of the abdomen is torn the signs of developing peritonitis may be the first indication of the diagnosis. In the case here reported the large retroperitoneal haematoma on the left side, associated with the free blood in the peritoneal cavity, no doubt explains the severe lower abdominal pain and tenderness in the left iliac fossa and probably accounted for so early a laparotomy.

The aetiology of retroperitoneal rupture of the duodenum is not clear. Cases of "burst injury" of the duodenum due to sudden compression of gastric contents with "blow out" of the duodenum have been described. This type of injury would be expected to cause a tear in the long axis of the gut. In the above case the tear was across the long axis and was most probably due to a sudden strain at the junction of the fixed and mobile parts of the first part of the duodenum associated with crushing against the vertebral column.

At operation, as pointed out by Simpson (1950), bile-staining of the retroperitoneal tissues should suggest a diagnosis and warrant inspection of this region. Simpson also recommends simple suture if possible, as was performed in this case.

Our thanks are due to Mr. G. H. Buckley for permission to publish this case.

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Reviews

A NAVAL OCCASION

Our National Ill Health Service: An Essay on the Preservation of Health. By Surgeon Vice-Admiral Sir Sheldon F. Dudley, K.C.B., F.R.S., Hon.L.L.D.(Ed.), M.D., F.R.C.P., Hon.F.R.C.S.Ed., D.T.M., D.P.H. (Pp. 225. 15s.) London: Watts and Co. 1953.

Is this book meant to be taken seriously? One might regard it as a *jeu d'esprit* were it not that its distinguished author, who was Medical Director-General of the Royal Navy for the greater part of the war, is not the person to jest with sacred subjects. Its theme is that the N.H.S., which shows "appalling ineptitude after five years of brawling, obstruction and procrastination by all concerned," fails because it aims at cure rather than prevention; it should have been modelled on the medical services of the Forces, particularly the Royal Navy.

The thread of the argument, conspicuous enough in the first section, becomes less and less perceptible as the book proceeds until, before the middle is reached, it is irretrievably lost in a patchwork of bewildering variety and inconsequence—priority in medical discovery, anonymity in publication, unnecessary operations, the treatment of burns, the ethics of placebos and proprietary medicines, the inferior intelligence of Members of Parliament, and many other topics of lively interest but hardly to the point. For any evidence of consistent thought apposite to the subject one looks in vain. In the section on "The Preservation of Global Health," for instance, fulmination against the Civil Service and particularly the Treasury (whose staff should be trained not in the classics but in applied anthropology) leads straight to a discussion of world food production, the host-parasite relationship, and the damage done by the rabbit, moth, locust, rat, and prickly pear. Then follow field hygiene and its enforcement by health education and propaganda.

The author naturally gives great prominence to Lind, Blane, and Pringle, who, it will be generally admitted, from their Service experience taught civilian medicine the principles of prevention. But this happened in the eighteenth century. Sir Sheldon fails to mention that in both wars of the twentieth century the Royal Naval medical services had to be buttressed by the appointment of civilian consultants who were given the rank of admiral. He seems to forget, too, that naval personnel are highly selected for an age-to-period of maximum efficiency and discarded before degenerative and senile changes set in. Criticism of the Medical Man-Power Committee comes ill from a Service which might have been less wasteful of its own personnel.

The author admits the great advantage of naval discipline, but thinks its absence from civilian life can be remedied. The principles of health preservation are to be instilled into children at a tender age. He would like to see problem families put "into large establishments, under a firm but benevolent discipline such as that of the Services, whereby all sorts of bad or amoral, antisocial personalities become happy, self-respecting citizens." He admits, however, that this is impracticable until "fecklessness is made a punishable misdemeanour or certifiable as a dangerous form of mental deficiency." As if these remedies were not sufficiently draconian, a code of health morals would be laid down by a "panel of medical specialists assisted by experienced Law Lords." Among offenders would be those who sneeze in buses without covering their faces.

An epilogue deals with Utopias, uncongenial work, the harm which "meddlesome psychiatrists" might have done to Dr. Johnson, Charles Darwin, and Florence Nightingale, the use of leisure, and the obscure "as if" philosophy of Vaihinger. It ends with the strange belief that King Solomon was the most famous of all Freudians and that he was the author of *Ecclesiastes*:

Since this book was written the Government has appointed a commission to inquire into the medical services of the Forces. *Post hoc*, of course, but can anything be wrong? FRANKCON ROBERTS.

RESUSCITATION

Inhalation Therapy and Resuscitation. Meyer Saklad, M.D. American Lecture Series. (Pp. 338; 130 illustrations. £2 14s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

Preventable anoxia as a direct cause of death is commoner than is generally believed. Not only in anaesthesia but in a wide range of diseases and circumstances this condition occurs, and its recognition, prevention, and treatment would undoubtedly save many lives every year. Dr. Saklad has cast his net wide to gather the material for his book. The physiology of respiration, the pathological effects of oxygen lack on every organ of the body, the treatment of a variety of conditions ranging from eclampsia to heat exhaustion and from intestinal distension to whooping-cough, the apparatus and technique of oxygen therapy, and the methods of artificial respiration and cardiac resuscitation—all these and many other topics too are to be found in some detail. The text does not make easy reading, for it is too often little more than a series of abstracts from the literature, but as a work of reference to the causes, results, and treatment of oxygen lack the book has no equivalent. It is well produced, the illustrations are clear and generally helpful, and an alphabetically arranged bibliography of some 402 papers and books is included.

This monograph is recommended to anaesthetists and others called upon to treat a patient suffering from oxygen lack. It is an invaluable book of reference to readers interested in the literature on anoxia.

W. W. MUSHIN.

SYNOVIAL FLUID

Synovial Fluid Changes in Joint Diseases. By Marian W. Ropes, M.D., and Walter Bauer, M.D. A Commonwealth Fund Book. (Pp. 150. £1 5s.) Harvard: University Press. London: Geoffrey Cumberlege. 1953.

Over a period of more than twenty years Dr. Marian Ropes and Dr. Walter Bauer, with others of their colleagues at the Massachusetts General Hospital and the Harvard Medical School, have become well known for a number of outstanding contributions—both clinical and pathological—to our knowledge of joint disease. One aspect of their studies is summarized in this interesting book, which includes a large amount of hitherto unpublished material. Not only are their findings of great practical importance to those who are concerned with the diagnosis of joint diseases, but they are of interest in connexion with many problems of the physiology of synovial fluid formation.

Joint disease is usually marked by some degree of effusion, and ever since the introduction of chemical methods as aids to clinical investigation it has been hoped that analysis of aspirated fluid would provide information of help in diagnosis. Study of the present volume makes it clear that, although this has proved to some extent to be so, there are serious limits to the diagnostic possibilities of synovial fluid analysis. No individual chemical constituent of synovial fluid shows any change which is specifically diagnostic for a particular disease, although the pattern of change in a number of constituents broadly reflects the type and the extent of pathological change in the synovium of the involved joint. Even so, on the basis of their tabulated findings for 1,500 fluids, the authors suggest that the following determinations are sometimes clinically rewarding: viscosity; pH; cell count (total and differential); protein content; albumin:globulin ratio; sugar content; mucin content; and the type of mucin precipitate obtained on addition of acetic acid. Values for non-protein nitrogen, uric acid, and electrolytes—such as calcium, inorganic phosphate, and chloride—were not found to have any diagnostic significance.

The main purpose of the work is to show that joint diseases may be divided into two main groups on the basis

of synovial fluid findings. The first of these groups includes conditions such as traumatic effusions, osteoarthritis, osteochondritis, neuroarthropathy, and osteochondromatosis, where the joint fluid is clear and viscous, forms little or no clot, contains few cells—mostly lymphocytes, and mononuclears—has a relatively low protein content with a high albumin:globulin ratio, has a sugar content approximately the same as that of the blood, and gives a conspicuous mucin precipitate. Contrasting with these is the second main group consisting of all infectious arthritides and rheumatoid arthritis, where the fluids are turbid and less viscous, form large clots, contain many cells, most of which are polymorphs, have a high protein content with a low albumin:globulin ratio, show a sugar content lower than that of the blood, and give a poor mucin precipitate. It is suggested that the joint effusions in the first group have a common "traumatic" origin, and that effusions can thus be regarded as "traumatic" or "inflammatory." The main diagnostic value of chemical study is that it aids materially in distinguishing between these two large groups, although in a few conditions—notably rheumatic fever, pigmented villonodular synovitis, and gout—the fluid changes resemble each of the two groups in some respects.

H. A. Sissons.

POLIOMYELITIS

Die Poliomyelitis. By Professor Stéphane Thieffry. (Pp. 328; 205 figures. 26.80 francs.) Bern and Stuttgart: Hans Huber, 1953.

This is a German edition of a French symposium published in 1950. It suffers from the unevenness of treatment characteristic of books formed from a collection of essays. The first essay, on epidemiology and immunology, has been brought up to date and is well documented in the text. It is as clear and balanced a short summary of the knowledge of to-day as I have yet read. After this the character of the book alters and the succeeding essays resemble more closely the chapters of a student's textbook and are devoid of references. The essays on the disturbances of respiration, muscle strength, and electrology are preceded by full discussion of the physiological basis of the respective subjects which at times is rather elementary. Their inclusion is useful for the student but swells the bulky volume unnecessarily. For example, the detailed description of the general chemical factors associated with muscular atrophy are not specific for poliomyelitis alone and could therefore have been compressed or omitted.

The book is illustrated by a series of line drawings which are most useful in the excellent section on testing muscle strength. Although the standard grading of muscle function is given, there are no comparative tables showing changes in muscle balance with convalescence. The orthopaedic section of the book is well illustrated and forms a sound résumé of the methods used with success. More important, it is dogmatic about what cannot be done with success.

While such a book, embracing as it does many specialties, cannot be expected to advance each one, it does give an overall picture of the disease and forms a sound student's manual. Many specialists would gain from it the advantage of a deeper insight into the problems of their co-workers on this distressing disease.

J. G. BONNIN.

EXAMINING THE PATIENT

Physical Examination of the Surgical Patient. By J. Englebert Dunphy, M.D., F.A.C.S., and Thomas W. Botsford, M.D., F.A.C.S. (Pp. 326; 188 figures. £1 17s. 6d.) Philadelphia and London: W. B. Saunders Company, 1953.

The tendency for the student to rely on laboratory tests and the x-ray examination in the diagnosis of surgical cases has often been deplored, but the only way to counteract it is to provide attractive books teaching him how to diagnose by his unaided senses. The authors quote Thayer: "Learn to see, hear, feel and smell and know that by practice alone can you become an expert," and in the preface they state that

"this book is designed to focus attention on the methods and importance of eliciting physical signs in surgical conditions." They have undoubtedly succeeded in their aim, and we can cordially recommend the book to every surgical student.

The changing problems in diagnosis are indicated by the caution given that in infections of the hand "systemic signs may be completely abolished by vigorous antibiotic therapy although the local process may be progressing." The same warning is given in diagnosis of peritonitis: "The liberal use of the antibiotics greatly alters the signs of peritonitis. There may be very little abdominal tenderness, rigidity, or distension." This is a book to welcome and not to criticize, but we should like to see a fuller description of the signs of coxa vara, and Figures 57 and 38 are not in our opinion distinctive enough. English students need not worry about distinguishing the bite of the black widow spider in diagnosing acute abdominal conditions.

ZACHARY COPE.

MEDICINE AS A WHOLE

Modern Concepts in Medicine. By Julius Jensen, Ph.D. (in Medicine), University of Minnesota; M.R.C.S., L.R.C.P. (Pp. 636; illustrated. £4 6s.) London: Henry Kimpton, 1953.

Successful textbooks may come about for at least two reasons. A book may represent material which the author has practised and perfected through years of teaching students and appreciating their difficulties. Or it may represent a new and stimulating approach to a subject, as when Osler gathered together the clinical investigations and pathological observations of the nineteenth century into a single vividly written volume, or when McCallum wrote of pathology in all its manifestations as a process and not as something static. Jensen has tried to write this second type of book, but good intentions are not the same as achievement, and this must be frankly described as a disappointing book. Jensen's thesis is that medicine can be regarded as a consistent whole, in harmony with a general unitary conception of man's life and his destiny. The keys to this holist conception are to be found in Selye's work on stress, the theory of cybernetics, and the writings of philosophers such as Gerald Heard. So far so good, but when we get to the body of the book we find nothing new or fresh in this sense. The introduction is on cellular activity and principles of adaptation. The second part is entitled the "Essential Processes of Adaptation" and is on the various mechanisms of homeostasis. Part III, "Structural Facilities in Support of Adaptive Processes," is internal medicine treated in the ordinary way. Part IV, "Cybernetics," deals with enzymes, vitamins, the endocrines, and the nervous system. The general impression is of material taken from standard textbooks of applied physiology and medicine which has been rearranged under new titles. The material is not illuminated with new ideas, and the book cannot be recommended for the ordinary medical reader.

L. J. WITTS.

PICTURES OF PARASITES

Synopsis of Medical Parasitology. By V. E. Brown, Ph.D. (Pp. 109; 103 figures. \$3.50.) Wisconsin, U.S.A.: V. E. Brown. No date.

Although most of the drawings in this book are beautifully executed, it is regrettable to find that in many instances they are inaccurate in detail. To take but a single page (p. 102), we find that in the drawing of the microfilaria of *Loa loa* no cephalic space is shown, and that in the figure of a *Mansonella ozzardi* microfilaria nuclei are shown extending to the tip of the tail. In both cases these details of structure are taxonomically of great importance. These are not the only mistakes on the page. Little can be expected of a text that deals with trypanosomes in less than a thousand words, but the book is hardly intended to be more than a collection of drawings.

FERGUS J. O'ROURKE.

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TOXIC GOITRE

In October, 1863, Trousseau¹ was consulted by "a young married lady who habitually resides in Paris suffering from a subacute exophthalmic goitre." He was occupied with the idea that there would be some danger in giving iodine—and wrote iodine instead of digitalis on the prescription. When the patient returned in a fortnight her pulse rate had fallen from 150 to 90. Despite this fortunate accident Trousseau wrote in his subsequent comments that iodine generally does harm in Graves's disease. Not until 30 years ago did Plummer,² of the Mayo Clinic, re-introduce and popularize the use of iodine for hyperthyroidism, following it with thyroidectomy. Two other landmarks stand out in the treatment of thyrotoxicosis: the introduction of radioactive iodine, first recorded by Hertz,³ and the discovery of the antithyroid drug thiouracil by Astwood,⁴ also of Boston, in 1943. The clinician, who forty years ago had no effective therapy to offer in Graves's disease, is nowadays sometimes bewildered by finding that he has no fewer than three forms of treatment from which to choose. Like Bassanio in *The Merchant of Venice*, he is faced with a good deal of heart searching before he can decide in which of the three caskets he will find the right answer.

The cause of thyrotoxicosis remains unknown, though much evidence points to the anterior pituitary as the villain of the piece. Since this disease is subject to spontaneous remissions and occurs in widely varying degrees of severity, it may also present particular difficulties in diagnosis. For these reasons the introduction of techniques using radioactive iodine as a diagnostic tool is particularly valuable and is

rightly emphasized in the Bradshaw Lecture delivered by Professor E. J. Wayne which we publish in the opening pages of the *Journal* this week. He reviews in comprehensive fashion the clinical manifestations of thyrotoxicosis and concludes that, while most of the classical signs and symptoms are a reliable guide to the disease in men, the diagnosis may be much more uncertain in women, especially at the menopause. Increased appetite, loss of weight, preference for cold weather, hot and sweating hands, persistent tachycardia especially during sleep, and hyperkinesis prove the most helpful diagnostic features. But there remains a group of patients in whom the diagnosis cannot be made with certainty, and then laboratory tests are necessary.

So many tests of thyroid function are available that it is clear that none is completely satisfactory. Estimation of the basal metabolic rate still remains the most useful test which is generally applicable, and when carried out with the careful technique described by Robertson⁵ it is remarkably accurate. But the metabolic rate is raised in conditions other than thyrotoxicosis and may be difficult to determine accurately in the nervous woman; moreover, the test can be conducted satisfactorily only on the in-patient.

Serum protein-bound iodine estimations (P.B.I.) are exceedingly difficult to carry out and the technique is expensive and exasperating—except in the hands of such experts as Riggs.⁶ The serum P.B.I. is a direct measure of the level of circulating hormone and therefore an excellent guide to hyperthyroidism; it is a pity that no simple method of determining it has been discovered. Cholesterol estimations⁷ reflect indirectly the function of the thyroid gland and are of most value in assessing hypothyroid states.⁸ Creatine and galactose tolerance tests vary too much in other pathological states to be of specific use in assessing hyperthyroidism.

Radio-iodine offers a unique way of measuring thyroid action, and it has deservedly become popular in clinics where many patients with thyroid disease are seen. It is idle to argue whether the B.M.R. or the radio-iodine uptake is a more accurate test of hyperthyroidism, since the two measure different functions of the gland. In fact all thyroid tests measure some aspect of thyroid metabolism, and a combination of them is more reliable than any single one. Radio-iodine has been used in many ways for measuring thyroid function. The rate of uptake in the gland can be obtained by placing a Geiger-Müller counter over the neck⁹; the amount excreted in the urine can be estimated from samples,¹⁰ or the uptake in neck and blood stream can be compared. In addition radio-iodine offers an easy method of measuring the radioactive P.B.I. in the blood.¹¹

¹ *Lectures on Clinical Medicine*, 1868, 1, 587. London: The New Sydenham Society.

² *J. Amer. med. Ass.*, 1923, 80, 1955.

³ *Ibid.*, 1946, 131, 81.

⁴ *Ibid.*, 1943, 122, 78.

⁵ *Lancet*, 1952, 1, 511.

⁶ *Pharmacol. Rev.*, 1952, 4, 284.

⁷ Gainsborough, H., *Proc. roy. Soc. Med.*, 1935, 28, 989.

⁸ Bartels, E. C., *J. clin. Endocr.*, 1950, 10, 1126.

⁹ Pochin, E. E., *Lancet*, 1950, 2, 41 and 84.

¹⁰ Fraser, R., et al., *Quart. J. Med.*, 1953, 22, 99.

¹¹ Goodwin, J. F., et al., *ibid.*, 1951, 20, 353.

¹² *Med. J. Aust.*, 1950, 1, 139.

¹³ *Lancet*, 1947, 1, 241.

¹⁴ Moynihan Lecture, Royal College of Surgeons, 1954.

¹⁵ Taylor, S., *Proc. roy. Soc. Med.*, 1953, 46, 242.

¹⁶ Nickson, J. J., *J. clin. Endocr.*, 1948, 8, 1721.

¹⁷ Cope, O., *New Engl. J. Med.*, 1952, 246, 368.

¹⁸ *N.Y. St. J. Med.*, 1951, 81, 1633.

¹⁹ Catz, B., and Starr, P., *J. clin. Endocr.*, 1952, 12, 228.

²⁰ *J. Hyg., Camb.*, 1927, 26, 1.

²¹ *Medical Research Council Memorandum*, No. 18. H.M.S.O., London, 1948.

The treatment of thyrotoxicosis by long-term therapy with thiouracil compounds can now be fairly assessed after the first ten years of trial. If a patient is given thiouracil it is almost always possible to control the hyperthyroidism; later the disease can still be controlled with a much smaller dose. Poate¹² in Sydney and Himsworth¹³ and others in this country have reported series of patients treated in this way. In this issue of the *Journal* Dr. J. F. Goodwin and his co-workers report at p. 422 the results obtained at Sheffield on 126 patients who were treated initially with thiouracil and a large number of whom have been maintained symptom-free for periods up to four and a half years. Their final conclusions are that about two out of every three patients will eventually relapse after withdrawal of treatment no matter how long that treatment is carried out. In view of this, such therapy can be recommended only for patients who live fairly close to a medical centre, since thiouracil may at any time cause agranulocytosis, and this will require treatment in a hospital if a fatal issue is to be avoided. The other disadvantages of long-term thiouracil therapy are that the thyroid gland enlarges, especially if the dose is not reduced early enough, drug rashes are fairly common, and unpleasant side-effects may be seen in individual patients.

The treatment of hyperthyroidism with radio-iodine is fairly new; the first patients were treated ten years ago, but they were few in number and a short-lived isotope, I¹³⁰, was usually given. To-day I¹³¹, with a half-life of eight days, is in common usage, and many clinics have now been equipped to provide this kind of therapy. Speaking at the Royal College of Surgeons last month, Dr. George Crile, jun., of Cleveland,¹⁴ stated that in his clinic hyperthyroidism, when not associated with a nodular gland, was now treated exclusively with radio-iodine. Over 1,000 patients have been so treated in the last five years, with a recurrence rate of about 1%. One disadvantage of this kind of therapy is that it is impossible to estimate the dose accurately, since this depends on the size of the gland. But the treatment has many advantages: the patient is spared an anaesthetic and operation and has only a short stay in hospital, and there is no risk of damage to the recurrent nerves or parathyroids. However, there remains the possibility that this therapy may lead to thyroid cancer. In the experimental animal there is quite good evidence that radio-iodine has a carcinogenic effect. Because of these findings many are unwilling to prescribe it for a patient under 40 years of age,¹⁵ remembering that in the past the irradiation of skin led to malignant changes after a long latent period,

often of the order of twenty years. At present the number of patients treated is too small and the time elapsed since treatment too short for a firm opinion to be given, but it appears unreasonable to give young patients this therapy.¹⁶

The surgical treatment of thyrotoxicosis has been greatly improved by preparing patients with the thiouracil drugs, so that now the mortality rate is negligible.¹⁷ In addition the practice of removing at least seven-eighths of a toxic gland has reduced the recurrence rate of thyrotoxicosis to about 2%. There is no doubt that surgery offers the best form of treatment for toxic nodular goitre, for this is resistant to all kinds of medical therapy. If the patient with Graves's disease is prepared with methylthiouracil or neo-mercazole, and iodine is given in the immediate pre-operative period, the results of operation are good. In this week's *Journal* Dr. H.-J. B. Galbraith and his colleagues describe at page 420 the pre-operative use of iodothiouracil, which is a thiouracil compound containing iodine in its chemical structure. This drug has been in use for about five years now, and McClintock,¹⁸ in Albany, and Catz and Starr,¹⁹ in Los Angeles, have described large series of patients treated with it. The claim of the latter workers that this compound is more effective in hyperthyroidism than the administration of thiouracil and iodine separately has not been confirmed by other workers, and Doniach has shown histologically in the rat that iodothiouracil is less effective than either thiouracil or iodine alone. It seems, however, that if iodine and thiouracil are given concurrently or in combination, as described by Galbraith, excellent preparation is obtained for the surgeon.

The number of operations for hyperthyroidism fell precipitously with the introduction of the thiourea compounds, but it is now seen that they are climbing again as it becomes apparent that these anti-thyroid drugs when used for long-term therapy do not offer a very good chance of producing a remission. Radio-iodine is being used increasingly for this disease, but until another ten years has elapsed it is unlikely that many clinicians will be happy in using it extensively because of the risk of causing cancer.

The old observation, confirmed by Campbell²⁰ in 1927, that hyperthyroidism is commoner where there is endemic goitre seems to have been overlooked in Britain. There are many parts of this land where there is a relative iodine deficiency and simple goitre occurs, as shown by the Medical Research Council's report.²¹ Despite the recommendation that salt should be iodized in this country, probably not more than 2% of salt consumed at present has this addition.

LUNG CANCER AND SMOKING

'That there is a "strong presumption" of a causal relationship between smoking and cancer of the lung was conceded in Parliament by the Minister of Health¹ last week. The evidence on which this opinion is based came to a head with the publication in this *Journal* of the paper² by Doll and Bradford Hill in 1950, and was reinforced by their second paper³ in 1952. The data have now been carefully assessed by a special panel under the chairmanship of the Government actuary (Sir George Maddex)⁴ on behalf of the Standing Advisory Committee on Cancer and Radiotherapy, which in turn advised the Minister. As readers who followed the cautious and close-knit arguments of Doll and Bradford Hill might expect, these writers' conclusions from their own and others' researches⁵ find ample confirmation in the statement that the Minister gave to Parliament. The evidence of some connexion between smoking and lung cancer may have received some additional support recently from the discovery by Wynder, Graham, and Croninger⁶ that the experimental painting of mice with tobacco tar causes carcinoma of their skin. Moreover, some earlier experiments, also in the U.S.A., had shown that mice of a strain liable to develop lung cancer were more likely to develop it when exposed for a year to tobacco smoke than other mice of the same strain not so exposed.⁷ The validity of these smoke experiments needs confirmation, and a series of somewhat similar experiments begun by the Medical Research Council 18 months ago will test the point. The strength of the evidence so far gathered together moved the tobacco manufacturers in the U.S.A. a month ago to set up a committee for research into lung cancer and smoking, and now British manufacturers have followed with the offer of a donation of £250,000 to the Medical Research Council, to be used at the Council's discretion.

Though so much evidence has been provided in Britain and the U.S.A. showing that some connexion exists between smoking and lung cancer, relatively much more is needed before a clear understanding of the connexion is obtained. No substance known to be carcinogenic to man, for instance, has yet been identified in tobacco, and this is one of the problems on which research is concentrated. The mouse carcinogen discovered by Wynder and his colleagues could prove to be misleading, a hazard to mice but not to

men. Again, it is well known that some patients with lung cancer are non-smokers. Nor is tobacco smoke the only agent or condition associated with the causation of lung cancer, for Stocks⁸ has shown that there is also a close association between urban residence and incidence of the disease. The possibility that townsmen smoke more than countrymen would seem to be insufficient to account for the disparity. On the other hand the principal and more positive facts known about lung cancer and smoking are broadly two: first, there is some kind of causal connexion; secondly, the risk increases with the amount smoked. In addition, cigarettes seem to carry a greater risk than pipes and cigars, and the risk attached to cigarettes may possibly be diminished by the use of filter tips or cigarette holders.

At a press conference held last week the Minister of Health wisely pointed out that it is not his duty or his Ministry's to speculate on the significance of the published reports, and he emphasized that research must be pursued with all vigour and speed. He considered the time had not yet come when the Ministry should issue public warnings against smoking, but, as his advisers pointed out, "It is desirable that young people should be warned of the risks apparently attendant on excessive smoking." The evidence perhaps allows medical men individually to go rather further than this and tell patients that there is probably an increased risk, to greater or less degree, associated with any amount of smoking, especially of cigarettes.

CHEMICALS IN FOOD

Agricultural chemicals used as insecticides, fungicides, and weed-killers have been in the medical news for the last few years. The dangers of some of these materials have been described, discussed, and, unfortunately, illustrated by cases of poisoning. In 1951 a working party under Professor S. Zuckerman reported¹ on the situation and made recommendations which have now been incorporated in legislation designed to reduce these hazards. No fatal or serious cases of poisoning were reported in this country during the past season. This satisfactory situation may be due not so much to the regulations as to the general alertness of the manufacturers and users, backed up by the watchfulness of the Government departments concerned.

Some of the chemicals used as pesticides may persist in crops and find their way in very small quantities into food. This possible danger is discussed in the second report² of the working party, which was reconstituted under the same chairman after finishing

¹ See *Journal*, p. 465.

² *British Medical Journal*, 1950, 2, 739.

³ *Ibid.*, 1952, 2, 1271.

⁴ The other members were Professor M. G. Kendall, Dr. W. P. D. Logan, and Dr. P. L. Mackinlay.

⁵ Wynder, E. L., and Graham, E. A., *J. Amer. med. Ass.*, 1950, 143, 329.

⁶ *Cancer Res.*, 1953, 13, 855. See *British Medical Journal*, December 19, 1953, p. 1362.

⁷ Eisenberg, J. M., *Science*, 1952, 116, 561.

⁸ *Brit. J. Cancer*, 1952, 6, 99.

its first task in 1951. It is not open to doubt that some of these chemicals are dangerous to those who use them. The doses received by men accidentally poisoned in this way are probably comparable in size to those causing signs of poisoning in experimental animals. The risks of consuming the very small quantities that could find their way into food are difficult, if not impossible, to measure. The dose likely to be taken in this way would probably be far below that capable of producing unequivocal changes in experimental animals.

Discussions on food are said to rank high on the list of subjects "having curious powers of robbing the speaker of his powers of logic,"¹ and members of the working party making this report have done well to retain their sense of proportion. The report gives an excellent survey of the situation as it exists to-day, and on the whole is reassuring. It contains an impressive list of materials that are used in pest control, including rodenticides. Incidentally, many will regret that the working party has not followed the lead of some other countries in condemning outright the use of bacterial cultures as rat poisons when there are other effective and safer rodenticides now freely available. In general the report states the facts or points out where ascertainable information is deficient and suggests how it may be amassed in the future. It wisely avoids adding more speculation to the question of possible health hazards arising from small quantities of chemicals in food, and begins by stating that no evidence has been presented "of any specific instances of illness which have resulted from eating such [treated] food. The position does not appear to have been established as one of immediate danger." Evidence and not mere opinion is needed before this assessment of the situation can be upset.

The working party then sought facts about the extent of the use of toxic chemicals in agriculture and the amounts that are actually present in food. These chemicals are not widely used in this country, but their use may become commoner as agricultural methods are modernized and efforts intensified. As to imported food, little information is available, and there is no control of the chemical treatment received during production, storage, and transit. Though some details might be obtained from analyses of food reaching this country, a much more satisfactory solution would be to organize some international

exchange of information about the practices current in each food-producing country. The routine analysis of food is a widespread practice, but the search at present is mainly for the older and better-known poisons, such as lead and arsenic. The range of analytical control will have to be extended before we can obtain information about the quantities of the new chemicals in our food.

The working party recommends that a committee should be set up "to advise departments on problems relating to the risks to the consumer arising from the use of toxic substances in agricultural products and in the storage of food," and this recommendation has been accepted by the Government. If it fulfils the functions suggested for it, the advisory committee will gradually accumulate factual data on which future action may be based. When it has acquired some of these facts, it is to be hoped that it will be able to speak with authority on these new agricultural practices, so that a fully documented case can be made out for or against the use of any particular toxic material. Such authority is in fact badly needed in the whole field where chemicals are deliberately or accidentally added to food. Seevers,⁴ for instance, has pointed to the impossibility of proving anything to be harmless and shown how scientific data have been distorted in attempts to make a case for or against the addition of this or that chemical to food. He writes:

"It is almost axiomatic that areas of activity such as these in which *opinion* may substitute for lack of factual data may become the province of the crack-pot, self-styled scientist, and the well-meaning but misinformed reformer, [who] may exert a powerful influence on the general public by posing as a champion of the individual safety and protector of the public welfare."

It is doubtful if the influence of any such reformer would ever equal or exceed that of a powerful commercial interest anxious to introduce a new material or technique into food production.

Several experts have suggested that decisions about the permissible chemical additions to food should be within the province of the medical profession, which, they think, is losing control of the situation. This presupposes that there are formulae that can be applied which will enable the doctor to decide whether or not a chemical will be harmful in given doses. But much still remains a matter of opinion. Mellanby⁵ has suggested that some of the diseases of our modern civilization may be attributable to the effects of eating sophisticated food. Dodds,⁶ taking an opposing stand, is apparently prepared to put his faith in animal tests to determine whether or

not a substance is likely to be harmless. But it is difficult to interpret the findings of animal tests. Some would allow a large safety factor and expect a substance to be harmless to animals in doses exceeding by 10- or 100-fold those likely to be consumed by man. The results of some recent experiments in which sodium chloride was fed to rats⁴ would lead, if such a formula was applied, to the condemnation of salt as a flavouring agent. In times of food shortage, rather than go hungry most people would cheerfully accept wheat contaminated with D.D.T. which had been added to prevent the depredation of insects. In other words, we must know the facts—be they political, economic, chemical, or biological—before we can assess what advantages will accrue from accepting an uncertain risk entailed by eating food containing foreign chemicals.

When an advisory committee such as that suggested by the working party has collected enough facts it may eventually frame a policy in which the use of chemicals in agriculture and food storage will come to represent a balance between productivity, cost, quality, keeping properties, nutritional value (for example, vitamin content) of the food and any possible risk of injury to health from chemicals persisting in the food. At least there is little question of the value of these chemicals in improving production and the quality of crops, whereas the benefits of some chemicals added to food during processing may be much more questionable.

BUCCAL CANCER

"Gentlemen," Sir Henry Butlin is supposed to have said to his students at St. Bartholomew's Hospital, "I shall not get cancer of the tongue. I neither smoke nor drink, my teeth have been removed, and I have never had syphilis." What is true for the aetiology of carcinoma of the tongue is also broadly true for the rest of the mouth. To these causes Butlin could have added leucoplakia, the importance of which as a precancerous lesion has long been recognized but the exact significance of which is still a matter for dispute. Two, at any rate, of these factors are less common now than they were at the beginning of the century, and it is therefore not so surprising that buccal cancer is one of the few types of malignant disease which appear to be on the wane. Certainly dental sepsis and patchy leucoplakia are found in the majority of patients with this disease, but it is equally true that it can occur in the cleanest of mouths. Squamous-celled carcinoma of the floor

of the mouth is a rare condition (the term is made to include by some the inferior aspect of the tongue and by others the mucosal surface of the lower alveolus). Only 83 deaths were recorded from this cause in 1952 in England and Wales.¹ *The British Journal of Surgery* has now published the symposium on this subject read before the Association of Surgeons of Great Britain and Ireland in 1952 by Sir Stanford Cade,² Professor Brian Windeyer,³ Mr. A. J. Gardham,⁴ and Dr. J. L. Dobbie.⁵ This valuable contribution puts on record the methods and results of treatment of a large number of patients from five of the hospitals which are justly renowned for their experience in the treatment of cancer. Cade reports on his patients at the Westminster and Mount Vernon Hospitals (97 patients in 25 years); Windeyer on the Middlesex Hospital group (131 patients in 20 years); Gardham on University College Hospital patients (72 patients in 27 years), and Dobbie on those from the Christie Hospital and Holt Radium Institute (427 patients in 12 years). If to these are added the figures published in 1950 by Ledlie and Harmer⁶ on behalf of the Royal Cancer Hospital (190 patients in 10 years) an excellent survey of the subject may be obtained. But for the best interpretation of survival rates, as Miss Marion H. Russell discusses in an article at page 430 of the *Journal* this week, men and women should be considered separately, for women have higher survival rates than do men.

It is generally agreed that the early lesion is best treated by radiotherapy and the late primary lesion by surgical excision, particularly when the mandible is invaded by growth. Secondary nodes are dealt with on the same principles that govern their treatment when arising from primary growths in the tongue. Gardham calls attention to the fact, which is evident not only in the University College Hospital series but in the others as well, that the most diverse methods of treatment produce very much the same proportion of "cures." Thus, interstitial radium needling, double radium mould, and radium applicator-cum-teleradium all result in about 45% five-year survivals for the early cases with no nodes and 15% five-year survivals for the late cases with nodes. Some surgeons and radiotherapists are still willing and even anxious to argue the merits of their own particular choice of treatment. A more rewarding debate might decide which procedure gives the patient least tribulation. In any case the moral is clear: to get patients earlier and treat them effectively.

MILK AND MALARIA

Two years ago Maegraith and his colleagues¹ at the Liverpool School of Tropical Medicine were studying the metabolism of malaria pigment in rats kept on a special diet. Much to their annoyance they found that few of the malaria infections progressed normally: infections were either completely suppressed or of a low intensity, and this line of research had to be abandoned. These workers, however, quickly realized the peculiar significance of their results, and were able to demonstrate that a diet consisting of milk plus certain vitamins inhibited infections of *Plasmodium berghei* in rats. Not

¹ *Toxic Chemicals in Agriculture*, 1951, H.M.S.O., London. Price 1s. 6d.

² *Toxic Chemicals in Agriculture—Residues in Food*, 1953, H.M.S.O., London.

³ Dodds, E. C., *Lancet*, 1953, 1, 1211.

⁴ *J. Amer. med. Ass.*, 1954, 153, 1329.

⁵ Mellanby, E., *British Medical Journal*, 1951, 2, 863.

⁶ Meneely, G. R., et al., *Ann. Int. Med.*, 1953, 39, 991.

¹ Registrar-General's Statistical Review of England and Wales for 1952. Tables, Part 1, Medical, 1953.

² *Brit. J. Surg.*, 1953, 41, 225.

³ *Ibid.*, 1953, 41, 231.

⁴ *Ibid.*, 1953, 41, 241.

⁵ *Ibid.*, 1953, 41, 250.

⁶ Ledlie, E. M., and Harmer, M. H., *Brit. J. Cancer*, 1950, 4, 6.

long afterwards Dr. F. Hawking² attributed the phenomenon to deficiency of *p*-aminobenzoic acid in the diet. This substance (or some derivative) was found to be necessary for the growth of the parasite, and when it was added to the milk diet normal infections followed. Elsewhere in this issue Hawking has analysed the process in greater detail, and has shown that it is not quite so simple as he originally thought. The parasite is affected at the intracorporeal stage when its nuclei are dividing—when it is metabolizing the haemoglobin. Rodhain³ has found that piroplasms—which also live in red blood cells but do not require haemoglobin—are unaffected by deficiency of P.A.B. Likewise, Bray and Garnham⁴ have shown that the pre-erythrocytic stage of mammalian plasmodia in the parenchyma cells of the liver is unaltered by a milk diet, possibly because the chemical processes accompanying nuclear multiplication at this stage do not involve haemoglobin. The malaria parasite is obviously very sensitive to slight changes in the constitution of haemoglobin: even minor alteration of the "sickling" type apparently inhibits growth of the parasite.⁵ Incidentally, it is probable that a milk diet would fail to influence *P. elongatum* infections in birds because this malaria parasite lives principally in cells containing no haemoglobin: such an experiment might provide useful confirmation of the theory.

Hawking now points out that suppression of malaria by milk is a marginal phenomenon. Maegraith⁶ had already reported that at certain seasons of the year the effect is not apparent, presumably because at these times the milk contains an extra amount of P.A.B. or derivative; and Hawking has found that the addition of P.A.B. to a nursing monkey's diet will permit the evolution of a normal infection of *P. cynomolgi* in the baby. On the other hand, he showed that the infection could be completely suppressed in a baby monkey whose mother was on a P.A.B.-deficient diet. The effect of a milk diet is discernible also in human malaria. The relative insusceptibility of African infants to this disease had been noticed for a long time, and Hackett⁷ originally thought that it was due to possession by the child of an inherited immunity; but now a milk diet seems likely to be as important a factor. The effects in breast-fed infants are, however, inconstant and incomplete. Experiments in India⁸ have recently shown that adults can be protected against *P. vivax* infections by living on milk alone.

The metabolic requirements of the malaria parasites are still so incompletely understood that the exact mechanism involved in this phenomenon remains unknown. Hawking points out that folic acid is as effective as P.A.B. in promoting the growth of *P. berghei*, and Fulton⁹ has recently shown that cortisone also brings on a normal parasitaemia in rats on a milk diet. All those working on this subject have realized its

importance to the chemotherapy of malaria, and Hawking reminds us of the way that drugs like sulphoamides or proguanil act in this disease by combining with or taking the place of the P.A.B. (or derivative) and thus depriving the parasite of an essential catalyst for its nuclear growth. This reaction can take place only when the parasite is in the blood; parasites living in liver cells are bathed in such a rich nutrient medium that such drugs cannot cope with the excess of catalyst and are therefore largely incapable of dealing with the tissue stages.

ASCITIC FLUID CIRCULATION

The peritoneal cavity normally contains only a few millilitres of free fluid, but in cases of hepatic cirrhosis or carcinomatous peritonei the volume of peritoneal fluid often exceeds 5 and sometimes even 10 litres. This excessive accumulation is generally attributed to gross over-filtration of fluid in the splanchnic area. When in any given case the volume of the ascites remains stationary the reabsorptive mechanisms are keeping pace with production. It is only recently, however, that studies in both man and experimental animals have shown that ascitic fluid is far from being a stagnant pool, but, like so many other constituents of the body, is in a constant state of flux. The production of ascites in experimental animals by partial ligation of the inferior vena cava above the diaphragm has been closely studied by Whipple and his colleagues¹ with special reference to the protein constituents of ascitic fluid. Using plasma protein labelled by lysine containing C¹⁴, they found that equilibrium between the ascitic fluid and the circulating blood was reached in one to two days in the case of albumin, and in something over two days in the case of globulin. Even more striking were the figures obtained by Prentice, Siri, and Joiner² for the turnover rate of the aqueous component of ascitic fluid. They gave intravenous or intraperitoneal injections of water labelled with tritium (radioactive hydrogen) to six patients with ascites, and recorded the passage of the radioactive water from the plasma to the peritoneal cavity and vice versa. Equilibrium was reached in about 10 hours, and from the slopes of the equilibration curves it was calculated that between 40 and 80% of the ascitic fluid present in any given case was exchanged every hour. Thus in a patient with 6 litres of ascitic fluid the daily turnover lies between 58 and 115 litres.

It has long been known that both fluid and particulate matter can be absorbed from the peritoneal cavity, but its capacity in this respect, demonstrated by the above experiments, is surprising. The results show that ascites can and does develop in the face of an absorptive mechanism capable of dealing with more than 100 litres a day. Figures for the turnover of peritoneal fluid in normal subjects are not at present available, but in view of those obtained by Prentice and his colleagues it is reasonable to attribute ascites to over-production rather than impaired removal of fluid. It is also apparent that only a slight displacement of the equilibrium can lead to rapid accumulation or equally rapid removal of the ascitic fluid.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

THE CEREBROSPINAL FLUID IN DIAGNOSIS

BY

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The examination of the cerebrospinal fluid (C.S.F.) constitutes a very valuable method in the investigation of many diseases of the nervous system, and even in some general disorders. It often enables a firm diagnosis to be made, even while the patient is still at home, and this cannot but be of immense satisfaction to both practitioner and patient. The process of recovery in diseases hitherto fatal, but now yielding to treatment by antibiotics, can be followed with a fair degree of scientific accuracy by means of the examination of frequent samples of C.S.F.

The C.S.F. is nearly always obtained by lumbar puncture. It can also be collected from the lateral ventricles of the brain and from the cisterna magna, but these two sites should be punctured only when the patient is in hospital, where such facilities as an x-ray department and operating theatre are readily available. Discussion of such procedures has accordingly been omitted from this article.

The technique of lumbar puncture,* while relatively simple, does require practice and should be performed only after due consideration has been given to the benefits likely to accrue from this method of examination. Should the specimen be collected by the patient's own doctor it should be dispatched to the pathologist at once, as examination of the fluid should always be made without any undue delay. This is particularly important in a suspected case of meningitis, for both the cell count and the sugar content of the fluid will fall after a few hours. The C.S.F. pressure, the result of the Queckenstedt test, and the suspected clinical diagnosis should in such cases always accompany the specimen. This will help the pathologist to decide what examinations will yield the most satisfactory answers to the problem concerned.

Normal Cerebrospinal Fluid

It is necessary to know, first of all, exactly what constitutes a normal fluid. Table I shows the range of figures that can

Pressure	125 mm. of water
Appearance	Clear and colourless
Cells	Up to 4 lymphocytes per c.mm.
Protein	Up to 30 mg. per 100 ml.
Globulin (e.g., Nonne-Apert reaction)	Negative
Chlorides	700–760 mg. per 100 ml.
Sugar	50–70 mg. per 100 ml.
Lange test	No change
Wassermann reaction	Negative

be regarded as normal for an adult. A few additional comments may be made. The cells are always lymphocytes in a fluid uncontaminated by blood, but if contamination has occurred one can assume that one polymorph may be present for every 500 red cells per c.mm.; never more than 4 and usually fewer than 4 cells per c.mm. are found. The level of the protein content—which is composed almost entirely of albumin and with only a trace of globulin—varies with age. A child should have 10 to 15 mg. of protein per 100 ml., while in an elderly adult a figure of 50–60 mg. per

*See the article on this subject by Dr. William Gooddy earlier in this series (*British Medical Journal*, November 7, 1953, p. 1040).

100 ml. can still be regarded as normal. Similarly, prolonged immobility in bed will tend to raise the protein level. The chloride content may vary a little with the blood chloride, but the sugar level is fairly constant throughout the day, and it is not necessary therefore to collect the specimen while the patient is fasting.

The Lange colloidal gold test is empirical, and normally colour changes do not occur in any of the 10 tubes containing dilutions of C.S.F. Varying degrees of precipitation of the colloidal gold may occur, resulting in changes of colour, and these are recorded numerically from 1 to 5, the latter figure representing a complete loss of all colour in the supernatant fluid. There are two main types of abnormal curve: (1) the paretic, in which the maximum degree of colour change occurs in the first tubes—that is, in those of the strongest concentration of C.S.F.; and (2) the mid-zone or luetic curve, which shows a maximum change in the middle of the curve. Examples of each of these are described below. The C.S.F. pressure is normally about 125 mm. of water when the patient is in the recumbent position, and an increase takes place in cases of infection and when there is some space-occupying lesion inside the cranium. When the jugular veins are compressed in a healthy subject there is a rapid rise in C.S.F. pressure as recorded in the manometer, followed on release of the jugular pressure by a drop to the initial figure. This is known as the Queckenstedt phenomenon or test.

The clinical diagnosis and the results of the pathological examinations have always to be correlated, so that it would seem to be easiest to describe the results of the examinations under the headings of various disease processes.

Meningitis

There are three main types of meningitis—pyogenic, tuberculous, and virus. Table II shows the types of results that can be expected in each group. Naturally, the actual figures depend upon the stage of the disease reached when lumbar puncture is performed.

TABLE II.—The C.S.F. in Meningitis

	Pyogenic	Tuberculous	Virus
Pressure	Raised ++	Raised ++	Slight increase
Appearance	Turbid in varying degree	Clear or slightly opalescent	Usually clear
Cells	Hundreds or thousands	Tens or hundreds	4–200/c.mm.
Type of cell	Polymorphs	Usually more lymphocytes than polymorphs (2 or 3 to 1)	Lymphocytes
Protein	100+ mg./100 ml.	100+ mg./100 ml.	Up to 150 mg./100 ml.
Globulin	Positive	Positive	Positive
Chlorides	Decreased to about 600 mg./100 ml.	600 to 650 mg./100 ml.	Slight decrease—680 mg./100 ml.
Sugar	Absent	Decreased to 20 to 35 mg./100 ml.	Normal or only very slightly reduced
Direct smear	Causal organism	T.B. present	None
Culture	" "	" "	Sterile

In pyogenic infections, such as meningococcal or pneumococcal meningitis, the fluid which is turbid shows a considerable increase of cells, all of which are polymorphs. The chloride content is often reduced, although not to such a low level as in tuberculous meningitis, but this must not be regarded as a diagnostic feature. The reduction in the sugar content is of the utmost importance, and an accurate estima-

¹ *British Medical Journal*, 1952, 2, 1389.
² *Ibid.*, 1953, 1, 1201.
³ *Ann. Soc. Belg. Méd. trop.*, 1953, 33, 245.
⁴ *British Medical Journal*, 1953, 1, 1200.
⁵ Allison, A. C., *ibid.*, 1954, 1, 290.
⁶ *Ibid.*, 1953, 2, 1047.
⁷ *Publ. Amer. Assoc. Adv. Sci.*, 1941, 15, 148.
⁸ Chaudhuri, R. N., and Chakravarty, N. K., *Bull. Calcutta School trop. Med.*, 1953, 1, 8.
⁹ *Lancet*, 1954, 1, 162.

¹ *J. exp. Med.*, 1950, 91, 115. ² *Amer. J. med.*, 1952, 13, 668.

tion should always be obtained. The fluid from cases of pyogenic meningitis shows a great reduction and often a complete absence of sugar. Effective treatment will always be reflected by a rise in sugar content, in fact this may precede the clinical improvement. The finding of the causal organism is vital, for it will indicate which antibiotic should be used. Prompt treatment is essential in all cases and is of special importance in pneumococcal meningitis.

The C.S.F. is less turbid in tuberculous meningitis than in the pyogenic group. There is an increase in cells, which are largely lymphocytes, although a small number of polymorphs are present in most cases. The chloride level is reduced in well-established cases, but may be almost normal in the early stages. The sugar content is early reduced, but this decrease never becomes a complete loss. Tubercle bacilli in the smears confirm the diagnosis. There is little doubt that they can be found in practically every case given enough care and time by the pathologist. Cultures or animal inoculation will confirm the smear findings after four or more weeks, but this delay is not permissible before initiating treatment. Again, a rise in the sugar level is the best guide to effective treatment, as intrathecal streptomycin will cause an increase in the cells and protein in the fluid, but does not affect the sugar level.

There are numerous viruses that are now known to affect the central nervous system, but all yield a somewhat similar C.S.F. picture. It is often difficult to distinguish between tuberculous meningitis, poliomyelitis, and lymphocytic meningitis in the early stages, but, by paying particular attention to the sugar and the results of the smear examinations, diagnosis should be possible. There are a few other conditions, such as sarcoidosis of the meninges and torulosis, both of which are very rare, that give rise to great difficulty in diagnosis.

Poliomyelitis

The C.S.F. varies with the stage of the disease, and in Table III are given the findings at the three most important stages. The noticeable feature in the pre-paralytic period is

TABLE III.—The C.S.F. in Poliomyelitis

	Before Paralysis	1st Week of Paralysis	Subsequent Weeks
Appearance	Clear and colourless	Clear and colourless	Clear and colourless, or with a coagulum
Cells	Can be up to 2,000/c.mm. (May be 25% polymorphs)	5-10 lymphocytes/c.mm.	Up to 4 per c.mm.
Protein	Normal or only slightly raised	Raised about 100 mg./100 ml.	Up to 300 mg./100 ml.
Globulin	Negative	Positive (+)	Positive (+)
Chlorides and sugar	Normal	Normal	Normal
Lange test	No change	0011210000	Normal or slightly mid-zone

the resemblance of the fluid, especially as regards the pleocytosis, to that found in tuberculous meningitis, except that the chlorides and sugar are normal. When paralysis occurs the cells decrease but the protein increases, and this increase may persist for some months. A fluid with a protein level of 150 mg. per 100 ml. or more may show a fibrin clot of the "spider web" type seen in tuberculous meningitis. Another point of importance is that, while polymorphs are commonly found in poliomyelitis, they are not seen in encephalitis.

Cerebral Abscess

The most characteristic features are to find a raised pressure, a pleocytosis of both lymphocytes and polymorphs, with normal sugar and perhaps normal or slightly reduced chloride levels, in a patient with infection of ear, frontal sinus, or lung. However, a deep-seated abscess may yield a C.S.F. similar to that found in a cerebral tumour in a similar site.

Encephalitis

The C.S.F. in the acute stage is under pressure, it is clear, and there is never a coagulum. A small lymphocytic pleocytosis with a slightly raised protein and a normal chloride content are found. The sugar level may be somewhat raised.

Syphilis

Primary.—A small proportion of patients with primary syphilis show a slight increase in the number of lymphocytes, together with a positive Wassermann reaction in the fluid before treatment. Few cases continue to give these findings after a normal course of treatment, but if these changes persist treatment should be continued, as in most instances the fluid will return to normal.

Secondary.—The C.S.F. shows an increase of cells up to about 50 per c.mm. composed almost entirely of lymphocytes, a slight increase in protein content, and a positive Wassermann reaction. The Lange test shows a mid-zone curve of the type 0012332100, but it is of no special significance. Rarely a spinal block caused by an inflammation of the meninges—an arachnoiditis—may be found, and give results similar to those seen in a spinal tumour, together with a pleocytosis and a positive Wassermann.

Tertiary.—There are three common types of disorder—namely, meningo-vascular syphilis, tabes, and general paralysis of the insane (G.P.I.). Table IV shows the results that

TABLE IV.—The C.S.F. in Syphilis

	Meningo-vascular	Tabes	G.P.I.
Pressure	Normal or slightly raised	Normal or slightly raised	Normal or slightly raised
Appearance	Clear and colourless	Clear and colourless	Clear and colourless
Cells	20-150/c.mm.	10-50/c.mm.	10-50/c.mm.
Type of cell	Mostly lymphocytes, few large mononuclears	Lymphocytes, a few large mononuclears	Usually lymphocytes and large mononuclears
Protein	Usually up to 100 mg./100 ml.	Usually up to 100 mg./100 ml.	50-150 mg./100 ml.
Globulin	Positive (+)	Positive (++)	Positive (++)
Lange test	Variable but usually mid-zone	Leutic, i.e., mid-zone (0012332100)	Paretic, i.e., 1st stage (5544322110)
Wassermann reaction: C.S.F.	+	++ (in 70%)	+++ (in 100%)
Blood	+++	+++ (in 65%)	+++

may be found in each of these conditions. It must be remembered that it is not always possible to place a patient in one of these categories with absolute accuracy following the first lumbar puncture, and it may be only after treatment or after a period of time that the correct diagnosis can be determined. The Lange test in particular does not always conform to pattern, and paretic curves such as 5544322110 may be found in meningo-vascular disease. Should, however, such a curve persist despite treatment a revision of the original diagnosis may be advisable. It is also noteworthy that a positive Lange curve of any pattern will change much more readily as a result of treatment in a patient with meningo-vascular syphilis than in either of the other two forms of this disease. The strength of the Wassermann reaction is indicated by the number of positive signs. Here again, treatment in meningo-vascular disease will reduce the strength of the Wassermann reaction faster in the C.S.F. than in the blood, and both will respond much more quickly in this type of disorder than in tabes or G.P.I. Fluids from these last two types of case may retain a positive Wassermann reaction in the blood or in blood and fluid, and an abnormal Lange test long after the patient improves clinically. The Wassermann reaction in the C.S.F. is positive in syphilitic conditions only, but a negative test does not exclude syphilis except for G.P.I. The other abnormal findings in the fluid in syphilis may be seen in some other conditions such as disseminated sclerosis, meningial spread of a secondary carcinoma, sarcoidosis, and torulosis.

Congenital.—No alterations from the normal may be found in the fluid from some patients. Cases of clinical

tabes or G.P.I. will often show findings comparable to those found in acquired syphilis. Treatment only results in slow improvement in the pathological findings.

Disseminated Sclerosis

Characteristic changes may be found in this condition, one of which is a raised cell count of up to about 50 per c.mm. While lymphocytes largely predominate, a few fluids will also contain polymorphs in small numbers. The protein is rarely raised above 100 mg. per 100 ml., but the globulin test (Nonne-Apel reaction) is almost always positive. The Lange test is abnormal in some 40-50% of cases and shows either a mid-zone or a paretic curve, the former occurring twice as often as the latter. The Wassermann reaction is always negative.

A paretic curve in the absence of a positive Wassermann reaction occurs only in disseminated sclerosis, inclusion-body encephalitis, and a few cases of encephalitis lethargica.

Cerebral Tumour

Lumbar puncture in cases of cerebral tumour is open to certain obvious dangers. Before removing C.S.F. it is essential to measure the fluid pressure, and to ensure by jugular compression, with a consequent rapid rise in pressure, that there is no herniation of the cerebellum into the foramen magnum. Great care must always be exercised in performing lumbar puncture in patients with a suspected cerebral tumour, and in general it is probably wiser to delay making this examination until the patient is in hospital, where operation can follow lumbar puncture should the need arise. Frequently the fluid pressure is raised, and any pressure above 200 mm. can be regarded as pathological. Examination of the fluid may show it to be quite normal. There is a raised cell count in some 5% of cases, which may be due to polymorphs as well as lymphocytes, and in a few cases even tumour cells may be found. The protein content is raised in some 75% of cases. On the whole the more innocent tumours tend to show a lower protein level, but there are exceptions to this rule. A glioma of the pons gives rise to a low protein, whereas a neurofibroma of the eighth cranial nerve is always associated with a raised protein content. Fluids from cases of tumours near the lateral ventricle have a higher protein content than do those associated with tumours above the tentorium and near the surface of the brain.

Spinal Tumour

The measurement of the C.S.F. pressure and the result of the Queckenstedt test are very important in this condition. There is no rise in pressure after jugular compression in a complete spinal block, while should the block be partial the rise will be slow, and the fall to the original level will also be slow. The initial pressure may, in fact, be low, figures of 40 mm. being not uncommon. The fluid, while it may be clear and colourless, is on some occasions straw-coloured and may clot spontaneously. Cells are not increased except in such conditions as meningial sarcomatosis. The protein content is always raised in complete block, with figures even as high as 2,000 mg. per 100 ml. In partial block the protein content is raised, but rarely above 300-400 mg. per 100 ml. The Wassermann reaction is always negative, except in cases of syphilitic spinal arachnoiditis.

Other Conditions

There are numerous other disorders in which the examination of the C.S.F. may yield instructive results. For instance, in subarachnoid haemorrhage a fluid intimately mixed with blood will be obtained and, should the bleeding have occurred three days or more prior to lumbar puncture, the fluid after centrifugation will show a yellow coloration and a positive indirect van den Bergh reaction.

The examination of the C.S.F. for barbiturates in cases of poisoning by these drugs, and for urea and sugar in cases of coma from uraemia or diabetes, may also be mentioned as examples of some of the less common investigations that can be carried out.

The pathologist, provided he is aware of the possible clinical diagnosis, should be able, as a result of his examination of the C.S.F., to express a reasonably confident opinion on the nature of the disease process. There are, however, some neurological conditions which may still baffle both the practitioner and the pathologist, but these will probably be seen only at very infrequent intervals by any one practitioner.

Next article on Clinical Pathology.—"Simple Skin Pathology," by Dr. John O. Oliver.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

APPROVED NAMES

The General Medical Council has authorized the following "approved names" of drugs, selected by the British Pharmacopoeia Commission. The last supplementary list was published in the *Journal* of December 12, 1953 (p. 1321).

Approved Name	Other Names
Aminopterin sodium	Sodium 4-aminopteroylglutamate.
Bacitracin	An antibiotic produced by a strain of <i>Bacillus subtilis</i> .
Benzathine penicillin	NN'-dibenzylethylenediamine di-benzylpenicillin. "Dibencil," "Neolin," "Penidural," "Permapen."
Benzethonium chloride	Benzyltrimethyl-p-(1:1:3:3-tetra-methylbutyl)phenoxyethoxyethyl-ammonium chloride. "Phemeride," "Phemerol chloride."
Dehydrocholic acid	3:7:12-Trioxocholanic acid. "Decholin," "Dehydrocholin."
Dichloroxylenol	2:4-Dichloro-3:5-xyleneol.
Dihydrotachysterol	"A.T. 10."
Dyfos	Diisopropyl fluorophosphonate "DFP."
Erythromycin	An antibiotic produced by a strain of <i>Streptomyces erythreus</i> "Erythrocin," "Ilotycin."
Fumagillin	An antibiotic produced by certain strains of <i>Aspergillus fumigatus</i>
Nicotinyl alcohol	3-Pyridylmethanol. "Ronicol" is the tartrate.
Pentolinium tartrate	Pentamethylene-1:5-bis-(1-methylpyrrolidinium tartrate). "Anso-lysen."
Primaquine	8-(4-Amino-1-methylbutylamino)-6-methoxyquinoline.
Reserpine	An alkaloid obtained from <i>Rauwolfia serpentina</i> Benth. "Serpasil."
Sodium acetizoate	Sodium 3-acetamido-2:4:6-triiodobenzoate. "Diaginol."
Tetracycline	4-Dimethylamino-1:4:4a:5:5a:6:11:12a-octahydro-3:6:10:12:12a-pentahydroxy-6-methyl-1:11-dioxonaphthacene-2-carboxamide. "Achromycin."
Tretamine	2:4:6-Tri(ethyleneimino)-s-triazine. "Triethanmelamine," "Triethylene melamine," "TEM."

Reports of Societies

DENTAL ANAESTHETICS

At a meeting of the Section of Anaesthetics at the Royal Society of Medicine on February 5, with Professor R. R. Macintosh presiding, Dr. J. G. BOURNE challenged the present custom of regarding nitrous oxide as the mainstay of anaesthesia for out-patients. In his opinion the time had come for a fresh clinical assessment of this low-potency anaesthetic. He had therefore devised a method by which the reactions of patients could be observed after nitrous oxide had developed its maximum effect (after 10 or more minutes). Only 1 in 4 out of 60 unselected adult patients investigated in this way reached surgical anaesthesia. In a further 1 in 4 patients Dr. Bourne was not even convinced that unconsciousness was present, though these patients remembered nothing. More than half the patients retained reflexes that were too brisk to allow even minor operations.

Saturation of the brain with nitrous oxide took time (periods varying from 7 to 15 minutes had been suggested). But the majority of out-patient dental operations, including induction of anaesthesia with nitrous oxide, were completed within two minutes. Armstrong, in his book on aviation medicine, had given the explanation why this method worked. He had written: "A man at rest can hold his breath for 1 to 1½ minutes. But if the oxygen in the lungs and blood is washed out by breathing any inert gas such as nitrogen, sudden and complete loss of consciousness will occur in about 50 seconds." Armstrong had recorded the times taken for pilots to lose consciousness when cut off from their oxygen supply at high altitudes and left breathing air, and his figures had led Dr. Bourne to the conclusion that "the expert with nitrous oxide, knowing the trick, induces 'anaesthesia' rapidly by taking his patients straight to 30,000 or 40,000 ft.* From there he allows them to descend only so long as they behave themselves and then only at a rate that is compensated by the accumulation in the central nervous system of increasing quantities of nitrous oxide."

Anoxia Plus Nitrous Oxide

In some patients not resistant to nitrous oxide a light plane of anaesthesia could be reached by the summation of two effects—anoxia plus nitrous oxide. As nitrous oxide accumulated in the brain more and more oxygen could be added and anoxia was gradually relieved. But with the large group of patients who were semi-resistant the position was not so happy. As several authorities had noted, anaesthesia demanded a restriction of oxygen supply (according to Kaye a "gross" restriction). Clement had written: "Control of anaesthesia is synonymous with control of the oxygen."

True resistance was seen in patients who were barely unconscious even when saturated with 80% or 90% nitrous oxide. It seemed to come from habituation to narcotic drugs, and was commonest in middle-aged and elderly patients—those in whom deprivation of oxygen would seem most unwise. Anoxia of the severity required to produce unconsciousness in these patients did not leave much room for bungling. Courville had shown that the anoxic decerebration of nitrous oxide anaesthesia could be irreversible. Some degree of damage to the brain might pass unnoticed in many cases. Though anoxia was recognized as harmful and was avoided in in-patient anaesthesia, in out-patient practice it was still employed by all and sundry as a supplementary, or perhaps even a main, agent of anaesthesia.

After asking whether nitrous oxide, as commonly used in out-patients, was a suitable introduction to anaesthesia for

*9,000 or 12,000 metres.

undergraduate medical and dental students, Dr. Bourne then described (with the help of an admirable film) the advantages of a method of out-patient anaesthesia with cyclopropane. Using a large reservoir bag (1.3 gallons—4.6 litres), with 50% cyclopropane in oxygen, he had anaesthetized 1,918 patients of all ages without mishap. Induction was very quick: all patients lost consciousness in 3 to 6 breaths, and after a few more breaths were ready for operation. By this means a maximum effect was produced with a minimum amount of drug.

The possible disadvantages of cyclopropane as an out-patient anaesthetic were threefold: first, salivation might occur, but was easily prevented by giving 1/75 gr. (0.86 mg.) of hyoscine hydrobromide, or half that dose to children, 40 minutes before operation; secondly, recovery might be delayed; and, thirdly, post-anaesthetic nausea and vomiting might occur.

Nausea and vomiting delayed recovery, but they could largely be avoided if the mixture of cyclopropane was breathed for only one minute. This gave satisfactory operating conditions for about 2½ minutes; if necessary the period of anaesthesia could in most cases be extended by administering nitrous oxide (80%) and oxygen after induction with cyclopropane. In Dr. Bourne's series of patients recovery was rapid, and 4 out of 5 of those who had previously had "gas" expressed a decided preference for cyclopropane. He claimed that, provided the duration of cyclopropane inhalation and its concentration were controlled as he had indicated, this technique might be safer in the hands of a novice than nitrous oxide. Nevertheless, nitrous oxide anaesthesia carried a very low mortality, and any method recommended as an alternative must be given a thorough clinical trial and no danger overlooked. The time had now come when the whole subject of anaesthesia for the out-patient should be reviewed.

Discussion

In the discussion that followed Mr. ROBSON said that from a dental surgeon's viewpoint the cyclopropane mixture was far preferable to the usual dental "gas." Bleeding was less and, most important of all, the patient was motionless. In short, the dentist received ideal conditions, and it was to be hoped that the day would come when nitrous oxide would be discontinued—the sooner the better.

Dr. VICTOR GOLDMAN pointed out the danger of attaching too much importance to the weak anaesthetic properties of nitrous oxide if the patient had previously been breathing a high percentage of oxygen. The nitrous oxide-oxygen mixture must be defended. He recalled that Clement claimed that the majority of "gases" were ruined by giving too much oxygen at the start, and yet even more were spoiled by not giving enough oxygen once the patient had lost consciousness.

Dr. G. S. W. ORGANE stressed the importance of the danger of an explosion with cyclopropane. He thought it might be possible for a spark between the dental forceps and a filling in the patient's mouth to ignite the anaesthetic mixture.

Dr. J. D. LAYCOCK felt that more thought should be given to the use of trichlorethylene in out-patient anaesthesia. In his experience trichlorethylene was capable of producing suitable anaesthesia even when used with "a rag and bottle."

Dr. R. BLAIR GOULD claimed that the dangers of nitrous oxide as a dental anaesthetic were exaggerated. Very few people could not be given nitrous oxide and still be kept "pink" during the two or three minutes of a dental operation. Resistant patients should be given a little pre-medication.

In a brief reply Dr. BOURNE countered any criticism of cyclopropane as an out-patient anaesthetic by saying, "The patients prefer it, the surgeons prefer it—so why use anything else?"

Correspondence

Early Treatment of Cleft-lip and Cleft-palate

SIR,—I do not agree with Mr. W. G. Holdsworth (*Journal*, February 6, p. 304) that in double clefts of the lip there is usually "a serious deficiency of tissue." I know this belief is widely held, and it has led to some surgeons advocating what is to me the horrifying procedure of a "primary Abbé" operation—that is to say, transplanting a part of the normal lower lip into the alleged deficiency of the upper.

In my opinion the meagre, tight, and immobile upper lips which result from the classical operations are due to fundamental faults of principle and technique. These are: (1) Not correcting the displacement of the premaxilla, if this is present. To do this it is necessary to understand what pushes it forward—the prevomerine bone—and to remove this alone. (2) Not getting junction of the premaxilla with the rest of the alveolar ridge. If this is not done it will atrophy. (3) Not forming the labio-gingival sulcus at the start. If this is not done the lip is tethered down and immobile, and the muscles cannot develop. (4) Not obeying the primary orthopaedic principle of joining the actual ends of divided muscle. All classical procedures join one end of the orbicularis oris to one side of an inert central piece of tissue, and the other end to the other side. Imagine what would happen were a ruptured quadriceps to be treated in the same way. (5) Not understanding the embryology of the lip. Embryologists have not noticed that there is an interesting minor problem to be solved in how the mouldings of the normal lip are produced by the fusion of its various primary parts. I think it is possible to work this embryology out, to translate the process into a geometrical formula, and finally to interpret this in a surgical proceeding.

I have published large-size unretouched photographs, without lipstick and without smiles, showing the results of treating double hare-lip with displaced premaxilla in two operations.¹ If those who use other methods would do the same we would be able to judge how we stand.—I am, etc.,

DENIS BROWNE.

London, W.1.

REFERENCE

¹ *Ann. roy. Coll. Surg. Engl.*, 1949, 5, 169.

SIR,—Mr. W. G. Holdsworth, in his article on the "Early Treatment of Cleft-lip and Cleft-palate" (*Journal*, February 6, p. 304), states: "Little is known of the effects of operation on the development of the facial skeleton, and these may be serious enough to prohibit procedures otherwise commendable." The essential problem which requires solution is whether the deviation from the normal growth pattern seen in the adult patient who has undergone surgical closure of a cleft lip and/or palate in infancy represents the mature development of an intrauterine defect, or the end result, which in some cases almost amounts to a mutilation, of surgical interference with growth centres, either directly from the operative procedures, or indirectly from restriction of the normal downward, forward, and lateral projection of the middle third of the facial skeleton by its enclosure in a vice of scar tissue.

Contrary to Mr. Holdsworth's statement, the whole question of the effects of operation for closure of cleft lip and/or palate defects on the development of the facial skeleton has been carefully and comprehensively studied since 1931 in the United States. The investigations carried out have not been confined merely to the dental arches, but have embraced the entire facial skeleton. The technique utilized was that of cephalometric roentgenology by means of the Broadbent-Bolton cephalometer, a method which employs a series of antero-posterior and lateral radiographs of the skull exposed and positioned under standardized conditions so that accurate determinations of the growth pattern may be carried out by anthropometric and cephalometric measurements.

Foremost among the conclusions derived from these investigations is the fact that five-sixths of the total palatal breadth have been accomplished by the end of the fourth year in normal individuals, with total width increments by the end of the tenth year. The other major points of interest can best be summarized by

reference to the observations of Slaughter and Brodie,¹ whose deductions are based upon a study of 1,349 cases. They state: "The evidence is already at hand that surgery can and does inhibit normal growth. This interference is directly proportional to the amount of injury to growth centres and to diminution of blood supply to the parts concerned. Other evidence is available to show that congenitally deformed parts, unless permanently damaged, grow at normal rates. These two findings alone should cause us to examine our concepts and procedures very carefully. Together they indicate that surgery, poorly executed or poorly timed, can do more damage than good in the long run."

The only advantage claimed for operation on the palate before the age of 9 months is that the child will ultimately have a much better chance of achieving normal speech later. Mr. Holdsworth refers to "the inadequacy of any classification based upon personal appraisal of cases," and this sense of inadequacy would appear to be particularly pronounced when it comes to the assessment of what constitutes apparently faultless speech. The evidence that better speech results from closure of the palatal defect before the age of 5 is largely based upon the auditory impressions of the operators themselves rather than upon impersonal scientific facts, which latter observations have at least established beyond reasonable doubt the price which must be paid when the debt of early operation is redeemed in adult life. A rough translation of the words of Veau and Borel quoted by Mr. Holdsworth would be: "The minor details of the lip which often attract all our attention, have not the same importance as the general appearance of the face which occupies us less." To which I would like to add the suggestion that the minor details of the differences in clarity of enunciation between cleft-palate patients operated upon at different ages have not the same importance as the major differences in the ultimate appearance of the face and jaws which ensue from surgical interference during the period of maximum growth of the maxillae—that is to say, the first four years of life.

The results which may be anticipated from the careful and meticulous technique employed by Mr. Holdsworth may ultimately be very much better than those hitherto performed by less delicate operators, but any attempt to advance the age of operation upon a cleft-palate must be deplored by those who have studied or carried out careful investigations into the ultimate sequelae of such a procedure.—I am, etc.,

Basingstoke.

REFERENCE

¹ *Angle Orthodont.*, 1949, 19, 223.

N. L. ROWE.

A Cosmetic Amputation

SIR,—It was a pleasure to see the letter of my friend and former teacher, Hamilton Bailey, on this subject (*Journal*, January 30, p. 275). From my experience I can support what he said. He taught me this amputation over 20 years ago, and since then I have practised it. It has always been pleasing to see these patients afterwards—they have had good functional and cosmetic results. Amputations where the head of the metacarpal has not been removed have always seemed to me unsightly, and for several patients I have re-operated to remove the "odd" prominence.—I am, etc.,

London, W.1.

HAROLD DODD.

Mucocele of the Appendix

SIR,—Mr. J. H. Johnston's article (*Journal*, January 16, p. 135) stimulates me to report a case of mucocele of the appendix with pseudomyxoma peritonei.

The patient was a para one, aged 30, whose only complaint was of a mucous vaginal discharge which appeared to be due to an excessive cervical secretion. The uterus was in fixed retroversion and there was a small cyst of the left ovary. Further questioning revealed some discomfort recently in the lower abdomen and back a few days before her periods. A diagnosis of pelvic endometriosis with a chocolate cyst of the ovary was made, and the discharge considered to be due to pelvic congestion.

At laparotomy about 10 oz. (284 ml.) of "mucin" was found lying free in the peritoneal cavity. The uterus was bound down in retroversion by extensive pelvic endometriosis, and there was a small chocolate cyst of the left ovary. The right ovary appeared normal. The appendix was grossly thickened throughout its length, and surrounded by myxomatous tissue which appeared to be coming from a perforation in the appendix which was neither constricted nor kinked, and I removed it with a small cuff of caecum. The ovarian cyst was enucleated, and the uterus anteverted by means of a Gilliam suspension.

I am grateful to Dr. Whitelaw for the following histological report. "Ovarian tissue shows a follicular cyst filled with blood clot. Section of appendix is cyst-like in character with diameter of lumen 1.0 cm. In the specimen there is no occluding stricture. The wall is composed of a lining of high mucus-secreting columnar cells. There are no remains of cysts, and lumen is filled with mucin material with a few scattered cells. The submucosa is narrowed, fibrous, and has a few scattered lymphoid follicles. The muscular coat is of considerable thickness (1.7 mm.) and in two places is ruptured or deficient, and the mucous contents pour through and infiltrate the peritoneal coat. The cells associated with the 'mucin' are plasma cells and round cells and a few foreign body giant cells. There are no cells of epithelial origin in this over-spill."

The patient had an uneventful convalescence, and subsequent questioning failed to elicit any history that could have been construed as appendicitis. The muscle hypertrophy and the perforation would conform with Wilson's theory of appendiceal diverticula,¹ which in the absence of a constriction must represent the continuous efforts of the appendix to expel its unusually profuse and viscous secretions.

I have called this case a pseudomyxoma peritonei, but if we accept Woodruff and Macdonald's classification of benign and malignant mucocoele this is really only a *pseudo* pseudomyxoma peritonei. We are so little conversant with the real mechanism of this condition that I do not agree with Mr. Johnston's suggestion of post-operative radiotherapy for these cases, particularly if the patient happens to be a young woman, unless the pseudomyxoma is seen to recur. Pseudomyxoma due to cystadenoma of the ovary requires separate consideration, which space does not permit.

I saw this patient recently, four months after the operation. There is no evidence of recurrence. She is now free of all discomfort at her period times, but her mucous vaginal discharge persists, and I shall now try a small "office procedure" which includes the use of a silver-nitrate stick.—I am, etc.,

EDWARD COPE.

Birmingham, 18.

REFERENCES

- ¹ Brit. J. Surg., 1950, 38, 65.
- ² Surg. Gynec. Obstet., 1940, 71, 750.

Immunization Against Tetanus

SIR,—I was interested to read in your leading article entitled "Combined Prophylactics" (*Journal*, December 12, 1953, p. 1313) a suggestion that active immunization against tetanus should be offered to schoolchildren. It is not generally realized that all Service recruits receive on enlistment full active immunization with three doses of tetanus toxoid. The Services laboratories consider that this confers a safe level of immunity for about four years, when a further boosting dose is necessary. After completing their National Service a high percentage of young men who meet with accidents will already have a reasonable level of immunity. Before giving an injured man anti-tetanus serum I think it is always worth while to ask about previous Service inoculations. No Serviceman will have missed having his doses of tetanus toxoid unless he has deliberately "refused" them, and this fact he will certainly remember. Within ten years of active immunization one boosting dose of tetanus toxoid should then be adequate. I have recently encountered several examples when Servicemen in uniform were given "3,000 A.T.S." by casualty officers.—I am, etc.,

Sunning-on-Thames.

G. M. BAILEY.

Ulcerative Colitis

SIR,—Just a few lines in reply to Dr. Norman P. Henderson (*Journal*, January 30, p. 277). All my patients were examined by the sigmoidoscope and opaque enema before operation, but I thought these elementary precautions so obvious as not to require mention. The conditions which may be mistaken for true ulcerative colitis and to which Dr. Henderson rightly draws attention were, therefore, as far as possible excluded.

I was flabbergasted to read that Dr. Henderson regards ileostomy as only a preliminary to colectomy. I have seen some of the results of the latter operation, not that I was ever guilty of recommending it myself, but a good many

years ago it was rather a favourite procedure of the late Sir Arbuthnot Lane, who regarded the colon as a sort of cesspool and the fons et origo of a mythical condition "auto-intoxication"—then almost as popular a diagnosis as "allergy," "endocrine-imbalance" (odious term), or "disk lesion" is now. (Odd, by the way, how every generation of our profession has its favourite diagnoses. Looking back over the past 60 years I can recall many such, each of which has had its little day and ceased to be, and if I might venture to give the young doctors of to-day a piece of fatherly advice I would say: Beware of the fashionable diagnosis.) Well, I often saw the end results of Lane's activities, and, apart from any question of immediate operative mortality, they were sometimes, in the idiom of to-day, "pretty grim." Dr. Henderson had best be careful, therefore, lest the last state of his patients be worse than the first, even if he does prevent an occasional one from developing cancer later on.—I am, etc.,

Streatley, Berks.

ROBERT HUTCHISON.

Fatal Bronchial Asthma

SIR,—The most important fact brought out again by Drs. C. K. Robertson and K. Sinclair (*Journal*, January 23, p. 187) is the necropsy finding of bronchi blocked by mucous plugs in all cases. The practical conclusion from this is that the mucus must be removed by treatment. The effect of a trypsin aerosol as reported in two American papers quoted by your annotator (p. 203)¹ scarcely justifies his optimism. One of the authors has not treated asthmatics, and the other stresses that the treatment was ineffective in chronic asthma. Neither has made any attempt to assess objectively the effect of trypsin on expectoration.

Nor do I agree with Mr. A. M. Zamora (*Journal*, February 6, p. 333) that treatment should be suction through the bronchoscope. This rather drastic method might give partial relief for a short time, but not all bronchi, and particularly not the smaller ones, are cleared by it. Moreover, the treatment cannot be repeated every few days. The aim of treatment for patients who continue to produce large amounts of sticky mucus must be to liquefy the mucus. This can be done efficiently by iodine, given either in the form of Lugol's iodine, as Drs. Robertson and Sinclair suggest, or as potassium iodide 15 gr. (1 g.) three times a day or more. Iodine sensitivity is infrequent in asthmatics and can be overcome by drastic reduction of dosage. Myxoedema² is rare and can be countered by thyroxine. Treatment with iodine is indeed so efficient that neither Pines³ nor I⁴ have had to resort to bronchoscopy in any case of asthma.—I am, etc.,

London, W.C.1.

H. HERXHEIMER.

REFERENCES

- ¹ Limber, C. R., et al. (1952). *J. Amer. med. Ass.*, 149, 816.
- ² Unger, L., and Unger, A. H. (1953). *Ibid.*, 152, 1109.
- ³ Morgans, M. E., and Trotter, W. R. (1953). *Lancet*, 2, 1335.
- ⁴ *J. Amer. med. Ass.*, 1950, 142, 537.
- ⁵ *Management of Bronchial Asthma*, 1952. Butterworth, London.

Chronic Bronchitis

SIR,—I read Mr. John Fry's article on chronic bronchitis (*Journal*, January 23, p. 190) with great interest. That the death rate in Great Britain should be so much higher than any other country certainly suggests that the subject requires further investigation.

It seems possible that the distribution of the disease and the morphology of the bacteria and/or virus involved might prove a useful angle of approach to the problem. In America (New England) the incidence of chronic bronchitis is higher in rural districts than industrial areas, and in England, if we exclude pneumoconiosis, we may find that rural districts have a high incidence, and I think this has been established in the Thames Valley. Is there a factor in the environment of bacteria and/or virus which increases their virulence? How is it that scarlet fever is commoner in late summer and autumn, that measles is prevalent in the winter and spring, that influenza has periodic pandemic waves, and that smallpox apparently spreads sometimes by convection? What is the factor that determines a harmless saprophyte such as *B. coli* becoming a virulent germ?

Sterilization of Ampoules

SIR,—It is inevitable that words of wisdom must fall on stony ground, for Dr. G. C. Steel (*Journal*, February 6, p. 335), alas, has missed the point, not only of correspondence which litters the literature, but also of the inferences to be drawn from Professor L. P. Garrod's excellent letter (*Journal*, December 5, 1953, p. 1269).

As the subject of "sterilizing ampoules" is fast becoming tedious, may I just ask Dr. Steel at least to examine his opened ampoules, preferably before intrathecal injection? Even if he does not believe that bacterial contamination of an intact ampoule can occur, the fragments of unsterile glass occasionally reposing in the bottom of his unsterile opened ampoule will doubtless be an object lesson to him.—I am, etc.,

Edgware.

D. RECKLESS.

Sedimentation Rate in Active Tuberculosis

SIR,—In his article on "The Laboratory Diagnosis of Pulmonary Tuberculosis" (*Journal*, January 30, p. 267) Dr. J. W. Clegg includes the sentence: "The sedimentation rate is always raised in active tuberculosis and falls as healing takes place." The article is one of a series giving excellent advice or instruction, and maintains the high standard which has been set. Consequently many who have read it will be likely to place great reliance on the statements made, and there is a danger that it will be assumed that the absence of a raised sedimentation rate excludes a diagnosis of activity of a tuberculous lesion. While it is true that the sedimentation rate is usually raised in active tuberculosis, active disease can exist in its absence. In 287 cases of active pulmonary tuberculosis which I analysed,¹ 107 (37%) had a B.S.R. of under 8 mm. in 1 hour. Of the 65 cases with a positive sputum smear stained by the Ziehl-Neelsen method, 17 (26%) had a normal B.S.R.—I am, etc.,

Harrow.

H. J. TRENCHARD.

REFERENCE

- ¹ *Lancet*, 1945, 2, 842.

Treatment of Tuberculous Meningitis

SIR,—With reference to Dr. J. Lorber's criticism (*Journal*, December 26, 1953, p. 1433) of my article (*Journal*, November 21, 1953, p. 1127), I would like to state that this article was intended to be an interim report. The apparent discrepancy between Dr. Lorber's and our analysis of mortality rates is due to the fact that several of the cases who were reported to have died did not die of tuberculous meningitis (see Table III of the article). Of all cases who were reported in the second series, one has since died of tuberculous meningitis, No. 60 remains the same, No. 50 is still paraplegic, and all the others now have a normal C.S.F. and are clinically well, except for two who have a residual weakness of one leg following a hemiplegia. With the exception of case 60, all children of a suitable age are now at school or at nursery school.—I am, etc.,

Durban.

WINIFRED C. M. BULKELEY.

The African in Industry

SIR,—The medical needs of the miners in Southern Africa are by no means as "fearful" as Mr. R. Schram (*Journal*, February 6, p. 334) would have us believe. Both the mines and the recruiting organizations provide free medical services to the Africans which are second to none. The health of most Africans is greatly improved during their period of service, since they receive a proper diet with a surfeit of proteins and vitamins which are sadly lacking from their diet at home. In addition, the South African Government provides free medical attention for the Africans and is giving the mission hospitals active financial support in their fight against tuberculosis and other diseases such as malaria, typhoid, bilharzia, drugs for the treatment of which are supplied free. Some areas have already been freed of malaria for several years.

Modern entomological books provide distribution maps of insects, and, although their pabulum may be widespread, the insects are found in more or less restricted areas. May not the flora of the bronchial tree be also restricted by certain unknown laws? Some years ago it was found in a large town that cases of rheumatism in children were largely restricted to the areas around the submerged rivers of the city. No doubt immunity and heredity play their part in resistance to infection, but is there not a case for the factors that increase the virulence of the germs?—I am, etc.,

Tarrington.

H. G. LANGDALE-SMITH.

The Normal Blood Count

SIR,—In his excellent article under the heading "Clinical Pathology in General Practice" (*Journal*, February 6, p. 326) Dr. George Discombe states that the mean corpuscular haemoglobin concentration is obtained by dividing the haemoglobin concentration in grammes per litre by the packed cell volume. I suggest that this should be calculated by dividing the haemoglobin concentration in grammes per 100 ml. by the packed cell volume and multiplying by 100.—I am, etc.,

Haywards Heath.

R. W. P. JOHNSON.

SIR,—Dr. George Discombe's article on "The Normal Blood Count" (*Journal*, February 6, p. 326) was helpful and stimulating. He rightly emphasizes the value of inspection of the stained film in the study of red cell abnormalities, and he says that the film should be "so thin that the cells are separate." This does not go far enough, for it does not exclude parts of the film which are too thin, notably the very last part spread. Here the cells are separate, but they are mechanically distorted and so flattened that the normal central pallor is not seen.

Red cells should be studied in parts of the film which are a little thicker than the thickness of a red cell. In such a place a few of the cells in a field will be slightly overlapped by other cells, but most will be uncovered. Such parts of a film are excellent for studying the morphology of both red and white cells (but are not suitable for white cell differential counts).—I am, etc.,

London, W.2.

R. R. WILSON.

Controlled Hypothermia

SIR,—We were relieved to see from his comments on the letter from Drs. J. W. Dundee and T. Cecil Gray (*Journal*, January 30, p. 272) that the writer of the annotation on "Chlorpromazine for Hypothermia" (*Journal*, January 9, p. 89) realized his error in assuming that we believed the drug to be a ganglion-blocking agent. It is clear, however, from his further remarks on regulation of body temperature and the autonomic system that we differ in our conceptions of what structures constitute this system. While it is quite true that from a strictly anatomical point of view the autonomic nervous system is simply an efferent outflow with two groups of peripheral pathways, sympathetic and parasympathetic, it has not seemed unreasonable to us to take a broader view of it. Physiologically it may be regarded as the system which effects those adjustments necessary to maintain constant the internal milieu in the face of a changing external environment.

Holding this view, we feel that it is quite logical to include in our conception of the autonomic system these centres in the hypothalamus and elsewhere which co-ordinate and integrate the functions of this system. Ample evidence exists that heat-regulating centres are present in the hypothalamus.¹ It is here as well as on other centres that we have supposed chlorpromazine to act, and in using the term autonomic block we intended to refer as much to this action of the drug as to its adrenolytic effect.—We are, etc.,

Liverpool, 7.

P. R. MESHAM.
W. E. B. SCOTT.

REFERENCE

- ¹ Ranson, S. W. (1940). *Res. Publ. Ass. nerv. ment. Dis.*, 20, 342.

I have had extensive experience in these fields of work, and would suggest to the critics that they bear in mind the vast areas involved and the extremely primitive conditions of African tribal life. The cost of these services has to be borne by a few million Europeans in a country several times the size of England.—I am, etc.,

London, W.C.1.

C. C. GRUNBERGER.

The Uvula and East African Negroes

SIR,—I do not think there is any record of the importance which the East African negroes attach to the uvula regarding disease and magic. It is considered by them to be the seat and cause of all diseases affecting the throat and to be the source of all coughs. Therefore they will go to any length and travel enormous distances to find a doctor who will cut their uvula.

My father, during his more than 50 years of practice in Nairobi, 1898–1951, must have cut altogether over 40,000 uvulas. I remember seeing him when I was a boy in the 1920's cut as many as 20 or more a day. He used to do this by the simple method of steadying the patient's head against the wall, catching the uvula with a forceps and snipping it in one stroke with sharp curved scissors. Then he gave the patient some dry ginger to take home and chew. The patient invariably reported that he was cured from his cough and from his sore throat.

The African, particularly of the Jajuo (Lake Victoria area) and the Kikuyu tribe from the Kenya Highlands, is absolutely certain that if his "kilimi" (Swahili word for the uvula) is not cut he will die from his sore throat. He is also convinced that all cough is produced by the "kilimi" and will not hear of any other treatment other than having it cut. The fear of death if "the kilimi is not cut" is probably due to some cases of diphtheria which died and which were diagnosed by the local witch doctor as "kilimi" and helped to establish this cult with the fear of the "kilimi" as the source of all evil to be removed at once. The Kikuyu, particularly the ignorant women from the bush, will insist that the "kilimi" is the sole cause of their child's illness and will refuse to treat the child for bronchopneumonia from which it is really suffering.

Such is the strange belief and cult of the "kilimi" among them, and it is worth putting it on record now, because it will probably disappear with education within the next 25 or 30 years.—I am, etc.,

Nairobi.

A. L. RIBEIRO.

Rheumatic Heart Disease Complicating Pregnancy

SIR,—We are grateful to your annotator (*Journal*, January 9, p. 87) and to Drs. Denny and Ryle (*Journal*, January 23, p. 215) for their interest in our article entitled "Rheumatic Heart Disease Complicating Pregnancy" (*Journal*, January 9, p. 70). The suggestion that pregnancy did not contribute to the deaths which occurred later than one year after confinement has been criticized. The relevant facts are these. The average age at death of these women was 38 years. Paul Wood¹ states that the average age at death of cases of mitral stenosis is 35 years. The average age of those who died from heart failure during, or within one year, of pregnancy was 25.4 years. Do these figures suggest that we have indulged in "wishful rather than logical thinking"?

The rejection of therapeutic abortion and sterilization and the references to contraception have also been questioned. Yet the text showed that each patient who died during or within one year of pregnancy was, when first seen, completely unsuitable for artificial termination both by virtue of the stage of pregnancy and of the cardiac condition. Thus no one died because therapeutic abortion was not employed. Since no patient who received antenatal care succumbed, it seems eminently reasonable to argue that antenatal care is preferable to abortion. Four of the women who died from heart failure were primigravidae and the other a gravida 2. If these deaths be used as arguments in favour

of sterilization and contraception it would seem to follow that women with heart disease should not be allowed to conceive at all.

Brief reference to the literature shows that we are not alone in believing that pregnancy, if survived, does not contribute to an early demise. Bunim and Rubricius² state that "data collected under well controlled conditions" indicate that pregnancy does not alter the course of rheumatic heart disease. Boyer and Hadas³ found that women who had four or more pregnancies did not die at a younger age than those who had none. Morgan Jones⁴ states that "there is no evidence that repeated pregnancies appreciably shorten life." We presume that women who have borne children generally must care for them.

We have seen fatalities result from operative intervention in other centres. Such fatalities frequently escape the obstetrical records, as these procedures are often carried out in gynaecological departments. Scientific analysis of our own cases and of published reports has convinced us that conservative management is the ideal at all stages in all cases of rheumatic heart disease complicating pregnancy. Contrary facts have not been published.—We are, etc.,

M. I. DRURY.

M. K. O'DRISCOLL.

Dublin.

T. D. HANRAHLY.

A. P. BARRY.

REFERENCES

- ¹ *Diseases of the Heart and Circulation*, 1950, p. 294. London.
- ² *Amer. Heart J.*, 1948, 35, 282.
- ³ *Ann. Intern. Med.*, 1944, 20, 99.
- ⁴ *Heart Disease in Pregnancy*, 1951, p. 51. London.

"Antidotarie Chyrurgical"

SIR,—I was interested to read your note on Banester's *Antidotarie Chyrurgical* (*Journal*, February 6, p. 329). I have always been puzzled as to the methods by which booksellers and others arrive at their estimate of a book's rarity. It is quite certain that there are more than two other copies of this book in existence, if one is in the Wellcome Museum and the other appeared at a book auction within the last 50 years. There has been a copy in the library of the Royal College of Physicians, Edinburgh, since 1846, which I have before me as I write and which corresponds exactly to the copy you describe.

It is a curious fact, which still awaits explanation, that the Tweed appears to present an insuperable barrier to medical bibliographers. It would take very little time to produce quite an impressive list of medical books of which it has been said that only one or two copies are preserved, and of which another six copies can be found in Scottish libraries. I would add that Banester's book is included in the printed catalogue of this Library, published in 1898.—I am, etc.,

Edinburgh, 2.

L. JOLLEY.

SIR,—Your interesting Nova et Vetera "An Extremely Rare Treatise" (*Journal*, February 6, p. 329) assumes too readily that all known copies of John Banester's *Antidotarie Chyrurgical* of 1589 are recorded in the *Short-Title Catalogue*. The Royal College of Surgeons of England has been fortunate to own a copy of this book since 1818, when it was bequeathed to the College library by William Long, surgeon to St. Bartholomew's Hospital and second Master (President) of the College.—I am, etc.,

London, W.C.2.

W. R. LE FANU.

Rh-Hr Nomenclature

SIR,—For some time there has been need for another conference on Rh-Hr nomenclature in order to clarify the confusion which exists among workers in the field. With the appearance of two new books dealing with the Rh-Hr types^{1,2} the facts regarding this problem become easily available to anyone. Clearly there is room for only a single nomenclature as in the other blood group systems—namely, the international Rh-Hr nomenclature. It may be, how-

ever, that the people still using the C-D-E notations feel that they should be given a final opportunity to defend their position. In that event they might decide to hold a conference either at the next meeting of the International Society of Haematology in Paris or at the International Congress of Clinical Pathology in Washington. Should it be felt desirable to hold such a meeting, I, for one, would not object, but would instead welcome the opportunity to explain this complex subject again.—I am, etc.,

Brooklyn, N.Y.

A. S. WIENER.

REFERENCES

- ¹ Wiener, A. S. (1954). *Rh-Hr Blood Types: Applications in Clinical and Legal Medicine and Anthropology*. Grune and Stratton, N.Y.C.
- ² — (1954). *An Rh-Hr Syllabus: The Types and Their Applications*. Grune and Stratton, N.Y.C.

Rh Antibodies and Domiciliary Midwifery

SIR,—With the establishment of the College of General Practitioners and the re-emergence of the general practitioner I would like to ask for the views of fellow G.P.s about the problem of Rh antibodies in domiciliary midwifery. I would particularly ask those who believe that domiciliary midwifery has distinct advantages over hospital midwifery and those who practise midwifery, not merely to fill in a claim form and pass the buck at any conceivable excuse. With the great strides in the treatment of haemolytic disease, such mental stress caused by the investigation alone is overlooked. The anxiety that can be caused by an "uncomplicated" green card is known only to the woman's G.P. The explanation is often misunderstood and comfort not accepted.

But to come to the specific problem. One is instructed by the local blood transfusion laboratory, and I use the word instructed deliberately, that should a woman have Rh antibodies then she must be confined in hospital. The reason for the instruction is set out with the letter of instruction. I feel that G.P.s are entitled to kick very hard at being instructed, but even if we are to assume that the laboratory's letter is one of advice one has to consider whether their advice is indeed correct and sound.

In the course of the last four years I have had some 300 confinements. All mothers had their blood grouped and there were five cases with Rh antibodies. Of these five, two infants were Rh -ve Coombs -ve, and were of course no problem. Two infants had haemoglobins of 120% approximately, and were very little problem. One infant had a Hb of a little under 100% and required a small transfusion for anaemia on the 8th and 20th day of life. Four of the confinements took place at home and the fifth I reluctantly advised to go into hospital—the advice was even more reluctantly accepted.

Provided one practises within easy reach of a laboratory with 24-hour facilities, and there is a hospital with proper facilities within easy reach, the problem as it appears to me is as follows. The mother has antibodies—the child may or may not have haemolytic disease. Provided one is prepared to be present at the confinement—for clinical assessment of the infant—and provided that one will send a sample of blood to the laboratory for estimation of Hb and Coombs test, what risks are run by a home confinement? Within an hour or two of the child's birth the practitioner will be able to report to the mother. In the great majority of cases this report will be entirely satisfactory. In the small minority of cases it will have been decided that replacement transfusion is required and arrangements will have been made, certainly well within four hours of birth. The case that may possibly require a small transfusion in the second week of life should, of course, not present any immediate problem.

It leaves one with the final small group—which I understand requires immediate transfusion—how extremely rare this group is I do not know. But I am pretty sure that the chances of an individual practitioner meeting a case are small to the extreme. In the past I have allowed my patients with antibodies to be confined at home—I have taken the precautions detailed—and I am very reluctant to give up this practice.

I am sure that many other G.P.s have given this problem thought, and one would be very grateful for their views. For myself, I feel that absolute safety is non-existent. (What about haemolytic disease due to other factors?) And to have given the mother peace of mind and happiness is a very great thing.—I am, etc.,

Gatehead, 8.

M. CHALK.

Mongolian Blue Spots

SIR,—Holt¹ describes these spots as follows: "In the skin of the lumbosacral region of the newborn infant one not infrequently finds irregular areas of pale brown or bluish pigmentation, several centimetres in diameter; they may also involve the buttocks and the posterior thoracic wall. These 'Mongolian spots' are quite regularly found in infants of Mongolian race, are fairly frequent in Negroes, but are not uncommon in infants of Caucasian stock. In Negroes they occasionally take the form of decreased, rather than increased, pigmentation. They usually disappear in later infancy or early childhood."

In this country these spots are usually considered to be rare. However, the proportion of foreign blood is steadily increasing, and investigation shows that they are becoming rather more common. During the year 1953 in the maternity wards of a large hospital 778 children were born. Four of them were observed to have Mongolian blue spots (0.51%). These four all had white British fathers. The mother of the first was a Negress and of the second an Indian. The mother of the third was of unknown race as she had herself been adopted in infancy. The parents of the fourth were both English, but the mother's mother was a Jewess from Odessa. An attempt was made to obtain a photograph of one of the spots with panchromatic and infra-red film, but it could not be seen in the prints. A colour photograph was successful.

This experience is recorded, as others may meet with the spots and be puzzled as to their nature. It is important to note that there is no connexion between these spots and Mongoloid idiocy.—I am, etc.,

Bath.

H. R. E. WALLIS.

REFERENCE

- ¹ *Holt's Diseases of Infancy and Childhood*, 1933, revised by L. E. Holt and R. McIntosh, 11th ed. New York.

Medicinal Teaspoons

SIR,—Dr. L. Carlyle Lyon's letter (*Journal*, January 23, p. 217) is a timely warning of the possible dangers of inaccurate measuring of medicines. Until comparatively recently most of the medicines supplied to patients for use in their own homes were relatively innocuous even in considerable excess of the correct dose. Now, however, very potent drugs such as methadone, the barbiturates, anti-histamines, and sulphonamides are issued as flavoured liquid preparations, especially for administration to children. With these drugs the margin of safety is small, and already at least one child has been poisoned by methadone because of inaccurate measurement of the dose.¹

There is even greater confusion about the value of a teaspoonful than Dr. Lyon has indicated. In 1947 the British Standards Institute issued a specification for a standard kitchen teaspoonful which holds approximately 49 minims (3 ml.). After protests from the pharmaceutical profession a standard for medicinal teaspoons was introduced in 1949 (B.S.S. 1348, 1949). The requirement for the capacity of this spoon is 60 minims (3.6 ml.) (±5%). In spite of the fact that a fluid drachm has been accepted by the medical, pharmaceutical, and nursing professions for many years as the volume of a teaspoon, at least three values are now in common use by manufacturers. For example, the dose of elixir of piperazine ("antepar") is given as 1 teaspoonful (3.5 ml.), that of chloramphenicol palmitate suspension as 1 teaspoonful (4 ml.), and of benzathine penicillin ("penidural") suspension 1 large teaspoonful (5 ml.).

Marston² quotes an example of two preparations of a similar compound being in one case labelled with 3.5 ml. as a teaspoonful and in the other 5 ml. He also mentions another preparation where the following is stated on the same label: "One teaspoonful (5 ml.) three times a day" and then "one drachm (4 ml.) contains x grains, etc." Spalton³ requested 20 clerical workers in a Leicestershire factory to bring from their homes "one tablespoon and one teaspoon such as you would use to administer medicine." He investigated the capacities of these and found that the teaspoons varied from 2.4 to 7.0 ml. and the tablespoons from 13.4

to 27.2 ml. It is probable that the majority of the public are unaware of the existence of the standard medicinal teaspoon, and the number of homes in which they are to be found must be very small. Surely the time has come to abandon the use of these inaccurate so-called "domestic equivalents" and to advise patients to measure medicines exactly. If drugs were prescribed and dispensed on the metric system it would be quite simple for patients to measure the dose as 4, 5, 10, or 30 ml., etc. Even on the old system it would be better for medicines to be labelled in fluid drachms and ounces and for measures to be supplied.

With modern drugs it is so important that the patient takes the correct dose that accurate medicine measures should be allowed to be prescribed on Health Service prescriptions. Diabetic patients can easily be taught to administer insulin in doses of 1 or 2 ml., and it should not take long to teach others to measure liquid medicines if the appropriate measures are readily available. Finally, it is obviously the duty of doctors and pharmacists to impress on their patients the need for accuracy in measuring medicines and the dangers of overdosage.—I am, etc.,

T. D. WHITTE.

London, W.C.1.

REFERENCES

- 1 *Pharm. J.*, 1951, 166, 52.
- 2 *Ibid.*, 1953, 170, 387.
- 3 *Ibid.*, 1949, 162, 338.

Ophthalmic Waiting-lists

SIR.—The City Surveyor of Birmingham in a recent speech gave a most apt description of a statistician: "A statistician is a man who can draw a straight line from an unfounded assumption to a questionable conclusion." Professor Sorsby in his report on the causes of blindness in England¹ has stated that each year about 2,500 to 3,000 patients are certified blind with cataracts and that some 80% have not had any treatment. Also, some 1,200 to 1,500 are registered blind from glaucoma. The statisticians have therefore jumped to the conclusion that these patients go blind while they are on ophthalmic waiting-lists.

I see, and certify as blind in each year, at least three patients with cataracts who decline operation because of fear (I wonder how many cases our general surgical colleagues see of malignant disease which has advanced to an inoperable stage for the same reason). I see at my hospital clinic at least two patients in each year who present themselves for the first time with grossly constricted visual fields and with optic disks that one could almost "take a bath in." I have no reason to suppose that I am in a different position to any of my colleagues, and I believe the membership roll of the Faculty of Ophthalmologists has 700 or 800 names on it. I have no difficulty, therefore, in accepting these figures. I do not think that any ophthalmic surgeon puts a case of bilateral mature cataracts on a routine waiting-list. I am convinced "glaucoma classes" for opticians would prove more beneficial than "glaucoma clinics" for patients, although the latter seems to me an excellent idea.—I am, etc.,

Dudley.

L. H. G. MOORE.

REFERENCE

- 1 *The Causes of Blindness in England, 1948-50, 1953.* H.M.S.O., London.

Doctors' Handwriting

SIR.—May I express my utmost sympathy with the views expressed by Dr. Frewen Moor on doctors' handwriting (*Journal*, February 6, p. 334)? Some of my professional friends seem to specialize in forming a totally illegible signature, which seems to me to be almost the worst sin of all, though this is not specifically mentioned by Dr. Moor. It is true that some of them try to mitigate the effect on their correspondents by having a secretary type out the name below the signature, since this by itself affords no clue to identity.

Whatever the reason for execrable writing among doctors, it has to be admitted that it is no recent phenomenon. Dr. Moor's distinguished predecessor in Norwich, Sir Thomas Browne, wrote a terrible hand, and I must admit,

as an editor of Browne's *Works*, that I could not have compassed the task without the assistance of a British Museum expert, who first transcribed the MSS. for me so that I might then verify them for myself. Dr. William Harvey is another lamentable example. His writing was so bad that his friend, Sir George Ent, apologized for it in his dedication to the President and Fellows of the College prefixed to Harvey's *De Generatione Animalium*, and explained that he had taken much trouble over the MS. himself, as no one else would have been able to read it. A similar problem now faces the President and Fellows of the College over the transcription of Harvey's remaining unpublished MS.

Some years ago the Marquis of Cholmondeley, aided and abetted by Sir Sydney Cockerell, instituted prizes for handwriting at Eton, Harrow, and Winchester, with the most gratifying results. A generous patron of this kind is perhaps needed for our larger medical schools, though it may be that the prizes should really be awarded among fellows, members, and licentiates of the royal colleges. Indeed, I know several young men recently graduated from my own hospital who have trained themselves as students to write beautiful and legible hands. Perhaps this resolution may falter when they find themselves faced with the exigencies of medical practice—though this does not always happen. The late Sir Norman Moore and his son, Sir Alan Moore, were both famous at St. Bartholomew's for their beautiful handwriting, though it will be urged that neither was afterwards in general practice.

There is one further point. It is not generally realized how many inaccuracies may be traced to the modern demand for everything in typescript. As the author of several bibliographies, books which are useless if inaccurate, I have always written out my material in such a way that it could go straight to the printer without any typewritten intermediary. Typist's errors are thus eliminated, and no printer has yet complained of any difficulty.—I am, etc.,

London, W.1.

GEOFFREY KEYNES.

Hospitals and the Visiting Public

SIR.—We shall be sharing Dr. Doris Odium's deep concern (*Journal*, February 6, p. 334) over her discovery of the lack of waiting amenities in our hospitals for the relatives of dangerously ill patients. It is our clear duty to ask for conditions calculated to enhearten and comfort rather than accentuate the depression of spirits naturally sorrowful and racked with anxiety. Nothing short of simple consideration in entertaining them is thinkable; and, fortunately, the occasion is likely to evoke sympathetic action by the administrative authorities.—I am, etc.,

Bristol, 8.

A. WILFRID ADAMS.

Cortisone and Manipulation of Knee-joint

SIR.—There are several aspects of the report of the joint committee of the Medical Research Council and the Nuffield Foundation entitled "A Comparison of Cortisone and Codeine Medication as an Adjuvant to Manipulation in Rheumatoid Arthritis" (*Journal*, January 30, p. 233) which invite comment.

(1) The title: this has been wisely rehearsed on other pages by you, Sir, as "Cortisone and Manipulation of Knee-joint," as the scope of the investigation was restricted to the knee-joint. The negative result of the knee-joint does not alter the possibility of the value of cortisone cover in manipulating other joints, such as the elbow- and finger-joints where local reactions are marked following manipulation. (2) The opening sentences specify that the essential problem was the flexion deformity of the knees. There are no figures given to indicate whether or not this flexion deformity was improved, and, if so, if there was any difference between the two series. (3) It would appear from the text that no clear distinction was made between manipulations to reduce flexion deformity and manipulations to improve range of movement. The aim influences the technique of manipulation and its after-treatment, and of course the post-manipulative

gain in range. Again, there is no indication as to whether the range of movement recorded is that obtained passively by an observer or that under voluntary control—surely not an unimportant technical point when drugs which might influence performance are being used. (4) It would be interesting to know how the cases were shared between the centres, and whether or not differences were noticed between the results obtained at different centres. (5) As mean values of such a small series of numbers are given then there should be some advantage in including the range of findings or the standard deviations.

I intend no criticism of the actual participants in this trial, but cannot help expressing my surprise at so woolly a report from so eminent a source.—I am, etc.,

Buxton.

R. HARRIS.

Displaced Intervertebral Disk

SIR.—Much of the discrepancy of opinion with regard to displaced intervertebral disks has arisen owing to a misunderstanding. There is no evidence that a displaced disk can ever be replaced by means of manipulation. Even when exposed at operation, there are no records of cases in which the surgeon has found it feasible to reduce the prolapsed tissues into their original position. On the other hand, it is undoubtedly true that instances of pain in the back may sometimes be relieved by means of manipulation, but in such cases the symptoms are to be attributed to rheumatic or fibrositic changes in the soft tissues, and not to a displaced disk as is sometimes supposed.

There are thus two distinct conditions of everyday occurrence, the symptoms of which bear a general resemblance to one another but which are of different origin and require different treatment. In cases of displacement of a disk manipulation aggravates the symptoms, whereas immobilization is of benefit. On the other hand, in rheumatic or fibrositic conditions manipulation may be of value, whereas immobilization delays recovery. Fortunately it is not difficult to distinguish between these two conditions, provided that they are approached with an open mind; and it is also fortunate that in both conditions there is a strong tendency for the symptoms to subside, a process aided or impeded according to the treatment employed.—I am, etc.,

Sheffield.

R. G. ABERCROMBIE.

Persistent Adult Bed-wetting

SIR.—Even the most Oedipus-ridden of us will welcome Mr. C. Jennings Marshall's paper (*Journal*, February 6, p. 308) not only for its clear statement of the unsolved anatomic and physiological problems of bladder behaviour but for the hope it holds out for those frustrating and intractable adult cases one sees, many of whom are remarkably free from emotional disturbance considering what they have been through. Certain things should be remembered, however, if this paper is not to start, quite unintentionally, a surgical pursuit of enuretics-as zealous as that which for a time attached to patients with "disks."

Essential nocturnal enuresis is certainly not a clearly defined entity. In the first place I doubt very much whether even the majority of cases show diurnal precipitancy or frequency. Many patients state that they can sit through cinema performances quite comfortably, and can empty their bladders in as leisurely a way as other people. Secondly, there are children in whom enuresis is one of a number of behaviour disturbances—temper, destructiveness, spitefulness to a sibling, and so on; and in whom the enuresis disappears with the other things under the impact of a little play therapy. Oedipus or no Oedipus, this just happens to be true. Thirdly, there are deep sleepers, both children and adults, in whom the loss of cortical inhibition seems to be the factor. The history is so often striking in that it is related that the patient "dies" when he goes to sleep. If such a patient spends a restful night after 30 mg. of amphetamine, which is what sometimes occurs, there cannot be much doubt about the matter. Lastly, it should be

remembered that spontaneous cures occur not only at puberty. There is a continuous falling off in incidence throughout childhood and adolescence.

This leaves a nucleus of cases, which from Mr. Marshall's case reports may be those with "great diurnal precipitancy," in which his theory of the mechanism of enuresis is convincing and his results encouraging. It is good to have Mr. Marshall's reassurance about the nervi erigentes. The stirrings of Nature have a biological function of some importance, and this has usually nothing to do with the Oedipus.—I am, etc.,

London, S.W.1.

GERALD GARMANY.

Thiopentone Injection into an Aberrant Artery

SIR.—Dr. M. Swerdlow's presence of mind in leaving the supposedly intravenous needle *in situ* in the aberrant artery until procaine solution had been injected may have saved his patient from serious complications (*Journal*, January 30, p. 258). To avoid this accident two simple precautions are recommended. Careful palpation will reveal pulsation, and the colour of the blood withdrawn will be seen to be bright red if from an artery. It has been stated, however, that blood withdrawn into a syringe containing thiopentone will darken and so nullify this test.

In some experiments carried out for me by Messrs. Abbott Laboratories Ltd. it was found that venous blood drawn into 5% thiopentone solution did darken a little temporarily, but blood taken from an artery into the solution remained bright red. It would appear, therefore, that thiopentone mixed with blood from an artery will not spoil the redness by which entry of an artery might be recognized. In spite of precautions it is possible to enter an artery, and it would be wise always to pause after injecting a little to see if anything untoward is happening.—I am, etc.,

Enfield, Middlesex.

C. ALLAN BIRCH.

Galactosaemia

SIR.—The two articles on galactosaemia that appeared in the *Journal* of January 30 (pp. 242 and 245) describing the full investigations done were an admirable contribution to our knowledge of this fascinating disease—probably the only authentic cause of "me milk don't agree with me baby." However, should not a note of caution be sounded, Sir, regarding these blood investigations? These babies are very liable to bleed. We have in hospital now, under the care of Dr. John Apley, a baby with proved galactosaemia who at the age of 14 days was admitted on account of profuse bleeding from the umbilicus that was very difficult to stop. Such haemorrhages are fairly common in this disease. Hence, since the diagnosis of galactosaemia can be confirmed by investigation of the urine alone, venepunctures are better avoided in the early stages of the disease. Should such venepunctures be considered necessary, they should be done with care and confined to the peripheral veins. It seems worth stressing that particularly an internal jugular puncture, or even a femoral puncture, might well prove disastrous.—I am, etc.,

Bristol, 2.

BERNARD LAURANCE.

Human Lactation

SIR.—Dr. F. E. Hytten has described (*Journal*, January 23, p. 175) his investigations of milk yield and the content of fat over periods of one day. Although he acknowledges the importance of the draught reflex he has not, it seems, appreciated that the effectiveness of the reflex is not strictly proportional to the fullness of the breast. If the breasts are very full the draught reflex may be exhausted before the breast is emptied and the residual milk be unobtainable. This then doubtless contributes to the available milk at the next feed. Probably, therefore, the diurnal variation in quantity of milk obtained in Dr. Hytten's investigation was produced by the preceding long night interval. Some of the 06.00 hours' unobtainable milk went to increase the 10.00 hours' yield. Dr. Stainer and I, when studying the diurnal

variation in the fat content of milk, took the precaution of emptying the breast at constant intervals and of emptying the breast at the same interval before the outset of each investigation. Under these conditions we found the rate of secretion of milk throughout 24 or even 52 hours to be almost steady. The consistent emptying of the breast gave a clearer picture of the diurnal variation of the fat content because residual milk had been reduced to a minimum.

Although there is reason to believe that milk is modified after leaving the alveolar cell—the passage of globulin direct from plasma,³ the variation of salt content with fullness of the breast,⁴ the nature of regression milk and the thinness of the duct epithelium all suggest it—the concept of constant secretion is an important one. Irregular yields indicate difficulties in obtaining milk, failure of draught or failure of suckling technique. They give warning of milk retention and its attendant risk of mastitis. In the management of human lactation they should be viewed as failure of emptying first, because this is common and can so often be remedied.—I am, etc.,

London, W.C.1.

MAVIS GUNTHER.

REFERENCES

- ¹ *Lancet*, 1949, 2, 235.
- ² Campbell, P. N., et al. (1953). *Biochem. J.*, 54, xli.
- ³ Kermack, W. O., and Miller, R. A. (1951). *Arch. Dis. Childh.*, 26, 265.
- ⁴ Gunther, M. (1952). *Brit. J. Nutrit.*, 6, 215.

Piperazine in the Treatment of Threadworms

SIR.—Professor T. Gordonoff (*Journal*, February 13, p. 394) "once gave piperazine by mouth to rats and . . . found it quite toxic. At 4 to 5 g. per kg. there was laboured breathing and twitchings, and some of the animals died." This is a reasonably accurate though not an original observation and agrees in a general way with more detailed tests carried out elsewhere, which were carefully considered before we undertook the trials recorded in our paper (*Journal*, October 3, 1953, p. 755). However, 4 to 5 g. per kg. is more than 60 times the maximum dose we recommend. Many drugs which are freely available to the public would be highly toxic, if not lethal, if given in equivalent quantities—e.g. (in terms of adult dosage), aspirin 2 oz. (62 g.) (180 5-grain (0.32 g.) tablets), santonin or gentian violet 180 gr. (12 g.), quinine 1½ oz. (41 g.), castor oil 1½ pints (0.9 l.). It is perhaps wise to exercise a certain sense of perspective.

Piperazine was commonly used for gout at the beginning of the century, in doses similar to those now recommended for threadworm, without noticeable ill effects. In the last few months it has been widely used in this country as an anthelmintic, with excellent results. The few side-effects which have been reported provide no sound reason for muzzling this very successful treatment.—We are, etc.,

R. H. R. WHITE.

O. D. STANDEN.

London, N.W.1.

POINTS FROM LETTERS

Press Publicity

Mr. N. C. WILKINSON (London, W.14) writes: As a journalist who has for some years reported medical news, both as a freelance and a staff writer, I may say that if doctors are treated with courtesy, their scruples regarding medical professional ethics carefully regarded, and if they are given the chance of verifying that they have been correctly reported before an article or news item is published, then they almost always help the journalist to the fullest extent in their power. This co-operation is a powerful factor in public health education.

Site for Vaccination

Dr. E. P. RIGBY (Nairobi) writes: I am intrigued by the suggestions of Dr. J. Cantor (*Journal*, November 7, 1953, p. 1050) and Dr. Dorothy M. Roels (*Journal*, December 5, 1953, p. 1272). Having at one time had to examine the vaccination scars of landing passengers, I can assure both these doctors that the examination of scars in the sites mentioned by them would cause considerable delay in the clearance of a ship. The most convenient site for this purpose is the volar aspect of the forearm, which, while not being absolutely ideal for cosmetic reasons, is, however, reasonably inconspicuous.

Obituary

WILLIAM DOW, M.D.

Dr. William Dow, formerly medical superintendent of Knightswood Hospital, Glasgow, died on January 31 in his 79th year. Of Highland stock, he was born in Glasgow and received his schooling and medical education in his native city. He graduated M.B., Ch.B. in 1903 and became house-physician to Dr. Finlayson in the Western Infirmary. After a voyage to India he joined the staff of Belvidere Infectious Diseases Hospital, Glasgow, under Dr. John Brownlie—one of the greatest epidemiologists of the day—and at the same time became a member of a coterie of medical men who were all to win distinction in their various fields of medical endeavour. During his stay at Belvidere he wrote a thesis on cerebrospinal meningitis, and for this work was awarded his M.D. degree, with high commendation, in 1908. He was troubled by ill health at this time, and spent the next ten years as medical officer to several extensive sheep ranches in Tierra del Fuego and Patagonia. A wonderful raconteur, he had many interesting stories to tell of his experiences there—of long journeys on horseback, and of meeting and attending to the author and many of the people mentioned in Lucas Bridges's book *Uttermost Part of the Earth*.

In 1919 he returned to Glasgow and after a year in Robroyston Hospital was appointed physician superintendent of Knightswood Infectious Diseases Hospital, where he remained until his retirement in 1940. After only a few months he was recalled to become superintendent of Peel Emergency Hospital, Galashiels, and this post he held till 1947. He then lived quietly in retirement, but maintained an intensive interest in all things medical, and, although greatly crippled by his last illness, was present at a meeting of the Glasgow Medico-Chirurgical Society only a few weeks before his death.

Dow was a kindly and genial man, and was truly beloved by all his residents, whom he affectionately spoke of as his "boys." A clinician of the older school, he had a deep knowledge of infectious diseases and an intuitive and sound clinical judgment. Medically he was rather self-effacing and had a remarkable gift of stimulating the younger members of his staff to original work. In many ways he was the ideal type of physician superintendent, taking a fatherly interest in all his staff—medical and nursing—but also being a firm disciplinarian when occasion demanded it. He was very proud of Knightswood Hospital, and on leaving he provided funds to have a gold medal presented annually to the most proficient nurse. He was a bachelor and is survived by his sister.—P. McK.

We are indebted to Sir ALEXANDER MACGREGOR for the following appreciation: Dr. William Dow was an intimate friend as well as a colleague of mine during most of our professional lives. He was for 20 years physician superintendent of Knightswood Fever Hospital—a hospital which under him and his successor, Dr. Thomas Anderson, acquired a high reputation for clinical and scientific research, which was continuously pursued there throughout the years. Indeed, a post as resident there was much sought after by young graduates in medicine. Dr. Dow had an inquiring mind, and the pursuit of knowledge was one of his main interests in life; above all, he had a gift for communicating

his enthusiasm to his junior staff. It will be a sufficient indication of his qualities and early promise to mention that after graduation he was invited simultaneously by two of the chiefs at the Western Infirmary, including the late Sir William Macewen, to become their resident. His clinical judgment and skill in the diagnosis and treatment of his patients were universally admired and often commented upon. But apart from these qualities he had a flare for administration, so that his hospital was always kept in a state of high efficiency.

Perhaps his most outstanding quality was his genius for friendship. He was by nature warm and friendly; he was that rare person who loves to mingle with young people, and to discuss with them their work and their prospects, and to stimulate them to high endeavour. I know that his memory is revered by almost a generation of former residents, as well as by the nursing and other staff of Knightswood Hospital. When he retired some years ago he was appointed by the Government as medical superintendent of the new War Emergency Hospital at Peel in the Lowlands of Scotland, and it was his duty to organize the hospital from the beginning so as to serve the large area of the border counties—a duty which he performed with the utmost success.

Dr. R. D. SMEDLEY, for 27 years county medical officer of health for West Sussex, died, after a long illness, on January 19 at his home in Goring-by-Sea. He was 77 years of age. Ralph Davies Smedley was born on March 15, 1876, at Pembroke Dock. From Shrewsbury School he went on to Pembroke College, Cambridge, with an exhibition. He completed his medical training at Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1902 and graduating M.B. two years later. He took the D.P.H. in 1904 and proceeded to the M.D. degree in 1908. After graduation he returned to Cambridge to undertake research work. Later he became bacteriologist to the City of Leeds, and for five years he was demonstrator of pathology in Sheffield University. His first post in the public health service was in the county of Durham, where he remained until 1913, when he was appointed county medical officer of health for West Sussex. In 1908 he married Dr. Florence Erin Gubb, daughter of Dr. Alfred E. Gubb, who was for long the editor of the *Medical Press and Circular*. His widow and a son and daughter survive him.

Dr. WILLIAM TEMPLETON writes: Dr. R. D. Smedley was virtually the first county medical officer of health for West Sussex, and he at once seized the opportunity of instituting a comprehensive service. He found only two part-time medical officers in the service, doing mainly school work, and within six months he added two whole-time medical officers for tuberculosis and school work, of whom I was one, and three whole-time nurses for staffing school and tuberculosis clinics. Progress was halted by the outbreak of the 1914-18 war, when Dr. Smedley himself, both his whole-time officers, and one of his part-time officers departed on war service. He was fortunate, however, in his wife, who was medically qualified and able to carry on the county health service under war conditions of great difficulty, with the assistance of several part-time temporary officers, though she had her own two young children to look after. In addition, she was appointed inspector of midwives for the county in 1918, and she inaugurated the midwifery and child welfare work under the Maternity and Child Welfare Act of 1918. Early in 1919, on the return of Dr. Smedley and of all his assistants from war service, a new chapter of public health endeavour began. The maternity and child welfare service was extended rapidly, and in 1920 the tuberculosis service became the whole responsibility of the county, and a county sanatorium was essential. After prolonged effort a suitable building was acquired, and Aldingbourne Sanatorium was opened in 1921. Dr. Smedley was from the first the moving spirit in adapting the building and providing equipment, and for many years he was responsible for the administrative work in the institution and grounds. Much of the sana-

torium's success was due to his foresight and care. The school medical service also demanded much of Dr. Smedley's time, and the development of treatment, dental, and orthopaedic clinics, and other departments gave full scope to his genius for visualizing the county's needs. He was closely associated with the local voluntary nursing services, which under his guidance became the efficient county nursing service of to-day. Another of his interests was the welfare of the blind. In 1921 he was largely responsible for the formation of the West Sussex Association for the Blind, and was its honorary secretary for many years. The provision of a new county hospital in Chichester was a project with which he was closely concerned, and, with the county architect, he was responsible for much of the planning of a new building opened in 1939. It was put into use immediately as a war hospital and is now the efficient modern general hospital, St. Richard's, Chichester. After a life of exacting responsibility, which from 1920 necessitated almost daily travelling between his home in Worthing and his office in Chichester, he retired in March, 1940. He immediately took an active part in the Home Guard, and served as battalion medical officer. He was a man of great charm and of sound judgment, considerate and thoughtful for all who worked for him, and a real "father" to all his numerous office staff. To his colleagues, not only in his own department but throughout the county, he was always approachable and willing to help and advise.

It was with great sorrow that the Colony of Aden learned of the death on January 7 of Dr. N. R. GUPTA at the Civil Hospital, where he had been in charge of the skin and V.D. departments. Born in Calcutta in 1902, Nirod Ranjan Gupta was the son of the late Dr. Dakshina Ranjan Gupta and Indu Bala das Gupta. He was educated at the Victoria Institution at Singapore, where he won high honours both in scholastic and in athletic fields. He studied medicine at Edinburgh, where he qualified in 1931. On his return to India Dr. Gupta served the Government of Bengal as surgeon-in-charge of the V.D. and skin departments of the Campbell Medical School and Hospital, Calcutta. During the war he served in the Indian Army, attaining the rank of major. In 1945 he joined the staff of the 13th Indian General Hospital at Aden, where he soon found friends at the Civil Hospital, little knowing that later he would become a member of its staff. His last post in India was officer commanding the Indian wing, Combined Military Hospitals, Peshawar. In 1947 he joined the Colonial Medical Service and was posted to the Civil Hospital, Aden, where he soon showed his therapeutic skill in the skin and V.D. departments. He returned to Edinburgh for a year in 1949 in order to take a postgraduate course in his specialty. Dr. Gupta was a loyal and conscientious physician, carrying out his work with exemplary skill. A deeply religious man, he was simple in his habits and charming in manner, and was admired and respected throughout the colony, where he will be sorely missed. He is survived by his wife and three children, to whom we extend our deepest sympathy.—N. H. S.-B.

The death of Surgeon Lieutenant-Commander BASIL GEOGHEGAN, at the early age of 34, is not only a personal tragedy to his many friends, it is a serious loss to the field of research in which he was engaged. His father was the late Dr. Joseph Geoghegan, who practised in Wimpole Street until his death in 1948. Basil Geoghegan was educated at Epsom College and the Middlesex Hospital Medical School, qualifying in 1945. After completing some house appointments, he joined the R.N.V.R. and was transferred to the permanent list of the Royal Navy in November, 1946. For two years he served in H.M.S. *Swift*, and here he was described as an officer of considerable professional ability, and capable and zealous in all his duties. In 1953 he was promoted to the rank of surgeon lieutenant-commander. In December, 1948, Geoghegan was seconded for duty to the Medical Research Council unit for climate and working efficiency in the department of anatomy at Oxford. He was an invaluable member of this unit, for he

combined a flair for sound and accurate research with a quite unusual insight into statistical methods and their practical application. He went on two Arctic cruises in order to carry out investigations on the effect of exposure to cold on naval personnel, and collected a great quantity of valuable data. Much of the latter has still to be analysed (for his illness unfortunately prevented him from preparing all his material for publication), but he established a most interesting relationship between the cholinesterase and vitamin-C content of blood plasma and the environmental temperature, which he communicated in 1952 to the International Congress of Biochemistry in Paris. In a Medical Research Council Report he presented an ingenious mathematical analysis of the cyclical diurnal variations of temperature conditions on board ship. The other data which Geoghegan accumulated on the Arctic cruises have particular reference to the nutritional effects of exposure to cold. In addition to these important observations he made a special study of the determination of body measurements, surface area, and body volume by a photographic technique (published last year in the *American Journal of Physical Anthropology*), and there can be little doubt that this method, from the point of view of its practical application, has many advantages over the traditional methods of anthropometry. Apart from his scientific activities, Geoghegan was a man who knew how to appreciate the good and simple things of life; he was a prodigious reader, and because of his wide interests he was a most engaging conversationalist. He also had a high reputation as a first-class swimmer and frequently took part in inter-university swimming contests. It is a remarkable tribute to his tenacity and loyalty that after his first severe illness in 1951 Geoghegan returned to work and continued to pursue his research with the greatest fortitude until at last, in September last year, the recurrence of the illness finally forced him to give it up.—W. E. Le G. C.

Dr. A. E. ROBERTS, county medical officer of health for Flintshire, died at his home at Rhyl on January 1 at the age of 65. His friends and colleagues will miss him greatly, for his influence permeated well beyond the responsibilities of his post. Aneurin Evan Roberts, who was born in Denbighshire on May 22, 1888, received his medical training at the London Hospital, and graduated M.B., B.S. from London University in 1913. During the first world war he served in the R.A.M.C., and on demobilization in 1919 he was appointed assistant county medical officer in Flintshire. On the death of his predecessor, Dr. A. E. Williams, during the last war, he took over the duties of county medical officer. After the war he attended the D.P.H. course at Liverpool University and obtained the diploma in 1946. In the following year he was appointed county medical officer of Flintshire.

We are indebted to Dr. M. T. ISLWYN JONES for the following appreciation: Having an intimate and detailed knowledge of the county he served, gained over many years, Dr. A. E. Roberts assessed accurately the needs of the community, and his shrewd advice and sound wisdom were greatly appreciated by his colleagues. Youthful in appearance and outlook, he kept abreast of recent developments and trends, while his congenial, energetic, and mature personality powerfully supported new advances. Blessed with the rare gift of true friendship and innate charm, he won the affection and loyalty of all those with whom he came in contact. His fortitude and unwavering acceptance of his illness reflected truly the philosophy which had guided him through life. He continued to work up to within a few days of his death, and received the unstinting support and sympathy of all his staff. He was denied the brief respite which his long years of service had earned, but those who knew him intimately realized that whether in office or not he would have continued to contribute to the betterment of humanity. On January 5 he was buried in the peaceful serenity of Llanrhudd church, near Ruthin, in his native county of Denbigh. Many colleagues and the staff of the Flintshire health department wish to be associated with this tribute

to an honoured, valued, and beloved friend. Dr. Roberts leaves a widow, a son, and a daughter, to whom we extend our deepest sympathy.

Dr. LL. S. H. GLANVILLE died at Emsworth, Hampshire, where he had been in practice for over forty years, on January 15 at the age of 75. Llewellyn Stanley Howard Glanville was born on July 25, 1878, and received his medical training at Guy's Hospital, graduating M.B. from London University in 1903. Two years later he obtained the B.S. degree and in 1906 he proceeded to the M.D. He held house appointments at Guy's Hospital, the East London Hospital for Children, and the Samaritan Free Hospital for Women before settling in practice at Emsworth in 1908. Except for the period of his service with the R.A.M.C. in the first world war, he continued in practice at Emsworth until shortly before his death. From 1915 to 1918 he served in Gallipoli, Egypt, and France, and was taken prisoner at St. Quentin in 1918. On return to civilian life he quickly settled down again to his work as a general practitioner, work in which his integrity, acute mind, and keen judgment combined to endear him to his patients and friends. A man of simple tastes and of rather diffident nature, he was nevertheless often asked for help and advice by those in difficulty. His good humour and his friendly chuckle made him a delightful companion. All thoughts of relaxation from work were dispelled in 1939, when retirement or semi-retirement was in his mind, by the outbreak of the second world war, and he remained in full-time practice until 1946, shouldering the burdens left behind by his partners on service in addition to his own duties. After the war his life became quieter and easier, although by no means idle, and he gave valuable assistance as chairman of the house committee of the Victoria Cottage Hospital at Emsworth, to which he was also consulting physician. An example of the very best type of general practitioner, he kept himself abreast of the many advances in medical treatment. He was happy in his work and never spared himself; he had, therefore, the affection of all his patients, to whom he was both kind and generous. For recreation he would take walks over the South Downs, or sail in Chichester harbour, or tend his beautiful garden. His life was saddened in 1951 by the death of his wife, whom he had nursed devotedly during her last illness.

Dr. C. D. EDWARDS died on January 15 at Kington, Herefordshire, at the age of 84. The son of the late Edwin Evans Edwards, Charles Derwent Edwards was born at Rugeley, Staffs, in 1870, and was educated at Hereford Cathedral School, St. John's College, Cambridge, and Guy's Hospital. After graduating M.B., B.Ch. in 1896, he held resident posts at his teaching hospital, and then went into practice, first at Woodford, Essex, and later at Chalford, Gloucestershire. In 1910 he proceeded to the degree of M.D., and in the following year he took the D.P.H. During the first world war he served in the R.A.M.C. with the rank of captain, and he was sanitary specialist to the 34th Division and medical officer of the 102nd Field Ambulance. He was awarded the Military Cross for his services. After his retirement he lived at Kington, and took an important part in the life of the district, as can be seen from the following description of his interests and activities. He was particularly devoted to the parish church, of which he was churchwarden, and he did a great deal for the maintenance of the church itself, and was largely responsible for the building of the Huntington Parish Hall. He was in fact a generous supporter of many charities. Chairman of the Huntington Parish Council for many years, he was also for some time a member of the Kington Rural District Council. He was always concerned in the assistance of disabled men, and worked unceasingly for the British Legion, being chairman of the Kington Branch from 1927 to 1953. A vice-president of the North Hereford Conservative Association and chairman of the Huntington Branch, he was also chairman of the Leominster Division of the Junior Imperial League. One of his appointments was that of Commissioner of In-

come Tax. As a member of the committee and a trustee of the Victoria Cottage Hospital, Kington, he was a considerable benefactor, and he was chairman of the Kington District Nursing Association, as well as being a member of the executive committee of the County Nursing Association. Interested as he was in helping young people, he was a keen supporter of the Boy Scouts Association, of which he was a district commissioner, a governor of the Lady Hawkins Grammar School, and chairman and correspondent of the managers of Mahollam School. Local agriculture also benefited by his enthusiasm: he was a member of the National Farmers' Union and of the Kington Local Committee of the Herefordshire War Agricultural Committee, and president of the Kington Young Farmers' Club since its foundation. For many years chairman of the Kington Horse Show and Agricultural Society, he helped greatly to build it up. He was particularly successful as a rose grower, and was also a keen bee-keeper, winning many prizes for his honey. A fine sportsman, he played Rugby football while at Cambridge and represented the university in athletics. He greatly enjoyed hunting and shooting, and was an ardent fisherman, being chairman and later president of the Kington Fishing Club. Another of his interests was first-aid work, and he was associated with both the British Red Cross Society and the St. John Ambulance Brigade, being president of the Kington Division of the latter. In 1898 he married Janet Louise Paterson, at one time a sister at Guy's Hospital: she died in 1949. Dr. Edwards will be missed by everyone with whom he came in contact.—W. L. J.

Dr. CHARLES HERBERT GOULDSMITH PRANCE died at Woodford Green on January 21 at the age of 84. He was a medical student at St. Bartholomew's Hospital and qualified in 1897. He practised in turn at Polyphant, near Launceston, at Plympton, South Devon, and then in Cornwall again, this time at St. Austell. During the first world war he served in the R.A.M.C. and was present at the Gallipoli landings. He attained the rank of major and was mentioned in dispatches for his services. After demobilization he settled at Ashted, in Surrey, where he was in practice until he retired in 1940. He then became chairman of a medical board. At Ashted he served on the welfare committee of the local branch of the British Legion for many years, being chairman of the branch in 1936. In 1945 he went to live at Mentone, in the South of France, but he returned to England shortly before his death. In the days when Dr. Prance first entered general practice great demands were made on the family doctor, who, besides being physician, general surgeon, and accoucheur, might be called upon to act as dental surgeon, dental mechanic, or veterinary surgeon: with his resourcefulness and versatility, however, Dr. Prance was capable of dealing with any emergency. His unbounded energy and his great love and understanding of his fellow-men endeared him to all who knew him.—S. F. H.

Dr. NOEL KEMM died suddenly at Bristol on January 23 at the age of 60. Noel Edward Ifarnewell Kemm, who was born on November 24, 1893, came of a medical family, both his grandfather and father having been in practice in the West Country, and his brother being in practice at Cheddar. He was educated at Blundells School, and from there went on to Bristol University as a medical student. Immediately after qualification, in 1918, he entered the R.A.M.C. and saw active service in Palestine as medical officer to the Queen's Bays. After demobilization he held a number of appointments at Bristol Royal Infirmary and then went to the Richard Murray Hospital, Blackhill, County Durham, as resident medical officer for three years. Returning to Bristol as surgical registrar at the Royal Infirmary, he obtained the London degrees of M.B., B.S. and the F.R.C.S.Ed. in 1925. Eventually he settled in practice at Clifton, but after a time he became interested in occupational health, and for the last 10 years had acted as whole-time industrial medical officer. During the last war he served as a combatant officer in a Bristol Home Guard

infantry battalion. Dr. Kemm had many interests outside his profession, and his tall, spare figure was well known and welcomed at meetings of local medical societies and at social functions. His bluff manner could never conceal his great kindness of heart, and he was a staunch friend to many. He continued to work, as he wished, to the end. He is survived by a widow and stepdaughter, to whom our deepest sympathy is extended.—R. B. B.

Dr. C. P. DONNISON, consulting physician to the children's department of the Cheltenham General Hospital, died at his home at Cheltenham on January 23 after a short illness. Cyril Percy Donnison served as a pilot in the Royal Flying Corps during the first world war, and then began the study of medicine at the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1924. Having joined the Colonial Medical Service, he worked for the next three years in Kenya. The results of his careful observations of the health of Africans were incorporated in his book *Civilization and Disease*, published in 1937. On returning to England, he entered general practice and took the London degrees of M.B., B.S. in 1928. Two years later he proceeded to the M.D., and in 1934 took the M.R.C.P. He practised at first at Benfleet and later moved to Cheltenham, where his interest in children led to his appointment as paediatrician to the Cheltenham and County Child Guidance Clinic and afterwards as consulting physician to the children's department of Cheltenham General Hospital. He was also a member of the medical staff of the two well-known public schools in Cheltenham. With the advent of the National Health Service he gave up general practice and worked purely as a consulting paediatrician. When he was in general practice he maintained a very high standard of work, himself carrying out such clinical pathology as was required, and he brought to consulting practice the same painstaking care over every detail. This, supported by an extensive knowledge of the literature of his specialty, gave his opinion a value which was greatly appreciated by doctors who sought his help. His other great interest, apart from his work, was sailing, and it was characteristic of him that he should bring to his hobby the same scrupulous care that he brought to his work. His death, at the comparatively early age of 55, has removed a friend and a colleague who was greatly loved and respected. He leaves a widow and two daughters, both of whom are working in hospitals—one as a house-physician and the other as an almoner.—R. G. A.

Dr. H. S. GABB, a member of a well-known Hastings family and consulting surgeon to the Royal East Sussex Hospital, died suddenly at his home at Hastings on January 24 at the age of 76. Harry Secretan Gabb was born at Framlingham, Suffolk, on November 16, 1877, and was educated at Walsall Grammar School, Wellington College, Shropshire, and Shrewsbury School. Entering Downing College, Cambridge, in 1895 with an open scholarship in natural science and a scholarship from the Shropshire County Council, he obtained the B.A. degree with a first class in the Natural Sciences Tripos in 1898. He then went to Charing Cross Hospital Medical School with a university scholarship and took the M.B., B.Chir. degrees in 1901. At hospital he won the Llewellyn scholarship, and, after holding house appointments there and at the Central London Ophthalmic Hospital, he became senior house-surgeon at the South Devon and East Cornwall Hospital, Plymouth. In 1904 he joined his cousin, the late Dr. C. B. Gabb, in practice at Hastings, where he soon gained the affection of his patients, who regarded him as family physician and friend, and of his professional colleagues. He combined the work of his private practice with the duties of a surgeon at the Royal East Sussex Hospital, and in 1948 he became consulting surgeon to the hospital. During the first world war he was in the R.A.M.C. and saw service in France. He represented the Hastings Division of the British Medical Association at the Annual Representative Meetings in 1944, when the proposals for a National Health Service were debated, and in 1945. Dr. Gabb held decided views about the Service, which he never entered. He was president of

need for any statutory requirement of notification. The Government was considering, in consultation with the interests concerned, the suggestion that the use of bacterial rodenticides should be discontinued in view of possible risks to public health. These preparations, which were not on sale to the general public, had been in use on a considerable scale for many years. The companies using them had agreed to adopt, with minor modifications, the precautions recommended in the report, the chief of which were already part of their current practice. They had also offered to collaborate with the appropriate Departments, who would keep the matter under close review.

Disability in the Ageing

Dr. HORACE KING, pressing the case for a speedy revision of the supplementary allowances for disabled ex-Service men, said in the House of Commons on February 8 that not only had the real value of the basic pension declined but disability got worse with old age. A group of M.P.s had been urging the Minister to give extra pensions for the ageing limbless. He hoped the Minister would not say that they must wait until the Rock Carling Committee's report had been received and fully considered. It did not need a medical report to tell them that physical handicaps were more burdensome in old age.

The Ministry had always been advised by medical men, and properly so. But medical men must give a medical opinion; if a disabled man's condition deteriorated the medical men must state what was the scientific truth—that if one lost one leg the other did not tend to degenerate. If a doctor gave false medical testimony he would cause much greater general anxiety than the extra pension would give relief to a particular man. But this was a human problem, not a medical one, and a man who had lost a leg in the war and then lost another ought to receive 100% disability pension, whatever the doctors said.

Brigadier J. G. SMYTH, Parliamentary Secretary, Ministry of Pensions, said the work of the Rock Carling Committee had taken longer than had been expected, but it must be done with the greatest thoroughness, because its findings would be of supreme importance. They would all hope that the result of the committee's work would indicate that amputees were not more liable to cardiovascular disorders than other people, and that their expectation of life was in no way reduced. But if the evidence was to the contrary they would have to re-examine the whole problem. On present medical evidence there was no reason to regard the disabled amputee as being any different from all the other classes of disabled. Dr. King had suggested that the Minister should disregard his medical experts in certain cases. In accordance with the royal warrant the Minister must abide by the decision of his medical advisers in purely medical cases, except where some serious medical doubt was disclosed by the evidence, when the Minister could appoint an independent medical expert; and in addition to that there were the tribunals.

Anaesthesia on Animals

The Protection of Animals (Anaesthetics) Bill was given a second reading in the House of Commons on February 12. Its purpose is to bring up to date the law on the use of anaesthetics in animal operations, and Viscountess DAVIDSON, who introduced the Bill, said there had been no legislation on the subject since the original Act of 1919, which the veterinary profession considered now to be too limited and rigid. The Bill made the use of anaesthetics compulsory for all except minor operations on animals, but not on birds, fish, or reptiles. It would give the veterinary profession a better opportunity in the application of modern scientific developments in anaesthesia. The motion was seconded by Mr. SOMERVILLE HASTINGS, who said the object of operations on animals was for the benefit of human beings. For that reason it behoved them to carry out operative treatment with as little discomfort to the animals as could be managed. That was the aim of the Bill. Surgery in animals and in humans had much in common, and had changed materially since 1919.

The Bill received Government support from Mr. G. R. H. NUGENT, Parliamentary Secretary to the Ministry of Agriculture. Sir THOMAS MOORE described it as a half-way house between those who believed that vivisection was a necessity and the antivivisectionists.

Fees for Inquest Work

The Coroners Bill, which enables the Home Secretary to prescribe the fees and allowances payable to witnesses at coroners' inquests and to medical practitioners who make post-mortem examinations for coroners, was given a second reading in the House of Commons on February 12. Sir HUGH LUCAS-TOOTH, Under Secretary, Home Office, promised Government assistance in the further stages of the Bill. During the short debate Dr. A. D. D. BROUGHTON said that the Bill was long overdue. He had conducted many post-mortem examinations; they occupied much time, and the fees were inadequate.

New Abortion Bill.—Lord Amulree introduced in the House of Lords on January 26 a private Member's Bill to amend s. 58 of the Offences against the Person Act, 1861.

Medico-Legal

PRINCIPLES OF CRIMINAL LAW

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Textbooks on the criminal law are inclined to approach the subject as a series of rules relating to particular crimes and groups of crimes. In *Criminal Law* Professor Glanville Williams approaches the subject by analysing and expounding the principles which underlie the rules and are common to most if not all crimes. Later, the author says in his preface, he hopes to follow it with a companion volume on specific crimes.

Anyone seriously interested in the criminal law will find the book of great interest. It is not a practitioner's textbook but a penetrating exploration of the foundations, the superstructure of which is to be seen in the everyday administration of justice. Those concerned in the administration of criminal justice will, if they approach the argument with the concentration it deserves, find much to stimulate their thought.

Doctors in particular will find in the chapter on mental abnormality a profound and comprehensive examination not only of the M'Naghten Rules but of the machinery for dealing with the mentally abnormal in the courts of summary jurisdiction. Though this attracts less popular attention, it is of no less importance to the community. When the next Straffen shocks doctors and lawyers into argument on the M'Naghten Rules, they would do well to read this chapter before taking up their pens to write to the press. Anyone interested in the why of the criminal law as well as in the how and the what will find their work repaid if they read this book.

Criminal Law: The General Part. By Glanville L. Williams. LL.D. (Pp. 736. £3 3s.) London: Stevens and Sons Ltd. 1953.

Universities and Colleges

UNIVERSITY OF OXFORD

In a Congregation held on December 12, 1953, the following degrees were conferred:

M.B.—N. L. Gittleston, T. H. Hughes-Davies, R. T. Wood, R. H. O. Parker, C. A. S. Wink, J. D. Craven, M. G. Gelder, J. Mould, I. Hadfield, R. C. Ilbert, B. E. Juell-Jensen, S. Solomons, C. E. Strode, J. E. Cooper, C. T. Howe, J. D. Wigdahl, R. F. N. Duke, V. D. Pippett, S. E. Smith, G. H. Bush, C. R. Tribe, J. Bradshaw, M. C. French-Constant, J. M. Jones, G. L. Asherson, G. St. John-Ives, D. K. Croll, G. Bennett, Barbara H. MacGibbon, Mrs. Hassia Orgel, Brenda L. Radford, Muriel K. Quick, Eileen B. B. Young, Mrs. Ann G. Parker, and (in absence) M. C. Brain.

UNIVERSITY OF CAMBRIDGE

Drs. B. Towers and A. D. Dickson have been appointed University Demonstrators in the Department of Anatomy with tenure for three years from April 1, 1954, and October 1, 1954, respectively.

In Congregation on December 12, 1953, the degree of M.B. was conferred, by proxy, on John Hughes.

UNIVERSITY OF DURHAM

The following medical degrees were conferred in Congregation on December 19, 1953:

M.B., B.S.—C. R. B. Bamford, R. W. Barker, J. A. Bewick, R. Brown, A. R. Buchan, B. Colville, J. P. Dawson, W. I. Hay, D. W. B. Hogg, Margaret R. Hutton, R. Jackson, R. F. Laverick, C. M. Leon, T. M. McKenzie, C. Madhoo, J. N. O'Neill, S. D. Pagden, A. Petterson, Madeleine A. Sharp, S. G. Shaw, Jane Sherman, A. J. Talbutt, A. A. Walker, *P. L. Campbell, *W. B. Chambers.

*In absentia.

UNIVERSITY OF WALES

The following candidates at the Welsh National School of Medicine have satisfied the examiners at the examination indicated:

D.P.H.—R. B. Davies, R. G. Evans, Anita J. Thomas.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

M.D.—June P. Arnold, L. Mandel.
M.Ch.Orth.—J. C. Anderson, M. Anwer, J. M. Gold, J. Harari, T. J. Mills, R. Owen, F. W. Shea, G. A. Wetherell.
Ch.M.—P. A. P. Joseph, J. K. M. Rawlinson, J. T. Rowling, and S. E. Wijetilaka have satisfied the examiners in the clinical and oral sections of the examination.

M.B., Ch.B.—Margaret J. Alltree, S. J. Alltree, D. R. Cole, T. R. W. Cowell, R. H. Cranmer-Gordon, B. E. Dalton, L. M. Ellis, M. A. R. Eslick, C. D. Fisher, Pamela M. Frazer, D. N. Guest, F. Hewitt, C. D. James, I. V. Lishman, D. R. Morris, S. Naylor, N. N. Nehra, D. F. Rice, A. M. Stewart. *Passed in separate subjects:* N. McKie (surgery and obstetrics and gynaecology), Pear Ramkallop (medicine and obstetrics and gynaecology), A. Swithinbank (medicine and surgery). *Part III:* T. R. Evans, T. R. T. Hughes, J. B. Middleton, B. J. O'Dowd.

DIPLOMA IN PUBLIC HEALTH.—Part I: Ursula M. Anderson, G. T. Crook, Jeannette Diamond, A. W. Iljon, Joan Knowles, P. Lorigan, H. P. P. Morris, D. S. Parken, J. L. Patterson, Joyce K. Watkin.

CERTIFICATE IN PUBLIC HEALTH.—Margaret Hughes, Eira Thomas.

DIPLOMA IN RADIOLOGY (RADIO-DIAGNOSIS).—J. G. Kay.

UNIVERSITY OF SHEFFIELD

The following appointments were made on December 18, 1953: Dr. J. D. S. Hammond, Full-time Research Assistant in Medicine; Dr. C. C. Bowley, Part-time Honorary Lecturer in Pathology; Dr. H. L. J. Wilson, Part-time Instructor in Anaesthetics.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

The following candidates have been awarded the Diploma in Obstetrics: C. A. C. Abraham, R. D. Allen, J. P. Alvey, A. G. Amias, J. A. D. Anderson, J. R. Angwin, J. H. Armstrong, R. Bain, D. A. Baird, Doreen S. Ball, G. V. Balmforth, J. A. C. Bamford, A. A. Bapty, A. P. Barclay, N. H. Barley, H. C. Barr, A. C. Beatty, H. R. C. Benny, W. G. Benson, J. S. Berkeley, Margaret S. Beverland, J. R. Billingham, Dorothy G. Blackett, Ord, R. C. Bloomfield, D. G. Bluett, Audrey A. Boutwood, Iona M. Brereton, R. W. Brotherhood, B. J. Brown, C. T. Brown, G. L. Brown, J. D. Bruce, C. V. Bullen, A. K. Burt, Seonaid C. Cameron, Patricia E. Campbell, R. W. Campbell, R. Carr, Sumathi R. Chandy, Sin Giap Chua, B. W. Cole, P. F. A. Crawshaw, Barbara M. St. J. Coventry, H. J. E. Cox, G. E. Crawford, P. M. Crawford, Flora M. Dale, G. M. Davidson, I. F. Digby, Josephine Dolan, K. C. Easton, Barbara C. Edwards, B. D. Ellis, Doreen A. Ellis, L. Elton, H. A. Evans, Margaret G. Fairman, D. C. Faull, L. C. Fernandez, F. I. Firth, J. A. Fleming, Marjorie H. E. Flowerday, D. S. Foster, I. H. Gardner, W. A. Gentle, W. J. Glover, M. Goodman, Leonora H. Goult, C. W. Grant, Monica C. Grant, C. C. Griffiths, Jean M. Halliwell, Elinor C. Hamlin, J. L. Hanington, Maureen E. Hardeman, J. G. Hayes, Margaret A. Hayes, J. Hennigan, J. R. Hewett, A. N. Horwitz, M. Howett, J. D. Jackson, R. J. Jameson, A.

Jervis, D. D. Johnstone, G. M. Johnstone, Zohra B. Kazi, T. W. Kidd, F. F. Kinnaird, W. A. Kirkpatrick, T. P. Kissack, R. I. Kleinman, Mukulika Konar, Yu Shing Lam, Sheila M. Lane, A. S. Liddell, Ruth Lister, Mary I. Lloyd, Anne E. T. Lodge, W. H. McBay, T. D. McCarthy, Jessie Macdonald, Morag S. Macdonald, J. MacIntosh, M. J. McKenna, A. Mackinnon, J. H. Marks, Helen F. Martin, J. B. H. Martin, P. L. Martin, D. G. May, Prabha Mehra, A. H. Mendoza, B. R. Middleton, N. A. Miles, R. H. D. Miles, A. P. Millar, A. P. Miller, D. D. Moir, Marjorie Monk, J. L. Montagnon, R. D. Morbey, D. F. Morley, J. D. Morris, E. A. Murray, Joan M. Nabarro, Shirley E. Nathan, R. W. A. Nel, P. A. Normandale, R. C. Norton, K. C. Nyman, Irene M. F. Ondatje, Heather M. Panton, E. R. Parry, Mary C. W. Paterson, D. C. Pattison, P. Pau, Barbara M. Philpott, A. C. C. Pinion, G. H. G. Poole, Gertrude M. Pullan, T. A. I. Rees, J. G. Rider, K. J. Roberts, C. Rooney, J. J. O'C. Rorke, A. D. Rose, L. Rose, D. P. Rough, P. C. Roy, F. C. Rutter, P. E. H. Rutter, R. G. Seagar-Thomas, Noel P. Shannon, J. Sharp, Mary E. T. Sheridan, H. A. D. Shirlaw, J. Li. Skinner, A. I. Smith, D. P. Q. Smith, L. Smith, R. C. Smith, A. G. Stephens, Monnica C. Stewart, A. M. Stobie, G. F. Stone, H. L. Symon, G. W. Taylor, Mary T. Taylor, J. C. Turner, Barbara V. Tyman, Lilian S. Underhill, T. W. West, I. J. Waite, Mary J. Watson, J. N. Wattie, H. B. G. Webb, A. L. Wells, W. G. Wenley, Constance M. Wilkinson, F. C. Wilkinson, R. Williams, E. A. Wilson, Janet W. Worling, Margaret E. Wort, V. Zuck.

ROYAL COLLEGE OF PHYSICIANS OF CANADA

At a recent examination the Fellowship of the College was awarded to W. F. T. Tatlow, M.D., M.R.C.P.

Vital Statistics

Week Ending February 6

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,015, whooping-cough 1,984, diphtheria 19, measles 1,487, dysentery 624, acute poliomyelitis 21, paratyphoid fever 4, and typhoid fever 0.

Infectious Diseases

The largest variations in the trends of infectious diseases in England and Wales during the week ending January 30 were decreases of 117 for whooping-cough, from 2,357 to 2,240, and 80 for scarlet fever, from 1,138 to 1,058, and increases of 84 for measles, from 1,106 to 1,190, and 82 for dysentery, from 490 to 572.

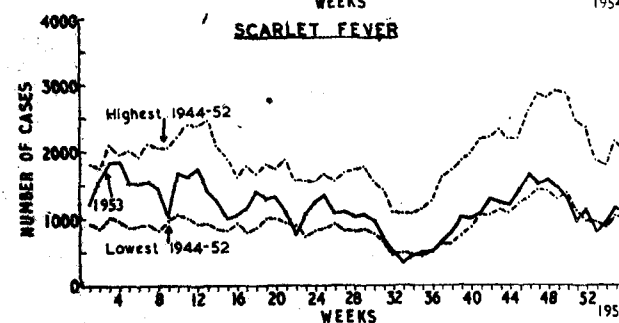
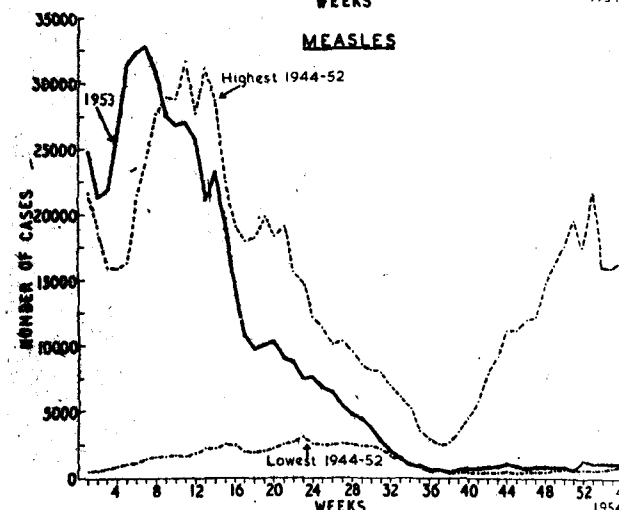
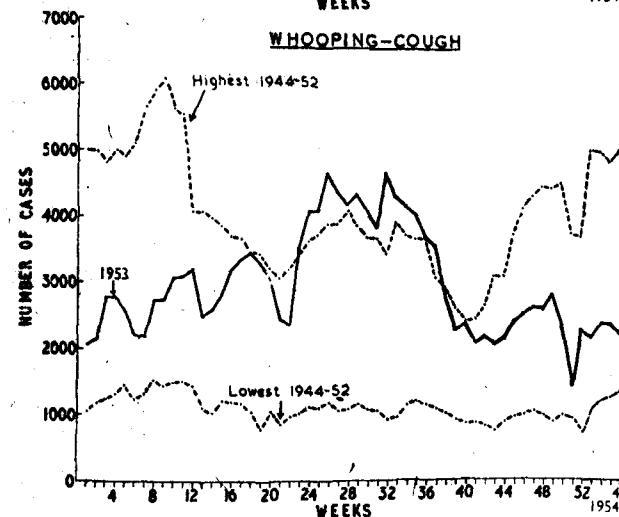
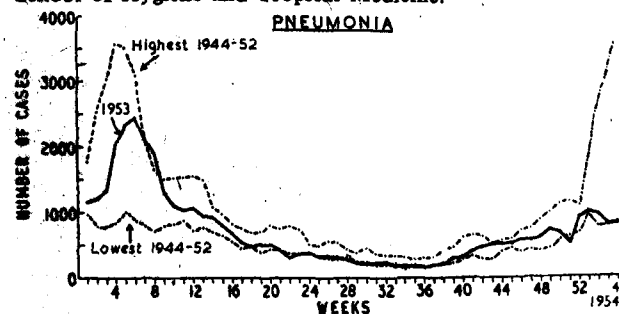
The largest falls in the trends of whooping-cough were 67 in Southampton, from 117 to 50, 38 in Lincolnshire, from 63 to 25, and 34 in Staffordshire, from 113 to 79. Only small variations occurred in the local trends of scarlet fever. The largest variations in the returns for measles were a decrease of 131 in Cumberland, from 196 to 65, and increases of 92 in Staffordshire, from 128 to 220, and 54 in Norfolk, from 166 to 220. The chief centres of infection in the last two counties were Stoke-on-Trent C.B. 148 and Norwich C.B. 104. 16 cases of diphtheria were notified, being 2 fewer than in the preceding week. The chief features of the returns for diphtheria were a decrease in Lancashire from 9 to 1 and a rise in Staffordshire from 1 to 5 (Coseley U.D. 3).

22 cases of acute poliomyelitis were notified. These were 14 fewer for paralytic and 1 fewer for non-paralytic cases than in the preceding week. The only areas with multiple cases were Gloucestershire, Mangotsfield U.D. 3, and Wiltshire, Calne and Chippenham R.D. 2.

The largest returns for dysentery were London 115 (Islington 40, Finsbury 11), Yorkshire West Riding 113 (Bradford C.B. 47, Leeds C.B. 28), Lancashire 76 (Bolton C.B. 16, Swinton and Pendlebury M.B. 16), Middlesex 53 (Enfield U.D. 14, Willesden M.B. 14), Nottinghamshire 30 (Worksop M.B. 27), Southampton 16 (Christchurch M.B. 10), Norfolk 15 (Norwich C.B. 15), Gloucestershire 15 (Bristol C.B. 15), and Warwickshire 15 (Birmingham C.B. 15).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944-52 are shown thus -----, the figures for 1953-4 thus ————. Except for the curves showing notifications in 1953-4, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 30 (No. 4) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng & Wales	London	Scot.	N. Ire.	Eire	Eng & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	16	1	8	0		24	1	9	1	0
Dysentery ..	572	115	173	3	6	435	32	110	6	0
Encephalitis, acute ..	1	0	0	0		8	2	0	0	
Enteric fever: Typhoid ..	1	0	0	1	2	1	0	0	0	7
Paratyphoid ..	3	0	0	0		7	0	2(B)	0	0
Food-poisoning ..	97	13		1		60	6		1	
Infective enteritis or diarrhoea under 2 years ..				13	22				13	12
Measles*	1,190	11	54	27	249	26,460	1470	273	49	178
Meningococcal infection ..	50	1	20	1		45	5	12	0	2
Ophthalmia neonatorum ..	32	0	1	1		32	2	5	0	
Pneumonia†	825	48	199	8	19	2,029	183	245	61	25
Poliomyelitis, acute: Paralytic ..	16	2	0	0	2	22	2	1	1	0
Non-paralytic ..	6	0	0	0		7	1		0	4
Puerperal fever‡	194	31	12	1		282	32	16	0	
Scarlet fever ..	1,058	57	192	23	27	1,850	85	292	41	57
Tuberculosis: Respiratory ..	729	91	146	35				165	27	
Non-respiratory ..	87	1	22	4				21	4	
Whooping-cough ..	2,240	83	352	47	109	2,799	153	159	35	187

DEATHS in Great Towns	1954					1953				
	Eng & Wales	London	Scot.	N. Ire.	Eire	Eng & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	1	0	0	0	0
Dysentery ..	1	0	0	0		0	0	0	0	
Encephalitis, acute ..		1				0	0	0	0	
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	9	1	2	0	1	11	2	3	1	1
Influenza ..	29	3	0	0	3	313	54	2	2	5
Measles ..		0	0	0	0		0	1	0	0
Meningococcal infection ..		0	0				0	1		
Pneumonia ..	310	51	38	9	8	654	153	29	15	11
Poliomyelitis, acute ..	1	0			0	4	0		0	
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	116	19	15	3	7	145	28	20	2	7
Non-respiratory ..		1	1	1	2		5	3	1	1
Whooping-cough ..	0	0	1	0	0	4	0	1	0	0
Deaths 0-1 year ..	227	33	31	12	13	321	37	38	13	14
Deaths (excluding stillbirths) ..	6,188	852	633	123	179	8,403	1542	621	143	189
LIVE BIRTHS ..	6,953	1023	926	204	354	7,437	1103	849	228	419
STILLBIRTHS ..	189	20	31			211	27	27		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Medical News

Diphtheria Prophylaxis.—The number of babies under 1 year receiving diphtheria immunization in England and Wales is disturbingly low. Instead of the 75% regarded as the desirable immunization target, in 1952 only 31% were immunized and the figure for the first half of 1953 is hardly any better. The Ministry of Health is therefore calling for renewed efforts on the part of all local authorities to improve the rate (Circular 5/54). The figures for diphtheria deaths and notifications during the last 10 years show a remarkable change: in 1944 there were 934 deaths and over 23,000 notifications; in 1953 the provisional figures are 24 deaths and 240 notifications, but, in the words of the Ministry circular, "if parents leave their children unprotected there may be a return of diphtheria outbreaks."

Hunterian Society.—The annual dinner of the Hunterian Society was held on February 11 with the president, Sir Heneage Ogilvie, in the chair. In proposing the toast of the Hunterian Society Sir Alan Herbert said that when he recalled all the stories he had read about medical students he was astonished to see how impressive was this gathering of beautifully dressed and decorated doctors. After a characteristic tribute to John Hunter—"a pioneer in all my favourite things, like the placental circulation"—Sir Alan praised the Society, saying he was pleased to find it was not composed of "ugly little groups discussing diseases of the bladder." In reply Sir Heneage Ogilvie said that John Hunter had established scientific surgery. He paid a special tribute to Mr. Mortimer Wolff for his great efforts in past years in bringing the Society up to its present strength. Mr. R. H. Metcalfe proposed the toast of the Lord Mayor and Corporation of the City of London, and Sir Noel Bowater replied. Sir Allen Daley proposed the toast of the guests and kindred societies, and responses were made by Miss Pat Hornsby-Smith, M.P., and Mr. E. W. Riches.

World Health Organization.—The executive board of W.H.O., under the chairmanship of Dr. Melville Mackenzie, has concluded its preparatory work for the seventh World Health Assembly in May. For 1955 a budget of \$10,300,000 is proposed, a 21% rise on this year's sum. The executive board warns the Assembly that any significant cut in the budget would have serious effects on W.H.O.'s programme. During its recent session the board also decided to look into two important public health problems, the chemical adulteration of food and the protection of workers and the general public against irradiation hazards.

World Medical Journal.—The World Medical Association has for the past few years published each quarter the *World Medical Association Bulletin*. This has now been renamed the *World Medical Journal*, and is, as was the *Bulletin*, the official journal of the W.M.A. The *Bulletin* was edited by Dr. Morris Fishbein, who has now been succeeded by Dr. Austin Smith, Editor of the *Journal of the American Medical Association*, and he is assisted by a small editorial committee. Dr. Louis H. Bauer, Secretary-General of the W.M.A., is business manager of the new journal, which now appears with a new look in the shape of a well-designed cover and an attractive lay-out of the text. The *World Medical Journal* is to appear bimonthly instead of quarterly, is published in the three official languages of the W.M.A.—English, French, and Spanish—and contains articles of information that should be of much interest to members of the 46 national medical associations which make up the membership of the W.M.A. The journal is widely circulated throughout the world, and the annual subscription to it for British readers is £1 15s. Anyone wishing to subscribe should write to Dr. Louis H. Bauer, World Medical Association, 345, East 46th Street, New York, 17, N.Y., U.S.A. The January number opens with an article entitled "Relations between the Medical and Non-medical Press," by Mr. John Pringle, public relations officer to the B.M.A. This article is based on a paper read by Mr. Pringle at the Medical Journalism meeting of the W.M.A. at The Hague

last September. Other communications include one on "The Medical Aspects of Social Security," by Dr. Gunnar Gundersen, "Conditions for Practising Medicine in Canada," by Dr. L. Gerin-Lajoie, and "On the Retirement of Doctors," by Dr. P. Cibré, of Paris.

Bicentenary Celebrations at Madras.—At the Government General Hospital, Madras, on December 19 celebrations were held to commemorate the bicentenary of its founding by the East India Company, the golden jubilee of the discovery of the causative organism of kala-azar by Lieutenant-Colonel Charles Donovan, I.M.S., and the opening of the cancer pavilion, which had been given by the Madras Cancer Association. Mr. Sri Prakasa, inaugurating the celebrations, paid tribute to the East India Company, which had done so much in building up institutions such as the hospital in Madras for the good of the community. The residence of the first agent of the Company had been used for housing the hospital. Dr. D. V. S. Reddy, professor of physiology in the Madras Medical College, introduced Sir A. Lakshmanaswami Mudaliar, Vice-Chancellor of Madras University, who unveiled a tablet to commemorate Colonel Donovan's discovery in 1903. Dr. S. Muthulakshmi Reddy opened the cancer pavilion.

Health Information Digest.—The Central Council for Health Education has published the first issue of a new half-yearly journal, *Health Information Digest*. The journal provides summarized information on important health problems. It is intended for those who are unable to search the literature for themselves. The first issue deals with the fluoridation of water supplies, mental deficiency, and the future of the child welfare centre. The journal is edited by Dr. A. J. Dalzell-Ward and Mrs. Priscilla Milton. It may be obtained from the Central Council for Health Education, Tavistock House North, Tavistock Square, London, W.C.1, or from leading booksellers, price 2s. 6d. a copy or 5s. annually, post free.

Journals for Chemists.—Two additions to the literature on chemistry have just made their appearance. *Current Chemical Papers* is a monthly classified world list of new papers in pure chemistry. It is published by the Chemical Society, Burlington House, London, W.1, price £2 10s. per annum (£4 10s. by air mail). *Analytical Abstracts* deals with all branches of analytical chemistry and is published monthly by the Society for Analytical Chemistry, 7-8, Idol Lane, London, E.C.3, price 50s. per annum.

Doctors with New Zealand Himalayan Expedition.—Sir Edmund Hillary's expedition to the Barun Glacier includes two British doctors. Dr. Michael Ball is the expedition's medical officer, and in addition there is Mr. R. C. Evans, F.R.C.S., who reached the south summit of Everest last year.

A Rare Treatise.—John Banester's *Antidotarie Chyrurgical*, which was recently the subject of a note in the *Journal* (February 6, p. 329), was sold for £400 on February 8.

Mr. Norman Hodgson, lecturer in surgery at Durham University and surgeon to the Royal Victoria Infirmary, Newcastle-upon-Tyne, has been appointed to a University professorship of surgery personal to himself. Professor A. G. R. Lowdon, who last year succeeded Professor F. H. Bentley in the chair of surgery at Durham University, continues as head of the department.

Dr. Donald McL. Johnson, a former member of the Liberal Party's national council, has been adopted by the local Conservative Party Council as Conservative candidate for Carlisle.

Dr. J. N. Loring has been appointed Apothecary to the Queen Mother's Household. Dr. Loring is also Apothecary to the Queen's Household and held the same appointment to the late Queen Mary's Household.

Journal Index.—The half-yearly indexes to Volume II of the *Journal* and the *Supplement* for 1953 are now being sent to members who receive them regularly and to subscribers. Members who have not previously asked for the indexes can obtain copies, post free, on application to the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

COMING EVENTS

Irish Medical Association.—The annual meeting will be held at Killarney from July 7 to 10. Opening speakers include Mr. Terence Millin, on "Urological Emergencies in General Practice"; Dr. William O'Donovan, on "Drug Eruptions, Old and New"; and Sir James Spence, on "Recent Advances in Paediatrics." There will also be clinical demonstrations at the Mental Hospital, Killarney. Further information from the medical secretary, 10, Fitzwilliam Place, Dublin.

Third International Congress of Nutrition.—The congress is to be held, under the auspices of the International Union of Nutritional Sciences, in Amsterdam from September 13 to 18. The programme will include sessions on the following topics: "Overnutrition and Disease," "Nutrition and Liver Disease," "Parenteral Nutrition," "Nutrition and Psyche," "Non-nutrient Foreign Chemical Substances in Foods (Intentional and Non-intentional Additives)." Nutrition workers in Britain who would like to participate in the discussions are invited to submit a title and a short synopsis (not exceeding 200 words) to Dr. G. H. Bourne, honorary secretary of the Nutrition Society, London Hospital Medical College, Turner Street, London, E.1, by February 28.

Dr. Paul Wood will deliver the Joseph Strickland Goodall Memorial Lecture at Apothecaries' Hall, Black Friars Lane, Queen Victoria Street, London, E.C.4, on March 24 at 5 p.m. His subject is "An Appreciation of Mitral Valve Disease."

National Association for Mental Health.—The annual conference will be held on March 25 and 26 at Friends House, Euston Road, London, N.W.1. The conference will be opened by Sir Walter Monckton, and the theme will be "Strain and Stress in Modern Living: Special Opportunities and Responsibilities of Public Authorities." Further particulars may be obtained from the conference secretary, National Association for Mental Health, 39, Queen Anne Street, London, W.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, February 22

HUNTERIAN SOCIETY.—At the Mansion House, 8.30 p.m., Hunterian Oration by Sir Gordon Gordon-Taylor: A Famous Hunterian—Sir Charles Bell.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Sengel.

MANCHESTER MEDICAL SOCIETY: SECTION OF GENERAL PRACTICE.—At Medical School, Manchester University, 9 p.m., Dr. W. H. Patterson: Convulsions in Infancy and Early Childhood.

Tuesday, February 23

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. R. R. Race, F.R.S.: Blood Groups.

KEATS-SHELLEY MEMORIAL ASSOCIATION.—At Anatomy Theatre, Guy's Hospital, 5 p.m., Mr. F. N. Doubleday: Portraits of John Keats.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Goulstonian Lecture by Dr. A. W. Woodruff: Natural History of Anaemia Associated with Protein Malnutrition.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Mr. Bryan Williams and Mr. J. D. Martin: Deep Transverse Atelectasis.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Dr. C. Worster-Drought: Blood-vessel Tumours of the Brain. Demonstration illustrated by lantern slides.

Wednesday, February 24

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., Dr. Jeannie E. Sturt: Dynamics and Preventive Mental Health.

EDINBURGH CLINICAL CLUB.—At Albyn Rooms, Edinburgh, annual dinner.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Foreign Body Granulomas.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. R. C. Higham: Diminished Fertility in the Male.

LONDON UNIVERSITY: DEPARTMENT OF EXTRA-MURAL STUDIES AND ATOMIC SCIENTISTS' ASSOCIATION.—At Beveridge Hall, Senate House, 7 p.m., Professor Kathleen Lonsdale, F.R.S.: Atomic Energy and Moral Issues.

MANCHESTER MEDICAL SOCIETY: SECTION OF MEDICINE.—At Medical School, Manchester University, 4.30 p.m., Professor R. V. Christie: Dyspnoea.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., Lettsomian Lecture by Mr. Norman C. Tanner: Surgery of Peptic Ulcers and its Complications.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., James Watson Lecture by Dr. A. S. Douglas: Modern Concepts of Blood Coagulation and its Disorders.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. J. D. W. Pearce: Lecture-demonstration in psychiatry.

SOCIETY FOR ENDOCRINOLOGY.—At Royal Society of Medicine, 10 a.m., joint meeting with Endocrinological Section of Royal Society of Medicine.

Symposium: Technique and Significance of Oestrogen Determinations.

Thursday, February 25

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Lord Stamp: Action of Bacterial Enzymes on Immunizing Antigens.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., B.M.A. Lecture by Dr. D. A. Williams: Problem of Asthma.

INSTITUTE OF CHILD HEALTH.—5.30 p.m., Dr. D. Stafford-Clark: Prevention of Delinquency.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Pathology of Lupus Erythematosus.

LEEDS UNIVERSITY.—At Littlewood Hall, General Infirmary at Leeds, 4.15 p.m., Professor Dorothy S. Russell: Methods of Growth and Spread in Primary Intracranial Tumours.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Symposium: Mitral Disease. Openers, Dr. G. R. Ellis, Dr. R. J. Keating, and Mr. F. R. Edwards.

NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, Headington, Oxford, 8.30 p.m., Mr. Geoffrey Platt: Recurrent Dislocation of the Elbow and its Treatment; Mr. M. H. M. Harrison: Recurrent Dislocation of the Patella and its Treatment.

OXFORD UNIVERSITY.—At Southfield School, Glanville Road, Cowley Road, Oxford, 8 p.m., Dr. A. G. M. Weddell: Science and Medicine.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Dr. R. H. Mole: Fission Products.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Goulstonian Lecture by Dr. A. W. Woodruff: Natural History of Anaemia Associated with Protein Malnutrition.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor J. M. Yoffey: Bone Marrow.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. D. Williams.

SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At Banstead Hospital, Sutton, 8 p.m., clinical meeting. Papers by Dr. I. F. Collie, Dr. T. Grygier, and Dr. R. Wheeler.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At South Kensington Hotel, 7.30 for 7.45 p.m., dinner meeting. 8.30 p.m., Dr. A. E. Martin: Smog.

Friday, February 26

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. D. I. Williams: Alopecia.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., clinical meeting for general practitioners. Mr. G. H. Howells: Modern Trends in Treatment of Cancer of the Ear, Nose, and Throat.

LIVERPOOL SOCIETY OF ANAESTHETISTS.—At Liverpool Medical Institution, 8 p.m., discussion to be opened by Dr. M. M. Burrows: Anaesthesia in Obstetrics.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—7.30 p.m., Dr. W. V. Macfarlane and Miss Johns (Almoner): Medico-Social Background of Congenital Syphilis. A discussion will follow.

OSLER CLUB OF LONDON.—At 26, Portland Place, W., 7.45 p.m., Sir Philip Manson-Bahr: Life and Work of Sir Patrick Manson. Discussion to be opened by Professor P. C. C. Garnham.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor W. A. Machy: Splenectomy.

ROYAL INSTITUTION.—9 p.m., Dr. C. H. Andrews, F.R.S.: The Common Cold.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Sir V. Zachary Cope: How Medicine Helped to Win the War of 1939-45.

APPOINTMENTS

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—W. A. Heaton-Ward, M.B., Ch.B., D.P.M., Medical Superintendent to Stoke Park Colony Group, Bristol; C. T. Vincent, M.B., B.S., Assistant Clinical Pathologist to North Gloucestershire Clinical Area; Margaret A. Lakeman, M.B., B.S., D.Obst.R.C.O.G., Registrar in Obstetrics and Gynaecology, Camborne, Redruth, Miners' and General Hospital, Redruth; Elizabeth P. Champion, M.B., B.S., D.A., Anaesthetic Registrar, Southmead Hospital, Bristol; Kathleen C. Iles, M.B., Ch.B., Registrar in Diseases of the Chest, Bristol Clinical Area; T. C. Gibson, M.B., B.Chir., Medical Registrar, Royal United Hospital and Royal National Hospital for Rheumatic Diseases, Bath; C. E. C. Wells, M.B., B.S., M.R.C.P., Senior Medical Registrar, Bath Clinical Area.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Grant.—On February 7, 1954, at Derby, to Patricia, wife of Dr. P. W. Grant, of Wayside, Duffield, Derby, a son—James Walker.

Meek.—On January 27, 1954, at Bristol Maternity Hospital, to Eileen, wife of Edward S. Meek, M.B., Ch.B., a daughter.

Nicholas.—On January 28, 1954, at Woodmount, Linden Road, Clevedon, Somerset, to Eileen (formerly Moore), M.B., Ch.B., wife of John C. Nicholas, L.D.S., a sister for Jennifer and John—Margaret.

Perry.—On February 7, 1954, at the Cardiff Royal Infirmary, to Dr. M. Elizabeth R. Perry (formerly Thomas), wife of Dr. C. Lynn Perry, a son.

GOLDEN WEDDING

Vartan-Hepworth.—On February 16, 1904, at Augustine Church, Edinburgh, Charles Samuel Vartan, M.B., Ch.B., to Florence Ethel Hepworth. Present address: Flat 4, 10, The Paragon, Blackheath, London, S.E.

DEATHS

Allan.—On January 20, 1954, in hospital, the result of an accident, Alexander William Allan, M.D., of 3, East Heath Road, Hampstead, London, N.W., late of Skegness, Lincs, aged 85.

Angus.—On January 24, 1954, at 6, Church Street, Epsom, Surrey, Dorothy Graham Angus, M.R.C.S., L.R.C.P.

Brady.—On January 22, 1954, in a nursing-home, Dublin, Michael Richard Brady, M.D., of 150, Harley Street, London, W.

Brown.—On January 20, 1954, at 2, Reddings Road, Moseley, Birmingham, James Duncan Brown, M.B., Ch.B., D.M.R.C., late of Mukden, Manchuria.

Fisher.—On January 20, 1954, at his home, Wells Road, Fakenham, Norfolk, William Henry Fisher, M.B., B.Ch., aged 87.

Steward.—On January 10, 1954, at Ellery Bank, Windermere, Edward Simmons Steward, F.R.C.S., aged 83.

Wrench.—On January 8, 1954, at his home, 5, Victoria Road, Karachi, Pakistan, Guy Theodore Wrench, M.D., formerly of London, W., and Reading, Berks.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Smoking Cures

Q.—Please tell me what you think about the various smoking cures one hears about. Are they any good?

A.—"Cures" for smoking, as for other forms of addiction, fall into three classes. In the first are those which aim at making the act of indulgence so unpleasant that it is soon renounced. The most impressive example of this class is the use of "antabuse" (tetraethylthiuram disulphide) in alcoholism. In the case of tobacco, however, no such effective agent exists: most of the methods suggested make the mouth dry or impart an unpleasant taste to tobacco smoke. Stramonium has been used for the first purpose; the second can be accomplished by a mouth wash of 0.25% silver nitrate or 0.01% copper sulphate or by a pill containing ferrous sulphate and alum. The psychotherapeutic approach has not been neglected and it has been recommended that unpleasant associations with the act of smoking should be established by suggestion.

The second method is by gradual withdrawal; this is, of course, familiar in the treatment of narcotic drug addiction. In its simplest form it would consist in gradual reduction in the number of cigarettes smoked, advice often tendered but seldom followed. In its more radical form smoking is forbidden and nicotine administered in gradually reducing doses, either by subcutaneous injection or in the form of pastilles. This method makes the assumption that the desire to smoke and nicotine addiction can be equated. Although addiction is certainly of importance, the causes of the habit are undoubtedly more complex. Smoking has become something of a social observance and the act has acquired a ritualistic significance.

The third class of "cures" attempt to abolish the desire to smoke. Their shortcomings are due to our ignorance of the origins of this desire. It has been claimed that the administration of lobeline sulphate by mouth reduces the desire to smoke. Lobeline is derived from a plant the leaves of which have long been smoked by some Indian tribes, and its pharmacological effects are similar to those of nicotine. The recommended dose of 8 mg. may cause a metallic taste, heartburn, epigastric pain, fainting, vomiting, salivation, lethargy, inability to concentrate, and fullness of the head. These symptoms may last for as long as four hours, and it will occasion no surprise that the subject experiences no desire to smoke while they endure. Other attempts to abolish the desire to smoke include hypnosis, simple exhortation, and admonition aimed at implanting in the smoker's mind notions of guilt, uncleanness, and pusillanimity.

It is difficult to assess the efficacy of these various cures. Patients seldom ask the doctor's advice on how to give up smoking; *per contra*, doctors frequently issue a bland injunction to abstain from tobacco without suggesting any means by which the renunciation can be made easier. It is a matter of common observation that a heavy smoker can stop smoking at no greater cost than a few days' shortness of temper. Determination is the only quality required; but it seems probable that one who lacks sufficient to give up smoking without a cure will certainly not possess enough to persevere with the various cures recommended. The very desire for a smoking "cure" shows that the smoker is not prepared to take full responsibility for his addiction and is anxious to be able to attribute his failure to abstain from it to the inefficacy of the cure rather than to the weakness of his will.

The Serum-sensitive Recruit

Q.—A boy, aged 13, was discovered to be serum sensitive about five years ago. An injection of A.T.S. (1 min—0.6 ml.—intradermally) produced a violent local reaction and a temperature of 103° F. (39.4° C.). He has never had any serum injections since. The boy wants to join the Navy. Would it be safe to give him T.A.B. injections? If not, can he be desensitized to horse serum generally?

A.—The degree of sensitivity of this boy to various allergens might be investigated in the first instance, partly by cross-examination about his history, including reactions to previous inoculations of all types, and partly by attempting active immunization against diphtheria and tetanus if this has not been done already. The reaction to the Schick control injection might also give useful information. Most subjects who are allergic to serum can be immunized actively with diphtheria or tetanus toxoid without much trouble from reactions. (Diphtheria prophylactic T.A.F. should be avoided as it contains a small amount of serum.) Active immunization is indicated where possible, because it should obviate the emergency use of diphtheria or tetanus antitoxic serum.

It should not be assumed that this youth is very sensitive to horse serum on the basis of what happened five years ago after an intradermal injection. If he should require serum again, a small "trial dose" given subcutaneously is much the best procedure.

With regard to T.A.B. injections, it is altogether exceptional for reactions to be so severe that immunization has to be discontinued. With this possibility in mind, however, it would obviously be wise to make a preliminary sensitivity test using a 1:100 dilution of vaccine subcutaneously. There is no horse serum in T.A.B. vaccine, the reactions to which are unrelated to sensitivity to serum. In any case it is probably impossible to desensitize a patient to horse serum.

REFERENCE

Laurent, L. J. M., and Parish, H. J. (1952). *British Medical Journal*, 1, 1294.

Pharaoh's Ants

Q.—My small hospital has had a plague of minute ants, reddish in colour and about 3 mm. long, called Pharaoh's ants by the pest officer. They are found in kitchens, dining rooms, passages, and in the patients' beds, and have resisted all attempts at eradication. Is there a cure? The state of mind of a patient in a plaster jacket with numbers of ants crawling about in his bed is becoming manic.

A.—Pharaoh's ant (*Monomorium pharaonis* L.) is a fairly common and very troublesome pest of hospitals and other large steam-heated buildings. Although it has been with us for over 100 years it does not live out of doors in Britain, but forms nests in crevices inside the walls and floors of buildings. It probably travels from one site to another in packing cases and similar goods.

The most effective treatment seems to be spraying with chlordane dissolved in kerosene. The trails of ants should be traced back to the nest or-nests (there may be more than one). Then the walls and ceilings in the neighbourhood should be thoroughly sprayed. It may be advisable to employ a reliable pest control firm for this purpose. One good treatment may effect a cure, but a watch should be maintained for survivors.

As a temporary measure to protect the beds of individual patients, the legs should be stood in tins containing oil or strong carbolic acid.

Phenylbutazone and Pulmonary Tuberculosis

Q.—Is phenylbutazone contraindicated in the presence of pulmonary tuberculosis?

A.—There is no special reason why phenylbutazone should not be given in the presence of pulmonary tuberculosis except that it occasionally has unpleasant and dangerous side-effects such as agranulocytosis, peptic ulceration, exfoliative dermatitis, and salt retention.

Acid-forming Foods

Q.—Which articles of food are acid forming and which alkali forming? Many patients complain of "acidity" and seek advice about diet, and we doctors give them conflicting advice. Some patients are told, for example, that oranges and grapefruit are acid forming and they avoid them permanently. But are not the organic acids such fruits contain broken down in the body to carbonates and therefore alkali forming?

A.—The acidogenic value of a food is expressed as the volume of 0.1 N acid which would be produced if all the phosphorus, sulphur, and chloride in the food were fully oxidized to phosphoric, sulphuric, and hydrochloric acid respectively. The alkalogenic value of a food is expressed as the volume of 0.1 N alkali which would be produced if all the sodium, potassium, calcium, and magnesium in the food were converted into their respective hydroxides. Tables of these values are readily available (e.g., *Medical Research Council Special Report Series No. 235, "The Chemical Composition of Foods,"* by R. A. McCance and E. M. Widdowson), where the excess of acidogenic or alkalogenic components in a large variety of foods is given. As examples, predominantly acidogenic foods are eggs, lean meat, fish, and cereals, whilst potatoes, vegetables, fruit, and leguminous foods are predominantly alkalogenic.

It will be seen from the above that the organic acids contribute neither to the acidogenic nor to the alkalogenic value of a diet, and do not appreciably alter the acid-base equilibrium of the body when taken in food, because they are completely oxidized to carbon dioxide and water, which are rapidly eliminated. If, however, these acids are present as their salts, the metals so combined would contribute to the alkalogenic value of the diet.

Selection for Work in Compression Chambers

Q.—In examining men for fitness for working in compression chambers, are there any special points to bear in mind?

A.—The routine examination should be very thorough, especially of the heart and lungs. It is also advisable to test the locomotor system and ask about previous injury, especially fractures, as such people are prone to "bends" at the site of the injuries. If enough candidates are available, then any history of serious lung disease (pneumothorax, complicated pneumonia, minimal tuberculosis) should mean exclusion, even though the present condition is satisfactory. It is now considered that, with even a minor lung lesion, breathing from a closed apparatus during severe pressure changes may cause serious accidents, such as pneumothorax and perhaps even aero-embolism. If no breathing apparatus is used under pressure this risk is not present. Men with even mild bronchitis or bronchospasm should also be excluded. For all these reasons a routine x-ray picture of the lungs is highly desirable.

Any nose or throat abnormality or disease, unless easily remediable, should also mean exclusion. The ears should be examined carefully and patency of the eustachian tubes checked by "ear clicking." Middle-ear disease of any degree contraindicates exposure to pressures. All selected candidates should be tested for easy pressure equalization in the middle ear by actual compression in a chamber. Those who can clear their ears but with some difficulty will finally suffer ear damage due to repeated congestion and oedema of the middle ear over long periods and are therefore best excluded.

Surprisingly enough, men with claustrophobia may volunteer for this work, and all candidates should be watched carefully during the compression tests. The behaviour of each man when breathing in a closed circuit is also a useful indication of suitability for this type of work. Finally, if possible, men of stable and moderate temperament should be selected.

Hypertension and Nocturnal Frequency

Q.—Is active treatment (for instance with hypotensive drugs) indicated in a middle-aged man with essential hypertension (B.P. 260/130) whose only symptom is nocturnal frequency of micturition (3-5 times)? Fluid restriction, barbiturates, and belladonna have failed to relieve the nocturnal frequency.

A.—Although this degree of hypertension suggests a serious prognosis in a male patient I do not think this is simply a problem of high blood pressure. There is no reason why hypertension should cause nocturnal frequency of micturition unless it is complicated by either renal failure or an enlarged prostate (or, of course, some other independent cause of nocturnal frequency). I do not think one can discuss treatment without an investigation of renal function and prostatic condition. There is no reason to expect that treatment directed solely to the hypertension will cure the frequency.

Ferrous Gluconate

Q.—Has ferrous gluconate any advantages over other iron preparations in the treatment of an iron-deficiency anaemia?

A.—Ferrous sulphate in tablet form in a dose of 3 to 5 gr. (0.2 to 0.32 g.) three times a day is a cheap and effective form of iron therapy, and it is seldom that any other preparation need be employed. Nevertheless ferrous sulphate is a gastric irritant, and in really big doses always gives rise to vomiting. A very few patients are peculiarly susceptible to its nauseating effect, and in them even ordinary doses may produce vomiting. There seems little doubt that ferrous gluconate does not have this disadvantage, and it is a perfectly effective form of iron therapy.

Ocular Side-effects of Streptomycin

Q.—Does streptomycin give rise to any subjective ocular symptoms? For instance, does it make patients with refractive errors more liable to complain of their eyes?

A.—Streptomycin is not known to give rise to any subjective ocular symptoms, nor does it aggravate existing symptoms. Some years ago, when the drug was not available in as pure a form as it is to-day, serious toxic effects, including optic atrophy, were reputed to occur. Such complications are no longer to be feared.

Are Cases of Disseminated Sclerosis Spared Other Diseases?

Q.—Does disseminated sclerosis show a negative correlation with any other diseases, e.g., diabetes?

A.—There is no recognized negative correlation between disseminated sclerosis and other diseases.

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THE NATURE OF DISEASE*

BY

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Doctors are apt to evade the question of the real nature of disease by giving certain states of body and mind names, as if these had an independent existence apart from their patients who suffer from them. Some we call after their primary causes (for example, fractures and cases of poisoning); others after the reactions of the body (for example, fever and reticulosis); some after the functional disturbance manifest during life (for example, diabetes, heart failure, and schizophrenia); others after the structural changes found in the body after death (for example, tuberculosis and cancer); some after the most arresting symptom or sign with which they are associated (for example, measles and mumps); others even after the clinicians who first described them (for example, Cushing's syndrome and Addison's disease). This, I admit, is clearly necessary for practical purposes. No system of nomenclature could, however, be more chaotic, and it is not surprising that we all get into the habit of thinking of diseases as if they had a real existence independent of our patients. And yet, a moment's thought, and we realize that diseases are not to be found in books or bottles, not even in post-mortem rooms or laboratories, but only in our individual patients who suffer from them and come to us for help. In fact, there can be no disease without a patient to suffer from it, any more than there can be a mind (in our ordinary experience) without a body and a brain to maintain it.

Before we can even start to discuss the question, therefore, we must form some idea of the nature of the potential patient who at any moment may develop his disease, and, on the evidence before us, is it really very difficult to arrive at a working concept on which we can all more or less agree as a common frame into which to fit our individual special interests? For must not every man be in part, at least, the product of three sets of factors: his genetic origin, his environment (physical, biological, and mental), and the use which he has made of his own free will? And to anticipate for one moment, just to give you an inkling of what I am aiming at, are not these three factors in his genesis in the last analysis also the only three possible factors in the pathogenesis of his diseases?

Body and Mind

But to return to the nature of the potential patient before we embark on a discussion of the nature of his

*A lecture delivered in the Medical Faculties of the Universities of Madrid and Granada in May, 1953.

disease. Everyone naturally thinks of himself as two separate things—a body and a mind—and yet how can two separate things be so intimately related? It does not make philosophical sense. Further, it is contrary to our own experience. The mind can upset the working of the body. It is well known that ill-health of the body can profoundly influence the mind. What, therefore, is the body? What in fact is the mind? Whence do both come? What is the relationship which exists between them? These questions must be answered, at least we must attempt to answer them, or how can we hope to understand the nature of disease of the body, or of the mind, or, more difficult still, of, as we see it, the body-mind relationship?

Nature and Origin of the Body

We will start with the body. First, what is it? From the point of thermodynamics it is a physico-chemical machine, made of compounds of carbon, hydrogen, oxygen, nitrogen, and sulphur, which converts the energy in the food we eat (derived originally from the light of the sun) into heat and kinetic energy which enable us to live and move and have our being. In that respect, in fact, it differs from a man-made machine only in that it is constructed of rather different stuff and works at rather lower temperature. Nevertheless, it exhibits the criteria of life. It is self-adapting, self-maintaining, self-repairing, and, if it mates, self-reproducing, reproduction of fixed form and structure being the main characteristic of living things.

Next, whence does it come? On evidence before us (and there would appear to be no escape from the conclusion) a man's body is the product of a plan laid at his conception when the genes in the chromosomes of his two parents were reshuffled in the fertilization of an ovum in much the same way, to give a rough analogy, as a house is the product of an architect's plan; and it is through this plan that he inherits all the ordinary characteristics of the human race, many of the particular characteristics of his ancestors, and some characteristics peculiarly his own. The motive force responsible for the execution of the plan remains one of the mysteries of life, but the right physical conditions are normally provided by the body of the potential mother, while the necessary building materials are supplied at first from her food through her blood and after birth direct from the environment into which the child is born. Its execution is not, however, finally

finished for over twenty years, and the original plan may be modified in the process of development and growth or actually spoilt at an early stage or in later life. No two men, therefore, can be the same in body, because (identical twins excepted) all are derived from different genetic plans, and all (identical twins included) are ultimately subject to different experience, mental and physical, in their environment.

Nature and Origin of the Mind

So much for the body. Now what about the mind?—and it helps us to understand its nature if we ask ourselves where it comes from, rather than what it is, first. For, as I see it, the body alone permits the development of the mind. (In ordinary human experience there can be no mind without a body, any more than there can be a disease without a patient.) It would, in fact, appear that the higher development of the nervous system in animals permits the development of consciousness, and that experience, writing on consciousness through the sensory machinery of the human body, leads to the development of the human mind. Thus the individual mind depends in part on the brain which a man possesses (as a result of his genetic origin and his physical environment) and in part on the conscious experience through which he has passed; and no two men can be the same in mind, because their brains are different and they have passed through different experience. Nevertheless, I do not think that on the evidence before us (scientific observation and experiment and human experience down the ages) the human mind can be explained *entirely* in terms of the brain, which a man has been given, and the experience through which he has passed. There is more to the human mind than that. The mystery of consciousness which permits of pleasure and pain, so unnecessary if we are but machines operated by conditioned reflexes (as the philosophy of behaviourism will have us believe), remains. We are all convinced that within limits we possess free will. Aesthetic sense cannot be explained on this basis. A strong case can be made out for the existence of intuitive as opposed to empirical knowledge. Faith in the real existence of the human soul is deeply rooted in human experience down the ages. Nevertheless, within factors capable of analysis at present, it is clear that the individual mind depends in part on the brain and in part on experience, and both of these are coming more and more under our power to control.

Psychosomatic Development

The development of the body in general and of the brain in particular therefore conditions the development of the mind under the stimulus of experience in the same way, to give a rough analogy, as the surface of a slate conditions the form of the writing on it. For example, the male body conditions the mind in such a way that it comes to exhibit the characteristics which we associate with a man, and the female body in such a way that it comes to exhibit those which we associate with a woman. And is there not reason to suppose that the mind so developed influences in some way which we do not yet understand the further development and maintenance of the body? We all know that a man's character is reflected in his face, and we must admit that psychological experience can have a profound effect on physical health. Therefore, not only are no two men the same either in body or in mind, but no two men are the same in their body-mind relationship. In fact, every man has his own particular psychosomatic constitution, because mind and body are mutually interdependent in their

development (although, of necessity, there are average types), which determines his reactions to physical and mental experience.

Adverse Action on Body and Mind

Now there may be a fault in the genetic plan whence a man is derived. Those which are hereditary are easily recognized, but those produced *de novo* by unfortunate combinations of genes are difficult to distinguish from those produced by adverse influences acting during the early months of intrauterine development. (The wrong environment can spoil the execution of a perfect plan.) For both during intrauterine development and throughout life the body is exposed to risk. At any stage it may suffer from lack of one or more of those substances on which its development and maintenance depend—food, water, salt, oxygen, iron, calcium, and vitamins. It may be damaged by physical trauma, excess of heat or cold, or by over-exposure to some form of radiation. It may succumb to some chemical poison taken by accident, used in industry, indulged in for pleasure, or swallowed, injected, or inhaled with suicidal intent. It may be infected by one of the larger parasites or by pathogenic protozoa, spirochaetes, bacteria, or viruses. It also runs risk because it is the basis of an individual human mind. Emotion can interfere with the physical health of the body through the nervous system or lead to maladaptation to social living. Free will enables a man within limits to choose his environment and his way of life.

Reactions of Body and Mind

In fact, the body would not survive long in the environment in which we live were it not endowed (presumably through the genetic plan whence it is derived) with the potentiality to react in such a way as to protect it from many of the risks to which it is exposed and often maintain its life when it does succumb. Now many of these reactions are part of everyday experience—for example, functional adaptation to exercise, change of temperature and altitude, intake of food and drink—and are therefore classed as physiological. Others are evoked only under unusual circumstances and are therefore regarded as pathological—for example, reactions to injury, chemical poisons, and infection. Similarly the mind would not maintain its balance long were it not endowed (presumably through the structure of the brain) with the capacity of adaptation to ordinary conscious experience. Now, most men react to experience in much the same way. Their behaviour is predictable. Reactions of this kind are therefore classed as psycho-physiological. Others, however, as a result of genetic predisposition due to the structure of their brains on which their minds are based, and/or as a result of previous experience, react abnormally. Their behaviour is not predictable. Reactions of this kind are classed as psycho-pathological.

Pathological Processes

Thus we arrive at the concept of primary pathological processes. A primary pathological process of the body is abnormal action on it evoking normal reaction by it. A primary pathological process of the mind is normal action on it evoking abnormal reaction by it. While, however, a pathological process of the body can run its course independently of the mind, a primary pathological process of the mind depends on the body, for the simple reason that the mind depends in part at least on the body. Therefore no absolute distinction can be maintained between primary pathological processes of the mind and primary pathological processes of the body, which often lead to secondary disturbance of the mind. In fact, the psychoneuroses—namely, anxiety states, obsessional states, and hysteria—merge into the organic psychoses, due to primary pathological processes of the body affecting the brain, through the so-called “functional” psychoses—namely, mental deficiency, schizophrenia, mania, endogenous depression, and involution melancholia.

Symptoms and Signs

Symptoms and signs due to physiological and normal psychological reactions to change of internal and external environment are a matter of everyday experience, but pathological processes, as above defined, lead to symptoms and signs which cannot be explained on this basis, although they can be identical with them. Primary pathological processes of the body lead directly—that is, through the body—to alteration of structure and disturbance of function of the body, with the result that the patient complains of physical symptoms and physical signs are often discovered on examination, but, if his brain (or any function of the body on which it depends) is affected, a primary pathological process of the body may lead to a secondary disturbance of the function of the mind and therefore to mental symptoms and mental signs. Primary pathological processes of the mind lead directly—that is, through the mind—to mental symptoms and signs, but they may also lead to a secondary disturbance of the structure or the functions of body and therefore to physical symptoms and signs, either through emotion and the autonomic nervous system, as in anxiety neuroses, or through conscious and unconscious thought and the skeleto-motor nervous system, as in malingering and hysteria. Some of the symptoms in any one case (in view of the nature of pathological processes) are due to action on the body or the mind and others to reaction by the body or the mind. The clinical picture produced by a pathological process is, however, often so complex that exact analysis on these lines is impossible.

Definition of Disease

A disease, therefore, so far as definition is possible, is that condition of a man, woman, or child of a certain psychosomatic constitution, and at a certain stage of his or her life, when a pathological process of body or mind is leading to alteration of structure or disturbance of function, with the result that he or she sooner or later starts to complain of symptoms, or signs are discovered on examination, most diseases being due to complicated interactions between genetic weakness, the adverse factors to which a man is exposed in his environment, and the psychosomatic machinery of his individual constitution. No two cases, therefore, are ever quite the same, although certain types of reaction are common, justifying the abstract conception of the real existence of diseases, apart from the individual patients who actually suffer from them.

Classification of Disease

Can we, however, classify the different manifestations of disease in order to help us in our understanding of it? For the human mind craves for classification and would impose discontinuity into the obvious continuum of the phenomenon of disease if it could. It is certainly very difficult. In the first instance there is no absolute dividing line between normality, that which is most common, and abnormality, that which is unusual, the extreme limit of generally accepted normality merging in one direction into the superathlete and the genius and in the other into disease of the functional variety in which body or mind is insufficiently strong (for obscure genetic or acquired reasons) to stand up to the demands on function which ordinary life in an average environment imposes on the psychosomatic machinery of the individual man. In the second place, although functional disease, weakness of body or mind as thus defined, is not a progressive process and is not, therefore, usually regarded as disease, it sometimes renders body and mind more liable to succumb to adverse factors in environment and therefore merges into disease proper, as I have attempted to define it. In the third place, no absolute dividing lines can be drawn between somatic, psychoneurotic, and the psychosomatic disease for the simple reason that body and mind are mutually interdependent in their development. Nevertheless we must make some attempt to classify disease.

Somatic Disease.—Somatic disease, as I see it, is alteration of structure and disturbance of function of the body

due to a primary pathological process of the body—that is to say, abnormal direct action on the body evoking potential reactions by it. If the brain or any function of the body on which it depends is affected, somatic disease as thus defined may lead to disturbances of the mind. Its recognized causes are genetic defects, any form of physical trauma, deficiency of any substance on which the development and maintenance of the body depends, chemical poisoning of any variety, and infections of all kinds. All somatic disease is organic in the sense that it is associated with structural or more or less permanent functional change, but all organic disease—that is, disease associated with structural change—is not necessarily somatic in the sense in which it has been defined in this paragraph.

Psychoneurotic Disease.—Psychoneurotic disease is alteration of structure or disturbance of function of the mind due to a primary pathological process of the mind—that is to say, to normal direct action on the mind and abnormal reaction by the mind. It may interfere with the functions of the body through the nervous system. The predisposition of the mind to react abnormally depends on unfortunate previous experience and/or genetic predisposition. Psychoneurotic disease therefore links up, as I have already pointed out, through defective personality, mental deficiency, and the functional psychoses with disorder of mind due to primary pathological processes of the body (the organic psychoses).

Psychosomatic Disease.—Psychosomatic disease is that to which a man succumbs under circumstances of stress in his environment on account of his own individual peculiar psychosomatic constitution. For, as I have already pointed out, no two men are the same in body or mind, or in the relationship which exists between body and mind. As thus defined, psychosomatic disease falls into two groups. In one group some peculiarity of body, as evidenced sometimes by hereditary tendency and association with physical characteristics, seems to have predisposed the mind to succumb to adverse factors in conscious experience. I am thinking of the people who fail to adapt to widening experience (the schizophrenics) or to dwindling experience (the involutional melancholics), or those who fail to control their emotions and lapse into uncontrolled excitement or unjustified depression. In the other group some peculiarity of the way in which the body has conditioned the development of the mind, and the mind the subsequent development of the body, seems to have predisposed the body to react to emotional experience in a way in which the average body does not react. I am thinking of people who develop asthma or thyrotoxicosis under circumstances of emotional stress. And I am sure that disease of this kind “piles up.” For instance, emotional stimulation of the bronchi renders them more sensitive to physical stimulation, and physical stimulation more sensitive to emotional stimulation, with the result that asthma or thyrotoxicosis, emotional in origin in the first instance, can actually lead to death.

Unclassifiable Disease

Nevertheless, there are many diseases normally regarded as organic, in the sense that they are associated with structural change in the body, which cannot be classified at present as psychoneurotic, somatic, or psychosomatic. They must, however, be due to some combination of the only three possible causes of disease which we can envisage—namely, genetic predisposition and adverse factors in environment, and the influence of the conscious mind on the physical state of the body. That cancer and old age are due to some complex interaction between genetic predisposition and adverse environmental factors seems likely. But can anxiety, stress, and disappointment lead to structural and functional change, such as hypertension, atherosclerosis, and cardiac infarction? For instance, can a person die of a broken heart, as is popularly supposed? Can the news of Napoleon's victory at Austerlitz have killed, as has been said, our great Prime Minister, the younger Pitt? Now, there is no theoretical reason why states of mind should not lead to structural change in the

body. For the will to execute the simplest movement leads to physico-chemical change in the nerves and muscles taking part, and chemical change, the body being basically a physico-chemical machine, is structural change. Further, we now know of three physiological mechanisms through which mental states can exert an influence on the body: the autonomic nervous system, the pituitary-thyroid mechanism, and the pituitary-adrenal mechanism. And it would be unscientific to expect consistency. All experience suggests that one man's psychosomatic constitution is such that his body can stand up to mental stress, while another man's is such that under the same circumstances he inevitably succumbs. One is like a castle built on sand and another like a house built on rock.

There remain, therefore, a group of diseases associated with structural change in the body for which at present no certain cause can be found, and in which the part played by the mind cannot as yet be assessed. It may well be very important. True that some of these—disseminated sclerosis and diabetes, for instance—may prove to be somatic only; that is, due to some combination of genetic predisposition and adverse factors acting on the body. Others—for example, duodenal ulcer and malignant hypertension—may well prove to be in part psychogenic in the sense that the psychosomatic constitution of the individual was such that he was predestined to succumb in this way when exposed to mental stress of that type or of that degree of intensity, while another person of different constitution under similar circumstances would have stood the strain.

The Future

What, therefore, of the future? For modern medicine, with its emphasis on the prevention of disease rather than on the treatment of the established condition, now that the age of materialistic optimism is past, can no longer ignore the psychosomatic concept or the part played by mental states in the pathogenesis of structural disease. Short of eugenic control of human mating we have no power (and one can hardly see how we could ever gain it) to alter the plan whence the individual is derived, and, although we should theoretically be able to modify its execution by controlling the environment in which it is carried out, the plan laid at the conception is hidden, so that, even if we could modify it in its execution, indications for the attempt are always wanting. We can, however, by controlling environment minimize the risks to which body and mind are exposed. But how is environment controlled? That depends on teaching the patient how to live, the doctor how to work, and the State its responsibilities (and the limits of its responsibilities) in this direction.

Lastly, will it ever be possible to alter the psychosomatic constitution of the individual so as to reduce the risks to which he is peculiarly exposed in one direction without increasing them in another? To give one example to indicate my meaning. Maleness is one form of psychosomatic development, as I have already pointed out, and femaleness another, while it is well known that men are predisposed to certain diseases and women to others by virtue of their constitution. If the female constitution could be converted into the male, and vice versa, it seems reasonable to suppose one would alter the diseases to which that person was liable to succumb by virtue of his or her sex. Whether in the future this will become possible is one question. Whether, if it ever does become possible, it will be wise or justifiable to do it, is, however, another.

Conclusion

One thing is certain. Our power over body and mind has increased, is increasing, and is likely to increase still further, and, as our power increases, it becomes more and more important that it should be used in the right way in the interests of society. This depends on a proper understanding of the nature of disease and on establishing the right relationship between the potential patient, the doctor, and the State.

IMMUNIZATION OF YOUNG BABIES AGAINST DIPHTHERIA

BY

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This paper records some of the first results obtained with one prophylactic in an investigation of the methods of immunizing young babies against diphtheria. The whole work includes a comparison between the efficiency of different prophylactics, and a consideration of the effect of age at the time of the first injection and of the interval between injections on the levels of immunity produced.

Immunization against diphtheria is usually started during the second half of the first year of life. It is now generally recognized that immunization can be carried out successfully in the great majority of babies if the first dose of prophylactic is given earlier than this. Immunization against diphtheria has not the same appeal to mothers as protection against whooping-cough. Their eagerness for immunization against whooping-cough, however, can be used to include early immunization also against diphtheria: work on early protection against whooping-cough is being carried out by one of us (N. R. B.) in conjunction with other workers.

Although diphtheria is not at present a danger to young babies there are several advantages in early immunization. Large doses of prophylactic can be given without fear of undue reaction, and injections can be made at the same time as those of *H. pertussis* vaccine, which should be given as early in life as possible. The chief disadvantage lies in the possibility that inherited passive immunity may interfere with active response by neutralizing some or all of the injected prophylactic. The extent to which such interference may occur may increase as the proportion of immunized mothers increases. It is therefore important to employ methods of immunization that are effective in the presence of considerable passively acquired antitoxin. At all times there is also the question of post-inoculation poliomyelitis, and it would seem that the incidence of poliomyelitis in very young babies is not so low as had been supposed (Wright and Owen, 1952).

Barr, Glenny, and Randall (1950) found that babies in whom the maternally conferred antitoxin had fallen below 0.04 unit per ml. at the time of the first injection could be successfully immunized by two doses, each of 0.5 ml. (25 Lf) of A.P.T. When, however, the passive antitoxin was in higher concentration, immunization was unsatisfactory as judged by antitoxic response two months after the second injection. Barr *et al.* (1952) have shown that babies with low maternally conferred antitoxin titres can be successfully immunized by two doses of 0.5 ml. of A.P.T. even when the first dose is injected at the age of 6–10 days. They also found, however, that a high proportion of failures could be

expected if, instead of two doses of A.P.T., three doses of purified toxoid were injected at monthly intervals, the first dose at the age of 6–10 days. They suggested that very young babies might not respond well to unprecipitated prophylactics, or that the intervals between the injections might have been ill-chosen.

Bousfield (1951) used a mixture of P.T.A.P. with additional fluid toxoid for the immunization of older babies. He thought it possible that the free toxoid in this preparation, which he named F.P.T., might neutralize circulating passive antitoxin, so that interference with the action of the P.T.A.P. would be reduced or abolished. He employed a mixture containing 100 Lf toxoid plus 25 Lf of P.T.A.P. per ml. and stated that a "reasonable proportion" of the toxoid remained unadsorbed on the phosphate: no figures were given.

Present Investigation

The results here recorded have been obtained with a preparation of F.P.T. This material contained a total dose of 145 Lf of purified diphtheria toxoid per ml., of which 75 Lf was unadsorbed a few days after preparation. This prophylactic was made for us by Dr. F. V. Linggood, who kindly retested the flocculation values after three months' storage at 4° C., and found that a further 15 Lf had been adsorbed during this time. The composition at the beginning of the work on babies was 60 Lf free plus 85 Lf adsorbed per ml. of prophylactic: 11 months later the composition was 52 Lf free plus 93 Lf adsorbed. The dose injected into babies on each occasion was 0.5 ml. (72.5 Lf), and the schemes used in this work are shown in Table I.

TABLE I.—Schemes of Injection of Babies with F.P.T.

Age	Scheme		
	A	B	A and B
1 week	F.P.T.	F.P.T.	<i>H. pertussis</i> vaccine
6 weeks	"	"	" " "
14 "	"	"	" " "

Of the babies in scheme A 96% received the first injection when between 6 and 9 days old (72% of the total were within the narrow limits of 7 or 8 days) and the remainder when from 9 to 15 days old. The variation in the length of time between the two injections in individual babies can be seen in Table VII; for practical administrative reasons few babies were injected at the exact ages shown in Table I. Blood samples were taken from the babies by jugular venepuncture, the first being taken eight to nine weeks after the second injection of F.P.T. in 90% of cases.

The children were consecutive babies born in the obstetric department of University College Hospital. Samples of cord blood were collected in every case for estimation of the diphtheria antitoxin content. The nature of the immunization scheme was explained to each mother personally or by pamphlet on or about the fifth day of the baby's life, and it was pointed out that most of the injections would be given at the time of routine hospital attendance. Premature babies weighing less than 5½ lb. (2.5 kg.) at birth were excluded, as were babies suffering at the end of the first week from congenital malformations, effects of birth trauma, or infections; a few others were excluded because their homes were so far from the hospital as to preclude further attendance. The parental response was excellent, for out of the first 250 births of all weights 209 (83%) received a first injection in hospital and 195 completed the primary course of diphtheria and whooping-cough immunization.

An autoclaved all-glass syringe was used for each injection; after the prophylactic had been drawn up, the needle was changed to a No. 20 for the injection. The route and site of the injection were varied, and included subcuticular

or deep subcutaneous in the leg and deep subcutaneous in the deltoid area: this route gave the lowest reaction rate to injections either of diphtheria prophylactic or of *H. pertussis* vaccine. Both local and general reactions to the first injection of F.P.T. were very slight, and no reaction was complained of after the second injection, given at either 6 or 14 weeks. Table II shows the incidence of local reactions

TABLE II.—Incidence of Local Reactions to First Injection of F.P.T. Given at Age of About 1 Week

Group	Site	Route	No. Showing Erythema				No. Showing Induration				Total
			0	1–25	26–50	>50 mm.	0	1–25	26–50	>50 mm.	
1	Thigh	Subcuticular	11	70	12	1	94	41	46	2	89
2	"	Deep subcutaneous	38	41	4	1	84	59	24	0	83
3	Deltoid	"	50	47	1	0	98	85	12	0	97
All groups			99	158	17	2	276	185	82	2	269
Percentage			35.9	57.2	6.2	0.7	68.8	30.5	0.7		

in 305 consecutive babies given the first injection of F.P.T. in the hospital nursery during the first two weeks of life: 99 (35.9% of the 276 examined) showed no erythema, and 185 (68.8% of 269) had no induration at the site of injection 24 hours after the first injection. Only 19 babies (6.9%) showed areas of erythema or induration of more than 2.5 cm. diameter, and none of these progressed to local abscess formation. There were 14 babies showing small nodules five weeks after the first injection, but none of these was still present at the age of 3 months.

We are indebted to Mr. P. A. Young, of the Wellcome Research Laboratories, for making a statistical analysis of the figures given in Table II. From this analysis he has drawn the following conclusions.

Erythema is significantly more frequent and more extensive after subcuticular injection than when it occurs after subcutaneous injection.

Erythema occurs with equal frequency on thigh and deltoid after deep subcutaneous injection, but when it does occur it tends to be more extensive on the thigh.

After deep subcutaneous injection induration is significantly more frequent on the thigh than on the deltoid.

Induration on the thigh is significantly more frequent after subcuticular injection than after deep subcutaneous injection.

Determination of Antitoxin Titres

The antitoxin titres of sera from cord blood and from the babies after immunization were determined by a modification of the Römer and Sames (1909) guinea-pig intracutaneous method (Glenny and Llewellyn-Jones, 1931). Tests were made at approximately twofold differences; the lowest level tested was 0.001 unit per ml. Since only small amounts of serum were available from some of the babies, a dilution 1 in 5 was made, and the lowest titre measured, in terms of undilute serum, was therefore raised to 0.005 unit. When serum was plentiful tests were made at lower levels, but for the purpose of analysis of results such low titres were included as under 0.005 unit: this figure corresponds roughly to the Schick level. Diluted sera were tested at the same levels as the undilute cord sera, but the multiplication of the titre by five brings some recorded values to slightly different figures. For example, cord blood titres are recorded as 0.004 (above 0.004 and below 0.01), 0.01, 0.02, and 0.04 unit per ml., but tests on diluted material at the same levels represent titres of 0.02, 0.05, and 0.1, etc., after correcting for dilution. The form of the histograms in Figs. I, II, and III shows the limiting values for all the recorded titres; The geometric means in the tables are calculated from the geometric means of the limiting titres; thus a recorded titre of 0.01 is regarded as 0.014 for the purpose of such calculations. Values recorded as under 0.005 are taken to be 0.002.

Antitoxin Titres of Babies in Scheme A

Fig. 1 shows the distribution of antitoxin titres of babies at the age of 3 months, about eight weeks after the second injection of F.P.T. The results have been arranged

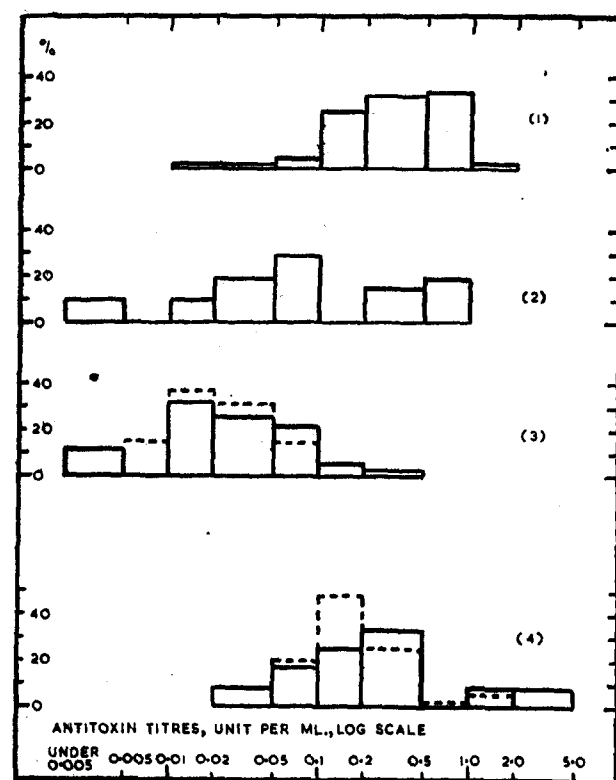


Fig. 1.—Distribution of diphtheria antitoxin titres in the serum of babies when 3 months old after immunization under scheme A.

(1) 110 babies with cord blood titre of 0.01 unit per ml. or less
(2) 21 " " " " " " 0.02 or 0.04 unit per ml.
(3) 34 " " " " " " 0.1, 0.2, or 0.5 unit
(4) 12 " " " " " " 1, 2, or 10 units
Broken lines show the distribution of residual passive antitoxin titres.

into four groups according to cord blood titre. In diagram 1, which shows the titres of babies for whom the cord blood had contained 0.01 unit or less, the great majority were between 0.1 and 1 unit per ml. Only four babies had titres below 0.05 unit.

In diagram 2 (cord blood titres between 0.01 and 0.1), there is a suggestion of two, possibly three, populations. Two babies out of 21, both with the higher cord blood titre of 0.04 unit, failed to produce 0.005 unit per ml.; 12 babies produced over 0.01 but under 0.1 unit; and only five reached 0.2 or 0.5 unit per ml. There is thus a clear dividing line at 0.02 unit between the cord blood titre which seldom interfered with and that which often reduced active response to injection. With lower cord blood titres (diagram 1) only 10 among 110 babies failed to produce 0.1 unit, compared with 14 of 21 shown in diagram 2.

Diagram 3 deals with babies whose cord blood titres were between 0.1 and 1 unit per ml. Such babies would have measurable amounts of residual passive antitoxin at the age of 3 months. Calculations from the formula of Barr, Glenny, and Randall (1949) show that slightly less than one-tenth (7.8%) of the cord blood titre would still be present in the serum of babies 3 months old. Babies with cord blood titres recorded as 0.1 unit per ml.—that is, between 0.1 and 0.2 unit—would thus be expected still to have titres between 0.0078 and 0.0156 unit. Such titres would be recorded as either 0.005 or 0.01. By assuming an even distribution of titres between the various limits, it is possible to work out the distribution of passive titres to be expected at 3 months (and also at 6 months as shown in Fig. II)

if no active antitoxin production had occurred as a result of the injections of F.P.T. This distribution is shown in Fig. I as a broken line, and corresponds fairly closely to the distribution actually found. There was thus little active response in these babies, though there is a suggestion from both diagrams 3 and 4 (babies whose cord blood titres were 1 unit or more) that a few babies may have produced some antitoxin actively. In diagram 4 the agreement between the distribution of calculated passive titres and those found is not so good as that in diagram 3, but the figures for both diagrams seem to provide confirmation of the formula of Barr, Glenny, and Randall.

Fig. II shows the distribution of antitoxin titres of the babies when 6 months old. The titres of those with low cord blood initially had mostly fallen to about one-half the titre found at 14 weeks (diagrams 1 and 5). A comparison of the titres in diagrams 2 and 6 shows that a few of the higher titres at 14 weeks had fallen, but that there was an increase in some of the lower ones. Diagram 7 shows that the passive titres of babies with cord blood values over 0.1 and under 1 were almost negligible at the age of 6 months, and that nearly all the babies had responded actively by this time. A number of the babies in the highest cord blood group (diagram 8) had also shown an active response by this time. Thus a delayed response, the "intermediate response" of Glenny and Südmersen (1921), may occur in babies with a high level of circulating passive antitoxin at the time of injection of prophylactic. Barr, Glenny, and Howie (1953) found a close inverse correlation between passive titre and response to the first and to the second injection of A.P.T. in lambs that had acquired diphtheria antitoxin from the colostrum of their actively immunized mothers. Even very high passive titres that

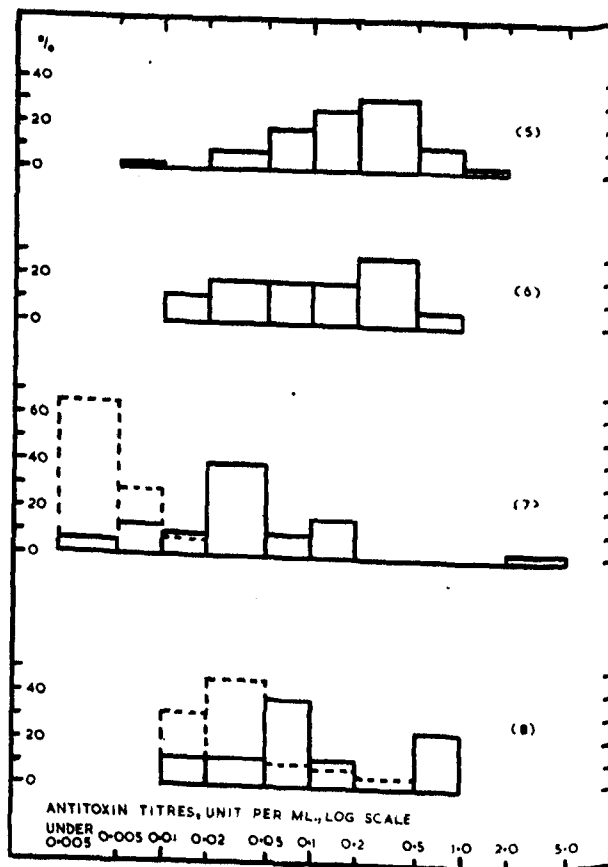


Fig. II.—Distribution of diphtheria antitoxin titres in the serum of babies at the age of 6 months after immunization under scheme A.

(5) 38 babies with cord blood titre of 0.01 unit per ml. or less
(6) 17 " " " " " " 0.02 or 0.04 unit per ml.
(7) 30 " " " " " " 0.1, 0.2, or 0.5 unit
(8) 8 " " " " " " 1, 2, or 10 units
Broken lines show the distribution of residual passive antitoxin titres.

prevented any detectable antitoxin production after two injections of A.P.T. did not prevent the development of basal immunity, so that considerable antitoxin production occurred after a third injection. It is therefore possible that some antitoxin would be actively produced by all babies if given a third injection at the age of 6 months.

TABLE III.—Changes in Antitoxin Titres in Serum of Babies Injected under Scheme A and Bled when 3 Months and 6 Months Old

Cord Blood Titres		No. of Babies Whose Titres			Total
Over	Under	Increased	Remained the Same	Decreased	
—	0.004	1	4	25	30
0.004	0.1	6	10	5	21
0.1	0.2	9	2	1	12
0.2	1.0	4	3	8	15
1.0	—	0	0	8	8
Total		20	19	47	86

Table III shows the changes in antitoxin titres of all babies injected under scheme A and bled when 3 months and 6 months old: the responses are divided according to cord blood titre, but in different groups from those in Figs. I and II. Twenty-five of the 30 babies whose cord blood titres were below 0.004 unit showed a fall in antitoxin between the third and sixth months, and only one increased. This suggests that nearly all the babies in the second group had given a secondary response to the second injection of F.P.T. Only two out of six with cord blood titres of 0.004 or 0.01 decreased in titre during the third to sixth months of life; these results are therefore included in the second group in Table III. Those with initial titres of 0.1 unit per ml. formed the only group in which more than half the titres increased during the third to sixth months; this group is therefore recorded separately. Those babies with higher cord blood titres—0.2 and 0.5—were almost equally divided between those who decreased in titre and those who either increased or remained the same. All with an original value of 1 or more decreased in titre during the third to sixth months.

Table IV gives a comparison of the distribution of antitoxin titres of those babies who were bled on two occasions, together with the average passive titre expected to be present in the higher groups at the time the blood samples were taken. These figures were calculated from the formula of Barr *et al.* (1949), and, by subtraction from the total titre found, the average active titre for each group has been calculated. Babies in the first group must have reached their maximum antitoxin titre at or before the time of their first bleeding when 3 months old, and their titres had fallen considerably when bleedings were taken three months later. The second group consisted of two populations irrespective of the cord blood titres within the recorded limits; 10

babies had responded by three months as well as those in the first group, and those had mostly fallen in value by 6 months, although the reduction in titre was not so great as that in the first group. The other population had responded badly by 3 months and mostly increased in titre by 6 months. As a result of this delay in reaching the maximum titre the average titre at 6 months of the second group was higher than that of the first group. The third group, consisting of those babies whose cord blood titre was 0.1 unit, included only one whose titre at 6 months was lower than that at 3 months. As this baby reached 0.2 unit at 3 months it can be concluded that all had been actively immunized.

It can be concluded, therefore, that all babies with cord blood titres of 0.1 unit or less per ml. were actively immunized by scheme A. This would apply to 766 of the first 1,000 at U.C.H. whose cord blood titres were tested.

The results given in the last two groups in Table IV are not so definite. In the fourth group the geometric mean of the titres found at 3 months is almost identical with the expected passive contribution, but at 6 months the mean titre found was 3.7 times the expected passive titre; some at least of the babies must have responded actively. It seems reasonable, therefore, to accept as actively immunized the 7 out of 15 recorded in Table III as at least maintaining their level of total antitoxin content from the third to the sixth month, although their passive antitoxin content fell by 0.03 unit per ml. This would bring the estimated number of babies immunizable under scheme A to at least 84%. The figures given for the fifth group in Table IV suggest that at least one of the seven babies was actively immunized, although the cord blood titre was 1–2 units per ml.

TABLE V.—Comparison Between Titres at 3, 6, and 9 Months of Babies Injected under Scheme A. Cord Blood Titres were all 0.01 Unit or Less per ml.

Antitoxin Titre (Unit/ml.)	No. of Babies Possessing the Stated Antitoxin Titre when Aged		
	3 Months	6 Months	9 Months
Under 0.005	1	1	1
0.005	1	0	1
0.01	2	3	3
0.02	5	7	5
0.05	27	10	9
0.1	34	12	7
0.2	36	4	4
0.5	3	1	—
1.0	—	—	—
Total	109	39	30
G.M. (unit/ml.)	0.298	0.150	0.136

Further data have been collected on later blood samples from some of these babies with low cord blood titres who were bled at the age of 9 months. Table V shows the distribution of all such babies immunized under scheme

TABLE IV.—Comparison Between Titres at 3 and 6 Months of Babies Bled on Both Occasions After Immunization under Scheme A

Antitoxin Titre (Unit/ml.)	No. of Babies with Cord Blood Titres of									
	0.004		> 0.004 < 0.1		> 0.1 < 0.2		> 0.2 < 1.0		> 1.0 < 5.0	
	Passing the Antitoxin Titre Stated when Aged (Months)									
	3	6	3	6	3	6	3	6	3	6
Under 0.005			1		2		1			
0.005			0		0		2			
0.01		1	1	2	4	0	5	3		1
0.02	1	0	6	3	3	6	5	7	1	1
0.05	1	3	4	3	2	2	4	1	0	3
0.1	1	7	3	3	0	3	1	1	3	1
0.2	16	9	0	8	1				2	0
0.5		7	3	2					0	1
1.0	9	3	7	1					1	
Total	30		22		12		15		7	
G.M. of titres	0.327	0.133	0.117	0.147	0.023	0.046	0.033	0.022	0.200	0.081
Passive contribution	Nil	Nil	Nil	Nil	0.011	0.002	0.036	0.006	0.155	0.026
Active production	0.327	0.133	0.117	0.147	0.012	0.044	Nil	0.016	0.045	0.055

A and bled at 3 months and at 6 or 9 months. The figures come from a dwindling and mixed population, and few of those bled at 9 months had been bled at 6 months, but it is important to note that, whereas the geometric mean titre of those bled at 6 months was about half that at 3 months, the mean titre at 9 months was only 10% lower than that at 6 months. This suggests that babies in whom the maternal antitoxin was insufficient to interfere with active immunization gave secondary responses, and that the flattening out of the curve of loss, typical of such responses, occurred at about 6 months.

TABLE VI.—Comparison Between Antitoxin Titres of Babies about 8 Weeks After the Second of Two Injections of F.P.T. under Scheme A Divided According to Route of Injection. Cord Blood Titres were all 0.01 Unit or Less per ml.

Route	No. of Babies with Antitoxin Titres (Units/ml.)							No.	G. Mean Titre
	0.01	0.02	0.05	0.1	0.2	0.5	1.0		
Subcutaneous	1	3	20	11	13	2	50	0.262	
Deep subcutaneous (arm and thigh)	2	1	1	7	22	23	0	56	0.377

It is perhaps of interest to record the antitoxin titres in babies immunized by subcutaneous and by deep subcutaneous injections of F.P.T. A comparison is given in Table VI, relating to babies injected in scheme A whose cord blood titres were 0.01 unit per ml. or lower. Although there is

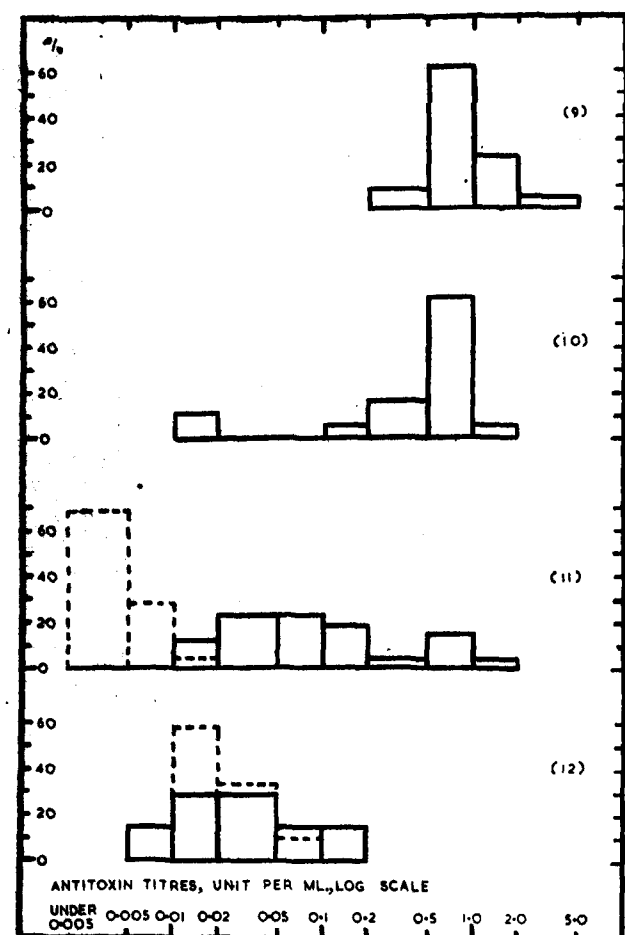


FIG. III.—Distribution of diphtheria antitoxin titres in the serum of babies when 6 months old after immunization under scheme B.

- (9) 43 babies with cord blood titres of 0.01 unit per ml. or less
 (10) 18 " " " " " " 0.02 or 0.04 unit per ml.
 (11) 26 " " " " " " 0.1, 0.2, or 0.5 unit
 (12) 7 " " " " " " 1 or 2 units

Broken lines show the calculated distribution of residual passive antitoxin titres.

a suggestion of better results with deep subcutaneous injections, the differences between the means of the logarithms of the two sets of titres is not significant.

Antitoxin Titres of Babies in Scheme B

Babies injected under scheme B were bled for the first time at the age of 6 months. Antitoxin titrations were therefore made about 12 weeks after the second injection, compared with eight to nine weeks in scheme A.

The distribution of antitoxin titres of these babies at 6 months is shown in Fig. III. The results are grouped according to cord blood titre as in Fig. 1, so that diagrams 1 and 9, 2 and 10, 3 and 11, and 4 and 12 show titres of babies with the same ranges of cord blood values. It is at once evident on comparing diagrams 1 and 9 that babies born with little maternally conferred antitoxin were better immunized under scheme B than under scheme A. There is a very small scatter of titres in diagram 9, in contrast to the wide scatter and the poor titres of some babies in diagram 1. We are of the opinion that a small scatter provides evidence of satisfactory immunity in a population as a whole (see Barr, Glenny, and Randall, 1950). The same improved response is shown in all groups under scheme B except those with cord blood titres of 1 unit or higher. The improved response of babies receiving the second injection at the longer interval after the first, recalls the finding of Barr *et al.* (1950) that young babies immunized with two doses, each 0.5 ml. of A.P.T., responded better if the interval between the injections was 10–18 weeks than if it was 6–9 weeks.

It is probable that, when a potent prophylactic such as F.P.T. is used, intervals between injections could be extended even further in babies with low passive titres at the time of the first injection. It is, however, of interest that those with high cord blood titres responded less well when the interval between injections was 13 weeks than when it was five weeks. This result suggests that the potential immunity conferred by the first dose of F.P.T., injected at a time when the circulating passive antitoxin was considerable, had been largely lost by the 13th week. The presence of considerable passively conferred antitoxin reduces the amount of effective prophylactic available to act as a stimulus. When very small dosage is used the degree of potential immunity established by the first injection is insufficient to provoke a good antitoxic response if the second injection is delayed unduly (Barr and Glenny, 1945). Although the babies whose titres are shown in diagram 12 may subsequently show delayed production of antitoxin, they seem to be less effectively immunized than those in diagram 4.

The effect of interval between injections upon response is shown in Table VII. The titres are those of babies for whom the cord blood titre was 0.01 unit or less per ml., and babies who received the second injection after eight

TABLE VII.—Distribution of Antitoxin Titres in Serum of Babies Taken about 8 Weeks After Second of Two Injections of F.P.T. under Schemes A and B Divided According to Interval Between Injections. Cord Blood Titres were all 0.01 Unit or Less per ml.

Interval Between Injections (Weeks)	No. of Babies with Antitoxin Titres (Unit ml.) of							Total	G.M. (Unit ml.)
	0.01	0.02	0.05	0.1	0.2	0.5	1.0		
4 to 5 ..	2	1	1	19	14	12	1	50	0.24
5 " 6 ..	0	1	4	7	17	17	0	46	0.31
6 " 8 ..	0	0	0	1	3	7	0	13	0.58
12 " 15 ..	0	0	0	0	3	21	2	35	0.86

weeks or less (scheme A) were bled and tested eight to nine weeks later, while those in scheme B (12–15 weeks interval) were bled about 12 weeks after the second injection. It is clear from the distribution of titres, the smaller scatter, and the geometric mean values that the response of these groups was improved as the interval between injections was increased.

Table VIII compares the distribution of titres of babies with higher cord blood values immunized under schemes A, and B. This table shows in addition the average passive titre to be expected in each group at the time the blood samples were taken. It is clear that much greater active antitoxin production occurred in babies immunized under scheme B than scheme A, except those with cord blood titres of 1 unit or more.

It is perhaps of interest to consider these results in relation to the distribution of 1,000 cord blood titres from this particular population. Only 7.4% of this large sample had cord antitoxin titres of 1 unit or more per ml., and it would therefore appear that over 90% of the babies would be immunized more satisfactorily by two doses of F.P.T. given at the ages of 1 and 14 weeks than by two similar doses given at the ages of 1 and 6 weeks. There was, however, one other point of difference between the injection procedures in schemes A and B. Whereas group A received

suitable, not necessarily optimal, interval for P.T.A.P., but a much longer interval, such as that in scheme B, was necessary for uniformly good results when F.P.T. was used.

Summary

Further evidence is given that active production of diphtheria antitoxin in babies is greatest in those with little or no antitoxin in their cord blood. The interference with active production caused by higher passive titres does not appear to be reduced by the use of F.P.T.—that is, P.T.A.P. to which additional unprecipitated purified toxoid has been added.

Babies whose cord blood titres were below 1 unit per ml. and who were immunized with two doses of F.P.T., each of about 70 Lf, gave better antitoxic responses if injected at the ages of about 8 days and 14 weeks than

TABLE VIII.—Distribution of Antitoxin Titres in Serum of Babies Given Two Injections of F.P.T. Under Schemes A and B Divided According to Cord Blood Titres

Cord Blood Titres (Units/ml.)	Scheme	No. of Babies with Antitoxin Titres (Units/ml.) of										Total	Geometric Mean	Passive Contribution	Active Response
		Under 0.005	0.005	0.01	0.02	0.05	0.1	0.2	0.5	1.0	2.0				
0.02, 0.04	A	2	0	2	4	6	0	3	4	0		21	0.074	Nil	0.074
0.02, 0.04	B	0	0	2	0	0	1	3	11	1		18	0.380	"	0.380
0.1, 0.2, 0.5	A	4	0	11	9	7	2	1	0	0		34	0.026	0.021	?Nil
0.1, 0.2, 0.5	B	0	0	3	6	6	5	1	4	1		26	0.094	0.005	0.089
1, 2, 5, 10	A		0	0	2	2	3	4	0	1	1	17	0.228	0.174	0.054
1, 2, 5, 10	B		1	2		1	1	0	0	0	0	7	0.028	0.026	Nil

two injections each of F.P.T. and of *H. pertussis* vaccine given at the same times but in a different site, group B received an injection of *H. pertussis* vaccine alone between the injections of F.P.T. and vaccine. The effect of the introduction of injections of one antigen alone in a course of combined prophylaxis has not received much investigation. It has been recently shown by Barr and Llewellyn-Jones (1953a) that a preliminary injection of typhoid-paratyphoid vaccine before the first of two injections of this vaccine in combination with tetanus toxoid may bring about interference with the response to the tetanus toxoid in guinea-pigs. The same workers (1953b) have found that in certain circumstances an injection of a vaccine in between two injections of a combined prophylactic containing the same vaccine and a toxoid may improve the response to the toxoid. It is possible that the injection of *H. pertussis* vaccine given to the babies of scheme B between the two injections of the same vaccine and of F.P.T. contributed in some measure to the better response of the majority of this group. We are, however, of the opinion that the superiority of results in scheme B to those in scheme A was due chiefly to the longer interval between the injections of F.P.T.

P.T.A.P.—A few babies, including 25 with cord blood titres of 0.01 unit or less per ml., were injected with 0.5 ml. of P.T.A.P., given at the same time as in scheme A. The responses of this group were far better than those injected with F.P.T. in scheme A, and approached the results of scheme B. The total antigen content in the dose of F.P.T. was slightly more than double that in the dose of P.T.A.P. Thus, babies with no circulating passive antitoxin at the time of the first injection of F.P.T. received twice as much total antigen as similar babies injected with P.T.A.P. In babies who had maternally conferred antitoxin the free toxoid in F.P.T., though it might neutralize this antitoxin, would be expected also to have an antigenic effect if gradual dissociation of the toxoid-antitoxin complex took place. It is therefore to be expected that the optimum interval between the two injections of this potent prophylactic would be longer than that for the weaker preparation, P.T.A.P. It is probable that five weeks between two injections was a

if injected at the ages of about 8 days and 6 weeks. When the cord blood titre was 1 unit or more, responses were poorer in the group receiving injections at the longer interval.

In the short-interval group, comparison of the antitoxin levels of babies at the ages of 3 and 6 months suggested that many with cord blood titres above 0.004 unit per ml. had given an intermediate, not a secondary, response to the second injection of prophylactic. This was shown as a delayed production of antitoxin, due to reduction in the effective first dose of F.P.T. because of neutralization by passively conferred antitoxin. A few babies with low cord blood titres gave better responses to two doses, each of about 25 Lf of P.T.A.P., given at the ages of 8 days and 6 weeks, than similar babies receiving two doses of F.P.T. at the same ages.

The general reaction rate was negligible after injections of F.P.T.: local reactions were also very slight, and were less after deep subcutaneous than after subcutaneous injection.

We are greatly indebted to the staff of the Obstetric Hospital and the Infant Welfare and Children's Department of University College Hospital. We also wish to thank Mrs. F. Blackman for considerable technical assistance.

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THE HERPES SIMPLEX VIRUS IN INFANTILE ECZEMA

BY

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Infantile eczema is perhaps one of the most distressing afflictions of early life, frequently more so to the parents than to the victim. Treatment is always a problem; at home improvement is often slow, and in hospital other conditions, occasionally serious, are readily contracted. The damaged skin is frequently infected by bacterial "opportunists," and less often, though with apparently increasing frequency, by viruses, which may produce an acute vesicular eruption not unlike smallpox, with a high mortality rate. This complication of atopic eczema was first recorded by Kaposi in 1887, and there is little to add to his vivid description:

"... an acute outbreak of numerous vesicles, partly scattered, partly arranged in groups. The vesicles are as large as a lentil, filled with clear serum, and the majority are umbilicated. They look like varicella lesions, but undoubtedly do not belong to this class. The integument which has been attacked in this manner now appears still more swollen, even tense. The little patients have a high fever and are very restless. The vesicles develop very acutely (sometimes overnight), in large numbers, and often continue to appear, in successive crops, for three or four days, or even a week. Those which appear first undergo desiccation, rupture, and expose the corium, or they become encrusted and fall off. The largest number of these varicella-like vesicles are found upon the already eczematous skin, but smaller groups appear upon the previously intact skin of the neighbourhood, upon the forehead, ears, neck, and even the shoulders and arms."

Kaposi originally suggested the title "eczema herpetiforme," but he suspected a fungus as the cause. The syndrome was first identified with the virus diseases by Juliusberg (1898), who, although confusing the issue himself, drew attention to the close resemblance of the individual lesions to vaccination pustules. Although the precise aetiology was subsequently disputed, by common consent the term "Kaposi's varicelliform eruption" became firmly established. The numerous reports during recent years have clearly demonstrated that this condition is a distinct entity, is commonly produced by the virus of either herpes simplex or vaccinia, and that, although rare, it may well be seen by many during their practising career (Whittle *et al.*, 1950). When due to vaccinia there is usually a history of recent vaccination or contact with recently vaccinated persons. In the absence of such contact it is likely to be due to herpes simplex, when a history of herpetic infection in a close contact is often obtained.

Several examples of both types have been seen recently. The object of this paper is to describe three typical cases and to review the published literature on the subject.

Case 1

A female infant aged 6 months, who had been immunized against diphtheria but not vaccinated, had suffered from infantile eczema in moderate form affecting both legs and face since the age of 3 months. Three days before admission she became listless and developed "blisters" be-

hind both knees. She was admitted to the ward on April 13, 1953. When seen on April 15 she showed groups of umbilicated vesicles and pustules superimposed on the eczematous skin of the neck and both legs, some areas being extensively traumatized. There was considerable inguinal lymphadenopathy. Her temperature was 101.4° F. (38.6° C.), pulse 146, and respirations 36. No abnormality was detected in any system. She was transferred to the fever hospital on April 15. The child's father and grandmother had recently suffered from colds associated with "cold spots." In fact, the father's labial herpetic infection was still present.

Treatment consisted of aureomycin lotion locally, soluble penicillin, and, later, "distaquaine" systemically (Fig. 1). The child was acutely ill during the pyrexial phase. Crops of fresh umbilicated vesicles appeared daily, even on the gums. Recovery ensued without pitting or scarring. The basic eczema remains unchanged.

Investigations.—Blood: Hb, 85%; white cells, 8,000 per c.mm. (polymorphs 76%, lymphocytes 20%, monocytes 4%; no eosinophils or basophils). Films showed anisocytosis of red cells. Swab from vesicle: films showed Gram-positive cocci; culture showed *Staph. aureus*. Egg culture: positive for herpes simplex. Serum for herpes-neutralization tests: increase in herpes-neutralizing antibody titre between first and second specimens.

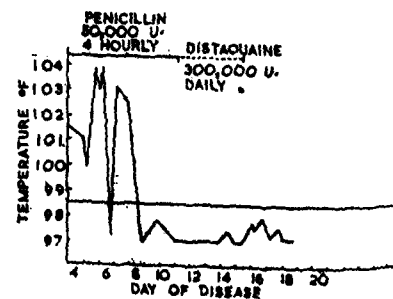


Fig. 1.—Chart of Case 1.

Case 2

A female infant aged 11 months, who had not been immunized or vaccinated, had suffered since the age of 3 months from moderately severe infantile eczema affecting the face and neck, for which she was in hospital when Case 1 was admitted (April 13, 1953). In the course of a routine ward round on April 20 comment was passed on this child's good luck in having escaped Kaposi's varicelliform eruption. Careful examination revealed nothing apart from her basic eczema. During the same evening she became listless and developed a temperature of 104° F. (40° C.), pulse 140, and respirations 40. One hour later crops of small clear vesicles were seen on the left shoulder and chest. The next day typical umbilicated vesicles and pustules were present. At first there was no lymphadenopathy, though this later became marked in the left axilla. The child was transferred to the fever hospital on April 21.

Treatment consisted of aureomycin lotion locally and penicillin and, later, aureomycin systemically (Fig. 2). The child was gravely ill during the pyrexial phase, fresh umbilicated vesicles appearing daily. Recovery ensued, but the basic eczema was unchanged. There are no pitted scars.

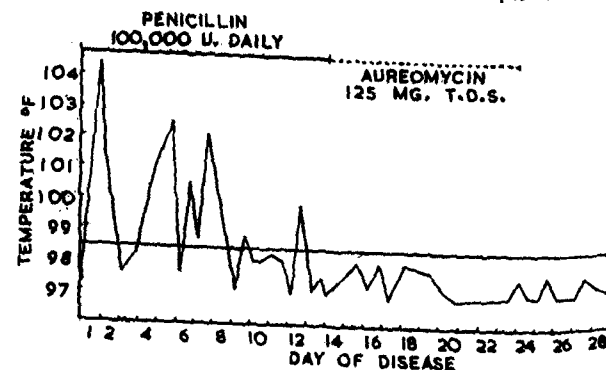


Fig. 2.—Chart of Case 2.

Investigations.—Blood: Hb, 80%; white cells, 20,000 per c.mm. (polymorphs 62%, lymphocytes 25%, monocytes 13%; no eosinophils or basophils). Films showed anisocytosis and microcytosis of red cells. Swab from vesicles: films showed Gram-positive cocci; culture showed *Staph. albus*. Urine: N.A.D. Portable x-ray film of chest showed no lesion. Egg culture: positive for herpes simplex. Complement-fixation test negative for vaccinia-variola group. Serum for herpes-neutralization tests: increase in herpes-neutralizing-antibody titre between first and second specimens.

Case 3

A male infant aged 8 months, who had not been immunized or vaccinated, had suffered from xeroderma since birth and had developed scattered patches of eczema, for which he had received treatment at hospital. Both parents were vaccinated on May 14, 1953, but this was not attempted on the child because of the skin condition. Four days before admission—that is, on May 27—the child suddenly became listless, developed a high temperature, and later had "vaccination blisters" on the left arm. When admitted to the fever hospital on May 31 the left arm showed groups of umbilicated vesicles and pustules, with marked inflammatory reaction, and occasional vesicles on the right arm and legs. There was moderate axillary lymphadenopathy. His temperature was 101° F. (38.3° C.), pulse 138, and respirations 34. No abnormality was detected in any system. Treatment consisted of systemic penicillin and local aureomycin cream. Recovery was rapid and uneventful. The basic xeroderma was unaltered. There is some residual scarring.

Investigations.—Blood: white cells, 13,600 per c.mm. (polymorphs 61%, lymphocytes 28%, monocytes 4%, eosinophils 7%; no basophils). Swab from vesicles: haemolytic streptococci present. Egg culture: positive for vaccinia; complement-fixation test positive for vaccinia-variola group. Serum for vaccinia-neutralization tests: increase in vaccinia-neutralizing-antibody titre between first and second specimens.

Diagnosis

The clinical diagnosis of virus eruptions in their typical form usually presents little difficulty. Confusion may arise because of pre-existing skin disease, particularly atopic eczema. Atypical forms of virus disease create further difficulties in diagnosis, especially during an outbreak of smallpox. In susceptible persons varicella, variola, and vaccinia, as well as herpes simplex and herpes zoster, should be considered, and, if excluded, some other virus sought.

The clinical diagnosis of eczema herpeticum in infants depends upon the sudden appearance of profound toxæmia, high temperature, and a pock-like eruption on eczematous skin. A history of recent herpetic infection in close contacts is often obtained. Cases are undoubtedly unrecognized or misdiagnosed, and the condition is probably commoner than reports indicate. In eczema vaccinatum the nature of the eruption and a history of recent vaccination or contact should suggest the diagnosis. The possibility of confusion with chickenpox is slight, but the resemblance to smallpox may be striking, especially if the face is affected. If possible, laboratory confirmation should be obtained.

The laboratory diagnosis of virus eruptions, although not easy, depends upon identification of the virus concerned after culture on the chorioallantoic membrane of fertile hens' eggs, or demonstration of its presence by complement-fixation tests. For both tests papule scrapings or vesicle fluid and crusts are required. Alternatively, the patient's serum may be used against known virus antigen. The complement-fixation tests are rapid; egg culture is precise, but

requires more time. Microscopical examination of smears of vesicle scrapings for elementary and inclusion bodies is rapid and, if positive, of considerable value. Biopsy and the demonstration of virus-neutralizing antibodies in the serum are of little value except in retrospect (Anderson, 1952).

For the laboratory, six to twelve "fresh" vesicle tops or scabs should be placed in a small sterile bottle. Vesicle fluid should be obtained in two or three capillary tubes (similar to those for vaccination lymph), which are sealed by flaming the ends, and then placed in a dry bottle. Smears may be made by scraping the bases of four to six lesions. The greater the quantity of material collected the better the interpretation of the results (MacCallum, 1952). If possible, two samples of clotted blood should be obtained—one during the first few days of illness and the other during the second to third week—in order to show a rise in serum antibody titre.

Treatment

There is as yet no effective form of antiviral treatment. Gamma globulin or transfusion of immune serum may be tried. Moccasin venom is mentioned by Barker and Hallinger (1947), but no other reports have been seen. Extensive cases should be watched for signs of fluid depletion, and corrected if necessary.

Despite varying reports, the recent antibiotics are probably equally effective, although differing from one case to another, in controlling secondary infection. The cases recorded here were given penicillin because the earlier cases had failed to respond to aureomycin. Sulphonamides should not be used, because there may be an actual or a relative leucopenia (Lane and Herold, 1944; Miller *et al.*, 1950). The value of A.C.T.H. and cortisone is still undecided, although one of the earlier cases developed eczema herpeticum whilst on small doses of A.C.T.H.

Locally, potassium permanganate soaks (1:100,000) are viricidal against vaccinia and variola (Gordon, 1941), and may be tried against herpes simplex. The viricidal action is inhibited by glycerin. Antibiotic creams or lotions should be used; all of the present series appeared to benefit from local aureomycin.

The basic eczema, although temporarily improved, usually remains unaltered.

Prognosis

The prognosis of eczema herpeticum depends upon virus virulence, susceptibility of host, nature and extent of previous skin trauma, and secondary infection with its ensuing complications. All grades of severity occur, from mild abortive to extensive fatal cases (Lynch and Steves, 1947). Death may occur during the primary toxæmia, or later because of extensive secondary infection. Most of the deaths reported in eczema vaccinatum have been due to encephalitis or general sepsis (Perry and Martineau, 1949).

The mortality rate is variable. Blattner *et al.* (1945) state that the disease is self-limiting and in general the prognosis is good. O'Leary (1944) thinks that its seriousness should not be minimized, as the literature indicates that probably one out of every three children with eczema herpeticum dies, whereas in adults it is not so serious; Sims and French (1948) report six deaths out of nine cases. None of the present series died, but at various times three (of six) cases were dangerously ill.

Communicability

All the pock viruses, including herpes simplex, are highly infectious, especially in the presence of eczema or other skin damage, when the reaction to primary infection may be unusually severe. The occasional epidemic outbreaks of eczema herpeticum are possibly due to an increase in virus virulence (Unger, 1947). In the presence of virus-neutralizing antibodies, recurrent lesions of herpes simplex may be due to local lowering of resistance (Varley and Kletz, 1949). The development of sore throats, vesico-pustules, and herpetic lesions in the attendant staff has been reported

(McLachlan and Gillespie, 1936; Barton and Brunsting, 1944). In the present series three nurses developed vesicopustules, which remained limited in extent on the hands and fingers and responded rapidly to local aureomycin. Virus studies were not made.

It is suggested that eczema herpeticum should be classed as a notifiable disease to ensure future epidemiological investigation.

Vaccination

As routine for public protection, vaccination is preferably performed by the multiple pressure method on the upper arm during the first six months of life. Despite cosmetic considerations the leg should be avoided, for it is almost impossible to keep an infant dry in this region, and the consequent skin damage predisposes to dangerous reactions.

There are certain contraindications to vaccination: it should not be attempted, on adult or child, in the presence of eczematous or otherwise damaged skin. The desirability of vaccinating the parents of children thus afflicted should be considered, and if attempted the vaccination site should be carefully occluded (Jeffs, 1952). Women should not be vaccinated during the first three months of pregnancy because of the significant increase in foetal mortality. There is virtually no risk during the later months of pregnancy (MacArthur, 1952).

Prevention

In view of their high infectivity to susceptible persons, cases of extensive eczema herpeticum and eczema vaccinatum should be isolated. Sufferers from atopic eczema should be warned of the danger of exposure, and safeguarded, if possible, from persons with active herpetic or vaccinia lesions, including, if infected, members of the medical and nursing staffs. Somerville *et al.* (1951) suggest that recently vaccinated persons should not be admitted to hospital, especially to a skin ward, without adequate precautions being taken. They suggest that during times of widespread vaccination it might be wise to discharge persons, especially children, suffering from allergic eczematous conditions. Normally, maternal antibodies in human milk protect infants up to the age of about 12 months: it may be that lack of this protection allows "ward" epidemics to occur. Mothers of infants in hospital should therefore be encouraged to continue breast-feeding.

Discussion

The cases described constitute a little-known clinical syndrome of which the main features are a sudden general disturbance and a pock-like eruption occurring on previously damaged skin. Hitherto the inclusive term "Kaposi's varicelliform eruption" has been used without qualification regarding the causative virus. Since there is little resemblance to chickenpox, it has been suggested that the term "Kaposi's varicelliform eruption" should be discarded in favour of "systemic herpes simplex" (Barker and Hallinger, 1947), "disseminated herpes simplex" (Sulzberger and Baer, 1948), or "eczema herpeticum" (Lynch, 1945) when due to the herpes simplex virus. Anderson (1949) has suggested the inclusive term "virus pyoderma."

The term "vaccinia" is used to denote the course of the eruption at the site of inoculation with the virus of vaccinia and the concurrent reaction of the body. Normally, the vesicular eruption is limited to that site, but rarely it may appear extensively over the body, for which the term "generalized vaccinia" has long been used (Jubb, 1943). About two-thirds of these cases have suffered from pre-existing skin disease, when the special title "eczema vaccinatum" is applied. There is no evidence to suggest that the remainder are due to "a latent unhealthy state of the skin" (Jubb, 1943).

Although not entirely satisfactory, but in order to obtain some degree of uniformity and to denote the association between damaged skin and inoculation with the virus of herpes simplex and vaccinia respectively, the terms "eczema herpeticum" and "eczema vaccinatum" are suggested.

The incidence of eczema herpeticum and eczema vaccinatum is higher among children, but adults are occasionally affected. In a review of the literature, Ruchman *et al.* (1947) state that of 96 reported cases 75 occurred in children, of whom 24 were under 1 year of age. The mortality rate was 23% in children and 9% in adults. Cases are normally sporadic, although epidemics occur in dermatological wards (McLachlan and Gillespie, 1936; Esser, 1941), and have been reported in paediatric and burns units (Nimpfer, 1936; Sims and French, 1948), indicating high infectivity to susceptible persons. Eczema herpeticum may be suspected in the absence of vaccination or known contacts.

A rise in the incidence of generalized vaccinia and eczema vaccinatum occurs when large numbers of people are vaccinated—for instance, following an outbreak of smallpox. Estimates have placed the incidence of generalized vaccinia at one in 20,000 to one in 96,000, and the mortality rate at 12% to 30% (Ross, 1940; Jubb, 1943).

During the course of approximately 50,000 recent vaccinations in the Bradford area at least five known cases of eczema vaccinatum have occurred, one being fatal (McDonagh, personal communication). Three were seen personally, one of which is described.

Since November, 1952, one case of eczema vaccinatum and six cases of eczema herpeticum, including the two reported, have occurred. There were no fatalities, but all the cases of eczema herpeticum were gravely ill, three of them, at one point, being considered moribund.

The lesions of eczema herpeticum were greater in number, more uniform in size, and of more widespread distribution than those of eczema vaccinatum, which showed close grouping of larger, firm, almost indurated vesicles of varying sizes with marked local inflammatory reaction. Crusts from herpetic vesicles were easily removable whole, whereas the vaccinia crusts were adherent, and when removed left frank bleeding surfaces. Lymphadenopathy was more pronounced in eczema herpeticum than eczema vaccinatum. In both types the eruption was maximal on eczematous areas, but occasional scattered lesions on apparently normal skin were seen. All the herpetic cases developed "cheeks" which gave rise to some concern. No corneal lesions occurred. Secondary infection was milder in eczema herpeticum, although it became severe in the later stages of the four earlier cases. It should be possible in the majority of cases to distinguish clinically between the herpetic and the vaccinia types (Lane and Herold, 1944; Lynch, 1945; Lynch and Steves, 1947), although other viruses may occasionally be causative (Anderson, 1949; Leverton and Whitlock, 1949; Brain *et al.*, 1950; Miller *et al.*, 1950; Whittle *et al.*, 1950; Leider, 1951).

The damaged skin is an ideal site for chance inoculation, not only because it presents a large raw surface but because the virus is thus afforded a wider choice of cells suitable for its continued existence. There is probably no immediate tissue response, as occurs with the pyogenic bacteria. This is possibly because the virus, depending upon an intracellular environment for growth and multiplication, allows cell metabolism to proceed normally until ultimate interference with enzyme mechanisms causes complete cellular disintegration, thus liberating the viruses into the tissue fluids. Subsequent haematogenous dissemination occurs, with localization of the viruses at sites of previous injury. This may account for the apparent lack of virus-neutralizing antibodies initially, with a rise in titre during convalescence (Ruchman *et al.*, 1947). This is illustrated by Case 2, in which there was a presumed maximum possible "incubation" period of seven days, during which the child was apparently quite well. When the first toxic sign appeared no eruption was visible, but almost within the hour herpeticiform vesicles were uniformly distributed throughout the eczematous areas. All the present cases show a rise in virus-neutralizing-antibody titre, suggesting primary infections.

The association between previous injury and localization of lesions is well known—occurring, for example, in warts, lichen planus, and psoriasis, along the line of a scratch (Koebner's phenomenon).

Eczema herpeticum—and in parallel eczema vaccinatum and the vaccinia virus—represents one of the primary manifestations of herpes simplex infection (Kipping and Downie, 1948; Blank, 1949; Brain *et al.*, 1950) occurring in persons subject to a cutaneous allergic diathesis. It may well be regarded as a specific infectious disease with a short incubation period (Burnet and Williams, 1939). This infection normally occurs during childhood, and is not usually accompanied by severe reactions, though these sometimes occur (Kipping and Downie, 1948). The severity of these reactions may be due to anaphylaxis (Barker and Hallinger, 1947), although virus virulence, susceptibility of host, secondary infection, and the nature and extent of the preceding eruption are probably contributory factors (Lynch, 1945). There is probably synergic action between virus and bacteria (Lack, 1948), and the prognosis may ultimately depend upon this (Brain *et al.*, 1950). In the two cases of eczema herpeticum reported, secondary infection was comparatively mild, possibly because of early diagnosis and administration of antibiotics.

Lane and Herold (1944) suggest that eczema herpeticum occurs predominantly in persons who suffer from a definite and particular disease—for instance, atopic eczema. By contrast, eczema vaccinatum may be superimposed on many different primary diseases, inoculation occurring at a point of lowered resistance or altered epidermis. This is illustrated by Case 3, in which, despite the presence of xeroderma, there was no immediate history of preceding epidermal breach at the site of the eruption.

Although infantile eczema is a common disease, and the virus of herpes simplex widely distributed, eczema herpeticum remains a relatively rare condition. After primary infection the virus is thought to become latent and exist symbiotically with its host, being stimulated to fresh activity by other exciting agents—for example, trauma, infections, or even vaccination. Although the primary attack of herpes simplex often passes without notice, other manifestations occur, since more organs than the skin are affected (Wenner, 1944; Evans *et al.*, 1945; Lancet, 1952). These are many and varied, including all grades of severity from keratoconjunctivitis and mild stomatitis to fatal hepatic disease and encephalitis (Dodd *et al.*, 1938; Quilligan and Wilson, 1951; Florman and Mindlin, 1952). Many cases are probably unrecognized or misdiagnosed. It is feasible that, because the virus of herpes simplex prefers ectodermal tissue, infection may occur with equal frequency in the skin and the central nervous system, thus accounting for several of the otherwise unexplained "temperatures" and mild toxic reactions which so commonly occur in children. Perhaps the well-known patch of "recurrent herpes simplex" which so consistently occupies its chosen site in the skin has its counterpart within the central nervous system.

Boake *et al.* (1951), reporting an adult case of recurrent eczema herpeticum, point out that, once infected, people are liable to recurrent attacks of herpes simplex, which vary in severity, frequency, and the stimulus required to produce them. Sulzberger (1945) suggested that some of the vesicular diseases of which little is at present known may be due to the virus of herpes simplex. Other forms of infection include herpetic paronychia, bullous herpes simplex of the fingers, and follicular and sycosiform herpes simplex of the beard area.

Miller *et al.* (1950) report a patient who contracted eczema herpeticum during the second to third month of pregnancy, and was subsequently delivered of an apparently normal infant. They discuss the possible role of the herpes simplex virus in the aetiology of congenital abnormalities. It is established that German measles contracted during the first three months of pregnancy is associated with a high incidence of foetal abnormalities (Gregg, 1941; Swan *et al.*, 1946). Wesselhoeft (1947) cites mumps, herpes

zoster, scarlet fever, varicella, influenza, hepatitis, and poliomyelitis as causative factors in congenital abnormalities. The actual way they produce this effect is uncertain. It is significant that the diseases are mostly viral, and that the viruses of smallpox, chickenpox, and vaccinia may pass the placental barrier, causing death or giving rise to active foetal disease *in utero* (MacArthur, 1952). The virus of measles probably affects the foetal tissue directly, and it is reasonable to expect other viruses, including herpes simplex, to act similarly. This view is supported by France and Wilmers (1953), who report premature twin boys dying a few days after birth showing pathological features of herpetic hepatitis, and in one case encephalitis. Since no obvious portal of entry was found, they consider that infection was probably transplacental.

It is apparent that the manifestations of infection with the virus of herpes simplex vary immensely in degree and character. One of the severe types constitutes the syndrome described here as eczema herpeticum.

Summary and Conclusions

Primary infection with the virus of herpes simplex, complicating infantile eczema, is probably often unrecognized although clinical diagnosis is possible. Two infants so affected are described, and attention is drawn to the characteristic features. Vaccination, and its bearing upon eczema vaccinatum, are commented upon. One case of eczema vaccinatum is reported. Despite the Lilliputian proportion of the present series, but in conjunction with the observations of others, the following conclusions suggest themselves:

The term "Kaposi's varicelliform eruption" should be discarded. Eczema herpeticum is suggested for extensive herpes simplex complicating eczema. It represents an exaggerated response to primary infection, and is highly infectious to susceptible persons. The primary inoculation of the virus may be via the damaged skin. Subsequent dissemination is haematogenous, with localization in the damaged areas. The prognosis is variable, but may be influenced by prompt diagnosis and prevention of secondary infection. Patients affected should be rigidly isolated. Persons afflicted with atopic eczema should be safeguarded from herpetic and vaccinia contacts, including members of the medical and nursing staffs if affected. Vaccination should never be performed in the presence of any skin damage, especially atopic eczema. It is doubtful whether the parents of children so afflicted should be vaccinated. If so, the vaccination site should be carefully occluded. Finally, both eczema herpeticum and eczema vaccinatum should be regarded as notifiable diseases.

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THE ADRENAL RESPONSE TO CORTICOTROPHIN EFFECT OF A.C.T.H. ON PLASMA ADRENAL STEROID LEVELS

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In certain diseases corticotrophin (A.C.T.H.) is used as a therapeutic agent with the object of reversing or modifying the underlying pathological process by increasing the secretion of adrenocortical steroids. The hormone is injected intramuscularly or intravenously, the amount given being increased or reduced according to the clinical response, which varies widely in different patients. For example, Kellgren *et al.* (1952) observed that, whereas in one patient intramuscular A.C.T.H. might relieve the symptoms and signs of rheumatoid arthritis and induce metabolic changes indicating hypercorticism, in another patient presenting a somewhat similar clinical picture the same treatment failed to produce any clinical improvement or metabolic changes. They noted that some patients showed excellent clinical improvement when given cortisone by mouth but derived little benefit from intramuscular A.C.T.H. All the cases which responded to either A.C.T.H. or cortisone showed an eosinopenia, which suggests that in these a significant increase in circulating adrenocortical hormones had been achieved.

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In the present investigation the effectiveness of A.C.T.H. as an adrenal stimulus has been assessed by estimating the concentration of adrenocortical steroids in peripheral blood.

Materials and Methods

Adrenocortical hormones were estimated by a method which is relatively specific for 17:21-dihydroxy-20-ketosteroids such as hydrocortisone, cortisone, and their metabolic reduction products (Nelson and Samuels, 1952; Bayliss and Steinbeck, 1953). The volume of plasma required for each estimation has limited the number of determinations made in each patient. The mean value for isolated determinations in normal subjects by our method is 9.5 μ g. of 17-hydroxycorticosteroids per 100 ml. plasma with 95% fiducial limits of 3 to 16 μ g. The accuracy of the method is such that a difference of 3.3 μ g. per 100 ml. between samples is significant.

Ordinary A.C.T.H. (Armour) and a long-acting preparation of A.C.T.H. in gelatin and propylene glycol ("acthar gel") were used in this investigation.

Results with Intravenous A.C.T.H. (Table I)

A.C.T.H. dissolved in saline was infused intravenously at a constant rate as possible, the concentration being arranged so that the amount given per hour was contained in 100 ml. of saline. When the response to different doses or different batches of A.C.T.H. was determined in the same patient, an interval of at least three days was allowed to elapse between each infusion to avoid producing adrenal hypertrophy. When the response to repeated stimulation with A.C.T.H. was investigated the infusions were given daily.

Of the twelve patients only two were not clinically ill at the time of study, Case 7 being a normal control and Case 8 being referred as a case of Addison's disease, a diagnosis which was not confirmed. Of the ill patients, No. 6 had been in status asthmaticus for five days when given his first infusion, but was asymptomatic when given the second a week later.

A slight increase in the plasma level of 17-hydroxycorticosteroids was detected within 15 to 30 minutes of starting the infusion, and a definite increase had occurred within an hour (Cases 1 to 5). The levels after two hours were not very different from those at one hour, and thereafter remained constant for six hours in Case 1, but rose still higher in Case 4. When the infusion was continued for six or eight hours there was no consistent rise after the fourth hour (Cases 7 to 9). On stopping the infusion the steroid level remained high for an hour and then fell, returning towards the control value within three hours (Case 4).

The effect of different doses of A.C.T.H. given at intervals of at least three days was studied in Cases 8 to 11. In Case 8 there was little difference in the degree of steroid elevation induced by 0.25 and 2.5 units per hour for eight hours, and in Case 9 after eight hours the effect of 2.5 and 5 units per hour was the same, but 0.25 unit produced a smaller rise. Cases 10 and 11 were given repeated six-hour infusions of A.C.T.H. in doses ranging from 0 to 3.3 units per hour. The results for Case 10 (Fig. 1) suggest that a dose of about 1 unit per hour caused maximum adrenal stimulation. (The poor response when 1.8 units was infused was probably related to difficulties in maintaining the drip at a constant rate during this particular infusion.) In Case 11 maximum stimulation was obtained with a dose of about 0.7 unit per hour.

Infusions of A.C.T.H., repeated daily, produced after six or eight hours a progressive rise in the steroid level, suggesting that repeated daily stimulation increased the hormonal output from the adrenal glands (Cases 3B, 3C, 12A, and 12B).

No significant difference was observed in the response to different batches of A.C.T.H. in Cases 6 and 7. The dosage

TABLE I.—Response to Intravenous Infusion of A.C.T.H.

Case No.	Age	Sex	Diagnosis	Batch No.	Dose (Units per Hour)	Duration of Infusion (Hours)	No. of Infusion*	17-Hydroxycorticosteroids (μ g./100 ml.) Hours after Start of Infusion											
								0	1	2	4	6	7	8	9	10	24		
1	75	M	Bronchitis	K. 56109	1.7	6	1	15	16	20	29	34	27	27					
2	39		Asthma		2.0	2	1	12	17		25	25							
3A	73	F	Temporal arteritis	K. 56009	1.0	2	1	25	27	29	37	32							
4	67	M	Carcinoma lung	J. 10402	2.5	6	1	9			23								
5	73		Asthma	K. 56009	2.5	8	1	13			17			36	39		12		
6A	32		"		2.5	8	1	7								27	20		
6B			"	K. 55608	2.5	8	1	4								32			
7A	29		Normal	K. 56109	3.3	6	1	10						28	26	29			
7B			"	K. 80709	3.3	6	1	7						26	25				
8A	46		Malnutrition	K. 54006	0.25	8	1	11											
8B			"		2.5	8	1	8						34		28	34		
9A	40		Asthma	"	0.25	8	1	19						34		20			
9B			"	"	2.5	8	1	12						30		34			
9C			"	"	5.0	8	1	17						38		35			
10A	49		"	Saline	0	6	1	11							12				
10B			"	K. 56109	0.3	6	1	1							19				
10C			"	"	0.9	6	1	6							27				
10D			"	"	1.3	6	1	5							30				
10E			"	"	1.8	6	1	4							31				
10F			"	"	3.3	6	1	4							21				
11A	32		"	Saline	0	6	1	12							9				
11B			"	K. 56009	0.45	6	1	8							16				
11C			"	"	0.7	6	1	10							27				
11D			"	"	1.5	6	1	7							24				
11E			"	"	2.5	6	1	12							25				
3B	73	F	Temporal arteritis	K. 56109	2.0	10	1	16									67		
3C			"		2.0	10	3	12									76		
12A	67	M	Asthma	K. 56009	2.0	10	1	6							23				
12B			"	"	2.0	10	3	13							36				

* The figure 1 indicates the first infusion of A.C.T.H. or an interval of at least three days since the previous infusion. Other figures indicate the number of the infusion during which blood samples were taken when the infusions were repeated daily.

TABLE II.—Response to Single and Repeated Injections of Acthar Gel

Case No.	Age	Sex	Diagnosis	Batch No.	Dose (Units)	No. of Injection*	17-Hydroxycorticosteroids (μ g./100 ml.) Hours after Injection											
							0	1	2	4	5	6	8	12	14	24		
13	39	F	Pneumothorax	K. 46710+	80	1	13											
14	23	M	Adenitis	"	80	1	10											
15	54	"	Gastric ulcer	"	80	1	17	21										
16	45	"	Headaches	"	80	1	7											
17	30	F	Anxiety state	"	80	1	5											
18	49	M	Hydrarthrosis	"	80	1	6											
19	54	F	Asthma	"	80	1	13											
20	60	M	Temporal arteritis	"	80	1	16											
21	18	"	Rheumatic fever	"	80	1	14											
22	60	"	Bronchitis	"	80	1	13											
23	49	"	"	"	80	1	17											
24	56	"	Leukaemia	"	80	1	8											
25	38	F	Barbiturate poisoning	"	80	1	10											
26	47	"	Asthma	"	80	1	12											
27	41	"	"	"	80	1	18											
28	70	"	"	"	80	1	9											
29	69	M	Coronary thrombosis	"	80	1	9											
30	30	"	Pleural effusion	4 ml. Gel	0	1	8											
31	40	F	Duodenal ulcer	" " "	0	1	6											
32A	51	"	Asthma	K. 46710	40 daily	1	10											
32B						4	5											
32C						8	19											
32D						10	4											
33A	40	M	Idiopathic granulocytopenia	"	40 daily	1	2											
33B						3	4											
33C						5	6											
34A						1	9											
34B	73	"	Asthma	K. 47311	40 12-hourly	2	12											
34C						3	15											
34D						4	10											
34E						5	11											
34F	49	F	Normal	K. 46710	25 daily	6	5											
34G						7	2											
35A						1	11											
35B						2	12											
35C	66	M	Asthma	"	20 12-hourly	3	24											
36A						1	—											
36B						3	5											
36C						5	8											
36D	26	M	Normal	"	20	11	6											
36E						13	1											
36F						15	4											
37						1	12											
38	72	F	Mitral stenosis	"	20	1	7											
39	33	M	Varicose eczema	"	20	1	6											
40	54	F	Malnutrition	"	20	1	12											
41	30	"	Dyspepsia	"	20	1	13											
42	72	M	Anxiety state	"	20	1	19											

used, however, was probably greater than the maximum stimulating dose and too large to indicate minor differences in the potency of the various batches given.

There was no apparent correlation between either the clinical state of the patient or the control level of plasma 17-hydroxycorticosteroids on the one hand and the height to which the steroid concentration rose during the infusion on the other. With two exceptions, a dose of A.C.T.H. ex-

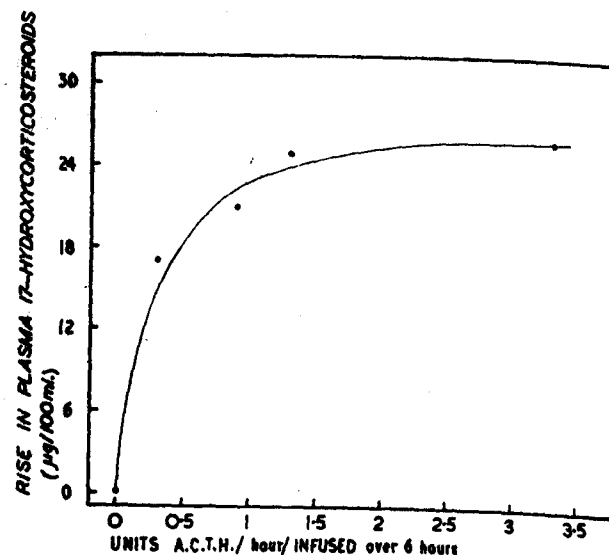


FIG. 1.—Case 10. The response to repeated six-hour infusions of A.C.T.H. given at intervals of at least three days in doses ranging from 0 to 3.3 units an hour. The results are plotted as the rise in plasma 17-hydroxycorticosteroids at the end of the infusion above the control value obtained just before each infusion was started.

ceeding 1 unit per hour raised the steroid level to a range varying from 24 to 36 µg. per 100 ml. in all patients receiving their first infusion. The two exceptions were Case 10E, in which there was difficulty in maintaining a constant drip rate, and Case 3B, in which the steroid level rose to the unusually high value of 67 µg. per 100 ml.

Results with Acthar Gel (Table II)

A single intramuscular injection of 4 ml. of acthar gel containing 80 units of A.C.T.H. was given to 17 patients (Cases 13 to 29), all of whom were comfortable at the time of study, except three with asthma (Cases 26 to 28). Injections into the gluteal muscles did not hurt, but a few into the lateral aspect of the thigh caused some pain. A significant increase in the plasma steroid level was found after two hours, and the maximum concentration was reached in four to eight hours. Thereafter the steroid level usually fell. In Cases 13 to 16 the concentration had returned to or below the control value in 12 to 14 hours; in Cases 17 to 19 it was still elevated at 12 to 14 hours, but was at or near the control value in 24 hours; in Cases 20 to 23 it was at or near the control value in 24 hours, but few intermediate estimations were made; and in only Cases 26 to 29 was the level still raised significantly 24 hours after the injection. As a control the same volume of gelatin menstruum containing no A.C.T.H. was injected in Cases 30 and 31 and caused no significant rise in the plasma steroid level.

A single injection of 20 units of acthar gel was given to Cases 37 to 42. In five the steroid level reached a maximum within two to four hours and had returned to or below the control value by eight hours. In Case 38 absorption was apparently delayed and the maximum level observed was at eight hours.

No correlation was detected between the clinical state of the patient and the height to which the plasma steroid level rose. In several the maximum level after 80 units of acthar gel was not significantly higher than after 20 units in other patients.

Repeated Injections. Five patients were given repeated injections of acthar gel every 12 or 24 hours (Cases 32 to 36). The steroid concentration four hours after the injections rose progressively to high levels in Cases 32 and 35 (Fig. 2), but in Cases 33 and 36 the results were variable and inconsistent. The differences in individual response were considerable (compare Cases 33 and 35). No consistent elevation of the plasma steroid level was found 24 hours after the daily injections, neither did an injection every 12 hours produce a consistent elevation up to the time of the next injection.

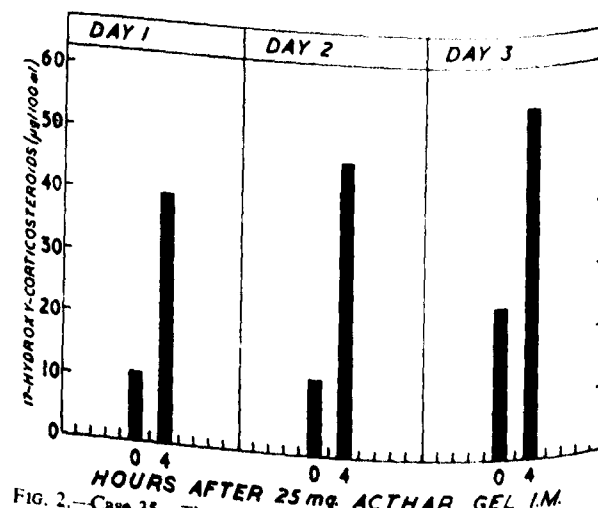


FIG. 2.—Case 35. The progressive increase in plasma 17-hydroxycorticosteroids following repeated daily injections of 25 units of acthar gel.

Results with Ordinary A.C.T.H. (Table III)

Single Injection.—A single intramuscular injection of 20 to 50 units dissolved in 4 ml. of saline was given to 16 subjects, of whom eight were clinically ill at the time of study (Cases 45, 46, 49, 50, 51, 52, 54, and 56). The maximum increase in circulating adrenocortical steroids occurred after one to two hours. Thereafter the concentration fell, returning towards the control value in four to six hours. The height to which the steroid level rose varied widely in different patients. Cases 49 and 56A showed the greatest response of the ill patients, but the levels induced in the others were not consistently different from those found in the normal and convalescent subjects. Cases 44A and 50 showed no apparent response. The variability of the response in different individuals was so great that no significant difference in the effect of 20, 30, 40, or 50 units of A.C.T.H. could be detected.

Repeated injections of 20 to 25 units of A.C.T.H. in 4 ml. of saline were given six-hourly to Cases 45, 46, 52, and 56. The height to which the steroid level rose after two hours did not increase with successive injections, nor was the elevation of steroid concentration persistently prolonged into the sixth hour.

Discussion

At any given time the plasma concentration of adrenocortical steroids depends upon the amount being secreted by the adrenal glands and the amount being excreted in the urine and faeces, utilized in the tissues, and metabolized to compounds not estimated by the analytical method used. When the plasma level is changing rapidly too much emphasis cannot be placed on the exact concentration at a particular time. Although some degree of individual variation in responsiveness to hormones is to be expected, the differences after A.C.T.H. are marked, and may be related to differences in the responsiveness of the patient's adrenals, and also in the rate of absorption and destruction of the administered A.C.T.H., in the potency of different batches of A.C.T.H., and in the rate of utilization and elimination of the adrenocortical steroids secreted. It has been suggested

TABLE III.—Response to Single and Repeated Intramuscular Injections of A.C.T.H. in Saline

Case No.	Age	Sex	Diagnosis	Batch No.	Dose (Units)	No. of Injection*	17-Hydroxycorticosteroids (µg./100 ml.) Hours after Injection					
							0	1	2	3	4	6
43A	45	M	Dyspepsia	K. 56109	20	1	7	29	26	23	14	
43B				K. 80709	20	1	12		20		10	
44A	50	"	Bronchitis	"	20	1	8		10		7	5
44B				"	40	1	11		15		10	7
45A	65	F	Asthma	"	20	1	11		27		16	6
45B				"	20	1	7		32		16	7
45C				"	20	2	4		26		17	5
46A	49	M	Psoriatic arthritis	K. 56009	20	1	7		22		10	8
46B				"	20	1	14		22		10	10
46C				"	20	19	9		16		10	9
47	27	F	Normal	K. 54006	25	1	6	23	32	23	19	
48	54	F	Asthma	"	25	1	6		18		8	
49	67	M	Rheumatic fever	"	25	1	14	65	48	32	34	
50	47	F	Asthma	"	25	1	8		4		9	8
51	62	M	Anaphylactoid purpura	"	25	1	5	22	19		24	20
52A	50	"	"	"	25	1	8					7
52B			"	"	25	1	10					18
52C			"	"	25	9	6					4
52D			"	"	25	12	5					4
53	55	"	Dyspepsia	K. 56109	30	1	10	21	25		17	
54	54	"	Asthma	"	30	1	13	28	22	18	13	
55	32	"	Normal	"	30	1	7	29	29	19	12	
56A	46	"	Anaphylactoid purpura	"	30	1	27		54	26		
56B				"	20	11	27		32	30		
57	52	"	Bronchitis	K. 80709	40	1	6		29		7	
58	49	"	"	K. 54006	50	1	16	26	32	33	29	

* The figure 1 indicates the first injection of A.C.T.H. or an interval of at least three days since the previous injection. Other figures indicate the number of the injection following which blood samples were taken. All injections were given six-hourly.

that the differing response of individual patients may be partly a reflection of the level of endogenous hormone production. "If the administered dose of hormone greatly exceeds endogenous production it causes some degree of hypercorticism . . . but if the administered dose is less than the amount produced endogenously the pituitary-adrenal system merely adjusts itself to a lower level of production and the net result is no change" (Kellgren *et al.*, 1952).

Duration of Response

There are striking differences in the duration of the adrenal response when A.C.T.H. is given by intravenous infusion, and when it is injected intramuscularly in saline or in gelatin. The duration of the response depends upon the length of time that the stimulating action of A.C.T.H. is applied. By intravenous infusion A.C.T.H. causes a rapid rise in the plasma steroid level, and thereafter the concentration remains constant during the remainder of a six- or eight-hour infusion. When the infusion is stopped the steroid level quickly falls, in keeping with the evidence that A.C.T.H. is rapidly destroyed in the blood stream (Sayers *et al.*, 1949; Greenspan *et al.*, 1950; Reiss *et al.*, 1951; Pincus *et al.*, 1952). Intramuscular injections of A.C.T.H. in saline usually cause a rapid rise in the plasma steroid level, reaching a maximum in one or two hours. Thereafter the concentration falls, returning in most instances to the control value in four to six hours. Two patients showed no apparent response to 20 to 25 units, and the one little response to 40 units, although A.C.T.H. of the same batch given by the same route was effective in other patients.

This lack of response to intramuscular A.C.T.H. in saline has been observed by other workers, and Thorn and his associates (Renold *et al.*, 1952) ascribe it to destruction of the hormone at the site of injection because patients unresponsive to intramuscular A.C.T.H. respond when the hormone is infused intravenously. When A.C.T.H. is incorporated in a gelatin menstruum its effect is prolonged. After large doses of 80 units the plasma steroid concentration rises within one to two hours, but does not reach a maximum until four to eight hours. Thereafter the level usually falls, returning to the control value in 12 to 24 hours. After 20 units of acthar gel the maximum level is usually reached in two to four hours and returns to the control value within eight hours. The action of gelatin is to retard absorption and perhaps also to prevent local destruction of A.C.T.H., so that the maximum plasma steroid concentration is delayed and the adrenal response more prolonged.

Degree of Plasma Steroid Increase

The degree of steroid elevation produced by A.C.T.H. infused intravenously over a constant time depends upon the rate of hormone infusion up to an optimum beyond which no further increase occurs. Our data suggest that over a six- or eight-hour period as little as 1 unit an hour will cause maximum adrenal stimulation. This dosage is similar to that suggested by Thorn and his colleagues (Renold *et al.*, 1952), who found that, whereas the urinary excretion of 17-ketosteroids increased with 0.12, 0.3, and 0.75 unit an hour for eight hours, no further increase occurred with 1.2, 2.5, or 5 units an hour. In all but two of our patients receiving their first infusion, a dose of A.C.T.H. exceeding 1 unit an hour raised the steroid level into the range of 24 to 36 µg. per 100 ml. This comparatively narrow range suggests that in these patients the degree of steroidogenesis achieved in response to maximum stimulation over six or eight hours was not greatly different from one patient to another, or, alternatively, the rate of elimination of the steroids secreted was similar. Too much significance cannot be attached to the height of the steroid levels obtained after a single intramuscular injection of A.C.T.H. in saline or gelatin because of the rapidly changing plasma concentration, but in many instances the values were comparable to those obtained after maximum stimulating doses of A.C.T.H. given intravenously. In the dosage used clinically A.C.T.H. by intramuscular injection in saline or gelatin may cause maximum adrenal stimulation, but because of variations in the rate of absorption and destruction of the A.C.T.H. the duration of the response may be so brief and short-lived that it appears submaximal.

The different responses to 20 units of A.C.T.H. infused intravenously over eight hours or injected intramuscularly in saline or gelatin are compared diagrammatically in Fig. 3.

Increasing the duration of the infusion or repeating the infusion at frequent intervals would be expected to produce a greater secretory response, and this has been achieved by the second method. In some patients repeated injections of acthar gel have induced progressively higher steroid levels, but in others this effect was not apparent, nor was it found in patients given repeated intramuscular injections of A.C.T.H. in saline, although other workers studying the urinary excretion of 17-ketosteroids have shown that this may increase adrenal secretion progressively (Sprague *et al.*, 1950). In a few instances intravenous and intramuscular A.C.T.H. produced a greater response than the level of 24 to 36 µg. usually encountered. It is not possible to relate these unusually marked responses to the control level of

circulating adrenocortical steroids, nor is it possible from our data to tell whether they are the response of adrenal glands previously hypertrophied by increased secretion of endogenous A.C.T.H. or are due to decreased excretion, utilization, or metabolism of the adrenal hormones secreted.

No striking differences in the potency of various batches of A.C.T.H. have been observed in the few observations made in this study, and further investigation of this by

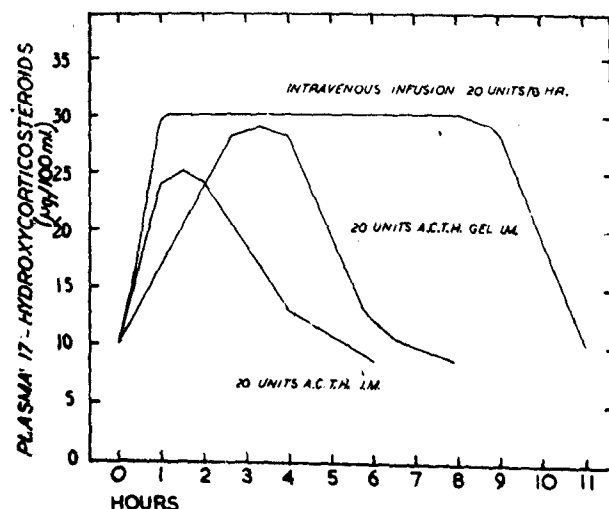


FIG. 3.—The responses to 20 units of A.C.T.H. given by intravenous infusion over eight hours and by intramuscular injection dissolved in saline and suspended in a gelatin menstrium.

biological assay in human subjects would not be practicable by our method. The clinical variations in the response to intramuscular A.C.T.H. in saline observed by Kellgren *et al.* (1952) are probably related to differences in the rate of absorption and destruction of the administered hormone, although in some instances, such as the case reported by Kersley *et al.* (1952), the disease process may not be influenced by increased levels of circulating adrenocortical steroids. The clinical dosage of A.C.T.H. appears so much larger than the amount secreted endogenously that it is unlikely that the pituitary-adrenal system can adjust itself so that there is no change in the steroid output from the adrenal glands.

If therapeutic effect depends upon the duration of the elevation of adrenocortical steroids in the blood stream, A.C.T.H. in gelatin or by intravenous infusion—or cortisone or hydrocortisone—is the agent of choice. Despite the theoretical objections to infusing a foreign protein intravenously no untoward effects have been observed by us, using Armour's A.C.T.H., nor by Thorn (Renold *et al.*, 1951), whose experience is much greater than ours. It must be determined for how long and at what intervals the infusions should be given to obtain the best therapeutic benefit, but there is ample clinical evidence of the greater efficiency of this method over intramuscular injections of A.C.T.H. in saline (Gordon *et al.*, 1951; Mandel *et al.*, 1951; Renold *et al.*, 1951). Not only is this method more effective and more reliable in raising the steroid level, it is much more economical in material.

Summary

The adrenocortical response, as reflected by changes in the plasma level of 17-hydroxycorticosteroids, has been determined after intravenous infusions of A.C.T.H. and after single and repeated intramuscular injections of A.C.T.H. in saline and in gelatin.

Infused intravenously A.C.T.H. causes a rapid rise in the plasma steroid level, which remains elevated during the rest of the infusion. Over a period of six to eight hours 1 unit an hour seems to cause a maximum response.

By intramuscular injection A.C.T.H. in saline usually causes a rapid rise in the plasma steroid level, which reaches its maximum in one to two hours. Thereafter the concentration falls, returning to the control value in four to six hours. Considerable individual variations in response were observed, and are largely attributable to differences in the rate of absorption and destruction of the administered hormone.

The incorporation of A.C.T.H. in a gelatin menstrium delays its absorption and prolongs its effects to a variable extent depending upon the rate of destruction of the injected hormone.

Factors influencing the adrenal response to A.C.T.H. are discussed.

We are grateful to Miss Pamela Griffin, Miss Eunice Burton, and Mr. Clive MacKenzie, who at various times have given technical assistance. Dr. H. Robinson, Merck Institute, Rahway, N.J., kindly provided steroids used in the 17-hydroxycorticosteroid estimations, and Dr. E. E. Hays, Armour Laboratories, Chicago, the gelatin menstrium for control observations.

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USE OF PHENYLBUTAZONE IN RHEUMATOID ARTHRITIS

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When phenylbutazone ("butazolidin") was first introduced to this country the report on its effects by Currie (1952) caused it to be hailed as a new "wonder drug" and likened to the corticosteroid hormones. Then the high incidence of toxic effects began to be discovered, and the pendulum of opinion has swung to the other extreme; at present many practitioners refuse to give the drug even to patients who have had it for long periods with no ill effects.

I hope to demonstrate that this view is pessimistic; given adequate management the drug has a definite place in the treatment of some forms of arthritis.

Present Series

Phenylbutazone was given to 210 patients (53 male, 157 female) (Table I). In 186 the condition was a polyarthritis of the rheumatoid type. The remaining 24 had a degenerative arthritis of one or both hip-joints. In most patients with rheumatoid arthritis the disease was in a chronic phase (either static or of low-grade activity), and they were attending the out-patient department. They continued to have

TABLE I.—General Classification

Duration of Treatment	Total	Continued		Stopped	
		No Reaction	With Reaction	No Reaction	With Reaction
3 months	210	109	24	23	54
6 "	89	72	3	6	8

N.B.—All patients treated for six months are also included among those treated for three months.

various other forms of treatment as required, including gold in 37 cases. Five patients with considerable activity of the rheumatoid process were treated initially in hospital; in assessing the result the effect of rest in bed was discounted. Any patient with dyspepsia or a history of congestive heart failure was not given the drug.

The dosage used varied from 200 to 1,200 mg. daily, averaging 600 mg. Occasionally the dose was gradually reduced, but this often resulted in a lessening of the effect. Some patients were given 800 mg. daily for five days out of every seven to investigate the effect of interrupted dosage on the incidence of reactions.

At the beginning of treatment each patient received a printed sheet, warning against the principal side-effects, with instructions to report to the hospital or family doctor any untoward event. Routine blood counts were not performed.

Patients were examined before treatment, after three months' treatment, and after six months' treatment. Subjectively, improvement was measured by the patient's capacity for and comfort during normal activity at these times, compared with his or her condition before treatment; objectively, the patient was assessed by the method of Janus (1950), including erythrocyte sedimentation rate (Westergren) and joint chart. Based on subjective evidence, the results were graded as follows: ++, indicating considerable remission of symptoms, with complete absence of pain; +, moderate improvement; and 0, absence of response or even deterioration.

Results

A total of 156 patients were reviewed at three months (see Table II); 36 found the drug to be of little or no value; 104 found it to be of moderate value; and 16 had considerable benefit, often amounting to complete remission. Many

TABLE II.—Degree of Improvement After Three Months' Treatment with Phenylbutazone

Disease	Rheumatoid				Degenerative Arthritis			
	Inactive	Active	++	+	Inactive	Active	++	+
Grade Number (156)	6	47	14	10	43	20	—	14

patients thought there was less stiffness, and there seems to be no doubt that the drug has a more powerful analgesic action than aspirin in full dosage, an effect which is not objectively demonstrable.

This decreased stiffness was never convincingly demonstrated, and its method of production is obscure; it is a definite entity, and occurs in about 70% of cases.

The E.S.R. was unaltered in 60% of the cases; in the remainder there was a rise or fall of more than 10 mm. in approximately equal numbers. In a few cases an improvement in the mobility of the joints occurred, but in each case this could be ascribed to natural remission of the disease; this is felt to have occurred in many of the patients showing a ++ response. It was noteworthy that the best effects were seen in patients with a relatively small number of involved joints, though the length of history did not appear to affect the response.

Reactions

A reaction of one form or another occurred in 81 cases; a further eight had two separate reactions; and three had reactions but had not completed the first three months' treatment. The total number of reactions listed is thus 100. The total assessed (89 patients) is 42.4% of the whole series. This figure is higher than that obtained by Leonard (1953), who found an average incidence of 22% in figures obtained from the literature; it agrees with figures obtained by Hart (1953) and by Freeland *et al.* (1953); 25% of my cases have been forced to stop taking the drug owing to side-effects. The strikingly low figure of 4.7% (Currie *et al.*, 1953) may be the result of the very low dosage they recommend, which in my experience is of doubtful therapeutic value. Table III

TABLE III.—Relation of Reaction-incidence to Dosage

	Daily Dose (mg.)						Stopped Within 2/12 (No Value)
	200	400	600	800	800*	1,200	
Total (221) Reactions (100) % reactions	7	52	56	30	47	16	13
		19	31	20	18	12	
		36.54	55.36	66.6	38.3	75	

* Interrupted dosage, the drug being given for five days out of every seven. N.B.—These figures include three reactions not included in Table I, and each reaction in patients having two reactions.

shows that there is a definite increase in the incidence of reactions as the dosage is increased, and that, as has been generally agreed, 1,200 mg. daily is a dangerous dosage; at this level 75% of patients have a reaction.

The relationship between dosage and the incidence of reactions is statistically significant; using the χ^2 test, P is much less than 0.01 ($n=5$, $\chi^2=21.56$). Further, a definite reduction in the incidence occurs when using 800 mg. for five days of every seven compared with continuous administration of 800 mg. daily; in this case P is less than 0.02 ($n=1$, $\chi^2=5.68$). The difference between the former dose and 600 mg. daily is not significant, P being 0.09 approximately.

It has been suggested recently that tolerance to phenylbutazone is greatly reduced in the older patient; this is shown in Table IV; while statistically the significance is not proved, P being less than 0.07 ($n=5$, $\chi^2=10.25$), the

TABLE IV.—Relation of Reaction Incidence to Age

	Age in Years					
	21-30	31-40	41-50	51-60	61-70	71+
Total (210) Reactions (89) % reactions	13	26	46	79	40	6
	3	8	19	31	24	4
	23.08	30.77	41.3	39.24	60.0	66.6

difference in incidence between the age group 61-70 and that of the decade earlier is significant, the value of P for these two groups being approximately 0.03.

For no obvious reason males appear to be less liable to side-effects than females, the incidences being 28.3% and 47.13% respectively; this difference again is significant, P being less than 0.01 ($n=1$, $\chi^2=7.32$). That this difference is not due to unequal age distribution between the two sexes is shown by the average ages of the two groups, these being 53.57 years for males and 51.19 years for females.

It is striking that 89% of all reactions occur in the first three months of treatment; 75% occur before the end of the first month. In the second three-months period of therapy only 8.99% of patients had to stop the drug because of a side-effect.

Table V shows the relative frequency of reactions occurring during the first and the second three months. Under

TABLE V.—Type and Onset of All Reactions

	General		Dyspepsia		Rash		Oedema		Sore Mouth		Miscell.		Total	
	S	C	S	C	S	C	S	C	S	C	S	C	S	C
In first 3 months	5	1	24	8	5	15	6	5	9	6	5	—	54	35
In second 3 months	—	—	2	1	—	—	1	6	1	—	—	—	8	3

S=Stopped. C=Continued.

the heading "general" are included patients having two or more reactions at the same time; this usually means the combination of a rash with oedema, with or without dyspepsia, and often with fever and considerable malaise. In these cases, and in patients having a rash alone, no significant alteration in the white-cell count, apart from an occasional eosinophilia, has been found. The rash is usually urticarial or morbilliform in type, and is often intensely pruritic, though this may be relieved by the use of antihistamines. Many of these patients have been able to return to the drug later, with no ill-effect.

Under the heading "dyspepsia" is included any gastrointestinal upset, ranging from flatulence to frank haemorrhage in one patient, who was thought to have had an acute gastric ulcer, a barium-meal examination at a later date being negative. Several patients were found to have previously unsuspected peptic ulcers, proved on x-ray examination after typical exacerbations had occurred within a few days of beginning treatment.

There is no doubt that phenylbutazone is extremely dangerous to any patient with proved or suspected peptic ulceration; several of the deaths already reported have been due to haemorrhage from such ulceration. In a few cases the "dyspepsia" merely consists of flatulence, and the patient is able to continue taking the drug in safety. Occasionally the pain is a typical colic, and has been known to mimic appendicitis; the reverse mistake could be tragic, but it almost occurred in one case in which the characteristic signs were late in appearing.

Sodium retention occurs in most patients, as has been demonstrated by regular weighing (Kidd *et al.*, 1953), but in few cases was it troublesome as overt oedema, and then was often controlled by dietary salt restriction.

The most common reaction during the second three months of treatment is soreness of the mouth, frequently accompanied by excessive salivation. Of patients who had to stop treatment at this period 75% did so because of this reaction, which recurs if the drug is given again at a later date. Usually little is to be found on examination, and the trouble is slow to pass away. No treatment has yet been found to produce any benefit.

The cases with miscellaneous reactions were as follows: (1) One patient who suddenly developed auricular fibrillation; she was hypertensive, but showed no evidence of sodium retention, and it is doubtful if this was a true toxic effect. (2) One patient who developed palpitation, and another who suffered from malaise; several patients had these symptoms in very mild form, and only as transitory effects. (3) In one patient a headache of migrainous type recurred each time after phenylbutazone had been given for three or four days; it was not relieved by salt restriction. (4) One patient who developed a febrile illness of uncertain aetiology. On the tenth day of treatment (800 mg. daily) she became febrile, but had no specific complaint or any abnormal physical signs apart from splenomegaly. Her white-cell count was 1,950 per c.mm. (polymorphs 62%, lymphocytes 33%, monocytes 5%). Three days later her total count was 4,800 per c.mm., the differential being unchanged. Her temperature settled spontaneously, and it was felt that she had a virus infection, the normal differential count making the possibility of drug-induced agranulocytosis unlikely. This is undoubtedly a reaction to be feared, but its incidence seems to be extremely low, and much less common with phenylbutazone than with amido-

pyrine. I would like to stress the futility of repeated blood counts as a precautionary measure; the alteration in the blood picture usually occurs with dramatic suddenness.

It will be seen that dyspepsia is by far the most troublesome reaction; its incidence does not appear to have been reduced by the use of thick enteric-coated tablets recently introduced. The mode of production of gastric irritation is obscure, as phenylbutazone is insoluble in an acid medium, and only slight benefit follows administration after meals.

Serum Concentration of Phenylbutazone

The drug, when given by mouth in the thinly coated tablets originally available, is rapidly absorbed, and levels of 6 to 8 mg. per 100 ml. are obtainable six hours after 800 mg. has been given. Pulver's (1950) method of estimation has been modified in the laboratories of the hospital (Moss, to be published) (see Appendix). By the new method it is claimed that 86 to 95% of the drug can be recovered, as compared with 60% by the original process. A good standard of accuracy is obtained, the mean difference of the mean of each pair of duplicate results being ± 0.3 mg. per 100 ml.

A series of readings have been obtained from blood samples taken six hours after the last dose of phenylbutazone had been given in patients who had received the drug

TABLE VI.—Serum Phenylbutazone Levels

Daily Dose	Average Level (mg./100 ml.)	No. of Readings	Range (mg./100 ml.)
200 mg.	7.4	10	3.5-12
400 "	13.7	33	6.1-19.5
600 "	14.76	17	8.5-23.5
800 "	16.3	11	4.5-20.5
800 "	15.22	17	6.6-21.8
1,200 "	19.55	9	18.8-24.3

* Interrupted dosage, the drug being given for five days out of every seven.

for at least two weeks (Table VI). It will be seen that there is no linear relationship between the concentration and the dosage. The effect of interrupted dosage is also seen. These levels are higher than those obtained by Currie *et al.* (1953) owing to the different method of estimation; in Pulver's original method whole blood is analysed, while Moss uses serum. I consider the therapeutic range to be 12 to 16 mg. per 100 ml., and to maintain this level the dose must remain steady; I was not able to confirm Currie's findings that such levels could be maintained with a dose as low as 200 mg. daily.

The blood level drops slowly after administration of the drug is stopped; appreciable levels remain after two weeks, and it appears that about 15% of the circulating level is metabolized daily. This agrees with the figures of Burns *et al.* (1952). There has, as yet, been no evidence of cumulation, and if concentrations are measured at long intervals a level at, say, three months is often lower than one obtained early in the administration. There is thus nothing to confirm the unexpected finding of a lower reaction incidence obtained with interrupted dosage: the incidence for a comparable blood level—that is, 600 mg. daily—is still much higher than for 800 mg. given for five days out of every seven. No correlation was observed between the blood level and the incidence of reactions.

In patients whose response to therapy is doubtful it is useful to obtain a blood concentration; this is at times found to be unusually low, and if raised to the "therapeutic range" the desired effect may be obtained.

Discussion

It would seem that an average incidence of reactions of 30 to 40% is to be expected from the use of phenylbutazone. In view of this high level of toxicity, should the drug be used? It is undoubtedly of benefit as an analgesic: it

seems to be the most powerful (after the corticosteroid hormones) in arthritis; and, in fact, Mason (1953), comparing the effect of phenylbutazone with that of A.C.T.H., found little difference in analgesic properties. Currie's original view that the drug has an anti-inflammatory effect was supported by the early experimental work on animals but has not been substantiated clinically (Hart, 1953; Cudkowicz and Jacobs, 1953). Is its value as an analgesic outweighed by its dangers? I consider that, given adequate medical supervision, the toxic effects should be sufficiently minimized. Agranulocytosis is the most dangerous reaction, but it is a remote chance in any given patient, who is often willing to take some risk to obtain relief from a painful and crippling disability.

To minimize reactions the following conditions must be observed.

Selection of Cases.—There must be a reasonably sure diagnosis of arthritis, either degenerative or of the rheumatoid type, including ankylosing spondylitis. It is not the treatment for rheumatic fever, in view of its lack of anti-inflammatory effect. Any patient with a history of dyspepsia, and especially in the presence of peptic ulceration, or having congestive heart failure, should not be given the drug, and older patients should be given small doses only. The most suitable type of case seems to be the patient in a "chronic" phase who has to undergo a fair amount of effort, either bread-winning or housework, often with a considerable amount of pain. It must be emphasized that this treatment has no curative value, and that accepted forms of treatment, including gold, must be used also as indicated.

Management.—The patient must be warned of possible dangers before beginning treatment, and instructed both to stop the drug and to report to the doctor immediately should any untoward effect occur.

Dosage. The optimum safe dose is still a matter for debate; Lawrence (1953) advocates using single doses of 400 mg. at prolonged intervals, of up to ten days, while Currie uses 200 mg. daily or on alternate days. These doses seem to be too low to be of therapeutic value. Hart (1953) uses 400 mg. daily, and Freeland *et al.* (1953) 600 mg. daily. This latter appears to be a commonly accepted level. My figures (Table III) show a lower incidence rate using 800 mg. daily for five days out of every seven, and this is now the dose that I use most commonly.

If these conditions are observed there seems to be no reason why the drug should not be used by the family practitioner, who must, however, be on the alert for possible cases of agranulocytosis. The patient's symptoms are of far greater value in early diagnosis than repeated leucocyte counts, which overtax pathological departments and may engender a false sense of security.

Summary

A series of 210 patients who have been treated with phenylbutazone is reviewed. The incidence of reactions is analysed. The use of the drug is discussed.

My thanks are due to Dr. H. Stuart Barber for encouragement and advice in the preparation of this paper; to Dr. R. Ellis for permission to include several of his patients in this investigation; to Mr. Moss for estimation of serum phenylbutazone levels; and to Miss Abberley for secretarial assistance.

APPENDIX

Estimation of phenylbutazone in blood has been carried out by Pulver (1950), who hydrolysed the substance, with formation of hydrazobenzene, which then rearranged to benzidine. This latter substance was estimated colorimetrically by a diazo reaction. The method used in the present investigation was based on the same series of reactions, but differs in the method of hydrolysis and the reagent used for the final colour reaction.

Reagents

(1) A.R. acetone. (2) N sulphuric acid. (3) 0.5% sodium nitrite: store at 0° C. (4) 1.8% N-sulphatoethyl-m-toluidine in water. Stored at 0° C, this solution keeps for several weeks, but should be discarded if a brown tint appears. (5) Standard phenylbutazone solution. 3 mg. per 100 ml. in A.R. acetone. Store in a tightly stoppered bottle.

Procedure

One ml. of serum is added to 4 ml. of acetone in a glass-stoppered centrifuge tube of 8-ml. capacity. After shaking well the mixture is stood for 30 minutes, and is then centrifuged, the stopper being retained in the tube during this procedure. Duplicate portions of 1 ml. of supernatant solution are removed and transferred to conical "pyrex" centrifuge tubes of 15-ml. capacity, graduated to tenths of a millilitre. A duplicate standard is set up simultaneously by taking two portions of 1 ml. of the standard phenylbutazone solution, in similar graduated centrifuge tubes.

The bulk of the acetone is now cautiously evaporated off in a hot-water bath, the tubes being agitated gently to prevent loss by spurring or bumping.

One ml. of N sulphuric acid is added to each tube, and the tubes are placed in a boiling-water bath for four hours. At half-hourly intervals the volumes in the tubes are restored to 1 ml. by addition of distilled water. The final volume is 1 ml. After hydrolysis the tubes are chilled in ice-water, and 0.5 ml. of ice-cold sodium nitrite solution is added, followed by 2 ml. of ice-cold N-sulphatoethyl-m-toluidine, the solution being mixed well after each addition. The purple colours are allowed to develop for 30 minutes at room temperature.

The serum tubes have a slight turbidity at this stage, owing to the presence of unsaponified lipid material. This turbidity is removed by the addition of 0.25 ml. of 40 to 60° light petroleum, shaking briefly, and centrifuging. Three ml. of the aqueous phase is then removed. The standards are similarly treated with light petroleum.

The coloured solutions are read in a spectrophotometer at 525 mg. or in a colorimeter with appropriate filter. The standards correspond to a serum level of 15 ml. per 100 ml.

A linear relationship was found between colour intensity and concentration of phenylbutazone. Normal serum gives a negligible colour by this method. Recoveries of phenylbutazone added to normal sera were 86 to 95%. In a series of 50 estimations the duplicate serum phenylbutazone levels differed from their mean by amounts varying from ± 0.0 to ± 0.8 mg. per 100 ml. The mean difference from the mean was ± 0.3 mg. per 100 ml.

The N-sulphatoethyl-m-toluidine was supplied by Imperial Chemicals (Pharmaceuticals) Ltd., Manchester. I am grateful to Geigy Ltd. for a gift of purified butazolidin.

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The *British Journal of Anaesthesia* enters its second quarter-century of publication with a modernized format and an increase in size. In future it will appear six times a year instead of quarterly. The January issue, which includes a historical note on gas cylinders, a short biography of Dr. Z. Mennell, and papers on current techniques and modern anaesthetic agents, reflects the important part which British workers have played and continue to play in the development of anaesthesia.

APHONIA AND DEAFNESS IN
HYPERPARATHYROIDISM

BY

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The role of calcium in variations of the excitability of nervous tissue is generally accepted. A relatively small decrease in the serum ionized calcium causes hyperexcitability of sensory and motor nerve fibres, and spontaneous activity may be sufficient to cause paraesthesiae and muscular spasm, which is the basis of tetany. Conversely, increased ionized calcium in the blood might be expected to decrease nerve excitability. The muscular weakness commonly found in cases of hyperparathyroidism has been so explained (Albright and Reifstein, 1948), but surprisingly few sensory symptoms have been reported. Aphonia and deafness were noted by a patient (Case 1) at a time when hypoexcitability of nerves was certainly present. Cases 2 and 3 were seen two years after operation, so data are not complete. It is suggested, however, that they closely resemble Case 1 in the type of symptoms exhibited, and in the prompt and permanent relief after removal of a parathyroid adenoma. They are reported by courtesy of Mr. J. Hinton Robertson.

Case 1

A married woman aged 58 was admitted to the Western Infirmary, Glasgow, under Mr. R. Barnes in October, 1952. In 1947 she had complained of weakness of the right leg sufficient to prevent her lifting the foot. This gradually improved, but once again deteriorated in March, 1951. She then became easily tired and both legs felt "slow and stiff," so that she was bedridden. In February, 1952, vomiting, associated with eating greasy food, and right subcostal pain were attributed to cholecystitis. Thereafter she complained of increasing weakness, pains in the legs, headache, anorexia, thirst, polyuria, and severe constipation. About the same time her voice became almost inaudible, she noted difficulty in opening her eyes and she had severe deafness, associated with sensations of being cut off from people—"as if my ears were blocked" and "as if the whole head was shutting

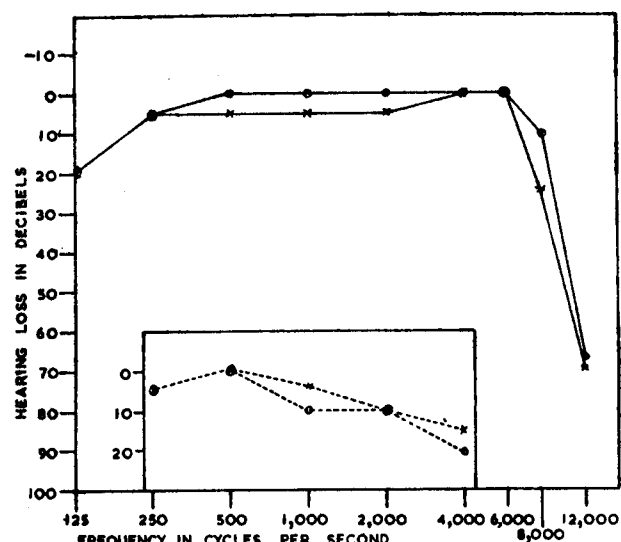


FIG. 1.—Case 1. Audiogram. O—O Rt. ear. X—X Lt. ear. Inset, bone conduction.

in." Deafness was severe for about a month, then gradually cleared. It was absent when she was examined at the orthopaedic clinic by Mr. T. Gardner, who diagnosed hyperparathyroidism as the cause of her limb pains.

Mr. Barnes kindly allowed me to investigate the case in the Gardiner Institute. There was generalized weakness with hypotonia but normal reflexes, the serum calcium was 15.0 mg. per 100 ml., serum inorganic phosphate 2.8 mg. per 100 ml., and serum alkaline phosphatase 145 K.-A. units. The serum calcium level slowly dropped to 13.6 mg. per 100 ml. Hearing was good and the ears were apparently normal. Dr. J. C. McKinley found the drum-heads normal, Rinne test positive, and bone conduction good in each ear. Whispered voice was heard at 6 ft. (1.8 m.) from each ear, and conversational voice at 18 ft. (5.5 m.). An audiogram was within the normal range in relation to the patient's age (Fig. 1). The response of

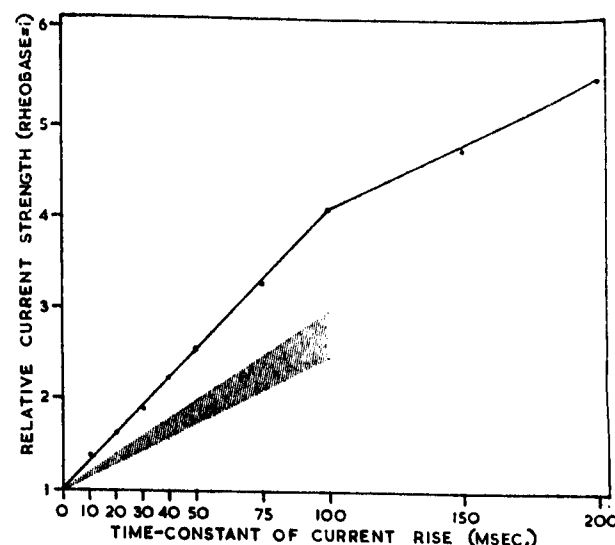


FIG. 2.—Case 1. Accommodation curve of right ulnar nerve. The slope is 31; the time-constant of accommodation (reciprocal of slope) is 32.3 msec. The shaded area shows the normal range for women (Solandt, 1936).

the right ulnar nerve to exponentially rising electric currents of variable time-constant was tested, as described by Solandt (1936), with Andrew's (1952) stimulator to estimate its time-constant of accommodation (λ) (Hill, 1936). It was found to be 32.3 msec. (Fig. 2).

A large parathyroid adenoma was removed from the upper mediastinum by Professor C. F. W. Illingworth on November 27, 1952. Symptoms and signs of latent tetany developed and were controlled by calcium gluconate injections, with calcium lactate and calciferol orally. A normal biochemical picture has been maintained. Strength was rapidly increasing, the patient was able to walk unsupported, and the bones were recalcifying. There has been no recurrence of aphonia or of deafness.

Case 2

A married woman aged 49 was admitted to the Victoria Infirmary, Glasgow, with spontaneous fracture of the femoral neck in April, 1950. A radiological diagnosis of hyperparathyroidism was confirmed by the biochemical findings. The serum calcium content was 15.8 mg. per 100 ml., serum inorganic phosphate 2.85 mg. per 100 ml., and serum alkaline phosphatase 59 K.-A. units. For one year previously she had complained of spells of deafness and tinnitus in the left ear. She was discharged from hospital after a negative exploration of the neck, but was readmitted in May, 1951. Her symptoms were as before, with the addition of dyspnoea on slight exertion, tiredness, mental depression, spells of tingling of the hands, and marked huskiness of speech. Serum calcium was now

12.2 mg. per 100 ml., serum inorganic phosphate 3.05 mg. per 100 ml., serum alkaline phosphatase 31 K.-A. units. A parathyroid adenoma was removed from the mediastinum by Mr. J. Hinton Robertson; signs of latent tetany developed, but spasm was prevented by injection of calcium gluconate. Fatigue, deafness, and tinnitus disappeared after operation, and had not returned when I examined the patient in March, 1953, and found no evidence of aural abnormality.

Case 3

A spinster aged 49 years was admitted to the Victoria Infirmary in December, 1950, with cardio-renal failure due to hypertension and with auricular fibrillation. She complained also of pains in many parts of the body, present for several years, and of weakness of the muscles. She had very bowed legs, kyphoscoliosis, and early lenticular cataract. Radiology suggested a diagnosis of hyperparathyroidism, which was confirmed by the biochemical findings (serum calcium 14.5 mg. per 100 ml.; serum inorganic phosphate 2.18 mg. per 100 ml.; serum alkaline phosphatase 62.8 K.-A. units). The reflexes were recorded as "physiological." A parathyroid adenoma was removed by Mr. J. Hinton Robertson in February, 1951, transient post-operative tetany being readily controlled. The patient was well when I examined her in March, 1953. In response to questioning she stated that she had noticed attacks of singing in the ears when muscle weakness was present before the operation, but had had no auditory disturbance since (without any specific treatment). In March, 1953, hearing was normal.

Discussion

Since 1937 five cases of hyperparathyroidism have been investigated in the Gardiner Institute, including Case 1 above. Of the other four, deafness was recorded in two. Unfortunately the deafness was not further investigated, and the case notes do not record the post-operative hearing state. The two patients who were admitted in 1937 and 1942 cannot now be traced.

The three cases presented exhibit the classical symptoms of hyperparathyroidism, including muscular weakness and hypotonia, which are attributed to diminished nerve excitability caused by hypercalcaemia (Albright and Reifstein, 1948). Though the husky voice of Case 2 is no doubt due to previous trauma, the aphonia described by Case 1 is thought to be due to muscle weakness of the same type. Gutman, Swenson, and Parsons (1934) report the case of a patient who was "almost aphonic," with a serum calcium content of 13.9 mg. per 100 ml. On laryngoscopy no abnormality was noted, except oedema of the mucous membrane.

Motor symptoms are alarming enough to a patient to be reported, but sensory symptoms other than pain tend to be ignored if thought irrelevant by both patient and examining physician. At any rate, a review of the literature on hyperparathyroidism reveals few references to disturbances of function of afferent nerves. Vertigo and dizziness are common complaints which are too indefinite to analyse. Gutman, Swenson, and Parsons (1934) also report a case in which the patient complained of occasional numbness of the extremities and pruritus, and the case records sometimes mention deafness without giving details—for example, Werner, 1942. Nevertheless, Cantarow (1947) finds that in late cases of hyperparathyroidism complaint of muscle weakness is made in 15%, paraesthesiae in 2%, and deafness in 1%. Reifstein (1950) states that decrease in auditory acuity occurs in hyperparathyroid patients, and Albright and Reifstein (1948) suggest that nerve deafness should be expected, but the case they quote as evidence was believed by Hunter and Turnbull (1931), who report it, to have otosclerotic deafness. It is common to find increased auditory acuity in tetany (Ucko, 1951), but this is always of short duration.

Bellin and Gershwin (1935) report severe deafness and decrease of muscle tone in a patient with hyperparathyroidism. "She was absolutely definite in stating that her hearing was markedly impaired since all these peculiar

things were happening to her." The serum calcium was 19.5 mg. per 100 ml., rising to 22 mg. before operation, and the serum inorganic phosphate was 6.8 mg. per 100 ml. The authors state that both eardrums showed calcification—more on the right side, "where almost complete deafness existed." Unfortunately they included no tests of bone conduction. After parathyroidectomy the serum calcium levelled out at about 11.6 mg. per 100 ml., muscle tone increased to normal, and hearing returned completely in the left ear and partially in the right. At the same time they observed disappearance of the calcific deposits in the eardrums. One hesitates to deny the possibility that metastatic calcification of the eardrums could be responsible for deafness in this case, yet it should be noticed that the authors found no other evidence of metastatic calcification and no renal calculi. Metastatic calcification most commonly affects those tissues in which acid secretion takes place (kidneys, stomach, lungs), or in scar tissue (Cantarow, 1947), so that it would be surprising to find that both eardrums were the only sites of metastatic calcification in hyperparathyroidism. Further, after removal of a parathyroid adenoma there is no tendency for resorption of metastatic deposits of calcium—indeed, they may increase—especially when the serum calcium level remains abnormally high.

On the other hand, the symptoms are strikingly like those of Case 1 of the present report, and comparison with Cases 2 and 3 suggests that auditory disturbance is greater when muscular weakness is severe, and so may have the same cause. The serum calcium level fluctuates considerably in untreated hyperparathyroidism (Cope, 1948) and may even return temporarily to a normal level (cf. Case 2), and symptoms are correspondingly variable. The serum calcium level was falling and muscle power improving when Case 1 was admitted to hospital. It may be presumed that the serum calcium had been higher than the recorded level at the time of maximum weakness, vomiting, aphonia, and deafness, yet even when the serum calcium was 15 mg. per 100 ml. and there was no deafness (Fig. 1), the accommodation of the motor fibres of the right ulnar nerve was greatly increased, with a time-constant of 32.3 msec. (Fig. 2), the lower limit in normal women being 50 msec. (Solandt, 1936).

The "time-constant of accommodation" (λ) of a nerve (Hill, 1936) is an index of its excitability by an electrical stimulus. It is lowered by increasing the calcium in the nerve's environment (Solandt, 1936). Increased accommodation (decreased λ) reduces the frequency of response of a nerve to a stimulus. Galambos and Davis (1943) have shown that alteration of loudness of a sound at the ear is signalled by the auditory nerve as variation in impulse-frequency so that the effect of increasing accommodation would be to decrease the apparent intensity of sound.

The possibility that deafness is determined by the bone changes rather than the biochemical changes must be examined, as at one time otosclerosis was widely believed to be due to hyperparathyroidism (Mayer, 1917), and deafness is also associated with other bone diseases. In osteitis deformans (Paget's disease) it is often attributed to nerve compression in the auditory canal, but otosclerosis is said to be common in advanced cases (Hunter, 1944), though Lindsay and Perlman (1936) and Wilson and Anson (1936) found no conclusive evidence for a close relationship. Anson and Wilson (1937) found that the deafness was usually due to damage of the inner ear from involvement of the petrous temporal bone. Otosclerosis also occurs in 60% of cases of osteogenesis imperfecta (Hunter, 1944), apparently as an associated genetic abnormality, and van der Hoeve and de Kleyn (1918) described degeneration of the labyrinth in this condition. It might seem, then, that deafness in hyperparathyroidism was of the same nature, but in these bone diseases, which are unaccompanied by hypercalcaemia, the deafness shows no tendency to spontaneous remission. It is inconceivable that otosclerosis can explain the loss of hearing in the cases of hyperparathyroidism in which deafness closely follows excessively high blood calcium levels, and is promptly and permanently relieved after parathyroidectomy.

The evidence cited cannot be regarded as conclusive, as the cases were all seen after recovery from deafness, but it is highly suggestive of a close relationship between reversible deafness, aphonia, muscular weakness, increased nerve accommodation, and hypercalcaemia. It is perhaps relevant to note that other causes of "chemical deafness" are quinine, which is well known to block nerve conduction (Cooper, 1924), and analgesics such as salicylates and acetanilid (Macht, Greenberg, and Isaacs, 1919). The latter drug at least has been shown to depress muscle-nerve excitability (Macht, 1919). Hyperparathyroidism is rare and is usually diagnosed at orthopaedic clinics. It is hoped that this paper will stimulate interest so that the occurrence of deafness can be fully investigated before and after operation.

Summary

Disturbances of hearing are reported in five cases of hyperparathyroidism, and aphonia in one case.

In three cases these symptoms disappeared after removal of a parathyroid adenoma, and examination showed no defect of hearing.

Increased nerve accommodation, demonstrated in one case, is suggested as a possible cause of these symptoms.

The cases are reported so as to draw attention to an unusual cause of nerve deafness.

I wish to thank Professor Sir John McNee, Mr. Roland Barnes, and Mr. J. Hinton Robertson for permission to study their cases; Mr. A. M. Andrew, of the department of physiology, for the use of his stimulator; and Dr. J. C. McKinley for the audiogram in Case 1.

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The National Multiple Sclerosis Society has published a 32-page booklet on *Psychological Factors in the Care of Patients with Multiple Sclerosis*, written by M. P. Harrower and R. Herrmann. A brief summary of facts on the nature of the disease and its management in the U.S.A. is followed by a discussion on the personality of the patient, the psychological aspects of his relations with the doctor, and the psychological difficulties peculiar to those with disseminated sclerosis. The use of psychological testing in diagnosis and as an adjunct to therapy is described. Group therapy for patients and relatives is advocated; occupational therapy in the home is important, and rehabilitation centres are also of value. The booklet may be had free of charge from the Society at 270, Park Avenue, New York, 17, U.S.A.

SKIN LESIONS AND DEAFNESS IN DISSEMINATED TUBERCULOSIS

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Skin lesions which form part of a clinical complex produced by the dissemination of active foci of tuberculosis in various organs of the body are comparatively infrequent, so that when they are encountered their significance may be overlooked. Early recognition of these lesions is desirable when the tuberculous disease is chronic. When it is acute, skin involvement may provide the earliest means of identifying the nature of a disease in which prompt administration of appropriate treatment is of vital importance.

In the first four cases of disseminated tuberculosis reported below cutaneous lesions were either prominent presenting features of the disease or were or might have been of diagnostic assistance; and it is interesting that deafness was recorded in two of them. In Cases 5-8 abnormalities of the skin produced by subcutaneous tuberculous lesions were important clinical features, and increasing deafness was a presenting symptom in the only one in which the disease was of an overwhelming nature.

Case 1

A man aged 50 was admitted to Ruchill Hospital on March 21, 1951, with a diagnosis of erysipelas. He had been in another hospital from December 15, 1950, to January 29, 1951, with a left lower lobe pneumonia which had failed to respond to penicillin, but showed complete resolution clinically and radiologically after treatment with aureomycin. Subsequently he remained well until March 18, when he developed what he thought was a sty on the left upper eyelid; on the 19th the inflammation involved the periorbital skin, and later other cutaneous lesions developed on the back of the neck.

On admission to Ruchill Hospital he was moderately ill. His pulse was 80 and respirations 16. His temperature was normal on admission but rose a few hours later to 103° F. (39.4° C.) and continued swinging to 103-104° F. (39.4-40° C.) until death. He had a purplish swelling round the left eye, with numerous small papules and pustules in the affected skin. On the back and right side of the neck were several infiltrated bluish plaques with surrounding erythema and scaling and also numerous small papules and pustules. A linear, infiltrated purplish lesion on the right malar region and several small crusted papules on the front and back of the chest were seen. The tip of the spleen was just palpable. The urine contained a trace of albumin. Blood examination showed: leucocytes, 6,000 per c.mm. (polymorphs 44%, lymphocytes 46%). A chest x-ray film on March 28 showed marked right hilar enlargement; the lung fields were clear except for a calcified primary focus in the right upper lobe with associated calcification in the right paratracheal glands. Sputum examinations were negative for *Mycobacterium tuberculosis*. Penicillin was given on admission, followed by aureomycin, and, from April 4, streptomycin, 1 g. daily, but there was no response.

Repeated blood examinations during the illness showed a steady decline in the leucocyte count from 6,000 on admission to 1,000 per c.mm. a few days before death; the erythrocytes declined in that period from 3,200,000 to 2,100,000 per c.mm. The patient died on April 11.

Post-mortem examination revealed grossly enlarged, caseous, and necrotic right paratracheal glands. The adjacent right main bronchus was the site of extensive tuberculous caseation in which many tubercle bacilli were demonstrated. The left lower lobe showed only some post-pneumonic fibrosis. Sections of the liver, spleen, and sternal bone marrow showed numerous miliary necrotic foci, round a proportion of which was a feeble cellular response. The kidneys were apparently healthy. By mischance the affected skin of the neck was not histologically examined.

Case 2

A man aged 20 was admitted to Ruchill Hospital on April 13, 1952. About a month previously he had begun to feel lethargic, and for the past five days he had suffered from rigors, headaches, pains in the limbs, and nausea. Three days before admission a rash appeared. On examination he appeared seriously ill. His temperature was 101° F. (38.3° C.), pulse 100, respirations 20, and B.P. 120/75. Scattered over the distal parts of the upper limbs, buttocks, trunk, and back of the left ear were little papules about 10-20 mm. in diameter, surrounded by an area of erythema and topped by a crust. There were also a few bright-red petechiae on the forehead and behind the ears. The urine contained a trace of albumin. A blood count showed: erythrocytes, 4,300,000 per c.mm.; Hb, 12.6 g. per 100 ml.; leucocytes 8,400 per c.mm. (polymorphs 53%, lymphocytes 35%).

On April 14 penicillin treatment was begun, but the patient's condition began to deteriorate, and next day he became moderately deaf and little areas of faucial ulceration were noted; there was also a post-nasal discharge tinged with blood. He became irrational and incontinent on the 16th, and next day a fresh crop of petechiae appeared on the distal part of the limbs and a few on the trunk and face. It was observed that in a day or two the "petechiae" developed into little crusted papules of the type noted on admission. His temperature swung between 104 and 105° F. (40 and 40.6° C.). Streptomycin, 1.5 g. daily, plus P.A.S. was begun on April 17.

Histological examination of a skin-biopsy specimen taken on April 19 showed necrosis of surface epithelium and the upper part of the corium in ulcerated areas, but staining with Ziehl-Neelsen's method did not demonstrate acid-fast bacilli. The patient continued to improve somewhat, although the pyrexia continued, and by April 22 he was rational and no longer incontinent, and no more skin lesions had developed.

On April 17 a chest radiograph showed a circular lesion about 1.5 cm. in diameter in the right upper lobe and a similar lesion in the left upper lobe; the appearances suggested fibro-calcific quiescent pulmonary tuberculosis. Liver-function tests showed no abnormality, and the liver was not enlarged, but the biopsy of this organ on May 19 showed several granulomatous follicles with giant-cell systems, the appearances corresponding with tuberculosis. Pyrexia continued, the patient's condition deteriorated, and by June 2 he was semi-moribund; isoniazid, 8 mg. per kg. was then substituted for streptomycin. The improvement was dramatic: his temperature finally settled on July 16, he made a steady recovery, and has remained well.

During his stay in hospital attempts to culture *M. tuberculosis* from sputum, gastric washings, urine, and faeces were unsuccessful.

Case 3

A man aged 69 was admitted to Ruchill Hospital on April 19, 1951. For some time before admission he had lost weight and more recently had complained of anorexia. Three weeks before admission a slightly productive cough had developed, together with pain under the sternum. On admission his temperature was 101° F. (38.3° C.), pulse 80, and respirations 20. On the front and back of the chest

were a few dark-red macules and nine dull-red papules, some of which were surmounted by a crust. The lesions closely resembled acne vulgaris, but had appeared only about six weeks before admission. Physical examination was otherwise negative. Blood examinations showed: erythrocytes, 4,000,000 per c.mm.; Hb, 11 g. per 100 ml.; leucocytes, 4,600 per c.mm. (polymorphs 55%, lymphocytes 42%). Pyrexia continued, the temperature swinging between 101 and 102° F. (38.3 and 38.9° C.). A chest-film report on April 24 stated: "The right root is enlarged, but there is no intrapulmonary lesion. There is a healed primary focus at the right apex."

On April 27 a right pleural effusion developed. A chest-film report on May 4 stated: "There is now considerable thickening of the right pleura and some loss of volume of the right lower lobe. The right root remains enlarged. The appearance is now strongly suggestive of bronchial carcinoma." A biopsy of a skin lesion taken on May 4 showed giant-cell systems suggestive of tuberculosis. Streptomycin, 1 g. daily, and P.A.S., 20 g. daily, were started on May 13. On May 29 it was reported that *M. tuberculosis* had been cultured from pleural fluid received on April 27. Direct examinations and culture of sputum, bone marrow, urine, gastric washings, bronchial secretions, and materials from a skin lesion were negative for *M. tuberculosis*. The temperature settled on May 29, and no further skin lesions appeared. Streptomycin and P.A.S. therapy was stopped on July 13 after 67 g. of streptomycin had been given.

The patient left hospital against advice on August 11 and was readmitted in poor general condition on September 21. Apart from slow deterioration in his general condition, and extension of the disease in the right lung in spite of further streptomycin and P.A.S. therapy, there were no additional significant clinical features. He died on March 15, 1952.

Post-mortem examination revealed bronchopneumonic tuberculosis in the right lower lobe with a few areas of more chronic disease here and at the right apex. Areas of recent tuberculous caseation were scattered in the left lung. The right paratracheal glands were enlarged and caseous. Tuberculous pericarditis was noted, and the peritoneum was studded with numerous tuberculous foci. The liver was of normal size, but was riddled with large and small tuberculous abscesses; the spleen was similarly affected. The mesenteric glands were caseous. The kidneys were apparently healthy. Section of the bone marrow showed no abnormality.

Case 4

A woman aged 71 was admitted to Ruchill Hospital on December 21, 1952. She had been in excellent health until five months before that date, when dysphagia had occurred. Examination of the throat and a barium swallow in a general hospital had revealed no abnormality. Subsequently she complained of weakness, loss of weight, hoarseness, pain in the throat, and slight productive cough. About two months before admission her hearing, which had previously been good, steadily deteriorated until she became almost totally deaf. Dusky-red papules appeared in the skin and continued to do so in spite of penicillin.

On admission her temperature was 98.4° F. (36.9° C.), pulse 78, respirations 18, and B.P. 110/70. She was well built but had obviously lost a good deal of weight. She was intelligent, and, apart from almost total deafness, no abnormality was detected in the nervous system. The tongue, uvula, and pharynx were inflamed and ulcerated; the larynx could not be properly examined. The right cervical glands were enlarged. Nine dull-red papulo-necrotic lesions about 0.5-1 cm. in diameter were noted on the forearms, chest, and face. The tip of the spleen was palpable. Physical examination of the chest was negative, but radiography showed small areas of consolidation scattered in both lung fields. Blood examination showed: erythrocytes, 4,600,000 per c.mm.; Hb, 9.8 g. per 100 ml.; leucocytes, 7,600 per c.mm. *M. tuberculosis* was not detected on repeated direct microscopical examination of the sputum.

Biopsy of a skin lesion on December 22 was reported on as follows: "The ulcer base is composed of tuberculous granulation tissue with giant-cell systems, early caseation, and superadded acute pyogenic inflammatory change. Acid-fast bacilli are present." The patient died suddenly on January 4, 1953.

Post-mortem examination revealed numerous small areas of tuberculous disease in both lungs, especially numerous in the upper lobes and left lower lobe. The tracheo-bronchial glands were enlarged, but not caseous. No disease was apparent in the stomach, intestines, or liver, but the mesenteric glands were caseous. The spleen was studded with caseous foci, and miliary lesions were present in the left kidney. The right kidney was healthy.

Case 5

A man aged 57 was admitted to Ruchill Hospital on February 20, 1951. He had been in good health until about three weeks before admission, when he began to suffer from weakness, loss of appetite, and a cough which later produced a little sputum. About a week before admission he became deaf.

On admission he was seriously ill. The pulse was 80, and the respirations 20. His temperature was 98.4° F. (36.9° C.), rising in the evening to 102° F. (38.9° C.), and continued to swing until his death. Examination of the chest revealed slight impairment of the percussion note and fine crepitations over the right lower lobe. The liver edge was palpable two fingerbreadths below the costal margin. The patient was moderately deaf. Physical examination was otherwise negative. The urine contained some albumin and a few leucocytes; Fouchet's test for bile pigments was positive. A blood count showed: erythrocytes, 4,500,000 per c.mm.; Hb., 11.8 g. per 100 ml.; leucocytes, 4,000 per c.mm. (polymorphs 87%, lymphocytes 7%). Blood urea was 85 mg. per 100 ml., and a van den Bergh test gave a delayed direct reaction. X-ray examination on February 22 showed extensive consolidation throughout the right lung and in the left upper and mid-zones; the affected areas had a hazy rather than a solid appearance. Repeated sputum examinations were negative for *M. tuberculosis*.

On February 27 10 painless nodules about 20 mm. in diameter were felt in the subcutaneous tissues of the anterior abdominal wall, and two were noted on the anterior chest wall. A nodule was excised and sent for pathological examination; the report was as follows: "Histological examination shows skin in which there is much congestion of the arterioles in all layers, but no other abnormality."

Slight jaundice was noted on March 1. On March 6 the leucocytes numbered 7,000 per c.mm. (polymorphs 82%, lymphocytes 13%). The patient died on March 7.

Only a limited post-mortem examination was allowed. A nodule on the abdomen was opened; pus flowed out and many acid-fast bacilli were demonstrated on direct microscopical examination; *M. tuberculosis* was grown on culture of the pus. A portion of liver was removed; histological examination showed lesions which were mainly necrotic, though some showed a slight surrounding cellular reaction; numerous acid-fast bacilli were noted in the lesions.

Case 6

A boy aged 16 was admitted to Ruchill Hospital on March 27, 1950. Eight weeks before admission two swellings had appeared simultaneously—one over the dorsum of the right foot and one in the left mastoid region. He was admitted to a surgical ward in a general hospital. The swellings became fluctuant; penicillin was given, and both abscesses were incised. Bacteriological examination of pus revealed *M. tuberculosis*, and a subsequent chest radiograph showed mottling of a coarse miliary character in the right upper lobe.

On admission to Ruchill Hospital his temperature was normal, and subsequently remained normal except for an

occasional rise to 99° F. (37.2° C.). Pus was draining from the wounds in the abscesses, and *M. tuberculosis* was grown on culture. Chest radiography showed the features previously described, and a radiograph of the mastoid processes showed no evidence of bone involvement. Culture and guinea-pig inoculation of gastric washings, and a 24-hour specimen of urine did not reveal the presence of *M. tuberculosis*. Treatment with streptomycin and P.A.S. was instituted on April 3, and the patient was discharged well on September 27.

Case 7

A youth aged 18 was admitted to Ruchill Hospital on August 10, 1950. About two years before admission a swelling had developed on the dorsum of his right hand. Two months before admission a subcutaneous nodule had appeared under the nail of his third right finger, another on his left wrist, and several on the right forearm; some of these nodules subsequently became fluctuant. A chest film at that time showed an enlarged left root with infiltration into the lung field.

On admission his general condition was good, his temperature was normal, and he felt well. X-ray examination of the chest now showed miliary opacities throughout both lungs. Treatment with streptomycin and P.A.S. was begun on August 17 with a dosage of 1 g. of streptomycin and 20 g. of P.A.S. daily; a total of 100 g. of streptomycin was given. The lung fields cleared by January 18, 1951, and, although several further abscesses appeared on the left forearm soon after admission, most had resolved in a further month; one or two continued to discharge pus from time to time, but all had healed by June, 1951. Several samples of pus aspirated from different abscesses were cultured, but *M. tuberculosis* was grown on only one occasion.

Case 8

A man aged 21 was admitted to Ruchill Hospital on December 4, 1949. He complained that for some months he had not felt well, had developed a productive cough, and had lost weight. Six weeks before admission he noted the appearance of a lump on the left foot, another on the right forearm, and one month before admission a painful swelling of the right testicle.

On examination his temperature was 99° F. (37.2° C.). Fluctuant, tender subcutaneous swellings were present on the dorsum of the left foot, the right forearm, and the anterior surface and left side of the neck; there were more fluctuant, tender subcutaneous swellings on the left forearm, left wrist, dorsum of the left hand, left knee, and right and left thighs; the lower pole of the right testicle was painful, tender, and swollen.

The liver was palpable two fingerbreadths below the costal margin, and examination of the chest revealed rales and diminished air entry in the left lower lobe. *M. tuberculosis* was cultured from sputum and from pus aspirated from a fluctuant swelling. A chest radiograph showed fibro-caseous tuberculosis in the left upper lobe and also miliary opacities, apparently of more recent origin, in the same area. The left lower lobe was emphysematous. Blood examination showed: erythrocytes, 4,400,000 per c.mm.; Hb., 14.4 g. per 100 ml.; leucocytes, 17,200 per c.mm. (polymorphs 53%, lymphocytes 33%).

With streptomycin and P.A.S. therapy the miliary opacities in the left upper lobe cleared, but fresh subcutaneous lesions continued to appear every few weeks despite repeated courses of these drugs until isoniazid therapy (8 mg. per kg. daily) was instituted on April 24, 1952. After left pneumonectomy and thoracoplasty on December 1, 1952, the patient improved and is now well.

Discussion

These case reports indicate that early recognition of the nature of skin lesions appearing in the course of the graver forms of disseminated tuberculosis may be of great value,

because there may be no other definite lead to the correct diagnosis, and appropriate treatment must be prompt to have a chance of achieving success.

Some of the lesions described as involving the skin were really subcutaneous, consisting of nodules which in some instances developed into abscesses of various dimensions. When the lesions arose in the dermis itself they varied greatly in appearance: in Case 1 they were multiform, consisting of papules and pustules in purplish-red skin, and violaceous infiltrated lesions; in Case 2 "petechiae" developed into tiny papules surmounted by a vesicle and later crust; in Case 3 innocuous-looking papules resembled the lesions of acne vulgaris; and in Case 4 the lesions looked like small indolent furuncles.

Biopsy specimens were histologically examined in Cases 2, 3, 4, and 5. The one from Case 2 showed only areas of necrosis, but giant-cell systems and areas of caseation were noted in those from Cases 3 and 4, and acid-fast bacilli were also demonstrated in that from Case 4. The specimen from Case 5 was of a small subcutaneous nodule, and the only abnormality noted was dilatation of capillaries and arterioles; when another nodule was examined *post mortem* eight days later its centre contained pus in which there were many tubercle bacilli.

In fulminating cases of disseminated tuberculosis histological examination of affected tissue may show areas of necrosis swarming with tubercle bacilli rather than characteristic tubercle formation. Necrosis was the prominent histological feature in Cases 1 and 5. In such instances involvement of the bone marrow may give rise to abnormalities of the peripheral blood: Ball *et al.* (1951) reported three cases with leucopenia and reviewed similar cases; Leibowitz (1938) recorded a case with a leukaemoid blood picture and reviewed similar cases; and Rennen (1922) reported a case with polycythaemia. Leucopenia, amounting by the time of death to a virtual agranulocytosis, was noted in Case 1. Histological examination of the bone marrow supported the suggestion of Ball *et al.* that sternal marrow examination may be diagnostically helpful in cases of disseminated tuberculosis, especially when there is an abnormal blood picture; and Horowitz and Gorelick (1951) have described a suitable technique for culture.

Rich and McCordock (1929) found that miliary tuberculosis occurred four times as often in white persons over the age of 60 as it did in those aged between 20 and 60, and Spain (1947) noted a similar age distribution in adults with haematogenous tuberculosis.

The relatively high proportion of older persons among those suffering from disseminated tuberculosis suggests that in later years there is a waning of immunity in some people, so that tuberculous disease takes in them the form it is apt to assume in children.

Ball *et al.* considered that in their three cases the source of the bacilli was either a recent primary complex or a lesion of the same nature as a primary complex which had occurred because previous tuberculous infection had completely healed. In our Case 1, however, there was a calcified primary complex in the right upper lobe, and it seems possible that products of the initial pyogenic infection of the left lower lobe, which would drain to the calcified right paratracheal glands (Rouvière, 1932), activated a latent focus there.

The deafness which occurred in three out of the five more acutely ill patients is worthy of attention, because further experience may prove it to be of some diagnostic importance in certain cases of acute tuberculosis. Interest in this symptom was aroused by the study of two patients encountered in the hospital. One was a woman of 20 who presented with a pyrexial illness, increasing and eventually severe deafness, and consolidation of the right lower lobe; after some weeks without antituberculous drugs the temperature settled, the general condition improved, the deafness gradually disappeared, and when the right lung was later removed the right lower lobe was found to be almost replaced by tuberculous caseation. The other patient was a woman of

20 who became deaf soon after the onset of very acute, widespread bilateral pulmonary tuberculosis; the temperature eventually settled and the deafness actually disappeared during the period of administration of streptomycin and P.A.S.

By the time the last patient was encountered, an alert old lady of 71, the recent onset of severe deafness did not appear to be contrary to but rather consistent with a clinical diagnosis of disseminated tuberculosis based on loss of weight, painful throat, and the appearance of suspicious skin lesions.

Deafness cannot be common in cases of acute tuberculosis or the fact of its occurrence would be better known, though at the same time it is obvious that its presence could easily be ignored in seriously ill patients. It is interesting, however, that Pagel and Woolf (1949) record the symptom of increasing deafness in a case of fulminating tuberculous septicaemia. In the five cases of deafness seen by us there was no evidence of tuberculous meningitis or of middle-ear disease, and it seems likely that the deafness was the result of toxæmia. Deafness occurs in the course of other communicable diseases, presumably for the same reason; it is common in rickettsial diseases such as typhus, and in the later stages of typhoid fever.

In conclusion, the cases described above illustrate the variety of clinical features which may be present in disseminated tuberculosis—pyrexia, skin lesions, deafness, mental confusion, leucopenia, buccal ulceration, laryngitis, respiratory symptoms and signs, splenic enlargement, and jaundice. It may be difficult to make an early diagnosis, but if suspicion is aroused confirmatory evidence may be obtained from biopsy of any skin lesions which may be present, biopsy of sternal marrow, or aspiration biopsy of the liver.

Summary

Attention is drawn to the diagnostic importance of skin involvement in disseminated tuberculosis. Eight cases of the latter condition, four with cutaneous and four with subcutaneous lesions, are described. The occurrence of deafness was recorded in three of five cases in which toxæmia was severe. The clinical features of disseminated tuberculosis are discussed.

Our thanks are due to Dr. T. Anderson, reader in infectious diseases, University of Glasgow, for his helpful criticism and advice in the preparation of this paper, and to Dr. J. H. Lawson, physician-superintendent, Ruchill Hospital, for his interest and his kindness in allowing us access to case records of patients who were under his care.

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The only population group whose diets in 1951 gave some cause for concern was large families with several children or adolescents, according to the National Food Survey Committee's second annual report on "Domestic Food Consumption and Expenditure." The report gives estimates of household expenditure on all kinds of foods and of the quantities of these foods consumed by families of different social class and different composition. Analyses of the energy value and nutrient content of the diets of the various groups are also given. During the period under review, food prices bore the full impact of the inflation caused by the Korean war; but, in general, food expenditure and consumption kept pace with rising prices, and the level of the diet was maintained. There was some further narrowing of the dietary gap between social classes, but the diets of large families revealed certain inadequacies, notably in protein and calcium.

BACTERIOSTATIC AGENTS IN THE TREATMENT OF SUBACUTE BACTERIAL ENDOCARDITIS

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Antibiotics that are purely bacteriostatic have proved to be disappointing in the treatment of subacute bacterial endocarditis, for it appears to be necessary to sterilize the valve lesions, and for this a bactericidal drug or a bactericidal mixture of drugs is usually required (Garrod, 1953). In both the following cases of subacute bacterial endocarditis treatment with oxytetracycline ("terramycin") or with other bacteriostatic antibiotics seemed at first to be indicated, but even with full dosage the infection was not controlled in either case, although the organisms were sensitive. Effective treatment was thus delayed. When, later, antibiotics with bactericidal action were employed both cases responded promptly.

Case 1

A girl aged 14 was admitted to hospital on October 28, 1952, under the care of Dr. G. W. Hayward. Three years previously she had been treated in Hamburg Military Hospital for subacute bacterial endocarditis due to *Str. viridans* and had received a four-weeks course of penicillin, 50,000 units three-hourly. Thereafter she remained well until a month before her admission here, when she developed febrile symptoms, a few painful spots on the fingers, and later transient stiffness of the neck. At the onset she was given a short course of sulphonamides and then of penicillin, but with the persistence of symptoms she was referred for investigation.

On admission she was febrile, petechiae were present on the right thumb, the spleen was palpable, and she had mitral stenosis. There was no clubbing of the fingers. Investigation showed a moderate normochromic anaemia, normal white count, normal urine without increase in red cells, normal electrocardiogram, and a blood culture positive for *Str. viridans*. This organism was inhibited by 0.04 unit of penicillin and by 0.3 µg. of oxytetracycline per ml.

On November 1 treatment with penicillin was begun with a dose of 1,200,000 units intramuscularly at 12 noon, the preparation used being "abbocillin," 1.5 ml. of which contains procaine benzyl penicillin, 900,000 units, together with buffered crystalline penicillin potassium, 300,000 units. At 12.15 p.m. a severe reaction started. She vomited, became very flushed, and then developed a rigor. The blood pressure fell and the pulse was for a while imperceptible at the wrist. The temperature rose to 103° F. (39.4° C.), but fell rapidly and by that evening she was feeling fairly well again. A test dose of penicillin was then given, 50,000 units subcutaneously. Fifteen minutes later a weal 2 cm. in diameter developed, with an area of erythema 8 cm. in diameter, at the site of injection; a control of saline given at the same time produced a weal 2 mm. in diameter with no surrounding erythema.

Following this the patient remained afebrile, with repeated negative blood cultures, until November 18, and during this period no further treatment was given. But on that day fever recurred and blood culture again revealed *Str. viridans*,

apparently the same organism that had been isolated previously. Another tender spot appeared on the right hypochondrium.

In view of the severity of her reaction to penicillin it was now decided that she should be treated with oxytetracycline instead, the organism being sensitive to it, and this was started on November 22 in a dosage of 750 mg. six-hourly. This gave a blood level of 24 µg. of oxytetracycline per ml. when measured four and a half hours after a dose. Within 48 hours the fever settled again, and blood cultures taken on the fourth day of treatment remained sterile. Treatment was continued for six weeks, but on January 1, 1953, two days before the end of the course, fever again recurred and blood culture once more revealed *Str. viridans*. The organism appeared to be the same as that isolated previously, and still showed no resistance to oxytetracycline. During the next two days further petechiae appeared, the spleen became palpable again, and the patient was evidently ill.

It was now obvious that penicillin, to which the patient had earlier shown sensitivity, had to be used, and it was hoped to overcome possible reactions by simultaneous injection of penicillin and an antihistamine (Maslansky and Sanger, 1952). Treatment was therefore started again on January 5, when she received by injection a mixture of crystalline penicillin, 100,000 units, with 50 mg. of mepyramine maleate; this was followed by a slight urticarial reaction. The next day the same mixture was injected six-hourly, a minimal urticarial reaction following the first of these injections; but thereafter no further reactions were experienced. The next day the same mixture was given three-hourly. The following day 250,000 units was given three-hourly and the antihistamine was changed to oral promethazine hydrochloride, 25 mg. six-hourly. On the fifth day the penicillin was increased to 650,000 units three-hourly, at which level treatment was then carried on for six weeks, but the antihistamine was stopped altogether on the sixth day. The infection was promptly controlled once more, and the patient declared she felt better than when being treated with oxytetracycline.

At the end of the course there was no evidence of activity of the disease, and she was discharged on March 6 apparently well. On readmission for dental treatment on June 4, 1953, no evidence of recurrence could be found.

Case 2

A woman aged 25 was admitted as a case of enterococcal endocarditis that had proved resistant to treatment with single and combined antibiotics. Following a septic abortion she had been found to have mitral stenosis, intermittent fever, multiple petechiae and a few larger peripheral emboli, scanty haematuria, and clubbing of the fingers. The spleen was not enlarged. Blood cultures had repeatedly yielded *Str. faecalis* sensitive to chloramphenicol, aureomycin, and oxytetracycline but resistant to penicillin and streptomycin. Treatment, starting on July 19, 1952, had consisted of penicillin, up to 12 mega units daily for six weeks, followed by aureomycin, 2 g. daily for 18 days, then oxytetracycline, 6 g. daily for 23 days, then oxytetracycline and aureomycin together for 7 days, and, finally, oxytetracycline, 6 g., and chloramphenicol, 3 g. daily, for 20 days, all without effect on the fever, on the occurrence of peripheral emboli, or on the general condition of the patient.

On admission here under the care of Professor R. V. Christie on November 20, 1952, the diagnosis of subacute bacterial endocarditis was confirmed. Blood cultures yielded *Str. faecalis* again, inhibited by penicillin, 2.5 µg. per ml.; streptomycin, 10 µg. per ml.; aureomycin, 0.3 µg. per ml.; oxytetracycline, 0.6 µg. per ml.; and chloramphenicol, 10 µg. per ml.; but none of these drugs sterilized the inoculum when used singly. The effects on the culture of mixtures of these drugs were then observed, using the following concentrations: penicillin, 1 µg. per ml.; streptomycin, 10 µg. per ml.; aureomycin, 5 µg. per ml.; and oxytetracycline, 5 µg. per ml. Aureomycin and oxytetracycline alone,

and mixtures of penicillin or of streptomycin with either aureomycin or oxytetracycline, left the bacterial population approximately static. Penicillin and streptomycin when used alone permitted growth to occur, but when they were used together they then formed the only combination discovered that would actually sterilize the inoculum in 24 hours.

Accordingly on November 28 treatment was started with penicillin, 2,500,000 units three-hourly, and streptomycin, 0.5 g. six-hourly, and this was continued for six weeks. Blood samples taken at various times during the day indicated that the penicillin level varied from over 80 to about 20 units per ml., and the streptomycin level remained at about 27 µg. per ml. From December 17 until January 8 probenidol was also given, 0.5 g. six-hourly, but it had little or no effect on the penicillin blood level.

Treatment was stopped on January 8, and thereafter repeated blood cultures have remained sterile. The patient was well when last seen on June 9.

Discussion

In both these cases bacteriostatic antibiotics were first employed in treatment, but, in spite of adequate dosage and although the organisms were fully sensitive, the disease was not controlled by them. This initial failure represented a serious hazard to the patients, for during all the time that infection remains there is an increasing danger of major emboli, renal failure, and irreversible damage to the heart: it has been established that the prognosis depends greatly on the speed with which effective treatment is started (Cates and Christie, 1951). It is not denied that bacteriostatic antibiotics are sometimes effective in this disorder, but the disadvantage of using them when bactericidal drugs are available as an alternative lies in the danger that, should they not work, the time lost whilst using them may well make all the difference to the patient's chances of ultimate recovery.

This being so, it may be as well to examine the reasons why bacteriostatic agents were used at all in the two cases described. In Case 1 the reaction of the patient to her first dose of penicillin was alarming, and the necessity of avoiding a repetition of it was taken as a good indication for a change over to oxytetracycline; but this decision was proved by events to be unwise. It had not been appreciated at this time that desensitization could be so simple a process. Fortunately in her case the delay during the time she was given oxytetracycline instead apparently caused no harm. It may be worth noting, however, that even severe reactions to penicillin do not necessarily preclude the use of the drug, as the technique of desensitization to it can be simple and effective.

In Case 2 treatment with chloramphenicol, aureomycin, or oxytetracycline seemed to be indicated on bacteriological grounds by virtue of the results of the usual sensitivity tests, but, as pointed out by Garrod (1953), the situation is in reality more complex than this. Thus the organism was with difficulty inhibited but not killed by penicillin and streptomycin acting singly; it was more readily inhibited but not killed by chloramphenicol, aureomycin, and oxytetracycline; but it was actually killed by the combined effect of penicillin and streptomycin when acting together. It was not until this situation had been revealed that effective treatment with the bactericidal mixture of penicillin and streptomycin could rationally be instituted.

In these two cases a great contrast was shown between the effectiveness of bactericidal as compared with bacteriostatic drugs. Since it has been shown (Cates and Christie, 1951) that 92% of relapses occur within one month of cessation of treatment it seems likely that both have now been cured, by penicillin in the one case and by penicillin combined with streptomycin in the other, whereas even prolonged treatment with the bacteriostatic antibiotics had previously been ineffective. They thus support the view held by Garrod that effective treatment for subacute bacterial endocarditis usually demands that the drug employed must have bactericidal and not merely bacteriostatic action.

Summary

Two cases of subacute bacterial endocarditis are reported.

The first case was treated with oxytetracycline because of severe reactions to penicillin, but the infection was not controlled by it, although the organism was sensitive. Subsequent use of penicillin, "covered" by antihistamines as described in the text, rapidly cleared the infection.

The second case was treated with chloramphenicol, aureomycin, and oxytetracycline because the organism, *Str. faecalis*, was sensitive to these drugs and resistant to penicillin and to streptomycin. Nevertheless the infection was not controlled by them. When it was subsequently shown that a combination of penicillin and streptomycin acting together was bactericidal whilst the other antibiotics had bacteriostatic action only, treatment with this combination was started, using penicillin in very large doses. The infection was then rapidly controlled.

It is emphasized that the delay caused by first using bacteriostatic antibiotics may well be dangerous because of the likelihood of continued progression of disease, and that every effort must be made from the onset to discover the appropriate bactericidal drug or bactericidal mixture of drugs.

We are indebted to Professor R. V. Christie for his assistance and encouragement in the preparation of this report, to Professor L. P. Garrod for his help and criticism and for the detailed laboratory work, to Dr. G. W. Hayward for permission to publish his case and for his advice with respect to it, and to the house-physicians who looked after the patients and assembled much of the information about them.

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Medical Memoranda

Oesophagitis Dissecans Superficialis

Sloughing of portions of the oesophageal wall is a recognized consequence of contact with scalding fluids or strong caustic or acid solutions. Phlegmonous oesophagitis may uncommonly result from pyogenic infections of the mucous and submucous coats, spreading, perhaps, from a primary infection of the fauces or larynx or originating at the site of a neoplastic ulcer or impaction of a foreign body. Thrush oesophagitis not infrequently gives rise to pseudo-membrane formation, while extension to the upper oesophagus of pharyngeal diphtheritic ulceration has been reported.

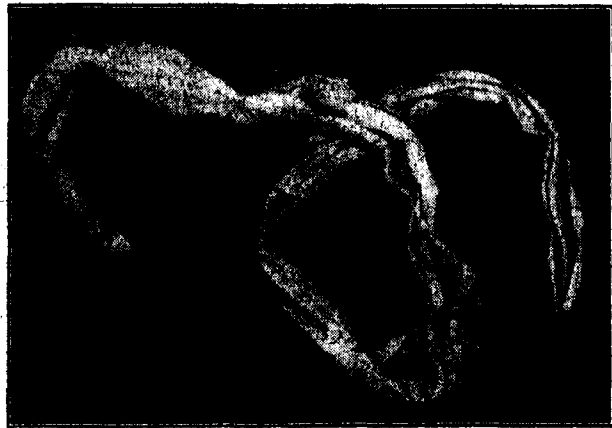
There remains for mention a lesion characterized by extensive dissection of the squamous epithelial lining of the oesophagus from its underlying corium in the form of a tubular cast—oesophagitis dissecans superficialis. The following case is recorded on account of the rarity of the condition and the obscurity of its aetiology.

CASE REPORT

A married woman aged 37 was admitted to hospital late at night on October 15, 1951. She had been in her usual good health until about an hour after her evening meal, which had been swallowed without difficulty, when she noticed a sensation of something sticking in her throat. Repeated retching brought the object into her mouth. It was found to be of fleshy substance and apparently attached to the throat. She went to her doctor, and with further

retching and some traction the object was completely removed to the accompaniment of severe tearing pain in the throat and the regurgitation of a small quantity of bright red blood.

Clinical examination on admission revealed no abnormality apart from obvious extreme discomfort on swallowing. There was no pyrexia. The patient presented her specimen (see illustration) in a bottle. It consisted of a flimsy collapsible tube 12 in. (30 cm.) in length and approximately 1 in. (2.5 cm.) in diameter, with a greyish-white, thin, translucent wall. At one end the lumen was slightly constricted and the termination abrupt and regular; at the other end the diameter appeared to widen, the wall of the tube was torn longitudinally, and the free margin was frayed, with adherent blood clot on the outer surface. From



the appearance of the cast and the method of its production it seems likely that initial separation had occurred at, or close to, the cardia, followed by regurgitation of the free end and a progressive stripping of the oesophageal epithelium. The freeing of the more firmly adherent upper portion had been incomplete and accompanied by pain and bleeding.

There was no history of the ingestion of any irritant substance. The diet was habitually bland, and on the day of admission had been in every way unexceptionable. There were no significant points in the personal or family history.

Treatment was directed to allaying the patient's anxiety and relieving the severe dysphagia. The discomfort on swallowing even saliva was considerable, and was confined to the region of the upper oesophagus. It was greatly reduced by the use of amethocaine hydrochloride lozenges. Within a week soft solids could be swallowed with comfort. At review three weeks later there was no complaint of dysphagia on a full diet and barium studies of the oesophagus were normal.

Histological examination showed the wall of the cast to be composed of stratified squamous epithelium resembling the normal oesophageal lining, with fragments of fibrous tissue attached to the separated surface. There were no inflammatory or degenerative changes.

COMMENT

A comprehensive review of the literature by Patterson (1935), in which he lists 17 previously recorded cases, adding one of his own, represents the most recent available publication on the subject and brings out the main features of the condition. The incidence has been equally distributed between the sexes, and the ages of the patients have varied between infancy and 69 years. The good prognosis is emphasized, and, as is to be expected from the superficial nature of the epithelial separation, in no case has subsequent stenosis occurred. Repeated cast formation, however, was a feature in three of the cases reviewed by Patterson, and Muir (1951) mentions a similar example.

As regards aetiology, infiltration of the deeper layers of the cast by inflammatory cells is not infrequently described,

and has been taken as evidence in support of an inflammatory basis for the lesion. In many other cases, however, as in the present one, no such histological feature has been present, and the systemic upset to be expected in the presence of an inflammatory process has been lacking. Significance has also been attached to a story of repeated minor trauma, chemical and physical, the result of dietary indiscretions, and Patterson explains his own case along such lines. In others the production of the cast has followed the swallowing of such varied substances as alcohol, chloroform, industrial spirit, hard crusts, or unusually hot food. No such mechanism can have been operative in the present example, and comparison of the incidence of the condition with the probable incidence of such minor oesophageal trauma would seem to indicate the unimportance of this factor.

Psychogenesis and muscular spasm with resultant epithelial devascularization have also received mention. The suggestion that the condition may represent an atavistic tendency akin to casting of the skin in lower species is not phylogenetically credible.

It may be concluded that no satisfactory explanation has as yet been put forward for what is a rare, benign, but distressing condition.

I am indebted to Dr. T. H. Crozier for permission to publish this case and to Dr. T. H. Crozier and Dr. D. A. D. Montgomery for their encouragement and advice. Dr. A. L. Wells kindly supplied the histological report, and Mr. D. McA. McHaffey the photograph.

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Armchair Dermatitis

This account of two recent cases is written in order to draw attention to a characteristic dermatitis in which the exogenic agent might be overlooked.

Case 1.—A grocer aged 44 had a history of sensitivity to turpentine in 1947. For three months he has had a rash starting below the right elbow and then spreading to below the left elbow. The rash cleared whilst he was on holiday, but relapsed when he returned home. He works with his sleeves down, but takes off his coat when sitting in his armchair at home. On examination there was a subacute patch of eczematous dermatitis over the extensor aspect of both forearms below the elbows. A patch test to the artificial leather of his armchair was positive.

Case 2.—A goods guard aged 32 had had eczematous patches on the extensor aspects of his forearms for two years. He previously worked as a shunter with his sleeves rolled up, but for the last two months in his present job he had kept his sleeves down without benefit. At home he sits in an armchair with his coat off and his sleeves rolled up. On examination there was a patch of lichenified eczematous dermatitis over the extensor aspect of both forearms below the elbows. A patch test to the artificial leather of the chair was positive.

These patients presented an identical picture of a chronic patch of eczematous dermatitis over the extensor aspect of each forearm below the elbows. The site of the lesion on apparently covered areas seemed to rule out an external irritant; the appearance of the rash suggested a diagnosis of localized neurodermatitis, though this is usually limited to, or more marked on, one arm, usually the left in right-handed persons. Further questioning of Case 1 revealed the patient's habit of sitting at home with his coat off and sleeves rolled up, resting his forearms on the artificial leather of his chair. In Case 2 the diagnosis was made at once from its similarity to the first one. In both instances patch tests with the artificial leather from the chair were positive.

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Reviews

HAND INJURIES

Functional and Surgical Anatomy of the Hand. By Emanuel B. Kaplan, M.D., F.A.C.S. (Pp. 288; 132 figures. £4.) Philadelphia and London: J. B. Lippincott Co. 1953.

Surgery of Repair as Applied to Hand Injuries. By B. K. Rank, M.S. (Melbourne), F.R.C.S., F.R.A.C.S., and A. R. Wakefield, M.S. (Melbourne), F.R.C.S., F.R.A.C.S. Foreword by Sir Gordon Gordon-Taylor, K.B.E., C.B., LL.D., Sc.D., F.R.C.S., F.R.C.S.(Ed.), F.R.A.C.S., F.A.C.S., F.R.C.S. (Canada). (Pp. 256; 188 figures. 40s.) Edinburgh and London: E. and S. Livingstone. 1953.

War and industry have this in common, that they both produce injuries of the hand, injuries the repair of which to-day forms one of the most important problems by which the surgeon is faced.

Fortunately the progress of surgery has made possible repairs which 20 years ago would have seemed hopeless, and the surgeon may now treat grave injuries with every prospect of success. But this success has been achieved only by laborious effort and by a new appreciation of the anatomy and function of the hand such as may be found in the books under review. The reader may at first be appalled by the amount of detail involved, but he will gradually realize that it is upon this detail that progress has depended. The field has in fact become highly specialized, and success can be attained only by those who are prepared to give the time and attention which such specialization demands.

Kaplan treats the anatomy of the hand from a very original standpoint, consistently bearing in mind the function which it serves. Profuse illustrations based on special dissections and drawn by an artist who evidently combines anatomical knowledge with a high degree of artistic skill enable the reader to appreciate and visualize descriptions of detail which might otherwise be obscure. As an example we would mention the chapter devoted to opposition, the exquisite and most complex movement by which the thumb is brought into symmetrical relation with each finger in turn. We would only suggest, however, that it is a function of the whole hand and not of the thumb alone. The chapter on surgical approach is of real value, particularly the description of Dupuytren's contracture illustrated by special dissections of a novel character.

Equally original is the description of hand injuries by Rank and Wakefield, the importance of which in industry can scarcely be overestimated. Their approach is essentially practical and is based on a wide experience of every type of injury.

They fully appreciate the importance of what might at first seem trivial injuries and show how subsequent deformity may be avoided; and they give superb examples of the results which can now be obtained in injuries which might well be regarded with despair. Perhaps the grafting of flexor tendons is one of the most dramatic advances, with a recovery of function of value untold. An interesting chapter is the one on injuries of the hand in children and the special problems involved. But no reference is made to the curious fact that the nerves in children are very nearly as large as those in adults, out of all proportion to the other structures, so that suture of such a nerve as the deep branch of the ulnar is easy, with a functional result which can rarely be obtained in the adult. This is a small point and in no way detracts from the great value of the book or the splendid achievement of the results it describes.

The two books are in many ways complementary and will well repay the study of surgeons who are working in this difficult and important field.

HENRY SOUTTAR.

ULCERATIVE COLITIS

Ulcerative Colitis and Its Surgical Treatment. By Bryan N. Brooke, M.Chir., F.R.C.S. Foreword by F. A. R. Stammers, C.B.E., T.D., B.Sc., Ch.M., F.R.C.S. (Pp. 147; 89 figures. 37s. 6d.) London: E. and S. Livingstone Ltd. 1954.

"The surgery of ulcerative colitis is essentially destructive. It comes in where medicine has failed, and has no place as an adjuvant to medical treatment." This statement, made by me in 1940, is quoted as an introduction to Chapter V by the author, who adds, "Since that time the approach to treatment has entirely changed." The only change is in the interpretation of the word "medicine." I use it to mean "treatment by non-operative means." Mr. Brooke gives it the interpretation of treatment by one holding the right trade-union ticket. Otherwise we have no quarrel.

I agree wholeheartedly with him that "physician and surgeon should act together in a unit," not alone in the treatment of ulcerative colitis, but in that of peptic ulcer, thyrotoxicosis, and hypertension. Apart from this terminological dissonance, the purpose of Mr. Brooke's book is to show that the surgical treatment of ulcerative colitis comes in when medical treatment has failed. There is a stage up to which recovery is possible without surgery, but after the colonic mucous membrane has been destroyed beyond a certain point no "adjuvant" operation such as appendicostomy, caecostomy, or temporary diversion have any place. The author gives careful thought to the possibility of eventually restoring anal defaecation, and comes to the conclusion, as have all surgeons with sufficient experience (and sense), that the attempt is unjustified.

The book is a record of personal experience and the statement of a personal viewpoint. Mr. Brooke's particular message is the belief that the omnibus category of ulcerative colitis includes three distinct conditions—ileocolitis involving the lower ileum and proximal colon, ulcerative colitis involving eventually the whole large intestine but appearing earliest and maximally in the distal colon, and proctosigmoiditis, which is limited to the distal colon. Many surgeons consider that these three are but manifestations of the same disease and that every gradation is found between them, but the author makes a good case for the segregation of the first at any rate.

The surgical treatment is admirably described, and the author's own results, which are better than most, are analysed in detail. The book is well produced, as are all monographs emanating from the Livingstone stable. The illustrations, which include a wide assortment of radiographs and many photographs and photomicrographs in colour, are excellent. It is a book that should be read by every surgeon who may deal with this distressing disease, and certainly by every candidate for a higher surgical degree.

HENEAGE OGILVIE.

THE THYROID

The Thyroid: A Physiological, Pathological, Clinical and Surgical Study. By T. Levitt, M.A., F.R.C.S.(Eng.), F.R.C.S.(Ed.), F.R.C.S.I. (Pp. 606; 502 illustrations. £5 5s.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

This book is a sumptuous expansion of the findings and thesis that Mr. Levitt published in the *Lancet* in 1951. He considers that diseases of the thyroid, excluding inflammatory and neoplastic conditions, can all be regarded as a part of six phases in the continued process of degeneration of the toxic thyroid gland. The histology of these phases in sequence is: (1) epithelial hyperplasia, (2) lympho-epithelial hyperplasia, (3) focal lymphoid hyperplasia, (4) diffuse lymphoid hyperplasia, (5) fibro-lymphoid hyperplasia, and (6) fibrosis. These were found to correlate with incidence and severity of thyrotoxicity, which was high in the early groups and diminished in the later ones. Group (5) is Hashimoto's type of disease and (6) Riedel's.

The material on which this thesis is based, 2,114 consecutive thyroidectomies, is presented in numerous tables, photographs, and diagrams. A well-illustrated description of the

pathological and clinical features is given of the average case in each phase. But the objective means by which the thyroid or patient was coded into the scheme are withheld. Thus, on the pathology side, we read that three carefully selected blocks were taken from each gland and on their histology were allocated a place on the epithelial-lymphoid-fibroid scale. We are not told whether the selection of blocks was done on an anatomical basis or on appearance. Nor are we given the average weights of the resected thyroid tissue. We have no idea how the proportion of lymphatic to epithelial tissue was assessed, whether by cell counts or measurement of cellular areas. There is no reference to controls, done, for instance, on post-mortem material from euthyroid patients. Clinically the patients are designated as mild, moderate, or severe thyrotoxic, but the criteria used to separate the cases studied are not given. We cannot tell from the tables whether the designated state refers to the patient at the time of operation or many years previously. Mr. Levitt states that toxicity was present or had been present in all 30 of the patients in the Hashimoto group. In 18 it was mild. He later says, with regard to the diagnosis of mild toxicity, that "all the intuitive ingenuity of the observer is required to elicit the evidence of any mild toxic phase in the previous history. Close co-operation of the patient's relatives has proved invaluable in assessing this type of patient." One cannot avoid the impression that Mr. Levitt's enthusiasm and belief in his thesis have led him to strain fact to fit theory.

This impression is strengthened by the tone of the chapters on the physiology of the thyroid and its relation to the other endocrine glands of the body. These, like the rest of the book, are presented in the main as a series of hypotheses which flow in abundance and are put down in such a manner that they read as statements of fact, whereas in truth they are mostly theory. For example: "A refractory interval or rest phase intervenes between secretion and proliferation, in order to promote the process of natural recovery. During this interval, the relatively non-receptive epithelial cells of the acinus fail to respond to the stimulus of the thyrotropic hormone." "Under the influence of stress the pituitary secretes, in varying degrees, an excess of its many tropic hormones, which include the two factors with which we are immediately concerned—thyrotropin and collagenin."

This is an unusual and very personal medical book. The production is magnificent—in fact, quite seductive. But I am afraid that the work as a whole will irritate the serious student beyond measure.

I. DONIACH.

CHILD HEALTH AND THE STATE

Child Health and the State. By Alan Moncrieff, M.D., F.R.C.P. Newsholme Lectures, 1953; London School of Hygiene and Tropical Medicine. (Pp. 48; 6s.) London, New York, and Toronto: Geoffrey Cumberlege (Oxford University Press), 1953.

Scratch a paediatrician and you may or may not find an exponent of child health. But there is no need to scarify Professor Moncrieff, because his work and his publications have long since established him as a distinguished leader in child health. This little book contains the three lectures delivered by him as Newsholme Lecturer for 1953.

The first lecture, on infant welfare, is wise and sound and evolutionary rather than revolutionary in tone. Indeed, one gets the impression that the author feels that we are on the right road but there is still a lot of mileage to cover—and that is true. Professor Moncrieff appears to believe that the local health authority child welfare service is a State service. The medical officer of health and his colleagues are employed by and responsible to a local authority and not to any Ministry or Minister, and on the financial side, although the State is responsible for providing nearly all the remuneration of consultants and general practitioners, it provides only about half the amount of the salaries of local authority medical officers.

The second lecture, on school health, is more stimulating, perhaps because there is more to argue about. A combined

child health service which is here suggested, as it has been before, seems to be right and inevitable.

The third lecture deals with the deprived child and will be found to be highly acceptable by those who enthuse about the work of the Curtis Committee and highly controversial by those who do not. The author suggests that the selection of the Home Office as the central administrative department was welcomed for two reasons, one of which was "because where homes are concerned it is not unnatural to consider that the title of the office has some meaning!" So now we know, and let us not mar the cosy contemplation of this agreeable conception by recalling some of the other functions of the Home Office.

This is a most interesting book. It will please the many who will find themselves in general agreement with the author; many others will find that the lectures are stimulating and constructive but also productive in places of disagreement. The latter group is likely to get the best out of this book.

C. MEICALEE BROWN.

GADGETS FOR THE DISABLED

Gadgets. (Pp. 78; illustrated, 2s. 6d., plus 3d. extra for postage. Obtainable from offices of the Association.) London: National Association for the Paralyzed, 1953.

"The object of this booklet is to give information about the various gadgets and appliances, already manufactured in this country or easily made, which can help to overcome the everyday problems of disabled people." This opening sentence taken from the introduction summarizes the contents of the booklet but gives no indication of the immense amount of trouble that has been taken in its preparation. While similar publications have been available in the United States for some years, this is the first comprehensive work that has appeared in Britain. Being loose-leaf, it can be readily kept up to date. It is divided into five sections ranging from "Mobility" to "Recreation." Each section gives a brief description of the gadget or apparatus, together with the name and address of the manufacturer, and indicates, where necessary, if it can be obtained under the National Health Service. Many of the gadgets are simple adaptations of articles in ordinary use to the needs of the disabled—as, for example, the non-spill plastic cup designed for infant-feeding, which has been found very helpful for those patients with a tremor or poorly co-ordinated movements of the hands. Many useful hints are included, such as smearing the inside of an egg-cup with rubber solution to create a non-skid surface. At the other end of the scale there are details of the elaborate lifting devices used for patients who are bedridden.

The work of collecting and cataloguing these various gadgets has been undertaken by the National Association for the Paralyzed with the help of many allied organizations. To those whose work brings them into daily contact with the severely disabled this booklet will prove a very useful source of reference, and to the many others who are not aware of the great strides that have been made in this particular branch of rehabilitation it will be a mine of information.

DONAL BROOKS.

A useful by-product has come from an investigation into the occurrence and distribution of essential hypertension carried out by the Division of Epidemiology and the Bureau of Applied Research (both units of Columbia University) and the Recess Commission on Hypertension of the Massachusetts State Legislature. It is a *Bibliography of the World Literature on Blood Pressure, 1920-1950*, in three volumes. Vol. 1 is an author catalogue of over 16,000 articles, reports, textbooks, and monographs. Vol. 2 is a subject index to the first volume and also includes an alphabetical list of co-authors whose contributions appear in Vol. 1. In Vol. 3 there are about 1,500 abstracts of papers selected from Vol. 1. Many of these are concerned with the incidence, prevalence, trend, and distribution of hypertension according to age, race, sex, occupation, and climate. The bibliography is edited by E. K. Koller and J. Katz, Columbia University, New York.

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ANAESTHESIA IN OUT-PATIENT DEPARTMENTS

The out-patient department sees little of trained anaesthetists. The main reason is that there are not enough of them, another is that both they and their administrative and professional colleagues consider that the anaesthetic work there is too simple to justify the presence of a specialist anaesthetist. It is not surprising therefore that the standard of anaesthesia there is apt to fall short of that in the major operating theatres, nor that accidents occur; it is amazing that they are so few. Even so, the Registrar-General's reports show that in England and Wales an average of some 60 deaths a year have been reported for the past twenty years due to nitrous oxide alone, and to this figure must be added those deaths due to other anaesthetics. The subject was aired at the Section of Anaesthetics of the Royal Society of Medicine recently by Dr. J. G. Bourne,¹ who drew attention to what is well known among anaesthetists—the low potency of nitrous oxide as an anaesthetic and the hazards that may follow attempts to obtain more than light anaesthesia with this reputedly "safe" anaesthetic. He advocated the use of a more potent agent, such as cyclopropane. Nitrous oxide is safe only in the sense that, if the patient breathes air, recovery even from the acute asphyxia of overdose occurs within a minute or two. No other interpretation of "safety" can be admitted, since nitrous oxide anaesthesia has all the lethal properties of acute anoxia when sufficient oxygen is not administered. An altogether wrong impression of this supposed safety still persists, and many are not aware that McKesson, the real pioneer of nitrous oxide anaesthesia, insisted that very large doses of morphine pre-operatively were needed to make nitrous oxide a satisfactory anaesthetic.

Most of the deaths in casualty and out-patient departments are of fit patients undergoing minor operations, and expert anaesthesia would probably have averted many of them. The remedy, however, is not simple and lies only partly in the particular anaesthetic used. Experience has shown that the

substitution of one drug by another will not prevent loss of life in anaesthesia. It is open to question, for instance, whether the substitution of nitrous oxide by cyclopropane, as suggested by Bourne, would appreciably reduce these accidents—quite apart from the new and added risks of explosion. It is not sufficient to take as sole criteria the likes of the patient and of the surgeon without reference to the anaesthetist's skill or the known physical and pharmacological hazards of the drug. Of the many valuable ideas propagated by Dr. Ralph Waters, of Wisconsin, perhaps the two outstanding are that to the patient the skill of the anaesthetist is of greater importance than the pharmacology of the drugs he uses, and that death is more likely to be due to some gross and obvious physiological cause such as respiratory obstruction or inhalation of vomit than to the more obscure pharmacological effects of the drug.

In discussing methods of anaesthesia in the out-patient department, the special circumstances there must be taken into account: the large number of patients treated every day; the need for them to be ambulant soon after their operation; and the need to use anaesthetic procedures which carry little inherent risk such as that of explosion or ease of overdose. At the inquest on a death in a casualty department in Birmingham² recently a pathologist expressed the opinion that trilene was particularly dangerous except in the hands of specialists, and he considered also that every patient should have premedication. His opinions received wide publicity, but few anaesthetists would agree with them. "Trilene" is one of the most commonly used anaesthetics in Britain and has deservedly acquired a reputation for safety. Its use is taught to students in nearly every medical school. In midwifery its administration is widespread and it will probably be placed in the hands of every midwife. Finally, at the Royal Society of Medicine meeting the other evening Laycock made a special plea for trichlorethylene in out-patient anaesthesia. As to premedication, atropine should without doubt be given if possible to every patient, but sedatives are another matter. The stay of the patient in the out-patient department might be unduly prolonged, while the certainty of the added risks of respiratory depression would more than balance the occasional benefit to the apprehensive patient. To advocate that only specialists should administer anaesthetics in out-patient departments is a counsel of perfection.

Difficulty is now being experienced all over the country in obtaining anaesthetists of any sort. There is a shortage of trained men and women in this specialty, and how to attract new entrants is at present the concern of the various national bodies dealing

¹ Bourne, J. G., *British Medical Journal*, 1954, 1, 452.

² *Manchester Guardian*, January 2, 1954.

³ Harbord, R. P., *Brit. J. Anaesth.*, 1954, 28, 64.

with anaesthetic affairs. Many undergraduates are not at present getting the training in anaesthetics they should, in spite of the requirements of the G.M.C. The time allowed to this subject compared with others is often too short in relation to its importance to the community. That the training of undergraduates in anaesthesia falls short of what it should be is also made clear in an admirable report by Harbord³ based on questionnaires sent to every medical school in the country. Teachers of anaesthesia find they are not getting the opportunities to carry out the necessary training in simple and safe methods. Some indeed in their frustration feel that anaesthesia is better kept out of the hands of the non-specialist altogether and its study limited to postgraduates. But until the number of trained anaesthetists is much greater the undergraduate must still be taught the subject and taught it well, so that when he qualifies he has one or two simple methods at his command. The problem of anaesthetics in out-patient departments is therefore bound up with the larger one of the training of undergraduates and the supply of future specialists. It deserves the closest study.

ARTICULAR CARTILAGE AND OSTEOARTHRITIS

Osteoarthritis has been recognized as a clinical entity for about 100 years, and accounts of its pathology—such as the important paper of Nichols and Richardson¹—have for half that time provided a description of the morphological changes constituting the disorder. Histological studies of this sort have directed attention to the degenerative changes in articular cartilage—described as “fibrillation” of the superficial part of the normally uniform cartilage matrix—from which all the other tissue changes of the deranged joints stem. In particular the more recent work of Bauer and his colleagues^{2,3} at Boston has emphasized the role of exaggerated wear and tear of cartilage in the pathogenesis of osteoarthritis.

Chemical studies have taught us much about the structure and function of cartilage, for in recent years an increasing number of papers have appeared on the chemical constituents of cartilage.⁴ For a long time a mucopolysaccharide, chondroitin sulphate, has been known as an important constituent of articular cartilage, and many of the elastic properties of the tissue are thought to depend on its presence. This substance was isolated from cartilage as long ago as 1890 by Schmiedeberg,⁵ and more recent chemical studies on this constituent have been summarized by Meyer.⁶ In

1944 Hirsch⁷ demonstrated histologically that the degenerated articular cartilage of the patella in early osteoarthritis (“chondromalacia of the patella”) loses its normally intense metachromatic staining reaction with certain basic dyes. Since chondroitin sulphate is regarded as responsible for this reaction, he suggested that the abnormal cartilage contains a diminished amount of this constituent and brought forward some chemical evidence in support of this thesis.

More precise chemical confirmation of changes in the chondroitin content of articular cartilage in osteoarthritis has now come from the Canadian Red Cross Memorial Hospital, Taplow. In a preliminary paper Matthews⁸ described how chemical estimations of collagen and chondroitin sulphate were carried out on samples of articular cartilage obtained at necropsy from a variety of normal joints. He found that the chondroitin sulphate content of cartilage from the knee-joint is greater than that of similar tissue from the shoulder-joint, but that the reverse holds for collagen. When weight-bearing and non-weight-bearing areas of articular cartilage were compared, the former were found to contain more chondroitin sulphate and less collagen. Matthews suggested that the greater resilience needed in weight-bearing areas is provided by the higher mucopolysaccharide content.

More recently the same author has described similar determinations in cartilage from osteoarthritic knee-joints. His results⁹ show increased amounts of collagen relatively to chondroitin sulphate, and suggest that the fibrillary change in articular cartilage, which is the essential structural abnormality in osteoarthritis, reflects different rates of loss of these two substances by the degenerating cartilage. As Matthews points out, “The evolution of fibrillation is the result of a vicious circle in which loss of chondroitin sulphate leads to decreased resilience, which in turn facilitates the mechanical perpetuation of the process.” This type of chemical study provides us with a clearer picture of what is happening in the abnormal cartilage of an osteoarthritic joint, and it is to be hoped that further studies—both chemical and histochemical—will throw light on the factors which, under normal circumstances, hold in check the degenerative process

¹ Nichols, E. H., and Richardson, F. L., *J. med. Res.*, 1909, **21**, 149.

² Bauer, W., and Bennett, G. A., *J. Bone Jt Surg.*, 1936, **18**, 1.

³ Bennett, G. A., Waite, H., and Bauer, W., *Changes in the Knee-joint at Various Ages (with particular reference to the nature and development of degenerative joint disease)*. The Commonwealth Fund, New York, 1942.

⁴ e.g., Eichelberger, L., Brower, T. D., and Roma, M., *Amer. J. Physiol.* 1951, **166**, 328.

⁵ Schmiedeberg, O., *Arch. exp. Path. Pharmacol.*, 1890, **28**, 355.

⁶ Meyer, K., *Cold Spr. Harb. Symp. quant. Biol.*, 1938, **3**, 91.

⁷ Hirsch, C., *Acta chir. scand.*, 1944, **90**, Suppl. 83.

⁸ Matthews, B. F., *British Medical Journal*, 1952, **2**, 1295.

⁹ *ibid.*, 1953, **2**, 660.

REMUNERATION OF CONSULTANTS

The Report of the Interdepartmental Committee on the Remuneration of Consultants and Specialists—the Consultants Spens—was published nearly six years ago, in May, 1948, and, along with the parallel report on the remuneration of general practitioners, was accepted by both the Government and the medical profession. This acceptance by the Government undoubtedly played a very large part in persuading the profession to enter the National Health Service, albeit with much reluctance. The two Spens reports are highly important documents and their significance may easily be lost sight of as time passes. In effect they lay down a standard of living for a learned profession which now to a large extent depends for its income upon the State. When the dispute over the remuneration of general practitioners dragged on over the months leading up to the Danckwerts award, signs were not lacking of a desire on the part of the Government to abandon the G.P. Spens Report. With such a report safely out of the way a severe limitation on the Government's capacity for arbitrary action would have been removed. The dispute, it is hardly necessary to repeat, was over the conversion of the Spens recommendations into the present-day value of money.

The negotiations which for a long time now have been in train on the remuneration for consultants and specialists are on the same theme. The recommended items of remuneration for consultants and hospital medical staffs were in terms of the value of money in 1939, and the recommendations were all governed by the second paragraph of the Spens report, which, in part, reads as follows:

“At an early stage in our deliberations it appeared to us that social and economic conditions were not yet sufficiently stable to justify the basing of our recommendations on evidence relating to remuneration in the post-war period, and the Evidence Committee was accordingly asked to obtain information of incomes earned in the year 1938–39. . . . We leave to others the problem of the necessary adjustments to present-day values of money, but we desire to emphasize as strongly as possible that such adjustments should have direct regard not only to estimates of the change in the value of money but to the increases which have in fact taken place since 1939 in incomes both in the medical and in other professions. In our judgment it is only if corresponding changes are made in the incomes of consultants and specialists that the recruitment and status of the various branches of specialist practice will be maintained.”

The “others” who are now faced with the “problem of the necessary adjustments to present-day values of money” are those who sit round the table

¹ *British Medical Journal Supplement*, 1953, **1**, 104.

of Whitley Committee “B.” The Management Side of this committee is made up of representatives of the Ministry of Health and the Department of Health for Scotland and of the hospital boards. The Staff Side is appointed by the Joint Consultants Committee (whose terms of reference, incidentally, exclude consideration of remuneration), and its members include those prominent in the Royal Colleges and Scottish Corporations and the British Medical Association. Their task is not enviable. Consultants and hospital medical staffs form a much less homogeneous body than do general practitioners, and they have very much less experience in negotiation. To this extent, then, the Staff Side is weakened, and the Management Side will accordingly be able to deploy its forces more effectively. Furthermore, certain new features have been introduced which make comparison with 1939 difficult—for example, payment of clinical teachers, and the merit awards for some third of all consultants and specialists. Was it in the minds of the members of the Spens Committee that these awards would be adjusted by whatever “betterment factor” might be agreed upon? Now that the awards, conceived of as “prizes,” have become pensionable increments to income, logic would suggest that an upper adjustment is called for. But those negotiating for consultants may find that strict logic here, as in other circumstances, is not necessarily a sound guide.

Correspondents in these columns and elsewhere have shown a growing sense of impatience and alarm over these various matters, and rumour has added its distorting voice. It is well, therefore, to recall the policy of the British Medical Association, which in this matter is represented by its Central Consultants and Specialists Committee. In the Annual Report of the Council last year¹ it was stated that the Staff Side of Committee “B” of the Medical Whitley Council had notified the Management Side in June, 1952, “of its intention to submit a claim for a review of the remuneration of hospital medical staff in order that the intention of the Consultant Spens Committee might be fulfilled and the salary scales recommended by the committee and based on the 1939 value of money should be adjusted to meet post-war conditions.” This was accepted by the Representative Body at Cardiff. Not only that, Dr. E. B. Smith, a general practitioner, put forward a motion that “an adequate betterment factor should now be accorded to the consultants and specialists, in conformity with the intention of the Spens report . . .”: the Representative Body carried this motion unanimously. On the same occasion the position was put forcibly and

clearly enough by Dr. T. Rowland Hill, Chairman of the Central Consultants and Specialists Committee, who, as reported,¹ said:

"In this matter they took their stand on the Spens Report, which defined the remuneration for different grades of hospital medical staffs, and which had been publicly accepted by the Government immediately after the inauguration of the Service, and which had also been accepted by the medical profession. . . . It might suit the dictates of political expediency to regard the Report as obsolete but that was something to which the representatives of the profession would never agree."

If either of the two big branches of the profession—general practitioners and consultants—departs from the recommendations of the two Spens reports as the basis of their deliberations, they will be on shifting sands. The decisions and actions of the one branch must have repercussions on the other. If to-day the consultants were to allow themselves to accept terms on any other basis they would prejudice the future not only for themselves but also for general practitioners. It may have been political expediency which induced the Government of the time to accept the Spens recommendations. Any fundamental change in policy must be made with the full consent of the profession's representatives; otherwise it would be interpreted as political trickery if any section of the profession were forced out of an agreed position by those who represent the Government.

IMMUNIZATION OF YOUNG BABIES

It is only within the last five or six years that such workers as Parish, Barr, Glenny, Randall, and Bousfield, in England, and Vahlquist, in Sweden, became interested in finding out what objections, if any, there were to immunizing children against diphtheria at a very young age. Holt meanwhile had been turning his attention to the development of powerful and less irritant diphtheria prophylactics, suitable for administering to infants. At first these investigations on young infants were prompted mainly by scientific curiosity, but later, with the advent of combined diphtheria and whooping-cough prophylaxis, the advantage of really early immunization against whooping-cough became obvious. Pertussis strikes early in life and strikes hard. With diphtheria prophylaxis the position is different: this disease now practically never occurs under the age of 1 year in this country. When it is proposed to immunize a young infant against the two diseases, an age for treatment must be chosen at which a satisfactory response to both antigens is obtainable. Now that diphtheria is no longer feared by the public, whooping-cough prophylaxis can become the bait for maintaining a satisfactory level of diphtheria immunization. A circular sent out by the Ministry of Health a few days ago is disturbing in that it shows that the proportion of babies who are immunized before

they reach the age of 1 year is well below the desired figure of 75%. In the first half of 1953 only 31.5% of babies under 1 year were immunized. Probably in the future immunization will be undertaken at a rather earlier age than is usual at present, and this should help to improve the present figure.

Barr and Llewellyn-Jones have recently shown that the use of mixed antigens may be a difficult matter technically. It has been known for some time that young infants with fairly large amounts of maternally endowed antitoxin are apt to respond either poorly or tardily to injections of diphtheria antigens. Elsewhere in this issue we publish a further helpful contribution to the subject from Dr. N. R. Butler, Miss M. Barr, and Mr. A. T. Glenny. Their carefully recorded investigations stress the complexity of antitoxin responses in such young subjects as week-old children, and their results seem to show that active immunization should not be undertaken in any sort of routine manner until a rather higher age. In infants 3 months old, interference with the development of immunity by residual maternally endowed antitoxin would be rarely encountered in our present population: at the most, occasional retardation of response to stimuli is likely to be met with at this age.

Several investigators are working on this problem at present, and it is too early to come to a decisive opinion. It does, however, appear that a mixture of purified fluid diphtheria toxoid and pertussis vaccine, given by subcutaneous injection in three doses at monthly intervals, is a satisfactory prophylactic for all babies of from 2 or 3 months of age upwards. The proportion of negative Schick reactions has been found by several workers to be highly satisfactory at reasonably long intervals after the inoculation. So far as can be judged at present, the results of the immunization against pertussis are also encouraging. This combined antigen, as originally produced by Holt, contained 30 Lf units of diphtheria toxoid and 10,000 million pertussis organisms in 1 ml. Similar preparations are now available from other sources.

Both Ungar and Bousfield have shown that the addition of pertussis vaccine to diphtheria toxoid greatly increases the antigenicity of the latter. So good is this mixture that the use of A.P.T. or P.T.A.P. in a combined prophylactic is now both unnecessary and undesirable when a three-injection course of treatment is to be given. The prophylactic, containing no mineral carrier, can be safely injected subcutaneously into young infants, and some believe that this method of administration may diminish the risk of post-injection paralysis. It seems logical to avoid intramuscular injections when the poliomyelitis virus is in evidence. If poliomyelitis becomes prevalent in an area all whooping-cough and combined prophylaxis should be stopped for the time being, but diphtheria prophylaxis may be continued alone, with a mild antigen. Probably three subcutaneous injections at monthly intervals of purified fluid toxoid afford the safest and yet fully adequate method of treatment. Only if the poliomyelitis risk becomes serious in an area should diphtheria immunization be abandoned entirely for the time being.

THE NORTHERN IRELAND TUBERCULOSIS AUTHORITY

The Northern Ireland Tuberculosis Authority, which has recently published its seventh annual report, was established in 1946 "for the purpose of securing, in co-operation with sanitary and other local authorities, the prevention and more effective treatment of tuberculosis and kindred diseases." A short account of the Authority was included in a recent survey¹ of the health services of Northern Ireland. A single authority charged with responsibility for a specific disease was unprecedented, but in Northern Ireland at that time there were no local health authorities organized on a county basis, although each of the two county boroughs had health departments. It was felt that an intensive campaign against the disease was needed and that this could best be conducted by a public body with power to act in all spheres over the whole Province. Consequently the Authority was given wide functions, which included the prevention of the disease, and the ascertainment, treatment, accommodation, and aftercare of patients. To carry out this work the Authority was composed of seventeen members nominated by the local authorities and by the Minister of Health and Local Government. Originally the officers of the Authority included a medical director and deputy director, but these posts were abolished as a result of a reorganization following the adoption of the Spens Report, and this, together with the fact that only one of the seventeen members of the Authority had a medical qualification, gave rise to much justifiable criticism. In 1952, however, the Authority co-opted two more medical men and appointed a medical advisory committee to advise on medical policy.

The resources taken over in September, 1947, were largely centred on Belfast, where there was a 350-bed sanatorium, an orthopaedic hospital with about 50 beds for children, a chest clinic with x-ray facilities, and a static mass miniature radiography unit. Elsewhere there were 129 beds in three hospitals; in two of these out-patient clinics were held. These clinics had x-ray equipment, but the forty-four dispensary premises which were also inherited had no medical facilities and many were rooms rented in private houses.

Considerable reorganization has taken place since the Authority assumed command. At present it controls eight hospitals with about 900 beds, while a further 700 beds are available in hospitals administered by the Northern Ireland Hospitals' Authority. There are now twenty-seven chest clinics scattered over the Province; nearly all are located at hospitals and have diagnostic facilities. The static mass miniature radiography unit has been supplemented by two mobile units. Administratively the country is divided into four areas, one of which has three subdivisions; each area or subdivision has a consultant chest physician and two or more chest or assistant chest physicians. The Authority has a team of about forty health visitors, and each area has a lay executive officer.

¹ Elder, A. T., *Brit. J. prev. soc. Med.*, 1953, 7, 105.

² *British Medical Journal*, 1954, 1, 368.

The degree of success attained by the venture is not easily assessed, because it is impossible to know what might have been achieved by other methods. The impression gained is one of steadily increasing activity along conventional lines. Thus, since the Authority took over, the number of available hospital beds has increased to about 1,600, or by about 30%. Clinic attendances have increased from 44,000 in 1948 to about 60,000 in 1952, while the annual number of mass miniature radiography examinations has increased from about 32,000 to 75,000. Meanwhile the annual number of new notifications (all forms) has fallen from nearly 3,000 to less than 2,000; in 1952 the notification rate was 134 per 100,000 of the population. Similarly, mortality has been more than halved; the death rate from all forms fell from 69 per 100,000 in 1948 to 30 per 100,000 in 1952.

The introduction of a B.C.G. service in July, 1949, requires special mention as a new step in prevention in Northern Ireland. At present vaccination is limited to Mantoux-negative contacts of tuberculous patients, nurses, medical students, and other specifically exposed persons, newborn children, school leavers, and volunteers.

By the end of 1952, 13,000 vaccinations had been carried out by the Authority's officers and by the medical staff of the Royal Belfast Hospital for Sick Children. A study of infant vaccination carried out at this hospital by Dr. Honor M. Purser was reported in this *Journal* recently,² and she makes it clear that the use of B.C.G. is warmly welcomed. Plans have been made for the county borough and county health authorities to co-operate in this service.

As the county health and county welfare authorities and the Northern Ireland Hospitals' Authority became effective it seemed likely that some overlapping of duties would be inevitable unless liaison and co-operation were readily established with these younger bodies. By the end of 1952 several schemes of mutual aid were in existence. Thus the local authority health departments are informed of notifications, and on request their nurses undertake home nursing with equipment provided by the Tuberculosis Authority. Again a home help service is operated on behalf of the Authority by four of the local authority health committees and by one of the county welfare committees. It appears that the Authority is well aware of the danger of duplicating services, but the degree of co-operation achieved is still imperfect. The closing stages of this experiment will be watched with interest, not only in Northern Ireland but elsewhere. If it can be judged a success, then it might well point the way for the conduct of campaigns against other diseases in other parts of the world.

LEPROSY

For many years progress in knowledge of leprosy and in ability to control the disease has been very slow. Although the bacillus was recognized eighty years ago (it was possibly the first pathogenic bacillus seen in

human tissues) it has defied all attempts at cultivation, and no animal has been found susceptible. This means that experimental work has been greatly handicapped. Treatment has been of limited value, and attempts to prevent infection in the community have been based on isolation measures which have too often caused concealment of the disease till it was far advanced. Most experienced leprosy workers have been pessimistic about the possibility of controlling the disease in the individual or the community. In recent years, however, advances in treatment and in immunology have changed the outlook of anti-leprosy work, and a review of the present situation has recently been attempted by the newly formed W.H.O. Expert Committee on Leprosy, which held its first meeting in Brazil in November, 1952. Some workers may feel that the first report¹ of this committee is too optimistic, but none can deny that much more can be done for leprosy than in the past.

The report states that "public health and not public fears and prejudices" should determine leprosy control policy, and even in these enlightened days this still cannot be emphasized too strongly. Measures for making isolation less rigid, more humane, and more practicable are suggested, and a warning is given against keeping the children of leprosy parents in special institutions for unnecessarily long periods. There is a marked difference in the degree of infectivity of "open" and "closed" cases, and members of the committee found no justification for departing from the widely practised policy of confining segregation to open cases.

The possibility that B.C.G. vaccination may have a place in the control of leprosy is at present being investigated, and Lowe and McNulty² recently described in this *Journal* some immunological studies having a bearing on this work. The W.H.O. expert committee takes the view that B.C.G. vaccination cannot be officially recommended as a control measure until large-scale trials have been conducted.

The members were of the unanimous opinion that sulphone treatment is greatly superior to methods of treatment previously in use. The parent sulphone (diaminodiphenyl sulphone, D.D.S., dapsone) has many advantages. Thiosemicarbazones are useful alternatives, but not suitable for mass treatment because of their toxicity. Streptomycin and isoniazid do not appear to be of much value in leprosy. Cortisone and A.C.T.H. have been used successfully in the treatment of the acute phases and complications of leprosy, and in sulphone allergy.

Other sections of the report are concerned with the classification of leprosy, with the lepromin test, and with histopathological examinations. These will be of interest mainly to specialists, but the document as a whole will be useful to leprologists and public health workers alike, and will, to use its own words, "contribute to the disappearance of the unnecessary horror attached to leprosy," and help to encourage anti-leprosy work along rational and humane lines.

¹ *Wld Hlth Org. techn. Rep. Ser.*, No. 71, 1953, Geneva.
² *British Medical Journal*, 1953, 2, 579.

FRUCTOSE IN DIABETES MELLITUS

There has recently been a revival of interest in the metabolism of fructose, especially in relation to the clinical problem of diabetes mellitus. The observation that diabetic animals can assimilate fructose more efficiently than glucose is not new. Minkowski¹ in 1893 showed that when fructose was given to depancreatized dogs the liver quickly produced glycogen, and this has been confirmed more recently by *in vitro* studies on liver slices from diabetic rats.² A number of American authors^{3,4,5} have studied the effect on normal and diabetic subjects of 10% intravenous infusions of fructose, and showed that fructose was utilized more rapidly than glucose by both groups. Insulin plays no part in this, although it will modify the rise in blood glucose which follows fructose infusion in the diabetic. It has been estimated that approximately 40% of the fructose is removed by the liver, presumably to form glycogen, since there is an accompanying fall in serum inorganic phosphorus⁶; a further fraction appears in the urine even at low blood concentrations, since there is no renal threshold for fructose. The level of pyruvic, lactic, and other acids rises sharply, and this is a theoretical objection to the use of fructose in diabetic acidosis. However, Daughaday and Weichselbaum⁷ could find little change in the degree of acidosis in nine patients with diabetic ketosis after infusions of fructose, and there seems to be no danger at infusion rates of less than 1.5 g. per kg. per hour. Oral administration is unsatisfactory in that much of the fructose is converted to glucose during its passage through the splanchnic area.

The finding that fructose is utilized normally by the patient with diabetes raises some interesting questions. For instance, Weichselbaum and his colleagues⁵ found large quantities of free fructose in the muscles after fructose infusion, and they believe that this hexose, unlike glucose, can be taken up by peripheral tissues in the free non-phosphorylated form, which would help to explain its rapid disappearance from the bloodstream. The ability of the diabetic to metabolize fructose supports the theory of the Coris that insulin is concerned in the phosphorylation of glucose by a specific hexokinase (glucokinase). It is known that there is a separate enzyme, fructokinase, present in liver and muscle, which is uninfluenced by insulin action. Exactly where fructose enters the carbohydrate cycle is not yet established, but the production of large amounts of citric, lactic, and pyruvic acid suggests that it is metabolized differently from glucose. Further research on this should clarify some of the details of carbohydrate metabolism. Besides its theoretical interest, fructose may prove to be a more useful sugar in conditions where glucose has a time-honoured place—for example, in the treatment of hypoglycaemia. It remains to be seen whether it will supplement established methods in the treatment of diabetic coma.

¹ *Arch. exp. Path. Pharmac.*, 1893, 31, 85.
² Chernick, S. S., and Chaikoff, I. L., *J. biol. Chem.*, 1951, 188, 389.
³ Miller, M., Drucker, W. R., Owens, J. E., Craig, J. W., and Woodward, H., *Jun., J. clin. Invest.*, 1952, 31, 115.
⁴ Smith, L. H., jun., Ettinger, R. H., and Seligson, D., *ibid.*, 1953, 32, 273.
⁵ Weichselbaum, T. E., Margraf, H. W., and Elman, R., *Metabolism*, 1953, 2, 434.
⁶ Mendeloff, A. J., and Weichselbaum, T. E., *ibid.*, 1953, 2, 450.
⁷ Daughaday, W. H., and Weichselbaum, T. E., *ibid.*, 1953, 2, 459.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

SIMPLE SKIN PATHOLOGY

BY

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In addition to the histological examination of biopsy specimens, often essential for accurate diagnosis, the clinical pathologist may give useful assistance in the diagnosis and treatment of some diseases of the skin.

As skin disease may be a local manifestation of a general disorder of the body, it follows that many of the investigations commonly performed by the clinical pathologist will have a place in dermatology. Some of these investigations are dealt with elsewhere in the present series, and it is necessary only to name them here. Others peculiar to dermatology justify more detailed attention. It may be useful to list the more important investigations which may be needed to aid in the diagnosis of skin diseases.

List of Examinations

"Parasitology"	Bacteriology	Culture of infecting organisms Sensitivity of organisms Culture of urine and faeces Sputum for tubercle bacilli
	Mycology	Direct and cultural examination of hairs, skin, and nails for fungus (dermatophytes) Examination for yeast-like organisms
	Animal Parasites	Fleas, lice, and bed-bugs Scabies Threadworms
Biochemistry	Blood	Glucose tolerance (and blood sugar) Cholesterol Serum proteins Diffusible calcium Uric acid
	Urine	17-Ketosteroids General chemical analysis Porphyrins
Haematology	Blood	Cell counts Haemoglobin estimation Bleeding and clotting times Blood platelets E.S.R. L.E. cells
	Bone marrow	Cell counts L.E. cells
	Serology	Wassermann reaction (or Kahn test)
Histology	Examination of biopsy specimens	

Bacteriology

When interpreting the result of bacterial cultures allowance must be made for the normal flora of the skin. Staphylococci which do not produce coagulase—*Staphylococcus albus*—and diphtheroid bacilli are commonly found, and occasionally other organisms such as coliform bacilli and *Proteus vulgaris*. Also there is a great difference between the isolation of a true infecting organism and a mere contaminant—for instance, pathogenic staphylococci (that is, coagulase producers) derived from the nose and trans-

ferred to the lesion. However, cultures of skin lesions are often useful in assessing the condition and also to some extent in regulating treatment by demonstrating sensitivity to antibiotics and sulphonamides, if these are under consideration. A sterile throat swab is the usual collecting implement and is, of course, most useful when pus or actual discharge is visible. Smears made on glass slides (from a second swab) should be taken at the same time. Mention should be made of examination of the gums or of ulcers in the mouth for the organisms of Vincent's angina. A smear made on a microscope slide is generally of greater value to the bacteriologist than a swab in this condition.

The malignant pustule of anthrax deserves special note, as, although anthrax is a rare condition, except as an occupational hazard, early diagnosis, often a matter of difficulty, is important. Smears should be made on glass slides of serum from a vesicle or from material scraped (gently) from the lesion. In addition, swabs are useful to provide cultural confirmation of any organisms seen in the direct film. Handle such material with special care.

As it is well recognized that normal commensals multiply rapidly in any skin lesion, it is important to take swabs for culture from the best situation in any given case, thus:

Scabbed or Crusted Lesions.—The surface of the lesion and the surrounding skin should be cleaned with 70% spirit, the crust removed, and a swab taken from underneath.

Vesicles, Pustules, or Bullae.—After cleansing with 70% spirit, the lesion is punctured and torn with a sterile needle, and the tip of a swab inserted in the cavity.

Fissures and Ulcers.—The skin should be cleansed with 70% spirit as near to the edge of the lesion as possible. A swab should then be drawn along the fissure several times, or rotated with firm pressure beneath the advancing edge of the ulcer.

In every case it is important to provide an adequate clinical description of the lesion for the guidance of the pathologist.

If bacteriological examination of urine is required, a catheter specimen is essential in the case of women, but a midstream specimen after "cleaning-up" may suffice from men. Vaginal swabs are generally useless for the cultivation of gonococci, but if these organisms are suspected the use of "preserving medium" will help in cultural investigation if the patient cannot attend the laboratory. Smears made from swabs may be of some use for direct identification of organisms, but the hosts of secondary invaders commonly encountered limit success when seeking gonococci. For *Trichomonas vaginalis* a small quantity of discharge collected in a capillary pipette is the only sure way of providing a suitable specimen. The tip of the pipette can be sealed off in a bunsen or spirit flame for transport purposes.

Bacteriological examination of faeces is not often required in dermatology, but in any case specimens present no special difficulties. Sputum examination for tubercle bacilli may be required as part of the general overhaul, and here again the usual methods of collection apply.

Fungal Infections

The examination of skin lesions for the presence of fungus is very necessary. Clinical appearances are often deceptive, and before excluding the possibility of ringworm on clinical

*Stuart's transport medium with special buffered swabs as used at the Whitechapel V.D. Clinic is required. The medium is a "sloppy" agar in bijou bottles filled to the brim in which the broken-off swab is immersed for transport.

grounds it is wise to have a thorough microscopic examination of skin scrapings made for the presence of fungus, either mycelium or spores, or both. Nails, too, are an important source of error, if laboratory examination is omitted, especially in early cases.

Now that ringworm of the scalp is much less commonly seen diagnosis depends far more on adequate mycological examination of hairs from suspected cases. Wood's light† is invaluable in demonstrating the typical fluorescence associated with microsporum infections (*Microsporum audouinii*, the commonest cause of human ringworm, and *Microsporum canis*, which also affects cats and dogs) but is useless for trichophyton infections, as no fluorescence occurs (except very faintly in favus). Unfortunately this aid to diagnosis, and the selection of the best material for examination, is not often available in practice.

Since infection is chiefly in the region of the hair follicle, breakage of the hair occurs at the mouth of the follicle or 2 to 3 mm. above it. Thus with a hand or watchmaker's lens search must be made for short broken-off hair stumps

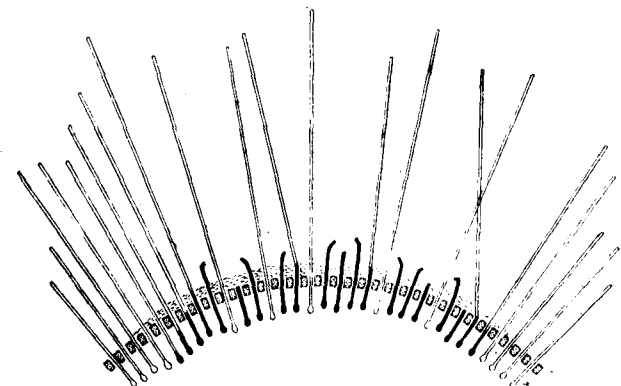


FIG. 1.—Diagram of the lesion in ringworm of the scalp, showing short broken hair stumps among normal hair. Solid black lines represent infected hair.

and some of these extracted by means of Whitfield's forceps, after swabbing the suspected area with spirit (Fig. 1). If forceps are used to depress the scalp immediately around suspected follicles, extraction of the hair is greatly facilitated. Hair stumps are placed on a clean microscope slide, another slide is pressed on to the hairs, and the two slides are secured between elastic bands for transport to the laboratory. If a microscope is at hand immediate examination may be carried out, using a drop of 20% potassium hydroxide on the slide and applying a coverslip. Both low-power ($\frac{1}{4}$ -in.) and high-power ($\frac{1}{8}$ -in.) dry lenses are employed, but the examination needs practice and it is better to seek laboratory confirmation unless some experience has been gained.

Skin lesions require scraping with a blunt scalpel. The active edge of the lesion quite near the normal skin margin is the most fruitful place for examination. Vesicles should be treated by snipping with fine scissors and submitting the "dome" of the vesicle for examination. Care must be taken to distinguish between the so-called "ide" eruptions near a primary focus, since these do not show the presence of fungus (see Fig. 2). Scrapings or other fragments of skin are conveniently transmitted between two glass microscope slides held together with elastic bands or in minute paper packets reminiscent of those for a chemist's powder. Potash specimens may also be made and examined microscopically.

Nails should be pared with sharp scissors or manicurist's nail clippers well into the diseased or misshapen area; and any cheesy material scraped out from under the nail (see Fig. 3). These specimens may also be transmitted in paper packets or in very small glass tubes.

Cultural examination of mycological specimens is at present restricted to special laboratories only, hence the importance of direct microscopical examination in clinical

†From a specially screened mercury vapour lamp.

practice. The need for cultural examination may, however, justify seeking help from one of the special laboratories (for instance, the department at St. John's Hospital for Diseases of the Skin), as identification of species plays a part in the epidemiology and prognosis, and also may determine special treatment.

Apart from the commoner dermatophyte (or ringworm) infections other superficial conditions due to fungus may be met with. In pityriasis versicolor examination of scales from the macules reveals clusters of typical round thick-walled budding cells with short mycelial filaments (*Malassezia furfur*). In erythrasma of the groins, axillary region, and other flexures examination of scales from the macular rash will show very delicate filaments, which appear to be breaking into coccil and bacillary forms (*Nocardia minutissima*). In trichonocardiosis minute nodules form on the hairs (of axillae and pubis), leading to lack of normal lustre and some brittleness. Discoloration of the hair results from superadded infection with pigment-producing micro-organisms and the hairs appear yellow, but may be black or even red. The colour may diffuse and stain the skin and clothing. Obviously affected hairs with nodules must be sought with a lens and plucked out with forceps for delivery to the pathologist between glass slides.

Otitis externa, either subacute or chronic, may be due (very rarely) to mycotic infection (*Aspergillus* species). Examination of the lining exudate is called for in these cases, and microscopical search is made for mycelium and sporing heads of fungus. This examination is not readily made on specimens submitted through the post.

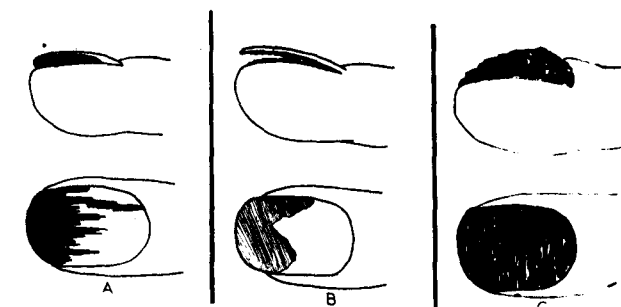


FIG. 3.—Ringworm of the nails. (A) Thickened nail with surface discoloured but otherwise unaltered. (B) Thinned, separated nail, with debris beneath surface discoloured but otherwise unaltered. (C) Irregularly thickened, raised soft or brittle nail, with surface destroyed.

Monilliasis

Infections with yeast-like organisms are becoming recognized more frequently. Monilliasis has long been known, but its importance has been increased owing to the action of

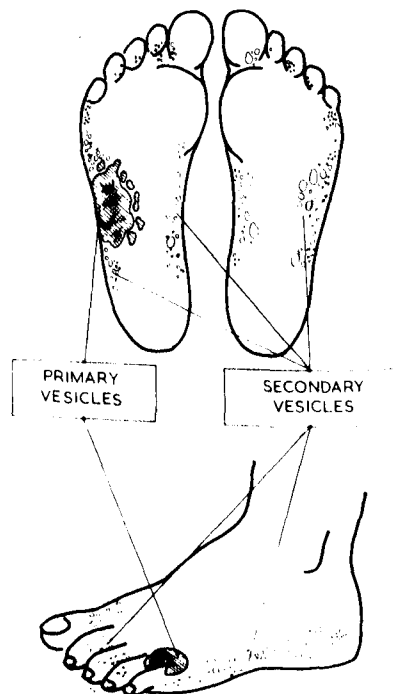


FIG. 2.—Vesicles of tinea pedis. Primary vesicles contain fungus, secondary vesicles do not.

antibiotics, which may disturb the balanced flora of the mouth, throat, gut, vagina, and even of the skin. In all these situations the causative organism *Candida albicans* exists as a normal commensal. Other factors may also lead to disturbance of the normal flora and an excessive multiplication of yeasts. Cutaneous monilliasis may simulate the ringworm or dermatophyte infections, though usually pruritus is a feature of monillial infection, whilst maceration of the skin or mucosae is also more common. Nail infections yield less destruction and debris formation, but more paronychia with monillial than with dermatophyte infections. Similar specimens serve for the diagnosis of monillial as for dermatophyte infections—namely, skin scrapings, nail clippings, and swabs from mucous membranes.

Animal Parasites

Usually little laboratory aid is required in establishing a diagnosis of bites from fleas, lice, or bed-bugs. Sometimes it is useful to confirm the presence of nits on hairs, and this is easily done with a low-power microscope, which reveals the eggs attached to the hair at some distance from its root, depending on the lapse of time since deposition by the adult female (Fig. 4).

The diagnosis of scabies on the other hand often requires laboratory aid, unless the practitioner is prepared to confirm the presence of the parasite microscopically. The acarus of scabies is only just visible to the naked eye, and a watchmaker's lens is recommended when examining the fine wavy dark lines of the skin lesions forming the burrows or runs, which occur on the fingers, wrists, palms, buttocks, etc. The usual method advocated for discovery of the parasite is to run a sterile flat cutting-edge Hagedorn needle into the burrow below the acarus, which is often seen more clearly against the darker background of the needle point. An upward movement of the needle severs the burrow and lifts the acarus free, the parasite generally co-operating in this by clinging to the needle point. While this method is quite useful, a more certain one is to gently scrape the whole area of the "burrow" with a blunt scalpel (as in taking ringworm specimens of skin). This provides debris in which

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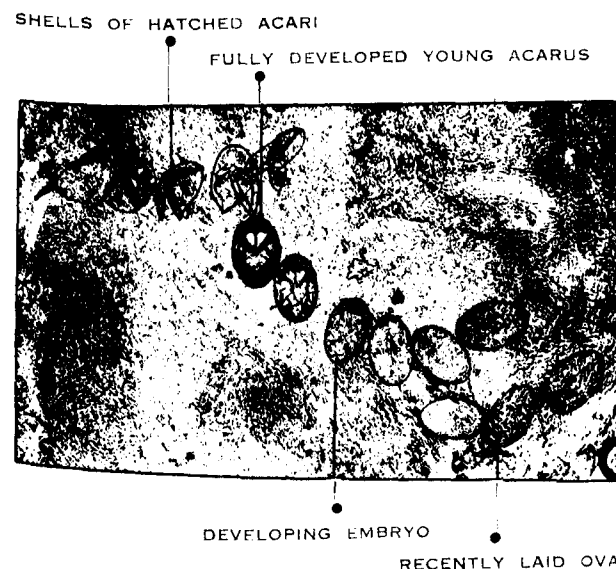


Fig. 5.—Ova of acarus in scraping of burrow. ($\times 60$.)

the parasite and her eggs (some containing larvae and others empty) may be identified on a glass slide with coverslip, using the lower-power microscope lens (Fig. 5). If it is desired to scrape the lesion an addition of some water, or 7% potassium hydroxide, will assist the operation. Material collected can, of course, be submitted to a laboratory (between glass slides) if necessary.

The possibility of infestation with threadworms, although not a common cause of pruritus ani (except in children), has sometimes to be considered. The method of establishing the diagnosis has been described by Dr. K. B. Rogers earlier in this series (January 16, p. 147).

Biochemical and Haematological Investigations

It is only necessary here just to touch on the biochemical and haematological investigations which may help in the diagnosis of skin conditions. The tests are described in other articles in this series.

In cases of furunculosis, for example, it is advisable to exclude diabetes as a predisposing cause by investigating the blood sugar. A blood cholesterol estimation (normal range 150-250 mg. per 100 ml.) may be helpful in xanthomatous conditions in which a marked rise is the rule—for example, up to 350 mg. or more per 100 ml. In lupus erythematosus the albumin/globulin ratio may be reversed from the average value of 2:1 to less than unity. The estimation of the diffusible fraction of the calcium in the serum has a place in the control of treatment of lupus vulgaris with calciferol.

In virilizing conditions, some of which may be associated with excessive hairiness, the urinary 17-ketosteroids will give assistance, while in cases of suspected light sensitization, or photodermatitis from contact with substances such as eau de Cologne, examination of the urine for porphyrins may be indicated. The best specimen for the laboratory is the early morning urine, following restriction of fluids overnight to concentrate the porphyrins.

The bleeding and clotting times and the platelet count will be required in cases of purpura. The E.S.R. is a useful index of activity in conditions such as lupus erythematosus. In acute systemic lupus erythematosus (but not in the other varieties of the disease) the Hargraves L.E. cell may be demonstrated in specimens of oxalated blood from peripheral vessels. A sternal marrow preparation gives the haematologist an even better chance of finding L.E. cells. Lastly, the Wassermann reaction (or Kahn test) will help in the diagnosis of syphilitic lesions of the skin.

Histology

The technique of skin biopsy is a minor surgical procedure similar to that for excision of a disfiguring "spot," except that all damage to the tissue removed—by rough handling or gripping in forceps—must be avoided at all costs. It must be emphasized that without observation of the lesion *in situ* the histologist requires an accurate description of the lesion, including site of the biopsy, age and sex of the patient, and a brief clinical history. Not all skin diseases can be diagnosed histologically, but, given suitable material and provided with adequate information, the expert is likely to make a diagnosis in upwards of 60% of cases, varying with the quality of the material and the adequacy of the descriptive notes.

The conditions most usefully examined are: small tumours of, or immediately below, the skin; and lesions associated with thickening of the skin, chronic discoloration, bullous eruptions, and ulcers thought to be malignant.

In its simplest form the biopsy incision is elliptical (see Fig. 6) with overlapping ends, some 2 cm. long and 0.5 cm. across at its widest point. The line of incision should follow the natural lines of cleavage of the part. The incision must be deep enough to include some of the subcutaneous fat. Preliminary cleaning of the skin with 70% spirit containing 1% "dettol" is the ideal. A 2% procaine solution, preferably without adrenaline, is infiltrated around (but not

under) the proposed area of excision. The incision is made with the point of a Bard-Parker scalpel fitted with a new No. 15 blade. Cutting must be at right angles to the surface of the skin. The excision line is best raised at the extreme

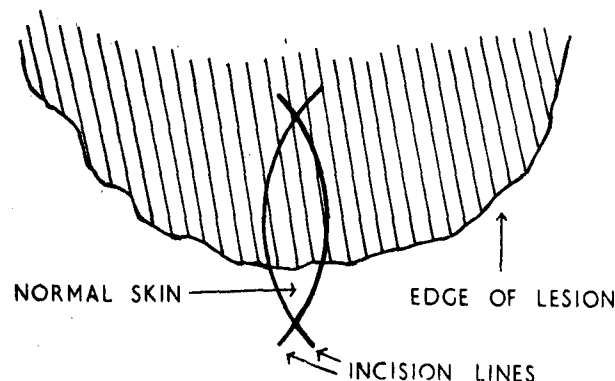


FIG. 6.—Plan of biopsy incision to include both normal skin and part of the lesion.

tip with a Kilner hook (or fine pair of "mosquito" forceps) to avoid damage during undercutting of the subcutaneous fat. The incision must be planned to include a portion of normal skin at one end of the specimen.

The specimen so obtained may be laid gently fat side downward on a small piece of blotting paper—to absorb any blood—and the whole transferred to a suitable bottle containing either 70% alcohol or saline with 10% of formalin—that is, 4% formaldehyde—the latter being preferable as it preserves fat more completely. The greatest possible care is necessary in handling biopsy specimens to avoid all pressure on the excised fragment, except at its extreme tip, which may be held gently with fine forceps.

Two or three fine sutures of ophthalmic nylon will serve to bring the edges together and the X-shaped ends allow of healing with a flattened and inconspicuous scar.

My thanks are due to Mr. R. C. Syms, chief technician in my department, for many useful points in technique and for most of the sketches.

Next article on Clinical Pathology.—"Tests for Venereal Disease," by Dr. I. N. Orpwood Price.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

Reports of Societies

LUNG RESECTION IN PULMONARY TUBERCULOSIS

A combined meeting of the Metropolitan Regional Tuberculosis Societies to discuss the place of resection in the treatment of pulmonary tuberculosis was held at the London School of Hygiene and Tropical Medicine on February 13, under the chairmanship of Dr. J. L. LIVINGSTONE.

The opening speaker was Mr. RONALD EDWARDS, who began by admitting that, because of the relatively short time for which resection had been practised, it was not yet possible to make any real comparison of its results with those of the various forms of collapse therapy. He described how in 1949 he and his colleagues at Liverpool had considered the analogy between pulmonary tuberculosis and other chronic inflammatory processes in the lungs. In chronic staphylococcal infection, for example, it was possible after overcoming the infecting organisms to remove the damaged pulmonary tissue. With the use of antibacterial drugs, might not a similar policy be feasible in tuberculosis?

The Case for Resection

Mr. Edwards then discussed the varieties of disease for which he undertook resection:—(1) *The Caseous Nodule.*—When a lesion of this sort had a diameter of more than 2 cm. he regarded it as being potentially dangerous, and especially so if there had been evidence at any time of cavitation in it. When he began to resect these lesions it was usually possible to find tubercle bacilli in them. More recently, after longer periods of antibacterial drug treatment, far fewer bacilli had been seen and it was frequently impossible even to culture them. The bacteriologists had been unable to give a clear answer to the question whether or not these organisms were dead. This clearly was the crucial question, because it would seem unnecessary to remove tissue incapable of producing progressive disease. Mr. Edwards answered by saying that he believed that many of these treated lesions if not removed do, in fact, cause later spread of disease. (2) *Destroyed Lung.*—This was generally accepted as an indication for resection. (3) *Bronchiectatic Areas.*—Mr. Edwards pointed out that localized bronchiectasis due to non-tuberculous disease was frequently treated by resection, and he thought that similar considerations applied to bronchiectatic areas in association with tuberculosis. He regarded treatment with thoracoplasty as unreasonable in the presence of bronchiectasis and preferred to remove the affected portion of the lung. (4) *Fibro-calcic Disease.*—Under this heading Mr. Edwards discussed the sort of cavitated lesion which used to be and still often was treated by means of thoracoplasty when situated in the upper part of the lung. He pointed out that it was now widely accepted that isolated cavitated disease in the apical segment of the lower lobe was best treated by resection, and he thought it unreasonable to treat a similar condition in the upper lobe differently merely because of its site. Such disease in the upper lobe was frequently entirely or almost entirely confined to the posterior and apical segments, and he had often restricted his resection to the affected segment or segments. These segments were often destroyed and functionless, and if collapsed under a thoracoplasty were bronchiectatic. On these grounds also, he thought resection was the preferable treatment. (5) *Empyema Associated with Underlying Pulmonary Disease.*—The treatment of tuberculous empyemas with the older methods of thoracoplasty preceded by repeated aspiration or surgical drainage was far from satisfactory, and modern methods of excising the empyema with the affected part of the underlying lung were a very great advance.

Mr. Edwards said that he had not entirely given up thoracoplasty; especially when the pulmonary disease was rather widespread he might carry out a thoracoplasty if the most severely affected area was suitably situated for this form of treatment. He felt that if a patient was to be treated by resection it should be possible to remove all the major areas of disease. On some occasions this might necessitate an operation on each side of the chest. In the elderly also Mr. Edwards preferred thoracoplasty to resection, which was usually not well tolerated. So far as pulmonary function is concerned, Mr. Edwards did not think that resection had any marked advantage over thoracoplasty. In fact, he found it often advisable to do a small thoracoplasty as well as the resection to prevent over-expansion of the residual lung. Referring to post-operative complications, Mr. Edwards admitted that a bronchial fistula was a worse disaster than any of the complications of thoracoplasty. However, it was very rare, and apart from this he had found the complications of resection less troublesome than those of thoracoplasty. Thus, spread of tuberculous infection to the lower part of the same lung or to the other lung, which Mr. Edwards regarded as a feature of thoracoplasty, was a much more serious event than any of the commoner complications of resection.

Patients treated by means of resection were usually back to active life in six to nine months after operation. Mr. Edwards described how in association with the chest physicians of his area much of the preliminary treatment and

aftercare was carried out at home, and many of his patients were in hospital for a few weeks only. In conclusion he gave some of the results of a recent survey of the patients he had treated over the past five years. The number of patients operated on five years ago was 11, of whom 10 were alive and well. Those treated four years or more ago number 112, of whom five were dead (three post-operatively), 10 not well, two lost sight of, and 95 well and working. So far as his total figures were concerned, Mr. Edwards and his colleagues had operated on 1,023 patients with a post-operative mortality of 1.95%. These were rightly acclaimed by the other speakers as truly remarkable results.

A More Conservative View

The next speaker was Mr. T. HOLMES SELLORS. While accepting resection as an essential part of the modern treatment of pulmonary tuberculosis, he wished, he said, to put forward a more conservative view than that of Mr. Edwards. He wondered whether pulmonary tuberculosis could really be safely regarded as a purely local phenomenon rather than as part of a general disease. Little was known of the fate of the caseous nodule, and he questioned the need to remove all small lesions of this sort. He pointed out, as had Mr. Edwards also, that the social background of the patients had often an important bearing on whether or not they could be treated surgically. Thus, lesions which might well be best excised from a patient who needed to return to vigorous manual labour could often be left alone in a patient who followed some quiet sedentary occupation.

Mr. Holmes Sellors felt that the complications of resection were considerable and could not be ignored. He gave his own figures for thoracoplasty and for resection for the years 1946 to 1952. He had carried out thoracoplasty on 1,171 patients compared with 538 resections. He showed diagrams illustrating the sort of lesions for which he regarded resection as being indicated. These were large, solid foci; thick-walled, unclosed cavities under artificial pneumothoraces; cavities in the apical segments of lower lobes; unclosed cavities beneath thoracoplasties; acute progressive destruction of a lung; and a shrunken, fibrosed, destroyed lung. He showed slides of radiographs illustrating some of these conditions, and made the point that, unlike Mr. Edwards, he did not regard upper lobe bronchiectasis as a contraindication to thoracoplasty. He thought that broncho-stenosis rather than bronchiectasis was an indication that resection and not collapse therapy should be used.

Medical Experience

Dr. J. G. SCADDING spoke next. As a physician he had a much smaller number of patients who had been treated by means of resection, but he had the advantage of being able to follow personally the course of each one. Since 1948, 45 of his patients had been treated in this way. He divided these for purposes of description into 25 cases in which the indication for resection was strictly localized disease, 12 in which it was residual localized cavitated or large caseous lesions after previous treatment by other methods, 6 in which resection was accompanied by pleurotomy for tuberculous disease of the pleura, and 2 with localized tuberculous bronchiectasis. One of the main points upon which Dr. Scadding laid emphasis was that the disease requiring treatment should be strictly localized. He had used lateral as well as antero-posterior tomograms in addition to postero-anterior and lateral radiographs to be as certain as possible that the lesions were confined to those pulmonary segments which it was proposed to resect. As an example of one variety of localized disease, Dr. Scadding showed slides of radiographs of a patient with a lesion of the bronchial cold abscess type. The presence of this sort of lesion could often be suspected from tomograms, which show a thickened bronchus leading up to a sharply outlined nodule with smaller satellite nodules. After preliminary treatment with antibacterial drugs this kind of lesion was best treated with resection. Dr. Scadding also showed radiographs of a pneumonic localized lesion which, again after

preliminary treatment and care in demonstrating the absence of disease in other parts of the lung, had been treated by resection of the affected segment. Another condition which Dr. Scadding had treated by means of resection was tuberculous bronchiectasis. By this he meant a progressive caseous ulceration and distension of bronchi. The residua of previous treatment formed another group of conditions which had been treated by means of resection.

Dr. Scadding then spoke of the very real improvement in the treatment of tuberculous empyema which had come with the use of pleurotomy either alone or, as in the cases to which he referred, in association with the removal of underlying diseased pulmonary tissue. In this group he mentioned two of particular interest in which pleuro-pneumectomy was undertaken for the acute rupture of tuberculous cavities into the pleural space with the rapid development of a pyo-pneumothorax. In one of these the rupture was into an existing artificial pneumothorax. Dr. Scadding considered that collapse treatment, either medical or surgical, was still to be preferred in cases in which localization of the disease was not so precise, and stated that, in the period reviewed, about twice as many of his patients had been treated by surgical collapse procedures as by resection.

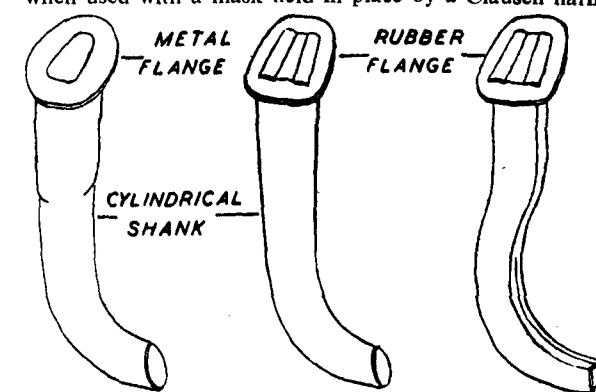
Discussion

In the discussion which followed a number of physicians as well as surgeons took part. In replying to some of the points raised, Mr. RONALD EDWARDS said that he regarded patients between 16 and 20 years old as not very suitable for resection. He found that their disease tended to be unstable, and he preferred to carry on their treatment with other measures until they were older. He said that he now did a thoracoplasty after every upper lobectomy, and also very frequently after segmental resection of the upper lobe, as he had found that this tended to reduce the incidence of air leaks into the pleural cavity.

Preparations and Appliances

"HYBRID" PHARYNGEAL AIRWAY

Dr. A. H. GALLEY, of King's College Hospital, London, writes: Some anaesthetists still prefer to use a Hewitt or a Phillips pharyngeal airway because of their ample cross-section and ease of insertion. Unfortunately, they both have metal flanges which occasionally cut or bruise the lips when used with a mask held in place by a Clausen harness,



PHILLIPS 'HYBRID' GUEDEL

for only too often the flange has a way of slipping under the cushion of the mask and being pressed into the flesh. To circumvent this complication I have had a "hybrid" airway made which has a Phillips-type end or shank, but a rubber flange, like that of the Guedel—thus combining the better features of each of these airways. The manufacturers are Messrs. A. Charles King Ltd., 27, Devonshire Street, London, W.1.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Valvotomy in Mitral Stenosis

SIR,—The suggestion made by Dr. H. E. S. Pearson (*Journal*, January 23, p. 216) that valvotomy might benefit patients with extreme narrowing of a rigid mitral orifice is certainly one which concerns us. The main purpose of our paper (*Journal*, November 14, 1953, p. 1059) was to guide those not closely associated with cardiac surgery in the selection of cases most likely to benefit from valvotomy, and to this end we emphasized the importance of a pliant diaphragmatic valve. We do not for a moment suggest that surgery should be confined to ideal cases. If we can offer a reasonable chance of some measure of relief to hopelessly crippled patients, then we must be prepared to take greater risks for less benefit.

As long as the mitral valve is operable, that is to say of diaphragmatic type and not completely rigid, then we may extend the scope of valvotomy to relatively unfavourable cases, for example to those with very large hearts, with long-standing failure, or complicated by systemic hypertension, pregnancy, and to those over 50 years of age. In such cases, however great the operative hazard, those who survive it are likely to be rewarded. Extension of the scope of operation to valves which are anatomically unsuitable for surgical correction, as Dr. Pearson suggests, is quite another matter, for here the reward is problematical.

It is true, as Dr. Pearson shows, that minimal widening of an extremely constricted orifice will permit a considerably increased flow, but this applies to flow in two directions. Owing to the higher pressure gradient between ventricle and auricle during systole, widening of a completely rigid valve may increase regurgitation disproportionately to normal flow, and the result may be the reverse of beneficial. The limits of operability in respect of rigid valves have not yet been fixed, and in a doubtful case surgical exploration of the mitral orifice is sometimes justifiable before it is finally classed as inoperable.

While we are much in sympathy with Dr. Pearson's plea, nevertheless we believe that the paramount indication for mitral valvotomy must remain the presence of a valvular lesion which is amenable to surgical correction. Given this indication, then greater operative risks may properly be accepted in otherwise unfavourable cases.—We are, etc.,

D. EVAN BEDFORD.
T. HOLMES SELLORS.
WALTER SOMERVILLE.

London, W.1.

Rheumatic Heart Disease Complicating Pregnancy

SIR,—I agree heartily with Drs. Frank Denny and Anthony Ryle (*Journal*, January 23, p. 215) that the life of the under-privileged mother living with her increasing family in a single room at the top of a tenement will surely throw an intolerable strain on a diseased heart.

The religion of the majority in Eire makes no ethical objection to the limitation of the family under such circumstances. It does, however, distinguish between natural and artificial means of doing so. Natural means such as continence or the use of the safe period are considered to be in accordance with the natural law, whereas artificial means such as contraception, therapeutic abortion, or sterilization are considered contrary to that law, on the grounds that the first is a perversion, or turning away of a function from its natural purpose, the second is a direct killing of an innocent life, and the third a self-mutilation unnecessary to the life and health of the whole body. Nor does the excellent end in view justify these unworthy means.—I am, etc.,

Dublin.

JOSEPH BARNES.

Reaction to Blood Transfusion

SIR,—We were rather concerned to read Dr. R. D. Barnard's letter (*Journal*, February 6, p. 332) suggesting that *in vitro* compatibility tests between dextran and suspensions of recipients' erythrocytes should be routinely carried out when the use of this plasma substitute is being considered. Is Dr. Barnard aware that several of the macromolecular substances currently available as plasma substitutes produce pseudo-agglutination of erythrocytes to a greater or lesser degree, depending on the molecular size and the concentration of the polymer which is used in the test? For this reason, if cells are suspended in a 6% clinical dextran solution and examined after 5 to 10 minutes, virtually 100% of potential recipients would be assumed unsuitable for infusions of these plasma substitutes, if we interpret Dr. Barnard correctly. It has, of course, been known for some time that erythrocytes suspended in solutions of gelatin, gum acacia, polyvinyl alcohol, and dextran are agglutinated by incomplete antibodies. When these colloid media are used as alternatives to 20% albumin, it is necessary to avoid rouleaux formation by choosing a dilution and molecular size of the polymer which will still promote cell agglutination by the incomplete antibody. It is true that many macromolecular substances possess potential antigenicity for man, but surely this does not imply that they can stimulate the production of specific blood group antibodies *in vivo*, nor can one arrive at the same conclusion because these macromolecules enhance erythrocyte agglutination by incomplete antibodies *in vitro*.

In view of the fact that the clinical use of these plasma substitutes, and particularly dextran, has been extensive since 1949, and has been associated with an extremely low incidence of reactions,^{1,2,3} it would appear that Dr. Barnard's conclusions are invalid on the basis of practical experience. Finally, we would like to stress that it is essential to obtain a sample of the recipient's blood prior to the infusion of these plasma substitute solutions both for grouping and especially for later cross-matching if blood is required, in order to avoid any error due to the pseudo-agglutination effect—i.e., rouleaux formation—mentioned above. We are, etc.,

FRANK FLEICHER.
L. E. MARTIN.

Research Department, Bengel's, Ltd.

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The Normal Blood Count

SIR,—I must apologize for the error in the computation of M.C.V. and M.C.H.C. (*Journal*, February 6, p. 326). The most convenient formulae are:

$$\text{M.C.H.C.} = \frac{\text{Hb. expressed in grammes per 100 ml.}}{\text{Packed cell volume, as \%}} \times 100$$

$$\text{M.C.V.} = \frac{10 \times \text{packed cell volume, as \%}}{\text{Rbc in millions per c.mm.}}$$

Fortunately, these errors cause only a shift in the decimal point, and, since the normal range is repeated several times in the article, I hope that they will cause little inconvenience.—I am, etc.,

London, N.W.10.

GEORGE DISCOMBE.

The Basis of Sensation

SIR,—Dr. E. D. Adrian in his Banting Memorial Lecture (*Journal*, February 6, p. 287) asks for new light in the field of the physiology of sensation. This new light might well come from a study of mental hospital patients, many of whom have intense sensory experiences, and where pathological lesions of the sensory tissues (ear, nose, and muscular tubes) are more commonly found than nerve lesions. It is possible that Dr. Adrian sees the problems only through the eyes of a neurophysiologist, and "advertising the difficulties" may be the surest way of "getting out of the wood." His admission that he cannot

see how further knowledge of brain physiology will help us to reconcile mind and matter is commendable, and follows Sherrington. A sharing of the "obscurity" is the first step in solving the problem.

The proof that the olfactory bipolar cells have discriminatory function is, however, not complete, since his admirable demonstration of olfactory selectivity did not go further peripherally than the mitral cells of the lobe. This leaves a doubt of the selective ability of the hair cells, which ought to be analogous to hair cells elsewhere and respond only to mechanical stimulation, as do those of the semicircular canals, the cochlea, and, in lower forms of life, the trigger cells and otocysts. The arrangement of a crown of six or more hairs on the olfactory bipolar cell seems particularly well adapted to mechanical stimulation by traction of the mucus secreted by the supporting cells. If these supporting cells reacted to odours by secretion or structural change, they might be the actual discriminatory cells. It is the basilar membrane of the cochlea which is the real analyser of sound-wave frequency, and visual selectivity is a function of the cells containing visual red and purple—i.e., not of the nerve elements. The contractile tissues which appeared during evolution before the nerve tissue must have had some selective properties. The male moth, with a rudimentary nervous system, has an almost unbelievable sensitivity, commensurate with the size and branching of the antennae, to the odour of the female, and moreover can discriminate in the presence of other odours.

A simple operation in animals frees the supporting cells of the olfactory tissues from all nerve elements. Such animals (and human beings who have lost the nerve elements by disease) might still have a specific reaction to odours of these supporting cells, and by training conceivably would associate them with other experiences.—I am, etc.,

Birmingham.

F. A. PICKWORTH.

Conquest of Plague

SIR,—In recent years there has been a disposition to deny to the late Professor Kitasato the honour of having been the first to discover *Pasteurella pestis*. The denial has been based on slight discrepancies in the cultural characteristics of the organism as described by him. Yet no criticism was ever voiced by contemporary authors of standard works, such as Manson, or Muir and Ritchie.

It is therefore good to see that Professor G. S. Wilson (*Journal*, December 26, 1953, p. 1433) has now put the matter in proper perspective by remarking that the differences between Kitasato's and Yersin's descriptions "were such as would not be regarded nowadays as of any serious differential importance." One might be tempted to add that if Kitasato's organism was not *P. pestis*, what was it? And why has it never been seen or heard of again?

In May, 1894, my father was a medical officer in the Colonial Medical Service in Hong Kong. It fell to his lot to diagnose the first case of plague found there, and on his shoulders rested a great deal of the work in the early stages of the epidemic. Among his duties was to take Kitasato and Yersin round the hospitals on their arrival in Hong Kong. He kept a diary, and the following brief extracts may not be without interest. They confirm the statements of Dr. L. Fabian Hirst (*Journal*, December 26, 1953, p. 1432).

"Sunday, May 6 (in Canton): Went into town to see plague and saw large number of cases with Rennie. May 8 (back in Hong Kong): . . . 1 a.m. Diagnosed Ah Hung as suffering from plague and isolated him. May 12 . . . rabbit and guinea-pig injected from Ah Hung. 26 deaths reported from plague. Ah Hung died. May 15 . . . guinea-pig dead in the morning. June 13 . . . Kitasato and Co. taken round. June 14 . . . Kitasato discovered bacillus. June 15 . . . wired *Lancet*. June 16 . . . took Frenchman (Yersin) round in afternoon. June 20 . . . P.M.s galore. Japs hard at work. June 23 . . . Frenchman got his bacillus. June 27 . . . slides off to Woodhead (German Sims: these slides were shown at the B.M.A. Annual Meeting in Bristol). June 28 . . . dined with Kitasato and Aoyama at Hong Kong Hotel. After getting home, called up an hour later and went back

to hotel to find Aoyama and Ishigami with high temperatures and glands. . . . Aoyama axillary and Ishigami femoral. Aoyama got it from mortuary case. July 1 . . . Aoyama very ill. July 3 . . . Aoyama and Ishigami still struggling. July 7 . . . Aoyama very ill. (He recovered.) July 10 . . . Kitasato's paper transmitted to *Lancet*."

It will be seen that Yersin took a week to find his bacillus. The reason for this was that he would not work in the same building as Kitasato, and it took him some time to get up his own mat-shed in which to work.—I am, etc.,

Victoria, Australia.

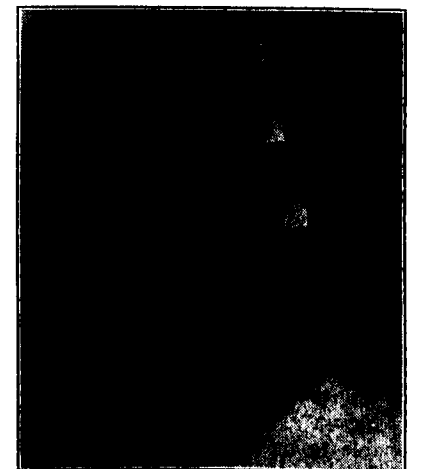
J. M. A. LOWSON.

Reduction of Fracture with Succinylcholine Chloride

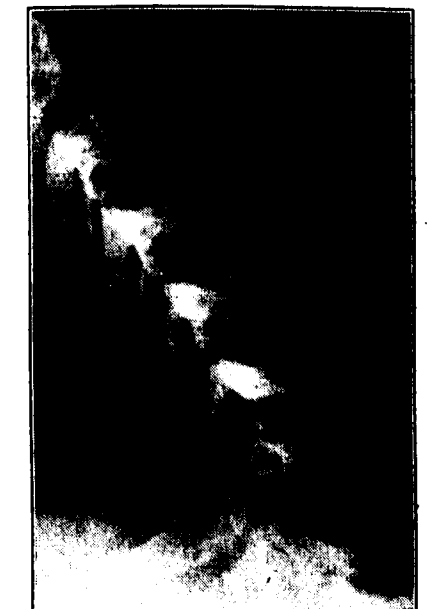
SIR,—The following case of a fractured cervical spine which normally would have required traction with skull callipers, but which was fully and completely reduced by the use of thiopentone ("pentothal") plus succinylcholine chloride ("scoline"), may be of enough interest to your readers for its reproduction in the *British Medical Journal*.

A male Dyak, aged 26, was admitted to Miri Hospital with a 12 days' history of trauma during a drunken fight, followed by

unconsciousness, after which he was found to be paralysed completely from the neck down. On admission a transverse section of the cord was indicated at and below the level of the 5th cervical segment. His urine was heavily blood-stained, most likely from a ruptured kidney, but, as his condition has not deteriorated and the urine is clearing, to date this has not been investigated. X rays showed a crush fracture of the body of the 6th cervical vertebra with dorsal displacement of the left articular facet behind that of the 5th cervical. With the patient supported in the usual way, reduction was attempted without anaesthesia by gradual hyperextension with no success. Atropine 1/100 gr. (0.65 mg.) was then given intravenously very slowly, and ten minutes later, after thiopentone 0.2 g. intravenously, succinylcholine chloride 1 ml. (50 mg.) was given. During the apnoeic period oxygen was supplied rhythmically through a face-piece only. A click was heard, but after x ray only partial reduction had occurred. Fifteen minutes later, 0.15 g. of pethidine and 1.4 ml. (70 mg.) of succinylcholine chloride were given, and by means of traction by hand plus hyperextension excellent reduction occurred easily, and confirmed by x rays. The patient has been kept in bed with the head hyperextended and between sandbags. No plaster has been applied yet. Some return of sensation to the arm has occurred, probably due to relief of pressure on the 5th cervical nerve trunks,



Before reduction.



After second reduction.

and he can appreciate abdominal pain (? vagus carrying pain fibres from the gut). After 48 hours, with routine supportive treatment, his morale and general condition are excellent, and time only will tell what recovery, if any, occurs with the cord condition.

The ease with which reduction of the fracture dislocation between the 5th cervical and the 6th cervical vertebrae was effected by use of a short-acting muscle relaxant indicates that the day of skull callipers may have passed for all but exceptional cases.—I am, etc.,

Miri, Sarawak.

K. F. D. SWEETMAN.

Presternal Oedema in Mumps

SIR.—The report by two members of the Epidemiological Research Unit at Cirencester (*Journal*, January 30, p. 258) on the occurrence of swelling over the manubrium sterni in cases of mumps prompts me to record a brief note of an outbreak of mumps in a boys' school in February and March, 1936. It occurred simultaneously with an outbreak of influenza, so that many cases could not be admitted to the sanatorium owing to lack of room and they were therefore nursed in their respective houses. It was in one of these houses that a number of cases of preternal oedema was observed in one dormitory. The oedema was well marked and was associated with swelling of the parotid and submaxillary glands and in some cases the testes were also involved, though the testicular swelling appeared some days later. That this is not invariably so is shown by two more recent cases in which the orchitis preceded the parotitis by several days. Although there have been outbreaks of mumps at fairly frequent intervals in this neighbourhood during the past 21 years, at no time have I observed any other case of preternal oedema.—I am, etc.,

Sherborne.

A. G. JEAFFRESON HARRIS.

Press Publicity

SIR.—Mr. Ritchie Calder (*Journal*, January 30, p. 271) is unable to understand why certain eminent doctors appear to be outside the medical ethic. The profession at large are equally puzzled. We have seen leaders of the profession publicized by the B.B.C., bulletins on famous patients reading like the "mentioned in dispatches" after a battle, and articles in the popular press with the name and photograph of the author. At the Annual Meeting a resolution moved by the East Yorkshire Branch (*Supplement*, July 18, 1953, p. 49) designed to promote discussion of these matters was energetically shepherded out. Medical ethics are likely to remain a mystery so long as the leaders of the profession pay lip service to them.—I am, etc.,

Hull.

J. CLAPHAM COATES.

The New Insulin Zinc Suspensions

SIR.—Considerable confusion has arisen for practitioners over the new insulins; and, although there have been many publications about detailed observations, it ought to be helpful to general practitioners to have a short description of them and their uses. The following is based on an inset in the last edition of *The Diabetic Life*.¹

The Novo Insulin Laboratories in Denmark have produced three new preparations, now also manufactured in Britain, which promise an advance in treatment. They have discovered that, by using an acetate buffer instead of phosphate, insulin can be linked to zinc to produce long-acting insulins without the use of protamine, globin, or other added proteins. Hence, for one thing, the occurrence of local allergy is minimized. I shall describe the clinical use of only one, "lente," as the most generally useful; and I shall use the more meaningful terms of "lente," "semi," and "ultra" rather than the more technical chemical terms on which the *British Pharmacopoeia* insists. They are all cloudy insulin zinc suspensions, identical in appearance.

(1) Semilente: insulin zinc suspension (amorphous). This is the quickest acting with a duration of some 10–15 hours, depending on the size of the dose. It resembles the action of globin and of NPH insulin. (2) Ultralente: insulin zinc suspension

(crystalline). Slow onset, but very prolonged action, like protamine zinc insulin. (3) Lente: insulin zinc suspension. A mixture in the same bottle of 30 parts of (1) and 70 parts of (2). It thus provides a mixture of quick and long action insulins, such as have been successfully used in appropriate mixtures of soluble and protamine zinc insulin. Its action is probably smoother and more regular than the latter mixture. All the above insulins can be mixed and retain their individual characteristics: more semilente can be added in the syringe to provide quicker initial action, more ultralente to prolong action. Old types of insulin cannot be mixed with the new. Soluble (regular) insulin remains as the quickest and strongest in action, the most valuable for emergency use.

In new cases the initial dose of lente would be 20–30 units before breakfast, or 30–40 units in severely ketosed patients. Every three to four days blood and/or urine sugar tests should be carried out on out-patients or, better, daily on in-patients. The best tests are short-period tests before the evening meal and before breakfast, these times being usually those of maximum lente insulin action, when the tests should be good. If heavy sugar is found then, an increase of 5–10 units is required: for hypoglycaemia a similar reduction. The carbohydrate of the diet should be spread to meet continuous insulin action as in treatment with mixtures of protamine zinc insulin and soluble insulin. New cases, both adult and children, have responded excellently.

In changing established cases there is no hurry and little point, until more exact knowledge accumulates, in trying to change patients well controlled on any one injection-a-day treatment. To make the change it seems a good general rule to give, as lente before breakfast, the total units of the previous daily dosage of insulin. The above-mentioned tests should then be used to make necessary adjustments. Some very severe diabetics, dependent on large doses of soluble insulin, have done badly on the attempted change and I now hesitate to try it.

At present I do not know enough to dogmatize about these new preparations, but think, with modifications that are sure to come, that they introduce an important and simplifying advance which I hope will cancel the need for protamine zinc insulin, and certainly globin and NPH insulin. I hope so, because we now have the extremely confusing situation for doctors of seven insulins on the British market.—I am, etc.,

London, W.1.

R. D. LAWRENCE.

REFERENCE

¹ *The Diabetic Life*, 1952, 14th ed. Churchill.

SIR.—I wish to comment on the insulin zinc suspensions and the articles and correspondence about them (*Journals*, November 7, 1953, pp. 1021, 1023, and 1027; November 28, pp. 1215 and 1216; and December 12, p. 1325). While there are three varieties of insulin zinc suspension, known as insulin zinc suspension (amorphous), insulin zinc suspension, and insulin zinc suspension (crystalline)—"semilente," "lente," and "ultralente" insulin respectively—there are, in fact, only two new insulins—insulin zinc suspension (amorphous) or semilente insulin, and insulin zinc suspension (crystalline) or ultralente insulin; insulin zinc suspension (lente insulin) is a ready-made mixture of insulin zinc suspension (amorphous) and insulin zinc suspension (crystalline) in the proportions 3:7. Insulin zinc suspension (lente insulin) is therefore not an insulin in its own right, but a mixture of two other insulins. When one uses insulin zinc suspension (lente insulin) one is using not so many units of insulin zinc suspension (lente insulin) but so many units of insulin zinc suspension (amorphous) and so many units of insulin zinc suspension (crystalline) in the form of a mixture. For example, 40 units of insulin zinc suspension (lente) is really 12 units of insulin zinc suspension (amorphous) and 28 units of insulin zinc suspension (crystalline) as a mixture. I think it is essential to have this fact clearly in one's mind.

I think insulin zinc suspension (lente insulin) is the first commercially made mixture of insulins to be marketed. A set mixture such as insulin zinc suspension (lente insulin) cannot be expected to suit all diabetics, nor does it do so. Would it not be better to have available only insulin zinc suspension (amorphous) and insulin zinc suspension (crystalline) and with them make the mixture which controls each diabetic best? Mixtures of protamine zinc insulin and regular insulin, and of "isophane insulin" and regular insulin have long been used, and the mixtures were usually made by the patient in the syringe each day, just before injection, though sometimes larger quantities of the

required mixture were made by the physician and supplied to the patient. This practice of using mixtures suited to the individual diabetic proved satisfactory, and could be carried out using insulin zinc suspension (amorphous) and insulin zinc suspension (crystalline); it will, in fact, be necessary, as insulin zinc suspension (lente) does not suit all diabetics—quite a few of them are best suited by other proportions in the mixture. To market other ready-made mixtures would lead to chaos. It is feasible to make mixtures of insulin zinc suspension (lente) with either insulin zinc suspension (amorphous) or insulin zinc suspension (crystalline), but I think it confusing, as the exact composition of these secondary mixtures in terms of insulin zinc suspension (amorphous) and insulin zinc suspension (crystalline) is not immediately obvious and takes some working out. It seems to me simpler (and more understandable) to make whatever individual mixture is required with insulin zinc suspension (amorphous) and insulin zinc suspension (crystalline). In view of this, is insulin zinc suspension (lente) essential?

Insulin zinc suspension (amorphous) and insulin zinc suspension (crystalline) should be made in U.40 and U.80 strengths to allow any necessary mixture to be of reasonable bulk. At present they are available only in U.40 strength, though insulin zinc suspension (lente) is supplied in U.40 and U.80 strengths. Many diabetics need a large number of units of insulin daily, and the use of U.40 strength insulin results in a bulk dose, which is neither comfortable nor practicable. Even if U.80 insulin zinc suspension (lente insulin) is mixed with U.40 insulin zinc suspension (amorphous) or insulin zinc suspension (crystalline) the bulk of the resulting mixture can be uncomfortably large. I understand Dr. R. D. Lawrence's concern (*Journal*, November 28, 1953, p. 1215), because there are now seven insulin preparations on the British market (and on the Australian too). It is confusing, but it is not so easy to reduce the number. Regular insulin is essential. Globin insulin, protamine zinc insulin, and isophane insulin are used by so many diabetics that they will be in demand for a long time. Reduction of the number of insulin zinc suspensions from three to two, by discontinuing insulin zinc suspension (lente insulin) might well be considered further.

In any case, insulin zinc suspension (amorphous) and insulin zinc suspension (crystalline) should be available in both U.40 and U.80 strengths. I am, etc.,

Melbourne, Australia.

T. A. F. HEALE.

Non-specific Urethritis

SIR.—My investigations into the aetiology and clinical features of non-specific urethritis since 1942, and Dr. R. R. Willcox's recent report (*Journal*, January 2, p. 13), prompt me to put forward some points not generally appreciated.

Nomenclature.—From the literature, non-specific urethritis is as yet too often identified with non-gonococcal urethritis while, on the other hand, most venereologists are aware of a specific urethritis having the following characteristic features: (1) Incubation period following exposure is longer than that of gonorrhoea—i.e., ten days to one month; (2) a urethral discharge which, even when profuse, is clinically distinguishable from that of gonorrhoea; (3) smears are abacterial; (4) culture is negative; (5) dark-ground examination negative for *Trichomonas vaginalis*; (6) fails to respond to treatment by arsenical preparations; (7) in which there is no evidence of stricture. It is admitted that the above does not distinguish non-specific urethritis from urethritis following enteritis, but I believe these are aetiologicaly identical.

Organism.—The "blue colonies" reported by Willcox from urethral scrapings are, in my opinion, demonstrable in ordinary smears stained by Gram, and a characteristic feature of the larger "blue bodies" is that their central area stains much more faintly than the periphery, giving a "thick ring" appearance. These bodies with the central clearer area which vary in size from 1–6 μ are also easily seen by dark-ground illumination. The significance of these bodies appears to me to merit further research, not however from a viral but from a protozoal aspect, since certain protozoal bodies are rather similar in appearance and size. In smears these bodies have another characteristic—i.e., grouping of the smaller bodies into epithelial-like forms with dispersion throughout the slide of the larger (? more adult) bodies. Finally, dark-ground examination reveals two further features: hair-like fine structures varying in size from 8–12 μ in length; and bodies suggestive of pleuro-pneumonia-like organisms. The significance of the former is doubtful, and

I would suspect that they are merely fine fibrin threads except for their length within such narrow limits.

Results of Treatment.—In gonorrhoea penicillin cures the great majority of cases, and within two weeks crystal-clear urines are obtained in the two-glass test. In a very small percentage, however, a "gleet" having all the characteristics of non-specific urethritis remains, which, like non-specific urethritis, is uninfluenced by further penicillin. Since to-day the systemic triad (arthritis, iritis, keratoderma blennorrhagica) only occur in these latter cases of dual infection, it follows that gonococcal rheumatism, etc., do not exist.

In varying percentages the discharge in non-specific urethritis disappears with sulphonamides and other antibiotics, but continuing urethral pathology is indicated by the presence of persistent threads in the "first" glass, for long periods after cessation of treatment. This fact, together with the high relapse rate known to occur in non-specific urethritis and the absence of any comparable disease in the female, should prevent cure being applied to the results obtained by these substances.—I am, etc.,

London, S.E.5.

F. L. LYDON.

"Sulpenin" as a Cause of Ureteric Blockage

SIR.—A case of sulphonamide anuria following "sulpenin" therapy was reported by Mr. J. G. Callanan (*Journal*, January 16, p. 138). On the day this issue was delivered a similar case was admitted to the wards of the Urological Unit in Newcastle.

This patient had been given sulpenin for chest complications during an attack of influenza. The dose taken was more than that advised by the manufacturers, 48 tablets being taken in less than three days. Haematuria, dysuria, oliguria, and left-sided abdominal colic brought him to our care. At cystoscopy, the left ureter was found to be blocked with debris at 1.5 cm. and a catheter would not pass this point. Dramatic relief of symptoms followed the alteration of the reaction of the urine by alkalis given by mouth and intravenously. It is of interest that, at about the same time, another patient in the same practice, receiving treatment with sulpenin in smaller doses, developed similar symptoms. In this case the haematuria and colic subsided rapidly when potassium citrate was given by mouth, and we did not have the opportunity to observe her.

The risk of crystallization of the acetylated drugs in the urine may be diminished by the use of compounds of this nature, but it is not abolished. The dosage must be carefully determined, and an adequate fluid intake is required to clear the drugs without too great a concentration in the urine. The relief of symptoms which followed the administration of alkalis in these cases suggests that it would be worth while to give mist. pot. cit. as a routine, as was the practice in the earlier days of sulphonamide therapy.—I am, etc.,

Newcastle-upon-Tyne.

HOWARD JAMISON.

Medical Needs in the Gold Coast

SIR.—I read with great interest Mr. Ian Fraser's interesting article, appealing for young doctors to go out to the Gold Coast (*Journal*, October 31, 1953, p. 987), and also the subsequent correspondence. It is clear that the Gold Coast and other British Colonies offer a rich field of medical work, but there are certain awkward practical questions which occur to any young doctor in this country who contemplates a career in the Colonial Medical Service.

The following occur to me: (1) I wish to embark on a career which will keep me happily employed for at least 20 years, preferably longer. What certainty is there, with the British Commonwealth developing politically at its present rate, that I shall not find myself unemployed after 5, 10, or 15 years, just when my family responsibilities are at their heaviest? (2) Can I be certain that if my appointment is prematurely terminated for some reason, such as the grant of self-government, I shall receive fair financial compensation? And what help can I expect from the Colonial Office, Ministry of Health, or other bodies, in securing re-employment? It seems to me that doctors who sacrifice prospects in the United Kingdom in order to assist the U.K.

Government's colonial policy overseas deserve some special assistance from that Government on return. (3) I understand that the Colonial Service pensions are paid, not by the U.K. Government, but by the government of the colony in which the officer last served. Is there any guarantee that a colony which is granted full self-government will continue to pay such pensions?

Perhaps I am too "security-minded" in asking these questions, and perhaps I ought to be prepared to take a chance on some of them. I feel sure, however, that it would be very helpful to recruitment if Mr. Ian Fraser or some other authority could provide the answers.—I am, etc.,

SENIOR REGISTRAR.

Medical Auxiliaries

SIR,—My council would appreciate a little space to reply to your annotation (*Journal*, February 6, p. 325) in order that a clearer picture may be presented to your readers regarding the new regulations affecting medical auxiliaries.

The National Health Service (Medical Auxiliaries) Regulations, 1954, due to come into force on April 1, are not based on the recommendations of the Cope report, the Minister having already made it quite clear that he did not intend to implement that report. His expressed intention to remove certain anomalies and injustices have been amply demonstrated in the new regulations, and by being fair to all parties concerned the Minister has initiated the most important piece of constructive statesmanship ever evolved in the history of medical auxiliaries. Statutory registration, one of the foundation aims of the Physiotherapists Association, is the next and obvious step, and the Minister intends to set up a working party to consider the best means of bringing this about. Meanwhile the new regulations are to be an interim measure pending State registration which, without doubt, all responsible medical auxiliaries urgently desire. It is perhaps unfortunate that the full qualifying requirements affecting members of this association were omitted from the published regulations, and the following information may help to clear up this point.

As a body founded by ex-Service physiotherapists primarily to represent their interests, the entry standard was judged to be a Service grading "Class I" physiotherapist. To meet war exigencies, the normal basic course was reduced to three months, and this was followed by a nine-month period in a Service hospital under supervision of a surgical specialist and superintendent physiotherapist. At the end of this first year, a Grade III qualification was granted, provided that the usual examination had been passed. At the end of the second and third years, advancement to Grades II and I were possible after suitable examination. At the latter stage the Physiotherapists Association considered the applicant eligible for its own open examination. Membership was granted only after these qualifications had been satisfied and the open examination successfully passed.

While, therefore, only a basic preclinical training of three months had been served, the period of 33 months which followed, in which the physiotherapist studied and gained experience in Service hospitals, brought the total period to three years, the same period as that required by the Chartered Society of Physiotherapy. It will be seen that no standards are in danger, but in fact the experience and responsibilities of the Service physiotherapist would be in advance by nature of the very work upon which it was engaged. It is therefore misleading and incorrect to suggest that standards other than those of the Chartered Society of Physiotherapy may be short of the requirements.

The educational curriculum submitted by the Physiotherapists Association to the Ministry of Health and to education authorities has received strong support, and it may be interesting to record that, while the association planned for a length of training lasting three years and nine months, it has been asked to trim its syllabus so as to conform with a general three-year course. From this it appears that the standard sought by the association is in advance of that thought necessary by the Ministry and its medical advisers. The technical colleges have evinced so much interest in our syllabus that there have been concrete offers to teach it, and hospital facilities will be provided by the Ministry, with whom the association has had recent talks.

The association's aims are, *inter alia*, improvement of status; promotion of postgraduate work and research; establishment of open examinations for unregistered prac-

tioners, thereby ensuring an adequate yardstick; and the establishment of a specialist corps in the armed Services and Civil Defence. How then can it be suggested that standards exist which are below the requirements?—I am, etc.,

London, W.1.

S. S. KNIGHT,
Secretary,
Physiotherapists Association Ltd.

The College of General Practitioners

SIR,—Since the College of General Practitioners was founded so largely through the publicity of the *Journal*, I should be grateful for your publication of the following as being of general interest to actual or prospective members.

Your current "Medical News" column (*Journal*, February 13, p. 407) contains a note on "Research Newsletter No. 2" of the College of General Practitioners, published in the February *Practitioner*. Although I am a founder member of the College of General Practitioners, for which honour I paid a subscription of 10 guineas, I have not received a copy of this Newsletter. Neither did I receive a copy of Newsletter No. 1 until the College's first annual report reached me, where it was reprinted from the *Practitioner*. Apparently, therefore, I am expected to add the cost of the *Practitioner* to what must obviously be regarded as a merely nominal subscription. As I already take two medical weeklies, neither of which has so far published Newsletter No. 2, and of which only the *Journal* has even given it mention, I do not feel justified in this extra expense. I understand that only doctors on the research register of the College of General Practitioners receive these Newsletters, but surely it is not too much to expect that all College members should receive them.

I may add that all the communications I have received from the College since I joined nearly one year ago can be counted on the fingers of one hand, with digits to spare. In particular, I have received no personal notice at all of its lectures, which, in any event, seem to have been held at 5.30 p.m. or thereabouts, when I, in common with most G.P.s, am holding my evening surgery. If the general lethargy of the College of General Practitioners since its foundation, as exemplified by the above facts, is at all disturbed by their publication, you, Sir, will have done the College a further service.—I am, etc.,

London, E.9.

D. G. BERRY.

The Winter Vomiting Disease

SIR,—After reading Dr. J. H. Whittle's letter (*Journal*, February 6, p. 333) on the subject of winter vomiting disease, I feel that I should like to make a few comments.

Like Dr. J. F. Goodall (*Journal*, January 23, p. 197) I feel that it is a separate entity from infective hepatitis. Following are some of my reasons. From my own experience I would only differ from Dr. Goodall's account of the syndrome in that I have not found diarrhoea to be a constant symptom. Indeed, in the majority of my cases it has been absent.

As Dr. Goodall remarks, the onset is often during the night after the patient went to bed feeling perfectly well. If, however, the attack begins during the day it is usually preceded by intense vertigo, but I have never been able to detect nystagmus. The patient is usually afebrile. The epigastric pain is often a result of repeated vomiting. I think, rather than a separate symptom. The vomiting lasts from 24 to 48 hours and stops as dramatically as it starts if the practitioner is lucky, just after the patient has taken his first dose of whatever has been prescribed, in my own case usually glucose and water. Following this the patient feels limp and out of sorts, with no appetite for a day or two. Headache is sometimes pronounced. The duration of this period is definitely related to age and general state of health. It seems to be exclusively a disease of cold weather.

Two years ago I had the opportunity of seeing over 300 cases of both frank and abortive cases of infective hepatitis during a severe epidemic which occurred in this practice. In the abortive cases anorexia always precedes the vomit-

ing. Indeed, this was the most constant symptom. Vomiting was infrequent. The stools were loose and pale but not necessarily frequent. The duration was from two to three weeks or longer. Infective hepatitis occurs at all times of the year.

Like Dr. Goodall I have also noted in the case of winter vomiting disease that someone else in the house often has a head cold, and I have no doubt that a virus is the causative agent.—I am, etc.,

Brampton, Cumberland.

FRANCES I. PANTON.

SIR,—The article on this subject by Dr. J. F. Goodall (*Journal*, January 23, p. 197) was timely, for the condition he described is widespread in parts of London at present. This condition can be diagnosed with fair accuracy on clinical grounds provided that the typical pale, putty-coloured stools are seen. When examined in the laboratory it is common, in my experience, for such stools to show a gross excess of microscopic fat globules. This steatorrhoea is usually found on the second and third days of illness and may be present for longer periods. When seen in epidemic circumstances it is almost diagnostic of "winter vomiting disease," since gross steatorrhoea is very rare indeed in bacterial and parasitic diarrhoeas in this country.

It should be remembered, however, that pale stools without fat globules are found at times in coliform gastroenteritis, dysentery and giardiasis, especially among young children, and for this reason it is wise to have the diagnosis substantiated by laboratory examination: for the antibiotics or chemotherapy which will help to cure the first group of diarrhoeas may well do further damage to the injured digestive tract in the case of "winter vomiting disease."—I am, etc.,

London, N.9.

MAIR E. M. THOMAS.

Myelomata of Bone

SIR,—Having recently reviewed the local cases of myelomatosis, I would like to corroborate Mr. A. Naylor and Dr. F. E. Chester-Williams's views (*Journal*, January 16, p. 120). This condition can be protean in its manifestations, and the presenting symptoms are often at wide variance with the classical text-book descriptions. In 49 consecutive cases here the diagnosis was considered initially in only 5, and in 17 was entirely unsuspected prior to necropsy. After 1944, when marrow aspiration became a more widely used diagnostic measure, the number of cases per 1,000 hospital admissions more than doubled, but an increased awareness of the condition attendant on a research project which began in January, 1952, has raised the number of cases per 1,000 admissions from 0.158 to 0.473 in the past two years as compared with the previous seven-year period.

As yet there is no known cure, but early diagnosis is essential for adequate evaluation of the newer therapeutic agents. Findings which we have found to be suspicious, and which are not particularly stressed in the literature, are: (a) the association of anaemia, a high erythrocyte sedimentation rate, and marked rouleaux formation, (b) normal or hypotensive blood pressure with proteinuria and microscopic urinary elements in a middle-aged person, and (c) an unexplained bleeding tendency. The all too common habit of excluding the diagnosis because of a negative roentgenological skeletal survey is unwarranted, because the x-ray picture may be entirely negative in spite of widespread disease.

On one minor point I would disagree with Mr. Naylor. Bence Jones proteinuria has been present for over two years in one of our patients, who has, even after a recent exhaustive reinvestigation, an apparently solitary large plasmocytoma of the sacrum. The recent work of Collier and Jackson¹ suggests that Bence Jones proteinuria is pathognomonic of this condition, and that its reported finding in other conditions is due to deficiencies in laboratory technique.—I am, etc.,

Vancouver, Canada.

HONOR M. KIDD.

REFERENCE

¹ *New Engl. J. Med.*, 1953, 248, 409.

Piperazine in the Treatment of Threadworms

SIR,—It is misleading of your correspondent Professor T. Gordonoff (*Journal*, February 13, p. 394) to quote his one experiment of giving piperazine to rats and draw a conclusion that this very useful drug should not be given to out-patients, for he does not make it clear that, relative to body weight, he gave enormously greater doses than were recommended by Dr. R. H. R. White and Mr. O. D. Standen (*Journal*, October 3, 1953, p. 755). It appears that Professor Gordonoff "once gave piperazine by mouth to rats" and that some of them died after doses of 4 to 5 g. per kg. Dr. White and Mr. Standen recommended 0.05 to 0.075 g. per kg.—i.e., a dose fifty to one hundred times smaller.

It is difficult to see any usefulness in Professor Gordonoff's letter. Aspirin is accepted as one of the safest drugs, and this opinion is not affected by the fact that doses of 250 gr. (16.5 g.) might be fatal in a man. The margin of safety of piperazine is high; Mr. Standen (*Journal*, October 3, 1953, p. 757) records survival of 100% of 13 mice given 2 g. per kg., and in the doses of 0.075 g. per kg. recommended for treating threadworm infection it can be given to out-patients with safety. For treating roundworm infection I have used double the dose recommended by White and Standen and seen no ill effects. Professor Gordonoff speaks of the danger that "mothers, if there is no therapeutic effect, will increase the dose." Ten times the dose that White and Standen suggest is unlikely to be dangerous to life, and what other drug treatments can claim the 97% success which followed treatment of threadworm infection on the doses recommended by White and Standen?—I am, etc.,

London, S.E.1.

RONALD MAC KEITH

SIR,—Piperazine adipate, a sparingly soluble salt of piperazine, does not exhibit the toxic properties shown by the parent base and its soluble salts referred to by Professor T. Gordonoff (*Journal*, February 13, p. 394). In extensive toxicological and pharmacological studies, to be published shortly, we have found no evidence of any acute or chronic toxicity on administering piperazine adipate to mice, rats, dogs, and other animals, even in doses of up to 7 g. per kg.

By contrast with the neurotoxic effects of preparations of piperazine hydrate referred to by Dr. R. H. R. White and Mr. O. D. Standen (*Journal*, December 5, 1953, p. 1272), no side effects whatever have been found on administering tablets of piperazine adipate ("entacyl") clinically, and eradication of threadworms appears to be secured in children and adults in two days by doses not exceeding 1.8 g. daily. Piperazine adipate, incidentally, has also been found effective against a wide range of roundworms and hookworms. It seems likely that the striking absence of toxic effects in piperazine adipate derives, in contrast to soluble forms of piperazine, from its low degree of absorption due to its relative insolubility.—I am, etc.,

London, N.1.

FRANK HARTLEY.

Infant B.C.G. Vaccination

SIR,—There are certain points about Dr. Honor Purser's most interesting account of her experience in B.C.G. vaccination of the newborn (*Journal*, February 13, p. 368) which demand comment. The first is her recommendation that 0.2 ml. of vaccine (0.15 mg.) should be given routinely. We have shown¹ that this dose is unnecessarily large; furthermore, the larger the dose the greater the incidence of complications. The second point is that Dr. Purser says that "it is admitted (Gaisford, 1953) that the percentage of cases giving a positive tuberculin reaction one year after vaccination falls off enormously if a smaller initial dose of vaccine is given." Gaisford said no such thing. In the preliminary report on our work which you published in 1951² we said that 0.1 ml. was satisfactory for routine immunization, and that larger doses were unnecessary and apt to produce complications. Subsequently, using 0.05 ml. routinely, we have maintained a 100% conversion rate and

have reduced the incidence of complications to 0.3%. There is as yet no evidence of any waning sensitivity in these infants one year after vaccination. Of those infants originally vaccinated with 0.1 ml. (twice our present recommended dose) 99.5% are still positive after two years.

Thirdly, Dr. Purser says that she confirms that regional adenitis and abscess formation are due to too deep rather than too large a dose of vaccine. This is contrary to our experience with more than 4,000 newborn vaccinations. Deep injections—i.e., partly subcutaneous instead of completely intradermal—lead to abscess at the site of injection, and not in the regional lymph node. This was also the finding of Palmer and Edwards, who, in the reference quoted,³ make no mention of adenitis—confining their remarks to the inoculation site. Fourthly, Dr. Purser refers to the vaccination of "premature babies," but in fact she did not vaccinate any such until they reached 5½ lb. (2.5 kg.) in weight—at which time they could no longer be considered premature. We have vaccinated a number of premature infants down to 3 lb. (1.36 kg.) in weight and would warn that, contrary to expectation, such infants require an even smaller dose than full-term infants, for they react more readily with adenitis. Fifthly, there is considerable objection to giving the vaccine into both arms as a routine procedure. We have found that subsequent injections—e.g., of pertussis vaccine or vaccinia—may—even if given six months after B.C.G.—cause a flare-up in the axillary node. This can be obviated by confining the B.C.G. to one arm, leaving the other free for any subsequently desired injection without risk.

We would suggest that the best procedure is to use a vaccine containing a known number of organisms per ml., and that in the near future it may be possible to determine the optimal number of bacilli to be injected, based on the infant's weight. The actual number of bacilli required will, of course, depend on the type of vaccine used.—We are, etc.,

WILFRID GAISFORD.
MARGARET GRIFFITHS.

Manchester, 13.

REFERENCES

- ¹ *Tubercle (Lond.)*, 1954, 25, 7.
- ² *British Medical Journal*, 1951, 2, 702.
- ³ *Ibid.*, 1953, 1, 363.

Treatment of Tuberculous Meningitis

SIR,—In my letter (*Journal*, May 2, 1953, p. 991) I drew attention to the very gratifying results obtained by means of A.C.T.H. in severe cases of tuberculous encephalitis in children. Therefore I read with great interest the article of Winifred C. M. Bulkeley (*Journal*, November 21, 1953, p. 1127) on the combined treatment of tuberculous meningitis with A.C.T.H. and isoniazid. As since December, 1951, I have had the opportunity to observe about 50 cases of tuberculous encephalitis treated with A.C.T.H. and 150 treated with isoniazid, may I be allowed to add a few remarks concerning this method of treatment?

As regards the effects of A.C.T.H. treatment on severe encephalitic forms in the early period of disease, my results were not so encouraging as those observed by Dr. Bulkeley. The frequent failure of response to the hormone in these cases is perhaps due to the exhaustion of the adrenal cortex, as a result of the severe course of the disease. Unfortunately, I had no opportunity to apply cortisone in such cases, but a combined treatment with A.C.T.H. and dehydroascorbic acid gave us here more interesting results. Very good effects were obtained with A.C.T.H. in cases of deterioration of general condition with eventual inflammatory reactions provoked by initial high doses (10–20 mg./kg.) of isoniazid (Herxheimer type of reaction).

The most important domain of A.C.T.H. therapy in tuberculous encephalitis is, however, the late period of the disease, characterized by dynamic neurological attacks, accompanied by lowered chloride levels in the C.S.F. ("late neurological disturbances" as we call them), especially after the provocative, intrathecal applications of tuberculin (purified protein derivative) (1 ml.), as I pointed out in my previous letter. I reported likewise there that A.C.T.H.

often reduces the protein level of C.S.F. and also sometimes re-establishes the free communication in cases of blockade. Isoniazid intrathecally applied can, however, have a similar effect. The reabsorption of the basal exudate and prompt recovery can also be observed after exclusive isoniazid treatment.

We, too, did not observe any symptoms of deterioration of the clinical status of our patients after A.C.T.H. administration, nor any clinical or radiological evidence of spreading of pulmonary tuberculosis. A detailed report of our experiences will be published shortly.—I am, etc.,

B. HALIKOWSKI,

Pediatric Department of the Research Institute
for Tuberculosis.

Warsaw.

Neomycin in Pyogenic Skin Diseases

SIR,—Undoubtedly the article on this subject by Dr. Ronald Church (*Journal*, February 6, p. 314) will provoke interest not only in dermatologists but also in general practitioners who have to cope with these infections. Because my interest has been aroused, I wish to make some gentle criticisms of this paper. First, though other antibiotics such as aureomycin, chloramphenicol, and bacitracin are mentioned, there is no reference whatsoever to terramycin, which appears to me to be not only perhaps the most effective antibiotic in pyogenic skin diseases but also by far the least likely to provoke reactions. Wright and Tschann¹ treated 845 patients with terramycin ointment; of 90 with impetigo contagiosa, 82 were cured within 24 hours to 7 days. The results in sycosis barbae were more impressive than in this series, and only four developed a reaction to the ointment not to the drug but to the soft paraffin base. My experience in over 200 patients treated with terramycin ointment tallies closely with this. The response to treatment in suitable cases has been as good as with aureomycin ointment and far better than neomycin: only one case of contact dermatitis developed, in a patient whose skin had already reacted to many drugs, including aureomycin. In comparison, in my series of over 100 cases in which neomycin was used the skin of eight patients reacted to the drug, and the results of the ointment were not nearly so satisfactory as with either terramycin or aureomycin.

My experience is that terramycin and aureomycin ointments are the most efficient preparations for such cases, but have the disadvantage that they cannot be easily obtained by general practitioners. Neomycin, however, is obtainable in ointment form, is made by at least two chemical firms, and is probably the next in order of effectiveness. The tendency of chloramphenicol, penicillin, and streptomycin to provoke contact dermatitis in a high percentage of cases makes them undesirable for local application to dermatoses. So far, I have not treated a sufficient number of patients with the other antibiotics such as erythromycin to form any conclusions about their action.—I am, etc.,

Edinburgh.

G. A. GRANT PETERKIN.

REFERENCE

- ¹ *Arch. Derm. Syph. (Chicago)*, 1953, 67, 125.

The Action of Penicillin Resistance

SIR,—Hotchkiss¹ has pointed out that penicillin resistance can be transferred in pneumococci if sensitive organisms are cultivated in a medium to which has been added an extract of the resistant pneumococci; a proportion of the resulting organisms become penicillin resistant and continue so on subcultivation. The active or transforming factor appears to be a desoxyribonucleic acid, and he concludes that the penicillin resistance is therefore determined by the desoxyribonucleic acid composition of the cell. We are writing this to show that the conclusions arrived at by Hotchkiss and earlier by us,² and by others, notably Vourekas,³ Winner,⁴ etc., definitely speak for the intimate association of penicillin sensitivity or resistance of a particular pathogen with its ribo- or desoxyribonucleic acid content.

It was known and confirmed by us that pus, which is a source of nucleic acid, does not inactivate penicillin. In

Obituary

E. P. CATHCART, C.B.E., M.D., D.Sc.,
LL.D., F.R.S.

We record with regret the death in Glasgow on February 18 of Professor E. P. Cathcart, emeritus professor of physiology in the University of Glasgow, at the age of 76. Though he was best known as an expert on nutrition, his interests were wide and his knowledge extensive; consequently his advice was eagerly sought, and few men can have served on so many expert committees.

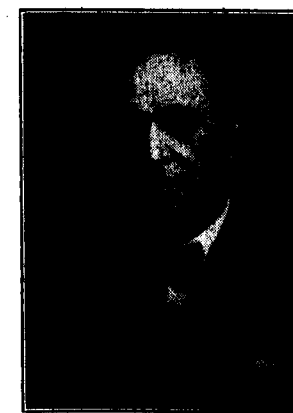
Edward Provan Cathcart was born at Ayr on July 18, 1877, and was educated at Ayr Academy and Glasgow University.

After graduating M.B., B.Ch. in 1900 he went abroad to continue his studies and visited Berlin, Munich, and St. Petersburg. On his return to this country he became a research scholar at the Lister Institute, but he gave up this appointment in 1905, when he became Grieve Lecturer in Chemical Physiology at the University of Glasgow.

He proceeded to the degree of M.D. in 1904 and took the D.Sc. in 1908.

In 1911 he was appointed an honorary research associate at the Carnegie Institute, Washington. Cathcart was elected to the chair of physiology at the London Hospital in 1915, and during the first world war he was called upon to advise the Government and the Services on many physiological problems. In the R.A.M.C. he held the honorary rank of lieutenant-colonel. In 1919 he returned to Glasgow as Gardiner Professor of Physiological Chemistry, and in 1928 was appointed Regius Professor of Physiology, a post from which he retired in 1947. He became a Fellow of the Royal Society in 1920 and was appointed C.B.E. in 1924.

Professor Cathcart's nutritional studies and his interest in industrial problems led to his appointment to numerous committees. At one time or another he was a member of the Medical Research Council, the Agricultural Research Council, the League of Nations Technical Commission on Nutrition, the Army Hygiene Advisory Committee, the National Advisory Council on Physical Training (Scotland), the Ministry of Health's Advisory Committee on Nutrition, the Committee on Nutrition in the Colonial Empire, and the International Labour Office's Committee on Industrial Hygiene. He was also chairman of the Industrial Health Research Board from 1933 to 1940, and of the Committee on Scottish Health Services. At the Annual Meeting of the B.M.A. in 1931 he was president of the Section of Pathology and Biochemistry. In 1933 he was appointed the representative of the University of Glasgow on the General Medical Council. He was the first chairman of the Western Regional Hospital Board (Scotland), but he had to resign from this appointment after only a few months because of ill-health.



[T. and R. Annan & Sons, Glasgow.]

our further work, therefore, we had studied the nature of the nucleic acid in relation to its action on penicillin bacteriostasis. This was necessary on account of the high percentage of desoxyribonucleic acid in penicillin resistant pathogens. The ratio of the relative amounts of the two types of nucleic acid differs in different organisms, but is very much correlated with the sensitivity of resistance of these organisms to penicillin. It is also now well recognized that fundamental differences exist between the basic proteins of the Gram-positive and Gram-negative organisms and probably in their mode of combination with the nucleic acids.⁵ It is also interesting to note that in the Gram-negative organisms so far examined the ratio of the desoxyribonucleic acid to ribonucleic acid is considerably higher than that in the Gram-positive bacteria. The results of studies with pus nucleic acid, which was proved to be of the desoxyribo type,^{6,7} thymus nucleic acid, also of the desoxy type, as well as with yeast nucleic acid, which is of the ribose type, showed that the desoxy type of nucleic acid has no antagonizing action on penicillin, while ribonucleic acid always exerted strong anti-penicillin action. This finding is in accord with our earlier results. Thus bacteria contain two nucleotide systems, one of the ribose type and the other of the desoxy type, and these two systems form a functional unit though not combined in a morphological unit. Malmgren and Heden⁸ have argued that the desoxy ribose organella which undergoes fission could form an equivalent to the euchromatin of the metazoan cells, and the ribose type system would be looked upon as a functional counterpart to the heterochromatin. While the former induces the formation of gene proteins, the latter controls the formation of the cell proteins. This latter process is reflected in great changes in the contents of the ribose nucleotides in the individual bacterium. These facts also appear to be significant on the sensitivity or resistance of a pathogen to penicillin.

It is well known that penicillin acts on actively young bacterial cells and not on adult ones. Casperson and his colleagues,⁹ on the basis of ultra-violet absorption measurements, have concluded that a high ribonucleic acid content is characteristic of the cells in which protein synthesis is vigorous for purposes of growth or secretion, and those cells or tissues such as pancreas, liver, gut, embryo, etc., which are actively engaged in the process of protein synthesis contain higher concentrations of ribonucleic acid than the adult cells or tissues. All the above facts individually and collectively justify conclusions to which we had already drawn attention in our earlier publications.—We are, etc.,

MARIAM GEORGE.
K. M. PANDALAI.

Kayamkulam, India.

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- ¹ *Le Congrès International de Biochimie*, Paris, 1952, Symposium No. 6, p. 40.
- ² *British Medical Journal*, 1947, 2, 210.
- ³ *Lancet*, 1948, 1, 62.
- ⁴ *Ibid.*, 1948, 1, 674.
- ⁵ *Symp. Soc. exp. Biol. London*, 1947.
- ⁶ Euler, H. von, and Hahn, L. (1946). *Svensk. Kem. Tidsn.*, 58, 251.
- ⁷ Dische, Z. (1930). *Mikrochemie*, 8, 4.
- ⁸ *Nature, Lond.*, 1947, 159, 577.
- ⁹ *Naturwissenschaften*, 1941, 29, 33.

The Value of Physiology in Medicine

SIR,—Dr. George Graham in his Harveian Oration (*Journal*, January 30, p. 225) makes a statement which in my opinion needs to be emphasized frequently to those persons engaged in medical research which involves experiments on animals.

Dr. Graham says that "it is of importance to repeat the work on different animals, for they often differ considerably." Two important facts need continually to be kept in mind by the investigator: (1) To submit that because a certain animal reacts in a certain way to a specific substance therefore the human animal will react in a similar way can be both a fallacious and misleading submission. (2) The investigator should have a sound knowledge of the physiology of the animal used in the experiment.—I am, etc.,

London, W.1.

R. F. GUYMER.

Cathcart wrote numerous papers on the subjects in which he was interested. His book, *The Physiology of Protein Metabolism*, was first published in 1911, and the results of his inquiry in 1929 into the physique of men and women in industry appeared as *The Human Factor in Industry*. He was an Honorary Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow, and he received the honorary degree of LL.D. from two universities—from St. Andrews in 1928 and from Glasgow in 1948.

During the last war he was a member of the scientific committee set up in 1940 by the War Cabinet's Food Policy Committee and of the B.M.A. Committee on War-time Problems of Nutrition.

Professor Cathcart married Dr. Gertrude Dorman Bostock, and there were three daughters of the marriage.

We are indebted to Professor R. C. GARRY for the following appreciation: In all sciences, as the body of knowledge grows, specialization becomes inevitable. A point is reached, often suddenly, when the interests of the various workers in a science diverge. Then each worker pursues his own line of inquiry, dropping, as he goes, a curtain of new techniques and of new knowledge between himself and his former colleagues. Physiology is peculiarly vulnerable to this process. Cathcart, who first graduated in medicine in Glasgow in 1900, embarked on his scientific career just before this process of fission became marked. He was a medical biologist of the old school, interested in the physiology of the whole man, and he remained so to the end. We shall not see his like again.

Chance drew Cathcart to biochemistry. As a young man he went to Germany to study bacteriology. On the day he turned into the laboratory of Carl Voit the die was cast. In 1905 Cathcart became the first Grieve Lecturer in Physiological Chemistry in the University of Glasgow. The following were fruitful years. There was the classical work on metabolism in starvation, quickly followed by authoritative studies on the metabolism of protein. In spite of his research activity Cathcart found time to travel widely. For a while he worked with Pavlov in Russia; he used the Pavlov stomach-pouch technique in Glasgow, but never really took kindly to animal experimentation. More significant for the Glasgow school was work with Benedict in America on indirect calorimetry and on exchange of energy in man.

In 1915 Cathcart was appointed to the London University chair of physiology in the London Hospital. But in 1919, at the invitation of the university, he returned to Glasgow to occupy the newly founded Gardiner Chair of Physiological Chemistry. During the first world war he had played an active part in the solution of physiological problems which arose in the Services. His work on the expenditure of energy by the soldier is still definitive. In the years after the war he became interested in the broader social aspects of nutrition. His dietary surveys threw a flood of light on the food habits of the people. He was somewhat critical of what he considered to be the excessive emphasis placed on the importance of vitamins; he believed that if one took care of the calories the vitamins took care of themselves. In this attitude he probably underrated the potentialities for mischief on the part of those who process and manufacture the urban food of to-day. By a natural transition he became interested in the physique, stature, and growth of human beings. Instinctively, and possibly with some justification, he reacted against the unconfirmed belief that rapidity of growth in childhood and in adolescence and attainment of great stature are inevitably sure indications of individual and social well-being.

In 1928 Cathcart succeeded Noël Paton in the Regius Chair of Physiology at Glasgow. Never very interested in the more chemical aspects of biochemistry, his translation from one chair to the other was logical and did no violence to his interests. His study of metabolism, of energy ex-

change, of physique, and of nutrition continued. He developed an interest in psychology, and in his later years he very happily turned his attention to histology.

Cathcart was completely out of sympathy with the jejune mechanistic theories of biology so popular in the first half of this century. He took great pleasure in the attitudes of J. S. Haldane and of Smuts. While not decrying the importance of research on isolated organs or systems, he doubted greatly if such studies could ever explain the integrated activity of the whole organism. Such an attitude, combined with his forceful, robust, and manly personality, not unmingled with a Puritan streak in his personal relationships and behaviour, made Cathcart an outstanding member of the academic community. So he continued to the end, ever stressing the duties and responsibilities of those who were dedicated to the profession of medicine. He cast a kindly, but somewhat critical and sceptical, eye on all those who made sweeping claims for progress in medicine and in the social order as a whole.

Cathcart retired from his chair in 1947 after 40 years of practically continuous devoted service to physiology and to his university. Fortunate were the undergraduates who came under his influence, and even more fortunate the members of his staff who had the privilege to work under his direction and to share his enthusiasms. He leaves a widow and three daughters, all medical graduates of his own university. Physiologists the world over share in their loss.

Sir GEORGE ELLISTON, M.C., M.A.,
D.L., J.P.

The announcement of the death of Sir George Elliston, which took place in London on February 21, will be received with regret in the medical profession, especially among those members of it serving in the field of public health. Although not a medical man, Sir George Elliston had hereditary and lifelong connexions with medicine. His father, himself the son of a doctor, was Dr. W. A. Elliston, of Ipswich, who was President of the British Medical Association when the Annual Meeting was held in that town in 1900, and was also one of the early presidents of the Medical Defence Union. An uncle, George Sampson Elliston the elder, was the first medical officer of health for Ipswich. One of Sir George Elliston's brothers was Guy Elliston, financial secretary to the British Medical Association, whose premature death in 1918 deprived the Association of a most promising officer. The youngest of the brothers, Dr. Chatterton Elliston, practised for many years in Cornwall.

George Sampson Elliston was born in 1875 and was educated at Framlingham College in Suffolk, and St. Catharine's College, Cambridge, taking his B.A. in 1896 and his M.A. in 1919. In 1897 he joined the well-known printing firm of Sir Joseph Causton and Sons, of which he was a director for many years up to the time of his death, and in 1904 he married Miss Alice Louise Causton, daughter of the then head of the firm. In 1901 he was called to the Bar by Lincoln's Inn.

One of his achievements of which he was most proud was the foundation of the *Medical Officer*, a weekly journal for medical men in the Government and municipal services, which he edited continuously for more than 40 years. During the first world war he was one of the few laymen commissioned in the Royal Army Medical Corps, serving in France with the B.E.F. as hygiene officer. For his services in the war he received the M.C. In 1919 he was appointed secretary of the Society of Medical Officers of Health, which office he held until 1930, when his son, Mr. G. I. C. Elliston, succeeded him. From 1931 until 1945 he was Conservative member of Parliament for Blackburn, and for

part of the time he was honorary secretary of the Parliamentary Medical Committee, acting as a skilled interpreter of medical and allied matters to his fellow members. He carried through most diligent and conscientious work at Westminster. The second world war recalled him to temporary duties at the Society of Medical Officers of Health, while his son, the secretary, was serving with the Navy. The Society had already made him an honorary fellow and elected him to its council as "a person eminently distinguished in the advancement of the public health."

Another field of work which engaged his attention was connected with the Corporation of the City of London. For several years he was chairman of the Corporation's public health committee, and a noteworthy duty which fell to him was to arrange the City dinner in 1948 to celebrate the centenary of the Public Health Act and the appointment of Sir John Simon as the City's first medical officer of health. Perhaps it was as chairman of the board of management of the London School of Hygiene that he obtained the greatest satisfaction. Under his chairmanship the school flourished, and no one was better pleased at its success than Sir George himself.

His energies found many other outlets. He was for a time president of the National Smoke Abatement Society, a member of the council of the Cremation Society, and a governor of Birkbeck College, Christ's Hospital, and the City of London School. In 1933 he was made a justice of the peace for the county of London, and in 1942 a deputy lieutenant of the county. He was knighted in 1944. Into every sphere of his very active life he carried urbanity and kindness, made many friends, and appeared to make no enemies. Lady Elliston with two sons and a daughter survive him. One other son was killed in the Normandy landing in 1944.

Dr. H. W. ROBINSON, who was a general practitioner in Bradford, Yorkshire, died on February 5 at his home in Cleckheaton, Yorkshire. Henry Whitterton Robinson was born on May 27, 1892, his father being the late Dr. A. H. Robinson, J.P. He studied medicine at Leeds University and graduated M.B., Ch.B. in 1914. After holding a resident post at Bradford Royal Infirmary he joined the R.A.M.C. and served as a medical officer with the West Yorkshire Regiment in France, being awarded the M.C. After demobilization he joined his father in practice at Low Moor, where nearly all his life was lived. In spite of ill-health he had a busy practice and became one of the best-known doctors in the Bradford area. During the last war he organized the medical service of the West Riding Home Guard Division, and held the rank of lieutenant-colonel. As a result of his very heavy commitments during the war years his health broke down, and he had two major chest operations in 1949 and 1950. He came back to work, however, and his courage and determination kept him going until the day before his death. He leaves a widow, a son, and a daughter.

P. MCE, writes: By the death of Dr. Harry Robinson, Bradford has lost one of its most highly respected and widely beloved general practitioners. His popularity was shown by the rapid growth of the practice of which he was for many years the senior partner. From a twin practice it grew to a group practice of five partners. Dr. Robinson was a most capable doctor, cheerful and happy in disposition, devoted to his work, and with a warm personal interest in his individual patients. In spite of chest trouble during many years—the sequel to pneumonia followed by an empyema and a thoracoplasty—he became a scratch golfer and the popular and esteemed captain of the Cleckheaton Golf Club. Being of a loyal and generous nature, he had a wide circle of friends, by whom he will be held in grateful memory.

Dr. VALERIE JONES, who died suddenly on January 28 after a very brief illness, had acted as registrar to the children's unit in the Newport and Monmouthshire hospital groups since January, 1952. She was 27 years old, and her death at so early an age, and at the beginning of a career showing the greatest promise, is mourned by all who knew her. Valerie Jones studied medicine at Edinburgh, qualifying in 1949 and being awarded a gold medal in surgery. She filled the posts of house-surgeon and house-physician (paediatrics) at Morriston Hospital, near Swansea, with conspicuous success, and, as always, left many friends behind on completing these appointments. She then spent a year as an assistant in general practice in Gorseinon, again proving herself a most successful and conscientious doctor, who, despite her academic leanings, adapted herself to the problems of practice with her natural enthusiasm and drive. In 1951 she took the D.C.H., and in the following year joined the newly formed paediatric unit in Newport and Monmouthshire, quickly proving her great worth. She was incapable of work other than of the highest quality, and combined a detailed knowledge of medicine with the ability to apply it practically and with great common sense. Every sick child was a challenge to her, and nothing was left undone that could be of help to the patient. She transmitted her faith and enthusiasm to her colleagues, medical and nursing, and, more important still, to her patients. She enjoyed her life to the full, and, despite being engrossed in her medical work, made time to interest herself in literature, music, and travel. She was always a stimulating companion to those around her, and had a natural capacity for making friends, being always ready to give help to others. She will be greatly missed by her host of friends, and the deepest sympathy is extended by all to her mother and father in the loss of their only child.—T. A. B.

Dr. H. E. BATEMAN died at Micklegate, Yorkshire, on February 9, after a long and courageous fight against failing health. He was 94 years of age. Hinton Ernest Bateman was educated at Kings School, Canterbury, and received his medical training at St. Bartholomew's Hospital, London, where he qualified in 1883. In 1886 he started working at the Dispensary in York and practised throughout his long life in that city. He is still remembered in York as an impressive figure riding in a brougham in winter and a victoria in summer to visit the many eminent people who were his patients. He became a pioneer of radiology, and during the 1914-18 war worked unceasingly at the Military Hospital in York as a radiologist. In consequence of exposure to irradiation by the inadequately screened apparatus of those days he became a victim of progress in his own branch of medical science. As the years went by he had numerous operations, and finally, when he was 91 years of age, his left arm was amputated. He bore his trials with admirable courage and showed a strength of character worthy of the highest traditions of his profession. Dr. Bateman was married twice and had two sons, one of whom entered the medical profession, and the other served in the Forces as an Army chaplain. He had the sadness to lose both sons in the course of his lifetime. His wife, who nursed him courageously throughout his long illness, survives him.—J. K. W.-P.

Dr. LIONEL WILSON BRADSHAW died on February 8 at his home at Scarborough at the age of 75. He studied medicine at the Leeds medical school, where he qualified in 1907. After holding resident posts at the General Infirmary, Leeds, he had some experience in general practice and then settled at Barnoldswick, in Yorkshire, where he was a much respected and successful family doctor for many years. By nature sensitive and conscientious, he became a friend and adviser to all his patients, who gave to him their affection and trust. His anxiety was always that everything possible should be done for the comfort and welfare of those under his care. In these days it would be unusual for a family doctor to know, as he did, every detail of the family and their relations, as well as the doubts and fears of them all. When Dr. Bradshaw retired from

his busy practice he was genuinely surprised at the way in which the people of Barnoldswick showed how much they had appreciated his work among them. He was high in the esteem of the St. John Ambulance organization, and he acted as police surgeon for the West Riding police in his locality. Having a liking for the sea, he acted for a time as ship surgeon after retirement. During the last war he became deputy medical officer of health for the City of Wakefield, and did valuable work in that capacity. He was a man of many interests, but his retiring nature made him averse to medical politics, though he often expressed his fears lest the conditions of service under the National Health Service Act would deny to the family doctor that priceless personal relationship with his patients that made family practice, for him, a real vocation. He was a profound Christian, and for many years read the lessons in his parish church. The profession will miss men of Bradshaw's sterling quality. Our sincere sympathy is extended to his widow.—J. LE F. B.

We record with regret the death at the age of 81 of Mr. H. R. MAYNARD, who was secretary of King Edward's Hospital Fund for London from 1906 to 1938. Henry Russell Maynard took a first in modern history at Oxford in 1901, and from 1903 to 1907 he was resident at Toynbee Hall, being also for a time secretary of the Mansion House Unemployed Committee and of the London Unemployed Fund. With his strongly developed social conscience he was admirably qualified to take on the post of secretary of King Edward's Hospital Fund, which had been founded in 1897 for the "support, benefit, or extension of the hospitals of London." During his long years of service the work of the Fund increased greatly in importance and gave a lead to hospitals in the rest of the country, and indeed the world. Mr. Maynard was created C.V.O. in 1932, and in 1938 he was made clerk to the general council of the Fund. When he retired in 1941 he became a member of the general council.

Dr. SYDNEY TIBBLES writes: Having practised in the next room to my old friend Dr. WILLIAM GRIFFITH, I feel I cannot let the obituary notice in the *Journal* of January 23 (p. 217) pass without adding my appreciation of his great kindness to patients and everyone else. Unfortunately he was predeceased by his wife, who had been an invalid for years and whom he greatly missed in the latter part of his life.

We record with regret the death on February 15 of Lady HORDER, wife of Lord Horder. She was the only daughter of Mr. Arthur Doggett, of Newnham Manor, Hertfordshire. Lord and Lady Horder celebrated their golden wedding in 1952.

Medical Notes in Parliament

CARE OF THE MENTALLY SICK

The House of Commons used a private Members' day on February 19 for a survey of the care and accommodation of the mentally sick, and at the end of the discussion adopted a resolution recognizing the advances made in recent years, but expressing concern at the serious overcrowding in mental and mental deficiency hospitals, and the high proportion of obsolete buildings, the acute shortage of nursing and junior medical staff, and calling for adequate provision for the modernization and development of this essential service.

Mr. KENNETH ROBINSON, a member of the North-west Regional Hospital Board, who moved the resolution, touched on many aspects of development since the passing of the Mental Treatment Act in 1930, and the shortcomings still prevailing. Sir FREDERICK MESSER, who served on the same board, seconded. Mr. Robinson mentioned television as an important amenity having therapeutic value as well, and said that he would not be happy until every mental

defective hospital had a television set in almost every ward. He also said there did not seem to be enough younger doctors coming into the mental health service.

Dr. REGINALD BENNETT, who said he had practised for some years as a psychiatrist, and for many of those years in mental hospitals, said the revolution in mental medicine and mental hospitals consisted of one thing—that, whereas previously the mental hospitals were limbo, to-day the whole outlook had changed from the merely custodial to a dynamic one, where treatment was given and hope provided. He knew hospitals which occupied deplorable buildings but which achieved a magnificent therapeutic record and high morale. Dr. Thomas Beaton had performed a revolutionary service in Portsmouth, in that there was none of the unreasoning terror among the local people about visiting out-patient clinics at the mental hospital. In another neighbourhood people still regarded it as some kind of penitentiary. Nursing and recruitment were a dreadful problem largely because mental nursing had been so widely misrepresented. What he sought to establish by the debate was that there were ways of using buildings which made some beds twice as useful. He was appalled at the terrible disincentives applied to girls who wished to become nurses. He did not believe they were really short of beds in mental hospitals. There was a big future, and brilliant new treatments were coming out all the time. If attention was given to the use of existing beds it was not necessary to rebuild all the Crimean War buildings at once.

Mr. SOMERVILLE HASTINGS said the Health Service had one great advantage—it enabled medical problems to be looked at as a whole, and because of that he had great hopes for the future of the treatment and prevention of many forms of mental disease. Did potential mental nurses realize that they would have an exceedingly interesting life? Did doctors realize that this was not the backwater it used to be, but that there were great possibilities for doing real good in the mental health service? The chief point to which he wanted to call attention was that mental diseases could be and must be treated much earlier than was ever realized thirty years ago. Much more should be done for mental out-patients. He wanted to see them at ordinary general hospitals and health centres, and treated there at times that would not cause too much interference with their daily affairs. On the nursing difficulty, he did not think it wise to insist that every mental nurse should be doubly qualified: a basic training in general nursing and then psychological study seemed to him enough.

Dr. A. D. D. BROUGHTON said that about 50% of hospital beds were occupied by mental cases, and it was ridiculous to be spending only 1% of the expenditure on medical research on mental illness.

Government Reply

Miss PAT HORNSBY-SMITH, Parliamentary Secretary, Ministry of Health, in a necessarily concentrated reply to a wide debate, said there was no evidence that mental illness or mental deficiency, as such, was increasing. The figures must be reconciled, however, with the fact that people were living longer and there was thus a larger number of aged patients who were mentally ill; and that with the new outlook people were coming voluntarily for treatment, so that in the past 15 years the number admitted to mental hospitals had doubled. The percentage of voluntary patients varied from 45 to 75 for males, and from 40 to 70 for females, according to the regional averages. The national average was 60%. These were voluntary patients in mental hospitals only; they did not include mental deficiency institutions.

The average number of beds per 1,000 population was 2.8, and the Ministry would like to see a standard of 3.5. There were unfortunately 1,640 unstaffed beds, but, in spite of that and the long waiting-list, in the five years of the Health Service the number of patients in mental hospitals had increased by 5,600. The actual waiting-list on the mental deficiency side on December 31 last was 8,521, compared with estimates previously given of 9,290, so that some

advance had been made. For the year 1953-4 there were schemes to provide 1,314 new beds for the mentally deficient, and in 1954-5 for another 1,200. Other schemes would bring into use some 3,000 beds in the next six years.

The major problem was nursing staff. The number had risen by 2,800 over five years, but there had been a serious decline in student nurses of 1,500. There were now 15,000-odd trained nurses, 4,500 student nurses, 174 assistant nurses, and 10,500 nursing assistants. There was no guarantee that the establishment of a roll of a new type of mental assistant nurse would lead to any substantial influx of candidates. Experience in the general hospitals suggested that the establishment of a grade of trained enrolled assistant nurses was a very slow process.

The cadet scheme was being closely investigated, but it raised difficulties. It would be virtually a continuance of education, and they had to consider whether it was an educational cost or a medical one. It was an expensive way of getting potential labour which, for those two years, was contributing very little to the Service. There was also a strong school of thought that the two years of adolescence and development between 16 and 18 should be spent by potential recruits to the mental health service in gaining experience in the world in other activities, to increase their fitness for the strain and responsibility of mental nursing. Others might dissent, but it was not unreasonable to be cautious about bringing 16- and 17-year-olds into association with mental hospitals except under strict supervision and with every assurance that they would not be used in the wards until they had reached the age of 18.

INDUSTRIAL DISEASES BILL

The Industrial Diseases (Benefit) Bill was given its third reading in the House of Commons on February 18.

Mr. R. H. TURTON, Parliamentary Secretary, Ministry of Pensions and National Insurance, said the Minister was engaged on discussions with the T.U.C. and interested parties on the two schemes to be made under the Bill's provisions. The first scheme was to extend the Pneumoconiosis and Byssinosis Benefit, Scheme of 1952 to partial cases, and there were formidable administrative difficulties. It might well bring some 40,000 claims, entailing 20,000 examinations. That number was nearly as large as all the examinations for pneumoconiosis being made under the Industrial Injuries Scheme, and it was clear that medical help would have to be obtained in such a way as not to interfere with the work on other schemes. Preliminary inquiries about the second scheme, to deal with cancers covered by the Workmen's Compensation Acts, led to the belief that it should not present great complications, since the numbers involved were much smaller. The scheme would be operated independently, and would be introduced as soon as it was ready.

Dr. H. MORGAN said this was one of the subjects which gave most trouble to the few doctors who specialized in diseases caused by industry. Dr. BARNET STROSS said it looked as though this Bill would cover all cases of inhalation of dust and the resulting fibrosis. The flat rate payment of 20s. for partial disablement was a mistake, because the men concerned were moving into a stage of deterioration. He hoped the Minister would introduce schemes for men who suffered not only from the inhalation of dust but from inhalation of fumes, who had a marked pulmonary fibrosis, and in particular bronchitis and emphysema.

Mr. OSBERT PEAKE, Minister of Pensions and National Insurance, said that the new scheme would be administered by the same board as that which administered the scheme for total incapacity established under the 1951 Act, and which, under the chairmanship of Mr. Paul Sandlands, Q.C., had given great satisfaction.

The Lung Cancer Inquiry

Mr. J. R. BEVINS, replying to a question addressed to the Lord President of the Council, stated on February 18 in

answer to Mr. Emrys Hughes that the statistical investigation into the relationship between smoking and cancer of the lung was carried out by members of the Statistical Research Unit of the Medical Research Council during the years 1948-52 at a total cost of about £7,000. The investigation was not in any way hampered by lack of funds. Subsequently a panel under the Government Actuary considered the results of the investigation: the cost of this was very small.

M.R.C. Expenditure

Figures of total expenditure on research by the Medical Research Council, and the proportion spent on research into mental health, were given on February 15 by Mr. J. R. BEVINS, who, as Parliamentary Secretary to the Ministry of Works, answers in the Commons for the Lord President of the Council. They were:

Year	Total Expenditure	On Mental Health
	£	£
1945-6	295,000	3,311
1946-7	415,000	300
1947-8	618,000	984
1948-9	770,000	5,991
1949-50	1,216,000	14,963
1950-1	1,363,671	18,176
1951-2	1,616,500	21,780
1952-3	1,505,917	21,361

In addition to these sums the Medical Research Council has during this period devoted a considerable proportion of its resources to researches into psychological and neurological problems. In the year 1952-3, for example, over £51,000 was spent on research in psychology and over £42,000 on research in neurology.

Vital Statistics

Week ending February 13

The notifications of infectious diseases in England and Wales during the week included pneumonia 931, scarlet fever 1,161, whooping-cough 1,916, diphtheria 11, measles 1,846, dysentery 669, acute poliomyelitis 21, paratyphoid fever 4, and typhoid fever 0.

Infectious Diseases

In England and Wales during the week ending February 6 the number of notifications increased by 297 for measles (from 1,190 to 1,487) and by 52 for dysentery (from 572 to 624), and decreased by 256 for whooping-cough (from 2,240 to 1,984) and by 43 for scarlet fever (from 1,058 to 1,015).

Two-thirds of the increase in the incidence of measles was contributed by two counties, a rise of 96 in Norfolk (from 220 to 316) and 95 in Cumberland (from 65 to 160). The largest fluctuation in the local trends of whooping-cough was a decrease of 38 notifications in London (from 83 to 45). Only very small changes occurred in the local trends of scarlet fever. 19 cases of diphtheria were notified, and these were 3 more than in the preceding week.

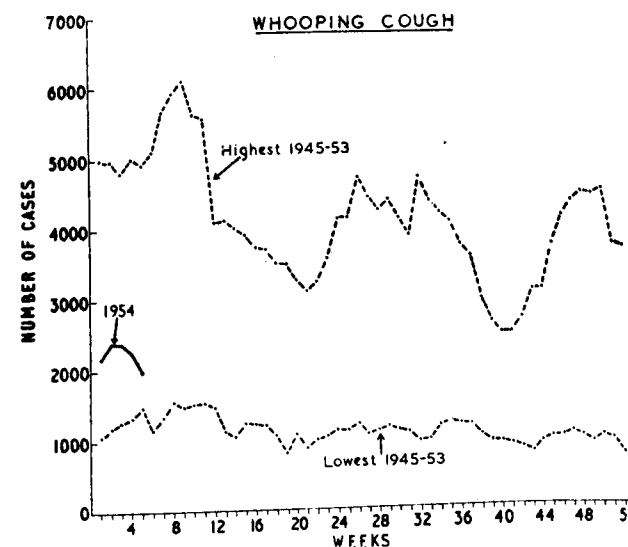
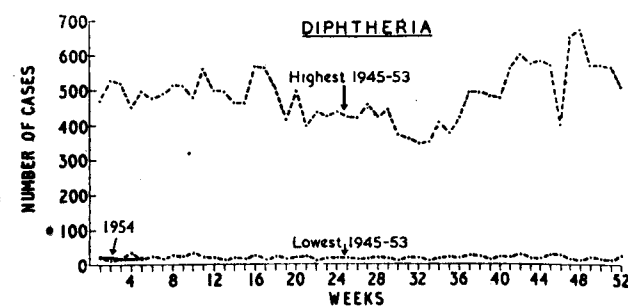
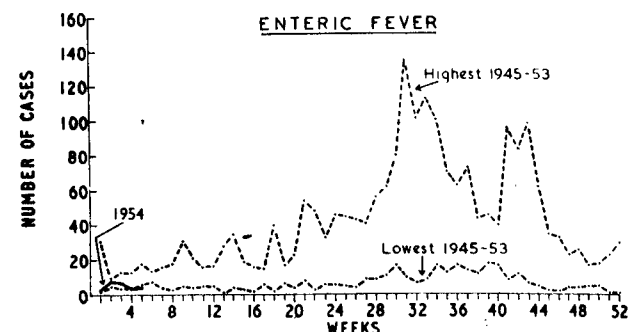
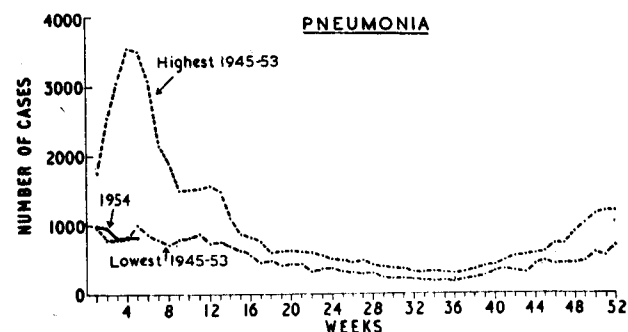
21 cases of acute poliomyelitis were notified, and these were 1 more for paralytic and 2 fewer for non-paralytic cases than in the preceding week. The largest returns were 3 cases—in London, Kent, and Essex.

The greatest increases in the notifications of dysentery were 64 in Lancashire, 30 in Norfolk, and 28 in Sussex. The largest returns during the week were Lancashire 140 (Preston C.B. 36, Swinton and Pendlebury M.B. 22, Preston R.D. 16, Oldham C.B. 15, Bolton C.B. 12), London 99 (Hackney 38, Islington 16), Yorkshire West Riding 89 (Bradford C.B. 27, Leeds C.B. 25), Norfolk 45 (Norwich C.B. 43), Middlesex 41 (Hornsey M.B. 11, Tottenham M.B. 11),

Sussex 37 (Battle R.D. 19, Brighton C.B. 11), Staffordshire 36 (Cannock U.D. 28), Warwickshire 20 (Birmingham C.B. 18), and Kent 18 (Chatham M.B. 10).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ———. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 6 (No. 5) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng & Wales	London	Scot.	N. Ire	Eire	Eng & Wales	London	Scot.	N. Ire	Eire
Diphtheria	19	2	9	0		16	0	12	0	
Dysentery	624	99	199	0	6	286	29	117		
Encephalitis, acute	3	1	0	0		4	0	1	0	
Enteric fever: Typhoid	0	0	0	0		2	1	0	0	2
Paratyphoid	4	0	1	0		15	0	0	0	0
Food-poisoning	88	19		0		76	11		0	
Infective enteritis or diarrhoea under 2 years				10	14				11	29
Measles*	1,487	19	50	20	240	31,494	1661	292	92	294
Meningococcal infection	33	4	13	0	2	45	2	14	1	4
Ophthalmia neonatorum	25	0	3	0		42	4	5	0	
Pneumonia†	826	37	249	10	2	2,338	199	253	34	9
Poliomyelitis, acute: Paralytic	17	2	3	0	1	20	3	1	0	2
Non-paralytic	4	1				6	0			
Puerperal fever‡	235	33	7	0		260	31	13	1	
Scarlet fever	1,015	41	187	36	20	1,545	58	270	43	52
Tuberculosis: Respiratory	825	103	141	23		158	31			
Non-respiratory	111	6	20	4		30	1			
Whooping-cough	1,984	45	328	46	54	2,571	131	204	44	134

DEATHS in Great Towns	1954					1953				
	Eng & Wales	London	Scot.	N. Ire	Eire	Eng & Wales	London	Scot.	N. Ire	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0	0	0		0	0	0	0	
Encephalitis, acute		0				0	0			
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	10	0	2	1	1	10	0	0	0	1
Influenza	41	3	1	0	3	446	89	2	2	2
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		2	0				0	0		
Pneumonia	382	48	27	16	14	667	138	21	20	9
Poliomyelitis, acute	2	0			0	3	0			1
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory	120	15	27	1	2	150	27	15	1	8
Non-respiratory	3	3	3	0	1	5	7	0	0	4
Whooping-cough	2	0	0	0	0	3	0	0	0	1
Deaths 0-1 year	304	36	41	9	20	291	42	33	10	9
Deaths (excluding stillbirths)	7,142	1018	791	149	219	8,252	1545	601	142	177

LIVE BIRTHS	7,399	1052	946	229	315	7,155	1037	876	202	389
STILLBIRTHS	202	34	21			179	28	19		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Medical News

Vitamins in Margarine.—At present margarine, as a condition of licence for its manufacture, must contain added vitamins A and D. Control ends on May 8, and with it the statutory obligation on manufacturers to add these vitamins. The Ministry of Food's food standards committee, which has been looking into the question, has now issued a report recommending not only that vitaminization of domestic margarine should continue but that the amount of vitamin A in it should be brought up to the level ordinarily found in butter. The committee says that the National Food Survey has shown that vitaminized margarine is an important source of vitamins A and D in the national dietary, particularly among the less well off and those with large families. The present levels of vitaminization are 450-550 I.U. vitamin A and 90 I.U. vitamin D per ounce (28 g.). The proposed new level for vitamin A is 760-940 I.U. per ounce. Interested parties are given until March 19 to make their views known, after which, presumably, new legislation will be introduced.

Royal Hospital and Home for Incurables, Putney.—The Duke of Devonshire, speaking at a reception at the Time and Life Building in London last week, opened an appeal for £100,000 to ensure the continuance of the Royal Hospital and Home for Incurables at Putney, whose centenary will be celebrated in July of this year. As its new president, he said that the hospital gave shelter to 260 resident patients, the majority of whom were able to leave their wards daily to use the downstairs rooms. It might be asked, the president continued, why the hospital had not been taken over by the State under the National Health Service. The point he wanted to stress was that it was a home as well as a hospital and was felt to be so by those incapacitated by disease or injury who were cared for there. It was feared that if the hospital were taken over by the State the home-like amenities, so important for the welfare of the incurable, would cease to be provided. The hospital was founded by Dr. Andrew Reed in 1854 for the purpose of relieving "men and women over the age of 30 who are hopelessly disqualified for the duties of life by disease, accident, or deformity, and who are considered after careful examination to be beyond the likelihood of cure." Most of the patients in the hospital are sufferers from such conditions as rheumatoid arthritis, Parkinson's disease, disseminated sclerosis, and disease of the heart. Patients with cancer, epilepsy, psychosis, or contagious or infectious disease are not admitted.

International College of Surgeons.—The College is holding its Ninth Biennial International Congress at São Paulo, Brazil, from April 26 to May 2, and also a meeting of its Joint European Sections at Turin on June 1 and 2. Fellowship of the College is open to British surgeons who are Fellows of one of the Royal Colleges, without entrance fee for the time being, at an annual subscription of five guineas. The headquarters of the College are in Chicago. The treasurer and secretary for the British Isles is Dr. J. F. Brailsford, 20, Highfield Road, Edgbaston, Birmingham, from whom may be obtained application forms for Fellowship and further details of the College's activities.

Chair of Surgery at Leeds.—Mr. J. C. Goligher, assistant surgeon at St. Mary's Hospital, London, has been appointed to the newly instituted Chair of Surgery at the University of Leeds. Mr. Goligher graduated at Edinburgh in 1934. He was a Hunterian professor of the Royal College of Surgeons of England in 1951, and has recently held a research fellowship at the College's Buckston Browne Research Farm. His main interest is gastro-intestinal surgery.

British Abstracts of Medical Sciences.—Section A III of *British Abstracts*, which covered the subjects of physiology,

biochemistry, anatomy, pharmacology, and experimental medicine, has now been replaced by *British Abstracts of Medical Sciences*. This publication will appear monthly and contain abstracts from the world literature on anatomy, biochemistry, experimental biology, experimental medicine, microbiology, pathology, pharmacology, and physiology. The chief editor is Dr. C. C. N. Vass (St. Thomas's Hospital Medical School), and the editorial office is at the Lister Institute, Chelsea Bridge Road, London, S.W.1. The annual subscription is £10. Although the fields covered by *British Abstracts of Medical Sciences* and *Abstracts of World Medicine* overlap to a small extent, the former will be of value primarily to the laboratory and research worker, whereas the latter caters principally for the clinician. Moreover, the two journals differ somewhat in the type of abstract published, those in *British Abstracts of Medical Sciences* being mainly brief and "indicative," and those in *Abstracts of World Medicine* being fuller and of the "informative" type. *Abstracts of World Medicine* is published monthly by the British Medical Association and the annual subscription is £4 4s.

Rheumatoid Arthritis: A Handbook for Patients.—A handbook on rheumatoid arthritis for doctors to give to their patients has just been published by the Empire Rheumatism Council. It tells the layman something about the nature of the disease and then goes on to discuss treatment. Copies may be obtained free of charge from the Empire Rheumatism Council, Tavistock House North, Tavistock Square, London, W.C.1.

Smokeless Zones for Bradford.—Bradford Corporation has approved an order which will create 20 smokeless zones in its area in about a year's time. Nineteen of the zones are council estates where the burning of smokeless fuel is already a condition of tenancy. There is reported to be local opposition to the order on the grounds of the expense to the tenants of the estates.

British Schools Exploring Society.—Applications are invited for the posts of honorary physician and honorary surgeon to the 1954 expedition to Northern Quebec (July 28 to September 15). The cost will be about £180. Applicants should write as soon as possible to the secretary, c/o Royal Empire Society, Northumberland Avenue, London, W.C.2.

Dr. E. B. Strauss, physician to the department of psychological medicine, St. Bartholomew's Hospital, has been awarded the honorary degree of Doctor of Natural Philosophy in the University of Frankfurt on the occasion of his 60th birthday.

Dr. David Nabarro, who is 80 on February 27, is to receive a presentation on that day from his colleagues and friends at the Hospital for Sick Children, Great Ormond Street, where he was for many years director of the pathology department.

COMING EVENTS

Association of Graduates, Royal College of Surgeons in Ireland.—The annual dinner will take place in the College at Dublin on March 13 at 7.30 p.m., the night of the Rugby international between Ireland and Wales. Tickets may be obtained from the honorary secretary at the College, and guests of either sex may be invited. The annual general meeting will be held at 6 p.m. on the same evening.

Airborne Medical Society.—The annual dinner will be held in Surgeons' Hall, 18, Nicolson Street, Edinburgh, 8, at 7.30 for 8 p.m. on March 20. Members who have not received a copy of the circular recently sent out should apply to the hon. secretary, Dr. J. S. Binning, Medical Department, Eastern Region, Marylebone Station, London, N.W.1.

The Faculty of Radiologists are organizing courses for candidates for the D.M.R.D. and D.M.R.T. (R.C.P.Lond., R.C.S.Eng.) starting in October, 1954. Further information will be found in the advertisement columns (p. 42).

NEW ISSUES

Journal of Clinical Pathology.—The next issue (Vol. 7, No. 1) is now available. Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Journal of Neurology, Neurosurgery, and Psychiatry.—The next issue (Vol. 17, No. 1) is now available. The contents include:

TRAUMATIC EPILEPSY AFTER CLOSED HEAD INJURY. Gilbert Phillips.
DEMONSTRATION OF "BR" IN NERVE CELLS. Sven-Olaf Brattgård and Torsten Lindqvist.
FRONTAL LOBE WOUNDS CAUSING DISINHIBITION. Hugh F. Jarvis.
A HISTOLOGICAL AND CHEMICAL STUDY OF THREE CASES OF DIFFUSE CEREBRAL SCLEROSIS. W. Blackwood and J. N. Cumings.
POST-ENCEPHALITIC PARKINSONISM WITH AMYOTROPHY. J. G. Greenfield and W. B. Matthews.
A STUDY OF EIGHT SURGICALLY TREATED CASES OF SPONTANEOUS SUBCORTICAL HAEMATOMA. Aloys Werner.
DIMERCAPROL IN THE PRE-NEUROLOGICAL STAGE OF WILSON'S DISEASE (HEPATOLENTICULAR DEGENERATION). C. G. Warnock and D. W. Neill.
STUDIES OF THE CONNECTIONS OF THE FORNIX SYSTEM. H. M. Daltz and T. P. S. Powell.
THE TREATMENT OF DYSTROPHIA MYOTONICA WITH A.C.T.H. Oliver Garai.
BOOK REVIEWS.

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Archives of Disease in Childhood.—The next issue (Vol. 29, No. 143) will be available in a week's time. The contents include:

TUBULAR INSUFFICIENCY AND RENAL DWARFISM. G. Fanconi.
CHONDRO-OSTEO-DYSTROPHY (MORQUIO'S DISEASE). W. F. Townsend-Coles.
NON-INFLAMMATORY LARYNGEAL STRIDOR IN INFANTS. James Crooks.
A CASE OF PHAECHROMOCYTOMA IN CHILDHOOD. M. Israelski, A. C. Kendall, and R. E. Shaw.
HORMONAL SEX REVERSAL IN A FEMALE. W. J. Matheson and E. M. Ward.
BLOOD SUGAR LEVELS IN BABIES BORN OF DIABETIC MOTHERS. George M. Komrower.
LABORATORY OBSERVATIONS ON THE VISCIDITY OF MECONIUM. John L. Emery.
HAEMOGLOBIN LEVELS IN PREMATURE INFANTS. Malcolm Arthurton, Donough O'Brien, and Trevor Main.
A CONGENITAL RENAL TUBULAR DEFECT. J. Luder and Dorothy Burnett.
A SECOND CASE IN THE SAME FAMILY OF CONGENITAL FAMILIAL CEREBRAL LIPIDOSIS RESEMBLING AMAOYTIC FAMILY IDIOSY. N. J. Brown, Beryl D. Corner, and M. C. H. Dodgson.
MONGOLISM IN BOTH OF MONOZYGOTIC TWINS. Robert J. Young.
HEPATIC NECROSIS IN DISSEMINATED HERPES SIMPLEX. R. C. B. Pugh, G. H. News, and J. A. Dudgeon.
A CLINICAL STUDY OF THE DRAUGHT REFLEX IN HUMAN LACTATION. Clair Isbister.
PETECHIAE WITH CYANOSIS IN THE NEWBORN. N. C. Elphinstone, M. Brenda Morris, and Simon Yudkin.
THROMBOCYTOPENIC PURPURA IN THE NEWBORN. M. Brenda Morris.
CHRONIC MYELOID LEUKAEMIA IN A CHILD PRESENTING AS ACUTE POLY-ARTHRITIS. G. A. Bedwell and A. M. Dawson.
ANNULAR PANCREAS IN THE NEWBORN. P. P. Rickham.

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SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, March 1

MEDICAL SOCIETY OF LONDON.—8.30 p.m., meeting of Fellows. Third Letchman Lecture by Mr. N. C. Tanner: Surgery of Peptic Ulcers and its Complications.

Tuesday, March 2

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor J. H. Kellgren: The Supporting System and its Disorders.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. I. Muende: Pigmentation. ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor D. J. Robertson: Congenital Arteriovenous Fistulae of the Extremities.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Professor L. J. Witts: Anaemias of Pregnancy. WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Mr. J. Minton: Ocular Manifestations in Nervous Disease. Part I.

Wednesday, March 3

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Epidemiology of Fungous Infections. INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Dr. E. G. B. Calvert: Surgery and the Diabetic.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., Dr. E. Baylis Ash and Professor J. R. Squire: Allergy. OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Sir Charles Symonds: Recent Advances in Our Knowledge of Epilepsy. SOCIETY FOR ANALYTICAL CHEMISTRY.—At Burlington House, Piccadilly, W., 4.30 p.m., A.G.M. Bernard Dyer Memorial Lecture by Dr. E. B. Hughes, D.Sc., F.R.I.C.: Contribution of Public Analysts and Other Analytical Chemists to Public Welfare.

Thursday, March 4

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor G. M. Bull: Regulation of Body Water.

INSTITUTE OF CHILD HEALTH.—5.30 p.m., Dr. D. W. Winnicott: A Case and its Management.

INSTITUTE OF LARYNGOLOGY AND OTIOLOGY.—At Royal College of Surgeons of England, 5.30 p.m., Mr. F. A. Williamson-Noble: Diseases of the Orbit and its Content Secondary to Pathological Conditions in the Nose, Sinuses, and Throat.

LIVERPOOL MEDICAL INSTITUTION.—5 p.m., visit of Manchester Medical Society. Dr. H. T. Howat and Mr. R. L. Holt: Medical and Surgical Aspects of Pancreatic Disease.

MIDLAND TUBERCULOSIS SOCIETY.—At Birmingham Chest Clinic, joint meeting with Midland Branch, Society of Medical Officers of Health, and Association of Industrial Medical Officers. Dr. J. E. Geddes, Dr. A. Meiklejohn, and Dr. E. L. M. Millar: Social Aspects of Chronic Respiratory Disease.

OXFORD UNIVERSITY.—At Southfield School, Glanville Road, Cowley Road, Oxford, 8 p.m., Dr. A. G. M. Weddell: Science and Medicine.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. W. F. Nicholson: History and Development of Surgical Treatment of Pulmonary Tuberculosis.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Lieutenant-Colonel P. Cuddon: History of the Provision for Army Pensioners.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Mr. F. A. Williamson-Noble: Diseases of the Orbit and its Content Secondary to Pathological Conditions in the Nose, Sinuses and Throat.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor A. G. R. Lowdon: Calculus Disease of the Biliary Tract.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Dr. M. Partridge.

SOCIETY FOR CULTURAL RELATIONS WITH THE U.S.S.R.—8 p.m., Dr. L. Crome: Recent Progress in Soviet Medicine.

Friday, March 5

BIRMINGHAM UNIVERSITY.—At Chemistry Theatre, Edgbaston, 5 p.m., Huxley Lecture by Professor D. M. S. Watson, D.Sc., F.R.S.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. G. B. Dowling.

INSTITUTE OF NEUROLOGY.—5 p.m., Dr. Gonzalo Lafara (Madrid): Familial and Sporadic Myoclonic Epilepsy: its Neuropathology and Classifications. LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.—7.30 p.m., clinical meeting.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., dissertation by Mr. J. W. Delamore: Problem of Pain.

ROYAL SANITARY INSTITUTE.—Sunderland sessional meeting (morning). Mr. W. G. Carey, F.R.I.C.: Modern Developments in the Examination of Food and Drugs; Dr. P. B. Crone: Bacteriological Side of Food Poisoning; Mr. H. C. Bishop, A.R.I.B.A.: Modern Planning of School Buildings and Housing Estates.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., clinical meeting.

Saturday, March 6

INSTITUTE OF LARYNGOLOGY AND OTIOLOGY.—11.30 a.m., Professor A. A. J. Van Ermond (Utrecht): Survey of Vestibular Function.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Cox.—On February 10, 1954, at Nuffield House, Guy's Hospital, London, S.E., to Elizabeth (formerly Padbury), wife of Dr. A. G. Charlton Cox, a daughter—Margaret Elizabeth.

Dally.—On February 14, 1954, at 41, Wiltshire Road, London, S.W., to Ann Mullins, M.A., M.B., B.S., wife of Peter Dally, M.B., B.S., a daughter.

Evans.—On February 7, 1954, at 387, Queen's Road, New Cross, London, S.E., to Alexa (formerly Mitchell), wife of Dr. Carlton John Evans, a sister for Alexa and Mary—Caroline Frederica.

Jones.—On February 16, 1954, at their home, "Froyle," Ty-Gwyn Road, Cardiff, to Pauline (formerly Jackson), wife of Hugh Owen Jones, M.S., F.R.C.S., a daughter.

DEATHS

Benson.—On January 12, 1954, at Moore House, Moore, near Warrington, Lancs., John Keith Hamilton Benson, M.B., Ch.B., B.D.S., F.D.S., R.C.S.

Bollans.—On January 29, 1954, in Woods Hospital, Glossop, Derbyshire, Manchester, Lancs., Robert Wilfred Bollans, M.B., Ch.B., J.P., of The Gables, Hatfield.

Corrigan.—On January 29, 1954, Alexander Duncan Fraser Corrigan, M.B., Ch.B., of Duns, Berwickshire.

Davey.—On January 29, 1954, at "Walton House," South Parade, Northallerton, Yorks., John Milton Davey, M.B., Ch.B.

Hicks.—On January 17, 1954, at Northampton General Hospital, Robert Thomas Hicks, O.B.E., M.R.C.S., L.R.C.P., Lieutenant-Colonel, I.M.S., retired, of 72, Kingsley Road, Northampton, aged 51.

Hildreth.—On January 20, 1954, at Tunbridge Wells, Kent, George Albert Hildreth, M.B., B.S., Lieutenant-Colonel, I.M.S., retired.

Kayton.—On January 25, 1954, at his home, Kensington, London, S.W., Maurice Edward Kayton, L.R.C.P.&S.Ed., L.R.F.P.S., D.P.H., late of Ashfield House, Annesley Woodhouse, Nottingham, aged 73.

Kemp.—On January 21, 1954, at the County Hospital, York, Norah Kemp, M.B., C.M., of 18, Coda Avenue, Bishopthorpe, York.

Kutek.—On January 24, 1954, at his home, London, S.W., Antoni Kutek, M.D.

McConnell.—On January 19, 1954, Samuel Ernest McConnell, M.B., Ch.B., of 9, Hawthorn Road, Gatley, Cheshire, aged 42.

Miles.—On January 18, 1954, Herbert Leslie Miles, M.R.C.P., of Cromal House, Droitwich, Wores.

Norman.—On January 15, 1954, at Edware, Middlesex, George Blake Norman, M.B., B.Ch., aged 78.

Robertson.—On January 10, 1954, at his home, Ashburnhams, Bishops Cleeve, Shropshire, Charles Robertson, M.D., aged 87.

Watson.—On January 20, 1954, at Del Rey House, Cheltenham, Glos., Charles Henry Watson, D.S.O., M.B., F.R.C.S.Ed., L.D.S., Lieutenant-Colonel, I.M.S., retired.

White.—On January 18, 1954, at his home, St. Merryn, Braunton, North Devon, Edward Barton Cartwright White, M.R.C.S., L.R.C.P.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Inheritance of Schizophrenia

Q.—How is schizophrenia inherited? A patient of 34 has been advised against having children because her sister-in-law has schizophrenia. There is no other history of mental disease on either side. What increased risk would there be of her having affected children?

A.—It is probable that schizophrenia is a class name for a number of genetically distinct disorders, and that in some families the mode of inheritance is different from what it is in others. It is also probable that in some cases causation is not genetic but predominantly environmental. It would therefore be desirable, before giving any definite eugenic prognosis, to know the family history in much greater detail, together with information about the normal members of the family.

However, taking all forms of schizophrenic psychosis together, the genetic factor is important. If the patient has a schizophrenic sister-in-law, her children would be nephews and nieces of a schizophrenic. Their expectation of developing schizophrenia at some time in their lives has been estimated (Kallmann) as approximately 4%—that is, about four times as great as the expectation for the average member of the population. If the prospective parents themselves are mentally stable, healthy, and happy with one another, this risk could be regarded as somewhat of an overestimate. In that event, and assuming that they would much want to have one or more children, the risk of schizophrenia for the children would not appear to be an unjustifiable one for reasonable people to take.

The Facts of Life

Q.—One is sometimes asked by parents how and when they should give their children instruction on the "facts of life." At what age should sex instruction be given, and what form should it take?

A.—This question creates a mental picture of the Victorian father taking his son to his study for a man-to-man chat on the evening before the boy leaves home. If a formal episode of instruction for either boy or girl is envisaged, then, whatever age is chosen as being appropriate for it, it is likely to be too late—the child will already have heard a garbled story from its friends and school-fellows and will have added to it by a few shrewd guesses. Moreover, such set explanation is difficult as well as unsatisfactory, and is usually embarrassing for both parent and child alike.

The extent to which sex education should be carried out and the form it should take are very much matters of opinion. The problem is in any case a very personal one, and its solution depends a good deal on the personalities of both the instructor and the instructed. In general, however, information on sex, as on most matters, should be given piecemeal as the child develops, and should be begun as soon as the child asks questions and provides opportunities. It should be merely one aspect of knowledge, gradually and naturally acquired by the child as part of growing up, and it should be treated like any other subject. The nature of the instruction must be moulded to suit the age and mental development of a particular child, but replies and explanations should be truthful, although simple and not necessarily conveying the whole truth. Difficulty can arise if the child happens to ask a direct question in the presence of comparative strangers. It may then be best to leave it unheeded and unanswered rather than to say an thing which is fictitious or which will make the child think it has said some-

thing wrong. The question will inevitably arise again at what is likely to be a more favourable moment for answering it.

One rule should be that knowledge should always anticipate events. For example, a girl should know of menstruation before it occurs. As puberty approaches or is established, and if the parents then consider that more detailed instruction in sex physiology is desirable and is beyond their scope, recourse may be had to books such as *Attaining Womanhood* and *Attaining Manhood*, by George W. Corner (George Allen and Unwin, Ltd., London, 1953).

Salivary Gland Swelling

Q.—A patient complains of pain and swelling in the region of the submandibular gland at meal times. No stone has been demonstrated clinically or radiologically. Is it worth trying to stimulate salivation with mercury to "flush out" the gland, are antibiotics indicated, or is there any other treatment for this tiresome condition?

A.—Despite the clinical and x-ray appearances in this case it is very probable that the patient has a stone in the salivary duct. Such a stone may be quite small, in fact no larger than a pin's head. Scrupulous digital palpation of the floor of the mouth just after the patient has sucked a piece of lemon may reveal the stone. It is not uncommon for a very small stone to be missed in the x-ray films, and these should certainly be repeated. Sucking a piece of lemon may bring the stone forward into the duct and thus enable it to be seen in an occlusal film of the floor of the mouth. In the ordinary lateral oblique views of the submandibular region a stone may be superimposed on an area of dense bone. It is usually wise to take further shots from different angles.

It is most unlikely that the symptoms described are due to anything else but a stone. Subacute infection, such as is sometimes seen in the parotid gland, is rare. It would be useless to prescribe mercury preparations, and, in the absence of superimposed infection by a sensitive organism, antibiotics are without value. Even if repeated investigation of this case fails to reveal a stone it is worth while considering exploration of the duct.

Massive Transfusion Causing a Haemorrhagic State

Q.—Are massive blood transfusions, particularly of citrated blood, apt to lead to a haemorrhagic state? I have noticed in such cases that a needle prick will continue to ooze for a long time and there has also been bleeding from the site of operation.

A.—There seems to be little likelihood of massive transfusions with citrated blood leading to a haemorrhagic state. Mollison¹ has calculated that as much as five litres of citrated blood can be given to an adult without signs of citrate toxicity developing. On the other hand, it is at least theoretically possible that a very massive haemorrhage might lead to a haemorrhagic state by causing a serious loss of platelets and other clotting factors. Correspondingly, massive transfusion would replace the latter, but not the platelets. It is doubtful, though, in practice whether the platelet count ever gets reduced to dangerous levels as the result of haemorrhage in an otherwise healthy person. In any case capillary tone is an important factor in controlling haemorrhage from minute vessels, and it seems in fact more likely that the observations prompting this question were the result of diminished capillary tone developing for some obscure reason rather than due to the effects of blood loss or transfusion *per se*.

REFERENCE

¹ Mollison (1951). *Blood Transfusion in Clinical Medicine*. London.

Dosage of Thyroid

Q.—In treating cases of hypothyroidism, is there any harm, or benefit, in giving rather more thyroid than is necessary just to keep the patient euthyroid?

A.—If rather more thyroid than necessary is given in the treatment of hypothyroidism the patient would become

hyperthyroid rather than euthyroid; it is inadvisable to render a patient hyperthyroid. Treatment should be started with an initial dose of $\frac{1}{2}$ gr. (32 mg.) a day (for adults); this is increased each week by $\frac{1}{2}$ gr. until the optimal minimal dose is found. A good plan is to increase the dose gradually until signs of overdosage appear—for example, tachycardia and irritability; treatment is then stopped for two weeks and is resumed at a dose of 1 gr. per day less than the overdose.

Parapertussis

Q.—At present there is an epidemic here of paroxysmal cough, worse at night and accompanied by vomiting and occasional lung complications, but without a whoop—otherwise it is indistinguishable from whooping-cough. Is this parapertussis? How is the diagnosis established? What treatment is advised for parapertussis, and what notification (if any) is required?

A.—Recently, at least in the London area, there has been a good deal of respiratory infection in children, often very severe in infants, with much bronchospasm. Radiologically a patchy bronchopneumonia limited to the lung bases has been a common feature. Some of the cases had coughs and a tendency to vomiting, suggestive of pertussis, but in those I saw there was no bacteriological or haematological support for the diagnosis.

Out of a large experience, I have seen only two cases of parapertussis confirmed by the laboratory. Generally only about 1% of any series of whooping-cough cases show *H. parapertussis*, although there are records of considerably higher percentages. Probably these infections present quite commonly as a mild clinical disease recognizable as whooping-cough, but even more often as a mild coryza and bronchitis without whoop. A definite diagnosis can be based only on skilled laboratory help. Clinically either pertussis or parapertussis may be indistinguishable from coryza or mild bronchitis. Differentiation is by culture and by agglutinin and absorption tests.

The treatment of parapertussis is symptomatic and, if diagnosed early (before tenth day of disease), by antibiotics—for example, chloramphenicol, aureomycin, or terramycin, in doses proportional to the patient's weight. Notification should be as whooping-cough.

Counter-irritant Ointments for Rheumatism

Q.—As most proprietary preparations used for local application in rheumatic conditions seem to have been placed in Category 5 or 6, could you kindly recommend an alternative counter-irritant cream? I would like it to be non-greasy, not to stain or damage the clothes, and to be free from odour.

A.—It is very questionable whether slight irritation of the skin over a painful rheumatic lesion has any significant beneficial effect, which no doubt explains why many proprietary counter-irritant creams have been placed by the Cohen Committee in Categories 5 or 6. Aspirin provides an alternative and more effective approach. Nevertheless several counter-irritant ointments have been retained in the *National Formulary* and can therefore be prescribed on Form E.C.10, though it is doubtful if their official cachet really endows them with any particular therapeutic efficacy. One of these is the *B.P.C.* unguentum iodi denigrescens cum methylis salicylate. When well rubbed in it is non-greasy and will not stain or damage the clothes, though it must be confessed that it has a characteristic but not unpleasant odour. It contains 5% methyl salicylate in non-staining ointment of iodine.

Thallium Poisoning

Q.—What are the symptoms and signs of thallium poisoning? How should it be treated? Thallium sulphate is used here (Turkey) as a rat poison.

A.—There have been several reports of thallium poisoning following the accidental or deliberate ingestion of rat poisons with food. The first symptoms are tingling and

pains in the hands and feet, followed by paroxysmal abdominal pains with vomiting. The next symptom is weakness of the extremities and this may be followed by mental disturbances. The breath is foul, the lips may be blistered, and a purple line on the gums has been reported. Chronic poisoning is associated with gastro-intestinal disturbances, muscular weakness, and pains in the limbs. Loss of hair may accompany both acute and chronic poisoning. There is no specific treatment, but one report¹ claims the successful use of dimercaprol (BAL), 300 mg. daily for eight days, in treating a single case. Ginsburg and Nixon² give a good account of acute poisoning.

REFERENCES

- ¹ *J. Amer. med. Ass.*, 1950, 143, 208.
- ² *Ibid.*, 1932, 98, 1076.

Hazards of Fluoroscopy

Q.—I spend about half my working day in the x-ray room, examining the chests of merchant seamen by fluoroscopy. I should appreciate information on the following points: (a) The immediate and long-term risks to health attendant upon prolonged fluoroscopy examination; (b) the optimum operating kilovoltage and milliamperage; and (c) the maximum amount of time which can be spent daily on screening if the optimum kilovoltage and milliamperage figures are adhered to.

A.—(a) If a fluoroscope is adequately protected and properly used there is no risk to health. There is no evidence that prolonged screening leads to malignancy; epithelioma does occur in chronic radiation dermatitis, but if lead gloves are used there is no risk of dermatitis.

(b) For chest screening 65–70 kV at 3 mA is adequate if the operator is fully adapted.

(c) A screening session of three hours is about the maximum desirable, but there are no rules or regulations defining the optimum period.

Craving for Salt

Q.—My daughter, aged 7, has a normally healthy appetite, but she desires enormous quantities of salt. She eats the equivalent of about a heaped teaspoonful of it at each meal (four times a day), taking it on her bread-and-butter as other people would jam. Is this habit of any significance and will it do any harm if persisted in?

A.—Small children sometimes develop cravings for the most odd foods, and a craving for salt is not very unusual in them. It is most unlikely to be more than a transient peculiarity of behaviour, but it is just possible, at any rate theoretically, that the desire for salt represents some physiological need, and that the child actually requires the extra salt. It is in any case a harmless oddity, and probably if she is allowed to indulge her taste for salt, and no further notice is taken of the habit, she will soon tire of it.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 6 1954

YESTERDAY AND TO-MORROW IN CHILD HEALTH*

BY

CHARLES McNEIL, M.D., LL.D., F.R.C.P., F.R.C.P.Ed.

Professor Emeritus in Child Life and Health, University of Edinburgh

This address gives a short review in general terms of child health in the last hundred years. Although the examples and figures used in it have been drawn mainly from Scotland, the history has been much the same in England, Wales, and Ireland, and indeed far beyond these islands: it has been similar both in the measures taken to promote child health and in the results obtained. From such a historical survey we can get a perspective view of the growth of the subject and of its future progress.

The Infant Death Rates

Child health is a phrase full of meaning, but is so wide and deep in its meaning that it is difficult and perhaps impossible to define it. As an idea in the mind and as an object of human effort it is as old as the human family; and long before human records were kept the health and well-being of children must have been deeply cherished by their natural guardians, their fathers and mothers. But as a medical concept, and especially as a medico-social problem, it emerged in Britain about the middle of the last century; while the actual phrase—child health—obtained a recognized place in the medical vocabulary only about twenty years ago. It was the publication, for England and Wales in 1840, and for Scotland in 1855, of the numbers of births, deaths, and marriages, and of the population that drew attention to public health and to child mortality, for among these figures, called vital statistics, was included an infant death rate.

This infant death rate (or infant mortality rate) is the number of babies dying in the first year of life in every thousand who survive birth. These rates do not completely measure child mortality, for they omit the heavy loss of infants during birth (stillbirths), and also the considerable loss of children over 1 year of age. None the less, as these infant death rates rise and fall they fluctuate with the stillbirths and the deaths of older children; and they have long been accepted as giving in terms of death an index in reverse of the health of the child community. These infant death rates are given for the whole country and for its units of towns and country districts; so that if the infant death rates have fallen for one or over several years, we say that the state of child health in Scotland or in Glasgow is better; while if these rates have risen we feel that child

health is worse. It is impossible to exaggerate the value of the infant death rates, which have now been published each year in Scotland for nearly a hundred years. These figure-measurements first disclosed the extent of child mortality; next they gradually uncovered the sinister and formidable league of causes that was producing such a wastage of child life; and then they brought into action, with slow and painful effort, various social and medical agencies to remove these causes. And now to-day, with a good deal accomplished in the reduction of child mortality, we tend to put still wider meanings into the phrase child health.

We realize that the child cannot be isolated as a person; and as we become aware of the connexions of child health with the fundamental social realities of family and home we see that child health in this wider context is at the centre of the nation's well-being. This wide conception of child health and the vision of its future fulfilment have been gradually reached by the use of the instrument of measurement that we have in the infant death rates.

Yesterday in Child Health

Let us look back over almost a hundred years of infant death rates in Scotland, for by giving the figures at the beginning and the end of the century we shall have a simple measure of the progress of child health in that time. The infant death rates for Glasgow for the same periods are added because later I make some remarks upon Glasgow, where the problem of infant mortality was perhaps more serious and more difficult than in any other large Scottish town. The infant death rates for Scotland and Glasgow were:

	1855-60	1952
Scotland	120	35
Glasgow	179	41

The figures speak for themselves and show a great reduction for Scotland and one relatively greater in the case of Glasgow. And the difference would be even greater if stillbirths were added; but stillbirths have been registered only in recent years. Even with incomplete figures we can see that in the last hundred years the tide of death has gone back a long, long way from the shore of infant life, or, to make a positive statement, that there has been a great gain in child health.

In running the eye over the figures in the years between the beginning and the end of the century a surprising fact becomes apparent. The great reduction over the century was not a steady downward trend

*The first G. B. Fleming Memorial Lecture, given in Glasgow on April 15, 1953. Dr. Geoffrey B. Fleming was Senior Physician at the Royal Hospital for Sick Children, Glasgow, and Professor of Child Health in the University of Glasgow from 1930 to 1947. The above address was prefaced by a tribute to his work and character.

throughout; there was nothing of the inevitability of gradualness about it. In fact, the infant death rates in Scotland hardly moved down at all during the first fifty years of the century; they fluctuated near 120; they rose to 130 in the 1891-1900 decade; and stood again at 120 in the 1901-5 period. But during the next fifty years (1906-52) the infant death rates have gone steadily down, with an acceleration since 1941. Is there any explanation of these tides of infant mortality remaining obstinately high for the first fifty years, and of their receding steadily during the next fifty years? We can answer the question only if we know something of the efforts that were being made to remove conditions hostile to infant life during the two periods. In any case the very different behaviour of the infant death rates in Scotland from 1855 to 1905 and from 1906 to 1952 justifies the division of our chosen "yesterday" into two periods of fifty years each.

It is interesting that in England and Wales the levels of infant death rates remained steadily high during the same 50-year period; indeed, they were at a higher level, remaining between 140 and 150. The English figures began to fall sooner than in Scotland. Presently they reached and then passed the Scottish levels, maintaining these lower levels until in 1952 the infant death rate in England and Wales was 28 and in Scotland it was 35.

The First Fifty Years: 1855-1905. Sanitation and the House

The first fifty years saw the first real beginning of sanitation as an organized community movement in Scotland; and naturally sanitary reform began in the largest towns. I take Glasgow as an example of the prevailing insanitary conditions in Scottish towns. Glasgow was first among Scottish towns for the size and density of her population, and was worst in her sanitary conditions. Her citizens were aware of these dangerous conditions; and in 1855, the first year of this first 50 years, the Loch Katrine Waterworks Act was passed which was to give Glasgow the finest water supply in the United Kingdom. This was followed by the creation of a sanitary department in 1862, and the appointment of her first medical officer of health the following year in the person of Dr. W. T. Gairdner, who was to become a distinguished physician. He was succeeded in 1872 by Dr. James Burn Russell, the second in a notable line of Glasgow medical officers of health. Before Russell took up his duties, great measures of sanitary reform had been carried out in water-supply, drainage, sewerage, removal of refuse, and paving, lighting, and cleansing of streets. The city as a whole and its streets had been cleaned up; but many thousands of its houses remained grossly insanitary. Russell held office till 1892; and he has left a record of sanitary and housing conditions in Glasgow during these 20 years, both in his official reports and in his addresses to the Glasgow Philosophical Society and other public audiences (Russell, 1905). These addresses were given to inform the citizens of what was happening in their midst, and to rouse their conscience to support official action and to engage in voluntary effort.

From the outset the new medical officer of health was convinced that further progress in Glasgow sanitation and public health would depend more than anything else on improvement of the housing conditions. He set himself to study the insanitary house. He listed the many ways in which a house could be insanitary—in structure, in sanitary conveniences, in lighting and ventilation, etc.; and high on his list he placed overcrowding. He noted the effects of such houses on the men, women, and children who lived in them in terms of disease and moral degradation. He was a firm believer in the principle of measurement, and he applied it wherever he could. He was like the man in Ezekiel's prophecies; and he went into and through the houses of Glasgow "with a line of flax in his hand, and

a measuring reed"—into the many-roomed mansions of Blythswood and the one- and two-roomed houses of Bridgegate. And he counted the number of persons who lived in each house. Thus after great labour he produced a house census for the whole city in which houses were graded according to the number of their rooms, the number of persons who lived in them, and the average air space for each person; and alongside these different grades of house he placed their general death rates and the infant death rates. All this work was embodied in official reports, but the gist of it was given to the citizens of Glasgow in these public addresses already mentioned.

These popular lectures give the classic account of the insanitary house, supplying the facts and figures, and adding vivid pictures of such houses and their effects upon their inhabitants. In a famous address, "Life in One Room," he told his audience that in 1881 the population of Glasgow was 511,520, and of this total 126,000 (a quarter) lived in one room, and 228,000 (nearly a half) lived in two rooms, and gave figures showing the high general death rates and the soaring infantile mortality rates in such houses. In another address, on "Uninhabitable Houses," he takes his audience inside "a one-roomed house . . . where there is no artificial light but a glimmer of light from a handful of red ashes, and going in one hears voices but sees no one, and 'where in the innermost recesses of the apartment, the air seems a residue of all the breath that had ever been breathed into it.'"

In 1891 Russell reviewed the progress of sanitary reform in Glasgow and for Scotland for the previous 30 years; he claimed that housing conditions had improved, giving facts and figures, and in support of his claims he showed the steady fall of the general death rates. But the fall in the infant death rates was trifling and insignificant, and these were to rise sharply in the next decade. He was sensitive about Glasgow's high infant mortality, and in another address he referred to this in one of his vivid phrases. Speaking of the quinquennium 1876-80 he says: "Glasgow makes away with 147 in every thousand of her children before she has had them in her fatal arms," but he notes with a kind of sad satisfaction that the infant death rate in Liverpool at the same time was 162.

Russell was a great man, and in his fight for sanitary reform in Glasgow he was single-minded, and concentrated his thought and effort on the dwelling-house as the final end of good sanitation. This task was a gigantic one and could not be finished in a single life, and when he died in 1904 much remained to be done.

Next year, 1905, saw the completion of 50 years of infant death rates in Scotland. I have already mentioned that the infant death rates remained steady throughout this period at 120 per 1,000, with small fluctuations; while the general death rates, starting at 20.7, had steadily fallen to 17 at the end (1901-5). In terms of health, we can say that the health of the whole population of Scotland, young and old, had become better in these 50 years; while the health of infants under 1 year remained at the same poor level. We know now that of all the death rates the infant death rate is the most sensitive to insanitary conditions; and by the end of this 50-year period (1855-1905) housing conditions in Glasgow and throughout Scotland had not reached a degree of improvement that was reflected in a lowered infant mortality, and during the same time no other effective aid, medical or social, was reaching mothers in their care of children inside these insanitary houses.

The Second Fifty Years: 1906-52. Mother and Child

In 1906, at the beginning of this second period, a national conference met in London to discuss infant mortality and measures for its reduction. The significance of this was that general attention was focused on the problem of infant mortality and its urgency. Still more significant were the words of Mr. John Burns, then President of the Local Government Board in England, in his address to the Conference: "Let us concentrate on the mother. What the

mother is the children are. . . . Let us glorify, dignify, and purify motherhood by every means in our power." In these words the Minister of State concerned with public health gave his blessing and support to efforts already being made, both by municipalities and by voluntary bodies, to assist mothers in their task of child care. I shall not overload this address with details of when and where in England and in Scotland milk depots, infant clinics, and schools for mothers were begun, but these agencies were already at work before 1906, fairly extensively in England, and here and there in Scotland. They were now extended; and they were gathered into a national system in the Maternity and Child Welfare Services Act of 1918. This Act might be described as a Special Education Act for Mothers; for its main benefits were that it provided mothers with teachers who gave them simple lessons in the care of their children.

I have already spoken of Dr. Russell, of Glasgow, and how he concentrated his effort on the good house as the end of sanitation in a well-governed city, and how he showed that bad houses brought disease and death to those within it, and especially to the children. But throughout the period of 50 years in which he lived bad housing was so widespread and deep-rooted that the movement of child health and also for general health was largely occupied with improving the sanitation of the city and of its houses. And now, in 1906, John Burns, of Battersea, spoke to the representatives of four nations and urged them to deal with the problem of infant mortality by concentrating on the mother. This is a simple phrase, but powerful in its wide and deep implications. For the mother is the housekeeper in a double sense, keeping both the house and her children and husband. The sanitary department does not sweep and clean her house, and the doctor and nurse do not feed or wash her baby. And when John Burns added, "What the mother is, the children are," he was stating in simple words a great truth, and indeed was filling in almost the whole truth of infant and child health. The two foundation stones of child health are a good house and a good housemother. And of a good mother much is required: a good conscience, both a sanitary conscience towards her house and all its materials, and a maternal conscience towards her children; a mind that knows how to keep the house clean and how to feed her baby; and a strong body and capable hands.

These are the abstract principles that govern the life and health of the mother and her children; and now we can speak of practical results. This advice to concentrate on the mother has been followed out for the last 50 years; and it has given a better understanding of her problems, separating the things that must be done for her from the things that she alone can do. It has strengthened services already at work, and has brought new services into action.

The care of the mother's general health and her careful supervision in pregnancy and in her confinement have been undertaken in the new service of antenatal clinics which have strongly reinforced the work of the maternity hospitals. The combined antenatal-maternity service has reduced maternal deaths, has raised the level of health in mothers, and has also reduced infant deaths during birth and in the first month after birth.

At the same time the care of the sick child has been greatly improved by increased accommodation in children's hospitals, by the building of new hospitals and especially of fever hospitals, and by advance in knowledge of disease in children and in the power of its treatment. This better knowledge of disease in children, put at the disposal of family doctors and practised in the home, has also strengthened the general service of the sick child.

Education of the Mother in Child Care

This had begun in a feeble and scattered way before the second period of 50 years had opened; and it was firmly established only in 1918 by the inauguration of the child welfare service. This was a new and great enterprise; an attempt on a national scale to provide the mother with

education in all the tasks of child care which she alone can give. The doctors and health visitors were the teachers, giving their lessons at the infant clinics and inside the homes; but the practice of these lessons in child care rested in the instructed mind and in the strong and willing hands of the mother in her home.

The important part of this education was in the feeding of infants and in domestic sanitation. Infant-feeding had long been a subject of study in children's hospitals; and it was mainly a study of the use of clean cows' milk as a substitute for breast milk. At first cows' milk mixtures were complicated, and the instruction in their use reached mothers only indirectly or not at all. But by the time the new child welfare service was begun the use of cows' milk for infants had been much simplified, and instruction was now given by an army of teachers, and directly into the ears of mothers. For the young baby, the right use of cows' milk is a matter of life and death, and thousands of infant lives must have been saved by this national education of mothers in infant feeding.

The Children's Hospitals

The teaching children's hospitals had always had a double function—the advance of knowledge of disease and its treatment, and the study of health and the instruments that secure it; and the courses of instruction both in disease and in health were steadily extended and given to increasing numbers of medical students. Further, the establishment of chairs and departments of child health, first in Glasgow in 1924 and later in Edinburgh, Aberdeen, and St. Andrews, took place in this period and strengthened the status of the subject in all the four Scottish medical schools; while the title of child health encouraged teaching and study in the whole field of child medicine.

I have given a short account of the more important results that have followed the London Conference on Infantile Mortality in 1906, with its slogan, "Let us concentrate on the mother." Throughout this second period of almost 50 years the work of sanitation and of replacing bad houses with good ones went on. The building of new houses was seriously interrupted during the two wars; but since 1945 it has been resumed, and at a greater pace than ever before. In addition, great attention has been paid to the mother and her children; old services of hospital care for mother and child have been extended and strengthened, and the great new experiment of education of the mother in her own care of her children has had a full trial of 30 years. In short, much effort has been made both for better houses and for the betterment of the mother and children who live in them. Under this combination of effort what progress has been made in child health, measured by infant death rates? The figures for the first quinquennium of the period under review (1906-10) and for the last completed year, 1952, are given for all Scotland, and for Glasgow; and will answer the question.

	1906-10	1952
Scotland	112	35
Glasgow	130	41

This fifty-year period began with a slight improvement; and this continued steadily throughout, with an acceleration since 1940, and reached low levels in 1952. There can be no doubt that in the second 50 years there has been a great improvement in child health. While most of us will agree that improved housing, the education of mothers in child care, and the better hospital care of the mother and the sick child have each played a part in the result, there may be argument about the order of their importance.

Near the end of his work in Glasgow James Russell, still grappling with his unfinished task of improving housing conditions, made a remarkable statement, a prophetic statement, but with no date of its fulfilment. "I see nothing in the nature of things," he said, "why life in the town should not be as healthy as the country." Within 50 years of his death in 1904, his prophetic hope has been realized in the infant death rates for Edinburgh and Aberdeen, and

almost realized for Glasgow. In 1952 the infant death rate for all Scotland was 35: for her rural areas it was 33, for Edinburgh 29, for Aberdeen 30, and for Glasgow 41. When we consider the factors of size and density of population, the presence of "heavy industries," and the legacy of insanitary houses, Glasgow's present low infant death rate entitles her to the place of honour among the larger Scottish towns.

To-morrow in Child Health

We have looked back over a hundred years of work for child health, and have noted the great progress made in the past 50 years. The ideas and the acts of this long yesterday will be carried forward into to-morrow. What are the prospects, immediate and more distant?

Let us name the list of the existing services of child care. They are communal and domestic sanitation; the antenatal, maternity, and neonatal services; the children's and fever hospitals; the child welfare service; family doctors; and, greatest of them all, the home service of mothers. This great array of agencies and their increasing efficiency will ensure in the lengthening years of to-morrow a continuing and steady reduction of the existing rates of infant deaths. A few examples will show the low levels of infant death rate that have already been reached: England and Wales (1952), 28; Holland (1951), 25; New Zealand (1951), 23; and Sweden (1951), 20. These rates do not measure the total infant loss, but this total loss can be obtained when stillbirths are added, and the total sum of infant deaths is divided into the two main groups of the early "catastrophic" deaths and the later "careless" deaths. Thus for New Zealand, in 1951, the first group of natal-neonatal deaths—that is, including stillbirths—gave a total death rate of 40, and the second group of deaths in the first year (after the first month) gave a rate of 7.

The Irreducible Minimum of Infant Deaths.—A closer examination of these record low levels of total infant loss shows that further reduction is still possible, until the irreducible minimum is reached, made up by the inevitable hazards and accidents of infant life; and we may be sure that the larger fraction of this minimum will lie in the natal-neonatal group. In 50 years' time, or longer, we might expect from one or two countries such rates of total infant loss as 20 for the natal-neonatal group, and 5 for the 11 succeeding months of the first year. But this attainable optimum will be reached only through the steady pressure and increasing efficiency of the services of child care.

I shall now give some notes upon each of these services of child care and upon their future contribution to child health.

Sanitation and Housing.—Only a few words are required on this subject. Local authorities and their medical officers of health know better than anyone else the importance of keeping general sanitation in all its aspects at the highest level, and of improving housing conditions and building new houses. Bad houses remain, but they are few in comparison with the thousands that Dr. Russell counted in Glasgow in his famous survey of 1881. Overcrowding remains, but the pace of building new houses increases year by year. And let us not forget that the fruit of good sanitation can be brought to perfection only by good houses and good housekeepers.

Antenatal, Maternity, and Neonatal Services.—This triple service is expanding in each of its branches. It grapples with difficult problems both in mother and in child, and with a high infant loss during birth and early infancy. The reduction of the maternal and infant death rates in the last two decades is the proof of its success. A further reduction in deaths from prematurity is certain to continue, both from the preventive work in the antenatal clinics and from the extending special care of premature newborn babies.

Children's and Fever Hospitals.—The future contribution of these hospitals will be mainly in curative medicine, in the diagnosis and treatment of serious illness, and in the deep study of the many problems of disease that remain

unsolved. Their teaching hospitals are well supplied with material of disease in childhood, but they lack the clinical material and experience of healthy infants and children. This lack of material can be supplied in the clinics of the child welfare service.

Future of the Child Welfare Service: Provision of Training Schools

The curative work of the service in the treatment of many kinds of minor disorder and in the diagnosis of serious illness at the clinics is of great value. But more valuable is its preventive work. This has a double aim—(1) to reduce to a minimum the number of infant and child deaths, and (2) to raise to a maximum the quality of life in the survivors—and a single method of achieving it by the education of mothers in the manifold kinds of child care and in the right use of each.

The two aims of this young child welfare service are an immense task. The first aim—the mastery of fatal disease in infants—has gone a long way towards achievement; the second aim of maximum health in childhood is only beginning, and its full accomplishment can come only in the far-distant future. Here and there suggestions are heard that, with the great reduction of the infant death rates, the personnel and work of the child welfare service may now be cut down, and that a partial demobilization in the civil war against disease in children might now take place. But there is no discharge in this war; the death rates must still be kept down, and the new campaign of raising levels of health in children is only beginning. And for this longer and more difficult campaign the child welfare service must be strengthened and given new and better weapons.

The most important work of the service is the education of mothers in the care of children. For this its doctors and nurses require better training than they now receive. There is an urgent need for the provision of training-schools in infant child health, these to be located in child welfare clinics. At present the doctors of the service get their training in child health in a children's hospital as part of the course of teaching in diseases of children. But the children's hospitals lack the essential clinical material of mothers and healthy infants and children. Such material, both for study and for training, can be provided only in a child welfare clinic, and, best of all, in one attached to a maternity hospital where the clinic has a close link with the nurseries of the newborn. I have already given the argument in favour of this proposal (McNeil, 1945) in an article "The Clinical Material of Child Health: where to obtain it; and how to use it." This argument was based on my conduct of such a clinic in Edinburgh for 17 years, and upon a teaching course in infant and child health given to medical students at the Maternity Pavilion, University of Edinburgh. This personal experience has convinced me that the most immediate and important need for the child welfare service is the provision of centres of study and schools of training in child health. These would, I believe, do for the new service what the use of hospitals for the study and teaching of disease has done for the medical practice of disease in children. The child welfare service with its own training-schools would steadily gain in power, authority, and prestige.

The Home Service of Mothers

The work of the mother for her children at home is the foundation and centre on which all the other activities of child care are built. In 1906 John Burns said: "Let us concentrate on the mother. . . . Let us glorify, dignify, and purify motherhood by all means in our power." These words set a target that is still far from being reached. But they turned the attention of medical and social reformers from the circumstantial things of child care—sanitation and the house—and towards the central persons—the mother and child at home; and they created in the child welfare service a national system of education of mothers in child care.

Fifty years later infant mortality, the subject of the London conference in 1906, has been brought under strong control in many countries, and to this massive achievement the new service of education has made an indispensable contribution. But great, difficult, and unfinished tasks of promoting the health of infants and children remain; and these tasks will lie largely in the hands of the child welfare service.

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ANAEMIA IN KWASHIORKOR

BY

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Kwashiorkor has been defined by Brock and Autret (1952) as a nutritional syndrome of African infants and children comprising retarded growth, alterations in skin and hair pigmentation, oedema, fatty infiltration, cellular necrosis or fibrosis of the liver, and frequently a variety of dermatoses. Mortality is heavy in the absence of proper dietary treatment.

The anaemia often found in kwashiorkor is usually mild in degree, normocytic or slightly macrocytic, and has responded somewhat slowly during treatment of the syndrome by high-protein diets (Altmann and Murray, 1948; Trowell *et al.*, 1952). In East Africa, where tropical infestations are common, sometimes there is hypochromia, responding to iron treatment; often there is slight macrocytosis, but megaloblastic change rarely if ever occurs (Trowell, 1949). Lehmann (1952) believes that this macrocytosis without megaloblastic change is due to the presence of reticulocytes following blood loss. In Johannesburg, where parasitic infestations are infrequent, Altmann and Murray have observed a more constant blood picture. They considered anaemia to be due to deficiency of protein. Three of their 34 cases showed macrocytosis, while others became macrocytic on high-protein diets. In the marrow smears of six cases abnormal cells were seen suggestive of lack of liver principle or folic acid, but, as Trowell has also observed, the red-cell precursors were of an intermediate type or macronormoblastic, there were some giant metamyelocytes, but true megaloblasts of Ehrlich were not seen. Walt *et al.* (1950) also record a moderate, slightly macrocytic normochromic anaemia in their cases in Durban. In three, all fatal, anaemia was severe, but there was no megaloblastic change. Macrocytosis was reported by van der Sar (1951) to be common in his 31 cases of kwashiorkor in Curaçao, but in only one was the bone marrow megaloblastic.

It is now generally accepted that the syndrome is due to deficiency of protein in the diet, and that it responds well to treatment with high-protein diets, anaemia slowly improving at the same time. It is said that the anaemia does not respond to folic acid, vitamin B₁₂, or liver extracts (Trowell *et al.*, 1952), although Piéraerts (1950) believes it will respond to these after protein replacement.

The possible relationship of this anaemia to protein deficiency, the occurrence of macrocytosis, and the reports that in the bone marrow there are features of megaloblastic change without the full picture seen in

megaloblastic anaemias have prompted the present investigation, in which haematological findings in a series of cases of kwashiorkor are described.

Clinical Material

Twenty-one cases have been studied—nineteen of African and two of Indian origin. The ages ranged from 1 to 5 years, with a mean of 2 years 3 months. Eleven were male and ten female.

In each case pitting oedema, dermatosis, and lowered plasma proteins were present. With the absence of complicating diseases these were the only criteria used in the selection of cases. Pitting oedema was always found in the legs and usually in the hands. Often facial oedema and generalized anasarca were marked. The dermatosis was similar to that described by Gillman and Gillman (1951) and by Brock and Autret (1952). Total plasma proteins ranged from 3.5 to 4.9 g.%, with a mean of 4.05 ± 0.10 g.%, and the albumin fraction from 1.2 to 2.6 g.% about a mean of 1.89 ± 0.04 g.% (see Table I).

TABLE I.—Plasma Proteins Before and After Treatment, and Plasma Bilirubin on Admission

Case No.	On Admission			After Treatment	
	Total Protein (g.%)	Albumin (g.%)	Bilirubin (mg./100 ml.)	Total Protein (g.%)	Albumin (g.%)
1	4.3	1.6	0.9		
2	4.0	—	0.9	6.7	4.0
3	3.8	1.8	0.2		
4	4.0	1.7	0.1	6.3	3.6
5	4.4	2.1	0.2	7.0	4.0
6	3.8	1.5	0.3	7.5	3.8
7	3.5	1.6	0.2	—	—
8	4.9	2.2	0.2	5.9	3.9
9	3.5	2.3	0.3		
10	3.5	2.3	0.4		
11	4.7	2.4	0.3	5.6	3.6
12	3.5	1.7	0.7	8.2	4.3
13	4.9	2.6	0.3	5.8	—
14	3.5	1.9	0.5	7.0	4.0
15	3.8	1.2	0.3		
16	3.8	1.9	0.4		
17	3.5	1.5	0.4		
18	4.5	1.9	0.3	6.7	3.8
19	4.4	1.7	0.3		
20	4.1	2.0	0.3		
21	4.6	1.8	0.3		
Means	4.05 ± 0.10	1.89 ± 0.04		6.70 ± 0.23	3.89 ± 0.07

d=died. * = removed from hospital before recovery complete.

No case was included without all these features, but other manifestations of the syndrome such as mental apathy, retardation of growth, and thinning of the hair with reddish pigmentation were present in varying degree. The liver was enlarged in 12 cases. In none was the spleen palpable. Abnormalities were not detected in the heart or nervous system, and lymph nodes were never enlarged. No specific changes were observed in the tongue although it was sometimes red, and there were no significant lung changes clinically or on x-ray examination except in two of the fatal cases which showed radiological evidence of bronchopneumonia.

Stools were sometimes watery and occasionally oily, but diarrhoea was not a marked feature. Stools were always examined, usually on three consecutive days. *Entamoeba histolytica* was isolated in two cases, but there was no dysentery. Ova of ascaris were observed in three cases, while in one of these there were hookworm ova, but here the test for occult blood was negative. This low incidence of parasites indicates the small chance that intestinal infestations were responsible for the anaemia in this series.

Plasma bilirubin was estimated in every case, but in none was it elevated (see Table I).

Treatment consisted of soured milk (maas) or this and a hydrolysed protein preparation ("casydrol") given in alternate feeds until convalescence, when ward diet was added.

Eleven patients made an excellent recovery, with disappearance of all symptoms, loss of oedema and skin changes,

and gain in weight and vitality. Hair changes often persisted. Three children died, permission for necropsy being refused. Seven were removed from hospital against advice before recovery was complete. There was a return of total plasma proteins and albumin to normal values in all cases, with complete clinical recovery except in one in which a final estimation was not made (see Table I).

Methods

Blood was obtained from the jugular veins in all cases, and all haematological investigations were done by me, using dry sterile syringes with ammonium and potassium oxalate as anticoagulant. Haemoglobin was determined by a photometric method. Packed cell volumes were estimated in duplicate and red cells counted in a double chamber filling. Reticulocytes were counted by the method of Dacie (1950). Aspiration specimens of iliac marrow were obtained from every case by iliac puncture and stained with May-Grunwald-Giemsa. Mean corpuscular diameters were measured by the method of Price-Jones (1933).

The Anaemia

On admission most cases showed only mild anaemia. Often, however, there was a drop in haemoglobin, red cells, and packed cell volume in the first week, although this sometimes occurred later. This drop took place without evidence of haemolysis or blood loss. If the lowest haemoglobin levels recorded are examined it is seen that the degree of anaemia encountered in these cases is not so mild. In 14 cases haemoglobin was below 9 g.%, while in six it was less than 7 g.% (see Table II).

White-cell counts tended to be high, with a range from 7,450 to 19,200 per c.mm., about a mean of 12,700 per c.mm. but otherwise they usually showed no departure from normal. Platelets always appeared to be plentiful and platelet counts were not done.

Hypochromia was seen only once—in Case 14 after treatment, when it was of mild degree. Mean corpuscular haemoglobin concentrations varied from 26 to 36%, with a mean of 31%.

Examination of the bone marrow showed normoblastic erythropoiesis in 13 cases and in these there were no abnormalities in the myeloid series. In the remaining eight cases the marrow deviated from normal in varying degree. In two there were some megaloblasts of Ehrlich as well as normoblasts and giant metamyelocytes (Cases 17 and 20). There were also macronormoblasts, some of which had nuclei with several lobes. The bone marrow in the other six cases showed a few giant metamyelocytes and occasional macropolycytes. The red-cell precursors were mainly normoblastic, but a few showed megaloblastic features. In these the cartwheel appearance of the nuclei was absent, a finer chromatin structure taking its place. They are presumably the cells described by Altmann and Murray as being of intermediate type. Premature haemoglobinization was sometimes seen; fully haemoglobinized erythroblasts were sometimes large, occasionally with lobed nuclei, but orthochromatic megaloblasts were not seen.

These cases with bone-marrow abnormalities appear to form a series, at one end of which the marrow is almost normal with only giant metamyelocytes, while at the other there is some definite megaloblastic change.

Cell Size

There was mild macrocytosis in 11 cases in which the mean corpuscular volume was above 100 μ^3 . It did not appear to be related to the bone-marrow changes just described: in those with normoblastic erythropoiesis the mean was $98.0 \pm 2.7 \mu^3$, while in the group with abnormal marrow there was a mean of $103.9 \pm 2.8 \mu^3$, the difference not being significant (see Table II). In most of the blood films the red cells appeared somewhat large, with some anisocytosis, but little poikilocytosis. Even in the two patients with partial megaloblastic change, the cells in the

blood films were round, but in one anisocytosis was marked (Case 17). This is demonstrated in the Price-Jones curve from this case, which shows broadening of the base and macrocytosis (see Fig. 1). Less variation was observed in other cases. There was some macrocytosis even in cases

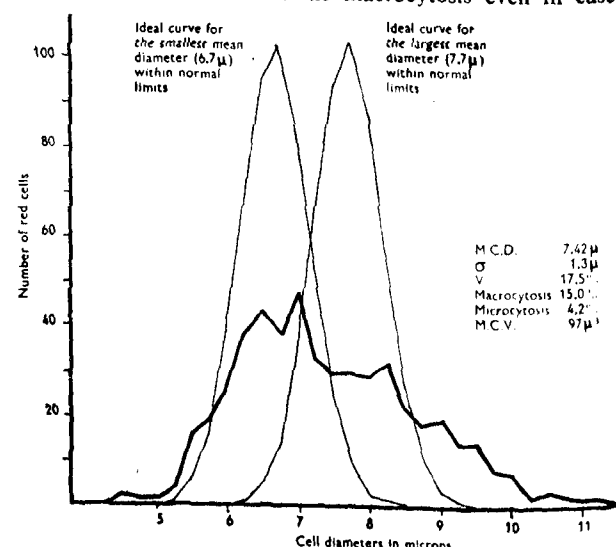


FIG. 1.—Erythrocyte diameter distribution curve from Case 17.

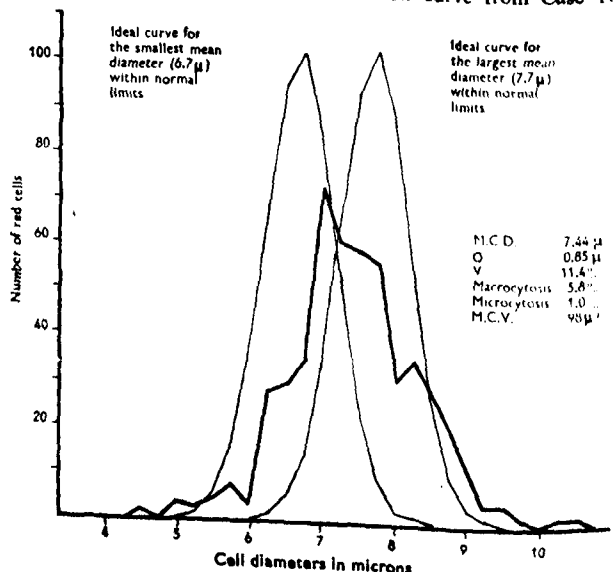


FIG. 2.—Erythrocyte diameter distribution curve from Case 16.

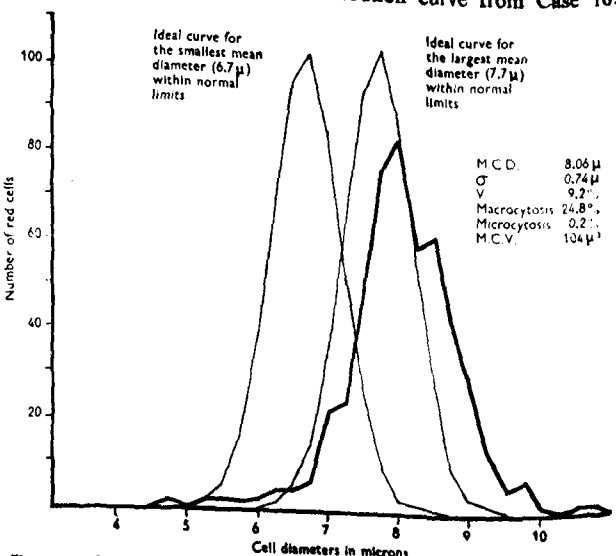


FIG. 3.—Erythrocyte diameter distribution curve from Case 8.

with normal marrow—for example, Case 16, in which the M.C.V. was 98 μ^3 , the mean of the group (see Fig. 2)—and in others with giant metamyelocytes and some intermediate red-cell precursors—for example, Case 8 (Fig. 3). Reticulocytosis did not seem to be the cause of the macrocytosis in any of these cases.

TABLE II.—Blood Counts on Admission and After Recovery, and Lowest Haemoglobin Recorded

Case No.	On Admission						After Recovery		
	Hb (g. 100 ml.)	Red Cells (mill. c.mm.)	M.C.V. (μ^3)	M.C.H.C. (%)	Retic. (%)	White Cells (per c.mm.)	Lowest Hb (g. 100 ml.)	Hb (g. 100 ml.)	Red Cells (mill. c.mm.)
<i>Cases with Normal Bone Marrow</i>									
1	10.5	3.21	106	31	3.5	14,600	9.0	10.2	2.86
2	7.9	2.42	124	26	7.1	15,600	6.6	10.6	3.97
3	8.2	2.78	103	29	0.6	13,100	8.2	9.5	4.07
6	10.5	4.33	83	29	0.7	12,500	8.2		
7	8.2	2.80	94	31	2.3	18,400	6.3		
9	6.5	2.24	89	32	0.9	7,450	11.2		
10	11.2	3.55	99	32	2.7	9,150	11.5	12.2	3.26
11	11.5	3.67	92	35	2.9	10,500	12.0	11.9	3.47
13	12.0	3.76	90	32	1.2	7,600	6.1	11.2	4.51
14	10.8	3.76	100	33	0.7	11,900	10.5	10.6	3.55
15	10.5	3.20	98	28	1.7	9,150	7.3		
16	8.6	3.15	102	31	2.1	15,450	9.7		
21	10.2	3.20							
<i>Cases with Abnormal Bone Marrow</i>									
4	7.7	2.58	107	28	3.0	11,050	7.6	3.23	102
5	9.5	2.52	119	32	0.3	19,200	8.7	10.6	3.73
8	6.6	2.06	104	30	2.6	9,550	4.7	13.0	3.95
12	9.0	2.46	102	36	3.0	16,400	6.8	11.7	3.85
17	5.5	1.95	97	29	2.9	16,500	5.5		
18	10.0	3.45	90	32	1.6	9,900	8.6	11.9	4.51
19	9.5	2.97	104	31	1.9	16,000	7.1		
20	10.8	3.18	108	31	1.1	9,950	10.8		

d = died. * = removed from hospital before recovery complete.

Case Histories

(i) Normoblastic Anaemias

In this group of 13 patients, the bulk of the series, anaemia was usually mild, although in one child who died haemoglobin on admission was only 6.3 g.%. The mean haemoglobin on admission was 9.7 g.%, while in the seven cases that recovered completely the mean on discharge was 10.9 g.%. Folic acid was used in one and vitamin B₁₂ in another without effect, and ferrous sulphate was ineffective in both. Usually the anaemia increased in severity while the condition of the child improved in all other respects, the blood count after full recovery being slightly higher than on admission, as illustrated by the following example.

Case 14.—An African girl aged 3 years was admitted with gross oedema and patchy pigmentation and desquamation of the groins. Plasma proteins were 3.5 g.%, with 1.9 g.% albumin. Haemoglobin was 10.8 g.%, with 3,760,000 red cells per c.mm., haematocrit 34%, reticulocytes 1.2%. The bone marrow was normoblastic. On maize diet only oedema disappeared in three weeks—when plasma proteins had reached 5.3 g.%, with 3.2 g.% albumin. Hb was then 8.6 g.%, but despite general improvement the blood count dropped steadily. Injection of 50 μ g. of vitamin B₁₂ had no effect. The lowest count was 6.1 g.% Hb, 2,360,000 red cells per c.mm., haematocrit 21.5%, while at the same time plasma proteins were 7 g.% and albumin 4 g.%. Slight hypochromia was now observed in the blood film. Later ferrous sulphate was given by mouth, although the count had already begun to rise. The rate of increase did not appear to be altered. When the child had fully recovered the Hb was 11.2 g.%, red cells 4,510,000 per c.mm., and haematocrit 35.5%.

(ii) Anaemias With Giant Metamyelocytes and Some Red-cell Precursors of Intermediate Type in the Bone Marrow

In this group of six cases the effect of diet only was observed in three. In one with 7.7 g.% Hb on admission (Case 4) anaemia slowly decreased as the child recovered, the Hb reaching 9.4 g.%. The haemoglobin of another with 10 g.% on admission dropped to 8.6 g.% in four days, rising slowly to 11.9 g.% when clinical recovery was complete (Case 18). Reticulocytes, counted daily for two weeks, reached a peak of 7.2% on the ninth day. The fourth child

(Case 19) was admitted with 9.5 g.% (haematocrit 31%), which dropped rapidly to 7.1 g.% (haematocrit 22%) on the sixth day, when he died. There was a peak reticulocyte count of 2.8% on the third day.

One child was given folic acid five weeks after admission. Haemoglobin was rising slowly on diet alone, and there was no reticulocyte increase.

In contrast, two patients with similar bone-marrow pictures responded to treatment with a crude liver extract and vitamin B₁₂.

Case 8.—An African child aged 20 months was admitted with a two-weeks history of swelling of the whole body, vomiting after feeds, anorexia, cough, and passing soft yellow stools. The temperature was 101.6° F. (38.7° C.), pulse 120, and respirations 20, weight 14½ lb. (6.6 kg.). There was marked oedema of the arms, legs, and face, and a red tinge of the hair. Black-pigmented skin changes were present in the inguinal region, with central desquamation, and there were similar lesions on the legs. The mucous membranes were pale. The liver and spleen could not be felt and there were no other abnormalities. The Hb was 6.6 g.%, red cells 2,060,000 per c.mm., haematocrit 21.5%, reticulocytes 2.6%, leucocytes 9,550 per c.mm. (the Price-Jones curve from this case is shown in Fig. 3). The bone marrow was mainly normoblastic, but there were some giant metamyelocytes and the nuclear structure of a minority of the basophil erythroblasts was rather fine. Plasma proteins were 4.9 g.%, albumin 2.2 g.%, bilirubin 0.2 mg. per 100 ml. No pathogens were detected in six stool specimens. The test for occult blood was negative. Urine was normal. X-ray examination of the chest showed marked striations in the right middle lobe, but the Mantoux test was negative, and x-ray films showed no change three weeks later. Free acid was present in the gastric juice after histamine.

On high-protein diet alone reticulocytes reached 5.8% on the fifth day, and oedema began to decrease. After two weeks, however, there was rapid deterioration; on the 17th day the Hb was only 4.7 g.%, with 1,370,000 red cells per c.mm., and haematocrit 15.5%. No reticulocytes were seen. 150 ml. of compatible blood was transfused and 1 ml. of a crude liver extract ("pernaemon") given by intramuscular injection. Seven days later there was a reticulocyte peak of 10.4%.

Two further injections of the same liver preparation were given, the blood count rising steadily to 13.7 g.% Hb in seven weeks, with 4,580,000 red cells per c.mm., and haematocrit 45%. Plasma proteins were 5.9 g.%, albumin 3.9 g.%. There was now no oedema, skin changes had disappeared, and the child was well and happy.

Case 12.—An African infant aged 4 had the same pattern of disease. Anaemia became more severe as oedema subsided and plasma proteins increased, although there was again no haemolysis or blood loss. The admission Hb of 9 g.% dropped in seven days to 7 g.%, with 1,880,000 red cells per c.mm., haematocrit 21.5%, and reticulocytes 2.3%. There was histamine-fast achlorhydria. Injection of 50 μ g. of vitamin B₁₂ was followed in six days by a reticulocyte peak of 12.7%, and the blood count increased on this and further injections of vitamin B₁₂ to reach 11.7 g.% Hb, 3,850,000 red cells, and haematocrit 38.5% on full recovery.

(iii) Megaloblastic Anaemias

There was megaloblastic change in the bone marrow of two infants. In one, who was removed from hospital against advice, there were many typical megaloblasts of Ehrlich and giant metamyelocytes in the marrow (Case 20). These changes were present but less well marked in the other (Case 17), who died, so it was not possible in either to observe the response of the anaemia to treatment.

Case 17.—A male African child of 18 months was admitted with a history of swelling of the body for one month, loose stools, and a cough for two weeks. His diet had consisted entirely of sump porridge and tea. His temperature was 100.4° F. (38° C.), pulse 112, respirations 22, weight 18 lb. (8.2 kg.). He was listless and apathetic, with gross swelling of the whole body and pitting oedema of the limbs and trunk. Facial oedema had occluded one eye. The hair was fine in texture and reddish brown. Widespread dermatitis was present, with scaling on the limbs and lower trunk, large areas of desquamation, and raw bleeding lesions on the legs. The right ear was discharging. The liver was large and firm, but the spleen was not palpable. No other abnormalities were detected. The Hb was 5.5 g.%, red cells 1,950,000 per c.mm., haematocrit 19%, reticulocytes 2.9%, leucocytes 16,500 per c.mm. The blood film showed many macrocytes, some microcytes, but only occasional poikilocytes (mean corpuscular diameter

7.42 μ , standard deviation 1.3 μ , macrocytosis 15%, microcytosis 4.2%—see Fig. 1). Fifteen normoblasts and macronormoblasts and one intermediate megaloblast were seen per 100 white cells, which included one large metamyelocyte. Iliac marrow showed normoblasts, some basophilic megaloblasts, many large haemoglobinized erythroblasts with lobed nuclei, and giant metamyelocytes. Abnormalities were absent in the urine and stool, although the latter was oily. Plasma proteins were 3.5 g.%, albumin 1.5 g.%, bilirubin 0.4 mg. per 100 ml. On admission there were no abnormal chest signs, but x-ray examination on the following day showed bronchopneumonic infiltration in the right upper lobe with an associated pleural effusion, detectable clinically on the next day. This appears to have been a terminal bronchopneumonia, for the child died shortly afterwards. Permission for necropsy was refused.

Discussion

Kwashiorkor is a syndrome due to protein deficiency in the diet, and it might be expected that the anaemia accompanying it has the same cause, as Altmann and Murray have suggested. Cartwright (1947) has reviewed the evidence that protein deficiency produces anaemia in animals, while Keys *et al.* (1950) have shown experimentally in man that anaemia develops during starvation. In prisoner-of-war and concentration camps anaemia was often associated with low plasma proteins following starvation (Vaughan *et al.*, 1945; Leyton, 1946; Mollison, 1946; Walters *et al.*, 1947), but it was not established that this was a primary protein-deficiency anaemia. Leyton demonstrated a relationship between the plasma protein level and haemoglobin, but Mollison was not able to show a similar correlation. He considered anaemia to be due to lowered metabolism and not to any specific deficiency.

It is difficult to assess the role of protein deficiency in the production of anaemia in kwashiorkor. Often in severe cases anaemia is mild, and there is no correlation between the haemoglobin on admission and the plasma proteins in this series of cases (see Fig. 4). It has been seen that there is often a drop in haemoglobin and haematocrit levels while oedema is decreasing and plasma proteins are increasing, which appears to exclude protein deficiency as the cause of anaemia. These changes, however, can probably be explained by variations in blood volume. In his oedematous cases at Belsen, Mollison found the blood volume to be lowered, but in other studies of hunger oedema there are conflicting reports (Denz, 1947). On indirect evidence in these oedematous cases of kwashiorkor, it seems likely that the blood volume is initially low and that it rises as soon as plasma proteins increase. As a result the blood count appears to drop. In no case has there been evidence of haemolysis or blood loss, and the changes in blood counts were often so rapid that they could be explained only by changes in blood volume. Under these circumstances the reticulocyte count, which is independent of changes in blood volume, will be a better index of response to treatment than haemoglobin or haematocrit levels. In most cases treated with high-protein diets only there have been small early rises in the reticulocyte count. Similar small rises were observed by Altmann and Murray. It is thus possible that some factor present in soured milk (maas) has stimulated erythropoiesis; but other factors such as increased metabolism might be responsible, and no definite conclusion can be drawn regarding the effect of protein replacement on blood production.

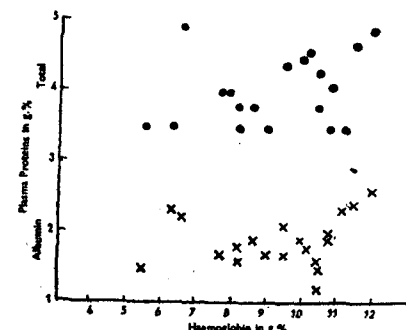


FIG. 4.—Relationship between haemoglobin on admission and total plasma proteins (●), and between haemoglobin and plasma albumin (×).

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In Nigeria, Woodruff (1951) describes the predominant anaemia in pregnant African women living on protein-deficient diets as macronormoblastic and seldom megaloblastic. He showed by liver biopsy that the liver is diffusely fibrosed in many cases, and in others infiltrated with fat, and he believes that the similarity to kwashiorkor extends to the anaemia. Both may be due to underlying chronic liver disease, which is known to be accompanied by macronormoblastic erythropoiesis (Bodley Scott, 1939). Woodruff's bone-marrow findings are certainly similar to those described in this paper, but the two anaemias differ in some respects. It is perhaps worthy of note that, contrary to his experience in West Africa, severe megaloblastic anaemia of pregnancy, responding to folic acid and sometimes to vitamin B₁₂, is not uncommon among African and Indian women in Durban, many of whom live on diets low in protein.

In infancy, megaloblastic anaemia has been reported by Zuelzer and Ogden (1946), who described 25 cases. Zuelzer *et al.* (1947) carried out serial studies of the bone marrow in patients with infantile megaloblastic anaemia. They showed that there are patterns varying from predominantly normoblastic to frankly megaloblastic marrow pictures, and in all they record satisfactory responses to folic acid. Zuelzer and Ogden believe that nutritional deficiencies are partly responsible for the production of megaloblastic anaemia in infancy, and it would be surprising if nutritional megaloblastic anaemia were not sometimes encountered in a severe nutritional syndrome like kwashiorkor.

In the cases presented here it has been seen that megaloblastic transformation of the marrow occurs, although it is unusual. Dacie and White (1949) have described megaloblasts in the bone marrow of mild cases of Addisonian pernicious anaemia, the degree of deviation from normal being closely linked with the severity of the lack of haemopoietic factors. In East Africa, Foy *et al.* (1952) have described two groups of macrocytic or normocytic anaemia. In one there are giant stab cells in the bone marrow with erythroblasts, macronormoblasts, and megaloblasts in various stages of development; in the other giant metamyelocytes are present without megaloblasts. Both respond to haemopoietic substances. In kwashiorkor there is also a group in which the marrow contains giant metamyelocytes and some cells which are intermediate between normoblasts and megaloblasts. In two of these there have been satisfactory responses to crude liver extract or to vitamin B₁₂, so it would appear that these cases are examples of developing stages of nutritional megaloblastic anaemia.

There are also similarities between this marrow picture and the type of bone-marrow change in idiopathic steatorrhoea reported by Cooke *et al.* (1948). In kwashiorkor, Thompson and Trowell (1952) have demonstrated a deficiency of pancreatic enzyme production. Some of the stools examined in this series were microscopically oily, but clinically they were neither bulky nor fatty. Subclinical fat-absorption defects, with associated anaemia, however, have not been excluded, since fat-balance studies in African infants are technically difficult to perform.

In the detection of this type of anaemia in kwashiorkor examination of the blood alone for macrocytosis is of little help. Non-megaloblastic macrocytic anaemias occur in a variety of conditions. When appreciable anaemia is found on admission, or when it develops as oedema disappears, the bone marrow should be examined, and in those cases with megaloblastic change—partial or complete—liver extract, vitamin B₁₂, or folic acid should be administered in addition to high-protein diets.

Summary

In a series of 21 cases of kwashiorkor, selected only on the presence of pitting oedema, dermatosis, and lowered plasma proteins, appreciable normocytic or macrocytic anaemia was found in six cases, while two-thirds of the children had less than 9 g.% haemoglobin.

Anaemia may increase considerably as oedema decreases and plasma proteins rise. In this way severe anaemia may be unmasked.

Megaloblastic change was present in two cases. In six others there were bone-marrow abnormalities consisting of giant metamyelocytes and scanty red-cell precursors of intermediate type. Two of these had satisfactory haematological responses to crude liver extract or to vitamin B₁₂.

The possible relationship of this anaemia to protein deficiency, liver disease, and nutritional megaloblastic anaemia is discussed.

I thank Dr. Pauline Klenerman for giving me full access to her cases of kwashiorkor in African children, Dr. N. A. Rossiter for facilities to study Indian children under his care, and Dr. J. Parker, medical superintendent, for permission to publish these cases. Thanks are also due to Dr. J. Thomas, Director of Pathological Services, and his staff for their help with the biochemical estimations; and to Dr. Joan Scragg and the sisters for their assistance.

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The Minister of Education has issued a circular (272, 1954) about the precautions necessary to avoid food poisoning in the preparation and service of meals in school canteens. One of the objects of the Food and Drugs Amendment Bill at present before Parliament is to secure better hygienic conditions in places where food is prepared or served. The prevention of the contamination of food served in canteens depends, however, in large measure on the constant vigilance and the observance of hygienic practices by the canteen staffs. The Minister emphasizes that the risks of food poisoning are present wherever meals are prepared and served, and that there is no reason whatever to think that school canteens are more exposed to them than other forms of corporate meals. After briefly describing some typical examples of outbreaks of food poisoning in school canteens, the circular goes on to consider the prevention of food poisoning in schools under the following headings: Co-operation between medical, teaching, and kitchen staff; health of food handlers; hygienic conditions in the kitchen; the preparation and cooking of food; domestic animals and pests; milk supply; and notification of outbreaks of food poisoning to the medical officer of health. Under the last heading it is recommended that authorities should take steps to ensure that any outbreak of food poisoning is notified immediately, preferably by telephone, to the borough or district medical officer of health, so that he can begin his investigations and take precautionary measures without delay.

ADRENOCORTICAL FUNCTION IN BURNED PATIENTS WITH SPECIAL REFERENCE TO A.C.T.H. AND ADRENALINE TESTS

BY

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This paper is concerned with the activity of the adrenal cortex of burned patients, and in particular with a search for evidence of adrenocortical failure arising during the illness. The investigation is based on the spontaneous changes in the blood eosinophil count in burned patients, on the changes in the circulating eosinophils induced by injection of pituitary adrenocorticotrophic hormone (A.C.T.H.) or adrenaline, and on other findings.

In a previous paper (Sevitt, 1951) it was shown that a definite pattern of changes affects the number of blood eosinophils after burning (Fig. 1). Within a few hours their number is found either to be falling or to have fallen to low or zero values. This eosinopenia, which is accompanied by a neutrophil leucocytosis and commonly by some lymphopenia, is maintained for a variable number of days, after which the count begins to rise, to reach a peak value within the next few days. Evidence was produced which indicates that the eosinopenia after burning is a sensitive reflection of adrenocortical hyperactivity. This pattern of changes has been confirmed by Evans and Butterfield (1951) and by Wight *et al.* (1953).

The period of eosinopenia during which eosinophils are few or absent in the blood stream is maintained for varying periods in different patients and is terminated by the post-eosinopenic rise (Fig. 1). The duration of the periods of eosinopenia was estimated in 35 patients with an accuracy within $\pm \frac{1}{2}$ day. In Fig. 2 these periods are plotted against the skin area burned, which is expressed as a percentage of the total skin area. In patients with burns covering less than 10% of the body area the periods of eosinopenia are only one or two days, but are longer, usually three to five days, in those more extensively burned. The relationship between the eosinopenic period and the percentage area seems to be an exponential zone with its concavity facing to the left, rising steeply between four and six days after burning.

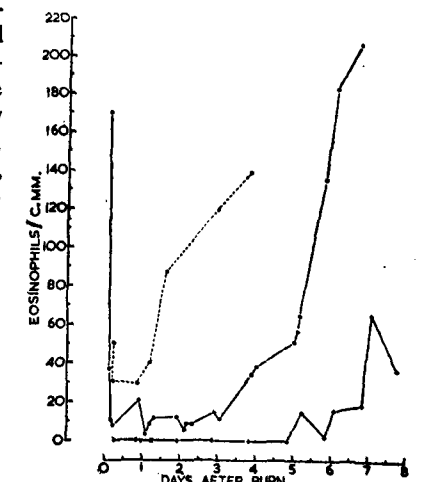


FIG. 1.—Serial blood eosinophil counts during the first week after burning in three patients. In one patient the falling of the count soon after burning is seen, and this is followed by a period of eosinopenia, which is present in all three. The eosinopenia lasted 1, 5, and 7 days respectively in the three patients and was followed by a rise in the count.

Several points, however, fall away from the correlation zone. On clinical evidence it was concluded that in those patients with a more prolonged period of eosinopenia—for example, Case 22—the percentage area burned underestimated the degree and duration of shock and stress. On the other hand, a period of eosinopenia appreciably shorter than that "expected" from the area burned may be due to one of three causes. Firstly, stress after burning may be less than expected

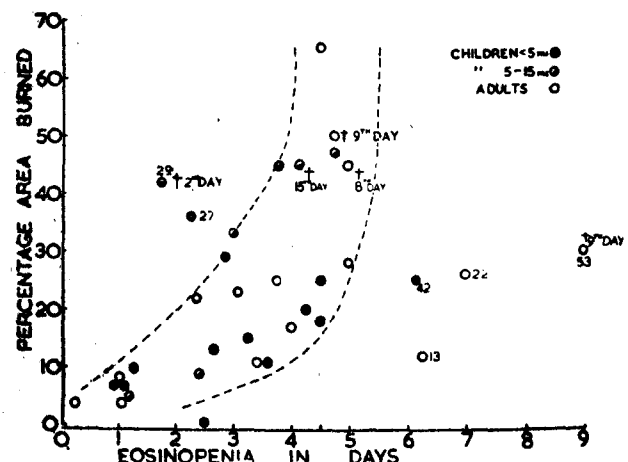


FIG. 2.—Relationship of the percentage body area burned to the duration of eosinopenia in 35 patients (see text). † = died. The numerals are case numbers.

from the area burned, and this may be reflected in physiological abatement of adrenocortical activity (Case 27); secondly, the eosinophils may become resistant to the action of adrenal steroids; and, thirdly, adrenocortical failure may be suspected (Case 29, see below).

Eosinophil Changes in Those Fatally Burned

Eighteen patients were investigated, including the eight previously reported (Sevitt, 1951). Eleven died during the period of eosinopenia, including one who died four hours after burning whilst the eosinophil count was falling. It is concluded that these patients died with hyperactive adrenal cortices. Their ages varied from 1½ to 77 years (five were younger than 12 years, four older than 75 years), nine were females, and the extent of body areas burned ranged from 30% to 80% in the different patients.

In the other seven patients post-burn eosinopenia was not present at the time of death (see Table). In two of them (Cases 29 and 30) adrenocortical failure may have occurred.

In Case 29, which was reported previously, there was a zero eosinopenia for only 1½ days after burning, indicating

adrenocortical hyperactivity during this period. After this a sudden hyperpyrexia and a rapid deterioration of the patient took place. At the same time the eosinophils returned "prematurely" to the blood stream and the patient died a few hours later. Biochemical changes in the heart blood removed immediately after death were consistent with acute adrenocortical failure, but previous oliguria complicated the picture. Case 30 is discussed later.

In the remaining five patients (see Table) there was no evidence of adrenocortical failure. One patient (Case 28) died three hours after burning without a fall in the eosinophils, but eosinopenia may have occurred had he lived long enough. Two (Cases 32 and 36) died a few days after normal periods of post-burn eosinopenia, and these indicated that adrenocortical hyperactivity was present at least for the duration of the eosinopenia. In Cases 44 and 49 the normal A.C.T.H. or adrenaline tests five and seven days before death (15 and 10 days respectively after burning) indicated normal stimulative reserves of the adrenal cortex at the time of the tests.

Stimulation of the Adrenal Cortex by A.C.T.H. and Adrenaline

An injection of A.C.T.H. or cortisone in normal persons produces a significant fall in the blood eosinophil count, but in patients with Addison's disease cortisone, but not A.C.T.H., produces this effect (Thorn *et al.*, 1947; Dougherty and White, 1947; Forsham *et al.*, 1948; Hills *et al.*, 1948; Prunty, 1950). A.C.T.H. therefore does not act directly on the peripheral organs, but its action is mediated through an increased glyco-corticoid secretion from the adrenal cortex.

The secretion of A.C.T.H. by the anterior pituitary is under hypothalamic control probably via an endocrine secreted by the hypothalamus into the hypophyseal portal blood supply (de Groot and Harris, 1950; Hume and Wittenstein, 1950). Hume and Wittenstein also showed that this hypothalamic-adrenocorticotrophic activity can be produced by nervous stimuli from an injured area and that this activation occurs through the spinal cord. This is obviously of significance in burns.

Intravenous adrenaline produces an increase of adrenocortical activity (Vogt, 1944), but this does not occur in the hypophysectomized animal (Long and Fry, 1945). From this and other work we may conclude that a small dose of adrenaline has little or no direct effect on the adrenal cortex, although this is not necessarily true of large doses, and that adrenaline produces its major effect on the adrenal cortex indirectly through the pituitary gland (Harris, 1951). The site of action of adrenaline is uncertain. It may be the adeno-hypophysis itself (McDermott *et al.*, 1950), but, if not, it is above this level, possibly in the hypothalamus. In future discussion the site of action of adrenaline will be referred to as the hypothalamic-pituitary or supra-adrenal level.

Seven Patients in Whom the Post-burn Eosinopenia Was Not Present at the Time of Death

Case No.	Sex and Age (Years)	Surface Area Burned	Interval Between Burning and Death	*Eosinophils	A.C.T.H. and Adrenaline Tests	Conclusion
29	F 9	42%	1½ days	Post-burn zero eosinopenia rising to 11, 99, and 127 a few hours before death ("premature" rise)		Adrenocortical hyperactivity after burning, possibly followed by adrenocortical failure
30	F 5½	49%	15 "	Post-burn eosinopenia 4½ days. Antemortem eosinopenia	A.C.T.H. test on 5th day = rise of 26%	Adrenocortical hyperactivity after burning and before death, ? temporary period of adrenocortical failure
28	M 80	40%	3 hours	257, 276, 268, at 1½, 2, and 2½ hours		None
32	F 36	50%	9 days	Post-burn eosinopenia 4½ days		Hyperactive adrenal cortices a few days before death
36	F 38	45%	8 "	Post-burn eosinopenia 5 days		
44	M 9	25%	20 "		Normal adrenaline test 15th day.	Normal functional reserves of adrenal cortices at times of death
49	F 2½	30%	17 "		Normal A.C.T.H. tests 8th and 10th days	

* Hours and days refer to period since burning; other numerals are eosinophils per c.mm. of blood.

A.C.T.H. and Adrenaline Tests on Burned Patients

If a lesion is present in the adrenal glands—for example, bilateral destruction by haemorrhage—neither A.C.T.H. nor adrenaline will depress the eosinophil count.

If a recent lesion is present at the hypothalamic-pituitary level in a patient with intact adrenal glands, an injection of a small amount of adrenaline will have no effect on the adrenal cortex and the eosinophil count will not fall. On the other hand, injected A.C.T.H. will stimulate the adrenal cortex and the eosinophil count will fall. Failure of adrenaline to lower the eosinophil count could reflect a disturbance at the supra-adrenal level: conversely, if an adequate eosinopenia is produced by a small dose of adrenaline the hypothalamic-pituitary adrenocortical mechanism may be considered intact.

A.C.T.H. and adrenaline tests were therefore performed on burned patients. The 21 patients tested were among the more severely burned and were all "shock" cases transfused with plasma or dextran. Twenty had burns involving 20% or more of the body surface, eight 30% or more.

The other factors involved in the interpretation of results are considered later.

Techniques of the Tests

One or two eosinophil counts on capillary blood were made one to 30 minutes before the injection, after which the counts were repeated hourly for four to six hours. The eosinophil counts were plotted against time after injection and the maximum change in the count was expressed as a percentage of the pre-injection level: a fall was given a negative value—for example, -60%—and a rise a positive value—for example, +15%.

The B.P. solution of adrenaline, 1 in 1,000, was used and 0.3 ml. (≡ 0.3 mg.) was injected subcutaneously or intramuscularly.

The A.C.T.H. used (batch numbers J 16205, 27111, 27511, and 28112) was first shown to have the expected eosinopenic activity in normal adults and children. In five of the nine children tested the amount injected was 10 to 12.5 mg., in the remainder of the 14 patients tested 20 to 25 mg. was used.

It was not possible to standardize strictly the times of injection, but in two-thirds of the tests the drug was injected between 10 and 11 a.m., and in most of the remainder before 1 p.m. Abnormal results were repeated when possible.

Eosinophil counts were made by the direct "wet-field" method of Dunger (1910), using the eosin-acetone-water diluting fluid. The blood was diluted 1 in 20 in two pipettes and the cells in 0.65 c.mm. were enumerated in four Fuchs-Rosenthal fields.

Normal Eosinophil Response to A.C.T.H.

In normal people the blood eosinophils fall within an hour or so of injection and continue to fall during the next two to four hours, reaching their minimum level about three to five (usually four) hours after the injection (Fig. 3). Forsham *et al.* (1948), Prunty (1949), and others have shown that an injection of 25 mg. of A.C.T.H. produces an eosinophil depression of 50% or more, usually 60 to 90% four hours after injection, and this has been our experience.

Care was taken in interpreting results because it was thought that the blood level of eosinophils after the injection of A.C.T.H. or adrenaline could be influenced by factors unrelated to the injection. The first of these is the pre-injection level of the eosinophil count. If this is already low, adrenocortical hyperactivity may already be present, little or no additional activity may be produced by the injection, and a significant eosinopenia may not occur. Secondly, since some of the tests were performed during the post-eosinopenic rise of the eosinophil count, this spontaneous elevating effect might have antagonized the eosino-

phil-depressing effect of A.C.T.H. or adrenaline. Thirdly, in the diurnal variation of the blood eosinophils there is a morning fall in the count up to about 12 noon, after which the count rises. Therefore, in interpreting the present results, not only the maximum percentage fall in the count and the shape of the curve were considered, but also the possible influence of the above factors.

Normal results were obtained in 12 of the 14 tests with A.C.T.H., the eosinophils falling by 60% to 87% in 11 of them (Fig. 4), and in the twelfth a nearly normal fall of 46% was found. This is not considered significant, as four days later the response to adrenaline was normal. In all but three of the patients the tests were performed 10 days or less from the time of burning and one to five days from the end of the eosinopenic period—that is, during or soon after the post-eosinopenic rise.

Therefore, in these 12 patients, including one who died a week later, there was no evidence of adrenocortical failure of adrenal gland origin. Three of them, however, showed abnormal eosinophil reactions to adrenaline (see below).

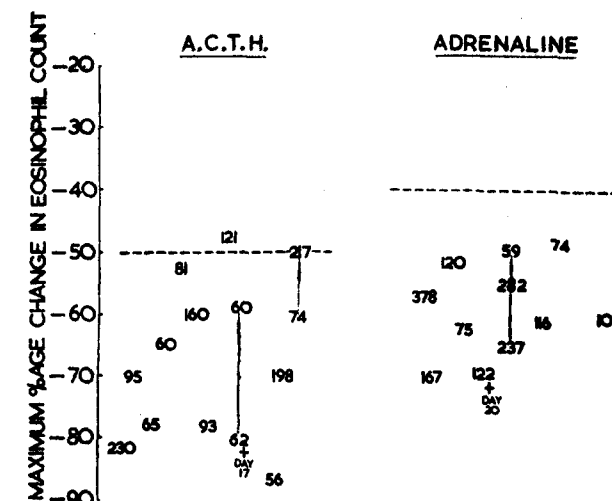


FIG. 4.—Normal A.C.T.H. and adrenaline tests in severely burned patients. Each point is the result of one test. It is represented by a numeral which is the pre-injection value of the blood eosinophil count per c.mm. Its vertical position expresses the maximum percentage lowering of the count. The interrupted horizontal lines at -50% for A.C.T.H. and -40% for adrenaline represent the upper limits considered to be normal. The dotted vertical lines join the results of two or more tests on one patient. Fourteen of the A.C.T.H. tests were normal. These were done on 12 patients, one of whom subsequently died. Eleven of the adrenaline tests were normal, and these were done on nine patients, one of whom subsequently died. + = died.

Normal Eosinophil Response to Adrenaline

In normal people the shape of the eosinophil curve following adrenaline (Fig. 3) differs from the response to A.C.T.H. Usually little or no fall in the eosinophil count is found at an hour after injection; thereafter the count falls to reach its lowest level at two to three hours, and at four hours the count may be rising again. The adrenaline effect is usually slower and shorter than the effect of A.C.T.H. The maximum fall in the count varies between 45% and 70%.

Here it will be assumed that a lowering of the blood eosinophil count to 40% or more of the pre-injection level is normal, provided that the shape of the curve is within normal limits.

Normal curves were found in 9 patients (11 tests: Fig. 4) of the 12 patients tested, with maximum eosinophil depressions ranging from 47 to 70% (average 61%). Eight were tested within 15 days of burning, one of whom died from duodenal obstruction 20 days after burning and five days after the adrenaline test. Subsequent tests on one patient were also normal, as were the responses to A.C.T.H. in two others. Therefore, in these nine patients there was no evidence of adrenocortical failure. Indeed, the results indicated a normal function of the supra-adrenal adrenocortical pathway.

Abnormal Response to A.C.T.H.

Two of the 12 patients tested responded abnormally and one subsequently died.

Case 30

A girl of 5½ years, having burns involving 49% of the body area, was admitted shocked and with haemoconcentrations six hours after burning. She received 6 litres of intravenous plasma and 300 ml. of blood. Attacks of hyperpyrexia occurred on the first and ninth days after burning and slight jaundice on the fourth day. Her burns became colonized with *Ps. pyocyanea*.

Eosinopenia was present on admission and lasted just over four days, indicating hyperactivity of the adrenal cortex during this period. On the fifth day, during the post-eosinopenic rise of the eosinophil count, 12.5 mg. of A.C.T.H. was injected, but the eosinophil count never fell. Instead it rose from 108 per c.mm. before injection to a maximum level of 135 (+26%) at four hours after the injection (Fig. 5). Her blood pressure was normal (120/80) and normal blood glucose values (120 to 140 mg. per 100 ml.) were found. She became anaemic and was transfused. Her condition worsened, eosinopenia reappeared on the ninth day (eosinophils 12 per c.mm.), and was maintained until her death 15 days after burning, zero values being found during the last three days.

At necropsy, purulent bronchitis was found. The adrenals were swollen and congested; histologically very little cortical lipid remained and small foci of haemorrhage were present. Such changes are common in fatally burned patients, particularly in children who die during the period of eosinopenia, and are largely due to intense adrenocortical hyperactivity (unpublished observations). However, many of the columns of the zona fasciculata were transformed into pseudo-acinous or pseudo-tubular structures by an albuminous exudate containing occasional polymorphs. These changes were noted by Rich (1944) in diphtheria and in meningococcal and other infections, and he suggested that they may explain the circulatory collapse. The lymph nodes of the lymph glands, tonsils, and the spleen showed central degenerative changes with oedema, cytoplasmic swelling, and rupture. These changes, which are commonly found after burning (Bardeen, 1898; Baker, 1945), also occur after the injection of A.C.T.H. and are probably due to adrenocortical steroids.

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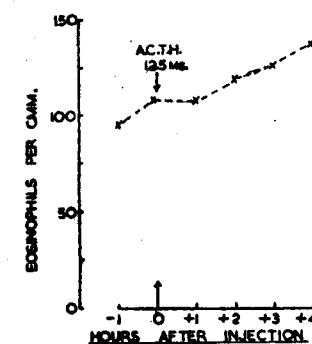


FIG. 5.—Case 30. Abnormal blood eosinophil reaction to an injection of 12.5 mg. of A.C.T.H. The eosinophil count does not fall after the injection, suggesting that adrenocortical failure is present.

The abnormal response to the A.C.T.H. test during life and the pseudo-acinous degeneration of the adrenal cortex found at necropsy support a diagnosis of adrenocortical failure. However, the reappearance of eosinopenia on the ninth day after burning and the degeneration of lymphoid tissue found at necropsy do not support this view. If adrenocortical failure occurred it was a temporary phenomenon.

Case 52

A 6-year-old girl with burns involving 45% of her body was admitted shocked and with haemoconcentration one and a half hours after burning. She was transfused with dextran, plasma, and blood. Eosinopenia was found, and lasted three and a half days, indicating early adrenocortical hyperactivity. On the fifth day after burning, at the peak of the post-eosinopenic increase of eosinophils, 20 mg. of A.C.T.H. was injected. An unusual curve was obtained: the eosinophils did not fall from the pre-injection level of 287 per c.mm. for two and a half hours after the injection; at three and a half hours the count was falling sharply to a maximum depression of 49% at four hours, but at five hours the eosinophils had increased to more than their pre-injection level. Three days later the test was repeated, and this time the count rose hourly for five hours from the pre-injection level of 152 per c.mm. On the following (ninth) day a test showed a curve of nearly normal shape though the maximum fall was only 39%, but on the sixteenth day a normal curve was found (-73%). Biochemical investigations on the eighth and ninth days gave normal values for blood glucose (120 mg. per 100 ml.) and serum chloride (595 mg. per 100 ml.), but the serum sodium (285 mg. per 100 ml.) and the serum potassium (15.1 mg. per 100 ml.) were slightly low. On the seventeenth day the child excreted 1.2 mg. of 17-ketosteroids in the urine, probably normal for her age (King, 1951).

Clinically the child was never very seriously ill and she made a good recovery. If the abnormal eosinophil responses to A.C.T.H. on the fifth and eighth days indicate adrenocortical failure, then this was of short duration and of no clinical significance. On the other hand, the four A.C.T.H. injections may have excited a therapeutic effect.

Abnormal Responses to Adrenaline

Results of tests were abnormal in three patients, each of whom responded normally to A.C.T.H. Two were children in whom the abnormal responses were associated with a temporary abnormal mental state. When the children recovered mentally the adrenaline responses were found to be normal.

Case 31

A girl of 8 years with burns involving 47% of the body surface was admitted shocked and with haemoconcentration two hours after burning. Her transfusion with 6.2 litres of plasma and 1 litre of blood was probably excessive, as a temporary attack of pulmonary oedema occurred soon after. She became pyrexial—100–102° F. (37.8–38.9° C.). Meanwhile post-burn eosinopenia was found, and lasted 4.7 days. Her mental state and behaviour at this time became abnormal. She was confused, irritable, and querulous. Six days after burning, at the peak of the post-eosinopenic rise of the eosinophils, adrenaline failed to lower the eosinophil count significantly (-12%) (Fig. 6). This was confirmed two days later (-4%), and again on the 38th day after burning (-11%), although on the 15th day an A.C.T.H. injection produced a normal eosinophil response. Gradually,

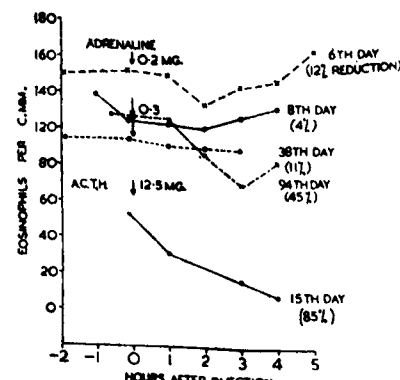


FIG. 6.—Case 31. Abnormal blood eosinophil responses to adrenaline occurred on the 6th, 8th, and 38th days after burning, when little or no change in the eosinophil counts followed the injections. However, the response to the A.C.T.H. test on the 15th day was normal. During this time the child was mentally abnormal. An adrenaline test was normal on the 94th day, when the child's mental condition had returned to normal.

with careful nursing and feeding, blood transfusion, and successful skin cover by grafting, the child improved. Three months after burning, when she had once again become a likeable, normal, and intelligent child, an injection of adrenaline produced a normal eosinophil-depression curve (-45%).

Case 43

A girl of 9 years with burns involving 33% of the body area was admitted one and a half hours after burning, shocked and with haemoconcentration. She was transfused with 6 litres of plasma in the first 24 hours: a short-lived oliguria and oedema of unburned areas occurred.

Meanwhile the patient had become delirious and irrational (? cerebral oedema). Eosinopenia was found, and lasted three days. On the sixth day after burning, and at the peak of the rising eosinophil curve, the eosinophil response to A.C.T.H. was normal, but two days later an injection of adrenaline failed to lower the eosinophil count (Fig. 7). At 14 days, when her mental condition was improving, adrenaline depressed the eosinophil count by 40%—"borderline" normal result. Within a month of burning she was behaving naturally and was mentally normal. Four months after burning an adrenaline test produced a normal eosinophil depression curve to adrenaline was normal (-77%).

The third patient with an abnormal response to adrenaline was a man in whom the A.C.T.H. response was normal. Clinically there were no unusual features, and it was not found possible to repeat the test.

Discussion

In a previous paper it was concluded that adrenocortical hyperactivity always occurs after significant burning (Sevitt, 1951). This was confirmed and extended in the present study, the main aim of which was to determine whether physiological failure of the adrenal cortex occurs in some patients. This was considered important, since "replacement" therapy with A.C.T.H. or cortisone may be indicated.

In 5 of the 54 patients studied there was evidence suggestive of adrenocortical failure. In one patient the evidence was based largely on a "premature" return of the blood eosinophils after a relatively short post-burn eosinopenia associated with clinical deterioration and, soon after, the death of the patient. In the absence of a post-mortem examination the evidence could not be conclusive. In two patients the eosinophil responses to A.C.T.H. were abnormal. One of them was not unduly ill, and the initial abnormal reactions to A.C.T.H. found within 10 days of burning were succeeded by a normal test a week later. In the other patient the abnormal reaction to A.C.T.H. and the pseudo-acinous change in the adrenal cortex found at necropsy support a diagnosis of adrenocortical failure, but the development of an ante-mortem eosinopenia and the finding of degenerative changes in the lymphoid tissue at necropsy indicate that the patient died with hyperactive adrenal cortices. If adrenocortical failure occurred in these two patients it was no more than a temporary phenomenon.

Nevertheless, two of these three patients died. The prognosis of severely burned patients with a tentative diagnosis of adrenocortical failure, based either on a premature rise

in the eosinophil count or on an abnormal eosinophil response to A.C.T.H., may be very serious. Therefore, in spite of the uncertainty whether or not adrenocortical failure occurred or was of clinical significance, it is suggested that such patients should be treated with cortisone as soon as the tentative evidence of adrenocortical failure is obtained.

Two children showed abnormal eosinophil reactions to adrenaline, associated with disturbed mental states: the reactions became normal when the mental conditions of the patients were either improving or had returned to normal. This association may be more than a coincidence. The cerebral changes may have involved not only the higher centres to produce mental disturbance but the lower centres, including the hypothalamic area or its central connexions, and so have interfered with the site of action of adrenaline. With recovery of the brain, adrenaline would again become eosinopenic. On the other hand, adrenaline tests performed on a child with a "true" encephalitis developing during the burn illness gave a normal result. Treatment with A.C.T.H. may be indicated in these patients.

Summary

A study of adrenocortical activity was made in 54 burned patients. It was largely based on the spontaneous changes in the eosinophil count found after burning, and, in 21 of the patients, upon the changes induced by a test dose of A.C.T.H. or adrenaline.

It is concluded that adrenocortical hyperactivity always occurs after significant burning. In 49 out of the 54 patients there was no evidence of subsequent adrenocortical failure, and these included 16 of the 18 patients who died.

In five patients, two of whom died, there was evidence of adrenocortical failure. In one a "premature" rise in the eosinophil count after burning was associated with clinical deterioration, and death soon occurred.

Twelve of the 14 patients tested with A.C.T.H. gave normal eosinophil depression curves, indicating normal stimulative reserves of the adrenal cortex. However, eosinopenia was not induced in a young girl tested on the fifth day after burning, suggesting that adrenocortical failure was present; but the spontaneous eosinopenia developing a few days later indicated that, if failure had occurred earlier, it was of short duration. She died 15 days after burning. In another child, not unduly ill, several abnormal reactions to A.C.T.H. were found within 10 days of burning, but on the sixteenth day the test was normal. She survived.

In nine out of twelve patients tested with adrenaline, normal eosinophil depression curves were obtained. The abnormal results found in two children indicated adrenocortical failure at the hypothalamic-pituitary level, since the A.C.T.H. tests were normal. The children were confused and irrational at the times of the abnormal reactions, but later, when normal adrenaline reactions were found, mental recovery had taken or was taking place. It is suggested that both the mental disturbance after burning and the persistence of circulating eosinophils after adrenaline were due to similar changes affecting the cerebral cortex and hypothalamus respectively.

I am in part-time employment of the Medical Research Council. The A.C.T.H. was made by Armour Laboratories and was obtained through the courtesy of the allocation committee of the Medical Research Council. Thanks are due to Messrs. R. Gill and C. Richardson, of the photographic department of the hospital, for photographing the figures, to various members of the

laboratory staff for help with the eosinophil counts, and to Miss M. Hayes. Finally, the co-operation of Sister M. Nicholls and other members of the nursing staff is gratefully acknowledged.

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THE ACHLORHYDRIC PATIENT WITH DYSPEPSIA

BY

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Among those patients who are referred to hospital with a complaint of dyspepsia there remain after routine investigation an appreciable number in whom no satisfactory diagnosis is reached despite the fact that they give the impression of having organic disease. Such cases are usually labelled functional or nervous dyspepsia, or, if there is no free hydrochloric acid secreted in response to a test meal, achlorhydric dyspepsia. Gastroscopic examination will provide a satisfactory explanation of the symptoms in a large proportion of cases. Not only may small ulcers and ulcer scars which have been missed at a barium meal x-ray examination be discovered by this means, but it is also the most satisfactory method of confirming the presence of and differentiating gastritis. Where gastritis is found it is, however, impossible to give a reliable prognosis regarding the future comfort of the patient or to assess the possibilities of complications such as bleeding, ulceration, or the development of gastric carcinoma. As many patients have gastritic changes without dyspepsia it is also impossible to be dogmatic on how much the patients' symptoms are attributable to the gastric condition.

Schindler (1947) has given a good working classification of chronic gastritis. He divides cases into four types—hypertrophic, superficial, and atrophic gastritis, and gastritis in the post-operative stomach.

Chronic hypertrophic gastritis seems to be a very rare condition in this country and is not to be confused with the simple hypertrophy with thick folds and prominent areae gastricae which is a normal variant and is the usual finding in patients with hyperchlorhydria and duodenal ulcer. In hypertrophic gastritis intra-

mucosal scarring has led to unevenness of the mucosal pattern, and there may even be pseudo-polypoid changes.

In chronic superficial gastritis there is uneven congestion of the mucosa and excess adherent mucus. Simple diffuse reddening of the mucosa is a physiological state, whereas a stippled or variegated appearance is pathological. Non-adherent mucus is a normal exudate and mucopus is usually swallowed sputum.

The atrophic group is characterized by thinning of the gastric folds, inability to distinguish the areae gastricae, and, when atrophy is marked, by the ability to see the intramucosal and submucosal vessels through the thinned mucosa (Fig. 1). There is often an element of inflammation, shown by congestion along the tips of the folds and by stippling of the mucosa. The appearance of gastric atrophy may be generalized or patchy, and a localized variety is not infrequently seen in the vicinity of ulcer scars. This latter is in reality a new thin mucosa or a stretched mucosa around a scar (Fig. 2).

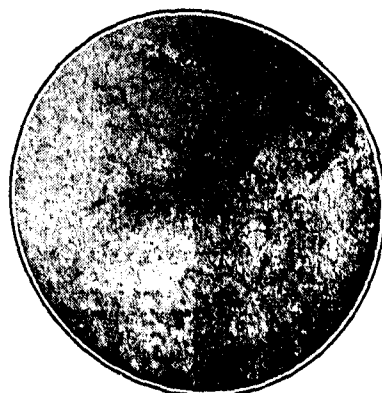


FIG. 1.—Gastroscopic view of atrophic gastritis, showing visible submucosal vessels.

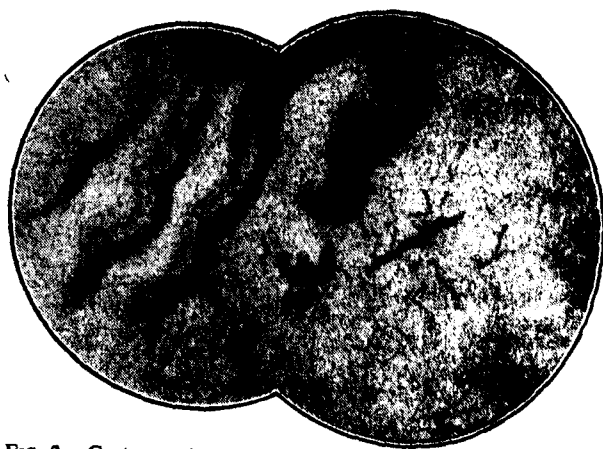


FIG. 2.—Gastroscopic view, showing atrophic gastritis with vessels more prominent in the vicinity of a healed gastric ulcer. Either a true adenoma is present or there is pseudo-polypoid change as a result of scarring. The folds towards the greater curve are normal.

Present Investigation

The case summaries of all patients attending the Gastroenterological Clinic, St. James's Hospital, London, during the years 1940-6 inclusive have been studied. Where a finding of achlorhydria on a first fractional test meal using gruel as the stimulant was recorded and where some address for the patient was given, the case reports have been abstracted. Certain groups have been followed up during 1952, giving minimum and maximum observation periods of five and twelve years.

These patients are almost without exception those with gastro-intestinal symptoms. It is well known that the

absence of free hydrochloric acid need not produce symptoms. It occurs in a proportion of otherwise normal people, it is an invariable accompaniment of pernicious anaemia, and is common in such diverse conditions as rheumatoid arthritis, steatorrhoea, and various chronic skin diseases.

The records of 403 patients with achlorhydria have been found, and these have been grouped as follows:

Carcinoma of the stomach	63
Pernicious anaemia	15
Advanced atrophy without pernicious anaemia	113
Superficial gastritis and early atrophy	126
Chronic duodenal ulcer	13
Normal gastroscopy—no other cause found	21
No gastroscopy—no other cause found	52

These figures give no true indication of the incidence of the different conditions. Superficial gastritis and early atrophy are not necessarily associated with achlorhydria. Gruel is a comparatively weak stimulant, and had it been combined with an injection of histamine some cases would certainly have secreted hydrochloric acid. In some cases the finding was either false or only temporary. Thus, in the duodenal ulcer group, although the majority had pyloric stenosis with retention gastritis, there were some in whom the tube was evidently not in the stomach. Such cases can usually be eliminated, as no starch can be found in any sample of the gastric aspiration. In the present series, however, we have not been able to exclude them, since a number were referred from other hospitals merely for gastroscopy, and no detailed reports of the analysis are available.

Some of the groups can be disposed of rapidly. Active duodenal ulcers are never associated with achlorhydria, except when complicated by retention gastritis. In this paper we are not concerned with those patients who presented initially with a gastric carcinoma, and this group is not analysed.

The gastroscopic appearances of patients with pernicious anaemia are identical with those of atrophic gastritis. Weighty evidence suggesting that pernicious anaemia is a precursor of gastric carcinoma has been advanced by Kaplan and Rigler (1945, 1947) and Rigler, Kaplan, and Fink (1945), but confirmation of their conclusions must be awaited, since Wilkinson (1945), in a series of 1,600 patients with pernicious anaemia, was unable to find any such association. In the present series there are only 15 patients. The majority did not have gastric symptoms. Nine are still alive, four are dead (one from gastric carcinoma two and a half years after gastroscopic discovery of atrophic changes), and the remaining two have not been traced.

The bulk of the paper is devoted to the superficial gastritis, the early atrophic, and the advanced atrophic groups associated with achlorhydria. The remaining two—those with normal gastroscopic findings and those in whom no gastroscopy was performed—are referred to only where they have something of interest to offer.

Superficial Gastritis; Gastric Atrophy

Patients with advanced atrophy are easily separated from the remainder by reason of the presence of visible submucosal vessels on gastroscopy. In the case of chronic superficial gastritis and early atrophy, however, there seems to be no sharp dividing line, and, at any rate in the presence of achlorhydria, the two conditions overlap. For this reason no attempt has been made to separate them, and they are referred to hereafter as the early atrophic group. A further complication in analysing these patients is that at any stage acute gastric erosions, acute, subacute, or chronic gastric ulcers, or old ulcer scars may occur. The presence of these alters the clinical findings to some extent, and it will often be necessary to separate the cases from their parent groups. There are a few cases of chronic gastric ulcer with achlorhydria in which the gastric mucosa was reported on as normal. Their inclusion in this analysis should not affect the results, as the chronic gastric ulcer cases are dealt with separately where they depart from the

general run of the findings. Patients in whom the only evidence of advanced atrophic changes was in the vicinity of ulcer scars are placed in the early group.

The Atrophic Groups

The data concerning the age and sex of the patients are outlined in Table I.

TABLE I.—Atrophic Gastritis—Age and Sex Incidence

Age Group	Early Atrophy			Advanced Atrophy		
	Men	Women	Total as %	Men	Women	Total as %
Under 30	1	5	4.8	—	3	2.7
30-40	13	3	12.7	8	3	9.7
40-50	13	11	19.0	11	9	17.7
50-60	20	17	29.4	21	18	34.5
60-70	17	11	22.2	19	14	29.2
70-79	6	7	10.3	4	2	5.3
Unknown	1	1	1.6	1	—	0.9
Total	71	55		64	49	

The ratio of men to women is about four to three in each group of the patients, but further division (Table II) suggests that this inequality may be due to the inclusion of patients with gastric ulcers.

TABLE II.—Atrophic Gastritis—Sex Incidence

	Early Atrophy		Advanced Atrophy		Combined	
	Men	Women	Men	Women	Men	Women
Acute erosions	7	10	6	13	13	23
Acute ulcers	6	3	6	3	12	6
Subacute "	1	2	2	1	3	3
Chronic "	27	7	7	4	34	11
Ulcer scars	9	9	4	2	13	11
Remainder	21	24	39	26	60	50
Total	71	55	64	49	135	104

The acute-erosions group has been taken to include not only cases in which an erosion was actually seen, but also those with manifest haemorrhage in which no lesion other than gastritis was found. Table II shows that these erosions were nearly twice as common in women as in men, while chronic gastric ulcers were three times more common in men than in women. If the erosion cases are kept with their parent groups and the ulcer cases are not included there is no great difference in the sex incidence.

The age distribution in the various subgroups is approximately the same, the highest incidence being in the fifties. As can be seen from Table I, there is a wide distribution, the youngest patient in the advanced atrophy group being a 17-year-old girl and the oldest a 79-year-old man. If the population at risk is taken into account there is probably an increasing incidence with increasing age.

TABLE III.—Atrophic Gastritis—Age at Onset of Symptoms

Age Group	Ulcers + Atrophy	Remainder	
		Early Atrophy	Advanced Atrophy
10-20	1 (1.2%)	1 (1.7%)	4 (5.4%)
20-30	9 (10.8%)	4 (6.9%)	6 (8.1%)
30-40	15 (18.1%)	13 (22.4%)	15 (20.3%)
40-50	26 (31.3%)	11 (19.0%)	14 (18.9%)
50-60	21 (25.3%)	14 (24.1%)	20 (27.0%)
60-70	9 (10.8%)	11 (19.0%)	10 (13.5%)
70-79	2 (2.4%)	4 (6.9%)	5 (6.8%)
Total	83	58	74

Patients in whom the age at onset was unknown have been omitted.

The onset of symptoms is commonest between the ages of 30 and 60, with a maximum incidence in the fifties (Table III). There is little difference between the early and late groups. Where there is a concomitant ulcer the distri-

bution resembles more closely that of chronic gastric ulcer, with a maximum incidence in the forties.

The data concerning the length of history of symptoms are set out in Table IV, where it has been necessary to subdivide the groups. A greater number of patients with

TABLE IV.—Atrophic Gastritis—Length of History of Symptoms

Length of History (Years)	Combined Groups				Remainder	
	Erosions	Acute and Subacute Ulcers	Chronic Ulcers	Scars	Early	Advanced
Under 1 ..	13 (38.2)	9 (39.1)	11 (28.2)	6 (28.6)	16 (38.1)	17 (30.4)
1- ..	8 (23.5)	4 (17.4)	12 (30.8)	7 (33.3)	14 (33.3)	12 (21.4)
5- ..	4 (11.8)	3 (13.0)	2 (5.1)	1 (4.8)	6 (14.3)	10 (17.9)
10- ..	5 (14.7)	4 (17.4)	8 (20.5)	6 (28.6)	5 (11.9)	8 (14.3)
Over 20 ..	4 (11.8)	3 (13.0)	6 (15.4)	1 (4.8)	1 (2.4)	9 (16.1)
Total ..	34	23	39	21	42	56

Patients in whom the length of history was unknown have been omitted.

early atrophy present with a short history of symptoms than do those with advanced atrophy. This is not unexpected, since atrophy is presumably a progressive process. Indeed, it is probable that gastritis is a degenerative rather than a true inflammatory condition. However, nearly a third of those with advanced atrophy have a history of under one year's duration. Possibly some added factor such as inflammation, an exogenous irritant, or a transitory erosive process is required for the production of symptoms.

It has been suggested that the low acid values associated with chronic gastric ulcer are secondary to the presence of the ulcer. Table IV suggests that this is not necessarily so. In a series of 498 patients with chronic gastric ulcers previously analysed, about 40% gave a history of symptoms of under five years' duration, while in the present series the figure is 60%. This increase is explained by the inclusion of patients who were found at other hospitals to have a short history of symptoms combined with achlorhydria and an ulcer crater, and who were referred here for gastroscopic examination to exclude malignancy. This does not interfere with the finding that low acid values in chronic gastric ulcer are often associated with a long history of ulcer symptoms, and we again stress that chronic gastric ulcer is in most cases probably the outcome of degenerative changes in the gastric mucosa (Tanner, 1951).

Symptomatology of the Atrophic Groups

Epigastric Pain and Discomfort

Over 90% of patients complained of epigastric pain or discomfort, the most common form being pain related to meals (Table V).

TABLE V.—Chronic Gastritis—Pain Related to Meals

	Pain Related to Meals	Remainder
Early atrophy, including erosions ..	37 (59.7%)	25 (40.3%)
Late ..	47 (56.0%)	37 (44.0%)
Acute and subacute ulcers ..	14 (38.3%)	10 (41.7%)
Chronic ulcers ..	36 (81.8%)	8 (18.2%)
Ulcer scars ..	10 (43.5%)	13 (56.5%)

Patients in whom the symptomatology was unknown are not included.

The erosion cases have been kept with their parent group. If they are separated the findings are not materially altered. The patients with chronic gastric ulcer are more likely to complain of post-prandial pain than the remainder, but of those without a demonstrable break in the continuity of the gastric mucosa over half complain of this symptom. The mode of production of the pain is intriguing and obscure. It appears to differ little from that accompanying peptic ulceration, though in the late atrophic group it seems to come on more often directly after eating. This is not always so, but the details of the time relationship to meals are insufficient for statistical analysis.

In some patients the pain is relieved by alkalis (it is well known that many achlorhydric dyspeptics complain of "acidity"). In some cases vomiting, and in others taking food, gives relief; some find that nothing helps. Relief from taking food follows the general rule that the longer the interval between eating and the onset of pain the more likely is food to afford relief.

Comparatively few patients in whom ulcer scars in addition to atrophy were found complained of post-prandial pain, since these patients not infrequently present with manifest haemorrhage without a previous history of dyspepsia.

Only 8% of patients with chronic ulcers (compared with 18% in the early atrophic and 25% in the late atrophic groups) complained of pain unrelated to meals.

The symptoms of fullness or discomfort after meals were rarely prominent in the chronic ulcer patients, but were present in 18% of the early atrophic and 15% of the late atrophic parent groups.

Manifest Haemorrhage

It has been found in this clinic that 50% of patients with haematemesis or melaena in whom no gross cause is found for the bleeding have gastroscopic evidence of atrophic changes (Tanner, 1949). The data in the present series are set out in Table VI.

TABLE VI.—Chronic Gastritis—Manifest Haemorrhage

	History of Haemorrhage	No History of Haemorrhage
Early atrophy, including erosions ..	17 (27.4%)	45 (72.6%)
Late ..	18 (21.4%)	66 (78.6%)
Acute and subacute ulcers ..	13 (54.2%)	11 (45.8%)
Chronic ulcers ..	11 (25.0%)	33 (75.0%)
Ulcer scars ..	10 (43.5%)	13 (56.5%)

TABLE VII.—Haemorrhage

	Haemorrhage with Preceding Dyspepsia	Haemorrhage as Sole Symptom
Early atrophy, including erosions ..	13	4
Late ..	14	4
Acute and subacute ulcers ..	11	2
Chronic ulcers ..	11	—
Ulcer scars ..	6	4

There is a history of haemorrhage in about a quarter of the cases of early and late atrophy, but when these are complicated by acute or subacute ulcers or ulcer scars the figure is doubled (Table VI). The incidence where there is an additional chronic ulcer is not higher than for the parent groups, and is approximately the same as in patients with chronic ulcers without achlorhydria (Swynnerton and Tanner, 1953).

In an appreciable number of cases haemorrhage may be the only symptom (Table VII).

In some cases an obvious lesion may be found from which the bleeding comes, but in others there may be no obvious bleeding point even in those rare cases which continue to bleed and come to necropsy. However, one of us has seen acute erosions overlying visible submucosal vessels (Tanner, 1949), and it may be that these patients are more



FIG. 3.—Gastroscopic view of an acute erosion, overlying a visible submucosal vessel.

susceptible to mucosal erosion than normal and a shallow erosion into a submucous vessel may cause copious haemorrhage (Fig. 3).

Other Symptoms

Nausea, Vomiting, Anorexia, Weight Loss.—The symptoms of nausea and vomiting, anorexia, or weight loss are present in approximately a fifth of the patients (Table VIII).

TABLE VIII.—Nausea and Vomiting, Anorexia, Weight Loss

	Nausea and Vomiting	Anorexia	Weight Loss
Early atrophy, including erosions ..	12 (19.4%)	11 (17.7%)	14 (22.6%)
Late ..	16 (19.0%)	13 (15.5%)	19 (22.6%)
Acute and subacute ulcers ..	2 (8.3%)	4 (16.7%)	7 (29.2%)
Chronic ulcers ..	6 (13.6%)	6 (13.6%)	10 (22.7%)
Ulcer scars ..	1 (4.3%)	5 (21.7%)	6 (26.1%)

Note: The totals on which percentages are based may be obtained by reference to Tables V or VI.

The presence of an ulcer does not greatly affect the incidence except in the case of nausea and vomiting, which is less frequent when an ulcer is present. So far as possible those patients who vomited merely in an attempt to relieve their symptoms and those who were afraid to eat have been omitted.

Bowel Habit.—Complaints of diarrhoea or constipation as prominent symptoms were uncommon, the maximum incidence being in the parent late atrophic group, in which one in ten complained of diarrhoea and one in twenty of constipation. Bowel habit is dealt with more fully in the late analysis.

Lassitude and anaemic symptoms were complained of by less than one in ten of the patients. Other more uncommon main complaints included belching, regurgitation, and dysphagia.

Conclusions on Symptomatology

Over 90% of the patients complained of epigastric pain or discomfort, most often related to meals. One in five was troubled with vomiting, anorexia, or weight loss; and one in three had manifest haemorrhage at some stage during the course of the disease. To sum up, there is no definite clinical picture to distinguish chronic atrophic gastritis from peptic ulceration or gastric carcinoma, and it may at times mimic gall-bladder disease, hiatus hernia, or many other disorders.

Associated Conditions

Gastric Adenoma.—In five of the 113 patients with advanced atrophy there were coexistent gastric adenomata—in two a single adenoma was seen; in one there were two adenomata, and in two the adenomata were multiple. In the early atrophic group one woman had two adenomata, and in one man a doubtful adenoma was seen at a later date.

Gall-bladder Diseases.—Six of the 113 patients in the advanced atrophic and 7 of the 126 in the early atrophic groups had a past, concurrent, or subsequent history of gall-bladder disease. Since the two conditions may be indistinguishable clinically, mistakes concerning the causation of symptoms are bound to occur. Thus patients who have had a cholecystectomy may return to hospital with their symptoms unaltered, while others in whom both conditions are found at the same admission may be permanently relieved by cholecystectomy. It is even possible that the dyspeptic symptoms of gall-bladder disease (not, of course, colic) may be due to a coincident gastritis or duodenitis, for it is well known that flatulent dyspepsia may persist after cholecystectomy.

Chronic Respiratory Infections.—Fourteen patients in the late and 10 in the early groups suffered from chronic bronchitis. It is not possible to say whether the two conditions are associated, since chronic bronchitis is a common condition in South London, but an incidence of 10% would seem to be high. Four patients in the late group have been diagnosed as suffering from pulmonary tuberculosis, and

another gave a past history of tuberculous peritonitis. In the early atrophic group two gave a history of pulmonary tuberculosis.

Tertiary Syphilis.—Three patients in the late and two in the early groups had tertiary syphilis. Three of these had syphilitic aortitis and the other two had tabes dorsalis. In one of the former, submucous gastric swellings were seen on gastroscopy, and these disappeared after antiluetic treatment.

Other Associated Conditions.—These include psoriasis (2), chronic dermatitis (1), osteoarthritis (3), rheumatoid arthritis (1), haemophilia (1), cystinuria (1), and diabetes mellitus (1).

Late Results

The method of follow-up of patients was the same as that previously described (Swynnerton and Tanner, 1953). Results are rather less complete than in the follow-up of cases of chronic gastric ulcer, for two reasons: (1) that the records of addresses and next-of-kin were often less detailed; and (2) that four of the patients referred from other hospitals were war refugees from Malta and Gibraltar whom it has proved impossible to trace. The general results of the follow-up investigation are given in Table IX.

TABLE IX.—Atrophic Gastritis—General Results of Follow-up

	Early Atrophy	Late Atrophy
Alive—adequate information ..	78 (61.9%)	82 (72.6%)
“—inadequate “ ..	2 (1.6%)	1 (0.9%)
Dead ..	38 (30.2%)	22 (19.5%)
No information ..	8 (6.3%)	8 (7.1%)
Total ..	126	113

Deaths

The causes of death in the early and late atrophic groups, in those with a gastroscopically normal mucosa, and in those in whom no gastroscopy was performed are shown in Table X.

TABLE X.—Causes of Death

	Late Atrophy	Early Atrophy	Normal Mucosa	No Gastroscopy
Gastro-intestinal:				
Gastric carcinoma ..	—	3	—	1
“ ulcer ..	—	2	—	—
“ haemorrhage ..	1	—	2	—
Carcinoma of large bowel ..	—	1	—	1
Sarcoma of ileum ..	—	—	—	1
Carcinoma of gall-bladder ..	—	2	—	—
“ pancreas ..	—	—	1	—
Appendicitis ..	—	1	—	—
Mediastinitis ..	—	1	—	—
Cardiovascular:				
Heart failure ..	7	13	2	3
Syphilis ..	1	1	—	—
Cerebral vascular accidents ..	3	2	1	1
Respiratory:				
Chronic bronchitis ..	—	3	2	1
Acute infections ..	2	2	—	—
Tuberculosis ..	4	2	1	1
Carcinoma of bronchus ..	1	1	—	—
Renal:				
Pyelonephritis ..	1	1	—	1
Chronic nephritis ..	—	—	—	1
Other:				
Aplastic anaemia ..	—	—	1	—
Accidents ..	—	1	—	—
Suicide ..	1	—	—	—
Unknown ..	—	2	—	2
Total ..	22	38	11	13

The figures in the early atrophic group again draw attention to the fact that the dyspepsia may be due to causes other than the gastritis, and one should not be satisfied with a single diagnosis of chronic gastritis before excluding all other possibilities. Thus the two patients with carcinoma of the gall-bladder both died less than two months after gastritis had been found. It would seem possible, too,

that in a number of those dying of "heart failure" the achlorhydria and gastroscopic appearances may have been secondary to chronic cardiac disease.

The average age at death in the advanced atrophic group was 67.6 years, only two patients having died under the age of 60—one of tuberculosis and the other of syphilitic aortitis. Of those patients still alive at least one is over 90. In the early atrophic group the average age at death was 65.

In the advanced atrophic group, apart from the one patient who died of uncontrolled gastric haemorrhage, no patient appears to have died either as a direct or as an indirect result of atrophy.

Carcinoma of Stomach

In the late atrophic group none of the traced patients have developed a gastric carcinoma and only two of them have developed a malignant tumour elsewhere in the body. In some 3% of all people the cause of death is attributed to gastric carcinoma (Registrar-General, 1953), so it is reasonable to suppose that if atrophic gastritis is a precursor of gastric carcinoma one might find a certain number of cases in the present series. The essentially negative findings are in line with the only other series of gastroscopically confirmed cases found in the literature. Findley *et al.* (1950) followed for five years or more 100 patients, of whom 49 had "mild," 33 "moderate," and 18 "pronounced" atrophy, and found none who developed gastric carcinoma.

In the early atrophic group four patients have developed gastric carcinoma and seven a carcinoma elsewhere in the body. The former are analysed further:

Case 1.—A man aged 52 was admitted on December 5, 1941, with an eighteen-months history of epigastric pain immediately after meals. Fractional test meal analysis showed achlorhydria. Gastroscopic examination revealed no gross abnormality apart from fine congestion of the mucosa. Barium-meal examination revealed no lesion. He was reinvestigated in 1943 and 1944 on account of recurrent symptoms. On both occasions a barium-meal examination was normal. In 1943 gastroscopy showed thinning of the mucosa without visible vessels and a small adenoma. This latter was not seen in 1944. He was seen at the follow-up clinic in April, 1952, when he still complained of similar symptoms. On examination a large epigastric mass was palpated. He was admitted and died following removal of a large adenocarcinoma of the body of the stomach.

Case 2.—A man aged 70 was admitted on February 3, 1942, with a two-years history of epigastric pain two to three hours after meals associated with anorexia and vomiting. Fractional test meal analysis showed achlorhydria. Gastroscopy revealed marked congestion of the mucosa and a chronic gastric ulcer at the angulus. In view of his general condition a gastro-jejunostomy instead of a partial gastrectomy was performed after failure of the ulcer to heal on medical treatment. He continued to have recurrent dyspepsia, and the ulcer was again seen gastroscopically in August, 1944. He was readmitted in May, 1947, when he had an epigastric mass, a palpable irregular liver, and ascites. He died a few days later. Permission for a necropsy was refused.

Case 3.—A woman aged 73 was admitted on February 17, 1945, with a four-years history of vague epigastric pain and recent lassitude. A barium-meal examination showed no lesion. Fractional test meal analysis showed achlorhydria. Gastroscopy revealed a mucosa which was thin in patches and associated with speckled congestion. For technical reasons the examination was incomplete, and it was thought that there might be a lesion at the angulus. She was readmitted in May, 1948, with a six-months history of pallor, lassitude, and anaemic symptoms. There was no further mention of dyspepsia. Severe hypochromic anaemia was found. During her stay in hospital she developed sudden pain in the epigastrium and died on June 9, 1948. At necropsy a small flat carcinoma was found arising $\frac{1}{2}$ in. (1.3 cm.) proximal to the pylorus. In addition there was a subphrenic abscess.

Case 4.—A man aged 51 was admitted on August 25, 1941, with haematemesis preceded by a week of epigastric discomfort after meals. Fractional test meal analysis showed achlorhydria. Barium-meal examination showed an innocent ulcer on the lesser curve and this was confirmed gastroscopically. The gastric mucosa was reported to be otherwise normal. The ulcer was

shown to be soundly healed seven weeks later. He returned in May, 1946, with a history of recurrence of dyspepsia for the past year. On gastroscopy the ulcer was thought to be innocent, but at operation and on section it was found to be a diffuse infiltrating spheroidal-cell carcinoma.

Apart from the presence of achlorhydria there is no factor common to these four cases. In three there was mucosal congestion, in two an apparently innocent chronic gastric ulcer, and in two evidence of atrophy of the mucosa. It is not possible to reach any conclusion on the study of these cases.

Pernicious Anaemia

One patient, a 69-year-old man, was diagnosed as suffering from pernicious anaemia three years after the initial gastroscopic diagnosis of advanced atrophy. Two other patients gave family histories of pernicious anaemia.

Late Results in Patients Still Alive

In the advanced atrophic group eight patients have had partial gastrectomies performed—seven for chronic ulcer and one for gastric polyposis—leaving 74 for late assessment. The early atrophic group is loaded with patients with concurrent chronic gastric ulcers, and, since these ulcers are just as apt to recur as those in patients without achlorhydria, it has been decided to omit them from the late analysis. Fifty patients remain alive and were followed up. The subsequent course of events in the two series is shown in Table XI.

TABLE XI.—Chronic Gastritis—Late Results

	Early Atrophy Excluding Chronic Ulcers		Late Atrophy		Total	
	No.	%	No.	%	No.	%
No further trouble	13	(26.0)	18	(24.3)	31	(25.0)
Occasional mild symptoms	16	(32.0)	21	(28.4)	37	(29.8)
severe	1	(2.0)	3	(4.1)	4	(3.2)
Frequent or constant symptoms	20	(40.0)	32	(43.2)	52	(41.9)

The results in the two series are very similar. Just over half the patients have had little or no further trouble from their stomach. Chronic superficial gastritis and the earlier stages of atrophy are conditions which may heal completely (Schindler, 1947), and, as we know from patients with pernicious anaemia, advanced atrophy need not cause symptoms.

Nearly all the patients in the advanced and many in the early atrophic group were advised to take a mixture containing hydrochloric acid, but only 11 have continued to do so, while 59 take alkalis more or less regularly.

The reason for this swing from acid to alkalis is threefold. First, patients find hydrochloric acid unpleasant to take, no matter how much diluted or disguised; secondly, dyspepsia means to general practitioners a prescription for alkalis, and the recommendation to prescribe acid is soon forgotten; and, thirdly, many patients find that alkalis are effective for relieving their symptoms. A wide variety of alkalis were used with good effect.

The bowel habits of 39 patients with early atrophy and 59 with advanced atrophy are known (Table XII). Constipation is common in the advanced atrophic group, while diarrhoea, either in attacks or as a constant looseness of the motions, is present in one in ten.

TABLE XII.—Bowel Habit in Patients with Atrophic Gastritis

	Early Atrophy	Advanced Atrophy
Normal	22 (56.4%)	24 (40.7%)
Constipation	12 (30.8%)	27 (45.8%)
Diarrhoea	5 (12.8%)	6 (10.2%)
or constipation	0 (0.0%)	2 (3.4%)

Discussion

The diagnosis of chronic gastritis should be accepted as the cause of the patient's symptoms only after exclusion of all other possible conditions. Confirmation of its presence will be obtained only by gastroscopic examination. Blind biopsy methods such as that described by Wood *et al.* (1949) may help to elucidate the process of gastritic changes, but will be unreliable for diagnosis, as the condition is often patchy.

The prognosis regarding symptoms is somewhat better than in the medical treatment of chronic gastric ulcer, since about half the patients have very little subsequent trouble. Amongst the other half there are a few who become disgruntled, finding that different regimes of treatment have little effect on their symptoms. A dietary regime similar to that used in patients with chronic gastric ulcer should be followed, and during exacerbations bed rest will undoubtedly hasten relief and may be followed by long remissions. A mixture containing hydrochloric acid should be prescribed, to be taken well diluted during meals, and the patient should be allowed to experiment until he finds the most effective flavouring agent, which is most likely to be one of the citrus fruit juices (Bockus, 1944). Hydrochloric acid therapy is usually sufficient to control attacks of achlorhydric diarrhoea, but in obstinate cases it may be supplemented with phthalyl or succinylsulphathiazole. A few patients are of the opinion that acid prevents or terminates attacks of dyspepsia, but this does not appear to be the general finding. If hydrochloric acid is badly tolerated or fails to relieve the symptoms when taken regularly over a period of time, one of the non-absorbable alkalis may be tried, or "autolavage" by taking 1 dr. (4 g.) of sodium bicarbonate in water before meals, as recommended by Spriggs and Marxer (1943).

Supplementary vitamin-B complex is often given to these patients, since there is evidence that a deficiency leads to a decrease in gastric acidity. It has been reported by several observers, notably by Jones, Benedict, and Hampton (1935), that in patients with pernicious anaemia there may be regeneration of the gastric mucosa with liver therapy, but this has been denied by others who regard advanced atrophy as an irreversible state. In this clinic one of us (N.C.T.) has seen a patient with pernicious anaemia whose gastric mucosa showed patchy regeneration on liver therapy. Until there is more evidence on the action of liver extract and vitamin B₁₂ on the stomach it would seem to be inadvisable to use them in simple atrophic gastritis for fear of masking the development of pernicious anaemia. Surgery appears to play little part in the treatment of atrophic gastritis. As Schindler (1947) remarks, "there is no reason to believe or to hope that the pain will be alleviated by surgical interference." Patients who have had partial gastrectomies performed for a coexistent ulcer or ulcer scar are not infrequently seen with their symptoms unaltered. In cases of uncontrolled haemorrhage a total gastrectomy would have to be contemplated to guarantee success, since the bleeding areas are often multiple and widely scattered, but in practice a partial resection usually leads to diminution and sometimes to cessation of bleeding.

Opinions concerning the role of chronic gastritis as a precursor of gastric carcinoma have been as much at variance as in the more familiar "ulcer-cancer" controversy. The histological examination of stomachs resected for cancer provides little evidence, for, even if there were general agreement on the degree of gastritic changes, it would still be impossible to decide whether these were the primary condition or whether they were secondary to the presence of the neoplasm. The solution of the problem is therefore a clinical one. The most important work done from the clinical aspect has been that of Comfort and his colleagues (1947) at the Mayo Clinic. They have studied a series of patients with gastric carcinoma who had had gastric analyses performed before the development of the carcinoma. They found that the proportion of low or

absent free hydrochloric acid values was greater than normal in these patients, suggesting that carcinoma arises in an already diseased stomach. It must be borne in mind, however, that this was a selected series of patients, since they were those in whom the carcinoma was preceded by many years of dyspepsia, and it is not possible to estimate the importance of chronic gastric disease in the development of gastric carcinoma as a whole.

In the present investigation none of the traced patients with advanced atrophic changes have developed gastric cancer. This is negative evidence which is suggestive but by no means conclusive, and, ideally, all these patients should be seen again in another five to ten years. The negative findings are to some extent supported by the sex incidence, which is not that of gastric carcinoma. It is now well established that gastric adenomata are prone to become malignant, and Schindler (1947) has reported that these adenomata are seven times more common in people with gastric atrophy than in those without. The adenomata are presumably secondary to or a variant of the atrophic changes and may form a connecting-link between the atrophy and the development of carcinoma. In the early atrophic series, in which four patients developed gastric carcinoma, it is not possible to estimate whether this is a significant incidence, and the factors involved were multiple. In only two was there macroscopic evidence of atrophy.

It will have been noticed that in 11 of the cases of advanced atrophy there were concomitant chronic benign gastric ulcers. It is usually taught that a diagnosis of gastric ulcer is incompatible with a finding of complete achlorhydria. In some of the present cases the atrophy was patchy, but in others it was generalized, and in these the capacity of the stomach to secrete acid in response to any stimulant must be negligible. It seems probable that hydrochloric acid is essential for the initial formation of the ulcer, but not for its maintenance. This latter may be due to poor healing powers in the degenerate atrophic mucosa and also, possibly, to superadded infection or trauma.

Summary

An analysis and late follow-up has been carried out on a series of patients who were found to secrete no free hydrochloric acid in response to a test meal using gruel as the stimulant. Two main groups of gastroscopically confirmed patients have been dealt with in some detail, the one comprising 113 cases of advanced atrophic gastritis, and the other 126 cases of chronic superficial gastritis or early atrophic gastritis.

The analysis is complicated by the frequent co-existence of gastric erosions or ulcers.

If patients with chronic gastric ulcers are excluded there is no great difference between the incidence in the two sexes.

There is a wide distribution in the age incidence, the majority of patients in the two groups presenting at hospital between the ages of 40 and 70. Information is given on the length of history and age at onset of symptoms.

Over 90% complain of epigastric pain or discomfort, which is usually related to eating.

Over a quarter give a history of manifest haemorrhage, and in one in five of these haemorrhage is the sole symptom. Complaints of nausea, vomiting, anorexia, and weight loss are frequent.

Less common main symptoms include diarrhoea, constipation, anaemia, belching, regurgitation, and dysphagia.

In the advanced atrophic group constipation is four times more common than diarrhoea.

Of associated conditions gall-bladder disease seems to be most important, since it may be clinically indistinguishable from atrophic gastritis, and since there may be direct association between the two. Other associated conditions which may be of aetiological significance include chronic bronchitis, pulmonary tuberculosis, tertiary syphilis, cardiovascular disease, and certain chronic skin and joint conditions.

In the late atrophic group 22 patients (19.5%) have died. In only one, a case of uncontrolled gastric haemorrhage, was there any connexion between the atrophic gastritis and the cause of death. No patient in this group has developed a gastric carcinoma.

In the early atrophic group 38 patients (30.2%) have died. Four of these have developed a gastric carcinoma, but, apart from the absence of free hydrochloric acid, no common factor could be found.

One patient with advanced atrophy was subsequently found to have developed pernicious anaemia.

Among those patients still alive the results in the two groups are very similar. About half have had very little subsequent trouble, but the course of the disease seems to have been little influenced by a variety of regimes in the remainder.

The treatment of atrophic gastritis is discussed.

Some of the evidence concerning the role of chronic gastritis as a precursor of gastric carcinoma is presented, and the apparently anomalous finding of peptic ulcer of the stomach in the absence of free hydrochloric acid is discussed.

We are greatly indebted to the many people, not least the patients themselves, who co-operated in the follow-up. We wish to thank Miss Temple and Mrs. Strong, of the Records Department, St. James's Hospital, and Miss Kirwin for the many hours spent unearthing ancient records, and the latter for her secretarial assistance. The cost of the investigation was met from a grant from the Weir Research Fund.

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The latest issue of *Scientific Film Review* includes appraisals of five medical films. "Coarctation of the Aorta" (E. R. Squibb & Sons), intended for students and society meetings. "Haemolytic Disease of the Newborn" (St. James's Film Unit) depicts the technique of replacement transfusion. "Marrow Puncture" (I.C.I.) surveys the techniques of marrow puncture in patients of various ages. It is intended for housemen and postgraduate students. "Venepuncture" (I.C.I.) demonstrates the technique in adults. These four films are in colour. A black-and-white film mentioned is "Prevention of Infection of Babies in Hospital" (British Film Institute), a comprehensive survey of modes of spread of infection in children's wards. It is for the training of nurses and medical students entering paediatric wards. *Scientific Film Review* is published quarterly by the British Film Institute at an annual subscription of 5s.

RESULTS OF TREATMENT OF CHRONIC VASOMOTOR RHINITIS

PART I. RESPONSE TO PHYSICAL TREATMENT

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Sufferers from chronic vasomotor rhinitis form a large proportion of all those attending the throat clinics of most hospitals, and we have been impressed not only by the frequency of the disorder but also by the unsatisfactory response to treatment. In addition it is apparent that many of these patients are emotionally upset, and that their disabilities are in part caused and in part magnified by psychological imbalance.

Results of Physical Investigation and Treatment

A series of 127 consecutive patients were studied. Symptoms, rhinological appearances, allergic responses, and the results of treatment were noted, and a superficial assessment of the emotional background was attempted in the throat clinic (by K. M.). As many as possible were invited to participate in more detailed psychological investigation, and those who did attend may fairly be regarded as a representative sample of sufferers from vasomotor rhinitis.

The main symptom in this disease is either paroxysmal rhinorrhoea or persistent nasal blockage. While well-defined examples of each may be recognized, yet in a great number the two clinical pictures are merged, to give symptoms and signs of both. In this series, there were 46 cases of paroxysmal sneezing and rhinorrhoea and 81 of chronic nasal oedema (49 with polypi and 32 without). A brief recapitulation of the two syndromes is appended.

1. Non-specific Paroxysmal Sneezing and Rhinorrhoea

Sufferers often refer to this as a "constant cold" or hay-fever, because of the similarity of the symptoms.

In non-specific rhinorrhoea the characteristic attacks usually occur in the morning, at or soon after waking; or they may be precipitated by some change in body temperature, as in getting out of bed or walking barefoot on a cold floor, by exposure to bright sunshine, by the inhalation of airborne irritants, especially dust, or by emotional stress. There is a feeling of irritation at the root of the nose, followed by sneezing, lacrimation, and a profuse watery discharge. The rhinorrhoea may last for only a few minutes or may continue for several hours, and as many as 50 large handkerchiefs may be soaked in the course of a day. Nasal obstruction, headaches, and anosmia are not usually features of the condition.

The attacks are distinguished from common colds by the nature of the discharge, which is clear and watery and not purulent as in coryza. Secondary infection can follow these attacks, whereupon the discharge becomes thick and yellow, and the infection is then identical with the later stages of a coryza.

Examination of the nose shows that the mucous membrane has a normal appearance, and during an attack the nasal passages are found flooded with thin mucus. Radiological examination of the sinuses indicates no change beyond a slight and occasional mucosal thickening. Repeated

examination of nasal smears often shows the presence of eosinophils. In this series of 46 cases 15 smears were examined, and 5 were positive—a finding to which no importance is attached.

The response of the skin to tests with allergens is usually non-specific, and we have come to the conclusion that allergy plays little part in the aetiology, as is shown in Table I.

TABLE I.—Results of 40 Skin Tests

Reaction:	Slight	Moderate	Strong	Total
Negative	..	..	..	12
General non-specific	1	10	5	16
House dust	2	2	3	7
Grass	4	1	0	5

It may be said that people suffering from non-specific rhinorrhoea have a more sensitive nasal mucosa than sufferers from hay-fever; they show brisker nasal reactions to many more irritants and in many more circumstances than do hay-fever subjects, who have been excluded altogether from this analysis.

The symptoms have an explosive character, the counterpart of which in the somatic nervous system would be termed epileptiform. Since the secretomotor nerves of the nose are from the parasympathetic centres in the hypothalamus, such an autonomic "epileptiform attack" would manifest itself in the fashion outlined in the symptoms. Such a concept places the disorder amongst other stress disorders such as asthma and duodenal ulcer, in which the cholinergic system seems to play a leading part.

This hypothesis is in part borne out by the effect of division of the greater superficial petrosal nerve. This nerve is occasionally damaged in fractures of the petrous bone or invaded by new growths, resulting in a "dry nose." From a study of such patients as we have been able to examine in whom this nerve has been injured, it is clear that the greater superficial petrosal nerve is in fact the secretomotor nerve to the nasal mucosa.

For some considerable time a patient has been sought whose rhinorrhoea was so intractable to medical measures and so distressing that any form of relief would be welcomed. When finally such a patient was found, Mr. Murray Falconer performed at our request a section of this nerve through a subtemporal craniotomy. This produced complete homolateral cessation of rhinorrhoea, and the patient is now anxious, after a lapse of six months, to have the other side operated upon. However, our approach must be cautious. The employment of a major surgical operation to rid the patient of what is at the worst a severe discomfort can be justified only if the results can honestly be predicted as completely satisfactory, and if it is reasonably without risk.

Treatment

When the skin tests show no specific reaction or show sensitivity to several allergens, it has proved of little value to attempt hyposensitization or desensitization.

The antihistaminic drugs have been of great value in the control of the rhinorrhoea. To find the particular drug which will prove most effective in any individual nose is a matter of trial and error. It is surprising how often a slight alteration in the radical attached to the ethylenediamine nucleus may make one antihistaminic effective and another useless in the control of symptoms. A combination of antazoline and tripeleminamine, such as "dibistin," gives a wider range of control. Results are often gratifying, but treatment must be continuous to correct this persistent disorder, and many patients find daily dosage over months and years very tiresome. That is to say, treatment by these drugs is in no sense treatment of the causes of the disorder, but is merely palliative.

The drowsiness occasioned by antihistaminics can be adequately countered by the administration of amphetamine or dexamphetamine sulphate.

Of the 46 patients suffering from non-specific rhinorrhoea, 32 derived a satisfactory degree of suppression of symptoms from the use of antihistaminics. Two required zinc ionization and have remained symptom-free up to the time of writing (21 months), and three have been relieved for a similar period by specific desensitization (see Table I—three patients with strongly positive reactions to house dust). In five all forms of treatment were completely fruitless.

It may be worthy of remark that some of these patients derive considerable temporary amelioration from the administration of calcium lactate, 10 gr. (0.65 g.) t.d.s., and parathyroid extract, 1/20–1/10 gr. (3.2–6.5 mg.) t.d.s.

2. Persistent Nasal Blockage

This title is used for want of a better term. "Chronic nasal oedema" emphasizes one of the commonest clinical features of the complaint—namely, nasal polypi. These are a frequent cause of nasal blockage in vasomotor rhinitis (Table II).

TABLE II.—Cause of Obstruction (81 Cases)

	No.	%
Polyp	41	53
Swelling of inferior turbinates	16	20
Polypoid swelling of middle turbinate	12	15
Mulberry swelling of posterior pole of inferior turbinate	5	6
Deviated septum with vasomotor features	5	6

When the inferior turbinate is swollen the obstruction is due to vascular dilatation under vasomotor influences rather than to extracellular fluid collections. Lucas (1952) has demonstrated the contrast between the filled and closed vascular bed, and one is led to conclude that oedema is not the main factor in this type of obstruction.

Eosinophils may be present in the nasal secretions as in the paroxysmal type of the disease. Of 12 smears taken 6 were positive. The patient refers to his nasal blockage as "catarrh"—"I blow my nose and nothing comes away." Further questions establish that the obstruction affects one or both sides, intermittently or alternately. It is made worse by any interference with the normal mechanism of regulation of the body temperature. For this reason it is worse at night, when the body surface is covered with heavy non-conductive bedclothes. A warm, moist atmosphere makes the obstruction worse. Provided a source of permanent obstruction in the shape of polypi is not present, energetic physical effort in the open air helps to clear the obstruction.

Paroxysmal sneezing and rhinorrhoea may also be present, but generally there is little nasal discharge. A slight post-nasal discharge, worse in the morning, is the result of accumulation and drying of the mucus secreted overnight. Frontal, retro-orbital, and occipital headaches are not uncommon, and are caused by temporary blockage of the ostia of the nasal sinuses. Anosmia and "nasal speech" are often reported as a result of the nasal blockage.

Treatment

Chronic nasal obstruction can be alleviated by the rhinologist only by mechanical and, to a lesser extent, by pharmacological methods. The use of the antihistaminics has proved disappointing; their effect on polypi is negligible, and on mucosal swelling slight and inconstant.

Surgical removal of nasal polypi, ablation of the engorged posterior ends of the inferior turbinates, and linear cauterization of the middle turbinates are the measures most commonly employed. Zinc ionization has proved valuable in obtaining long-term freedom from symptoms.

TABLE III.—Treatment

Relieved by polypectomy	..	38
Relieved by cautery of inferior turbinates	..	16
Relieved by vasoconstrictors	..	4
Relieved by zinc ionization	..	1
Specific desensitization	..	2
39 tested: 24 positive, 5 strongly positive		
Antihistaminics, slight relief:		
With polyp	..	5
Without ..	..	10

As shown in Part II, stress factors influence both clinical groups. When an organic obstruction such as a polyp blocks the nose little change can be expected in the airway under the influence of emotion. On the other hand, one would expect to find a clearer relationship between emotion and the state of the nose when the rhinitis has an episodic character as in paroxysmal sneezing and rhinorrhoea.

Thanks are due to the Board of Governors of Guy's Hospital and to the Research Committee of Guy's Hospital Medical School for the provision of a grant to one of us (K. M.) in the execution of this work.

RESULTS OF TREATMENT OF CHRONIC VASOMOTOR RHINITIS

PART II. RESPONSE TO PSYCHOLOGICAL TREATMENT

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Results of Psychiatric Assessment and Psychotherapy

Thirty-one patients under treatment in the throat and ear department were examined. There are two separate series. The patients in series I (13) were the subjects of a pilot study carried out to discover whether there appeared to be any significant correlation, in general terms, between the emotional life of the patient and variations in nasal symptoms. Those in series II (18) were kept under continuous observation for periods of time varying from 1 to 20 months.

The long-term and short-term behaviour of the illness was reviewed against the background of the patient's day-to-day existence and its vicissitudes. Some attempt was made to deal with emotional tension by psychotherapy in all the patients in series II.

Series I

This series comprised eight women and five men. The age range was 16-66 and the mean age 37.9 years. The patients were interviewed on a few occasions only, and the investigation was on a superficial level. Eight had no other complaints but the rhinitis itself. Case 7 had occasional headaches after an especially laborious task; Case 1 felt sometimes irritable and depressed; and Case 10 was tense and moody. Cases 5 and 8 had multiple symptoms—malaise, "run-down," headache, "indigestion," poor sleep, bad dreams.

When the history of rhinitis was explored by a method which took account of the patient's attitudes, feelings, and reactions to stress, the series could be subdivided into three groups.

Group A.—In four patients no significant association of the symptoms of vasomotor rhinitis with emotional tension could be found. Three of these were placid, stable people who had no mental or physical symptoms of anxiety; nasal function seemed to be influenced by physical agencies, such as change of temperature, but not by emotional state. The fourth was a tense, hostile, paranoid man who showed considerable resistance to a psychiatric approach to his illness. If his resistance and the hostility to which it gave rise had been better handled it might have been possible to demonstrate to him some association of nasal symptoms with feelings, since it was manifest that his feelings were very much disturbed; on the evidence, this association seemed probable but could not be proved.

Group B.—Some relationship between mental state and nasal symptoms was present in eight patients. The emotional states correlated with symptoms in these patients were in the main unpleasant and threatening—anxiety, guilt, resentment, despair. The following case is typical.

Case 10.—A woman of 30 was evacuated from London to the country in 1941. She objected to this move and found her new life dull and tedious; in this setting of frustration and discontent she began to have attacks of sneezing (up to 12 attacks daily, average 12 sneezes each), running of the nose (usually 10 large handkerchiefs daily), and obstruction. Clinically, she had pale swollen inferior turbinates; skin tests were negative. Attacks sometimes followed an argument at work. She was not troubled at all by nasal dysfunction when she was walking out with her boy friend; after he left her she felt disappointed and dejected, and symptoms began again.

Group C.—In one patient rhinitis began at a time of crisis in her life, and its symptoms were plainly related to anxiety. The association between nasal symptoms and emotional tension in this case was thus very close.

The preliminary investigation showed, then, that in only one-third of the series did the nasal disorder bear no relation to stress. Furthermore, it seemed likely that, if some of the patients in group B had been examined more often and a better rapport had been established, other links between the rhinitis and the patient's adjustment might have come to light. It was therefore decided to examine a second series of patients and to keep them under observation long enough to allow variations in the nasal symptoms to be correlated directly with life circumstances and the process of psychotherapy. Information of this kind is more reliable than that taken from the patient's anamnesis.

Series II

This series comprised 11 women and 7 men. The age range was 20-58 and the mean age 35 years. The mean duration of attendance at the out-patient clinic was eight months. During psychotherapy the behaviour of the rhinitis and the patient's attitudes, feelings, and reactions were observed, and the correlation, or lack of correlation, between these was recorded.

Group A

The patient's emotional reaction in three cases was thought to have no influence or an insignificant influence on nasal symptoms. The onset of rhinitis in these patients could not be clearly related to disturbing experiences, and, although there was some association between stress and variations in symptoms, this association did not appear to govern the behaviour of the disorder.

Case 15.—A woman of 48 was left alone when her husband died in 1948. She had few friends and felt isolated from her family. In January, 1951, she caught "flu" and had to stay in bed; she was hurt and disappointed that none of her family came to visit her. Symptoms of rhinitis began after this illness. There did not seem to be any close relation between sneezing and nasal blockage and discharge, and spells of anxiety, tension, and resentment against her family.

Here, although the rhinitis did appear for the first time when the patient was depressed and discontented, it later pursued its own course, apparently uninfluenced by her state of feeling.

Group B

In seven patients emotional tension was one of the main determinants of the illness.

Case 10.—A man of 35 suffered from blocking and running of the nose, "indigestion," and occasional attacks of asthma. The indigestion was very plainly related to anxiety, and some of the asthmatic attacks occurred in a setting of emotional tension. The rhinitis first appeared when he left school and went to work. There were attacks coincident with illness in a relative and in his wife. He experienced a kind of internal agitation when he went to visit his parents: "I feel excited in the stomach." This state was in part pleasurable, but it contained a considerable tension component as well. Three times an attack of rhinitis began at the time of the visit. On the other hand, he had attacks which did

not seem to be related to stress. When the course of the illness was reviewed the attacks associated with emotional tension outweighed the remainder.

Here the stress factor accounted for most of the attacks, but there were others which accompanied a change in climate and some which appeared "out of the blue" for no reason which we could discover. An important association of nasal symptoms in this patient was with relaxation; it was plain from his story that the pathogenic agent was not the relaxation itself but the effort and emotional strain which preceded it. This kind of association is familiar in other stress disorders; it is very often seen in migraine (O'Neill, 1952).

Six of the seven patients had other symptoms besides the rhinitis—anxiety, depression, fatigue, asthma, "indigestion," irregularity of menstruation, and menorrhagia. These may be regarded as mental and physical manifestations of a stress reaction of which the nasal disorder was one component.

The onset of symptoms in five patients occurred at a time of especial difficulty and frustration.

Case 4.—A man of 31 came back to his firm after six years' war service to find that some of his junior colleagues who had not joined up had risen to positions of importance and were now senior to him. "I tried not to be resentful"; but he could not help feeling bitter and indignant. Attacks of sneezing and running of the nose began, and have continued. He observed that annoyance affected the nose: "If my little boy pesters me I sneeze." Nasal symptoms were least in evidence while he was active. "If I mope the nose runs."

Variations in symptoms in these patients could for the most part, though not entirely, be accounted for by their emotional state at the time. This relationship is further discussed below.

Group C

A careful review of the story of the illness in the eight remaining patients led to the conclusion that stress was the dominant factor in the pathogenesis.

Case 6.—Sneezing began in a man of 32 when he was working in a power-station. The work was monotonous and boring, and he felt frustrated: "I want a change. At a loss now. Feel very anxious." In the Army he had risen from the ranks to W.O.I by diligent application to duty; he was ambitious and believed that he could better himself at work if he had the opportunity. At the same time he was reluctant to resign from the power-station, since the job was secure and carried a pension. While he was under observation every attack of nasal symptoms could be related to anxiety. After several discussions of his attitude to work, and the pros and cons of making a move, he decided to stay where he was, and to accommodate himself to the conditions; he became less restless and more content. When last seen, ten months later, the rhinitis had almost disappeared. There were occasional mild attacks after fits of worry and depression.

A change of attitude and emotional state, brought about by reflection and discussion, was accompanied in this patient by improvement in the rhinitis.

Five of the eight patients had other tension symptoms—fatigue, depression, menorrhagia, "indigestion," bodily pains, and migraine.

In all eight, symptoms of nasal dysfunction began when they were passing through an experience that aroused emotional tension. These experiences, it should be noted, were not in themselves very dramatic or extraordinary. They were disturbing to the patient because of the strong feeling which was mobilized, and their importance depended on the patient's own internal conflicts and not upon disaster in the outside world.

Case 18.—Symptoms (irritation, sneezing up to 30 times, and watery rhinorrhoea for several hours) began in a woman of 29 after she started music lessons with a male teacher. To her, marriage was a symbol of independence, and she ardently desired to form the kind of friendship which might lead to it. Strivings in this direction, however, stirred up anxiety because of a strong bond of dependence on her mother. Beneath this was deeper anxiety; she had once entered into a homosexual relationship of which she was very ashamed, and she was most apprehensive lest her feelings for her own sex should prove stronger than her feelings for men.

Variations in the intensity of nasal symptoms were associated with variations in emotional state in every patient in this group.

Correlation of Nasal Dysfunction with Emotional State

The data for this correlation are taken from observations on all 18 patients in series II. Two types of correlation can be considered: (1) long-term—the association of attacks with painful experiences over the whole course of the illness; and (2) short-term—momentary variation of symptoms with state of feeling, such as the appearance of nasal blockage in a fit of anger. Furthermore, the emotional determination of physical symptoms is often, if not always, a complex process; the immediate apparent precipitant may be found to rest upon other and deeper levels of conflict. Examples of this kind of psycho-physical relationship are given below.

Precipitating Symptoms

The immediate precipitants of symptoms may be classed as follows.

Anxiety from various sources (10 cases) was much the most common. In two of these the chief focus of anxiety was hypochondriacal concern.

Case 8.—Nasal obstruction due to polypi, and watery rhinorrhoea, began in a man of 42 after he had gone to consult a doctor about pain in his side. The doctor told him that he was doing too much and had tachycardia. The patient thought that this meant serious heart disease, and became extremely anxious about himself. He was sent to a cardiologist for an opinion and given strong reassurance. He ceased to worry about his heart, and the rhinitis diminished.

A blend of anxiety and resentment was predominant in three patients, and an association of symptoms with feelings of depression and deprivation was observed in three others. In three patients symptoms would often appear in the phase of relaxation after effort.

In some patients nasal dysfunction tended to be more pronounced in states of fatigue, probably because the power to keep in check painful emotions is lessened at such times.

Sex feeling, in the sense of unsatisfied desire, manifestly contributed to the causation of symptoms in two patients; and in a third (Case 18) conflicts over the sexual role, which gave rise to acute anxiety, came to light over some months through dream analysis. In several patients who were investigated at length, attitudes and feelings which had at first been entirely hidden rose to the surface, and it was then clear that the tension caused by these underlay and reinforced the emotional states which acted as the immediate precipitants of physical symptoms.

Case 1.—A man of 34 took over the editorship of a trade journal in 1946. The journal was a "one-man show," and he was alone responsible for its production and management. He took his work seriously and worried about it. Soon after he started the task he began to notice "repeated colds." He kept a chart of the variation in symptoms, and saw that the nose gave least trouble when he was working efficiently and at high pressure; nasal block and discharge at once appeared when he "flopped" after a period of intense effort. The analysis of dreams led almost at once to the themes of guilt and fear of punishment; then to the association of sex feeling and violence; and then the patient recalled that his first marriage had early come to grief because his wife was frigid. One night, in a kind of fugue state, he had made a furious attack on her. The memory of this experience had been wholly suppressed, and its recall caused him intense distress, and brought into consciousness the fear that he might make a similar attack on his present wife. When the guilt and fear linked with these impulses had been ventilated he was relieved, but said that he thought the primary problem had yet to be reached. The dream thoughts then took up the theme of his relationship to his mother, and the hostility and rebellion which as an only child he felt towards her. In speaking on this theme, strong feeling was expressed, and nasal symptoms gradually diminished until, nine months after his first attendance, the rhinitis ceased to give much trouble.

In this patient the intensity of nasal dysfunction was related to work strain. When the tensions which lay beneath

this had been to some extent alleviated, nasal block and discharge were reduced, though the actual situation at work had not altered.

Effect of Psychotherapy upon Nasal Symptoms

All the patients in series II were treated in the out-patient department by repeated interviews for periods ranging from 1 to 20 months. The sources of tension were explored and the patients were given help to deal with these. Dream analysis was utilized in six cases. The results of treatment were:

	Paroxysmal Rhinorrhoea	Chronic Nasal Oedema
Much improved or recovered ..	5	3
Improved ..	3	3
No change ..	2	1
Improvement in rhinitis, development of asthma ..	1	—

It will be seen that in response to treatment there was no significant difference between paroxysmal rhinorrhoea and chronic nasal oedema.

The best results were obtained in cases in which the relationship of the illness to stress was strongest, and six of the eight patients in group C were much improved.

These results suggest that sustained improvement in vasomotor rhinitis can be brought about by the diminution in emotional tension which follows psychotherapy—an improvement that does not depend on the use of antihistamine drugs.

Comment

A comparison of the grouping in series I and II shows that the principal difference is in group C (series I, 1; series II, 6). This suggests that the more that is known about the patient, and the better his reactions are understood, the more does the stress factor stand out. This conclusion is confirmed by the clinical findings in those patients who were investigated at greater length. The patient mentioned above (Case 1 of series II) could not, at his first interview, have told of his attack on his wife, since he was not at that time aware of it. The judgment that a particular disorder is not related to stress is a difficult one to make without a really thorough inquiry.

One of the patients in series II (Case 16), who was most anxious and hypochondriacal and suffered from abdominal discomfort, bodily pains, migraine, tension, and depression, had to consult a doctor about his other symptoms; another (Case 3) looked pale and ill, and was depressed and anxious. Both of these patients were manifestly anxious on examination, and their anxiety and its symptoms were severe enough to warrant their seeking medical advice. The other 16 patients did not seem to be very anxious or very depressed, and would not have asked for a psychiatric appraisal if it had not been offered to them. Few of the patients in either series were able, at their first attendance, to relate the symptoms of their rhinitis to stress, yet they were able to grasp this relationship readily enough when it was made clear to them by the anamnesis, and the more intelligent among them strove to make such modifications in their lives as were necessary to keep symptoms to a minimum.

No specific personality pattern emerged from the psychiatric examination of the patients in series II. Reactions of evasion and retreat (Cases 3 and 5) were represented among the patterns of illness, as well as reactions of combativeness and defiance (Cases 10 and 17). Symptoms of nasal dysfunction could appear in anticipation of stress (Case 13), during the stress itself (Case 7), and after it was over (Case 1).

Once the physical symptoms had appeared, utilization of them in order to gain some advantage was not a feature of the illness in any of these patients. In this respect the disorder resembles duodenal ulcer.

Summary

The results of treatment of chronic vasomotor rhinitis by physical and psychiatric methods are reviewed.

A few patients may be relieved of their symptoms by desensitization, and a few more are benefited by

zinc ionization. Obstruction of vascular origin, and that due to polypi, can be lessened by cautery and polypectomy. Antihistamine drugs are capable of suppressing the symptoms of paroxysmal rhinorrhoea, but only when they are being given continuously. They do not benefit the patient with chronic nasal oedema.

Some relationship between stress and the onset and course of vasomotor rhinitis has been demonstrated from a superficial psychiatric investigation. When the investigation is more prolonged and is carried to deeper levels a close relationship between nasal symptoms and stress can be shown in most patients. Such a relationship was found in 24 of this series of 31 patients. Recovery or sustained improvement followed psychotherapy in 14 of 18 patients treated at some length.

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COMPLICATIONS OF MECKEL'S DIVERTICULUM

WITH AN ANALYSIS OF 18 CASES

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Meckel's diverticulum has been the subject of many authoritative and stimulating papers in the past. It is not a rare congenital abnormality; the complications of this lesion are, however, of such gravity that the subject is always of importance in any consideration of acute abdominal emergencies. The cases reported here illustrate well some of its more serious complications, and it is by keeping such facts constantly in mind that we may hope to reduce the mortality of such lesions.

The first adequate description was published by J. F. Meckel in a series of three papers which appeared between 1808 and 1815. He was apparently the first to associate the diverticulum with the omphalo-mesenteric duct which connects the yolk sac with the intestine during the first few weeks of foetal life. Failure of obliteration of part or whole of the duct results in various anatomical types, ranging from complete patency to the outpouching of intestine, usually of the terminal ileum.

Meckel's diverticulum usually arises from the antemesenteric border of the ileum, about 20 in. (50 cm.) proximal to the ileo-caecal valve, the distance being less as the age approaches infancy. The diverticulum is usually composed of the same three layers which make up the ileum, but at times contains heterotopic tissues; the incidence varies between 15 and 25% of cases. It takes the form of gastric, duodenal, jejunal, and colonic mucosa, as well as pancreatic tissue. The most common type of heterotopic tissue is gastric mucosa, occurring in 16.6% of all cases of Meckel's diverticulum. When present, the heterotopic tissue usually lines the greater portion of the diverticulum, often involving the neck of the sac.

Complications

Meckel's diverticulum attracts the attention of the surgeon as a rule only when one of the several complications of this anomaly develop. These include:

1. *Diverticulitis With or Without Perforation.*—Meckel's diverticulum is subject to inflammatory changes giving rise to symptoms and signs similar to those of appendicitis. It is impossible to distinguish between the two conditions with

any degree of confidence, unless the patient has had his appendix removed at a previous operation. Perforation with peritonitis may occur, the latter being more lethal than that seen with a perforated appendix, owing to less efficient "walling off" and to greater volume and fluidity of intestinal contents.

2. *Ulceration or Haemorrhage or Both from Heterotopic Gastric Tissue.*—Peptic ulcer with haemorrhage or perforation or both is a common complication of Meckel's diverti-

Summary of Cases

Case No.	Age	Sex	Clinical Features on Admission	Pre-operative Diagnosis	Post-operative Diagnosis	Treatment and End-result
1	21	M	Recurrent severe attacks of melaena extending over period of 10 months requiring transfusion. Barium meal and gastroscopy: N.A.D. History of mild ulcer dyspepsia.	? Bleeding duodenal ulcer. ? Bleeding ulcer of Meckel's diverticulum.	Bleeding ulcer of Meckel's diverticulum.	Simple excision of diverticulum, which appeared to be fibrosed at apex. End-result satisfactory.
2	9	M	Admitted with 48-hours history of abdominal pain and vomiting. T. 100.8° F. (38.2° C.). Examination revealed tenderness and rigidity of lower abdomen. Per rectum: tender on right side anteriorly.	Acute appendicitis.	Gangrenous Meckel's diverticulitis.	Simple excision of diverticulum. End-result satisfactory.
3	39	F	History of colicky abdominal pain and vomiting of 4 hours' duration. T. 99° F. (37.2° C.). Tenderness and guarding high in right iliac fossa and right hypochondrium. Previous but less severe attacks of abdominal pain.	Acute appendicitis.	Meckel's diverticulitis.	Simple excision of diverticulum. End-result satisfactory.
4	55	F	Recurrent attacks of melaena associated with vague attacks of upper abdominal pain. Barium meal, barium enema, and gastroscopy normal.	Bleeding duodenal ulcer.	Bleeding ulcer of Meckel's diverticulum.	Simple excision of diverticulum with invagination of the stump. Histology: no heterotopic gastric mucosa.
5	33	F	Lower right abdominal pain associated with vomiting for 3 days. T. 98.4° F. (36.9° C.). Also previous attacks of colicky right lower abdominal pain with vomiting for 3 years.	Acute appendicitis.	Meckel's diverticulitis.	Simple excision of diverticulum. Discharged well 2 weeks after operation. Histology suggests heterotopic gastric mucosa.
6	9	M	Severe recurrent attacks of melaena necessitating blood transfusion. Barium meal: N.A.D.	Bleeding ulcer of Meckel's diverticulum.	Bleeding ulcer of Meckel's diverticulum.	Simple excision of diverticulum. Discharged well 7 weeks after operation.
7	54	F	Lower abdominal pain and vomiting for 3 days. Rheumatic heart disease associated with fibrillation. On examination there was evidence of slight abdominal distension.	Intestinal obstruction.	Intestinal obstruction.	Patient died from toxæmia without any operative intervention. Necropsy showed gangrenous Meckel's diverticulum causing intestinal obstruction.
8	38	M	Colicky lower abdominal pain and vomiting.	Intestinal obstruction.	Meckel's diverticulitis causing intestinal obstruction.	Simple excision of diverticulum. As the diverticulum was kinking small intestine and causing marked obstruction, temporary ileostomy was performed. Discharged well about 7 weeks after operation.
9	10/12	M	Colicky abdominal pain and vomiting, associated with bleeding per rectum. T. 100° F. (37.8° C.). ? Mass felt in right hypochondrium.	Intussusception.	Intussusception caused by Meckel's diverticulum.	Simple excision of diverticulum. Discharged well 8 days after operation.
10	17	M	4 months' history of vague dyspepsia with recent severe attack of melaena requiring blood transfusion.	? Bleeding peptic ulcer of Meckel's diverticulum. ? Bleeding D.U.	Bleeding ulcer of Meckel's diverticulum.	Simple excision of Meckel's diverticulum. Histology showed heterotopic gastric mucosa. Discharged well 12 days after operation.
11	38	M	Intermittent mild abdominal pain for 9 days. Much more severe 24 hours before admission, associated with vomiting. Examination showed tenderness and guarding in right iliac fossa.	Acute appendicitis.	Gangrenous Meckel's diverticulitis.	Excision of diverticulum, plus adjacent portion of small bowel. Discharged well about 4 weeks after operation.
12	10/12	M	Painless melaena for one day. Irritability, especially after feeds for a few days. No abnormality found on examination of abdomen.	? Intussusception. ? Bleeding ulcer of Meckel's diverticulum.	Bleeding ulcer of Meckel's diverticulum.	Excision of diverticulum. Discharged well 8 days after operation.
13	29	M	2 days' history of colicky mid-abdominal pain. Examination revealed tenderness and guarding in right iliac fossa. T. 102° F. (38.9° C.).	Acute appendicitis. ? Meckel's diverticulitis.	Meckel's diverticulitis.	Simple diverticulectomy. Discharged well 11 days after admission.
14	50	M	5 days' history of abdominal pain and vomiting. On examination no definite distension seen but obstructive sounds heard on auscultation.	Intestinal obstruction.	Meckel's diverticulum causing obstruction of small bowel.	Excision of diverticulum plus adjacent portion of small intestine.
15	33	F	20 years' history of pain 4-hour after meals with recent attacks of colicky abdominal pain. One attack of right-sided abdominal pain diagnosed as appendicitis; appendicectomy performed but appendix normal. Meckel's diverticulum was not looked for. Barium meal and gastroscopy negative. Occult blood positive on several occasions.	? Ulcer of Meckel's diverticulum.	Meckel's diverticulum with ulcer on adjacent portion of small bowel.	Excision of diverticulum plus portion of small intestine on each side. The ulcer in this case was in the ileum, 1 cm. proximal to stoma of Meckel's diverticulum. The ulcer had caused ring stricture of small intestine, producing marked intestinal obstruction.
16	45	M	2 days' history of generalized abdominal pain and vomiting; pain more marked in right iliac fossa on day of admission. On examination marked tenderness and guarding in right iliac fossa.	Acute appendicitis.	Gangrenous Meckel's diverticulitis and sub-acute appendicitis.	Simple excision of diverticulum. The diverticulum was divided into two portions by a constriction in its wall, and the larger pouch contained a number of hard stones.
17	18	M	2 years' history of occasional dyspepsia. Recurrent attacks of fairly severe melaena extending over a period of 8 months. On examination tender to right of umbilicus. Barium meal normal.	? Meckel's diverticulum. ? Duodenal ulcer.	Meckel's diverticulum.	Simple excision of diverticulum. Post-operative progress satisfactory.
18	63	F	24 hours' history of acute abdominal pain. Pulse 150, T. 101° F. (38.3° C.). On examination tenderness and rigidity of whole lower abdomen, more marked to right of midline.	? Perforated appendicitis. ? Perforated diverticulitis of colon.	Gangrenous Meckel's diverticulitis with peritonitis.	Simple excision of diverticulum, with satisfactory result.

culum. It is more often seen in infancy and childhood, and is the only complication of Meckel's diverticulum other than umbilical lesions which can be diagnosed pre-operatively. The cardinal symptoms and signs are: (a) history of massive intestinal haemorrhage, (b) an average age of from 10 to 15 years, and (c) abdominal pain. Usually the patient gives a history of previous massive intestinal haemorrhage followed by a period of months, or even years, before recurrence. The haemorrhage is usually massive, although in some cases there may be a history of small and recurrent melaenas. Other conditions giving rise to rectal bleeding are Henoch's purpura, bleeding peptic ulcer, rectal polyp, ruptured rectal varicosities, and early congenital intestinal telangiectasis. In adults, benign and malignant tumours of the gastro-intestinal tract must also be considered. With careful examination it is usually possible to eliminate most of the conditions mentioned. The bleeding gastric or duodenal ulcer may, however, cause difficulty in the diagnosis, because some cases of diverticular ulcer do have a definite pain-food relation (see Case 15). Regardless of other symptoms, a history of massive haemorrhage from the rectum followed by recovery and then recurrence of haemorrhage after the lapse of weeks or months is almost pathognomonic of peptic ulcer of Meckel's diverticulum.

3. *Intestinal Obstruction.*—Meckel's diverticulum may be the cause of intestinal obstruction. The fibrous band connecting the diverticulum to the parietes or other adjacent organs may act as an axis about which the bowel may rotate to form a volvulus. At other times the diverticulum itself may be the leading point of an intussusception, particularly in the broad-based diverticulum. There is no characteristic feature to distinguish it from small-bowel obstruction due to other causes, but this condition must be borne in mind when confronted with a case of intestinal obstruction in infants and children.

4. *Umbilical Fistula and Associated Lesions.*—Lesions of the umbilicus associated with incomplete obliteration of the omphalo-mesenteric duct also occur, and are relatively easy to diagnose.

5. *Neoplasms.*—Tumours, both benign and malignant, have also been reported in Meckel's diverticulum, but are of rare occurrence.

6. *Foreign Bodies.*—Calculi and various foreign bodies have been encountered, giving rise in some instances to inflammation, perforation, and obstruction (see Case 18).

Treatment

It is generally agreed that silent diverticula found incidentally at laparotomy require no special treatment. It is only when a complication supervenes that the surgical treatment becomes a matter of urgency. The detail of operative procedure used must of necessity vary with the findings in the individual case. When intestinal obstruction is found, it is usually due to either a band or an intussusception. The band must be divided and the intussusception should be reduced, and, provided the general condition of the patient is satisfactory and there is no gross distension of bowel, the diverticulum may be resected at the same time. The method of excision, however, varies with different surgeons; some advise excision with closure of the defect by two rows of sutures, or by the same technique as used for appendicectomy, while others believe in resecting the diverticulum plus a portion of adjacent bowel, with subsequent anastomosis. With the former method particular care must be taken to avoid undue narrowing of the lumen. Ladd and Gross (1941) recommend that clamps should be placed at an angle of 45 degrees to the long axis of the bowel to reduce the risk of this complication. In cases of perforation or haemorrhage from an ulcer there is the possibility of heterotopic gastric mucosa extending up to the adjacent portion of the bowel, and it is therefore important to include it in the resection.

Cases of umbilical fistula or adenoma require formal laparotomy, as these conditions are commonly associated

with incomplete obliteration of the omphalo-mesenteric duct, which should be remedied at the same time. In cases of diverticulitis with or without perforation, the general and local condition must be taken into account in deciding the advisability of resection of adjacent portions of the intestine. Diverticula which are sites of tumour formation should be excised, with a few inches of small intestine on each side, including a wedge of the mesentery.

The patients whose cases are reported in the Table were operated upon at Central Middlesex Hospital between 1936 and 1953. They illustrate well some of the more important complications of Meckel's diverticulum.

In seven of the cases the possibility of Meckel's diverticulum as the causative factor was considered, but in only three was the diagnosis made with some degree of confidence. The greater incidence of the condition in males in this series agrees with the findings generally recorded by other writers. There was one death in this series, giving a mortality of 5.5%. This occurred in a patient who was too ill for operation. Heterotopic gastric mucosa was found in two cases; some of the specimens were not submitted to histology, while in others there was no evidence of heterotopic tissue. However, without making several sections from each specimen, such tissue might readily be missed.

The complications of Meckel's diverticulum in childhood have been stressed by many writers, and, while such studies are entirely appropriate, the importance of these complications in adults must also be remembered. This is well shown in the Table, in which two-thirds of the cases were found in adults over the age of 21. In fact, in any acute abdominal emergency, unexplained bleeding from the gastro-intestinal tract, and vague intra-abdominal complaints the possibility of Meckel's diverticulum as the cause must be considered.

Summary and Conclusions

An account is given of the common complications of Meckel's diverticulum, together with a short note on treatment.

Eighteen cases, with one death, are reported and subjected to analysis.

The importance of Meckel's diverticulum as a cause of acute abdominal emergency, unexplained intestinal haemorrhage, or vague abdominal symptoms is stressed.

We wish to thank all members of the medical and surgical staff of the Central Middlesex Hospital, in particular Mr. T. G. J. James and Dr. F. Avery Jones, for their permission to publish these cases.

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The annual report of Yale Medical Library for the year ending June 30, 1953, includes some interesting information on the relative use made of medical periodicals. The library receives 1,140 serial publications of all types, and a rearrangement in the reading-room made it necessary to reduce the number of journals housed there. An analysis was therefore made of the recorded use of these journals, and it was noticed that the "current use" of a journal appears to continue for about five years, with the second year after publication being the time of heaviest use. It is shown that the availability of such periodicals is greatly increased if binding is delayed for five years. As much use was made of the two most popular journals together as was made of the 158 least popular on the list combined. Forty journals accounted for nearly half of the total use made of periodicals.

EARLY RECURRENT ACUTE INTUSSUSCEPTION IN CHILDREN

BY

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Acute intussusception in children is not a common condition. Spence and Court (1950) traced every child with this condition in the City of Newcastle-upon-Tyne during a six-year period and found the incidence was 3.8 per 1,000 births, or one case per family practitioner during that time. Recurrence of acute intussusception in children can be expected even less often. Thorndike (1932) reported five cases but found only 75 others in the literature. Since then Killins and Clagett (1941) and Mastin (1942) have described one case each, but the number even with the four cases reported here remains small. The following cases show that a recurrence can occur in the immediate post-operative period, a fact which does not seem to have been emphasized before.

Case 1

A female child aged 7 months was admitted to Bridgend General Hospital on January 22, 1950. She was an only child, was breast-fed until weaning one month previously, and had been quite well until the previous evening, when she began to have attacks of severe abdominal pain which, the mother stated, made the child draw up her knees. There had been some vomiting of food shortly after its ingestion. The bowels had been regular, but no action had occurred since the previous day. There were no urinary symptoms. On examination the child was seen to be in good general condition, and well nourished, and showed no signs of dehydration. Examination of the abdomen was difficult, as the child had repeated attacks of colic. No tumour was felt on abdominal or rectal examination, but whilst the latter was being performed the child had a bowel action with streaks of bright blood and mucus. A presumptive diagnosis of intussusception was made and operation undertaken immediately.

First Operation.—Under general anaesthesia a lower right paramedian incision was made and an ileo-colic intussusception was found, the apex of which had reached the splenic flexure. This was easily reduced. Enlarged mesenteric glands were noted but no cause was found for the intussusception.

The post-operative course was uneventful until January 30, when the child became restless and was obviously in some pain. There was mild infection of the wound but no physical signs were elicited on abdominal examination. Rectal examination revealed a small quantity of foul-smelling soft faeces but no blood. There was some dehydration which warranted an intravenous transfusion of half-strength Hartmann's solution. Examination of the urine showed a moderate growth of coliform organisms. On the following day the abdomen was obviously distended and the bowel sounds were greatly increased and high pitched. A diagnosis of acute small-bowel obstruction was made and laparotomy undertaken.

Second Operation.—Under general anaesthesia a lower left paramedian incision was made and an ileo-ileal intussusception was found with distension of the proximal small intestine. The origin of this intussusception was proximal to the previous one, the distal bowel now appearing normal, and, except for the enlarged mesenteric glands previously

noted, no other abnormality was found. There was some superficial wound infection following the second operation which delayed convalescence, but the child was discharged in a month and was still well three years later.

Case 2

A female child aged 7 months was admitted to Bridgend General Hospital on May 11, 1950, with a history of repeated attacks of abdominal pain and vomiting for two days. She had also been passing blood and mucus per rectum for two days. Previously she had been a healthy child who was breast-fed until the age of 5 months, and had since then been fed on a proprietary milk food. On examination her general condition was good, she was having repeated attacks of abdominal colic, and a tumour was palpable in the left iliac fossa. On rectal examination a mass could be felt at the tip of the finger; it was continuous with the abdominal mass; there was blood on the examining finger; and a diagnosis of acute intussusception was made.

First Operation.—Under general anaesthesia a right paramedian incision was made. Two intussusceptions were found; an ileo-colic one originating just proximal to the caecum, and a colo-colic one in the left iliac fossa. The latter was antiperistaltic in the descending colon. The caecum, the ascending colon, and descending colon each had a long mesentery. The intussusceptions were reduced without difficulty.

The post-operative course was normal until May 15, when the child again had spasms of abdominal pain and vomited copiously. The abdomen was not distended, but the bowel sounds were high pitched and increased, and rectal examination revealed some blood and mucus. Recurrent acute intussusception was diagnosed and laparotomy undertaken immediately.

Second Operation.—A lower left paramedian incision was made and some free fluid found in the peritoneal cavity. An ileo-ileal intussusception 8 to 9 in. (20 to 22.5 cm.) in length was situated 2 ft. (60 cm.) from the ileo-caecal valve, the proximal small intestine being greatly dilated. The intussusception was reduced. No apparent cause for the recurrence was found. The bowel at the sites of the previous intussusceptions was normal. The convalescence was uneventful, the child being discharged in three weeks. There had been no further recurrence on follow-up (1953).

Case 3

A previously healthy male child aged 2½ years was admitted to St. James's Hospital, Balham, on January 21, 1951, with a history of recurrent attacks of abdominal colic and vomiting for the past 36 hours. The bowels had not been open for 24 hours and there were no urinary symptoms. On examination the child was pale and looked ill, but there was no gross dehydration. Some tenderness was present in the right iliac fossa but no tumour was palpable in the abdomen. On rectal examination there was some bloody discharge on the examining finger. A presumptive diagnosis of intussusception was made, and operation performed immediately.

First Operation.—A lower right paramedian incision was made under general anaesthesia and an ileo-ileal intussusception was found about 5 ft. (150 cm.) from the ligament of Treitz; it was reduced. No other abnormality or cause of the intussusception was found.

On January 24 vomiting of most feeds occurred, but no abdominal physical signs were found. Vomiting persisted, and on January 26 some signs of dehydration were apparent and a radiograph of the abdomen showed dilated loops of bowel in the upper abdomen with fluid levels. Laparotomy was immediately undertaken.

Second Operation.—Under general anaesthesia the previous wound was reopened and about 18 in. (45 cm.) from the ileo-caecal valve an ileo-ileal intussusception was found and reduced. A second intussusception about 8 ft. (240 cm.)

from the ileo-caecal valve was also reduced. The cause of the intussusceptions could not be found, and the site of the previous intussusception was normal. The child made an uneventful recovery and was discharged home on February 12.

Case 4

A female child aged 6 months was admitted to Llandough Hospital on October 29, 1952, with a history of vomiting after each feed two weeks earlier; this had become less, and four days before admission the child had had attacks of screaming and drawing up of the legs. She had vomited green fluid and had been constipated for two days, but had passed clots of blood per rectum on the day of admission; only small amounts of urine had been passed. On examination the child showed signs of severe dehydration. A large mass 3 in. (7.5 cm.) in length was palpable in the left iliac fossa, the apex of an intussusception was palpable per rectum, and there was blood on the examining finger. A diagnosis of acute intussusception was made.

First Operation.—The abdomen was opened through a lower right paramedian incision and an ileo-colic intussusception was found, extending to the pelvic colon. It was easily reduced.

On November 2 a loose green stool was passed. On November 4 the child vomited green material, the stool was relaxed and contained mucus. The abdomen was distended and tympanitic; bowel sounds were present. A radiograph of the abdomen showed distension of the small intestine. Treatment by intravenous fluids and gastric suction was begun, but as the condition did not improve laparotomy was undertaken on November 6.

Second Operation.—An ileo-ileal intussusception was found, 10 in. (25 cm.) from the ileo-caecal valve. There was no obvious cause for the intussusception. Convalescence was uneventful, the child being discharged on November 17.

The child was again admitted to the Cardiff Royal Infirmary on February 1, 1953, with a history of sudden onset of screaming and the passage of bright red blood per rectum on one occasion, but no vomiting. On examination the general condition was found to be good, no abnormality was noted in the abdomen, and a hard faecal mass was palpated in the rectum. Plain radiography of the abdomen showed no abnormality. On the following day the bowels opened normally, the child was discharged, and was well on follow-up on March 16, 1953.

Discussion

Killins and Clagett (1941) reported a case of recurrent intussusception at the Mayo Clinic and believed the condition to be rare. They further stated that "the patient, by undergoing two successful operations for intussusception, has become something of a surgical curiosity." Thorndike (1932), in searching the records of the Children's Hospital, Boston, found that 405 cases of acute intussusception in children had been admitted between 1869 and 1932, and of these only five had had post-operative recurrences, which is a ratio of about one in 80. As intussusception itself is not uncommon, this means that a small but nevertheless important number may go on to recurrence. Mastin (1942) reported a case in which three separate intussusceptions took place within twelve months.

The period of time between the initial attack and the recurrence varies considerably. In Thorndike's series the average time was five months and in all his cases the patient had left hospital. Arntzen and Helsted (1929) reported the longest interval between the initial attack and recurrence of eight years, whilst Cohen (1921) reported a case occurring 30 hours after operation. The cases reported above recurred at eight, four, five, and six days respectively after operation, and come into some of the earliest groups recorded.

The cause of acute intussusception when there is no underlying disease such as a tumour or Meckel's diverticu-

lum is still unsettled and theories involving neuromuscular dysfunction and enlarged Peyer's patches still remain unproved. It is therefore not surprising that there is no satisfactory theory for the recurrence of acute intussusception. Mastin (1942) stated that in more than half the cases of acute intussusception the caecum was found to be mobile, and that he anchored the latter in the right iliac fossa. This caecal mobility was present in Case 2, and the long mesentery in both ascending and descending colon may well have been an aetiological factor in the causation of the original intussusception, but it does not explain the recurrence, which was ileo-ileal in origin. In Cases 1, 3, and 4 there was no mobility of the caecum.

Conclusion

Recurrent acute intussusception in children, although rare, is a condition to be borne in mind even in the early post-operative days, and careful observation of these small patients is recommended so that laparotomy may be undertaken early in this condition. The diagnosis is easier to make when there is a longer interval and the patient has been discharged from hospital, but in the post-operative period it may easily be overlooked and an incorrect diagnosis made because the child has already had an intussusception. We wish to draw attention to this possibility of early post-operative recurrence so that treatment may be undertaken. Immediate operation is the form of treatment recommended, and, as imbalance very readily occurs, attention should be paid to the fluid requirements of the child, intravenous infusion being carried out if necessary. If there is a mobile caecum the anchoring of this is suggested as a measure that may prevent further recurrence, but if no such mobility exists no further treatment other than the reduction of the intussusception can be advised until the aetiology of the condition is more fully understood.

Summary

Four cases of early recurrent acute intussusception in children treated successfully are reported.

The rarity and importance of the condition are shown.

The importance of early diagnosis, based on the clinical state and radiological findings, is emphasized.

The treatment is operative, with reduction of the intussusception.

We would like to express our thanks to Dr. Jeffrey W. Jones for permission to publish Cases 1 and 2, to Mr. Norman C. Tanner for Case 3, and Professor A. G. Watkins and Mr. D. B. E. Foster for Case 4; to Mr. F. J. Hedden who performed the original operation in Case 1, to Mr. D. H. Teasdale in Case 3, and Mr. H. Millard in Case 4. Our thanks are also due to Mr. N. C. Tanner and Mr. A. M. Desmond for their helpful criticism of this paper.

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At Harrow trust funds of about £20,000 of the former district nursing association are to be used to establish a physiotherapy service for residents confined to their homes. Treatment will be restricted to the less well off, who will pay varying charges according to their means or receive it free if in needy circumstances. The diagnosis and prescription of the family doctor will be sufficient for the physiotherapist to proceed with treatment. It is expected that local private physiotherapists will be willing to undertake the service, but if that is not possible a van, or vans, equipped with apparatus and in charge of a driver-physiotherapist will be used.

CRANIOSTENOSIS WITH FAMILIAL VITAMIN-D-RESISTANT RICKETS

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The syndrome of rickets resistant to normal therapeutic doses of vitamin D but amenable to treatment with massive doses (up to 1,500,000 i.u. daily) was first described by Albright, Butler, and Bloomberg (1937). Since then the literature has become extensive, and it is now recognized that the condition is by no means rare. Holt (1950), Scott (1951), and Pedersen and McCarroll (1951) give good accounts of it; the latter, in the course of an account of 25 cases, point out the strongly familial nature of the disease. Albright *et al.* established by metabolic studies that there is a resistance to normal doses of vitamin D not attributable to malabsorption of the vitamin; and Robertson, Harris, and McCune (1942) attribute the complaint to

deficiency of an enzyme, of which vitamin D is said to be the prosthetic group, normally responsible for absorption of phosphate by the gut and its retention by the kidney. Freeman and Dunskey (1950), however, failed to get a restoration of normal serum phosphate despite successful therapy, and they question whether vitamin-D treatment corrects the metabolic defect.

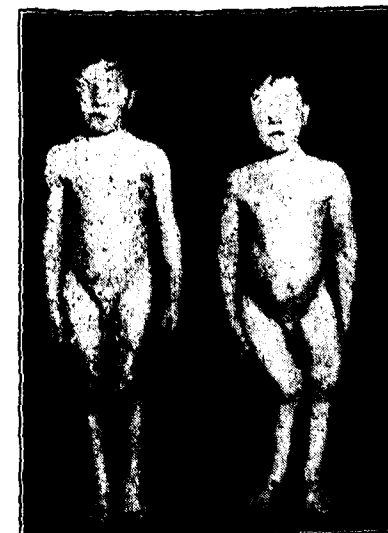


FIG. 1.—The patient aged 6½ (right), with his brother aged 5½.



FIG. 2.—Active rickets (aged 3).



FIG. 3.—Improvement (aged 6½).

The deformities occurring in vitamin-D-resistant rickets are similar to those of classical rickets; indeed, there is no reason to suppose that the mechanism of deformity is in any way different in the two conditions. In one respect, however, there appears to be a difference—that in the familial resistant variety craniostenosis occasionally occurs. This has been stated only once in the literature, by Imerslund (1951), who describes a boy with typical vitamin-D-resistant rickets whose mother has old rachitic deformities. This child has a considerable degree of scaphocephaly following on premature fusion of the sagittal suture, and necessitating craniotomy for the relief of increased intracranial pressure.

This is not the only occasion on which scaphocephaly has been reported, for it is evident in an illustration of one of the cases of Albright *et al.*, and Pedersen and McCarroll mention the deformity while attributing it to rickets. In addition, Scott comments on the existence, in some cases, of frontal bossing with increased antero-posterior skull diameter and decreased transverse measurement. None of these authors, however, make mention of craniostenosis due to premature fusion of the sagittal suture, which clearly occurred in Imerslund's patient, whose mother also showed a small degree of scaphocephaly. No attempt has been made to explain this association of conditions, the one manifested as delay in ossification, the other by its premature occurrence. We regard this association as unusual enough to warrant the following description of a second case showing both phenomena.

Case Report

A boy aged 6 was first diagnosed as suffering from classical rickets when 2-3 years old. He is the eldest of three, the third child having died of meningitis in infancy. Fig. 1 shows the patient with his younger brother. All three were born by caesarean section, as the mother has old rickets with a contracted pelvis and genu valgum. She has no obvious biochemical abnormality apart from the rather low figure of 1.7 mg. of phosphorus per 100 ml. for her plasma inorganic phosphate. She has not got scaphocephaly. No relevant family history was obtained, as the family is not particularly "clannish" and little is known of some relatives. The patient had a normal diet as an infant and an adequate supplement of national cod-liver oil—2 dr. (7 ml.) daily from 1 year onwards. Despite this he developed frank rickets when 2 years old. A photograph (too "grainy" for repro-

duction) at 20 months shows him walking normally, but with the skull deformity already apparent. At 3 years he had active rickets (Fig. 2). He was given routine anti-rachitic treatment (sunlight and fish-liver oils). When first seen by us in August, 1952, at 6½ years, his wrists were as shown in Fig. 3. His skull deformity is shown in Figs. 4 and 5.

Biochemical Investigations (in each case the mean of two or more estimates is given).—Serum calcium, 10.2 mg. per 100 ml.; plasma inorganic phosphate, 2 mg. of phosphorus per 100 ml.; alkaline phosphatase, 31 King-Armstrong units; blood urea, 26 mg. per 100 ml.; urea-clearance test (Van Slyke), 120% of average normal; urine, N.A.D. on numerous occasions. In addition the following were found on one occasion each: plasma chloride, 100 mEq per litre; alkali reserve, 27 mEq per litre; fasting blood sugar, 88 mg. per 100 ml.; faecal fat, 15.7 g. per 100 g. dried faeces (unsplit, 1.4 g.); three-day fat balance, absorption 94%.

After treatment with 50,000 i.u. of vitamin D daily by mouth, starting in early September, 1952, the serum calcium rose slightly to 11.2 mg. and the plasma inorganic phosphate rose progressively to 2.7 mg. after three weeks and to 4.3 mg. in six weeks, but fell to 2.4 mg. after 25 weeks of the same treatment. The alkaline phosphatase did not vary significantly over this period. The only definite biochemical abnormalities were the low plasma inorganic phosphate and the



FIG. 4.—The patient aged 6½.

slightly raised phosphatase. The former responded temporarily to the relatively small dose of vitamin D. Renal function remained normal throughout.

We are indebted to Dr. C. H. Wood, for the following report: "November, 1948:—Generalized decalcification with bowing of long bones; widening of the space between



FIG. 5.—Skull (aged 6½).

epiphyses and metaphyses; saucer-shaped and irregular metaphyses; these changes are more advanced in the legs. Skull: marked scaphocephaly with closure of the sagittal suture. August, 1952:—Appreciable improvement since earlier films, although not healed February, 1953:—Improvement maintained, but still not healed; x-ray films of patient's mother showed typical changes of healed rickets but no scaphocephaly."

There seemed to be little doubt of the diagnosis of vitamin-D-resistant rickets, and more vigorous therapy was instituted. In addition he has well-marked craniostenosis from premature fusion of his sagittal suture, a condition only once previously described in association with resistant rickets.

Summary

The second reported case of craniostenosis associated with vitamin-D-resistant rickets is presented together with evidence to suggest that the association of these conditions may have occurred previously and been mistaken for a purely rachitic phenomenon.

We are indebted to Dr. J. M. Macfie for permission to publish this case; to Dr. C. H. Wood for the x-ray films; and to the department of clinical photography, General Hospital, Nottingham, for the other illustrations.

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ANAESTHESIA IN HOSPITAL BREECH DELIVERY

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For practical purposes an infant may be delivered by the breech in one of two very different ways: an assisted breech delivery or breech extraction. The two essential features of the former type of delivery are that labour should be left to the natural forces so far as possible and that any intervention should imitate the normal mechanism of breech delivery. In practice this implies that assistance is confined to the birth of the arms and, more especially, of the head. In contradistinction to an assisted breech delivery, delivery in a breech extraction is entirely operative, the maternal powers playing no part. In most cases intervention is undertaken before the breech has started to distend the vulva, the legs being brought down and delivery completed by a combination of traction and gentle fundal pressure.

In the absence of definite indications for early delivery, choice of methods is dictated by consideration of the foetal hazards. These have been shown to be due to two factors—namely, trauma and anoxia, of which the former is by far the more

common. Although trauma may at times be due to disproportion, in the great majority of instances it may be directly ascribed to one or more of the following causes: undue manipulation of the foetus; manipulation carried out under difficulties; and uncontrolled delivery of the after-coming head. Ideally, therefore, an assisted breech delivery should always be aimed at, since it demands the minimum of intervention. Where, however, indications arise for a breech extraction, it is important that the necessary manipulations—which often involve the passing of the whole hand into the uterine cavity—should be rendered as atraumatic as possible by ensuring good relaxation not only of the perineal floor but also of the uterus itself.

In addition, in both these methods of delivery the foetus may have to undergo a period of oxygen deprivation before delivery of the mouth.

From what has been said, it will be evident that the anaesthetic requirements in breech delivery will to a large extent depend upon the obstetric procedure decided on. Thus, in an assisted breech delivery there must be good oxygenation, restraint in inducing anaesthesia prematurely at a time when reliance should be placed upon the mother's expulsive powers, and rapid and smooth induction of anaesthesia when this is finally necessary. In a breech extraction, on the other hand, as well as good oxygenation there must be good relaxation both of the uterus and of the muscles of the perineal floor.

Analgesia.—No contraindication exists to pethidine, given in doses of 100–150 mg. (Nixon and Ransom, 1951) during the first stage of a breech delivery. Although that drug may depress the foetal respiratory centre to a slight extent, this is not necessarily a disadvantage, since respiratory efforts are best delayed until after the delivery of the mouth. Inhalation analgesia may be required at times to supplement the effect of pethidine. For the period preceding the birth of the breech a nitrous oxide and oxygen mixture (75% and 25%) has the advantage of providing good oxygenation.

Assisted Breech Delivery

Perineotomy

This operation is an essential procedure in all primiparae and in most multiparae. It should be deferred until the breech is widely distending the perineum, in order to reduce the amount of blood loss. The incision should be made under local infiltration analgesia, preferably 1% lignocaine hydrochloride ("xylocaine"). By this means, despite a temporary inhibition of the perineal reflex, strong expulsive efforts usually return within two to three minutes and result in the spontaneous delivery of the breech and trunk.

Some workers (Urnes and Timmerman, 1937; Greig, 1945; Trites, 1948) prefer pudendal block to the local infiltration described above, it being claimed that this procedure gives enough analgesia for the safe and painless completion of delivery. In experienced hands this is a valuable method for selected cases, but it possesses certain disadvantages: (1) If it is carried out too soon the resulting interference with the perineal reflex reduces the incidence of spontaneous delivery of the breech, and early intervention is correspondingly more common. (2) If, in order to derive the maximum benefit from the mother's expulsive efforts, analgesia is delayed until the breech is distending the perineum, it may be impossible to reach the ischial spines. The pudendal nerve must then be blocked at its exit from Alcock's canal at the ischial tuberosities. Since this point cannot at times be determined with accuracy, the resultant analgesia may be insufficient for the routine application of

forceps to the after-coming head, a procedure which we strongly advocate in all cases. (3) The extent of analgesia is insufficient for the safe and effective correction of some of the complications which may arise in the course of delivery.

Delivery of the Arms and Head

While in agreement with a policy of minimal intervention in assisted breech deliveries, we do, however, feel that if carried to excess it imposes a definite risk on the foetus. Occasions may arise, especially in relation to the delivery of the after-coming head, when, owing to unforeseen difficulties, simple measures do not suffice and a sudden need for anaesthesia arises often after loss of much valuable time. It is therefore our custom to allow spontaneous delivery to proceed only until the angles of the scapulae are visible. At this stage anaesthesia is induced, after which the arms are brought down by Løvset's manoeuvre and the forceps applied to the after-coming head.

As already stated, the chief anaesthetic requirements in this type of delivery are that induction should be smooth and swift while maintaining good oxygenation. Every experienced anaesthetist develops his own techniques with which he produces the best results, but for the benefit of those approaching this problem for the first time we feel that mention should be made of some disadvantages of two common methods of induction: (1) thiopentone, and (2) gas, oxygen, and ether. Thiopentone sodium (5% solution) has many advocates (Dippel *et al.*, 1947; Kerr and Moir, 1949; Cox, 1950; Calverley, 1950; Dewhurst, 1952), and at first sight would seem to fulfil all requirements. It is, however, widely felt that the danger of regurgitation and inhalation of stomach contents is a contraindication to the extended use of this substance. With gas, oxygen, and ether, induction is either too slow for the purpose under discussion, or, should induction be deliberately hastened, a period of reduced oxygen intake often results.

We would like to suggest that divinyl ether has properties which recommend it for use in assisted breech deliveries. It may be given in a variety of ways, our preference being to combine it in a closed circuit with oxygen and cyclopropane. After this, anaesthesia may be continued with any suitable mixture, such as gas, oxygen, and ether.

Some obstetricians (Allan, 1935; Rosenfeld, 1940; Cunningham, 1945) recommend that general anaesthesia be induced as soon as the perineum is distended by the breech. We do not, however, subscribe to this view, since the resultant interference with voluntary expulsive efforts substantially increases the frequency and extent of operative intervention. For the same reason low spinal or extradural anaesthesia (Urnes and Timmerman, 1937; Kerr and Moir, 1949) are unsatisfactory. In addition, in the case of spinal anaesthesia there is a slight but definite risk associated with the injection of foreign material into the cerebrospinal fluid.

Neither of the two methods referred to above outweighs in advantages a general anaesthetic withheld until the correct moment—a procedure which is easy to perfect, given the proper degree of co-operation between anaesthetist and obstetrician.

Breech Extraction

In this type of breech delivery the need for a rapid induction is no longer present, while good relaxation of the uterus and of the muscles of the perineal floor is essential if trauma is to be avoided (Potter, 1922; Piper and Bachman, 1929; Greig, 1945; Gustafson, 1949). This in effect means that a sufficiently deep ether anaesthesia must be given, since the use of the only other uterine relaxant—namely, chloroform—is unjustifiable in hospital practice. It might be thought that the degree of foetal narcosis thus produced would be hazardous, but in any event this is preferable to trauma, and in practice seldom gives rise to anxiety.

Drugs such as thiopentone, cyclopropane, and curare are on the whole unsuited to the procedure under consideration, since, although they may or may not produce a rise of uterine tone, they certainly do not relax the uterus.

On the other hand, a spinal or extradural anaesthetic given to a height sufficient to abolish uterine sensation does cause a considerably "heightened reactivity" to stimuli of the uterus (Malpas, 1944; Lull and Hingson, 1948). As a result not only is the risk of trauma both to the foetus and to the mother greatly increased, but, in addition, foetal anoxia may arise owing to placental ischaemia. This form of anaesthesia is therefore entirely contraindicated in breech extraction.

Considerations with Regard to the Third Stage.—A possible argument against the use of ether in breech extraction is that the resultant lowering of uterine tone might predispose to serious post-partum haemorrhage. It is probable, however, that this complication has been over-emphasized in the past; certainly in our experience it has rarely been observed. This may be due to the fact that it has always been our policy to give 0.5 mg. of ergometrine intravenously following the birth of the head. At all events, the danger of a contracted uterus during breech extraction would seem considerably to outweigh that of a relaxed uterus after delivery has been completed.

Summary

Assisted breech delivery and breech extraction are two very distinct obstetric operations requiring different anaesthetic techniques.

The special considerations involved in anaesthesia for such deliveries have been reviewed.

In assisted breech delivery it is recommended that a perineotomy be performed under local infiltration analgesia, inhalation anaesthesia being limited to the delivery of the arms and head.

In breech extraction a high degree of uterine relaxation is necessary. For this reason a deep ether anaesthetic is the only one which may justifiably be employed.

Spinal or extradural anaesthetics are not the most suitable for assisted breech deliveries and are absolutely contraindicated in breech extraction.

Close co-operation between obstetrician and anaesthetist is essential if the best results are to be obtained in this branch of obstetrics.

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Conservancy Systems at Collieries is the title of a medical memorandum recently issued by the National Coal Board. It is intended as a general guide for colliery managers. After stating the legal requirements, the memorandum describes various installations for use above or below ground. The standard of sanitation in mines is, not surprisingly, below that in other industries. Both health and morale would benefit if it were improved.

DANGERS OF POLYPHARMACEUTICAL PREPARATIONS CONTAINING FOLIC ACID

BY

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The inclusion of folic acid in proprietary preparations was deplored by Davidson (1948), but, as can be seen from the examination of recent advertising matter, the practice continues. The purpose of this note is to draw attention to the difficulties which may arise when anti-anaemia treatment is undertaken without proper investigation of the case and with preparations of the "blunderbuss" type.

Case Report

A 46-year-old housewife first complained of stiffness of her knees in October, 1952. Treatment with short-wave diathermy was given after she had attended orthopaedic and medical dispensaries. In January, 1953, she developed a short febrile illness associated with vomiting, anorexia, and loss of weight, from which she did not fully recover. In February, at another medical dispensary, no abnormality was found on examination, with the exception of a haemoglobin level of 48% (Sahli). A course of iron was recommended, and the patient was requested to attend for further investigations. Her family doctor gave her a proprietary preparation of iron, and her general condition improved greatly. Her appetite returned to normal and her weight increased, but the stiffness of her legs began to worsen rapidly. She did not return for investigation, but in May, 1953, she fell and was admitted to hospital for treatment of an infected haematoma. After 10 days in bed she was found to be unable to rise or walk, and was transferred to a medical ward for investigation.

On examination the patient was found to have a spastic paraplegia with great muscular weakness, bilateral extensor plantar responses, and complete loss of posterior column sensation in both legs. There was no upset of the function of bladder or bowels. Histamine-fast achlorhydria was demonstrated. Blood examination showed: haemoglobin, 12.3 g.; red cells, 3,600,000 per c.mm.; white cells, 8,000 per c.mm.; P.C.V., 38%; M.C.V., 105.6 μ^3 ; M.C.H.C., 32.1%. Sternal marrow biopsy showed appearances suggesting a partially treated anaemia resulting from deficiency of the haemopoietic principle. Lumbar puncture and radio-scopsy of the lumbar spine showed no abnormality.

A diagnosis of subacute combined degeneration of the cord was made, and treatment with "anahaemin" and vitamin B₁₂ was started (4 ml. of anahaemin on alternate days, and 100 μ g. of "cytamen" daily). Haematological and neurological improvement was rapid, and five weeks later the patient was walking well enough to continue treatment as an out-patient. When last seen she had only very slight ataxia, and examination of the blood and marrow showed normal appearances.

It was found that she had been treated originally with capsules containing iron, vitamin B, extract of raw liver, and folic acid. The amount of folic acid present in each capsule was 1 mg., and she had consumed 3 mg. of folic acid daily for 38 days.

Discussion

The literature on the results of treatment of cases of Addisonian anaemia with folic acid was reviewed by Davidson (1948) and by Israëls and Wilkinson (1949). These authors concluded that folic acid had no place in the treatment of pernicious anaemia. The haematological state not

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infrequently remains unsatisfactory (Wilkinson, 1948), and the neurological state is not prevented from deteriorating (Davidson, 1948; Israëls and Wilkinson, 1949). Since then Fuld (1950) and Schwartz *et al.* (1950) have reported poor haematological and neurological results with folic acid therapy. The latter reported 72 cases followed for three and a half years and treated with 5 mg. of folic acid daily: 23 cases developed cord degeneration, in 23 the red cell count and marrow showed relapse, and in 9 cases both occurred. Subacute combined degeneration of the cord has been reported as occurring with doses varying between 5 and 25 mg. daily. In the present case 3 mg. daily was enough to produce a considerable improvement in the blood condition, but did not prevent the rapid development of paraplegia.

In at least two large series folic acid has been given to normal subjects and to cases of anaemia other than pernicious anaemia (Weissberg *et al.*, 1950; Harvey *et al.*, 1950). There was no subsequent development of cord degeneration, and it is thus unlikely that folic acid has any direct toxic effect. The following reports of authors who have had the opportunity of observing large numbers of cases of Addisonian anaemia contain statements which suggest that they have not rejected the possibility that folic acid actually precipitates cord disease. Thus the explosive character of the onset of cord disease, as well as its rapid progression, have been more often noted after folic acid therapy, and have been contrasted with the more insidious disease previously described (Davidson, 1948; Wilkinson, 1948; Ross *et al.*, 1948; Jacobson *et al.*, 1948). The present case also showed these more acute features.

The experience of Conley and Krevans (1951) is interesting, being more akin to the present case. These authors saw 10 patients in 1950 who were suffering from undiagnosed Addisonian anaemia. Five had only neurological symptoms with no associated anaemia, and on this account various diagnoses, such as disseminated sclerosis and syphilis, were entertained. It was established that four out of the five had been given multivitamin preparations containing folic acid. The patients were not aware that they had received anti-anaemic treatment, and in two cases the physician prescribing the capsules was unaware that they contained folic acid. In all cases an excellent response to vitamin B₁₂ was obtained. It was therefore suggested that in all doubtful cases a marked improvement in nervous system signs and symptoms following the injection of vitamin B₁₂ provides strong support for a diagnosis of Addisonian anaemia.

The arguments against the inclusion of folic acid in polypharmaceutical preparations may be summed up as follows: (1) Folic acid temporarily improves the blood picture, and may restore it to normal. The physician is then faced with a disease of the central nervous system, the misdiagnosis of which is likely, as subacute combined degeneration of the cord without anaemia is very uncommon. (2) The relief of the general symptoms of pernicious anaemia often reassures the patient and the doctor, and masks the deterioration of the nervous system. (3) Folic acid deficiency occurs infrequently, and there is no need for this substance in multivitamin or iron preparations. (4) The question whether folic acid actually precipitates cord degeneration is still uncertain.

Summary

A case is described in which a proprietary preparation of iron containing folic acid was given to a patient with an anaemia which had not been accurately diagnosed. In fact, the patient was suffering from Addisonian anaemia. Deceptive improvement in the blood condition occurred, but was accompanied by the rapid development of combined degeneration of the cord.

My thanks are due to Dr. J. A. W. McCluskie, in whose ward the patient was treated; to Dr. S. Lazarus for encouragement and helpful suggestions; and to Miss N. Johnston for secretarial aid.

Medical Memoranda

Carbon Dioxide Retention Simulating Curarization

Numerous reports have appeared of persistent curarization after the use of one or other of the relaxants; the following case therefore seems worthy of description.

CASE REPORT

The patient, a child aged 6, weighing 42 lb. (19 kg.), had undergone a laparotomy for the removal of a polyp from the sigmoid colon.

The premedication consisted of pentobarbitone sodium, 2 gr. (0.13 g.), and atropine, 1/100 gr. (0.65 mg.), following which the child arrived at the theatre asleep. Anaesthesia was maintained with nitrous oxide and oxygen and a trace of ether, a size 3 endotracheal tube having been inserted. The flow was at the rate of 3 litres of nitrous oxide and 2 litres of oxygen a minute. No absorber was incorporated. Just before opening the peritoneum 2 mg. of decamethonium iodide was given intravenously. After a brief period of apnoea respiration returned and was accompanied by a satisfactory degree of relaxation. (The respiration was assisted throughout.) Some 15 minutes after the first dose a second injection of 2 mg. of decamethonium iodide was given. This time the apnoea persisted for 15 minutes, and at the time of the skin closure only minimal diaphragmatic respiration was present.

After an interval of five minutes, respiratory activity, although minimal, appeared just sufficient to keep the child a good colour, provided pure oxygen was given through a T-piece connected to the endotracheal tube. The child was therefore returned to bed with a flow of 5 litres of oxygen a minute passing through the T-piece, and inflation by means of a bag was carried out for one-minute periods every five minutes.

Respiratory activity did not increase, although the child at all times remained a very good colour, there being no evidence of suboxygenation. After two hours it was noted that, if anything, respiratory activity was decreasing again, but that there was some improvement after each period of ventilation. There was no response at all to an intravenous dose of 2 ml. of nikethamide. The delay in recovery of respiration had until this time been attributed to a residual effect of the decamethonium iodide; but it was noted that such respiratory effort as was present was not marked by any urgency, neither was it accompanied by a tracheal tug, both of which features are usually present in cases of residual curarization.

Three hours after the injection of the second dose of decamethonium iodide, on the supposition that carbon dioxide accumulation might be the underlying cause of the respiratory depression, the child was vigorously hyperventilated through an absorber for a period of three minutes. The absorber very rapidly became intensely hot, indicating considerable elimination of carbon dioxide. Promptly following this hyperventilation the child's respiration was noted

to be greatly increased in depth, and therefore a further three-minute period of hyperventilation through the canister was undertaken. At the end of this the child's respiration was noted to be normal in depth and character. The endotracheal tube was therefore removed, and an airway was substituted. No further oxygen administration was required.

COMMENT

The remarkable features of this case appear to be: (1) Persistent respiratory paralysis, apparently due to the residual effect of a relaxant, seems to have been caused by carbon dioxide retention. Possibly an increased carbon dioxide tension is capable of producing myoneural block. (2) The child did not recover consciousness for some four hours, although recovery would normally have been anticipated within one hour after operation; it therefore seems likely that the degree of carbon dioxide retention was sufficient to produce narcosis.

It is unfortunate that carbon dioxide estimations were not possible in this case. The difficulty of the treatment of prolonged respiratory depression is illustrated. Such depression has been attributed to hyperventilation; it now appears that underventilation also may perpetuate respiratory depression. It is possible that an electronic apparatus may in future be devised which, by means of an electrode inserted into the tissues, may give continuous measurement either of pH or of carbon dioxide concentration. Such an instrument would obviously be of the greatest value in cases requiring controlled ventilation.

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A Possible Method of Pre-operative Anticipation of Thrombo-Embolic Episodes

In recent years major advances have been made in the preparation of patients for the stress and eventualities of surgical procedures, and many previously fatal secondary factors can now be evaluated and corrected pre-operatively to prevent a fatal outcome. Not so post-operative thrombo-embolic episodes: the majority still occur apparently unexpectedly and in spite of increasing awareness of the condition and diligent attempts to anticipate its occurrence.

Ochsner has shown that approximately 50% of pulmonary emboli occur in patients without recognizable preceding peripheral stigmata. Sulamaa and Pentti (1949) reported 170 cases of thrombo-embolic disease, 20 being fatal pulmonary emboli: of the latter, 14 were not diagnosed or were not suspected before their occurrence. Felder (1949) reported 27 cases of pulmonary emboli; in 10 the chest and peripheral signs occurred simultaneously and in 11 cases the chest signs were the first indication. In 78% of his cases treatment began after the chest signs were manifest.

Active prophylactic therapy, excluding routine use of anticoagulants, has not lowered the incidence; 0.57% of patients are liable to pulmonary infarction and 0.22% to fatal pulmonary emboli. A perusal of gastrectomy fatalities shows that about 20% are due to pulmonary emboli.

It is thus the more apparent that pre-operative diagnosis of the thrombophilic type of patient would present a major advance in the selection of those patients who require post-operative anticoagulant therapy. At present it would be unwise to adopt routine anticoagulant treatment owing to its cost, its sequelae, and the labour involved.

It seems reasonable to postulate that clotting *per se* is a normal physiological accompaniment to wound-healing, and that in association with any trauma, definitive or accidental, there is a general and a local mechanism which ensures clotting at the breaches in vascular continuity; likewise, this process is graded in degree to meet the local requirement, and its duration should be proportional to the initial lesion. This effector mechanism has already been discussed in detail by many authors, and no useful purpose will be served by repeating their observations.

Previous attempts have been made to prevent patients from developing thrombo-embolic episodes—the construction of a coagulation graph post-operatively and detection of fibrinogen B in the plasma (Cummine and Lyons, 1948). Ochsner also propounded the theory of a lowered anti-thrombin titre, and advocated the use of alpha-tocopherol and intravenous injections of calcium to raise a lowered titre. No case selection was made, and such a method, even if it proved to be effective, would be costly and, like coagulation-graph charting, could be conducted only in well-staffed institutions. If it could be foreseen which patients were liable to thrombo-embolic phenomena, active measures could be taken with this smaller group.

It is possible that an increased post-operative clotting tendency is a function of the general response of the body to the strain applied to it by a surgical operation and that the degree of clotting is an indication of adrenal cortical function. During recent years there have been increasing records of spontaneous thromboses and embolic phenomena occurring during cortisone therapy. Cosgriff (1951) recorded the increased coagulability of the blood during treatment and an unexpectedly high incidence of thrombo-embolic complications. The patient liable to post-operative thrombotic episodes may thus respond abnormally to stress or prolongation of the post-operative state.

Godlowski (1951) demonstrated that changes in the eosinophil count could be modified by the administration of heparin, and this suggested that such changes may bear some relation to blood coagulability. Post-operative eosinophil counts were charted on several cases, but the results were not uniform.

An effective reproduction of stress to the body can be secured by the adrenaline test, as used extensively in America to ascertain the resistance to stress of a patient about to undergo a given major operation.

Adrenaline hydrochloride, 0.3 mg., was given to pre-operative patients, and their clotting-times and eosinophil counts were recorded half-hourly during the next four hours. It was found that varying results were obtained. These same patients had coagulation graphs taken post-operatively and were examined clinically for thrombotic stigmata. In all, about 50 patients have been examined and a certain pattern is developing.

The majority of those patients examined showed a rapid shortening of their coagulation time during the first hour and then a fairly quick return to normal time inside the four-hour period of examination. Six of them showed a shortened coagulation time, but it persisted at a low level and was still present after six hours. They also were followed up post-operatively, and all six developed thrombotic episodes, two of a major nature and one fatal. The other patients demonstrated shortening of their coagulation time for four days and then elongation to normal.

All patients were treated identically: pre-operative and post-operative physiotherapy, early rising, and routine examination for tender calf muscles and calf-muscle spasms. The duration of stay on the operating table was almost identical, and the operative procedures were of a similar magnitude and location.

Application.—Given forewarning of subjects who are likely to develop post-operative thrombotic episodes, it is possible to provide selective treatment with anticoagulants 24–48 hours after operation; and, in the event of the discovery of a more innocuous replacement therapy on the lines of the antithrombin hypothesis, treatment could be given post-operatively to those subjects showing a suggestive adrenaline response and liable to undergo major surgery.

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Reviews

DISEASES OF MUSCLE

Diseases of Muscle: A Study in Pathology. By Raymond D. Adams, M.A., M.D., D. Denny-Brown, M.D., D.Phil., F.R.C.P., and Carl M. Pearson, M.D. (Pp. 556; 347 illustrations. £5 18s. 6d.) London: Cassell and Company. 1953.

It is quite surprising that before this monograph was written there was no comprehensive and critical account of the diseases of skeletal muscle in the medical, surgical, or neurological literature of this country or America. The deficiency becomes all the more remarkable when, after even a brief perusal of this almost encyclopaedic volume, one appreciates how fascinating the study of skeletal muscle can be made when its development, structure, and function are skilfully related to its behaviour in the wide variety of diseases and injuries in which it participates.

The monograph is divided into two parts. The first is on the nature of skeletal muscle, including its embryology, anatomy, and histology, the chemistry and physiology of muscular contraction, and its general pathology. This last section must be unique in pathological literature. It deals with the large volume of widely scattered observations relating to the experimental pathology of muscle and is followed by a description of the basic pathology of human muscle.

This first part on anatomy, physiology, and general pathology serves as an introduction to the second. This covers the special pathology of myopathic diseases, and, though it is primarily concerned with pathology, informative and concise surveys of the clinical background clearly define the disease entities. There are several useful chapters in this well-illustrated section, which includes the pathology of the muscular dystrophies, myositis in general, the effects of ischaemia, spinal and neuronal atrophy, and toxic metabolic and endocrine disorders, and a remarkably informative chapter on disorders of excitability and contraction. The account of myasthenia gravis is outstanding.

Taken as a whole, the book contains a large number of reviews of subjects which have not yet reached the orthodox textbooks. Among these reviews are accounts of haemopoiesis in skeletal muscle, fibril structures of muscle by electron microscopy, the part played by venous occlusion in obliterative vascular disease, the remarkable resistance of muscle to several poisons and to irradiation, and its equally remarkable susceptibility to certain quinoline compounds, to Cocksackie virus, vitamin-E deficiency, and variations in the potassium content of the plasma.

Workers in many fields will be indebted to the authors for the thoroughness with which they have collected and skilfully analysed an enormous amount of relevant information. There are many references; the illustrations are of the highest standard, and a large proportion will be new to most general readers. The substantial contributions to the subject made by the authors themselves stamp their monograph with authority. This is certainly a book which every serious student of disease must acquire.

GEOFFREY HADFIELD.

INDUSTRIAL PHYSIOLOGY

Praktische Arbeitsphysiologie. By Professor Gunter Lehmann. (Pp. 352; 145 figures. M.33.) Stuttgart: Georg Thieme. 1953.

Analysis of human endeavour, and study of the conditions of human endurance and comfort, in peace and in war, at work or at sport, has often engaged the attention of physiologists. It is especially in the highly industrialized countries that the scientific study of the conditions of human labour is of high importance, for, in the author's opening words, "Working man is the most important and valuable factor in production." This book, by the distinguished director of a world-famous institute for the study of working conditions, is written not only for physiologists but for all who have the responsibility for the scientific organization and amelioration

of the conditions under which all sorts of work is done. It is of importance, therefore, for those with managerial responsibilities. Physiological theory as commonly understood has little place in it, for the outlook is rather that of an *ad hoc* approach to the many problems which affect conditions of effort, gainful or otherwise.

Problems discussed include those of the purely mechanical type, such as static and dynamic effort, co-ordination, fatigue, rest, accommodation, age and sex, climate, energetics, and the adaptation of machines to the individual. Most of the illustrative material is derived from studies in which the author or his colleagues have been engaged. As the recent inauguration and subsequent rapid growth of the Ergonomics Research Society in this country shows, these subjects now engage the attention of numerous experts, and there is already good progress to report. This book will set them a high standard to live up to, and will do much to disseminate useful information. Author and publishers are to be congratulated on having done a service in the interest of good industrial relations, as well as in the interests of science.

C. LOVATT EVANS.

PROBLEMS OF OLD AGE

Our Advancing Years: An Essay on Modern Problems of Old Age. By T. H. Howell, M.R.C.P.Ed. (Pp. 192; 28 illustrations. 16s.) London: Phoenix House Ltd. 1953.

This essay on the problems of old age is intended to encourage and stimulate our efforts in the medical care of the aged and to focus the attention of the public on their problems and needs. The author has had a wide and prolonged experience in the care of the aged and chronic sick, and this sensitively written book is welcomed as a record of his findings and his philosophy. The keynote here is the assistance of people in their search for happiness in old age. The author wisely points out that "happiness in elderly people is more closely associated with their psychological condition than their bodily health." This is a simple and profound truth applicable to all of us. The author suggests that in the aged, on the whole, cancer does not cause a great deal of pain. It is to be hoped that this is true, and, if indeed it is, the more widely this truth is known the happier many people will be. La Rochefoucauld is quoted: "Old age is a tyrant who forbids all the pleasures of youth, under pain of death"; to which some who are happily growing old might reply that they are well content.

Dr. Howell notes with approval that one London teaching hospital has broken with tradition and has established a geriatric unit. He would perform a valuable service if he could persuade all the other teaching hospitals to do likewise—perhaps this book may assist in their enlightenment.

There is but one small criticism. Dr. Howell with characteristic diffidence apologizes for mentioning by name some of his colleagues in geriatric practice. He is clearly right to discuss them and their work, but perhaps it would have been better to omit the adulatory adjectives. The superlatives, if any, are best left to after-dinner speakers, movers of votes of thanks, book reviewers, and writers of obituary notices.

This is a good book and worthy of careful study by everyone who is or may be concerned with the care of the aged and chronic sick—and that embraces everyone.

C. METCALFE BROWN.

INTRODUCTION TO OPHTHALMOLOGY

Parsons' Diseases of the Eye. By Sir Stewart Duke-Elder, K.C.V.O., Ph.D., D.Sc., LL.D., M.D., F.R.C.S., F.A.C.S. 12th edition. (Pp. 606; 22 coloured plates and 465 text figures. 42s.) London: J. and A. Churchill. 1954.

This is the best introduction to ophthalmology in English, and its value has been increased by changes made since the previous edition. Useful facts about modern therapy have been assembled in Chapter 10, and the new illustrations are excellent. Although rare conditions cannot all find room, many have been briefly surveyed. Moreover, Sir Stewart has helpfully described topics of recent interest, including

maternal rubella, toxoplasmosis, retrolental fibroplasia, and corneal grafting. How could so much new material be inserted without enlarging the book? Expert production gives the answer. The type is closer, and many paragraphs are set small. Publishers and printers deserve praise for arranging more words in fewer pages without sacrificing legibility, and the spacing of illustrations is vastly improved.

Certain treatments recommended for conjunctivitis and blepharitis are old-fashioned. Few would advise daily lid-painting with silver nitrate (p. 137) for gonococcal conjunctivitis. Bicarbonate of soda (p. 522) is inferior to hydrogen peroxide for removal of lid-crusts, and aniline dye painting is more effective than inunction of mercury in blepharitis. Haloes (p. 235) are not pathognomonic of glaucoma, and is it true that prophylactic iridectomy on a quiet eye (p. 241) "invariably results in a complete cessation of the disease"? Greeves's operation for ptosis, commended on p. 535, often produces gross hypertropia. On p. 473 Fig. 383 correctly indicates that the right superior rectus and left inferior oblique are the muscles chiefly concerned in looking up and to the right, but the text does not tally. Just below Fig. 383 the words *adducted* and *abducted* should be transposed; and in the next sentence the relevant muscles should be the *right* superior rectus and the *left* inferior oblique.

These defects are mentioned because the book's merits transcend them. Chapters 18 and 19, on fundus abnormality, abound in clinical wisdom, but young ophthalmologists should read the whole book six times to get acquainted with their subject. Thus will they learn to profit from larger books, of which Sir Stewart's six-volume system is easily the best.

J. H. DOGGART.

VITAMINS

The Vitamins in Medicine. By Franklin Bicknell, D.M., M.R.C.P., and Frederick Prescott, M.Sc., Ph.D., F.R.I.C., M.R.C.P. 3rd edition, revised and enlarged. (Pp. 784; 245 figures. 70s.) London: William Heinemann Medical Books, 1953.

The 11 years which have elapsed since the appearance of the first edition of this valuable book have seen great advances in our knowledge of many of the vitamins. In preparing its third edition Drs. Bicknell and Prescott have kept in step with this progress, both in describing new discoveries and in removing from their text references to work which has failed to stand the test of time. Their claim that their labours amounted to little short of complete rewriting can be accepted without question. Our gratitude and congratulations are due for the high standards which they have maintained, both in literary presentation and in the accuracy of their statements, in a volume which includes over 5,000 references to sources of information and nearly 250 illustrations.

As in previous editions, each vitamin has been considered under the headings of history, chemistry, sources, physiology, pharmacology, human requirements, deficiency diseases, methods used for detecting deficiency, and clinical applications. The emphasis is on human rather than on animal aspects, but experiments on animals which have a bearing on human vitamin requirements receive adequate mention. The chemistry and biochemistry of the vitamins and the details of their significance in medicine have seldom been so ably and clearly treated in the same book. As an aid to the diagnosis of vitamin deficiencies the clinician can refer to an excellent collection of photographs, which often show the appearance of the same patient before and after treatment with the appropriate vitamin.

The industry and understanding with which the authors have recorded the progress of research on every vitamin deserve high praise. Their obvious determination that nothing of importance should be missed out, however, may bring some risk of questionable material being included. The specialist in nutrition, and doubtless the authors themselves, will have no difficulty in distinguishing between established facts and claims still requiring confirmation, but the general practitioner may find it less easy to discriminate. Thus,

an excellent chapter on vitamin P, which is claimed to be necessary for the control of capillary fragility, does not perhaps sufficiently emphasize that many authorities would resist the classification of substances having this activity as vitamins. Similarly the cautious account of the possible significance of vitamin-E deficiency in the aetiology of human muscular dystrophy might give rise to some confusion between speculation and fact in a less cautious reader. However, we must congratulate the authors on producing a book which will serve the clinician well when he is confronted with patients in whom vitamin deficiency may be suspected.

T. MOORE.

ADRENOCORTICAL STEROIDS

Ciba Foundation Colloquia on Endocrinology, Volume VII: Synthesis and Metabolism of Adrenocortical Steroids. Consulting editor for this volume, W. Klyne, M.A., B.Sc., Ph.D. General editor, G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., assisted by Margaret P. Cameron, M.A., A.B.L.S. (Pp. 297; 375 structural formulae and 27 illustrations. 30s.) London: J. and A. Churchill, 1953.

This volume follows the same general form as its predecessors in this series and maintains the same high standard. It reports the proceedings of two conferences.

The first, on synthesis of adrenocortical and related steroids, has a largely chemical emphasis. One section on substances present in cholesterol includes an account of lathosterol. Another describes briefly the synthesis of adrenal cortical hormones from ergosterol, and a further one on cortisone production from sarmenotogenin includes an account of the distribution of this raw material in Africa. Other sections describe the synthesis of 11-oxygenated steroids from ergosterol, the infra-red spectroscopy of tri-substituted steroidal olefins, the stereochemistry of C-20, and the effects of x rays on steroids.

In the second conference the emphasis is on biochemistry. In a review of adrenal perfusion work at the Worcester Foundation an account is given of attempts to produce C¹⁴ labelled compound F. A.C.T.H. is shown to increase formation of compounds B and F from C¹⁴-labelled cholesterol. Studies of the enzymes involved in the synthesis and breakdown of adrenal hormones have analysed specially the oxidation of 3 β hydroxy-steroids to $\alpha\beta$ unsaturated ketones. Separate enzyme systems for hydroxylation at 11, 17, and 21 positions seem to exist, and the substrate requirements of some of these are outlined. Species differences in adrenal secretion are reviewed and some data are given on the new adrenal hormone influencing salt excretion and now called electrocortin. A section on corticosteroid metabolism in man reveals that some 33 "corticoids" can be found in urine and about 40 in human adrenal gland perfusates. A polarographic method is offered for estimating some of these steroids in blood.

The field of steroid metabolism has already become so complex that few can follow all its developments. The present volume should help workers in one field to learn what fellow workers in neighbouring fields of steroid work are doing and thinking.

C. L. COPE.

Dr. Henry E. Sigerist's *Grosse Ärzte* first appeared in 1932, to be followed by an English translation in 1933. It contained biographical sketches of fifty-five of the most important men in medical history, ranging from Imhotep to Osler. Written against a background of knowledge acquired during a lifetime devoted to the study of the history of medicine, the book was recognized as a major contribution to medical biography. A new German edition has now been published (J. F. Lehmanns Verlag, Paul-Heyse-Str. 26, Munich 15, price DM.24), in which Dr. Sigerist has taken the opportunity to revise his work in the light of further information that has come to hand during the past twenty years. He has also added five new biographies (Ramón y Cajal, Pavlov, Cushing, Friedrich von Müller, and Sauerbruch). Excellent portraits round off this finely produced volume, and it is to be hoped that a new English translation will soon be available for those whose unfamiliarity with German prevents their full enjoyment of a delightful book.

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CHILD LIFE AND HEALTH

No higher tribute could be paid to the child welfare services than that contained in Professor Charles McNeil's Fleming Memorial Lecture, reproduced in the opening pages of this issue. McNeil is of the opinion that success in the promotion of health in childhood in the future rests with the child welfare services, and he submits a plea for a strengthening of the services by providing what he terms "new and better weapons." His views differ from those expressed by Professor A. L. Banks,¹ who suggested that the maternity and child welfare service had largely accomplished its intended purpose and could now be merged with the hospital and paediatric services. It is, incidentally, remarkable that it is the hospital physician who advocates strengthening of the maternity and child welfare service, while the former public health officer recommends its demobilization. These two opposing, and perhaps somewhat extreme, views have in common that they contain little reference to the school health service and to the importance of the family doctor. If, as McNeil emphasizes, it is by education of the mother that child care can best be promoted, what more appropriate place could there be to do so than in the home? And if that be so, has the family doctor no part to play? It is no uncommon experience to hear it said that the general practitioner is not interested in prevention. There may be some foundation for the statement as a generalization. None the less, much of the work of many family doctors is concerned both directly and indirectly with the prevention of disease and with the promotion of health among the children in their practices. Not a few general practitioners give part-time service in local authority clinics. Others have their own organized arrangements specifically intended to cater for the needs of the expectant and the nursing mother and of the infant and child: this trend is one which will almost certainly be favoured by the encouragement being given to group practice. Evidence in some areas suggests that these arrangements are stimulating requests for the periodic examination of 3- and 4-year-old children whose mothers have stopped bringing them to the welfare clinics.

¹ *British Medical Journal*, 1952, 2, 1007.

The family doctor possesses numerous and in many ways unique opportunities to educate parents in child care. (Professor McNeil writes mainly about the education of mothers, but should not fathers have a share of the instruction?) While it is true to say that in the past the general practitioner has not on the whole received very much encouragement in this field, it must be admitted that his attitude has not always invited encouragement. The crux of the present problem is this: Is the family doctor capable of utilizing his opportunities to educate parents, and, if he is, will he find himself in conflict with the statutory child health services? In answering these questions account must be taken of the changes brought about within recent years in the instruction given the medical student in paediatrics and child health. The basis of instruction is the study of health. The student sees the child at home, in the nursery, in the residential home, at the welfare clinic, and in school; and he has opportunities of observing the day-to-day work of the medical and nursing staff of the child welfare and school health services among children, and also the family doctor's work. It is against this background that the student is encouraged to study disease, the restoration of well-being, and the promotion of healthy growth and development. There is already evidence that the young doctor enters practice suitably equipped and anxious to co-operate with the child health services in their work of education. Further progress in this direction would be discouraged, not favoured, by merging the child welfare services with the hospital obstetric and paediatric services. The foundations of child life are in the home. The success of measures to improve child health depends on acceptance of this conception. Sanitation has improved out of all bounds; so also have the general standards among children of cleanliness, clothing, and nutrition. In contrast, despite great improvements, housing and overcrowding remain the most potent deterrents to a nationwide attainment of optimum health in childhood.

Hospital management committees intent upon making provision for the sick are not always successful in interpreting the special requirements of the ailing child and cannot be expected fully to understand the needs or methods of parental education in child health, which should not be weighted in favour of hospital or specialist considerations. The need is for an increasingly close link between the general practitioner and the children's services provided by the local health authorities. With education for child health there might well be combined education in the care of childhood ailments, if only to reduce the number of unnecessary references of children to hospital

and to foster in mothers a confidence in their own ability to tend their sick children. Centres of study and schools of training in child health along the lines advocated by Professor McNeil would serve to co-ordinate the activities of all those working in this field, and would, as he believes, add to the authority and prestige of the child welfare service.

Q FEVER

When Q fever was first recognized in 1937¹ it appeared to be mainly an occupational disease affecting slaughter-house workers and restricted to the vicinity of Brisbane. This idea of the disease changed notably during the 1939-45 war, when it was established that several outbreaks of non-bacterial or atypical pneumonia in Allied and enemy forces in Southern Europe were caused by infection with *R. burneti*, the causative agent of Q fever.^{2,3} Subsequent reports, in addition to confirming the unusual feature of pulmonary involvement seen in man, have drawn attention also to the world-wide distribution of Q fever in animals.^{4,5}

Although a rickettsial disease, Q fever differs in many respects from the rest of this group of infections. Insect vectors, for instance, play little or no part in the spread of the disease to man, and the part they play in transmission of the disease from animal to animal is by no means an essential one. Cutaneous rashes are uncommon, and serum agglutinins to the proteus group do not appear in the patient's blood. Indeed, one of the few findings in Q fever, in common with other rickettsial infections, is the severe headache so frequently present. It now seems well established that infected animals—cows, sheep, and goats in particular—are the main sources of human infection. The organism is excreted in the faeces, the placenta, and the milk of infected animals, and infection is by inhalation of infected excreta or by drinking contaminated milk.⁶ *R. burneti* is a hardy organism, being relatively resistant to inactivation by normal physical and chemical methods. Pasteurization is only just adequate to inactivate the organism if the correct conditions are scrupulously maintained.⁶

The presence of Q fever in Britain was established in 1949,⁷ since when both outbreaks and sporadic cases have been reported.^{8,9} So far cattle appear

to be the only reservoir of infection in this country.¹⁰ A recent survey of Q fever in Britain by Marmion and his colleagues⁹ shows that a large proportion of the observed cases have occurred in the south-eastern counties, where a corresponding higher proportion of infected cattle have also been found. Epidemic Q fever as seen in Italy in 1943-4 is not likely to cause much confusion in diagnosis, but considerable variation is seen from case to case, and asymptomatic infection is by no means uncommon. Harnman,¹⁰ reviewing the clinical features, emphasizes that some of the points in favour of a diagnosis of Q fever are the extremely sudden onset, severe headache, often out of all proportion to the severity of the case, and the lack of upper respiratory or gastro-intestinal symptoms. Later an unproductive cough and radiological evidence of pulmonary infection develop. Serological tests are useful in helping to distinguish Q fever, and in particular the mild or sporadic case, from other forms of pyrexia of unknown origin labelled as influenza or atypical pneumonia. Specific antibodies can be detected by the seventh to twelfth day by the complement-fixation test, which remains positive for a considerable time.^{11,12} Except in old people the prognosis is good, with full recovery in most cases, but there is the possibility that some cases may become chronic and prove resistant to antibiotic treatment.⁹ Fortunately Q fever is not a serious problem in this country, but as the risk of milk-borne infection exists it would seem advisable on general principles to reduce the risk by suitable treatment of raw milk.

MEASURING HOSPITAL EFFICIENCY

The efficient use of the available hospital beds in this country is of special importance because of the meagre allocation of money for building new hospitals and major hospital extensions. When considering the use being made of the existing hospital beds, discussion is apt to centre on certain statistical information, and in particular on bed occupancy rates. Avery Jones¹ believes that a general community hospital should have at least a 90% bed occupancy and that it is feasible to achieve a 93% bed occupancy. The fact that there are many hospitals up and down the country with only 80% bed occupancy, and some substantially lower, he considers to be evidence of extravagance, and he concludes that, on the basis of the bed occupancy figures reported, there cannot be said to be any overall shortage of hospital beds in this country.

In assessing the amount of hospital accommodation required, and the efficiency of a particular hospital,

considerations other than mere figures must be given due weight, though statistical data are essential if the questions are to be fully studied. But the figure of bed occupancy is only one index of efficient bed utilization, and others must be taken into account, such as the average length of stay of patients in the hospital concerned and the "turnover interval." This is the interval which elapses between the discharge of one patient and the admission of another into the same bed. If the bed occupancy figure alone were taken into account in assessing the full utilization of a particular hospital bed, then the figure of 100% bed occupancy could be obtained by keeping one patient throughout the year in that bed. In other words, by increasing the length of stay and reducing the number of patients occupying the bed in one year, the bed occupancy rate will rise, but it cannot be said that the bed has necessarily been efficiently utilized. A hospital which has a low figure for the average length of stay, a minimum turnover interval, and a high bed occupancy rate is statistically a much more efficient hospital than one which has a high static bed occupancy. When these three requirements have been achieved, considerably more patients are being treated in the same number of hospital beds during a given period. As an example of the measurement of this kind of efficiency the figures for the Manchester Region may be taken. There, 20,000 more in-patients were dealt with in 1951 than in 1950 without any increase in the actual number of hospital beds. The alternative to this increase in the turnover would have been to provide a new hospital of 800 beds.

When considering bed utilization, the number of patients who have occupied the beds during the year must therefore be taken into account in addition to the percentage bed occupancy. This figure, known as the bed turnover or bed-use factor, is calculated by dividing the number of patients who were discharged or died during the year by the number of available beds. In the report of the Chief Medical Officer of the Ministry of Health for 1952² it is shown that there is considerable variation in this figure for hospitals which prima facie appear comparable. For example, the average figure for the London undergraduate teaching hospitals for 1952 in general medicine was 12.3 and that for provincial undergraduate teaching hospitals was 19.1, while the corresponding figures for general surgery were 19.4 and 25.0 respectively. Because of these wide variations, the bed occupancy rate taken in isolation can be misleading, for a higher figure of bed occupancy will be obtained

in the hospitals with a longer duration of stay if the turnover interval remains the same. Murley³ has pointed out that an increase in turnover will result in a lower bed occupancy figure, but this is conditional on the turnover interval remaining constant. At present the national figure for the turnover interval is 3.26 days, but there must be a minimum level to which the turnover interval can fall, and when this is reached improved utilization can be effected only by reducing the length of stay, which in turn reduces the rate of bed occupancy. At this point a rise in bed occupancy would in fact indicate that beds were being less efficiently used.

All these indices, therefore, have to be taken into account in considering the use of available hospital beds from a statistical point of view, but even so allowance must be made for the great variety of circumstances in different hospitals. In an acute general hospital it is not possible to obtain a 100% bed occupancy except by crowding in extra beds above the normal bed complement, particularly when wards have to be reserved for separate groups—for example, maternity patients. Indeed, it is undesirable for an acute general hospital to have a 100% bed occupancy, otherwise no reserve beds would be available for the admission of emergency cases. The admission of day cases for operation, variations in bed allocations to individual specialties, differences in hospital requirements in an industrial area as compared with a residential area, and the shortage of ancillary facilities in a hospital will all affect the bed occupancy figure, making it inappropriate for use as the sole yardstick for comparing hospitals of the same size and apparently otherwise comparable. But it can be a useful guide to hospital staffs and administrators in assessing the use which is being made of available resources when taken in conjunction with other factors and over a suitable time.

CANCER REGISTRATION

The development in Britain of cancer recording on a national scale comparable with the Danish system has been beset with difficulties. The Radium Commission, which controlled the supply of radium from 1930 to 1948, was in the fortunate position of being able to insist on the keeping of records wherever radium was used, but the obligation applied only for patients treated by radiotherapy, and it had to be suspended during the war and lapsed altogether in 1948 with the National Health Service Act. In 1939 the Ministry of Health had advised county and county borough councils to provide for the keeping of records of treatment and its results as part of the plans asked for under the Cancer Act, and in 1944 a circular letter was issued on

¹ Derrick, E. H., *Med. J. Aust.*, 1937, 2, 281.
² Robbins, F. C., and Ragan, C. A., *Amer. J. Hyg.*, 1946, 44, 6.
³ Caughey, J. E., and Dudgeon, J. A., *British Medical Journal*, 1947, 2, 684.
⁴ Berg, T. A., and Lennette, E. H., *Amer. J. Hyg.*, 1953, 57, 125.
⁵ Babudieri, B., *W.H.O. Monograph Series*, No. 19, 157, 1953.
⁶ Stoker, M. P. G., *Brit. med. Bull.*, 1953, 8, 231.
⁷ *Lancet*, 1949, 1, 178.
⁸ Marmion, B. P., and Stoker, M. P. G., *ibid.*, 1950, 2, 611.
⁹ *et al.*, *ibid.*, 1953, 1, 503.
¹⁰ Harnman, J. B., *ibid.*, 1949, 2, 1028.
¹¹ Kaplan, M. M., and Hulse, E. C., *W.H.O. Monograph Series*, No. 19, 175, 1953.
¹² Babudieri, B., *ibid.*, 1953, 1953.

¹ *Lancet*, 1953, 1, 999.
² *Annual Report of the Chief Medical Officer of the Ministry of Health*, H.M.S.O., 1952.
³ *Lancet*, 1953, 1, 1153.

the subject. The Radium Commission, having devoted much attention to methods of recording, introduced a standard card for use in radiotherapy centres, and in 1947 the General Register Office became the statistical bureau for dealing with the cards. After the repeal of the Cancer Act in 1948 local responsibility for cancer registration passed to the regional hospital boards and teaching hospitals, but not all have acted.

In 1945 some 29,000 cancer cases were registered, and by 1948 the annual number had risen to about 49,000, not yet amounting to half of the estimated total of new cases seen annually in England and Wales, and not properly representative because of overweighting with radiotherapy patients. In the first report issued by the General Register Office¹ the cases registered in 1945 and 1946 were studied with one-year survival rates, these being supplemented later by rates of survival to two and three years.² In a further supplement³ recently published the 1947-8 registrations have been analysed for each cancer site by sex, age, and confirmation of diagnosis, and also by interval before treatment at each hospital centre.

Since 1948 little further progress has been made towards reaching the objective of complete cancer registration, and it is to be hoped that a circular⁴ just issued by the Ministry of Health to regional hospital boards will receive serious attention. It expresses concern at the slow progress and underlines a recommendation of the Minister's Standing Advisory Committee on Cancer and Radiotherapy that registration should be continued on a voluntary basis in all regions, using a simpler follow-up card which has been designed by a special subcommittee of the Registrar-General's Advisory Committee on Medical Nomenclature and Statistics. In revising the standard card great care was taken to eliminate items which experience has shown to be of doubtful value or to present difficulty, and the new abstract card can easily be transcribed by a lay clerk from clinical records. Brought up to date and shorn of resemblance to an official record form, it aims to provide essential information on cancer incidence by site, sex, age, geographical area, interval between first signs and start of treatment, methods of treatment in use, and survival according to extent of disease when first seen. Regional hospital boards are asked to examine the position in their regions in conjunction with the teaching hospitals and to report by June 30 on the projected development of cancer registration.

In some regions the teaching hospitals have shown little enthusiasm for cancer recording, and in others discouragement has been felt because of lack of publication of findings as they concern the region. The United Birmingham Hospitals set a good example by deciding to issue a series of annual reports on survival of cancer patients admitted during the period 1936-49. The first⁵ of the series deals with the methods of treatment and survivals to two and five years of some 6,500

patients with new growths of the alimentary tract and tongue. This report is a model of concise presentation, profusely illustrated by 32 diagrams, and, depressing though many of the facts recorded undoubtedly are, their presentation in a manner such as this can do nothing but good. It is much to be desired that other hospital regions will strive to bring their cancer registration nearer to completeness with a view not only to providing the national information that is needed but also to producing regional studies of this kind on special aspects of the cancer problem.

BURNS AND THE ADRENAL

The weak point in all discussions on stress and the pituitary-adrenal axis is the gross inadequacy of all the methods of assessing the activity of the adrenal cortex, whether in the experimental animal, the live patient, or even at post-mortem examination. Without exact and objective evidence on this point the way lies open to the flood of hypotheses which have swamped and almost discredited this most important field of research. Reliable methods for chemical assay of steroid hormones in the blood are the only final answer, and are slow in appearing. Meanwhile modern histochemical techniques are being used in a promising new attack¹ on the problem of estimating pituitary and adrenal activity from examination of post-mortem specimens; and, as Dr. S. Sevvitt shows elsewhere in this issue, the only technically simple method of approach—the eosinophil count—can still give useful results in a field which has become the province of the well-equipped biochemist. In 1951 Dr. Sevvitt² described the changes in the eosinophil count in burned patients seen at the Birmingham Burns Unit. The eosinophils fall from their normal 200 per c.mm. to below 40 within two hours of the accident and remain low for several days.^{3,4} The period of eosinopenia can be presumed to correspond to a period of increased secretion of cortical steroids. Broadly speaking, the duration of the eosinopenia depends on the severity of the injury, being a day or less in burns involving 10% of the body surface, and four to five days in 50% burns. A moderate "rebound" eosinophilia often follows.

Some patients show less eosinopenia than would be expected from the size of their burns, as Sevvitt and others⁴ have found, and this seems to worsen the prognosis. An inadequate adrenal response to stress is the obvious suggestion. Sevvitt's present work offers new evidence of this and gives some indication of its causation. The eosinophil responses were studied in burned patients who had passed the initial eosinopenic phase. Two drugs were used which have different mechanisms. A.C.T.H. acts directly on the adrenal, and failure to respond to it indicates an unresponsive adrenal. Intravenous adrenaline acts on the pituitary (perhaps through the hypothalamus), stimulating the production of

A.C.T.H. A patient who responds to A.C.T.H. but not to adrenaline must have some defect at the pituitary end of the axis. Two of Sevvitt's patients failed to respond to A.C.T.H., and one of these died: though equivocal, the post-mortem findings were compatible with true adrenal cortical failure. Three other patients were found in whom intravenous adrenaline was ineffective: two had simultaneous mental changes, and the suggestion that a hypothalamic lesion was present seems reasonable. Sevvitt has established the fact that adrenal cortical deficiency can occur in burns, and that at least two wholly distinct mechanisms can be involved. It follows from his work that there is a case for treating some (not more than 10%) of burned patients with cortisone for short periods.

EMOTIONS AND THE NOSE

The primary purposes of the nose are olfaction and conditioning of the air which passes through it, so that when the air reaches the lower respiratory tract it will be suitably filtered, warmed, and moistened. This conditioning of the inspired air includes the filtering-off of unwanted foreign particles and the giving-off of more than a litre of moisture in the course of 24 hours. Such activity is made possible by the nasal mucous membrane, which is rich in blood vessels and mucous glands. The surface area of the nasal mucous membrane is also greatly increased by the turbinates, which project into the nasal cavities and contain erectile tissue enabling them to swell and give off mucus in accordance with the needs of the body. This delicate mechanism is under the control of the parasympathetic system and can be readily invoked by a variety of stimuli, some of which may be quite unconnected with respiration. Nasal obstruction and hypersecretion are part of many emotional experiences—the "honeymoon cold," for instance, being a common phenomenon. Holmes, Goodell, Wolf, and Wolff,¹ in a study of reactions within the nose in human subjects during varying emotional situations, have continued observations which they had previously made by direct observation of the mucosa of the stomach in a patient with a large gastric fistula. They found that circulatory changes in the nose were similar to those in the gastric mucosa. In particular they noted that emotional reactions induced by anxiety, resentment, and feelings of frustration were associated with hyperaemia and hypersecretion in both nasal and gastric mucosae. They concluded that if such reactions were sustained troublesome symptoms would result which might predispose to chronic disease in the nose.

Elsewhere in this issue Mr. P. Reading, Mr. K. Malcomson, and Mr. D. O'Neill give an interesting account of the investigation and treatment of chronic vasomotor rhinitis. When hay fever is excluded they found that there is still a large and troublesome group of sufferers in whom inhaled allergens play little part in the aetiology. These workers believe that chronic vasomotor rhinitis is a disorder associated with emotional tension or stress and is therefore comparable in aetiology

with asthma and duodenal ulcer, in which the cholinergic system seems to play a part. When local and general treatment failed to alleviate the rhinitis, psychological investigation often brought to light a condition of emotional strain, and psychotherapy, sometimes continued for 20 months, had a gratifying success in relieving both paroxysmal rhinorrhoea and chronic nasal oedema.

FOLIC ACID AND PERNICIOUS ANAEMIA

The Addisonian type of macrocytic anaemia is effectively treated with extracts of liver or stomach or with vitamin B₁₂ (cyanocobalamin); on the other hand, hypochromic microcytic anaemia responds only to full doses of suitably administered iron preparations and neither requires nor responds to the other anti-pernicious-anaemia agents. Nevertheless, in spite of these simple therapeutic facts, many elegant and expensive preparations containing iron, vitamins, liver and stomach extracts, yeast, copper, vitamin B₁₂, folic acid, and often other substances, are on the market and recommended by their manufacturers to the doctor for the treatment of his anaemic patients. These polypharmaceutical remedies rarely contain enough of any constituent to deal effectively with any form of anaemia, while their heavy cost sometimes leads the doctor to prescribe them in such small doses as one pill or capsule per day. Anaemic patients still commonly receive some form of treatment with these blunderbuss preparations before their blood has been examined for the purpose of determining the type of anaemia and the appropriate treatment. Then, when a patient does not fully respond to the remedy given, subsequent blood and marrow examinations may fail to give a clear-cut diagnosis. This difficulty is noticed most often in pernicious anaemia—which is still a fatal condition if not properly treated—since the bone marrow rapidly loses its megaloblastic character even after inadequate anti-anaemic treatment, though this does not necessarily lead to a remission of the anaemic state.

Elsewhere in this issue Dr. C. P. Lowther (p. 564) once again draws attention to the dangers of this practice. In the past the worst that could happen to a patient with pernicious anaemia treated with an ineffective remedy was a failure to respond to treatment, the development of a more severely anaemic state, and, consequently, a misdiagnosis of refractory macrocytic anaemia; usually, and fortunately for the patient, this led to subsequent reference to hospital for investigation, diagnosis, and treatment. Now, however, the danger is more serious and may be acute, because so many of the blunderbuss anti-anaemic preparations contain folic acid, though this is not always realized by those who prescribe them. The tablets taken by Dr. Lowther's patient contained this substance. Both Davidson¹ and Wilkinson² clearly showed that folic acid was undesirable for the treatment of pernicious anaemia, while in 1949 Israëls and Wilkinson,³ and others, later concluded that folic acid induces peripheral

¹ "Cancer Registration in England and Wales," *Studies on Medical and Population Subjects*, No. 3, 1950, General Register Office.

² Supplement to above, 1952.

³ Registrar-General's Statistical Review for 1949, Supplement on "General Morbidity, Cancer and Mental Health," 1953.

⁴ H.M. (54) 18.

⁵ Annual Cancer Report of the United Birmingham Hospitals, Vol. 1, 1953.

¹ Symington, T., and Currie, A. R. Papers read to the Pathological Society at Birmingham in January, 1954.

² *British Medical Journal*, 1951, 1, 976.

³ Evans, E. L., and Butterfield, W. J. H., *Ann. Surg.*, 1951, 134, 588.

⁴ Wright, A., Raker, J. W., Merrington, W. R., and Cope, O., *ibid.*, 1953, 137, 175.

¹ *The Nose*, 1950, Springfield, Illinois.

¹ *Edinb. med. J.*, 1948, 55, 400.

² *British Medical Journal*, 1948, 1, 771, 822.

³ *Ibid.*, 1949, 2, 1072.

neuritis and spinal cord degeneration in patients with pernicious anaemia who had previously shown no signs of such complications, or else makes worse an early peripheral neuritis. The onset of such, often acute, neurological complications may be quite sudden, and in some cases even while liver extracts or vitamin B₁₂ are being given at the same time as folic acid, as was the case with Dr. Lowther's patient, who had been taking 3 mg. of folic acid daily for only 38 days. Fortunately, if the real diagnosis is made early enough, the prompt administration of liver extracts or vitamin B₁₂ and the immediate discontinuance of the folic acid usually reverses this disconcerting and serious complication.

Folic acid has no place in the treatment of pernicious anaemia and is of no value in hypochromic microcytic anaemia. In patients with pernicious anaemia it may mask the development of, or deterioration in, neurological symptoms by bringing about a false sense of improvement in the general symptoms and a variable degree of improvement in the blood count. There is now a strong case against the inclusion of folic acid in polypharmaceutical anti-anaemic preparations, the usefulness of which in the opinion of most haematologists is in any case open to grave doubt.

PYRAZINAMIDE WITH ISONIAZID IN TUBERCULOSIS

Drugs in bewildering variety, falling into several main classes, are now known to possess anti-tuberculous activity, and their use in various combinations and for different forms of the disease bid fair to occupy the attention of investigators for some years to come. One of the latest and least familiar is pyrazinamide ("aldinamide"). This is a derivative of nicotinic acid, as isoniazid is of isonicotinic acid, and was shown to exert moderate anti-tuberculous activity in guinea-pigs by Dessau and his colleagues.¹ In a clinical study² they reported on the treatment of 43 patients, of whom 25 had far advanced disease: the results were generally encouraging, although the authors regarded the usefulness of the drug as limited by the rapid emergence of drug-resistant bacilli, particularly in patients with far advanced tuberculosis with large cavities.

Walsh McDermott and his colleagues³ now report a clinical study of the action of pyrazinamide and isoniazid given together, prefaced by a description of an animal study by McCune and Tompsett of which a fuller account is to appear later. The latter workers used this drug combination in infected mice, and studied its effects by quantitative cultures of the organs. The striking fact which emerged was that the initial fall in the bacillary content of the spleen which follows the use of either drug alone or of other forms of chemotherapy was continued during combined treatment to complete extinction. This apparent sterilization of splenic lesions has never been achieved before, and suggests an "eradicated" action in surprising contrast

to the relative inactivity of pyrazinamide *in vitro*. The clinical study embraced 81 patients, of whom some were treated in New York City and some (presumably Navajo Indians) in the Navajo Medical Centre, Fort Defiance, Arizona. In all but nine the pulmonary lesions were classified as far or moderately advanced. Both drugs were given orally, pyrazinamide in a daily dose of 50 mg./kg. and isoniazid in one of 5 mg./kg., the intention being to continue this treatment for three months and to continue thereafter with isoniazid alone: complete courses were given to 61 patients, early deaths and other causes having prevented completion in the remainder.

The results from all points of view but one were gratifying. An effect comparable to that observed in the mouse spleen was apparently obtained in the disappearance of bacilli from the sputum of 90% of the patients. Substantial radiographic improvement was achieved in 70% and cavity closure in 65% of those with cavitation. On the other hand, unequivocal signs of liver damage developed in six patients, and this complication was fatal in one of them. Jaundice with impairment of liver function was also observed by Yeager, Munroe, and Dessau² in two of their 43 patients. Although this does not mean that the treatment is unjustifiable, it clearly can be used only under strict supervision: its freedom from any tendency to cause gastro-intestinal upset, in contrast with the disturbing effects of P.A.S., had encouraged the hope of domiciliary application. Possibly a modification of dosage may diminish this risk of toxic effect.

THE CLARE WAND FUND

The Conference of Local Medical Committees at its meeting on June 26, 1952, resolved to pay a tribute to Dr. S. Wand and Dr. D. P. Stevenson—chairman and secretary of the General Medical Services Committee—in recognition of their "outstanding services to the profession during the negotiations on remuneration which culminated in the Danckwerts award." An appeal was sent to all local medical committees in which it was suggested that the major portion of the money subscribed should be used to form a fund to provide educational assistance for doctors in general practice. At the wish of Dr. Wand the fund was to be called the "Clare Wand Fund." In the first letter in this week's *Supplement*, the chairman of the Trustees of the Fund puts forward tentative proposals for the use of the sum of £12,000 which has been subscribed. Further suggestions, it says, will be sympathetically examined. Some may well be forthcoming, but the Trustees' own ideas seem to be well designed for their purpose of encouraging "projects which will enhance the prestige of general practice."

We announce with regret the death on February 27 of Dr. T. Jenner Hoskin, senior physician and cardiologist to the Royal Free Hospital. A memoir will be published in next week's *Journal*.

¹ *Amer. Rev. Tuberc.*, 1952, 65, 519.
² *Ibid.*, 1952, 65, 523.
³ *Ibid.*, 1954, 68, No. 3.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

TESTS FOR VENEREAL DISEASE—I

BY

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Laboratory tests for venereal diseases are mostly concerned with gonorrhoea, non-gonococcal urethritis, chancroid (soft sore), and syphilis. Occasionally laboratory investigation of material from patients suspected of suffering from lymphogranuloma inguinale (lymphogranuloma venereum) or granuloma inguinale is required.

At the outset it must be stressed that before instituting treatment for any of these diseases, laboratory assistance should always be invoked in order to confirm the diagnosis, and when occasion demands the practitioner should telephone the laboratory for the necessary glass slides, culture media, or screw-capped bottles, with containers for transport. If he is uncertain about which test should be employed, the pathologist will give the necessary advice.

Before taking material from the patient it is essential to mark each specimen with an identification name or number, the date, and the source of the material—for example, urethra, vagina, cervix.

Specimens

No laboratory, whatever resources it may have or however experienced its personnel, can give the best advice when supplied with badly harvested specimens.

Smears.—These should be made with a platinum loop, thinly and evenly spread on the glass slides (mix a drop of sterile water or saline with a drop of the discharge, if necessary), and fixed by moderate heat—that is, the slide should not feel uncomfortably hot when placed on the back of the hand.

Cultures.—Specimens for culture should be taken with a platinum loop or the sterile wool swabs supplied by the laboratory.

Blood.—With adults at least 8 ml. should be obtained by venepuncture. In order to avoid haemolysis, which may vitiate the tests, care should be taken that both needle and syringe are free from water or spirit (wash out with sterile normal saline if necessary). The needle should be removed before transferring the blood to the sterile screw-capped blood bottle, care being taken to use no undue force. In the case of adults or small children with "difficult veins" a guarded safety-razor blade can be used. All except the last $\frac{1}{4}$ in. (3 mm.) of one cutting edge is covered with adhesive plaster; a clean-cut nick is inflicted into the surgically cleaned and warmed heel of the patient. If the skin is stretched by the use of the thumb and forefinger of the left hand and the cut made at right angles to the "stretch," the small wound will tend to gape and sufficient blood will usually run into the container (5-ml. bijou screw-capped bottle) held against the skin below the cut. Umbilical cord blood, as will be explained in Part II of this article, is not a suitable specimen to collect.

Cerebrospinal Fluid.—It is, of course, essential that cerebrospinal fluid should not contain any blood.

Serum from Primary Sore.—A capillary tube closed at one end should be used to obtain serum from a suspected syphilitic sore if the presence of *Treponema pallidum* is to be demonstrated. If the sore is covered with a scab, this should be removed, the lesion washed thoroughly with plain tap-water or normal salt solution (soap should not be used), and then dried. The dried surface is gently scari-

fied so as to provoke slight bleeding and the exudation of serum. Wipe away the first few drops of exudation, especially if they contain blood, and wait for a clear drop of serum to appear from the depth of the lesion. Gently heat the closed end of the capillary tube and immediately apply the open end to the drop of clear serum, and as the closed heated end cools allow sufficient serum to be drawn up into the tube so that none is present $\frac{1}{4}$ in. (13 mm.) from either end of the tube. The open end is then sealed by heat.

Clinical Details.—Finally, all specimens should be accompanied by a brief note containing the name and address of the doctor, the patient's name or identification mark, the essentials of the clinical history, the probable diagnosis, and the examination required. It cannot be too strongly stated that "slot-machine" laboratory reports are largely a waste of time and money. If the pathologist and clinician do not collaborate, the latter may well be deprived of vital information.

Transport.—The speedy transport of specimens from the patient to the laboratory is of paramount importance. Time is often the essence of a useful investigation. Fluid specimens may deteriorate rapidly after being taken, and thus the examination of such material would be fruitless. For example, the cells in the cerebrospinal fluid begin to disappear within two hours of lumbar puncture, and in 24 hours few, if any, cells can be seen.

Reports.—Reports on the findings of tests for venereal diseases are intended to be regarded only as part of the evidence required in order to make a diagnosis. Thus a report that no gonococci can be found in the smear from a urethral discharge is no proof that the patient is not suffering from gonorrhoea. Further investigation may be required and the final decision must rest with the clinician.

Identification of Gonococci

When the patient is suspected of suffering from gonorrhoea, three types of test should be employed—namely, smears, cultures, and blood tests.

In acute gonorrhoea in the male smears should be made with a platinum loop from urethral discharge after carefully cleaning up the glans penis and meatus with sterile water or saline. In the female, with the patient in the lithotomy position, smears should be made from the urethra, posterior fornix of the vagina, and the cervical canal. In the case of suspected chronic gonorrhoea in the male smears should be made from the prostatic secretion after massage as well as from the early morning discharge obtained from the urethra after the patient has held his water all night. In the female, examination of smears from the urethra, cervical canal, and the rectum should be made. Satisfactory rectal smears cannot be obtained without the aid of a proctoscope, and unless the practitioner is skilled in the use of this instrument he should obtain the advice of an expert. Strands of mucus on the mucosal wall can often be found (30% cases, C. S. Nicol, personal communication), which on examination may reveal the presence of gonococci.

Most bacteriologists will report that the smears contain Gram-negative intracellular diplococci and/or other organisms such as coliform bacilli, diphtheroid bacilli, or monilia. Further information on the cellular content of the smear will also be given. Polymorphonuclear leucocytes predominate in acute inflammatory conditions, whilst epithelial cells suggest a more chronic infection. Two points must be remembered: (1) that the absence of the relevant organism

is no proof that the patient is not suffering from gonorrhoea, and an examination of another specimen may be indicated; and (2) a report that Gram-negative intracellular organisms morphologically resembling gonococci have been seen will not be accepted in a Court of Law as proof that the patient from whom the specimen came is suffering from gonorrhoea, because other organisms of the Neisseria group may occasionally be present in the genital tract.

In suspected gonorrhoea in the female smears and cultures should be taken just after the menstrual period.

Cultures should be taken immediately after the smears and from the same anatomical sites. Direct inoculation of discharges on to solid media has been largely abandoned in favour of transport media. The sterile cotton-wool swab impregnated with carbon provided by the laboratory should be well rubbed into the discharge and then plunged straight into a bijou bottle containing Stuart's transport medium. The wooden stick is snapped off by pressure against the side of the bottle so that the screw cap can be replaced and tightly screwed up again. Since the success of this transport medium depends on anaerobic conditions, this manoeuvre should be carried out with speed and great care taken to check that the screw cap is not loose when the operation is completed. After receipt at the laboratory, the swab is used to inoculate suitable media, incubated in an atmosphere of carbon dioxide and examined after 24 to 48 hours, depending on the amount of growth obtained. Typical pure gonococcal colonies, if present, are picked off, some examined under the microscope, some tested with the oxidase reactions, and some subcultured for testing with sugar reactions. If gonococci are grown the organism can be isolated in pure culture and "sugared" in 80% of such specimens. These are reported as morphologically and culturally gonococci. The 20% which cannot be obtained in pure culture are reported as "presumptive" gonococci, and warrant the institution of anti-gonococcal treatment, provided the history and clinical condition indicate a strong probability that the patient is suffering from gonorrhoea. If there is any doubt consultation with the bacteriologist is indicated.

Gonococcal Complement-fixation Test

The only blood test at present in routine use is the complement-fixation test for gonorrhoea (G.C.F.T.) and reports on this test are given as negative or positive. Positive reactions are quantitated and reported as positive with neat serum or a dilution thereof. A positive reaction is evidence of a gonococcal focus of infection, but in the absence of any supporting evidence the test should be repeated. A negative reaction, however, does not exclude gonorrhoea, because in the early stages of the disease the body may not have had time to elaborate the antibodies detected by the test. The table shows how soon after exposure to infection one might expect a positive G.C.F.T. in untreated gonorrhoea.

Time after Exposure	No. of Cases	Percentage with Positive G.C.F.T.
1st week	663	9
2nd "	491	16
3rd "	160	34
4th-6th weeks	90	39
7th week	26	50

During the course of treatment of acute gonorrhoea with penicillin the fate of the reaction is as follows: 68% fail to record a positive reaction throughout the course of their illness; 19.2% are positive at first testing before treatment is begun; 6.4% at the end of the first week of treatment; 2.5% at the end of the second week; 0.8% at the end of the third week; and 0.5% at the end of the fourth to eighth weeks. The remaining 2.1% show "oscillating" reactions—that is, on serial testing at intervals the reaction results recorded may be negative, positive, negative, or alternatively positive, negative, positive. This type of serological pattern probably means that the antibody content of the

patient's serum is sometimes over and sometimes under the threshold of recognition by the test. In gonorrhoea this process goes on for a relatively short time, until antibody production recedes, and thereafter negative results are recorded.

Of patients who record a positive reaction at the first testing before treatment, approximately 64% may be expected to become negative after treatment within three months, leaving 36% who will become "oscillators" and revert to negative in due course. Of patients who have a negative test when first tested, and subsequently become positive, 60% will have a positive G.C.F.T. before the end of the first week, when in all probability the treatment has not had time to take effect; 24% will become positive before the end of the second week; and the remaining 16% will become positive during the third to eighth weeks. Complications of gonorrhoea are not common, but at least 66% can be expected to show a positive G.C.F.T.

The value of the G.C.F.T. may be summed up as follows: in early acute gonorrhoea its use is limited; it is of value in subacute or chronic gonorrhoea, particularly in the female, when smears may give little or no help initially; it is of definite value in the diagnosis of complications; it is useful in the management of gonorrhoea; it is unwise to ignore a positive test which has been confirmed by retesting.

Non-gonococcal Urethritis

Non-gonococcal urethritis is a most troublesome condition. According to the latest Ministry of Health returns 11,552 men attended public V.D. clinics with this condition in 1952, as compared with 15,510 new cases of gonorrhoea in the male. The cause of the condition is unknown, though it is thought that it may be due to a virus infection or one of the organisms of the Pleuropneumonia group. Laboratory help is therefore entirely confined to negative findings in excluding a diagnosis of gonorrhoea. In the acute stage of the disease smears from the urethral discharge usually reveal the presence of masses of leucocytes but no organisms. Later many lymphocytic cells and contaminants such as staphylococci and diphtheroid bacilli may also be found. In like manner cultures will either fail to grow any organisms or grow only the contaminants. Blood tests for gonorrhoea are always negative.

Chancroid

Laboratory tests in the diagnosis of chancroid are of some value. Smears taken from the sore usually contain a mass of leucocytes plus a variety of contaminating organisms. Occasionally organisms resembling Ducrey's bacilli (small Gram-negative bacilli, characteristically arranged in chains) may be seen. Cultures can be taken into clotted sterile rabbit's blood which has been heated at 55° C. for five minutes. Fresh medium should be used and a head of discharge is obtained from the base of the ulcer under its undermined edge by means of a platinum loop. The medium is inoculated by the wire being passed several times round the clot so as to ensure even distribution of the inoculum. Two media tubes should be inoculated and examined after 24 to 48 hours. According to Teague and Deibert* if the characteristic chains and tangles of small Gram-negative bacilli are found even in admixture with contaminants the culture may be regarded with confidence as being positive for Ducrey's bacillus. In all cases a cutaneous skin test (dmelcos) should be performed to confirm the diagnosis and standard serum tests should be requested with a view to excluding syphilis. Always remember that the first result of the latter may be negative if the blood is taken during the incubation period of syphilis.

[Part II will appear in our next issue.]

*System of Bacteriology, 2, 415. Medical Research Council, 1929.

Nova et Vetera

THE JENNER OF AMERICA: A BICENTENARY

Benjamin Waterhouse was essentially and aggressively American—even to the extent of placing after his name on the matriculation roll of the University of Leyden the words *Liberæ Reipublicæ Americanæ Foederatæ Civis* in 1778. He came there, as he said, to acquire "a little of the Dutch phlegm." But, ardent nationalist as he was, he nevertheless lived on to illustrate the truth that political ties, however severed, cannot prevent the permeation of scientific thought from one country to another.

Perhaps his English ancestry helped. Born on March 4, 1754, at Newport, Rhode Island, his mother was a cousin of the Quaker physician John Fothergill, F.R.S., collector of one of the finest botanical gardens in Europe and a great friend of Benjamin Franklin. It was with Fothergill in London that he came to study in the year before the Declaration of Independence, and three years later (varied by nine months in Edinburgh) he moved to Leyden, London, Edinburgh, and Leyden fashioned him so well that a year after he returned to America he was offered, and accepted, the chair of physic in the newly founded medical department at Harvard. Here his most immediate colleague was John Warren, the professor of anatomy and surgery, who was reputed to have taken part in the Boston Tea Party, and who had drafted the plans for the medical department. Warren was a bold and skilful surgeon who had not only performed one of the first abdominal operations recorded in America but also pioneered in amputation at the shoulder-joint. It was Warren's clear outlook, no less than Waterhouse's own English connexions, which were to play so decisive a part in the great event which is for ever associated with the name of Benjamin Waterhouse in medical history—the introduction of vaccination into the United States.

It is hard now to estimate the one-time ravages of smallpox. John Coakley Lettsom, a Quaker like Waterhouse and Fothergill, co-operated in reporting to the House of Commons that it was responsible for the loss, in England, of from 34,000 to 36,000 lives annually. No less severe were its ravages in the United States, for as early as 1721, during the sixth epidemic in Boston, Zabdiel Boylston had courageously inoculated his son and two negro slaves and some 244 other persons, risking death by hanging in doing so. Fifty-seven years later, in the same place, a subsequent epidemic led John Warren to establish a hospital. So when Lettsom sent Waterhouse a copy of Edward Jenner's *Inquiry into the Causes and Effects of the Variolæ Vaccinæ* early in 1799 the immense advantage of cowpox vaccinations over smallpox inoculations was immediately appreciated by Waterhouse, who on March 16 in that year published an account of it in the *Columbian Centinel*, following it up a few weeks later by showing Jenner's book to the members of the American Academy of Arts and Sciences assembled at Boston.

He did more. Although England was at war with Napoleon at the time, he secured some vaccine from England in the form of infected threads, and on May 8, 1800, used his son Daniel Oliver Waterhouse, then 5 years old, as a subject. As the vaccine pustule reacted on Jennerian lines, he then vaccinated a servant boy. Then, at his request, William Aspinwall, of the smallpox hospital at Brookline, inoculated one of the boys to test the theory that the subject would now be immune from the general disease. And so the boy was. For, though his arms became infected, nothing else was manifest, and Waterhouse could justifiably write, "One fact, in such cases, is worth a thousand arguments," and within six weeks his report, *A Prospect of Exterminating the Small Pox*, was published.

Success was so dramatic and so sudden that it temporarily eclipsed the discovery. For the quacks and charlatans, who are ever on the watch to exploit such things, leapt to administer vaccine. And since their cowpox matter was often

impure, sometimes being even mixed with smallpox, yet another epidemic occurred in Boston and a number of people died. Waterhouse then had to endure much the same kind of abuse meted out to early inoculators, and in the end asked the Boston Board of Health to make an investigation. This was duly carried out by a committee of seven practitioners (of whom Waterhouse was one) on 19 subjects, and served to vindicate him completely. Waterhouse followed this up by publishing a second part to his original report, which included letters from Jenner himself, Benjamin Rush, and the President of the United States, who had had his family vaccinated at Monticello in 1801.

From now on Waterhouse continued to stress the importance of inoculating with pure vaccine virus, not with that taken from the vaccine virus after the efflorescence had formed around the pustule. But the effort impoverished him. Professional jealousies and academic intrigues wore him down so much that he resigned his chair when he was only 56 years old. He was able to support his family only by the gift of the medical superintendency of nine New England medical posts, a gift made to him by President Madison. He also campaigned with some success against the use of tobacco, and his *Cautions to Young Persons Concerning Health*, embodying his doctrines, ran to six editions and several translations from its first delivery in 1804. He died, aged 92, in 1846, and lives on in history as the Jenner of America.

W. H. G. ARMYTAGE.

Reports of Societies

RELATION OF FAMILY AND CONSULTANT SERVICES

A meeting of the Sections of Medicine and General Practice of the Royal Society of Medicine on February 23, under the chairmanship of Sir Henry Cohen, devoted itself to a discussion on the relation of family and consultant services.

Changing Relations

Dr. GEOFFREY BARBER, who opened from the point of view of the general practitioner, referred to the changes in relationship between general practitioners and consultants which had taken place during his own experience of practice since 1930. In his early days when he encountered, for example, an acute appendix, he would ring up a fellow practitioner who did surgery and if necessary an operation would be arranged at which he himself gave the anaesthetic. That co-operation was of enormous advantage to the young practitioner because "his bluff was called every time. He knew when he had made an incorrect diagnosis and how he came to make it, and repartees cracked like small-arms fire." That had all been changed. The surgeons who were also general practitioners had largely disappeared. The distance between the general practitioner and the consultant had widened. There were those who appeared to think that the work of the general practitioner must be increasingly to direct his patient to the proper department in which his ailment could be treated. But many still felt that human illness was an intangible affair, and that the general practitioner, with his knowledge of the patient and of his mentality and background, should initiate the medical sequence of events and only when he came up against his own limitations should shepherd his patient to the consultant.

He had found to his horror that he did not always know the consultant to whom he was sending his patient. Unless the personality of the consultant was known one could not confidently choose the right one. Two equally good men, each proficient in his specialty, might be poles apart in their personality. A proper consultation, in his view, was one in which the patient, in his absence, was first discussed between the practitioner and consultant, afterwards in the presence of the patient his case was discussed by them together, and again was discussed between themselves after

the patient had retired. In that way he had continued his own postgraduate education. One form of self-discipline to which he had subjected himself was to put himself in the consultant's place in dealing with some poor old chronic patient who had borne a label for perhaps 15 years, to look at the patient again with the consultant's eye, as if he saw him for the first time, and it was astonishing how often one could detect something fresh to modify the label and to suggest something new in treatment.

To narrow the gulf between the general practitioner and the consultant he suggested that general practitioners should follow their cases into hospital, maintaining continuing responsibility for them. From the personal point of view there was a pathetic pride and gratitude in a patient when his general practitioner walked into the ward and he could say to his fellow patients, "This is my doctor." Secondly, the general practitioner must have sufficient pathological and x-ray facilities to take the patient up to a certain stage before he sent him to the consultant. Thirdly, he must regard the consultant as his friend and provide him with all the essential information which he had obtained by virtue of being the family doctor.

The Right Use of Hospital Beds

Dr. E. BULMER, who spoke for the consultants, asked that the problem be looked at from the point of view of the right use of hospital beds. The consultant nowadays was always on the hospital staff; formerly many respected family doctors were consultants; those days were gone. Mistakes were often made in hospital in keeping interesting patients for too long; in not admitting early enough that a case was incurable; in admitting patients only for them to die. He viewed with extreme alarm the competition for priorities for hospital beds. Why should cancer always have priority, second only to acute surgical emergency? Could not special hospitals be built for the surgical treatment of the humdrum—piles, hernias, prolapse, tonsils, etc.—and so avoid such competition? In the General Hospital, Birmingham, the number of beds in the medical department was 322, and the number of patients waiting 375, or 1.1 waiting patients for each bed. In the surgical department there were 5.7 waiting patients for each bed. A duty was placed upon the consultant to use his beds properly. Hospitals were too often regarded as dumping grounds for nuisances. The question whether the hospital was the right place for the patient to go to was seldom considered as it should be. No one yet had the courage to say what type of patient should be admitted to hospital, and it was very difficult to deal with situations in which the patient's medical condition was not suitable for in-patient treatment and yet socially admission was imperative. Many forms of illness could be dealt with by the family doctor, with interest to himself and benefit to his patients.

Dr. Bulmer gave a restricted list of conditions which demanded admission on medical grounds. After mentioning that some patients were admitted to hospital for rest and care, he said that care in the modern hospital was certainly excellent, but rest was apt to be non-existent. The decrease in the size of families, the employment of women in industry, and the lamentable ignorance of most young women of the elementary principles of home nursing made it seem to many that the only place to be ill in was the hospital. To-day almost everyone was born in hospital, or their parents would like them to be, and there seemed to be a demand that everyone should die there also. He thought that people should die in their beds at home if that was socially possible.

There should be hand-picking of patients for admission to hospital, Dr. Bulmer continued, but hand-picking was possible only by consultation. The teaching hospitals were in a unique position. In his own hospital about 85% of the patients were hand-picked; the remaining 15% came in through the bed-bureau or by order of the regional hospital board or in some other way.

How popular was consultation? It was popular with part-time consultants, but less so with full-time, who had

routine work to do. How popular it was with the family doctor he had no means of knowing. For his own part he wished to see the general practitioner visit his patient in hospital. He was now notifying every doctor when his patient was admitted and had offered him a welcome. This scheme was to be run for a year, and it remained to be seen what the response would be. Ward rounds with general practitioners were growing in popularity. Sunday morning was perhaps the least inconvenient time for the purpose.

The Patient Speaks

Miss ROSE HEILBRON, Q.C. (the first woman to do so and herself the wife of a doctor), said that after listening to the discussion so far she thought that the only person who had come really well out of it was the patient. Much was heard about the convenience of the doctor, but illness did not always fit into the schedule. The need to call a doctor sometimes occurred on a Sunday or even on Christmas Day. As the mother of a young child she had suffered from the frustration of wanting to call a doctor at some inconvenient hour and being told that she had better wait. The child had a temperature at night and so she called up the doctor at 11 p.m. and braved his wrath. She was not to know that by the next morning the child would be laughing in the doctor's face. She also criticized doctors for not explaining sufficiently to the patient and his family what was wrong. With broadcasting and television and newspapers even the most ignorant lay people nowadays had a little knowledge of medicine and could be entrusted with more explanation. Some health education would also lessen the queues in the waiting-room.

In further discussion Dr. L. W. BATTEN said that he agreed that the home and not the hospital was a good place to be ill in so long as the illness could be managed there, and he rather thought that when he came to die he would like to die at home if possible. Many patients who went into hospital now would be better off at home. But there was a corollary to this, that if the family doctor was to deal with many more types of illness he must have a greatly increased nursing service at his command.

Hospital Beds for the General Practitioner

Dr. H. GUY DAIN spoke of his experience in the war of 1914-18 when he was placed in charge of a Territorial General Hospital to which convoys of sick and wounded were brought straight from the front, and he was responsible for saying what should be done with them. He had behind him surgical specialists and any material aid he required. That was the ideal practice of medicine. The general practitioner should have hospital beds under his control, with the facilities of modern medicine, so that he could be responsible for patients right through their stay in hospital.

Sir HENRY COHEN said that in the discussion a speaker had observed that one of the openers had been looking back and the other forward, but he would remind them of Sir Winston Churchill's comment on history: "The farther back you look the farther forward can you see."

Figures for bed-occupancy unless related to the special circumstances—for example, the type of case, use for teaching or research, or for prolonged observation—could be misleading. In his own wards, three years ago, he had found that patients referred from other consultants had, over a period, a stay on an average of 12 to 13 days, but he would refrain from drawing any specific inference from that fact. It must never be forgotten that the research worker rightly isolated one facet of a problem and studied it intensively. Consequently, he was able to make major contributions to the prevention and control of disease. But the patient, in and out of hospital, was greater than the sum of these scientific isolates and must be studied as a whole personality.

Finally, Sir Henry doubted the validity of economic advantage as the sole criterion of the hospitals' contribution to human welfare. There were imponderables in human happiness and pleasure which, in his view, were of at least equal value.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

The Place of Forceps in Present-day Obstetrics

SIR, I expected my article on the above subject (*Journal*, October 31, 1953, p. 951) to arouse criticism if only because it was prepared deliberately to provoke discussion at the Cardiff meeting of the Section of Obstetrics and Gynaecology of the British Medical Association. I was therefore surprised and more than a little gratified to find that what I had thought might be viewed as heresy met with such a large measure of approval, not only at the meeting itself and amongst contributors to your correspondence columns, but also amongst a large number of general practitioners and obstetricians in this and other countries who have written or spoken to me privately.

Dr. M. W. Fordham (*Journal*, November 21, 1953, p. 1159) and Dr. A. H. Morley (*Journal*, December 12, 1953, p. 1324, and February 13, 1954, p. 396) appear to be your only correspondents who have been provoked to what could be regarded as adverse comment, although the technical points which they raise impress me as being reasonable and deserving attention if not acceptance. When attempting to cover a large subject within a strictly limited number of words it is difficult to avoid a semblance of dogmatism, but I am sorry that Dr. Morley should have gained the impression that I was writing "majestically"; for humility is essential to good midwifery and any attempt to dictate technique to others is a sign of ignorance.

In regard to axis traction forceps, I only stated that they had been discarded in the hospital whose results I was reporting and that I regarded this development as merely one of many factors contributing to the improvement in these results. It was not suggested that all who practise obstetrics should immediately abandon axis traction forceps; on the contrary, anyone who is trained and experienced in the use of this or any other particular instrument should adhere to it unless he is convinced that a change would improve his results. The pattern of forceps does not matter so much as the judgment and skill of the obstetrician; the good workman can adapt a well-tried and trusted tool or method to meet all manner of circumstances.

Unswerving lifelong loyalty of apprentices to their master, admirable though it may be, can, however, hinder progress, and in this case it ought not to prevent us from recognizing that with the recent rapid evolution of obstetric technique, and from the standpoint of rising generations of obstetricians, the place of forceps having axis traction handles is becoming historical rather than utilitarian. They were introduced for delivery of the head from a high station in the pelvis, and at a time when the mechanism of labour was generally misunderstood. In designing and using them the older obstetricians often sacrificed an accurate cephalic application, or rotated a head from a normal to an abnormal position, in the interests of a pull in the right direction. If it be accepted that caesarean section is now generally preferable to difficult mid-forceps delivery, and that forceps should not be applied (at least in domiciliary practice) until the foetal head has already passed along the greater part of the birth canal, the need is not for an axis traction mechanism but for a simple pattern of forceps which makes for easy observance of the more important principle of an accurate cephalic application. Although axis traction instruments can readily be used on the head arrested at the pelvic outlet, they have no advantage in such a situation. Their potential dangers are that they lure the less experienced operator to reach for a head which is too high to be extracted safely, and they put emphasis on a factor which in these days is not the most important.

Dr. Morley is correct in assuming that the lithotomy position was used in the majority of the forceps deliveries reported in my article, including those in which the mother died from inhalation asphyxia. Space does not permit discussion of the various reasons why the lithotomy position is referred by nearly all obstetricians throughout the world. Dr. Morley will find them stated in detail in *Operative Obstetrics* by J. Munro Kerr and J. Moir. His rather naive explanation that it is

because gynaecologists have invaded the realm of obstetrics cannot be accepted, if only because the lithotomy position was widely adopted long before there were any gynaecologists, and some of its strongest advocates to-day are specialists in obstetrics alone. Even if Dr. Morley's suggestion were correct, however, it remains to be asked why the gynaecologist prefers the patient in the lithotomy position for operating.

Nevertheless, it must be recognized that the left lateral position has some advantages, at least in certain circumstances, and that the lithotomy position may have some disadvantages, among which Dr. Morley very properly emphasizes that, according to the type of anaesthesia employed, it may increase the risk of inhalation asphyxia. Here again it is unreasonable to lay down hard and fast rules, and, even if it is generally accepted that the advantages of the lithotomy position ordinarily far outweigh its disadvantages, it does not mean that every obstetrician must use it or that any obstetrician should use it in every case.

Just as Dr. Morley was taught to use axis traction forceps with the patient lying on her left side and has found the method to his liking, I was, soon after qualifying, advised to avoid engaging in public correspondence as far as possible. This explains why I did not reply to Dr. Morley's letters of June 4, 1950 (p. 1319), and December, 1953, letters in which he made his points well and which could safely be left to rest on their own merits. I reply now only because to leave a third letter unanswered might appear discourteous, and because I should like him and Dr. Fordham, as well as other contributors to this discussion, to know that I appreciate their observations, which have helped to fill in some of the many gaps in the original paper. We can certainly ill afford to neglect any suggestion which might reduce the present risks of general anaesthesia in midwifery.—I am, etc.,

Liverpool.

T. N. A. JEFFCOATE.

REFERENCE

Operative Obstetrics, 1949, London.

Rh Antibodies and Domiciliary Midwifery

SIR, I am sure all general-practitioner obstetricians will be grateful to Dr. M. Chalk (*Journal*, February 20, p. 457) for bringing the subject of Rh antibodies and domiciliary midwifery up for discussion. All who practise domiciliary midwifery are familiar with this problem and will admire the soundness of Dr. Chalk's methods in dealing with these cases, but how many are fortunate enough to have a laboratory with 24-hour facilities close at hand?

First, I would like to underline the need for reassurance to the Rh-negative mothers, most of whom have exaggerated ideas on the gravity of the condition. In this connexion, as well as a precaution should need for transfusions arise later, it is wise to determine the paternal blood group—and a certain number of patients can have their minds put at rest immediately. In the case of a primigravida without a history of miscarriages in whom antibodies are found at the thirty-second week, domiciliary confinement can be permitted, for the risks of an affected baby, let alone a severely affected baby, are negligible. A sample of blood is sent for a Coombs test as a routine. In a subsequent pregnancy arrangements should be made for admission to hospital.

The case of the multigravida is somewhat different, and if antibodies are present she should certainly be confined in hospital. Anybody who has seen an affected baby turn yellow within a few seconds of cutting the cord will surely agree. Even the best-equipped hospital likes to have some notice that a replacement transfusion may be required. It takes some time to mobilize the equipment, paediatrician, and haematologist, and to obtain the correct blood, cross-match and alter the P.C.V., etc. There are no reliable tests to determine in utero if the foetus is affected (the presence of antibodies puts us on guard). Until there are, let us of general practitioners, who have a lot of other problems, leave this one to those whose intimate concern it is, for they need all the research material they can obtain.

Unlike your correspondent, I am only too willing to receive instruction on such a complicated and important matter.—I am, etc.,

Southwold.

R. H. REYNOLDS.

SIR,—Dr. M. Chalk (*Journal*, February 20, p. 457) raises an important problem. I have notes of over 600 confinements from 1945. Three patients were Rh-negative with antibodies with following results in four confinements. All the children were affected with erythroblastosis.

(1) Mrs. X, 3rd para, confined in hospital. Child was transfused and died after a few hours from cerebral haemorrhage. (2) Mrs. Y, 2nd para, confined in private nursing home. Child alive, not anaemic (Hb 13.6 g.), required transfusion 230 ml. at 3/52. Alive and well. (3) Mrs. Z, 2nd para, confined in private nursing home. Child (cord blood, Hb 9.1 g.) given replacement transfusion immediately after birth in hospital, returned to mother in home the same evening alive and well. (4) Mrs. Z, 3rd para, confined in hospital January, 1952. Stillborn.

I am satisfied that with the help of the paediatrician and the haematologist there was no more delay in case No. 3 than would have occurred in hospital. I am convinced that this help must be laid on for all women with antibodies. In this small series the hospital results were poor, although no blame could be attached to anyone for the result in case No. 4, as the foetus was dead before labour started. I believe that case No. 1 would have had an easier labour at home, as I should not have allowed her to struggle so long with an occipito-posterior without rotating manually. The nursing homes concerned were no better equipped than a decent house.

I conclude, therefore, that these women may be confined at home provided: (1) the home is of reasonable standard; (2) the mother really wants to be delivered at home; (3) the general practitioner is willing to take precautions and enlist the help of the paediatrician and haematologist. I agree with Dr. Chalk that pregnant women should be surrounded with all modern care and attention, but this care should not be so blatant, not to say strident, as is found in many hospitals. The women just get worried to death.—I am, etc.,

Cambridge.

C. W. WALKER.

SIR,—As a general practitioner, I agree wholeheartedly with Dr. M. Chalk (*Journal*, February 20, p. 457) that domiciliary midwifery provides distinct advantages over hospital midwifery. If, however, one concedes that 45% of Rh-negative women with antibodies bear affected children,¹ and that exchange transfusion undertaken within the first nine hours of life has been found to be the best remedy for preventing the development of kernicterus,² then, I submit, there are grave disadvantages in their delivery at home.

First, the general practitioner must be at the delivery to obtain umbilical cord blood for a Coombs test, to do a haemoglobin estimation, and to make a detailed physical examination of the neonate for signs of haemolytic disease. All general practitioners know what such an implacable "must" implies. Secondly, a reassuring negative Coombs may be unobtainable within nine hours of birth. Many laboratories do close at night. Thirdly, hospitals may be loth to take in a neonate for blood tests and observation only, and rightly so, for a case from outside is for them technically not clean. On the other hand, to put a clean baby in a nursery in which it might possibly become infected is hardly fair. Breast troubles in the mother and feeding difficulties in the baby on its return home may be increased.

After one experience of having to leave a busy evening surgery to attend the confinement of a Rh-negative woman with strong antibodies, who refused categorically to enter hospital, of finding that pre-natal arrangements for hospital admission of the suspect neonate had come unstuck, and of finally getting its admission to hospital after three further refusals from other hospitals, I am, for myself, quite certain where Rh-negative women with antibodies ought to be confined.—I am, etc.,

Manchester.

ERNEST S. WYDER.

REFERENCES

- ¹ Gaisford, W. F., and Lightwood, R. C. (1953). *Paediatrics for the Practitioner*, vol. 1, p. 87. Butterworth, London.
² (1953). *Ibid.*, vol. 1, p. 90.

Papilloedema in Emphysema

SIR,—I was interested in the very instructive article by Dr. T. Simpson on acute respiratory infections in emphysema (*Journal*, February 6, p. 297). I have examined the fundi of a considerable number of cases of emphysema with severe cyanosis and the findings are quite characteristic. In gross cases the veins are enormously dilated and the tortuous, black sausage-like appearance is very striking. The arteries are often quite normal, although they usually share in the tortuosity. I feel, however, that a word of caution is necessary in interpreting the appearance of the disk as a true papilloedema. It is the rule rather than the exception that the margin of the disk appears to be indistinct in these severe cases, but I think that marked swelling is very uncommon. It would seem that this appearance is due to the dilated veins displacing the tissues of the disk and obliterating the physiological cup, but there is often little or no forward displacement, and when one tries to measure the swelling this is found to be impossible. No case of optic atrophy has been reported, although, of course, papilloedema can subside without this occurring.

I have no doubt that true papilloedema can occur, as Drs. Westlake and Kaye (p. 302) have shown that the C.S.F. pressure can be raised in certain cases and quote an example in which actual retinal haemorrhages were seen with papilloedema, but this type of case must be very rare. In his article Dr. Simpson is aware of the difficulty of interpretation of the disk findings and has only included a few cases in the large number of acute emphysema cases in which he has been certain of the swelling of the disk.

I mention the above points to avoid the diagnosis of papilloedema in cases of emphysema more often than it is actually present.—I am, etc.,

London, W.1.

J. GIBSON MOORE.

Medical Needs in the Gold Coast

SIR,—The letter from "Senior Registrar" (*Journal*, February 27, p. 519) raises important questions for all men and women contemplating service in the overseas territories with which the Colonial Office is concerned, and perhaps I may be permitted to offer some comments on the points which he mentions in view of the connexions which I have had with the Colonial Service.

On the issue of a career overseas, it must be admitted that, in the past, officers could look forward without apprehension to a life's work and, on its conclusion, to a pension. While that may not seem so to-day in those territories which are rapidly approaching self-governing status, we must not overlook, for example, the declared statement of the Prime Minister of the Gold Coast that a fully self-governing Gold Coast would need and want the services of overseas officers and that their interests would be fully safeguarded. Is it realistic to expect that any employer of labour could say more than this without inviting a sense of overstatement in the minds of the readers of that statement?

In considering what alternative employment would be open to officers who were no longer required by a territory on attaining self-government, it can reasonably be assumed that in the negotiations leading up to the grant of self-government the question of compensation for loss of career would be one of the important issues to be settled at that date. In 1930, when constitutional changes were agreed upon for Ceylon, officers were given the right to leave the service with compensation for loss of career, and when Ceylon became independent in 1948 an agreement was signed guaranteeing the pensions and salaries of existing and retired public servants. When the mandate for Palestine was given up, arrangements for compensation were made. For those officers who would wish to continue in service overseas, every effort would be made to find suitable employment for them, and it should be noted that all medical officers serving in Palestine who wished to continue in service overseas were allocated to suitable posts in the Colonial Service.

While a guarantee clearly cannot be given in advance that it will be possible to follow some precise course on a particular occasion, it is certain that, taking the overseas territories as a whole, British officers will be needed for many years to come and no keen and efficient officer should be apprehensive about his chances of continuing in employment.

Colonial pensions are not paid by the United Kingdom Government, since that Government is not the employer of officers in the Colonial Service. The payment of pensions is a liability of the Colonial Government which employs the officer. As was mentioned above in connexion with compensation for loss of career, the negotiations leading up to the grant of self-governing status would also cover the payment of pensions. There is no evidence, so far, to suggest that this aspect also would not be settled satisfactorily or that the terms of settlement would not be honoured. Your correspondent asks whether there is any guarantee that pensions would continue to be paid. One can only answer this by asking another question: What evidence of any default is there, so far, which would justify apprehension on this score?

I hope that your correspondent and others who will read this letter will appreciate that there are really no grounds for apprehension, either about the payment of reasonable compensation if careers are cut short, or about the payment of pensions when an overseas territory achieves self-government. Where this has happened to date, satisfactory arrangements have been made and there is no reason to suppose that the same will not be the case in the future.—I am, etc.,

Cardiff.

FREDERICK HEAF.

Lumbar Puncture

SIR,—It is unfortunate that Dr. J. N. Cumings in his article on "The Cerebrospinal Fluid in Diagnosis" (*Journal*, February 20, p. 449) should advocate anew the procedure of lumbar puncture in cases of intracranial and spinal tumour. The majority of the younger generation of neurologists and general physicians are alive to the danger of this investigation producing tentorial or medullary pressure cones and realize that very little information of value accrues from its use. This enlightened view was well put forward by Dr. W. Gooddy in your issue of November 7, 1953 (p. 1040). Once the suspicion of space-occupying lesion within the skull has arisen upon clinical grounds the appropriate investigations are those of radiography of the skull, air study of the ventricular system and/or angiography, the aim being to localize the expanding lesion in order to give the neurosurgeon the best chance of making a radical cure, if this be possible.

Lumbar puncture disturbs the pressure relationships within the skull and spine, frequently produces an aggravation of symptoms or signs and occasionally death within 24 to 48 hours as a result of slow seepage of cerebrospinal fluid into the extradural spinal tissues, with the precipitation of a medullary or tentorial pressure cone. Once this vicious circle has been established the chances of a successful result from surgery are gravely prejudiced. Lumbar puncture is dangerous enough, but the added insult of jugular compression is the one measure calculated to initiate pressure coning at the tentorium or foramen magnum. Similarly, lumbar puncture in cases of spinal compression is highly dangerous and often the cause of sudden onset of bladder and bowel complications or of rapid worsening of the clinical picture. When necessary to aid in the diagnosis of spinal tumour, lumbar puncture should be performed on the same day as, and as a preliminary to, myelography and laminectomy in an attempt to relieve the compression.

Lumbar puncture has a use when properly employed in suspected cases of spinal tumour, but it has no place, or value, in the investigation of patients suffering from suspected intracranial tumour.—I am, etc.,

London, W.C.1.

WYLIE MCKISSOCK.

Sterilization of Ampoules

SIR,—It is evident that I owe an apology to Dr. D. Reckless (*Journal*, February 20, p. 455) for the ambiguity in my letter (*Journal*, February 6, p. 355). Lignocaine ("xylocaine"), which I use for practically every extradural block that I do, is supplied in ampoules (or possibly they are better described as phials) made of thick glass and closed by a small rubber plug. This latter can be removed without the slightest risk of any glass being broken. Bacteriological examination of the ampoules' contents has never shown contamination having occurred through the thick glass. So I can assure Dr. Reckless that the technique is absolutely safe, and I am sorry that the lack of clarity in my letter should have happened.

Concerning his admonition to examine the contents of ampoules prior to intrathecal injection, this is advice I am unable to take for the simple reason that I abandoned spinals in favour of the very satisfactory and, I suggest, safer extradural block, six years ago. There is an abundance of good advice in the literature on how to find the extradural space: if Dr. Reckless is still content to encounter the "only disaster" of a fruitless entry into the theca, then I suggest that these are the words of wisdom that have fallen on stony ground.—I am, etc.,

London, S.W.15.

G. C. STEEL.

Reaction to Blood Transfusion

SIR,—I suggest that the fears expressed by Dr. R. D. Barnard (*Journal*, February 6, p. 332) are unjustified because he does not take into account the indications which serve to show when dextran is likely to benefit the patient. The principal indication for dextran is oligæmic shock due to haemorrhage, whether evident or concealed as in crush injuries, or in concealed accidental haemorrhage of pregnancy; and the purpose of its administration is to increase blood volume so that the circulation again becomes effective. Dextran is, in fact, a plasma volume expander and we use it as such, either alone or as a stop-gap, until properly grouped and cross-matched blood can be obtained. We have administered about 1,300 bottles to about 600 patients, and encountered only one reaction sufficiently severe to warrant our stopping the infusion. We do not often administer more than 1,000 ml. 6% dextran to one patient, but we have given 1,500–2,000 ml. occasionally without any serious reactions; all these infusions have been given to patients with haemorrhage or crush injury, and a few have saved lives.

If dextran is used in this way its "conglutinin" powers do not matter. Even were it to increase anti-A or anti-D titres a thousandfold, the patient would not suffer provided that ABO and D homologous blood were administered. In England to-day few transfusionists consider group O blood to be "universal donor" blood, and even in America I believe it is usual to add Wittebsky's group-specific substances to neutralize the agglutinins of group O blood which is to be used as "universal donor" blood. Anyone knowing of the "conglutinate" powers of dextran would expect that if a sufficient quantity of dextran were administered to patients whose blood contained high titres of auto-antibodies an episode of acute intravascular haemolysis would follow. Fortunately, auto-antibodies are fairly uncommon except in acquired haemolytic anaemia, atypical pneumonia, and leukaemia, and are rare in neoplastic disease. It is very unusual for patients with these diseases to require treatment with a plasma volume expander, and I am a little surprised that Dr. Barnard has been able to obtain experimental confirmation that dextran given to such patients causes haemagglutination and (presumably) haemolysis.

In the patient with severe oligæmic shock, treatment must be directed to restoring blood volume. In many patients the *vis medicatrix naturae*, with warmth and fluids by mouth, will suffice; others can tolerate a few hours' delay while blood is obtained; but there remain some who need blood volume restoration as soon as possible. In this last group one must choose between plasma—which carries a 1% risk of hepatitis—and dextran, the dangers of which appear to be theoretical

—unless, of course, one is to fly to the blood bank and demand blood at once, thus increasing the risk of incompatibility. Dr. Barnard's fears seem to be based mainly on work *in vitro*. I agree that when dextran is mixed with blood in the test-tube many peculiar things happen; but if dextran is mixed with the blood remaining in an exsanguinated patient the patient gets better.

I have never done "dextran compatibility tests" and I do not intend to start until it is shown that they would serve a useful purpose; nor do I propose to allow Dr. Barnard's largely theoretical fears to overwhelm my practical experience, which is that patients who have had a sudden severe haemorrhage can usually be revived by dextran infusion, and that in such circumstances dextran is safer than plasma or whole blood.—I am, etc.,

London, N.W.10.

GEORGE DISCOMBE.

"Status Lymphaticus"

SIR,—In his article on "Status Lymphaticus" (*Journal*, January 16, p. 149) Dr. H. B. Dodwell, presumably in support of his views, quotes from Boyd's *Textbook of Pathology* the author's statement that "there is no proof that the thymus gland has anything to do with stoppage of the heart." A few lines above this Boyd writes: "There is no doubt that the diagnosis of status lymphaticus or enlarged thymus has been much misused at coroners' inquests, but on the other hand there does appear to be some relationship between lowered constitutional resistance to certain otherwise trivial injuries and a condition of lymphatic hyperplasia. I may quote the following case from the medico-legal practice of my colleague Dr. Erb, which is surely sufficient proof that the concept of death from status lymphaticus is not a pure myth. One of a group of children who were playing on the road was struck down by a motor car and injured. He did not die, but a little lad watching the accident from an adjoining lawn fell dead. At post mortem the child was found to have an enlarged thymus, a thin-walled hypoplastic aorta, and marked hyperplasia of the lymphoid tissue throughout the body."

I submit that if the above illustrates the way in which Dr. Dodwell has made use of the subject-matter reviewed then his researches on the subject of status lymphaticus, which appear to be entirely literary, must be regarded with misgiving.—I am, etc.,

Alloa.

W. B. LAING.

REFERENCE

¹ *Textbook of Pathology*, 1947, 5th ed., London.

SIR,—May I reply to the letters criticizing my article on the above subject (*Journal*, January 16, p. 149) which have appeared in the *Journal*? Dr. H. Ucko (*Journal*, February 13, p. 398) would appear to be discussing an entirely different pathological condition; no report of any case of status lymphaticus that I have ever read has described a patient who, prior to unexpected sudden death, displayed anatomical anomalies, recurrent asthma, lymphocytosis, and evidence of the breaking down of the nuclei of lymphocytes. Had this syndrome been associated in this country with sudden death surely a few cases among the two hundred odd deaths per annum would have been described.

Dr. C. Langton Hewer (*Journal*, January 30, p. 274) raises two points of objection to my views—the late Sir Bernard Spilsbury's expressed opinions, and my denial of Dr. Kemp's case records. With regard to Sir Bernard's view, there is no supporting published evidence, the Medical Research Council's Committee found no association between enlarged thymus glands and enlarged lymphatic glands, the only writers to publish a series of narrowed aortae in unexpected deaths found no enlargement of the thymus gland, and I have failed to find any collection of cases of fatty infiltration of the myocardium in sudden death in the young. As to Dr. Hewer's view that it is incredible that Sir Bernard could have pursued a chimera for so many years, surely it is equally incredible that the twelve distinguished members of the Medical Research Council's Committee should have

been thoroughly misled after such painstaking collecting and weighing of evidence?

Turning to Dr. Hewer's second point, I certainly owe Dr. Kemp an apology for stating that he did not cite any cases; he did not do so in the article originally quoted by Dr. Hewer but did cite five cases in his article (which I overlooked) in the *Canadian Medical Association Journal* for 1933 and which, together with two other cases, were reported again in *Elementary Anaesthesia*.¹ I cannot agree with Dr. Hewer in regarding this article as an excellent account, since only a bare majority of the cases have the weights of the thymus glands recorded and all "the" aortas are capable of another explanation—thus, of the two tonsillotomies, that with the really large thymus gland was found after death to have some blood in the lower trachea, and that with the slightly enlarged thymus some venous congestion of the lungs. Of the five non-operative cases, in only two is the weight of the thymus gland stated; both infants found dead showed cardiac petechiae and the other three cases had been ill for from fifteen hours to two days, one of them having a "chest full of rales" shortly before death.

Finally, in his historical account of status lymphaticus Dr. Kemp, in dealing with the article published in Vienna in 1889 from which Osler took his account,² states that Dr. Paltauf had "access to a vast quantity of clinical pathological material and from his wide experience advanced the view . . ."; Dr. Kemp is obviously confusing the author with his elder brother, since the author Arnold Paltauf died in his thirty-third year, four years after the article was published, while it was his elder brother Richard Paltauf who subsequently became in 1898 professor of pathology in Vienna, dying in 1924.—I am, etc.,

London, N.7.

H. B. DODWELL.

REFERENCES

¹ *Elementary Anaesthesia*, 1948. Baillière, Tindall and Cox, London.
² *Principles and Practice of Medicine*, 1898, 3rd ed. London.

SIR,—The cycles of the old, and some of the new, arguments for and against "status lymphaticus" have been moving again in your correspondence. The observations of Dr. H. Ucko (*Journal*, February 13, p. 398) are not only interesting but seem to relate reasonably thymic hyperplasia with adrenal, or pituitary adrenocortical, deficiency in a lack of resistance to stress.

In gross morbid anatomical study of cases of "status lymphaticus" 25 years ago I noticed that a common finding was peculiarly small adrenals. I am now therefore quite interested in Dr. Ucko's final observation that the hypothesis (adrenocortical deficiency) could easily be verified by investigations into the adrenal cortical reserve of cases with suspected status thymo-lymphaticus. Perhaps some specially skilled team will take up this well-worth-while study.—I am, etc.,

Bristol.

A. V. NEALE.

Cortisone and Manipulation of Knee-joint

SIR,—With all due deference to the distinguished members of the Medical Research Council subcommittee, I would like to make a few comments on their recent report (*Journal*, January 30, p. 233) concerning the effect of cortisone as an adjuvant to manipulation in rheumatoid arthritis. No one to-day would use systemic cortisone in preference to topical hydrocortisone to cover the manipulation required to straighten a knee-joint fixed in flexion. It is presumed that when these therapeutic trials were initiated hydrocortisone was either not readily available or its advantages in this situation were not recognized; in either event, it would be interesting to observe the result of further studies, similarly controlled, using intra-articular hydrocortisone.

It is noted that in all cases in this series the contralateral knee was also affected, though less severely than the one selected for manipulation; however, there was no significant difference between the cortisone-treated and codeine-treated groups, the contralateral knee in each group showing some slight improvement. To anyone not entirely familiar with the indications for cortisone therapy, these results might

seem surprisingly negative; but it should be recalled that patients with "severe disease activity" were excluded from this study, and it is only in so far as active inflammation exists in a joint that cortisone can be of temporary benefit. Since in these patients deformities had been present for a minimum of six months, it is reasonable to assume, in the absence of any information to the contrary, that in most of them the arthritis had reached the chronic fibrotic stage in which little if any inflammatory reaction persisted.—I am, etc.,

J. H. LAURIE.

Medical Director, Merck & Co., Ltd.

Whither Anaesthesia?

SIR,—The letter of Dr. Charles E. Sykes (*Journal*, February 6, p. 336) expresses the view of most anaesthetists. The race to be first with the news could be laughable were it not so dangerous, because false facts often endure for a long time. The confidence and comparative ease with which barbiturates and relaxants were so successfully introduced into anaesthesia became presumptuous in the case of hypotension and the bloodless field, even though the dangers were obvious. Doubtless the very highly skilled escaped disaster or confined its use to those cases where the risk is justified, but others were either not so skilled or so lucky. It should be a sobering thought that the majority of these misfortunes could have been avoided if well-established methods had been employed, since, if there is sufficient skill and experience available, the patient unfit for anaesthesia scarcely exists to-day. There was some lack of discernment in the conclusions of many of the research workers in this field.

Our profession very properly defends and encourages the right of freedom of action among its members. It holds, however, that this right implies a responsibility, and the opportunity an obligation. The introduction of every new anaesthetic agent results in a flood of reports of strange reactions, most of which fortunately appear to happen only to a few, and which, after a while, no longer seem to happen at all. Such reports only cause confusion or amusement, since errors of technique and judgment are always possible. Otherwise why are the majority of anaesthetists spared these dramatic experiences when the drugs are in daily use?

Hypothermia is now in the news. Is it too much to ask whether the promised benefits are sufficiently great to justify haste in its use, and if it is not possible that research should be carried out by those with the experience and the facilities to do it adequately? Surely some control is justifiable to ensure that the hypotensive debacle is not repeated, and that our inevitable progress is sane, safe, and satisfactory.—I am, etc.,

Deal

G. DONAL MCGRATH

Controlled Hypothermia

SIR,—Drs. P. R. Mesham and W. E. B. Scott (*Journal*, February 20, p. 455), while discussing the possible site of action of chlorpromazine, state, "We include in our conception of the autonomic system those centres in the hypothalamus and elsewhere which co-ordinate and integrate the functions of this system." Such a wide interpretation of the autonomic nervous system may well justify the claims of the above authors (together with Drs. J. W. Dundee and T. Cecil Gray) in a previous paper entitled "Hypothermia with Autonomic Block in Man,"¹ but it opens the term "autonomic blocking-agent" to include practically every known anaesthetic agent.

No one would question the close association of the hypothalamus with the autonomic system, but are we justified in describing any drug which interrupts the normal mechanism of thermo-regulation as an autonomic blocking-agent? Any anaesthetic drug which produces unconsciousness disrupts the heat-regulating mechanism, and, provided shivering is prevented, the patient's body temperature rapidly approaches that of his environment. Chlorpromazine, therefore, is but one of a multitude of drugs available for lowering the body temperature, and it remains to be proved that

it possesses any advantage over routine and established anaesthetic techniques.

Professor G. A. G. Mitchell, in his excellent book *Anatomy of the Autonomic Nervous System*,² classifies this system into "a central part which includes centres located in the cerebrum, cerebellum, brain stem, and cord," and "a peripheral part which consists of two paravertebral ganglionated trunks and various prevertebral, visceral and vascular nerve plexuses. . . ." If we are to name any drug that acts on this vast network as an "autonomic blocking-agent," then the confusion will be great.

In the interests of clarity, therefore, may I suggest that we should abandon the term "autonomic blocking-agent" at its birth, and return to the parental term from which it obviously sprang—that is, "autonomic ganglion-blocking drug"—a name which has a specific meaning in both physiology and pharmacology?—I am, etc.,

London, S.E.1.

H. C. CHURCHILL-DAVIDSON.

REFERENCES

¹ *British Medical Journal*, 1953, 2, 1237.
² *Anatomy of the Autonomic Nervous System*, 1953, E. and S. Livingstone.

The Unsaturated Fatty Acids

SIR,—In answer to Dr. Eric Lodge's inquiry (*Journal*, February 13, p. 395), one of my partners and I have had some experience of the unsaturated fatty acids in the treatment of leg ulcers in elderly women. These cases healed up well on the treatment. We also found that if the ulcer is infected with *B. pyocyaneus* the ointment was not successful until the *B. pyocyaneus* was killed off; and we found dibromopropylamine isethionate ("brulidine") the most useful cream for this purpose.

We also tried this treatment in two cases of psoriasis. One healed in the course of three months and has not relapsed as far as we know (18 months). The other did not respond to the treatment until ung. dithranol was applied at night. It is now responding very well.

In conclusion we found this treatment most efficacious in the treatment of bedsores.—I am, etc.,

New Malden, Surrey.

CHRISTOPHER PETT.

Intravenous Iron

SIR,—I very much enjoyed Dr. J. A. Nissim's article on intravenous iron (*Journal*, February 13, p. 352). I would appreciate the hospitality of your columns to reply to some of the points raised. I entirely agree that the question of iron precipitation is of great, if not fundamental, importance. Although it has been shown to occur in animals, there is as yet no evidence, as Dr. Nissim himself admits, that it occurs in man with normal dosage, which means, I think he will agree, a maximum of 100 mg. Fe per injection. I am prepared to admit that the iron moiety may not be involved and that my tuberculous cases¹ were not strictly normal cases of iron-deficiency anaemia. Nevertheless, I do not think that impurities in the saccharated component are fundamental causes of reactions. After all, many thousands of injections must be given annually, and only a small fraction cause reactions severe enough to be talked or written of. Surely one should expect more. Betty Holt² has told us that in India reactions are rare despite the fact that the same compounds are used there. Although not strictly apposite, intravenous glucose and glucose saline are given very frequently, but little is heard of painful reactions from this cause. I have no doubt, however, that the compound is locally irritating, for maladministration in my hands has produced some painful and swollen arms from intravenous extravasation. I have tried, without success, to get some saccharated component itself, as I felt that investigation of this moiety would yield interesting information.

It is my experience with the use of antisera, especially anti-diphtheria, that has led me to stress the importance of an altered antigen-antibody reaction in these cases. Landsteiner's³ classical experiments with *para*-arsanilic acid showed that it was its combination with protein, and not the compound itself, which was important. Combinations of bacterial polysaccharides with protein similarly act as

happens. Protein is therefore essential in the production of antigenic effects. This does not seem to me to be incompatible with any theory of the cause of these iron reactions, for either the iron or the saccharated components could combine with the subject's protein to act as an antigen. With regard to paroxysmal haemoglobinuria, this is another example of a violent and abnormal antigen-antibody response—namely, an abnormal cold haemolysin. The reticulo-endothelial system activity can therefore be invoked not as a cause but as an effect of this abnormal reaction.

As to the age of the patient, my limited experience of its use in the old was encouraging in that I thought injections were tolerated better or as well as in younger subjects. There were no reactions in my cases. I have had no experience of injections in children, but the fact that reactions are commoner among them and young adults may be linked with their increased susceptibility to abnormal antigen-antibody effects—e.g., asthma, serum sickness, and so on—just as such effects are rarer in the old.—I am, etc.,

Romford, Essex.

I. M. LIBRACH.

REFERENCES

- ¹ *British Medical Journal*, 1953, 1, 21.
- ² *Ibid.*, 1953, 1, 834.
- ³ *J. exp. Med.*, 1924, 39, 631.

SIR,—I hope that the possibility of toxic reactions reported in Dr. J. A. Nissim's interesting paper (*Journal*, February 13, p. 352) will not dissuade others from the use of this valuable remedy. We have used saccharated iron oxide, mainly for anaemia in rheumatoid arthritis, for four years, and in the last two years or so have been impressed by the lack of toxic reactions. We have used "neoferrum" throughout this latter period. Complete figures are only available since the beginning of 1953. Since then, 117 patients have been given 899 injections (107 of the patients had rheumatoid arthritis). No serious toxic effects and no venous thrombosis occurred; the only "complications" seen were the following: One nervous girl complained of "tingling fingers and a faint feeling" shortly after the first two injections, lasting about 15 minutes. She completed the course without further upset. Two women, given injections during menstruation, thought their loss was heavier for a day after the injections.

Clinical evidence of visceral arteriosclerosis is an indication for caution and the maximal dose may need to be restricted to 100 mg. I do not now think that age of itself, however, is a contraindication. During the period in question, 14 patients over 65 years of age were treated without any ill effects; the eldest was 79 and was treated as an out-patient.

The following practical points may be worth mentioning. Injections are given thrice weekly as a rule, but sometimes daily, using hypodermic needles (size 12), the injection of 10 ml. taking about one minute. These small needles limit the rate of injection and enable veins on the back of the hand to be used when elbows are fixed in flexion. Total dosage is calculated to raise the haemoglobin to 100% (on the basis that 100 mg. iron raises the Hb by 4%), with 50% of the dose added. The initial dose is usually 50 mg., followed by 100 mg., and then 200 mg. injections to the required amount. In frail patients the first dose may be reduced to 40 mg. or less. Care must of course be taken that the injection is wholly intravenous. After injection the arm is raised for a few minutes without any local pressure and the patient rests for a few minutes more (we insist that patients must be recumbent); out-patients are detained for at least 15 minutes.

At least in anaemic cases of rheumatoid arthritis, intravenous iron appears to be a safe remedy, though not, of course, invariably effective.—I am, etc.,

Bath.

M. R. JEFFREY.

The Thyroid

SIR,—Dr. I. Doniach (*Journal*, February 27, p. 503) ends his review of my book, *The Thyroid, a Physiological, Pathological, Clinical, and Surgical Study*, with the remark, "But I am afraid that the work as a whole would irritate the serious student beyond measure." The perceptive reader

will have gathered from the tone and substance of the review that Dr. Doniach, who is a pathologist, does not agree with the conclusions that I have reached from a study of the material obtained from 2,114 consecutive thyroidectomies. Though we must agree to differ I see no reason why there should be any feeling of irritation on either side: time will show where the truth lies.

In fairness to prospective readers may I be allowed to point out that more than 400 out of the 600 pages of the book deal with the anatomy and physiology of the gland, and with the clinical aspects of thyroid diseases and their medical, radiotherapeutic, and surgical treatment. And as to the pathology of the thyroid, if Dr. Doniach will be good enough to re-read my book more carefully he will find that his queries are fully dealt with.—I am, etc.,

London, W.1.

T. LEVILL.

Diagnosis of Thyrotoxicosis

SIR,—I read with great interest Professor E. J. Wayne's paper on the diagnosis of thyrotoxicosis (*Journal*, February 20, p. 411). Some time ago, while following up a number of thyrotoxic patients treated with methythiouracil, I noticed that as they became euthyroid a sinus arrhythmia appeared. It occurred to me that it was perhaps possible that hyperthyroidism with its increased sympathetic tone abolishes sinus arrhythmia, and therefore one could exclude, in most cases, a diagnosis of hyperthyroidism if sinus arrhythmia is found. Once aware of this possibility, I have looked for this sign in a number of cases in which a suspicion of hyperthyroidism was raised by the presence of palpitations, sweating, tachycardia, etc.,

So far I have been satisfied that no cases showing sinus arrhythmia have proved, after further investigation, to have thyrotoxicosis. As I have seen no references to this matter in the literature, I venture to make this observation known, as it may be of help in doubtful cases.—I am, etc.,

London, N.19.

E. MONTUSCHÉ.

SIR,—We feel that the article by Professor E. J. Wayne (*Journal*, February 20, p. 411) and the leading article of the same issue (p. 443) contain certain experimental and bibliographical inaccuracies which deserve comment.

It was Robertson and Reid¹ and not Robertson² who "pointed out that a specially careful technique and standards derived from normal persons in Great Britain should be used" for estimation of the B.M.R. Robertson³ drew attention to the value of the effect of iodine on the B.M.R. as a diagnostic test for thyrotoxicosis, of great value when the thyrotoxicosis is mild and the B.M.R., though raised for the patient, yet may fall within the normal range, and Means⁴ stated this a year previously. It is not our experience that B.M.R. "observations on out-patients are often unsatisfactory" or that "the test can be conducted satisfactorily only on the in-patient." To quote from a previous paper by Robertson,⁵ "this is an entirely false conception without any experimental evidence to support it." Around 1930 both Benedict and DuBois told one of us (J.D.R.) that B.M.R. tests on ambulatory patients were as accurate and reliable as those carried out at the bedside, if half an hour's rest on a comfortable bed in a warm room at a temperature around 20° C. precedes the determination. Full details are given in the paper just quoted, in which paper Benedict and DuBois's views were amply confirmed.

With regard to the determination of serum protein-bound iodine, the pessimistic note struck by both Professor Wayne and your leader writer is contrary to our experience. One of us (Kirkpatrick⁶) has recently discussed the practical aspects of a method somewhat different in principle to that used by Professor Wayne, and has indicated the precautions needed to avoid the most serious of the difficulties that may arise. We have employed this method routinely in this department during the past two years, and have found it of great assistance in the assessment of thyroid status, the time and cost involved comparing favourably with those of a determination such as the 17-ketosteroids in urine which is now a more or less familiar feature in clinical bio-

chemical work. We feel justified, therefore, in having a more hopeful outlook regarding the extension of availability of the determination to clinicians, especially as stimulation of interest is prerequisite to improvements in accuracy and technique.—We are, etc.,

H. F. W. KIRKPATRICK.

J. DOUGLAS ROBERTSON.

London, W.1.

REFERENCES

- ¹ *Lancet*, 1952, 1, 940.
- ² *Ibid.*, 1952, 1, 511.
- ³ *Ibid.*, 1934, 2, 1076.
- ⁴ *Ann. intern. Med.*, 1933, 7, 439.
- ⁵ *British Medical Journal*, 1944, 1, 617.
- ⁶ *Analyst*, 1953, 78, 348.

College of General Practitioners

SIR,—In answer to Dr. D. G. Berry (*Journal*, February 27, p. 520), we would like to say that the arrangement to send the College's Research Newsletters to members on the Research Register only (before publishing them in the *Practitioner* and subsequently in the Annual Report) is a Council decision which could be changed if the expense of circulating nearly 3,000 members and associates with frequent letters was considered justifiable. During the past year you have kindly published in your *Journal* more than a dozen notices about the activities of the College which many members have seen.

The time for lectures delivered to undergraduates last autumn (5.30 p.m.) was deliberately chosen, after discussion with medical schools, as being that most suitable for medical students. Any similar course of lectures for postgraduates will clearly be arranged at times which will not clash with normal surgery hours.

Some regional faculties have already been formed in the provinces and overseas, which, with others now being developed in London and elsewhere, will provide information on all College activities for those members and associates who wish to play an active part.—We are, etc.,

G. F. ARERCROMBIE,
Chairman of Council.J. H. HUNT,
Honorary Secretary.College of General Practitioners,
London, E.C.4.

The Feeble-minded

SIR,—The paper by Drs. N. O'Connor and J. Tizard (*Journal*, January 2, p. 16) was welcome as a piece of factual information, especially where it depended on the observations over a wide range of hospitals of one team of workers. This kind of knowledge is hard to come by. It is a pity that it made a text for the unhelpful suggestions in the annotation (p. 35) and, apparently, elsewhere to which Dr. J. M. Crawford refers so wisely and so clearly (*Journal*, February 13, p. 395). I endorse his every word, particularly about the treatment of the feeble-minded.

It is true that there is some variation in policy between one hospital and another—we have not reached the dullness of certainty that there is only one best way—but to his statement from Botley's Park I can add one on the practice of the hospital for which, until recently, I had been responsible for 20 years. Each patient was regarded as an individual rather than as a member of a group, and none was "detained for an indefinite period" because he "might become" difficult. The aim was to develop and train each one as far towards life in the community as it seemed possible for him to go. Apart from such psychiatric adjustment as was necessary, the stages were freedom of movement within the hospital, parole in the neighbourhood, short leaves, long leaves, full licence, and possible discharge. At the same time there was social and occupational training within the hospital leading to daily work outside the hospital, usually of progressive responsibility and importance, and then to useful employment on licence in employable cases. The process took only a short time for a few patients, even when admitted with a lurid history; for some it took years and several trials and failures; and for many the full grade could never be made. But the hope and the effort

were always there, and the patient's capacity and ability were estimated and his treatment and progress judged—in fact he was fathered and mothered by the team of doctors, nurses, trainers, teachers, and other staff, the social workers and, when possible, the parent or friend outside under the guidance of the psychiatrist.

The fallacy in the annotation, and it was suggested in Tizard and O'Connor's earlier paper¹ on the factory experiment at Darenth, is that employment is the main object and employability the criterion. As Dr. Crawford makes clear, the long aim of all treatment is the wider one of social rehabilitation, to enable the feeble-minded person to live in the community with reasonable success and with comfort to himself and his neighbours.—I am, etc.,

Wimbledon, S.W.19.

NOEL H. M. BURKE.

REFERENCE

- ¹ *Lancet*, 1952, 2, 620.

Eli Lilly Medical Research Fellowship (South Africa)

SIR,—May I, through the courtesy of your columns, draw the attention of medical practitioners registered in South Africa, who may at present be in the United Kingdom, to the fact that applications may be submitted for the 1954 award of this Fellowship? The value of the Fellowship is \$250 a month for 12 months, plus return travelling expenses to the point of study in the United States of America. Further details can be obtained from the undersigned. The closing date for applications is June 15, 1954.—I am, etc.,

Capetown.

H. A. SHAPIRO.

Honorary Chairman, Selection Committee,
Eli Lilly Medical Research Fellowship (South Africa).

A New Oral Diuretic

SIR,—Referring to Dr. Myer Cohen's letter (*Journal*, February 13, p. 394) under the above title, I too found your annotator's arguments regarding "mercloran" unconvincing if not actually misleading, and with no other information than from your annotation would have dismissed the preparation as unreliable as previous oral mercurials. I had, however, used mercloran in a number of cases, both before and after your annotation appeared, both under hospital conditions, with measured fluid intake and output, and also in the home. My technique has, however, been that suggested by the manufacturers—the administration of one tablet, three or four times daily, supplementary injections of a mercurial being given once weekly or less frequently. The results have been entirely satisfactory, the basal output being in most cases greatly increased, with no gastro-intestinal upset, a result I have never achieved with previous oral preparations.

Given as recommended above, mercloran should prove a most valuable aid to the general practitioner, in keeping his cardiac cases oedema free, without unpleasant side-effect.—I am, etc.,

Tiverton, Devon.

T. N. RUDD.

Westminster Abbey Appeal

SIR,—During the course of last year you were good enough to draw the attention of your readers to the Westminster Abbey Appeal Fund. I shall be grateful if you will now allow me through your columns to thank all the members of the medical profession who so kindly responded to the Appeal. It has proved impossible to write to all contributors personally, beyond sending them an official receipt, but I hope that these few words will serve to assure them one and all of the sincere gratitude of the Dean and Chapter of Westminster. There is good hope that before the Fund finally closes down the target of a million pounds will have been reached.—I am, etc.,

London, S.W.1.

ALAN C. DON,
Dean of Westminster.

Obituary

K. H. DIGBY, O.B.E., M.B., F.R.C.S.

We record with regret the death of Professor Kenelm Digby in London on February 23 at the age of 69. For many years he was professor of surgery in the University of Hong Kong, and since his return to England he had been doing surgical research work at the Royal College of Surgeons.

Kenelm Hutchinson Digby, the son of the late William Digby, C.I.E., was born at Ealing on August 4, 1884. From Quernmore School, in Kent, he entered Guy's Hospital Medical School, where he had a distinguished career as a student, winning the Michael Harris, the Hilton, and the Beaney prizes. After graduation in 1907 he held a number of resident posts at Guy's, and was surgical registrar there from 1909 to 1911. Meanwhile he had taken the F.R.C.S., and in 1912 he was appointed principal medical officer of the Great Central Railway. He held this post for only one year, however, for in 1913 began his long association with the Colony of Hong Kong, where he took up the appointment of professor of anatomy in the university which had been opened the previous year. He occupied the chair until 1923, when he became professor of surgery; since 1915 he had also been Ho Tung professor of clinical surgery in the university. He relinquished both surgical chairs in 1945, when he was appointed emeritus professor. From 1915 to 1948 he was honorary consultant in surgery to the Government of Hong Kong and from 1930 to 1948 surgeon at the Queen Mary Hospital in the island. In the Birthday Honours in 1939 he was appointed O.B.E. for his medical services in Hong Kong. Interned in the Stanley Camp, by the Japanese during the last war, he returned to this country in 1949 and had since been engaged in research work at the Royal College of Surgeons of England's surgical research farm at Downe, in Kent.

Professor Digby's medical interests were wide, and he turned his inquiring mind to problems both within and outside the scope of clinical surgery. He published many papers on a great variety of subjects and, in 1919, a book entitled *Immunity in Health: the Functions of the Tonsils and the Appendix*. His ingenuity and versatility were remarkable, and he enjoyed devising his own equipment. At the Scientific Exhibition at the Annual Meeting of the B.M.A. in Cardiff last year he demonstrated methods of investigating the functions of the subepithelial lymphatic glands.

A member of the British Medical Association for many years, Professor Digby was president of the Hong Kong and China Branch in 1946, and after his return to England served on the Council of the Association from 1952 until January of this year (when he resigned) as the representative of the Borneo, Ceylon, Hong Kong and China, and Malayan Branches, and on the Overseas Committee during the same period. He married Miss Selina D. Law in 1913, and there were two daughters of the marriage.

We are indebted to Professor L. J. DAVIS for the following appreciation: As a man, Digby was remarkable for his integrity, his honesty of purpose, his enthusiastic attitude to life, and his complete absence of smallmindedness. His colleagues in committee sometimes found him somewhat intransigent when there were differences of opinion, but his opinions were often vindicated by time, and he never

nourished rancour. If he did disagree with people he never spoke ill of them. He had no enemies, but many friends among people of all positions and races.

As a teacher, he was remarkable for his zeal, which never flagged notwithstanding advancing age and adverse climatic conditions. Many hundreds of medical students who have passed through his hands owe much to him for his sound teaching of the principles and practice of surgery. As a surgeon he was quite first-rate. He neglected no opportunity of extending his knowledge of new developments, and during his leaves of absence from Hong Kong he visited most of the leading surgical centres in Europe and the U.S.A. Despite his heavy commitments as a teacher and a practitioner of surgery, he took a lively interest in research. He wrote papers himself and stimulated his associates to do likewise. Throughout his life he maintained his interest in the role of lymphatic tissues in immunity. Only just recently he demonstrated an exhibition of this subject before a scientific society in this country. News of his death will be learnt with great sorrow by his former colleagues, patients, and students in the Far East and elsewhere.

F. R. SELBIE, M.D., Ph.D., D.Sc.

Professor F. R. Selbie, professor of bacteriology at the Middlesex Hospital Medical School since 1949, died suddenly in London on February 22 at the age of 49.

Frederick Robert Selbie early gave evidence that he was destined for high academic honours. He had a brilliant career at Aberdeen University, gaining gold medals for anatomy and one for being adjudged the most distinguished student of his year. He graduated M.B., Ch.B. in 1928, and four years later his thesis for the M.D. brought him the Thursfield Award, which is given for the best thesis of the year. Resolved on a research career in some branch of pathology he went to Paris to continue his training at the Pasteur Institute. Here he worked in the department of Professor Levaditi, studying rat-bite fever and relapsing fever. From Paris he went to the University of Munich to work with Professor Borst, and, returning to this country, he joined the staff of the Imperial Cancer Research Fund, then under the directorship of the late Dr. J. A. Murray. For the first few years that he spent there he made a study of transplantable tumours, a subject which was still in its infancy at that time, but later he joined forces with the late Dr. W. E. Gye, who succeeded Murray as director, and together they tackled the problem of virus-induced tumours. This work he continued after his move to the Middlesex Hospital in 1936, where with the late Professor James McIntosh he was responsible for some outstanding achievements on the nature of virus neoplasia.

The next phase of his work included the war years, and at this time Selbie turned his attention to the urgent problems arising from the discovery of the sulphonamides and the antibiotics. On this subject he made some first-class contributions to the medical literature, among which may be mentioned his work on infective endocarditis and on gas gangrene. In this, close collaboration with the clinician was essential, and his co-operation with the clinical staff of the Middlesex Hospital was an important contributing factor to the great value of this work.

After the war Selbie was called upon to take charge of the bacteriology department of the Middlesex Hospital, and while still continuing with research work his activities found a much wider scope in the assistance he gave to the staff of the Middlesex Hospital and in his great service to the students. He was a brilliant

exponent of his subject and a sympathetic teacher with a full realization of the students' difficulties. He took the degrees of Ph.D. (London) in 1944 and D.Sc. in 1949.

Apart from his contributions to research and his work in the school and hospital, his ability and personality led to his being invited to undertake numerous outside responsibilities. These he carried out with enthusiasm and the same high standard which characterized all his work. He was secretary of the Pathological Section of the Royal Society of Medicine, and latterly was the representative of that Section on the editorial committee. He was also secretary of the Board of Studies in Pathology for four years and acted as examiner in pathology for the final degree. He had been editor of the *British Journal of Experimental Pathology* and of the *British Journal of Cancer*. He gave lectures to the nurses of the Middlesex Hospital and also, for the Royal College of Nursing, to the sister tutors; he was in the middle of a course of these lectures at the time of his death. He was an energetic member of the Royal Microscopical Society, of which he was a vice-president, and attended most of its meetings. He was also a member of the Medical Research Club and of the Pathological Society of Great Britain and Ireland. In these numerous activities Selbie was unsparing of himself and rendered considerable service to the world of pathology in general.

His apparent reserve on early acquaintance soon melted on better knowledge of him, and his colleagues have cause to appreciate his great helpfulness and loyalty to them. To his fellows his outstanding characteristic was one of unselfish helpfulness, but he could be very forthright in denouncing slipshod work or specious assertions made with little foundation. He made an excellent companion both in his work and elsewhere. At the height of a brilliant career the tragic death of Selbie at the age of 49 leaves gaps in many circles.—R. W. S. and S. P. B.

EUGENE WOLFF, M.B., F.R.C.S.

Mr. Eugene Wolff, ophthalmic surgeon to the Royal Northern Hospital and to the Moorfields, Westminster, and Central Eye Hospital, died suddenly in London on February 28. He was 57 years of age.

Eugene Wolff was born at Oudtshoorn, Cape Province, South Africa, on March 11, 1896. He was educated in London at University College School and then at University College Hospital. Graduating M.B., B.S. in 1918, he won the Lister medal for clinical surgery in the same year, and was appointed ophthalmic registrar at University College Hospital after he had held the post of house-surgeon there. From 1918-19 he served in France as a captain in the South African Medical Corps, and then returned to University College as demonstrator of anatomy, a post which he held until 1930. Meanwhile he was developing his interest in ophthalmic surgery, and held the post of chief clinical assistant at the Royal London Ophthalmic Hospital. In 1928 he was appointed ophthalmic surgeon to the Royal Northern Hospital. Eight years later he joined the staff of the Royal Westminster Ophthalmic Hospital. He was also at one time ophthalmic surgeon to the Metropolitan Hospital in London.

Besides building up a big practice in his specialty he played an important part in ophthalmological affairs generally, and in 1950 he was appointed by the University of London as a teacher in ophthalmology at the

Institute of Ophthalmology. He had held office as vice-president of the Ophthalmological Society of the United Kingdom and also the Ophthalmic Section of the Royal Society of Medicine; and the Belgian and Greek Ophthalmological Societies had honoured him by awarding him honorary membership. Since 1950 he had been a member of the North-west Metropolitan Regional Hospital Board.

Wolff was not only a first-class ophthalmological surgeon, but he had a keen, inquiring mind and an enviable ability to express himself clearly. His early interest in anatomy never left him. One of the earliest of his publications was a book entitled *Anatomy for Artists*, which reached its third edition in 1947. He was also the author of *An Anatomy of the Eye and Orbit* (fourth edition, 1953), *Pathology of the Eye* (third edition, 1951), and *Diseases of the Eye* (fourth edition, 1952). In 1923 he married Lydia Abravanel; she and a daughter survive him.

We are indebted to Mr. P. MCG. MOFFATT for the following appreciation: The sudden and unexpected death of Eugene Wolff has deprived ophthalmology of one of its most distinguished exponents. I had the privilege of knowing him from the time of his first association with the then Royal Westminster Ophthalmic Hospital in 1930. His career had already taken shape. A brilliant studentship at U.C.H. had been followed by ten years' study of, and demonstrating, anatomy, pursued at the same time as the study of ophthalmology at his parent hospital and at Moorfields. His love of anatomical detail and the influence of Elliot Smith, Percy Flemming, and Sir John Parsons give the clue to his early devotion to the study of the anatomy, histology, and pathology of the eye. In these fields he earned an international reputation by his original observations and the publication of *An Anatomy of the Eye and Orbit* and *A Pathology of the Eye*: both are accepted standard works to-day. He was a lucid lecturer and a great teacher, possessing infinite patience, anxious and able to impart his knowledge to others. I enjoyed many demonstrations of slides and specimens in the pathological laboratory, where he spent much of his time, and where many of the illustrations for his books were prepared. He had an immensely wide knowledge of ophthalmic literature, a fact well known to his colleagues, who often brought their problems to him and rarely did so in vain. To his juniors he was always encouraging and imbued them with the spirit of enthusiasm to advance the knowledge of their specialty. He used to say that he could read French and German but could not speak either language. On one occasion when he was due to read a paper before the French Ophthalmological Congress he confessed to his friends that it was possible to read the paper in French but that answering questions afterwards was a very different matter. As expected, he acquitted himself with distinction. He wrote a great many papers on subjects of histological, pathological, and clinical interest, and in addition to the two books already mentioned he wrote *An Anatomy for Artists* in 1926, *A Shorter Anatomy* in 1928, and *Diseases of the Eye* in 1937. All his books have gone into several editions. He was for ten years lecturer in anatomy at the Slade School of Art.

To his friends who knew him well, his outstanding qualities were his modesty about himself and his very considerable achievements, his enthusiasm and indefatigable industry, and his kindness. As a recognition of his valuable contributions to ophthalmology he was awarded the William Mackenzie Memorial Medal at Glasgow in 1947. In the preface to his books he paid tribute to the help afforded him by his wife. To her and their daughter we extend our deepest sympathy. Wherever ophthalmologists gather together the name of Eugene Wolff will be remembered.

H. E. L. writes: I should like to add a small tribute to the late Mr. Eugene Wolff. It was my great privilege to have his friendship soon after I arrived in Britain and came

to work at University College. I shall always remember with affection the time spent with the Wolffs at their beautiful home in Wimpole Street. To us—postgraduate students and junior academic people—these were wonderful evenings, full of warmth, human kindness, and cultured conversation. Sir Arthur Keith, in his *Autobiography*, recalls as a young man, living in "digs," how much he appreciated the visits he made to certain friends of his, and that they kept him in touch with "how life should be lived." I felt the same appreciation of Mr. Wolff's hospitality, but he was always embarrassed when I quoted Sir Arthur Keith. One was often tempted to stretch one of their invitations and include a colleague or two who might be currently depressed by impending examinations, or home sickness, or the general physical discomforts of lodgings in Bloomsbury, Notting Hill Gate, or Camden Town. A few hours spent in the lively sympathetic company of Mr. Wolff and his family would restore morale for a long time. Their generosity seemed inexhaustible; they never boggled at the troop that I brought, and somehow or other I was always asked again. An adequate tribute is very difficult, coming from me: it tends to sound trite, and I shall respect his memory by avoiding what he abhorred. I speak on behalf of many of my friends when I extend our deepest sympathies to his family.

H. W. POOLER, M.D.

We record with regret the death on February 28 of Dr. H. W. Pooler at the age of 88. He was elected a Vice-president of the British Medical Association in 1947. In his autobiography, *My Life in General Practice*, he described himself as "an ordinary general practitioner." He certainly showed in that volume that the life of the busy family doctor, ordinary or otherwise, was not lacking in human interest or drama or colourful incident. He showed also that it had its deep and abiding satisfactions.

Henry William Pooler was born at Wellington, Shropshire, on January 30, 1866. His father was a tailor and draper in that town. One of his earliest recollections was of seeing Captain Webb, of Channel-swimming fame, who was the son of a doctor in the neighbourhood, arrive at Wellington, where the people took the horses out of his carriage and dragged it to his hotel. At the age of 10 Pooler was sent to the traditional school of his family, Adams' Grammar School, Newport, in the same county. At 17, having passed the London matriculation, he was firmly resolved on medicine as his career. The difficulty was ways and means. His father had no money to spare. It was arranged that Pooler should become a pupil of his uncle, Dr. George Hollies, a man of sterling character—when approaching his 80th year he went up to Cambridge to take his M.A. degree at the same time as his grand-nephew. This pupilage allowed Pooler to register as a medical student eighteen months before entering a medical school proper, and it gave him an insight into medical practice. In those days there were no telephones and no cars. The doctor, if a call came at night, had to saddle and bridle his horse for riding or harness it to his vehicle for driving, and whatever complications he found when he got to his case he had to deal with them himself. Pooler never ceased to be grateful for an insight into general practice in the country under those conditions. After about eighteen months with Hollies he was entered as a student at Queen's College, Birmingham, in 1885. Later on he returned as a qualified assistant, spending six months with his uncle before taking up a succession of resident hospital posts. During those six months he helped his uncle amputate a

thigh and a forearm, while finger amputations, strangulated hernias, and the like were all in the day's work. He would start out on horseback on his country round at about ten in the morning, lunch at a convenient inn, and return home about four in the afternoon; and then perhaps he might have to saddle another horse to visit a patient some miles away. Midwifery calls were frequent. Pooler himself declared much later that he had done every operation in midwifery except caesarean section.

During his student career in Birmingham he served as a dispenser to a doctor in the city. His wages began at 15s. a week and rose to 50s., together with the offer of a partnership by the time he had qualified, but, having his eye at that time on the Indian Medical Service, he declined the offer. He was accustomed to do his dispensing each morning until ten or later, then to rush to the hospital for clinical lectures and ward work, and, in the afternoon, lectures at the college.

He qualified L.S.A. in 1889, and before going up for the last part of his final he obtained the most valuable prize open to senior students at the General Hospital, that of resident medical assistantship. Later he became house-surgeon in the obstetric and ophthalmic department at Queen's, and subsequently was elected to the post of house-physician. Dr. Guy Dain was one of those who, as clinical clerks, came under his more or less paternal eye. It was while at Queen's that Pooler met Sybil Woodward, a nurse, whom he married in 1894, and thus began the happiest of married partnerships, which continued for more than 50 years. Mrs. Pooler died on November 5, 1951. He obtained the London Conjoint diploma in 1890 and took the degrees of M.B., B.Ch. of the University of Birmingham in 1901, proceeding M.D. in 1952, over 50 years later.

On leaving hospital Dr. Pooler bought a practice at Ashted, a district in the east end of Birmingham, for £700, and received in the first twelve months £412. Eventually, however, he made a good income, but the work was very hard—morning and evening surgery at home and at a branch surgery from 8 to 9 p.m. or later, after a long day's visiting, and there were many night calls. Midwifery was essential in those days to the general practitioner, and he averaged over 200 cases a year. After 15 years, tired of the round of practice, he took up a whole-time position as district medical officer and public vaccinator, but when the National Health Insurance Act came in he resolved to get back into private practice. Practice in the east end of Birmingham was not exactly a bed of roses, but one thing on which he always looked back with great satisfaction was the formation of the Birmingham Infant Health Society, of which he was appointed honorary medical officer. It was a gratification to him, many years after he had left Birmingham, to have his old centre chosen on the occasion of a royal visit as a representative example of pioneer child welfare work. For some years Pooler was a member of the Birmingham City Council, and undertook as a member of the housing committee two extensive tours to inspect Continental housing. He also represented the city at international conferences on child welfare at Berlin and Dresden.

His connexion with Birmingham came to an end in 1916, when he took up a practice in the attractive village of Stonebroom, near Alfreton, in Derbyshire. Here the income was small, but the work, though heavy, was congenial and the people friendly and pleasant to serve. After twenty happy years he left this village for the

neighbouring one of Ashover, while his son Alan carried on at Stonebroom, the father still continuing to do some work in the practice. To the great grief of his family and friends, Alan Pooler, always delicate in health as the result of rheumatic fever in early life, died as the result of overstrain during the second world war. Dr. Pooler's other three sons are all members of the medical profession, and his daughter is married to a doctor. The later years of Dr. H. W. Pooler were spent in retirement at Ashover, where his hobbies were alpine gardening, the collection of old English watercolours, music, and the game of chess.

While in practice in Birmingham Pooler was made honorary secretary of the Central Division. There his first duty was to issue 350 confidential circulars to members informing them that certain practitioners had come under the ban of the Association for conduct held not to be in accordance with the honour of the medical profession by acting as medical officers of a certain dispensary in Coventry. That affair ended in a writ for conspiracy, libel, and slander, and heavy damages were awarded against the Association.

On moving to Derbyshire he was again made honorary secretary of the Division, where he found himself plunged into a series of fights with miners' clubs—clubs formed for the purpose of providing miners' dependants with medical treatment—and in a fight with the county council over the salaries of district medical officers. He was elected president of the Midland Branch, and later, when Derbyshire became a Branch by itself, of that Branch also. He was a member and the treasurer of the Derbyshire Panel Committee, and the moving spirit of a benevolent trust, the object of which was to make grants to needy Derbyshire insurance practitioners or their dependants, particularly for educational purposes. For many years he was a familiar figure in the Representative Body, and in 1930 he became a member of the Council, where he sat on many committees, but did his chief work as chairman of the subcommittee concerned with maternity and child welfare. He was one of a small committee which went to South Wales to investigate the well-remembered Llanelly dispute in 1934. His term as member of Council ended in 1943, and in 1946 he gave up the local secretaryship. He had then been in the medical profession as student and practitioner for more than sixty years. At the Annual Representative Meeting held in London in July, 1947, he was elected a Vice-President of the British Medical Association as an appreciation of the exceptional services he had rendered to the Association.

Pooler will be recalled as a friendly, vivacious companion, a man with a great faith in his profession and its ideals, and an "ordinary general practitioner" who managed to fill out his length of days with the most devoted service to his fellow-beings and thereby with an amplitude of quiet happiness for himself.

Dr. GEORGE COOPER, who died on November 24, 1953, at Budleigh Salterton, where he had spent many years in retirement, was at one time director of the department of radiotherapy at the General Infirmary at Leeds. He was 75 years of age. Born at Belfast on June 22, 1878, he had a distinguished academic career at Queen's University. He took an arts degree at the Old Royal University of Ireland in 1909, and in 1911 graduated M.B., Ch.B. at Queen's University, gaining not only first-class honours but obtaining first place and being awarded a special exhibition. Two years later he

proceeded to the degree of M.D. He held resident appointments at Worcester General Infirmary and at the National Hospital for Nervous Diseases before, during the first world war, he became medical officer in charge of the electrotherapeutic department of the Royal Victoria Hospital at Netley. This appointment was followed, in 1921, by a similar one at the General Infirmary at Leeds, where he was placed in charge of the electro- and radiotherapeutic departments. The following year he obtained the Cambridge D.M.R.E. Dr. Cooper was one of the pioneers of deep x-ray therapy, and was unremitting in his efforts to obtain the most up-to-date and powerful apparatus available. His enthusiasm often induced interested philanthropists to buy new apparatus for his department. In 1920 less than 100 patients attended the department, and by 1925 the number of new patients had increased tenfold. He was appointed lecturer in radiology and electrotherapy at Leeds University in 1924. When the British Medical Association held its Annual Meeting at Oxford in 1936 he served as a vice-president of the Section of Physical Medicine. He retired in 1937. George Cooper did his work with a thoroughness and care which were a feature of every aspect of his life. His specialty brought him into contact with large numbers of patients, many of whom were gravely, and often hopelessly, afflicted. He felt deeply for these people, and invariably extended to them a kindness and sympathy which were as sincere as they were spontaneous; for his quiet, sometimes almost whimsically shy bearing concealed a warm and generous humanity, which was itself the product of a refined and cultured mind. A wide and avid reader, he was keenly devoted to both music and painting, and was as well a true countryman, deeply interested in his garden, and indeed in all aspects of natural beauty. He will be remembered as a delightful professional colleague, a refined and courteous gentleman, and a loyal and trusted friend.—A.W.G.

Dr. ROBERT WILLIAM BOLLANS, who died in hospital at Glossop, Derbyshire, on January 29 at the age of 81, was well known in the district for over half a century. He was born at York and educated at the Yorkshire College, Leeds, graduating M.B., Ch.B. at the Victoria University of Manchester in 1897. Having lived in Derbyshire since boyhood he came to regard Glossop as his home town, although he actually practised from the neighbouring village of Hadfield. From the time he returned to Derbyshire in 1898 as a qualified medical practitioner until his death he was liked and respected by his patients and colleagues as a real family doctor. Always immaculately dressed, and quiet and courteous in manner, he quickly built up a large practice. He was an admirable choice for a justice of the peace, his tolerance and common sense being particularly appreciated in the juvenile court. For many years he was surgeon to Woods Hospital, Glossop, and medical officer to the Hadfield district of the Glossop Union. He had the distinction of being a hereditary freeman of the City of York, his birthplace. A member of the British Medical Association for 53 years, he was secretary of the Glossop Division from 1922 to 1925 and chairman of the Division from 1940 until the time of his death. He had a heart attack on Christmas night last year and was admitted to Woods Hospital, where he died. He leaves a widow, one son, and one daughter.

Dr. DOROTHY STOPFORD PRICE, consulting physician to St. Ultan's Infant Hospital, Dublin, died at her home at Dublin on January 30 at the age of 63. Elinor Dorothy Stopford was born at Dublin in 1890, the daughter of the late Mr. J. J. Stopford, and was educated at St. Paul's Girls' School, London, and at Trinity College, Dublin, graduating M.B., B.Ch. in 1921. She proceeded to the M.D. in 1935. Shortly after graduation she became dispensary medical officer at Kilbrittain, Co. Cork, where she figured prominently during the "troubled times" as the medical officer to a brigade of the I.R.A. When all other means of transport were denied, Dr. Stopford reached her more distant patients in West Cork

on horseback. Early in her career she became associated with St. Ultan's Infant Hospital, Dublin. Other appointments which she held were those of clinical assistant to the children's department, Royal City of Dublin Hospital, consulting physician to the Royal National Hospital for Consumption for Ireland, and consulting physician to the Children's Sunshine Home, Stillorgan, Co. Dublin. In 1925 she married Mr. Liam Price, D.J., who survives her.

J. St. P. C. writes: It was for her work as consultant physician at St. Ultan's Hospital that Dr. Price earned for herself an international reputation. She became attracted by the problem of childhood tuberculosis and devoted herself more and more to this specialty. Directly through her efforts there was built in 1945 at St. Ultan's a unit specially for the treatment of primary tuberculosis. Four years later, in 1949, the B.C.G. unit, another monument to her endeavour, was formally opened at the same hospital. In the City of Dublin to-day and throughout the Irish countryside there are many who owe their lives to her enlightened care of them when, as children, they were brought to her wards at St. Ultan's suffering from the effects of childhood tuberculosis. Her vast experience of the treatment of childhood tuberculosis was frequently drawn upon by Dr. Price for her many scientific contributions to British and Irish medical journals; it was synthesized and published in 1942 in her book, *Tuberculosis in Childhood*, a classic in its subject and a book which to-day enjoys world-wide circulation. In 1937 she began to use B.C.G. vaccine at St. Ultan's Hospital. Advocating its use more widely, she met, inevitably, with considerable opposition, but in the subsequent years she stuck fast to her faith in its powers of prevention and her work did not go unnoticed. In 1949 the Irish Government, as part of a vigorous drive against tuberculosis, decided to launch a national campaign for the use of B.C.G. vaccine. In deference to her pioneering work and to her accumulated experience at St. Ultan's Hospital, the Government centred its campaign on her hospital, and the Minister for Health nominated Dr. Price as chairman of the National B.C.G. Committee. She pursued this work with renewed vigour and enthusiasm. Indeed, her illness, which began in 1950, was undoubtedly the result of so much overwork. In the years since 1950, Dr. Price, although physically incapacitated, kept in constant touch with the development of the use of B.C.G. vaccine at home and abroad. From time to time she published results of the work in Ireland, and indeed, until a fortnight before her death, was engaged in the preparation of a paper for publication. In 1951 Dr. Price was nominated by the executive committee of the Irish Medical Association as a candidate for the award of the Leon Bernhard Foundation prize, given by the World Health Organization for practical achievement in social medicine. Her loss will be widely mourned.

Dr. BALFOUR MCKEAN, who was in practice at Sheffield for over 40 years, died suddenly on February 12 at the age of 66. He was educated at Glasgow High School and Glasgow University, where, after a distinguished career as an undergraduate, he graduated M.B., Ch.B. in 1910. Three years later he proceeded to the M.D., being awarded a high commendation for his thesis. His first appointment was that of house-surgeon at Glasgow Royal Infirmary. In 1911 he was for a time assistant medical officer at the Park Hospital, Hither Green, London, when that institution was being used as a hospital for sick children, and then he returned to Glasgow as house-physician at the Western Infirmary. In 1912 he moved to Sheffield, where he held the appointments of assistant medical officer and, later, deputy medical superintendent at Fir Vale Hospital, known since 1930 as the City General Hospital, Sheffield. During the first world war he held a commission as a captain in the R.A.M.C. and was attached to the 3rd Northern General Hospital, of which the 550 military beds at his hospital were a part. After 13 years of whole-time hospital work he decided to enter private practice. He was an active member of the British Medical Association all his profes-

sional life and served on the executive committee of the Sheffield Division. He was a medical referee for the Ministry of Health and chairman of No. 2 medical board of the Ministry of Labour and National Service. He also served for a time on the board of governors of the United Sheffield Hospitals. In December, 1940, during the first major air raids on Sheffield, his house suffered a direct hit, and he, his wife, and his daughter were buried under the debris. Fortunately he was a strong man, and was able to lift a girder which lay across his wife's chest and to extricate her and his daughter. A less powerful man would probably have failed and all would have perished, as the debris was then on fire. In spite of severe shock he carried on his work as a practitioner. He was an athlete in his younger days, his favourite sports being tennis and swimming, but in later years pressure of work left him little time for recreation. Eventually work at such high pressure took its toll, and in 1951 he suffered a severe vascular lesion from which he slowly recovered. He was advised to take things easy, but it was not his nature to relax, and soon he was working as hard as ever. On the day of his death he had a very full list of professional engagements, and was on his way home when he collapsed. He was able to drive his car to the side of the road and stop the engine before he died, as he wished, in harness. Dr. McKean was a clinician of exceptional ability and wide experience who never spared himself in any circumstances. He was a staunch friend and loyal colleague and will be sadly missed by his patients, his friends, and his fellow practitioners. Our sympathy goes out to his widow and daughter in their loss.—J. C. and R. C. B.

Medical Notes in Parliament

MEDICAL AUXILIARIES' QUALIFICATIONS

The new regulations governing the employment of medical auxiliaries, which come into operation on April 1, were discussed in the House of Commons on February 23. The debate, which arose on a prayer for the annulment of the regulations, was primarily designed to seek information of the Minister's intentions, and to ventilate some doubts, and the motion was withdrawn at the end of it.

Mr. IAIN MACLEOD, Minister of Health, did not offer an enthusiastic defence of the regulations, presenting the procedure adopted as no more than the least undesirable of the courses open to him. He recounted the failure to get agreement on the 1951 suggestions, which were more favourable to medical auxiliaries than the Cope Report from which they originated, and the necessity for taking a decision which faced him at the end of 1952. He could have pushed ahead on the lines of the Cope Report, either on its original basis or as modified, but in face of the known hostility of many of the bodies concerned, including some of the most important, that would have been disastrous. He could, assuming time was available for the necessary legislation, have established statutory registration for each of the groups concerned; the overwhelming objections to that were the necessity for consultation between the groups, and the practical difficulty that many were too small to justify or support financially such a proposal. He could have done nothing, but government by circular was bad, and cases of unfairness were arising as a result of the 1951 circular. So he was left to exercise his powers under Section 66 of the Health Act to lay down qualifications. It was undesirable that the Minister should have to concern himself with qualifications of this kind, and the whole basis of his case was that the regulations were only a temporary measure. He had sent his "rough ideas" to the organizations concerned, and had told them in recent correspondence of his intention to set up a working party to continue the probe to get agreement. He was hopeful of the results. It was important to note that a solution did emerge from

the organizations concerned, partly no doubt as a result of the catalyst of these regulations.

Approval had to be given before April 1 to existing courses of training that were adequate. All the bodies had been asked to send him before the end of February particulars of their courses and examinations. He intended, for the future, to invite those who advised him, assisted by his consultant advisers, to examine the courses and examinations of the representative training schools. Since the discussion had been most closely concerned with physiotherapists, he added that on this he would ask the advice of his consultant adviser, Dr. Cooksey, director of the department of physical medicine at King's, and also of Sir Harry Platt, emeritus professor of orthopaedics at Manchester.

He repeated the assurance that standards that were too low would not be accepted, and quoted from the *British Medical Journal* annotation of February 6 (p. 325):

"There is now undoubtedly an opportunity for the Minister to achieve a piece of constructive statesmanship which will bring the position of medical auxiliaries into line with the other professions in the National Health Service."

This is what he would like to achieve. This was a temporary measure. He would do his best to reach a final solution. In the consideration of standards he would first be guided by the findings of the Cope Committee, and would then act on the best advice available to him.

Dollars for Cardiac Delegation

Lord CROOK asked on February 23 whether the Treasury had reconsidered the application of the British Cardiac Society for permission to send a larger number of delegates to the World Conference on Cardiology in Washington next September, and, if so, with what result. Lord HAWKE, Lord-in-Waiting, replied that after full consideration the Treasury had allowed currency for the full number of delegates applied for—namely, 32.

Prescription Charge Claims

Mr. OSBERT PEAKE, Minister of Pensions and National Insurance, informed Mr. A. BLENKINSOP on February 22 that it was estimated that in the calendar year 1953 Assistance Board grants in respect of Health Service charges amounted to about £1,060,000, of which prescription charges account for about £445,000 and dental charges about £235,000.

Typhoid-Infected Cream

Mr. IAIN MACLEOD, Minister of Health, in a statement on February 22 on the search for tins of cream suspected of being infected with typhoid, said that from information supplied by the manufacturers and importers medical officers of health were informed of the location of wholesalers and retailers as soon as their names could be ascertained. Although at that stage he could obviously make no predictions, he could say that up to that date no case of typhoid attributable to this cream had been notified.

Mr. T. STEPLE asked on February 25 if the Minister was prepared to use his powers to prevent the import of tinned foods from Ireland pending proper investigations. Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, replied that the Minister did not think the circumstances called for this.

Supplementary Ophthalmic Services

Mr. SOMERVILLE HASTINGS asked the Minister of Health on February 25 whether, in order to save time, he would give instructions to ophthalmic opticians providing supplementary ophthalmic services under the National Health Service Act to refer cases needing further investigation direct to ophthalmic surgeons, at the same time notifying the general practitioner in charge of the case. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, replied "No." It was for the general practitioner to decide whether a

patient required specialist treatment, which would not always be that of an ophthalmologist. The Minister had no evidence that this caused needless delay.

Medico-Legal

PLOT TO DEFRAUD HEALTH SERVICE

A doctor and a chemist were each sentenced to prison for one year by Mr. Justice Sellers at Essex Assizes on March 1. They had been found guilty of conspiring together to defraud the Essex Executive Council of the National Health Service, and causing to be paid to the firm of which the chemist was managing director, by false pretences with intent to defraud, cheques for £1,121 6s. 8d., £1,392 18s. 1d., and £826 16s. 7d. The doctor was Archibald Luke Basham, aged 49, of Rayleigh, Essex, and the chemist Geoffrey William Unwin, aged 38, managing director of Yardley (Rayleigh), Ltd. They had pleaded not guilty.

The prosecution contended that Basham wrote out some prescriptions, and that Unwin collected the money from the paying authority of the National Health Service on the basis that the articles mentioned on the prescription had been supplied from his shop, whereas in some cases the articles had not been received by the patients. It was not suggested that the whole of the large sums mentioned in the charges represented drugs that were not supplied, but that a portion represented drugs and other articles not supplied. It was said for Unwin that only 2% of the sums mentioned in the charges were actually involved.

Both men gave evidence strongly denying any dishonest intent. They said that, although there might have been some irregularities, there was certainly no dishonesty or any attempt to obtain any money by false pretences.

Patients of Dr. Basham were called, one of whom described him as "a thoroughly satisfactory and painstaking doctor."

Detective-Sergeant L. H. Chaplin stated that in 1941 Basham, then an R.A.F. medical officer, had been convicted at a court martial for drawing drugs for his own use and neglecting to record prescriptions. He was sentenced to be dismissed the Service, but this was commuted to a severe reprimand. He afterwards resigned from the Service. Before the war he had been a house-surgeon at several hospitals. Sergeant Chaplin agreed that the doctor had been a voluntary patient in a mental hospital for seven weeks last autumn, and that he was now practically penniless. He was unmarried. He first went into practice on his own in 1950.

Unwin, married, with one child, had no previous convictions.

The Judge said it was apparent that the National Health scheme required the utmost honesty on the part of those engaged in it as medical practitioners or chemists, because the prescription was a thing of value. If the ingredients on it were dishonestly increased, the value was increased, and this increased the amount to be paid to the chemist. While the increases might be small in relation to this particular case, it opened up an avenue of continued and successive fraud against the system, and this had to be paid for by the public.

The Judge said that he would take into consideration the fact that Basham had been in a mental hospital, and had been in custody since December, and treat both men equally. The basis of the allegation against the two men, he said, was that they had used bogus prescriptions. He told the jury that Dr. Basham appeared to be a quite skilled, qualified doctor who attended to his duties quite diligently, and no one was suggesting that Unwin was not a qualified chemist or that he was unskilled or careless. The allegation was that they had been dishonest. The heart of the case was that the prescriptions were at times for drugs which were never dispensed and never supplied. Therefore there was a demand for money to which the chemist was

not entitled. Or perhaps there might be a lesser view, the Judge continued, that at times part, but not all, of the drugs prescribed were dispensed. The defence had said that the doctor had dispensed drugs at his surgery and later sent prescriptions to the chemist to replenish his stock, and they asked the jury to say that they might have been irregular and careless. If the jury thought that was all, and nothing more, then they would acquit them.

Vital Statistics

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in January, 1954, was 132, compared with 116 in the previous month and 100 (revised figure) in January, 1953.

The number of cases of industrial diseases in the United Kingdom reported during January was as follows: lead-poisoning, 4; other poisoning, 0; anthrax, 2; epitheliomatous ulceration, 6; and chrome ulceration, 28; total, 40. There was one death from anthrax.

The number of persons killed during the 13 weeks ending December 26, 1953, as a result of accidents occurring in that period at mines as defined by the Coal Mines Act, 1911, in Great Britain was 87, compared with 86 in the 13 weeks ending September 26, 1953, and 107 (revised figure) in the 13 weeks ending December 27, 1952. The corresponding numbers of persons seriously injured at such mines were 475, 445, and 598 (revised figure).—*Ministry of Labour Gazette*, February, 1954.

Week Ending February 20

The notifications of infectious diseases in England and Wales during the week included pneumonia 932, scarlet fever 1,223, whooping-cough 2,099, diphtheria 19, measles 1,944, dysentery 754, acute poliomyelitis 19, paratyphoid fever 10, and typhoid fever 1.

Infectious Diseases

Only relatively small changes occurred in the trends of the notifications of infectious diseases in England and Wales during the week ending February 13. The largest fluctuations were increases of 359 for measles, from 1,487 to 1,846, 146 for scarlet fever, from 1,015 to 1,161, and 45 for dysentery, from 624 to 669, and a decrease of 68 for whooping-cough, from 1,984 to 1,916.

The increase in the incidence of measles was concentrated in the northern section of the country. The largest rises were 103 in Lancashire, from 262 to 365, 47 in Yorkshire West Riding, from 61 to 108, and 40 in Cumberland, from 160 to 200. The rise in scarlet fever was mainly contributed by the south-eastern and midland counties; the largest rise was 30 in Kent, from 35 to 65. The largest rises in the local trends of whooping-cough were 31 in London, from 45 to 76, and 31 in Yorkshire West Riding, from 141 to 172. 11 cases of diphtheria were notified, being 8 fewer than in the preceding week. The chief features of the returns of diphtheria were a rise of 0 to 3 in Middlesex and a fall from 3 to 0 in Warwickshire.

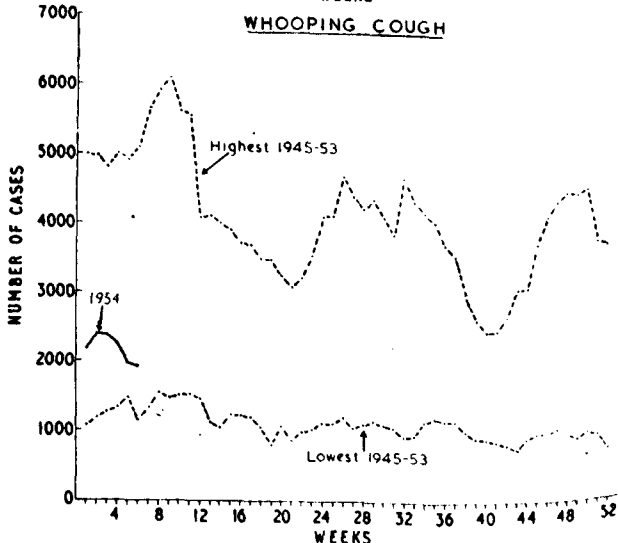
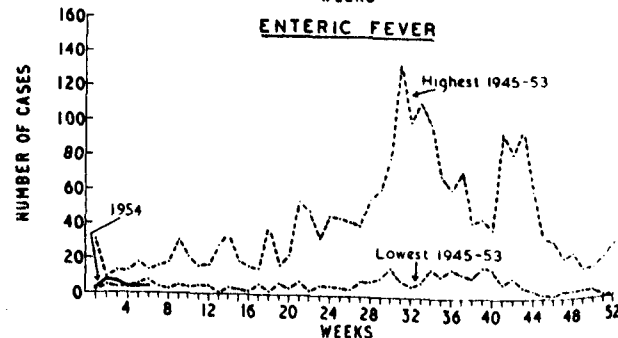
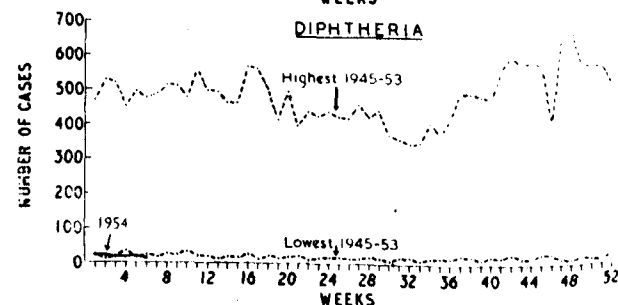
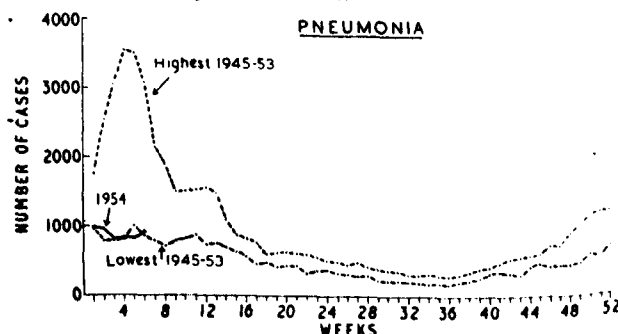
21 cases of acute poliomyelitis were notified, and these were 2 fewer for paralytic and 2 more for non-paralytic cases than in the preceding week. The largest returns were London 3 and Gloucestershire 3 (Bristol C.B. 3).

For the fifth consecutive week the incidence of dysentery has risen and the number of notifications is now double what it was five weeks ago. The largest centres of infection during the week were Lancashire 132 (Preston C.B. 37, Bolton C.B. 13, Oldham C.B. 10, Eccles M.B. 10), Yorkshire West Riding 114 (Leeds C.B. 47, Bradford C.B. 37), London 100 (Islington 34, Hackney 26, Wandsworth 10), Middlesex 61 (Enfield U.D. 19, Ealing M.B. 10), Stafford-

shire 33 (Cannock U.D. 26), Nottinghamshire 24 (Worksop M.B. 16), Norfolk 23 (Norwich C.B. 22), Warwickshire 21 (Birmingham C.B. 20), Essex 18, Kent 17, Durham 17, Leicestershire 17 (Leicester C.B. 12), and Sussex 16 (Brighton C.B. 16).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 13 (No. 6) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1954					1953				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	11	0	7	2	3	24	1	13	0	2
Dysentery ..	669	100	186	6	3	320	36	113	16	1
Encephalitis, acute ..	1	0	3	0		4	0	0	1	
Enteric fever: Typhoid ..	0	0	0	0	2	4	0	0	0	1
Paratyphoid ..	4	0	1	0		6	0	1 (B)	0	0
Food-poisoning ..	109	12		0		40	6		0	
Infective enteritis or diarrhoea under 2 years ..				15	21				12	14
Measles* ..	1,849	16	52	28	356	32,359	1507	372	76	293
Meningococcal infection ..	40	2	11	2	2	53	2	19	2	3
Ophthalmia neonatorum ..	27	3	5	0		28	2	7	0	
Pneumonia† ..	931	38	252	10		2,431	228	306	33	10
Poliomyelitis, acute: Paralytic ..	15	2		4	0	15	2	0	1	4
Non-paralytic ..	6	1				1	0			
Puerperal fever‡ ..	280	38	13	2		294	33	18	1	
Scarlet fever ..	1,161	44	202	39	27	1,515	61	247	34	82
Tuberculosis: Respiratory ..	787	70	117	33			170	25		
Non-respiratory ..	117	4	33	3			29	3		
Whooping-cough ..	1,916	76	366	74	34	2,238	96	196	34	116

DEATHS In Great Towns	1954					1953				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	1	0	0	0	0	0	0	0	0	0
Dysentery ..	1	0		0		0	0		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	13	0	4	1	1	8	2	3	4	1
Influenza ..	41	8	6	0	3	530	111	3	3	3
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		1	1				1	2		
Pneumonia ..	495	74	30	8	15	802	158	22	12	11
Poliomyelitis, acute ..	0	0			0	2	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	133	6	22	2	5	184	35	18	6	10
Non-respiratory ..	0	0	0	0	0	4	0	0	0	2
Whooping-cough ..	0	0	0	0	0	6	2	0	0	2
Deaths 0-1 year ..	297	27	37	7	25	293	37	31	11	24
Deaths (excluding stillbirths) ..	7,982	1207	747	147	243	9,102	1579	644	111	199
LIVE BIRTHS ..	7,756	1154	899	221	413	6,926	1045	880	155	364
STILLBIRTHS ..	228	24	23			181	28	19		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Medical News

"The London" at Home.—During the last six years the London Hospital, Whitechapel, has expended much thought and money on reorganizing its out-patient department. With 700,000 attendances each year—some 2,000 a day—the London has the largest out-patient department in the country. The whole building, with its 40 departments, has been modernized and redecorated. The new departments—the genito-urinary and gynaecological in particular—are models from the staff point of view of designed efficiency and give greater comfort and privacy for the patients. An appointments system has been arranged and the medical records department has been reorganized. A questionnaire was sent out recently to 800 general-practitioner "clients" to obtain their criticisms and suggestions from the consumer angle. This was followed up on Wednesday, February 24, when these doctors were invited to an evening At Home in the out-patients department. In addition, members of the lay press were present. Here in an informal atmosphere the hospital staff—consultants, sisters, registrars, and residents—talked with their guests and showed them round. Many who had till then been but a voice on the 'phone or a signature on a letter became realities to each other and, as is usual after such human contacts, felt the better for it.

Poliomyelitis Vaccine.—According to a report last week in the *New York Times*, Dr. J. E. Salk and his colleagues from Pittsburg University, U.S.A., have started to inoculate local schoolchildren against poliomyelitis. This is said to be the first large-scale trial of Dr. Salk's vaccine (see *Journal*, April 11, 1953, page 826), which is said to contain the three main types of poliomyelitis virus. The children are between the ages of 6 and 9 years, and the aim is to inoculate 5,000 of them. From Australia comes the report that the Queen and the Duke of Edinburgh have also been inoculated against the disease, though whether with gamma globulin or a virus-containing vaccine has not been stated.

Medical Education in Manchester.—The ripples caused by last year's World Conference on Medical Education are now becoming apparent. The February issue of the *Manchester University Medical School Gazette* is devoted to a symposium on the education of the medical student, to which a general practitioner and no fewer than seven of the faculty's professors have contributed. In addition there are accounts of medical education in Australia and Sweden, and as an introduction to the symposium a brief summary of the proceedings of the First World Conference is given. What lends special cogency to these essays is the fact that the Manchester curriculum is just now about to be extensively revised, and medical educators elsewhere will welcome the views of their Mancunian colleagues on this very thorny problem. The *Gazette* is obtainable from the Treasurer, *Manchester University Medical School Gazette*, the University, Manchester, 13.

Report on Homosexuality.—The Church of England Moral Welfare Council has issued for private circulation and comment an interim report on homosexuality. The report is the work of a small group of Anglican clergy and doctors, with legal advice, and they alone are responsible for the views expressed in it. Limited to a consideration of the male homosexual, the report discusses the clinical patterns, predisposing and precipitating causes, moral and religious aspects, and the law. At the end are tables of police statistics from 1926 to 1952. That current public anxiety might lead to ill-conceived measures of repression is recognized, and the report seeks to clear the air by a calm statement and examination of the facts. These, in the view of its authors, are of sufficient importance to deserve a full official inquiry. The report is available from the Church of England Moral Welfare Council (price 2s. 6d.) to all concerned with the problem of homosexuality, and com-

ments on it should be sent to Canon H. C. Warner, Church of England Moral Welfare Council, Room 252, Church House, Westminster, London, S.W.1.

B.M.A. Film Library.—The Association is seeking to enlarge and improve its Film Library. The Film Committee would therefore be glad to have details of any recently produced medical films, and to know whether they may be borrowed for appraisal. Information should be sent to the secretary of the Film Committee, B.M.A. House, Tavistock Square, London, W.C.1.

Dr. David Nabarro.—Dr. David Nabarro was 80 years old on February 27. On Monday evening this week Dr. Bernard Schlesinger, the senior physician at the Hospital for Sick Children, Great Ormond Street, presented Dr. Nabarro with a pair of eighteenth century Sheffield plate tea-caddies, an eighteenth century Nanking teapot, an eighteenth century Crown Derby cup and saucer of exquisite design, and a modern tea alarm. Dr. Nabarro was appointed bacteriologist in 1912 and later director of the pathological department, being the first so named in any department of the hospital. He started the first V.D. clinic in the hospital in 1917 and later initiated the biochemical laboratory. His contribution in 1903 in Uganda to the discovery of the trypanosome as a cause of sleeping sickness is now commemorated in the annals of the history of medicine. His book on congenital syphilis, to be published soon, will add further laurels to a name so long held in esteem among paediatricians and pathologists.

Dr. Douglas Guthrie, lecturer on history of medicine, University of Edinburgh, who is returning home from New Zealand and Australia, will deliver the Clendening Memorial Lectures at Kansas City on March 24 and 25, and the Woodward Lecture at the Medical School of Yale University on May 5.

Dr. J. P. M. Tizard, assistant director at the paediatric unit at St. Mary's Hospital Medical School, has been appointed to the University Readership in Child Health tenable at the Institute of Child Health.

Dr. H. J. Gibson, at present medical officer to that part of the University of St. Andrews which is in Dundee, has been appointed to the new post of assistant to the Dean of the Faculty of Medicine, Edinburgh University. Dr. Gibson, who is 43, was previously in the Indian Medical Service.

Dr. J. W. Thompson, research assistant in the department of applied pharmacology at University College Hospital Medical School, London, has been appointed lecturer in the department of pharmacology of the Royal College of Surgeons.

COMING EVENTS

Willesden General Hospital Medical Society.—The inaugural meeting of this society will be held on March 17 at 8.45 p.m. in the department of physical medicine. The meeting is open to all practitioners in the neighbourhood. The subject for discussion will be "The Medical and Surgical Aspects of Thyrotoxicosis." Further information may be obtained from the honorary secretary of the society, Dr. Alec Wingfield, the Willesden General Hospital, Harlesden Road, London, N.W.10.

Ergonomics Research Society.—The fourth annual conference will be held from April 5 to 8 at Ashorne Hill, near Leamington Spa. The theme of the conference will be "The Scientific Study of Human Work in Industry." Sir George P. Barnett, H.M. Chief Inspector of Factories, will speak at the opening session, at which Sir Frederic Bartlett, F.R.S., will be chairman. Further information may be obtained from Miss B. G. Murrell, Slaters Cottage, Peppard Common, near Henley-on-Thames, Oxfordshire.

International Poliomyelitis Congress.—The third international poliomyelitis conference will be held in Rome from September 6 to 10. Further information may be obtained from the secretariat of the conference, Via Lucullo 6, Rome.

British Association of Sport and Medicine.—The annual general meeting will be held on March 19 at 5 p.m. at the Westminster Hospital Medical School, Horseferry Road, London, S.W.1. This will be followed by a paper by Dr. J. L. Blonstein on "Some Medical Aspects of Boxing."

St. Thomas's Hospital Musical Society.—A concert will be held on March 15 at 8.15 p.m. at St. Sepulchre's Church, Holborn Viaduct. No tickets are required.

C.M.F./M.E.F. Physicians' Reunion.—The annual dinner will be held at Simpson's-in-the-Strand on April 10, with Dr. D. Evan Bedford in the chair. Further information may be obtained from the honorary secretary, Dr. A. Willcox, 59, Harley Street, London, W.1.

Dr. A. H. Douthwaite will deliver the Harveian Lecture to the Harveian Society of London at the Royal College of Surgeons on March 16 at 8 p.m. The title of the lecture is "The Problem of Duodenal Ulceration."

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, March 8

INSTITUTE OF NEUROLOGY.—5 p.m., Dr. W. R. Bell: Preparation and Writing of Papers for the Medical Journals.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.

MEDICAL SOCIETY OF LONDON.—8.30 p.m., meeting of Fellows. Clinico-pathological Meeting.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, 4.45 p.m., public lecture by Professor F. Lynen (Munich): Participation of Coenzyme A in the Metabolism of Fat.

Tuesday, March 9

CHLSEA CLINICAL SOCIETY.—At South Kensington Hotel, 7.30 p.m., annual general meeting, followed by a discussion: The Royal Hospital and the Chelsea Pensioners, to be opened by Captain C. J. T. Denn.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. J. Hare: Xanthoma Necrobiosis Lipoidica and Granuloma Annulare.

LONDON UNIVERSITY.—At University College Hospital Medical School, 5 p.m., special university lecture in Dentistry by Professor J. Dankmeyer (Leyden): Early Differentiation of Nasal and Buccal Cavities in Relation to Tooth Development.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Mr. A. J. Wrigley: Problem of Postmaturity.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Mr. J. Minton: Ocular Manifestations in Nervous Disease. Part II.

Wednesday, March 10

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Treatment of Mycotic Diseases.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—6 p.m., Professor Gösta Dahlman (Lund): Mechanism of Vestibular Fistula Reaction.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Dr. S. B. Osborn: Radiotherapy.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.15 p.m., special university lecture in Physiology by Professor E. A. Müller (Dortmund): Man at Work, a Physiological Analysis.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Sir Cecil P. G. Wakeley, F.R.S., F.R.C.S.: Health of a Nation.

ROYAL SANITARY INSTITUTE.—2.30 p.m., discussion: Tuberculosis: Problems of Notification and Rehabilitation. To be opened by Dr. H. J. Trenchard and Dr. P. W. Edwards.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. S. A. MacKeith: Lecture-demonstration in Psychiatry.

Thursday, March 11

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. R. R. Bomford: A General Practitioner Looks at Psychosomatic Medicine.

INSTITUTE OF CHILD HEALTH.—5.30 p.m., Dr. D. A. Pond: The E.E.G. in the Neuro-psychiatry of Childhood.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Animal Parasites of the Skin.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—5 p.m., Professor F. C. Ormerod: Types of Deafness.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Professor D. T. Robinson: Duct as a Possible Source of Infection in Neonatal and Post-operative Tetanus: Dr. T. Black: Role of the Spleen in Thrombocytopenic Purpura.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.15 p.m., special university lecture in Physiology by Professor E. A. Müller (Dortmund): Man at Work, a Physiological Analysis.

NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, Headington, Oxford, 8.30 p.m., Mr. H. Osmond-Clarke: Cervical Spondylosis.

OXFORD UNIVERSITY.—At Southfield School, Glanville Road, Cowley Road, Oxford, 8 p.m., Dr. A. G. M. Weddell: Science and Medicine.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor F. W. Holdsworth: Traumatic Paraplegia.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor G. L. Montgomery: Biology of Repair.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. J. H. Paterson.

Friday, March 12

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. P. J. Hare: Xanthoma Necrobiosis Lipoidica and Granuloma Annulare.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.15 p.m., special university lecture in Physiology by Professor E. A. Müller (Dortmund): Man at Work, a Physiological Analysis.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—At Royal Army Medical College, 5.30 p.m., address to Metropolitan Branch, Society of Medical Officers of Health: Non-specific Urethritis. Opening speakers, Mr. A. H. Harkness and Dr. C. S. Nicol.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. N. C. Tanner: Present Position of Definitive Surgery for Peptic Ulcer.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Valedictory Address by the Senior President.

Saturday, March 13

INSTITUTE OF ORTHOPAEDICS, Royal National Orthopaedic Hospital, Stanmore.—10 a.m., Mr. J. A. Cholmeley: Teaching Ward Round.

MIDLAND TUBERCULOSIS SOCIETY.—At Birmingham Chest Clinic, 3 p.m., Dr. J. Pepys: Relationship of Non-specific and Specific Factors in the Tuberculin Reaction.

APPOINTMENTS

BOIZ, ISTVAN ANDRAS, M.D., D.P.H., Medical Officer of Health, Maesteg Urban District Council.

JACK, JOHN B., M.B., Ch.B., Assistant Medical Officer of Health, County of Perth.

NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—A. S. Walker, L.R.C.P.Ed., D.L.O., Ear, Nose, and Throat Surgeon (Consultant), Royal London Homoeopathic Hospital, Great Ormond Street; R. L. G. Dawson, F.R.C.S., Assistant Plastic Surgeon (Consultant), Mount Vernon Centre for Plastic Surgery, Northwood; P. E. Baldry, M.B., B.S., M.R.C.P., Physician (Consultant), Ashford Chest Clinic, Ashford, Middlesex; M. W. Hutchings, M.B., Ch.B., Assistant Pathologist (S.H.M.O.), St. Charles' Hospital, Ladbroke Grove; S. K. Ganczakowski, M.B., Ch.B., Assistant Anaesthetist (S.H.M.O.), Bedford General Hospital; Faith C. Poles, M.B., B.S., M.R.C.P., Assistant Chest Physician (S.H.M.O.), Pinewood Hospital, Wokingham; B. Bradley, M.D., D.O.M.S., Assistant Ophthalmologist (S.H.M.O.), Central Middlesex Hospital, Acton Lane, N.W.; D. H. Bodger, M.B., B.S., D.M.R.D., Diagnostic Radiologist (Consultant), West Middlesex Hospital, Isleworth; Mildred I. Port, M.B., Ch.B., D.C.H., D.P.M., Psychiatrist-in-charge (Consultant), "High Wick" Centre, St. Albans; A. T. Frapp, M.B., B.Ch., F.R.C.S., Orthopaedic Surgeon (Consultant), Heatherwood Hospital, Ascot; Margaret T. Collins, M.B., B.S., D.C.H., D.P.M., Psychiatrist (Consultant), Child Guidance Training Centre, Osnaburgh Street; E. Zwielfach, M.D., F.R.C.S., D.L.O., Ear, Nose, and Throat Surgeon (Consultant), West Middlesex Hospital, Isleworth; P. R. N. Kerr, M.B., B.S., F.R.C.S., Assistant Orthopaedic and Accident Surgeon (Consultant), Luton and Dunstable Hospital; H. D. L. Campton, M.B., B.Chir., Resident Medical Officer (S.H.M.O.), Mount Vernon Hospital, Northwood; C. E. Bagg, M.R.C.S., L.R.C.P., D.P.M., Assistant Psychiatrist (S.H.M.O.), Three Counties Hospital, Arlesey; Ruth A. Cohen, M.B., Ch.B., D.P.M., Assistant Child Psychiatrist (S.H.M.O.), Hill End Clinic, St. Albans; Olive N. Roper, M.B., B.S., Assistant Child Psychiatrist (S.H.M.O.), Hill End Clinic, St. Albans; C. A. G. Cook, M.C., G.M., F.R.C.S., D.O.M.S., Ophthalmic Surgeon (Consultant), West Middlesex Hospital; N. S. Slater, M.B., B.S., F.R.C.S., Assistant Surgeon (Consultant), Edgware General Hospital; J. F. Azzopardi, M.D., Assistant Physician in Geriatrics (S.H.M.O.), Barnet General Hospital; G. W. Csonka, M.D., M.R.C.P., Venereologist (Consultant), Male V.D. Clinic, at Shrodel's Hospital, Watford; J. C. Ballantyne, F.R.C.S., D.L.O., Ear, Nose, and Throat Surgeon (Consultant), Royal Northern and Highlands Hospital; J. R. Hudson, F.R.C.S., D.O.M.S., Ophthalmic Surgeon (Consultant), Mount Vernon Hospital, Northwood; Jean M. Laidlaw, M.B., Ch.B., D.P.M., Assistant Psychiatrist (S.H.M.O.), St. Bernard's Hospital; W. K. Schnarr, M.R.C.S., L.R.C.P., D.P.H., D.P.M., Assistant Psychiatrist (S.H.M.O.), Priern Hospital.

TATLOW, W. F. T., M.D., F.R.C.P.C., M.R.C.P., Clinical Assistant, Montreal Neurological Institute, and Lecturer in Neurology, McGill University.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Brown.—On February 26, 1954, to Ruth (formerly Richardson), F.R.C.S.Ed., wife of Dr. R. W. W. Brown, South Collingham, Newark, Notts, twin sons.

Gordon.—On February 20, 1954, at 27, Arlington Drive, Ruislip, Middlesex, to Valerie, wife of Neil Gordon, M.D., M.R.C.P., a son—Keith Gray.

Jones.—On January 21, 1954, at the Royal Infirmary, Cardiff, to Dr. Vera Jones, wife of Dr. Idris G. Jones, a daughter.

Law.—On February 23, 1954, at the London Hospital, London, E., to Beryl (formerly Dyson), wife of W. Alexander Law, F.R.C.S., a sister for Bruce—Aileen Margaret.

DEATHS

Brown.—On February 14, 1954, at his home, Buckland House, Esher, Surrey, William Brown, M.B., Ch.B., aged 64.

Crawford.—On February 9, 1954, at Gamlingay, Cambs, Jane Crawford, L.M.S.S.A., of Angmering-on-Sea, Sussex, late of Knebworth, Herts, aged 71.

Croucher.—On February 1, 1954, at his home, Chiltern Rise, Woodcote, Reading, Berks, Alexander Henry Croucher, M.D., F.R.C.S.Ed., aged 90.

Curran.—On February 6, 1954, at The Vicarage, Saxton, Yorks, Patrick Joseph Curran, M.B., B.Ch., late of Pudsey, Yorks, aged 57.

Dalling.—On February 1, 1954, Reginald Ramsdale Dalling, M.R.C.S., L.R.C.P., M.R.C.V.S., Major, R.A.V.C., T.A., of Bryn Castell, Caernarfon, North Wales, aged 60.

Emerson.—On January 28, 1954, at his home, Chalet Alpina, Venne-sur-Lausanne, Switzerland, Ambrose Emerson, M.D., aged 78.

Fraser.—On February 8, 1954, at 91, Back Hilton Road, Aberdeen, George Hudson Fraser, M.B., Ch.B., D.P.M., Colonel, I.M.S., retired, aged 63.

Haydon.—On February 2, 1954, at Kingston Hospital, Kingston-on-Thames, Surrey, Walter Turner Haydon, M.R.C.S., L.R.C.P., Surgeon-Captain, R.N., retired, of 221, Sheen Lane, London, S.W., aged 77.

Hill.—On January 29, 1954, at his home, "Dalestead," Caterham, Surrey, Frederick Teophilus Hill, M.C., M.R.C.S., L.R.C.P.

Hoskin.—On February 27, 1954, at his home, London, W., Theo Jenner Hooper Hoskin, M.D., F.R.C.P., aged 65. A memorial service will be held on Thursday, March 11, at Holy Trinity Church, Marylebone Road, at 12.30 p.m.

Klasley.—On January 29, 1954, Sylvia Victoria Klasley (formerly Elman), M.R.C.S., L.R.C.P., D.P.H., of Brighton, Sussex.

Stevenson.—On February 3, 1954, at "Redcroft," Meols Drive, Hoylake, Cheshire, Edgar Stevenson, M.D., aged 85.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Straight Leg Raising Test

Q.—What exactly does the straight leg raising test measure, and how should it be interpreted? How should the test be performed?

A.—Straight leg raising tests the mobility of the fifth lumbar or first sacral nerve root: thus, if a disk prolapse lies under it, stretching the leg would pull the nerve down and cause pain by increasing the tension. It is therefore a very good diagnostic test for the presence of a disk prolapse, and also a very good measure of the size of the prolapse. It is found that very limited straight leg raising is almost pathognomonic of a large disk prolapse. Clearly, however, adhesions of the nerve root due to inflammation or scarring from an old disk prolapse or post-operative adhesions will also cause pain on stretching. Finally, some patients have tight hamstrings and this will limit straight leg raising, but that does not usually cause severe pain, and is the same on both sides.

The straight leg raising test is usually performed with the patient lying on the back, and each leg is elevated with the knee straight until pain is just caused. It is essential to watch the pelvis, as this may rotate and give a false impression of the freedom of elevation. A refinement of the test is that, when pain just begins, if the foot is dorsiflexed pain will be increased, as this causes further pull on the nerve roots.

Metal Containers for Chloroform

Q.—Are there any objections to storing chloroform in metal containers similar to those in which trichlorethylene is supplied?

A.—The manufacturers of one well-known brand of chloroform recommend that chloroform should not be stored in tins. The tins are affected and the chloroform is therefore suspect so far as anaesthetic use is concerned. For this reason, chloroform, including that for export to the Tropics, is packed in bottles.

Boy with a Small Penis

Q.—The penis of a boy of 12 has hardly increased in size since babyhood, and it is very small. Puberty has not begun. What treatment is recommended? Should treatment be started before puberty, or is it better to wait until then?

A.—Assuming that the penis is really small and not hidden by fat and that the testes are smaller than one might expect at this age, the more obvious diagnosis would rest between infantilism (of pituitary origin) or eunuchoidism. In the absence of assays of F.S.H. (follicle-stimulating hormone) the differential diagnosis at this age may be difficult, but a positive response to gonadotrophins—for example, chorionic gonadotrophin, 500 units twice weekly for six weeks—would indicate a primary pituitary defect. There would be no response in the case of eunuchoidism, and the appropriate treatment for this latter condition is testosterone or methyl testosterone.

No information is given about height, bone age, muscular development, or adiposity, all of which are relevant to diagnosis and treatment. The age of 12 is near enough to chronological puberty to justify therapy if such is sought by the patient or his parents.

Oestrogens for Prostatic Cancer

Q.—What is the optimum dosage of stilboestrol in cases of carcinoma of the prostate, and is there any advantage or danger in giving such massive doses as 100 mg. thrice daily? What survival rates are usual after treatment with stilboestrol, and how do they compare with untreated cases?

A.—There is no general optimum dose of stilboestrol for carcinoma of the prostate; it varies with the individual. It is a good practice to start with 1 mg. three times daily, increasing by 1 mg. each day up to 5 mg. thrice daily by the fifth day. Thereafter the dose is continued, increased, or diminished according to the response. Doses up to 100 mg. thrice daily are usually well tolerated and often have a better effect than smaller doses in refractory cases. There appears to be no danger. It is always better to do a subcapsular orchidectomy as well as giving stilboestrol, and smaller doses may then suffice.

Patients have survived for from 5 to 10 years when oestrogens are combined with surgical measures. Before stilboestrol a survival of three years was considered good.

Severe Myopia in Motorists

Q.—Do persons with moderate or severe myopia have difficulty in judging distances and thus become potentially dangerous drivers? Is this disability entirely eliminated by correcting glasses?

A.—There is no sharp dividing-line between moderate and severe myopia, but it is generally true that anything up to 10 dioptres is unlikely to be a severe handicap in driving, provided that appropriate spectacles are worn and the eyes are healthy in other respects. When the myopia exceeds 10 dioptres in amount, peripheral vision is necessarily curtailed by the powerful correcting lenses, but, even so, many high myopes manage to drive well by exercising special care. One source of confusion in driving arises from sensitivity to the glare of headlights, and there is no doubt that the average myope is more readily dazzled than are those who are not short-sighted; and macular disturbances afflict many high myopes, especially in later life. Mobile vitreous opacities are also prevalent. Any of these three pathological states can of course lead to intense confusion in driving, but their detailed consideration is beyond the scope of the query.

Dating the Menopause by the Menstrual Cycle

Q.—Is there any correlation between the length of a woman's menstrual cycle and her reproductive period of life? For example, does a woman who menstruates every 23 days or so have an earlier menopause than the average?

A.—The idea behind this question, presumably, is that if a woman uses up her allotted number of ova more quickly than average the menopause will occur earlier. Another popular notion with a similar background is that each pregnancy (during which ovulation is suppressed) postpones the age of the menopause. The basis for such views is unsound, because it is doubtful whether the menopause is the result of the ovary coming to the end of its supply of ova. And, even if this is the case, then it has to be recognized that ovulation plays an insignificant part in the disappearance of ova, and a few more or a few less follicular cycles in any one year make no material difference to the duration of reproductive life. Of the 30,000 to 50,000 ova generally estimated to be present in the ovaries at puberty not more than 450 are destined to be lost by way of ovulation.

Statistical inquiries into matters raised in this question are difficult because they depend so much on the patient's memory of past events—and this tends to be unreliable. Nevertheless, they have been attempted from time to time, and the results go to show that the age of the menopause is not significantly related to either previous menstrual or previous reproductive function. Nor is it related to the age of the menarche. Of all the possible factors which have

been considered, the only ones (other than disease) which most authorities would accept as likely to have any bearing on the age of the menopause are an inherited disposition manifested among races and families, and possibly social and economic status.

Male and Female Symbols

Q.—What is the origin of the symbols ♂ and ♀?

A.—The origin of ♂ for male and ♀ for female is from the well-known symbols of the planets, ♂ being for Mars and ♀ for Venus. Thus they come to indicate masculine and feminine qualities respectively. Very early—perhaps before the Christian era, but certainly soon after—the planetary symbols became associated also with certain metals, ♂ standing for iron and ♀ for copper. Thus they entered alchemy, where we need not follow them. How much older than the Christian era are these signs for planets it is hard to say. The association of deities with planets was borrowed from Mesopotamia by the Greeks in the 4th–5th century B.C., and later by the Romans. Thus Roman Venus corresponded to Greek Aphrodite, who corresponded to Babylonian Ishtar, the Ashtaroth of the Bible. It would therefore not be surprising if these planetary (and sexual) signs, or something like them, were ultimately traced to the second millennium B.C. In any event they are extremely ancient. One idea is that ♀ represented a hand-mirror—the “looking-glass of Venus”—and corresponded to the Egyptian *ankh*, ♀ “the handled cross,” the sun's gift of life, but all such stories—and there are many—are mere fancies, unverified and perhaps unverifiable.

Borax for Cholera

Q.—Is there any authority for the belief that borax is effective in the treatment of cholera?

A.—There is no reliable evidence that borax is of any value in the treatment of cholera.

Testosterone into the Scrotum

Q.—Is there any valid reason why small injections of testosterone propionate (5 mg. in 1 ml. of oil) should not be given into the scrotum? It seems to me that there might be economy by this procedure. I have a case of testicular atrophy following mumps, and the cost of normally disposed treatment is high.

A.—There is no advantage in injecting testosterone propionate into the scrotum. The dose would not be diminished by giving it by this route, since the amount provided in a case of testicular atrophy should be roughly equivalent to the amount of testosterone produced by the normal testis. Testosterone has no effect on the atrophic testis itself.

“Any Questions?” Book.—The second book of selected “Any Questions?” is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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A CRITICAL ANALYSIS OF CATION-EXCHANGE THERAPY

BY

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It is now established that cation-exchange resins are sometimes an effective adjuvant to a low-salt diet in the treatment of oedema. The early hope that the use of ion-exchange resins would allow patients with cardiac oedema to take a more liberal diet and an increased intake of salt has not been realized (Greenman *et al.*, 1953). The main advantages now appear to be these: first, resin treatment may succeed when other methods have failed; secondly, by preventing the absorption of sodium and the reaccumulation of oedema fluid, the patient may be spared much discomfort, and the periodic use of mercurial diuretics becomes unnecessary.

It is often difficult to assess the contribution of ion-exchange resins to the successful results that have been reported. This is because a preliminary control period has not always been obtained, and because resin therapy has been used simultaneously with other forms of treatment, such as mercurial diuretics (Elkinton *et al.*, 1952), A.C.T.H. (Greenman *et al.*, 1951b), and abdominal paracentesis (Payne and Wilkinson, 1951). In addition, the published results show a great variation in the response of individual patients; in some a negative sodium balance was not obtained (Danowski *et al.*, 1951; Klingensmith and Elkinton, 1952), and it seems certain that these patients failed to benefit from ion-exchange therapy. Serious complications such as acidosis and potassium depletion are common to many reports (Dock and Frank, 1950; Greenman *et al.*, 1953) and were encountered in the present series. Although resins are now available in a palatable form, the large bulk that must be ingested, the relatively high cost, and the close chemical control that is necessary during treatment are practical reasons for restricting their use. Moreover, the response of many patients to rest in bed, a low-salt diet, digitalis, and mercurial diuretics is so good that no other treatment is needed.

It is clear that the selection and management of patients require considerable experience and care. Despite an abundance of biochemical data, there is little information to guide the practitioner in the safe and effective use of cation-exchange resins. The purpose of the present paper, therefore, is to present and analyse the results obtained over the past three years with special reference to the selection of patients, the methods by which dangerous complications can be avoided, and the most effective use of the resins now available.

Material and Methods

Observations were made on 39 patients with peripheral oedema due to cardiac (30) or renal (9) disease (Table II). The patients were not specially selected, and included those with all degrees of oedema from gross anasarca to minimal ankle-swelling; but many (32) had persistent chronic oedema which had failed to respond to intensive treatment by all the standard methods.

The patients were treated in bed on a constant regime, taking a low-salt diet with a restricted fluid intake of 40 oz. (1,140 ml.) a day. Six diets were analysed in duplicate, and the cation content is given in Table I.

TABLE I.—Daily Cation Content of the Low-salt Diet; Data Obtained by Analysis

	Mean	Range
Sodium ..	15 mEq	11–23 mEq
Potassium ..	48 "	41–65 "
Calcium ..	631 mg.	614–654 mg.
Magnesium ..	312 "	305–344 "
Iron ..	11 "	10–12.5 mg.

Metabolic balance studies for sodium and potassium were obtained on 12 patients during 42 three-day collection periods, and for calcium, magnesium, and iron on six patients. The diet and stools were homogenized and aliquots ashed at 550° C. in a muffle furnace. The methods of analysis were the standard techniques previously described from this laboratory (Spencer, 1950; Nabarro *et al.*, 1952); inorganic iron and calcium were determined by the methods described by Hawk *et al.* (1947). Frequent observations were made on the plasma electrolyte concentrations and on the patients' weights.

A sulphonated polystyrene cation-exchange resin was administered as a 3:1 mixture of the ammonium and potassium phases (kationium), except for four patients who were given hydrogen-phase resin (“zeo-karb 225 H”) and four who received a mixed cation-anion exchanger 29% in the potassium phase (“carbo-resin”). The usual dose was 20 g. thrice daily suspended in a liquid vehicle, taken after meals. Treatment lasted from two to eight weeks, with an average of 3.6 weeks. A special watch was kept for clinical and chemical complications, and records were kept of the patients' complaints.

There can be no doubt about the successful treatment of oedema: there is a rapid loss of weight, a water diuresis, and the swelling is grossly diminished.

Our results have been classified on the following basis:

	Excellent Over 14 lb. (6.4 kg.) +++	Moderate 14-7 lb. (6.4-3.2 kg.) ++	Failure 0-7 lb. (0-3.2 kg.) +→0
Loss in weight ..	Over 7 litres	7-3 litres	<3 litres
Excess urine volume over fluid intake (Total)	Over 7 litres	7-3 litres	<3 litres

Seven of the 39 patients had insufficient oedema to permit classification of their response in this way, and these are grouped in Table II as "not assessed." They are included in the series to give a true overall account of the patients and of the incidence of complications during treatment.

Whereas the effective treatment of oedema is obvious, the credit is easily allotted to one particular form of therapy when it should be given to a combination of several, or, more correctly, recognized as a spontaneous improvement independent of any. To reduce this error, all patients were observed during a preliminary period of at least three weeks' (average five weeks) treatment by rest in bed, a low-salt diet, and fluid restriction; digitalis and mercurial diuretics were given when indicated. Except for the diuretics, this basal treatment was continued during the administration of the cation-exchange resins, and the results obtained are not considered as an unaided response to resin therapy.

Results

The clinical results obtained in 39 patients during the administration of ion-exchange resins are summarized in Table II. In 34% of the patients there was an excellent response, with clearing of massive oedema. Considerable

TABLE II.—Clinical Response of 39 Patients to Ion-exchange Resins, Classified According to the Standards Given in the Text

	Total	Clinical Response			
		Excellent	Moderate	Failure	Not Assessed
Heart disease:					
Rheumatic ..	8	3	3	2	0
Ischaemic ..	19	4	3	5	7
Cor pulmonale ..	3	1	1	1	0
Renal disease:					
Type II nephritis ..	7	4	0	3	0
Chronic ..	2	1	1	0	0
Total ..	39	13	8	11	7

improvement was obtained in a further 21%, with loss of oedema and weight up to 14 lb. (6.4 kg.); but in 45% no definite benefit resulted. If the seven patients with minimal oedema are excluded, an excellent response or considerable improvement was obtained in 65%. The resins were most effective in type II nephritis in the absence of uraemia, and in chronic rheumatic heart disease without cardiac cirrhosis. Poor results were obtained in patients with very chronic or recurrent congestive cardiac failure, whether due to advanced disease of the coronary arteries or to rheumatic heart disease; in those with renal failure; and in oedematous patients with a plasma sodium below 130 mEq/l. after long-continued treatment by salt depletion. Three seriously ill patients died during treatment—the first from a large pulmonary embolus, the second and third from advanced coronary artery disease.

Patients' Complaints

The frequency and type of complaints induced by the ingestion of resins were similar to those reported by Klingensmith and Elkinton (1952), and are summarized in Table III. In 67% there was discomfort, mainly related to the gastro-intestinal tract, and in 11% this was severe enough to cause the treatment to be abandoned. In 10% the complaints were moderately severe but were relieved by adjust-

TABLE III.—Incidence of Complaints During Cation-exchange Therapy

Incidence of Complaints		Severity	
Anorexia ..	12	Weakness ..	7
Constipation ..	11	Paraesthesia ..	4
Nausea ..	9	Sore mouth ..	4
Vomiting ..	4	Haematemesis ..	1
Abdominal pain ..	6	Alopecia ..	1
Diarrhoea ..	4		
		Nil ..	33%
		Mild ..	46%
		Moderate ..	10%
		Severe ..	11%

ments to the regime; while in 46% symptoms were slight. Although only 33% of these patients were entirely free from symptoms, severe gastro-intestinal complaints such as stomatitis and vomiting were confined to four subjects who were given the 100% hydrogen-phase resin in the early stages of this investigation. Resin preparations which were more palatable soon became available; these could be taken by most patients over periods of several weeks. Despite these improvements, patients still objected to the large bulk of resin that was required for effective treatment.

Biochemical disorders frequently developed during treatment with cation-exchange resins, but were not often serious. A characteristic metabolic response to resin therapy is illustrated in Fig. 1, which summarizes the data obtained in the following patient.

Case 4.—A woman aged 44 had type II nephritis, with gross anasarca, ascites, and pleural effusions. B.P. 110/70; serum albumin, 1.8 g./100 ml.; plasma cholesterol, 710 mg./100 ml.; blood urea, 24 mg./100 ml., with a maximum urea clearance of 83% of normal; albuminuria 16 parts per 1,000 (1.6 g./100 ml.). There was no improvement during three weeks' treatment with rest in bed and a low-salt diet containing 15 mEq of sodium. The ingestion of 60 g. a day of a cation-exchange resin was followed by complete relief of the oedema in four weeks, a weight loss of 16 kg. and a negative sodium balance totalling 1,860 mEq. The bowels were opened twice daily by a laxative. The faecal excretion of sodium was the greatest obtained in this series of patients, but an increased renal loss of water and salt accounted for 67% of the negative sodium balance. The stool potassium increased from 8 to 96 mEq a day, and the patient developed a negative potassium balance, hypokalaemia, and a compensated hyperchloraemic acidosis. These were corrected by supplements of potassium citrate, 2 g. three times daily. As the oedema disappeared the albuminuria decreased from 16 parts to 1 part per 1,000, the serum albumin gradually rose from 1.8 to 4.8 g./100 ml., and the plasma cholesterol fell from 710 to 265 mg. per 100 ml. One year later the patient was free of oedema and in good health, with normal renal function and normal urine.

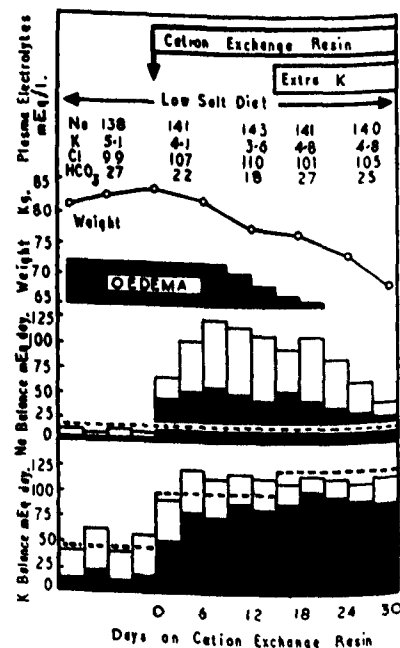


FIG. 1.—Metabolic balance chart of Case 4, type II nephritis, during treatment with ion-exchange resin. The black columns represent the stool electrolytes, while the renal excretion is unshaded. The intake is at the level of the interrupted lines, and the output is plotted upwards from zero. A negative balance is shown when the columns extend above the interrupted lines.

The frequency and type of complaints induced by the ingestion of resins were similar to those reported by Klingensmith and Elkinton (1952), and are summarized in Table III. In 67% there was discomfort, mainly related to the gastro-intestinal tract, and in 11% this was severe enough to cause the treatment to be abandoned. In 10% the complaints were moderately severe but were relieved by adjust-

Sodium Depletion

The object of resin therapy was, of course, to deplete the body of excess sodium contained in the oedema fluid, and this was achieved in 8 out of 12 patients on whom balance studies were obtained (Table IV). The mean nega-

TABLE IV.—Sodium Balances of 12 Patients Receiving 60 g. of a Cation-exchange Resin and a Sodium Intake of 15 mEq a Day

Case No.	Mean Daily Balance of Sodium			Total Balance			
	Urine Na (mEq)	Stools Na (mEq)	Balance mEq	Days	Sodium (mEq)	Water (Litres)	Weight (Kg.)
1	34	17	-36	18	-648	-10	-12
2	4	22	-11	14	-154	0	-1
3	36	21	-42	23	-966	-6	-7
4	18	64	-67	28	-1,876	-14	-16
5	0	12	+2	6	+12	0	0
6	37	41	-63	12	-768	-4	-6
7	2	21	-8	6	-48	-1	-2
8	18	37	-40	10	-400	0	0
9	0	12	-3	6	-18	0	0
10	38	15	-39	28	-1,092	-9	-11
11	22	52	-57	6	-342	-3	-5
12	34	18	-37	35	-1,295	-9	-12

tive balance of sodium in these eight subjects was 48 mEq a day, and the total sodium depletion was very great in patients relieved of gross oedema. These studies demonstrate that the action of cation-exchange resins is not confined to the removal of dietary sodium as suggested by Dock and Frank (1950) and Danowski *et al.* (1951); but also show that they extract sodium from the body fluids, thus confirming the results of Duncan (1953). The faecal excretion of sodium varied greatly in different patients, and

often declined during prolonged treatment, as it did in the studies of Cobbe *et al.* (1949), Emerson *et al.* (1951), and Barker and Mackay (1951).

A major factor, however, in the relief of oedema during resin therapy was an increased renal excretion of water and salt as noted by Greenman *et al.* (1951a). Thus the increment of sodium excretion generally had two components, an increased faecal excretion accounting for 42%, and that in the urine for the remaining 58% (Figs. 2 and 3).

The salt-depletion syndrome characterized by

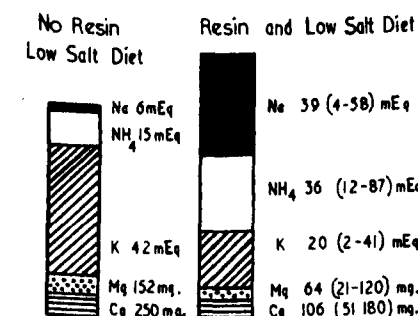


FIG. 2.—Mean daily excretion of cations in the urine of 12 oedematous patients before and during the administration of a cation-exchange resin and a low-salt diet.

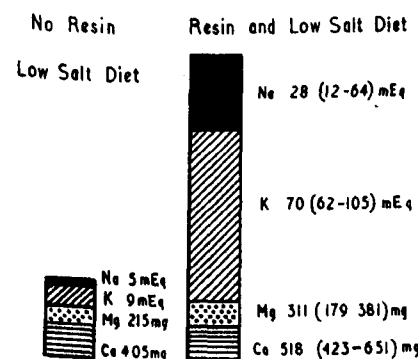


FIG. 3.—Mean daily excretion of cations in the stools of 12 oedematous patients before and during the administration of a cation-exchange resin and a low-salt diet.

weakness, anorexia, nausea, muscular cramps, a fall in blood pressure, oliguria, and uraemia, together with a low plasma sodium, was not observed in any of our patients. In nine a complaint of anorexia and nausea was not associated with any other indication of salt depletion, and possibly resulted from the local action of the resin on the gastro-intestinal

tract. Weakness was observed in seven subjects, but this was accompanied by a low plasma potassium. A normal blood urea and a plasma sodium over 130 mEq/l. is strong evidence against the existence of a serious degree of salt depletion.

The plasma sodium concentration did not fall significantly in any of the patients (Fig. 4), the mean sodium concentration remaining unchanged at 137-138 mEq/l. (81 observations). These results are similar to those reported by Kraus (1950) and by Klingensmith and Elkinton (1952); but a fall in plasma sodium during resin therapy was observed by Greenman *et al.* (1953) and Weston *et al.* (1953). The initial plasma sodium concentration was usually lower in oedematous patients (mean, 137 mEq/l.) than in normal subjects (mean, 142 mEq/l.). In six it was below 130 mEq/l., but during administration of the ion-exchange resin it did not fall any lower. The blood urea did not rise during resin treatment except in those patients with pre-existing renal failure.

Potassium Depletion

Significant potassium depletion developed in 19 out of 39 patients, as shown by the incidence of muscular weakness (7), paraesthesiae (4), electrocardiographic changes (4), digitalis sensitization (4). The plasma potassium concentration fell below 4 mEq/l. in 26 out of 83 observations. Kraus (1950) and Greenman *et al.* (1953) experienced a comparable incidence. Potassium depletion results from a gross increase in the faecal excretion of potassium, mean 70 mEq a day (Fig. 3). The renal excretion of this ion usually decreased during resin therapy, except when potassium supplements were given (Fig. 2). The deficiency was closely related to the total intake of potassium, as it was less commonly found in patients taking a resin mixture 25% in the potassium phase, and was reduced still further by supplements of potassium citrate, 2 g. three times daily (Table V). Kling-

TABLE V.—Effect of Potassium Intake on the Plasma Concentration and Balance of Potassium of Patients Taking 60 g. a Day of a Cation-exchange Resin

Total Potassium Intake (mEq/day)	Potassium Balance (mEq/week)	Plasma Potassium After 2 Weeks
41-65 (diet + 100% hydrogen-phase resin)	-270	2.1-2.9 mEq/l.
70-98 (diet + 25% potassium-phase resin)	-80	3.2-5.1 ..
90-108 (diet + 25% potassium-phase resin + 20 m.mols potassium citrate)	+20	4.3-7.5 ..

ensmith and Elkinton (1952) avoided potassium depletion by administering resin 30% in the potassium phase, while Weston *et al.* (1953) recommended supplements of potassium salts for this purpose. Potassium depletion was not always avoided by these means, and occurred whenever our patients failed, through lack of appetite, to eat all their diet.

Potassium Retention

Potassium retention occurred in two oedematous patients with impaired renal function during treatment with 25% potassium-phase resin, the plasma concentration rising to 7.5 and 7.8 mEq/l. This has also been described by Peel and Semple (1953).

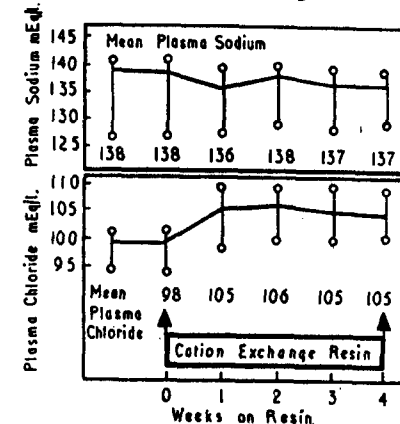


FIG. 4.—Plasma concentration of sodium and chloride ions before and during cation-exchange therapy. Means and ranges of 141 determinations on 28 patients. The graph is drawn through the means, while the vertical lines represent the ranges.

Depletion of Calcium, Magnesium, and Iron

There was no clinical evidence of depletion of calcium, although tetany (Dock and Frank, 1950; Martz *et al.*, 1952), and a low serum calcium (Greenblatt and Gilwood, 1948; Greenman *et al.*, 1953) have been reported during prolonged treatment with ion-exchange resins. The mean faecal calcium excretion increased from 405 to 518 mg. a day, but renal losses decreased from an average of 251 to 106 mg. a day (Figs. 2 and 3), and a small negative balance was found in only two patients. The mean faecal excretion of magnesium rose from 215 to 311 mg. a day and renal losses fell from 152 to 64 mg. a day, producing a mean negative balance of 46 mg. a day. No changes were observed in the serum calcium, but in five subjects the plasma magnesium was low, the mean being 2.4 mg./100 ml. (normal 4 mg./100 ml.). The faecal excretion of iron was not altered by resin therapy, and the patients remained in balance. Apart from the experiments of McChesney *et al.* (1951) and McChesney (1952), little is known about the effects of resin therapy on the metabolism of magnesium and iron.

Acidosis

It was unusual for clinical signs of acidosis to appear during treatment with cation-exchange resins. The plasma chloride usually rose, the mean increasing from 98 to 105 mEq/l. (Fig. 4). This hyperchloraemia was associated with a decrease in the plasma bicarbonate, the mean falling from 25 to 16 mEq/l. (Fig. 5). These changes were more apparent when a hydrogen-cycle resin was used. Similar observations were made by Elkinton *et al.* (1952).

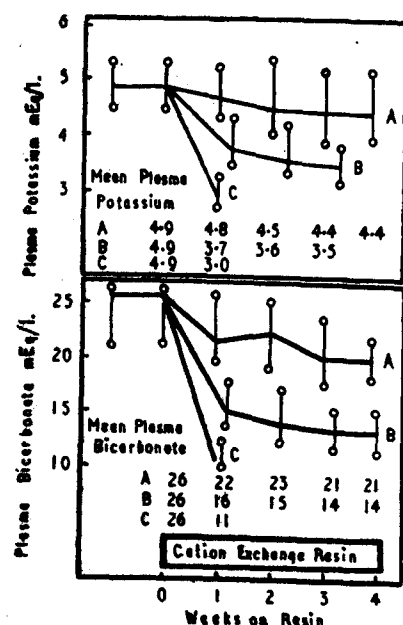


FIG. 5.—Plasma concentrations of potassium and bicarbonate ions before and during cation-exchange therapy. Means and ranges of 146 determinations on 28 patients. The graphs are drawn through the means while the vertical lines represent the ranges. A=Patients taking 60 g. of a 3:1 $\text{NH}_4^+:\text{K}^+$ -phase resin and a dietary intake of 68 mEq K. B=Patients taking 60 g. of a 3:1 $\text{NH}_4^+:\text{K}^+$ -phase resin and a dietary intake of 48 mEq K. C=Patients taking 60 g. of a 100% H-phase resin and a dietary intake of 48 mEq K.

deficient in early renal failure, and six patients developed clinical signs of acidosis, with the plasma chloride rising to 115 mEq/l. and the bicarbonate falling to 8 mEq/l. Acidosis was less apparent in four patients with renal disease who were treated with a mixed anion-cation exchanger, the mean plasma chloride being 106 mEq/l., and the bicarbonate 18 mEq/l.

Renal Failure

There was no evidence that renal failure ever resulted from resin therapy, but uraemia, acidosis, and electrolyte disorders were usually increased by this treatment. Serial determinations of the blood urea were made in 21 patients,

and in 15 these were normal throughout. Six subjects had a raised blood urea before treatment; in one of these the blood urea fell, but in the other five it increased rapidly, and treatment by exchange resins was abandoned on this account.

Factors Relating to the Effectiveness of Exchange Resins

The efficiency with which cation-exchange resins increase the loss of sodium in the stools when the diet is constant appears to be related to the intestinal motility, to the body sodium content, and to the total intake of potassium in relation to the dose of resin.

Intestinal Motility.—On the same intake of sodium and resin the faecal excretion of sodium varied greatly from one patient to another (12 to 64 mEq a day, Table IV), but when measured over a period of several days was relatively constant for the same individual. In only 4 of 12 patients taking resins did the stool sodium (mean, 48 mEq a day) clearly exceed the intake, and these had loose motions; whereas in eight constipated patients the mean daily faecal excretion of sodium was 17 mEq a day. Laxatives consistently increased the loss of sodium in the stool, in part because of the extra quantity of resin passed and of the electrolytes contained in the larger volume of stool water, but largely due to the increment in sodium bound per gramme of resin. Potassium excretion also rose, but to a smaller degree, and the ratio of Na/K ions on the resin was greatly increased whenever the bowel motility was rapid. The stool sodium of four subjects taking resins was constantly very low, and, although this was increased by laxatives, the absolute loss of sodium was still comparatively small. The significance of these observations in relation to the dynamics of cation-exchange resins in the intestines is considered in detail by Spencer, Ross, and Lloyd-Thomas (p. 603 of this issue).

Total Body Sodium.—During prolonged treatment the mean faecal excretion of sodium declined from 38 mEq a day during the first week to 22 mEq a day after six to eight weeks, but at the same time the oedema became less extensive. Stool sodium was also greater in the first week of treatment in grossly oedematous patients (mean 46 mEq a day) than in those with slight oedema (mean 27 mEq a day). However, in four patients with extensive oedema associated with a plasma sodium between 126 and 130 mEq/l. the faecal excretion of sodium in response to resins was only 14 mEq a day. The ion-exchange resins are therefore more efficient when the total body sodium is increased, except when the plasma sodium concentration is low.

Dietary Potassium.—The faecal excretion of sodium was decreased by increasing the dietary intake of potassium. With a combined potassium intake in the diet and on the resin of 88 mEq a day the mean excretion of sodium in a group of eight patients was 32 mEq a day. When extra potassium was given to a total of 108 mEq a day, the mean stool sodium declined to 24 mEq a day.

Discussion

The value of ion-exchange resins in the treatment of oedema is seriously limited by their small exchange capacity, and even more by the complete lack of specificity for the sodium ion. For example, the resin mainly used in the present study has a maximum capacity of only 3.1 mEq/g. and combines with three to four times as much potassium as sodium when in equilibrium with solutions containing equal proportions of these ions. Whereas resins are available with an *in vitro* capacity of up to 10 mEq/g. (Duncan, 1953), this has not been achieved at the hydron concentration of the intestines. Moreover, all these resins exhibit a descending order of affinities for cations, $\text{Ca}^{++} > \text{Mg}^{++} > \text{K}^{+} > \text{Na}^{+} > \text{NH}_4^{+} > \text{H}^{+}$ (Nachod, 1949).

Considering the high concentration of sodium in the small-intestinal juices, the failure of cation-exchange resins to extract large amounts of this ion from the alimentary

tract of all subjects ingesting the resin has occasioned surprise (Dock and Frank, 1950). This has led to statements that ingested exchange resins extract sodium only from the diet and the upper small intestine (Hegsted *et al.*, 1951), or that increased secretory activity of the adrenal cortex in response to sodium depletion grossly alters the sodium content of the alimentary secretions (Berger *et al.*, 1951; Berger and Steele, 1952). Such conceptions of the action of exchange resins in the body are at variance with their known physical properties. Moreover, studies from this department, using the radioactive tracers Na^{24} and K^{42} have demonstrated that cation-exchange resins establish a dynamic equilibrium with the intestinal contents throughout the alimentary tract. There is a continuous interchange of ions to and from the resin and the body pool of sodium and potassium, with a rate of turnover at least equal to the total body content of these electrolytes every 24 hours. Large quantities of sodium are taken up by the resin in the small intestine even when there is only a small excretion of this ion bound to the resin in the stools. Most of the sodium taken up in the small intestine is exchanged for potassium in the colon (Spencer, Ross, and Lloyd-Thomas, p. 603).

From these observations, it appears that the efficiency of ion-exchange resins in the treatment of oedema could be increased in at least three different ways: first, by avoiding constipation; secondly, by developing resins which have a high exchange capacity and a special affinity for sodium; thirdly, by influencing cation exchange across the mucosa of the small intestine and colon, as by the use of specific enzyme inhibitors.

In their present stage of development cation-exchange resins cannot be recommended for general use in the treatment of oedema. Most oedematous patients respond well to treatment by rest in bed, a low-salt diet, digitalis, and mercurial diuretics. These measures are generally so simple, effective, and safe that cation-exchange therapy is not likely to replace them. Some patients, however, remain oedematous despite vigorous treatment by these standard methods, and in others mercurial diuretics are contraindicated. It is in these patients that resin therapy finds its most useful application; but not all of these benefit, and in others serious complications may occur. An attempt has been made to define these two groups from an analysis of the results obtained in the present series and from those previously published. It now seems possible to select patients and manage their treatment with ion-exchange resins so that the majority become free of oedema without the risk of grave metabolic disorders.

Indications

1. **Cardiovascular Disease.**—In the absence of contraindications, treatment by ion-exchange resins is advised: (a) in persistent congestive cardiac failure of all types when pitting oedema remains after two to three weeks' treatment by standard methods; (b) when mercurial diuretics or digitalis are contraindicated because of sensitivity, toxicity, or failure to respond; and (c) during the convalescence from heart failure to prevent the recurrence of oedema. A satisfactory response is less often obtained in the presence of extensive disease of the coronary arteries, chronic congestive heart failure with cirrhosis of the liver and ascites, and whenever intensive salt depletion by other means has failed to relieve oedema. Two points merit further consideration. When the routine treatment of oedema has failed, resin therapy should not be delayed. Prolonged immobilization in bed leads to a steady deterioration, and greatly increases the risk of venous thrombosis and pulmonary embolism. Although the relief of oedema is highly desirable, it does not necessarily indicate any considerable improvement in cardiac function. In fact, treatment by resins or by other methods of salt depletion often removes many of the cardinal signs of heart failure.

Hypertensive Disease.—The use of cation-exchange resins together with a low-salt diet has been advocated as a more practical alternative to the rice diet in the treatment of

hypertension (Page, 1951; Gill and Duncan, 1952). However, six of our patients with a high blood pressure were treated in this way, and in only one was there an appreciable fall of blood pressure. The most useful application of resin therapy in hypertensive disease therefore seems to be in cardiac failure. Little information is available concerning the value of exchange resins in patients with cardiac asthma or with hypertensive encephalopathy.

Renal Disease.—An excellent response may be obtained in type II nephritis and in early diabetic nephrosclerosis, provided that the blood urea is not raised. Patients with chronic nephritis and oedema commonly have advanced renal failure and are made worse by resin therapy. Sodium-phase resins have been successfully used in the management of hyperkalaemia occurring in anuria (Merrill *et al.*, 1950; Bull, 1952).

Contraindications

Gastro-intestinal Disorders.—A poor appetite, nausea, and dyspepsia interfere with the continued ingestion of the resin or, by causing gross fluctuations in the dietary intake, precipitate potassium depletion. Anorexia and nausea are among the symptoms of sodium depletion, and are often indications for an estimation of the plasma sodium and the blood urea.

Renal Failure.—The absence of an effective renal compensation for electrolyte disorders should generally be an absolute contraindication to treatment by ion-exchange resins. Metabolic complications such as severe hyperchloraemic acidosis, potassium retention or depletion, and a rapid elevation of the blood urea are common; whereas relief from oedema is seldom achieved. The ammonium-phase resins contribute significantly to the nitrogen intake, and the usual dose is equivalent to the ingestion of 5 g. of urea a day. This extra load on the kidney would, if not excreted, raise the blood urea by 100 mg. per 100 ml. in ten days.

Advanced Liver Disease.—Ammonium phase resins may precipitate coma from ammonia intoxication in patients with advanced liver disease (Phillips *et al.*, 1952; Gabuzda *et al.*, 1952). Since effective sodium depletion can be achieved only by resins in the ammonium or hydrogen phases, and as the latter are unpalatable and likely to cause oesophageal erosions, resin treatment should not be used when liver function is severely impaired. Some excellent responses have been reported, however, in patients with cirrhosis of the liver (Gabuzda *et al.*, 1952).

Cation Depletion.—If in patients with heart failure the plasma sodium is consistently below 130 mEq/l., the daily urine volume is less than 500 ml., or the blood urea is over 60 mg./100 ml., treatment with cation-exchange resins is contraindicated. Uncorrected potassium depletion should be an absolute bar to cation-exchange therapy. This most commonly results from an inadequate intake of food associated with disease or operations on the gastro-intestinal tract, diarrhoea, and the previous use of exchange resins.

Management of Cation-exchange Treatment

The principles of management are these: to use exchange resins as an adjuvant to salt restriction, with digitalis, mercurial diuretics, and rest in bed when necessary; and to avoid complications by the exclusion of unsuitable patients, close supervision of the potassium intake, and the early detection of biochemical disorders.

Chemical Control.—Before treatment is begun it is advisable to measure the blood urea and the plasma concentration of sodium, potassium, and bicarbonate ions. The plasma potassium should be measured at intervals of one week. The treatment of patients with renal failure is not recommended, but, should there be doubt about the renal function, resin therapy may be tried, provided that weekly estimations of the blood urea, plasma bicarbonate, and potassium concentrations are available. It is helpful to keep a record of the weight, degree of oedema, urine volume, and bowel action.

Diet.—There is abundant evidence that the ingestion of exchange resins allows little increase in the intake of sodium (Greenman *et al.*, 1951a; Greenman *et al.*, 1953), and at first this should not exceed 20 mEq a day (1 g. salt). To avoid potassium depletion the intake needs to be maintained at 75 mEq (3 g.) potassium a day, in addition to that on the resin. The low-salt diet may not contain this amount of potassium, and the addition of fresh fruit will then form an acceptable supplement of this ion. Since a constant and relatively high intake of potassium is the chief safeguard against potassium depletion, close supervision of the patients' meals is required. Any failure to eat the diet should be recorded by the nurse and reported to the physician in charge. The addition of 1 pint (570 ml.) of milk a day makes the diet more palatable, and helps to prevent depletion of calcium and magnesium during prolonged therapy. Although exchange resins absorb thiamine (Nachod, 1949; McChesney and McAuliff, 1950), no evidence of vitamin deficiency has been observed during treatment (Greenman *et al.*, 1953). Nevertheless it may be advisable to provide a compound vitamin supplement. In the treatment of type II nephritis the introduction of up to 150 g. of protein into the diet is made more effective by the administration of exchange resins, which take up the increment in sodium.

Selection and Administration of the Resin.—Of the available preparations those containing a 3:1 mixture of the ammonium and potassium phases of a sulphonic or carboxylic cation-exchange resin are most generally useful. Ammonium-phase resins are contraindicated in advanced liver disease (Phillips *et al.*, 1952). The resins now in common use in this country have an effective combining capacity of about 3 mEq/g., and in adults the effective dose is 45–75 g. a day. These preparations are pleasantly flavoured, making them easy to take as a suspension in water or in fruit juices. It is immaterial whether the resins are given before or after meals (Martz *et al.*, 1952). The intermittent use of resins has been advocated by Weston *et al.* (1953). This reduces the risk of potassium depletion, the resin being given on five days a week with intervals of two days, in which potassium citrate, 2 g. three times a day, is provided in a simple mixture. There may be little response in the first ten days of treatment, but some of these patients rapidly improve thereafter. Resin therapy should therefore not be abandoned for this reason in less than two to three weeks.

Domiciliary Treatment.—In selected patients, treatment with ion-exchange resins and a modified low-salt diet (2 g. salt) has been continued at home for many months. This has successfully prevented the reaccumulation of oedema, and in this way has reduced the frequency of readmissions to hospital. These patients attend the follow-up clinic at intervals of two to four weeks for clinical supervision and estimation of the plasma electrolytes and the blood urea. Voyles and Orgain (1951) and Aaron and Weston (1952) have reported their experience of long-continued resin therapy.

Care of the Bowels.—Many patients have become constipated during the administration of exchange resins, and this may give rise to abdominal swelling and discomfort (Arnold, 1951). In the present study it has been demonstrated that the efficiency with which resins remove sodium from the gastro-intestinal tract was decreased by constipation and increased by the use of aperients. For this reason it is recommended that the bowels should be opened once or twice a day, obtaining soft stools by any laxative which suits the patient. Salts should not be used for this purpose, and diarrhoea must be avoided.

Administration of Digitalis.—An increased incidence of digitalis toxicity has been reported during treatment with cation-exchange resins (Kraus, 1950; Weston *et al.*, 1953). Gross disturbances of this kind were seen in 3 out of 28 patients in this series who were taking maintenance doses (0.25 to 0.75 mg. a day) of digoxin (Fig. 6). These occurred when the plasma potassium was reduced, and were relieved by the administration of potassium citrate. Special care

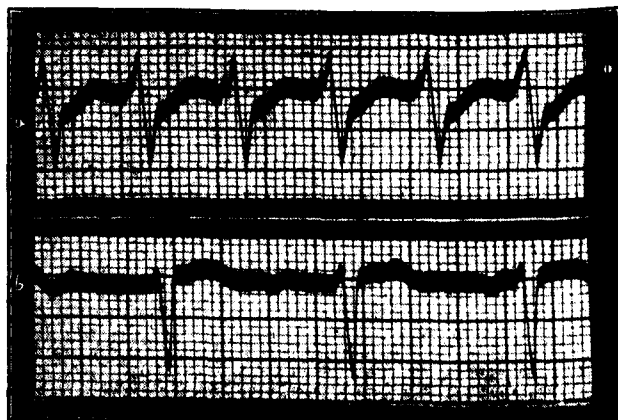


FIG. 6.—Digitalis toxicity associated with potassium depletion during the course of cation-exchange therapy. (a) Multiple ventricular extrasystoles. E.C.G. Lead I (rate 150 per minute). Plasma potassium, 3.6 mEq/l. (b) Auriculo-ventricular dissociation. E.C.G. Lead III (ventricular rate 79, auricular rate 130 per minute). Plasma potassium, 4.1 mEq/l.

should therefore be taken to avoid potassium depletion in patients taking both digitalis and ion-exchange resins. The maintenance dose of digitalis may be halved when the resin is begun, and increased later as indicated. The relation between potassium metabolism and the action of digitalis on the heart has been reviewed by Enselberg *et al.* (1950) and Lown *et al.* (1951).

Mercurial Diuretics.—Martz *et al.* (1952) and Elkinton *et al.* (1952) have reported that the efficiency of mercurial diuretics was increased during the administration of cation-exchange resins, and our recent experience confirms this observation.

Paracentesis.—When patients lose their oedema, effusions into the pleural and peritoneal cavities commonly persist. These are best removed by paracentesis in the early days of resin treatment.

Summary

Cation-exchange resins were administered to 39 patients with chronic oedema resulting from cardiac or renal disease.

A satisfactory response was obtained in 65% of those with gross oedema. Minor complaints induced by resin therapy occurred in 67%, but serious chemical disorders were uncommon.

Metabolic balance data were obtained in 12 patients, and the results are discussed and analysed in relation to the incidence of biochemical complications and to the clinical effectiveness of cation-exchange therapy.

Recommendations are made on the use of cation-exchange resins, with particular reference to the selection and management of patients and the methods by which dangerous complications can be avoided.

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CATION EXCHANGE IN THE GASTRO-INTESTINAL TRACT

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Cation-exchange resins are surprisingly inefficient at removing sodium from the gastro-intestinal tract. It had been anticipated from *in vitro* studies (Morton, 1951) that the large preponderance of sodium over other cations in the fluids of the small intestine would more than compensate for the greater affinity which such resins exhibit for potassium. In practice, when cation-exchange resins are administered to patients on a low-salt diet they remove far more potassium than sodium (Dock and Frank, 1950; Barker and Mackay, 1951; Greenman *et al.*, 1951). It has been suggested, therefore, that exchange resins extract sodium only from the diet, their activity being confined to the upper small intestine (Hegsted *et al.*, 1951). This concept is opposed by McChesney (1952) and seems to be at variance with the physical and chemical properties of the resins.

Despite the abundance of clinical and experimental studies there appears to be little direct evidence concerning the action of ion-exchange resins at various levels in the intestinal tract. Data of this kind have been obtained in the present investigation. The rates of turnover of sodium and potassium ions to and from the exchange resin have also been measured with the radioactive tracers Na^{24} and K^{42} . From these results the activity of cation-exchange resin has been interpreted

in terms of a constantly changing series of dynamic equilibria between the cations on the resin and those in the intestinal fluids. Through this medium all the cations in the body continually exchange with those on the resin. The activity of the exchange resin is not confined to one region of the intestinal tract. On the contrary, cation exchange is continuous throughout the length of the gut. The rates of turnover of cations to and from the resin are not constant, however, but undergo a regular sequence of change as the resin passes from the stomach onwards to the rectum. One result of this complex cycle of activity is that when cation-exchange resins are administered in the ammonium or hydrogen phase there is a predominant uptake of sodium in the small intestine. Most of this sodium is exchanged for potassium and other ions in the colon.

Materials and Methods

These have largely been described in the previous paper (Spencer and Lloyd-Thomas, p. 597 of this issue). The resin used in these studies was a sulphonated polystyrene of equivalence 3.1 mEq per g. of resin. The phase and mesh size is given separately in the accounts of the individual experiments.

The total electrolyte contents of the stools, intestinal contents, and enema samples were obtained by flame photometry of dilute solutions prepared from ashed aliquots of the entire specimen. The resin was isolated by flotation from aliquots of the homogenized intestinal fluid. This was facilitated by administering part or all of the resin as a coarse (40–80 mesh) powder. The resin so obtained was dried at 60° C and weighed. The cations were eluted with 4N HCl and estimated as before. The radioactivity of the acid extract was determined in a liquid counter.

Composition of Ion-exchange Resin in the Small and Large Intestines

Samples of fluid and exchange resin were obtained from the small intestine by Miller-Abbott tube (2), from a fresh ileostomy (7), and at post-mortem examination from three patients who had died suddenly from coronary thrombosis (2) or pulmonary embolism (1). In the necropsy studies samples were also taken from the proximal colon and rectum. The subjects had all been taking a low-salt diet and a cation-exchange resin, as previously described by Spencer and Lloyd-Thomas at p. 597. Their plasma sodium concentrations were in the range 137–141 mEq per litre.

SITE	SMALL INTESTINE RESIN	PROXIMAL COLON RESIN	DISTAL COLON RESIN
No. Obs.	11	3	15
Na mEq/g.	1.4	0.9	0.4
K "	0.5	0.8	1.1
Na:K	2.8	1.1	0.36

FIG. 1.—Mean concentration and relative proportions of sodium and potassium ions bound to a cation-exchange resin at different levels of the human gastro-intestinal tract.

Results.—Resin taken from the small intestine had a similar composition in all the subjects. The results of these analyses, together with those for the resin from the colon, are summarized in Fig. 1. From these data it was apparent that the exchange resin had taken up large amounts of sodium in the small intestine even though the patients were on a low-salt diet. In the distal part of the colon there was more potassium bound to the resin than sodium, while

in the proximal colon the composition of the resin was intermediate between these two. These results suggested that most of the sodium ions taken up by the resin in the small intestine were exchanged for potassium in the colon. A study was therefore made of the transfer of ions between the mucosa of the colon and the cation exchange resin.

Observations on Cation-exchange Resin in the Colon

Three experiments were completed on patients taking a low-salt diet, without exchange resin by mouth. The colon was washed out with water. Two hours later approximately 5 g. of a 40-80 mesh sulphonic acid cation-exchange resin 100% in the sodium phase was introduced into the bowel through a high rectal tube. The foot of the bed was raised, and at intervals of 60-120 minutes samples of resin were removed via the tube or were obtained as the bowels were opened. In one group of experiments the sodium-phase resin was labelled with Na^{24} , and in another K^{42}Cl was injected intravenously two hours before the enema was given.

Results.—The composition of the exchange resin as put into the lower bowel and as removed 60-120 minutes later is given in Table I. Although samples of resin removed

TABLE I

Cation	In (mEq/g. of Resin)	Out (mEq/g. of Resin)	
		Mean	Range
Na	2.8-3.1	1.4	2.5-0.8
K	0	1.1	1.9-0.3
Ca	0	0.14	0.21-0.06
Mg	0	0.18	0.24-0.08

from the colon varied in composition the results were qualitatively similar. The exchange resin regularly lost sodium in the colon, and this was replaced by potassium and to a smaller extent by calcium and magnesium. The duration of these experiments was comparatively brief, and the results of these analyses do not represent the ultimate distribution of cations on the exchange resin. The net rates of exchange as measured by the radioactive isotopes were similar to those found by chemical analysis. It was impracticable to obtain frequent samples of resin from the colon, and for this reason it was not possible to compute the rates of ion exchange both to and from the resin. Data of this kind were therefore obtained by experiments on rats.

Effect of Laxatives

It had previously been observed that, of patients taking a low-salt diet and a cation-exchange resin, those with loose motions lost more sodium in the stools than did the subjects who were constipated (Spencer and Lloyd-Thomas, p. 597). From seven patients who were constipated on such a regime the stools were collected and analysed before, during, and after a period of 48 hours in which the motions were kept fluid by the administration of castor oil or cascara.

Results.—The effect of laxatives was to increase the mean faecal excretion of sodium from 21 to 63 mEq a day, and that of potassium from 69 to 103 mEq a day, as shown in Table II. It was apparent that the faecal excretion of sodium

TABLE II.—Daily Excretion of Cations in the Stools

	Total (mEq)		Bound to Resin (mEq/g.)		
	Na	K	Na	K	Na/K
Resin only	21 (13-37)	69 (58-106)	0.32	1.2	0.26
Resin and purge	63 (39-114)	103 (73-127)	0.68	0.93	0.73

had increased for three different reasons: first, the greater quantity of stool and resin passed; secondly, the electrolytes in the extra volume of stool water; and, lastly, because of the increment in sodium bound to each gramme of resin. The method of analysis permitted the separation of these components. When the bowels were freely open the mean

excretion of sodium bound to resin increased from 0.32 to 0.68 mEq/g. and the Na/K ratio rose from 0.26 to 0.73. It was thought that laxatives had modified the uptake of cations on the resin by changing the composition of the intestinal fluids and by accelerating the passage of exchange resin from the small intestine through the colon into the stools.

Experiments with Isolated Loops of Rat Intestine

Methods.—Loops of small intestine and colon of 250-g. rats were isolated by ligature, under ether anaesthesia. Special care was taken to preserve the blood supply. Small quantities of a 40-80 mesh carboxylic cation-exchange resin were introduced into the loops with the minimum amount of water, and the loops were then returned to the abdomen. At timed intervals (20-30 minutes) 2-cm. lengths of gut were excised and their content of resin recovered and analysed as described above. In one group of rats, Na^{24}Cl or K^{42}Cl (1 μC . in 1 ml. of isotonic carrier) was injected subcutaneously two hours before the resin (100% hydrogen phase) was introduced into the gut. The data obtained permitted the calculation of the rates of transfer of sodium or potassium from the body fluids to the resin. In a second group, resin labelled with Na^{24} or K^{42} was introduced into the gut so that the rates of exchange in the direction resin to body fluid could be calculated. In a third group, resin which had equilibrated with the contents of the small intestine was transferred to the large intestine and samples of resin were removed at intervals and analysed as before. The analysis and interpretation of the data obtained follows the methods developed by Visscher *et al.* (1944) in their studies of cation transport across the intestinal mucosa. Details of these experiments will be reported elsewhere.

Results.—There is a continuous transfer of cations on and off the resin. The change in concentration of cations on the resin over a period of time is merely the net rate of transport, which is the algebraic sum of the rates of transport of cations on and off the resin. The net uptake of sodium and potassium by resin in the gut is shown in Fig. 2.

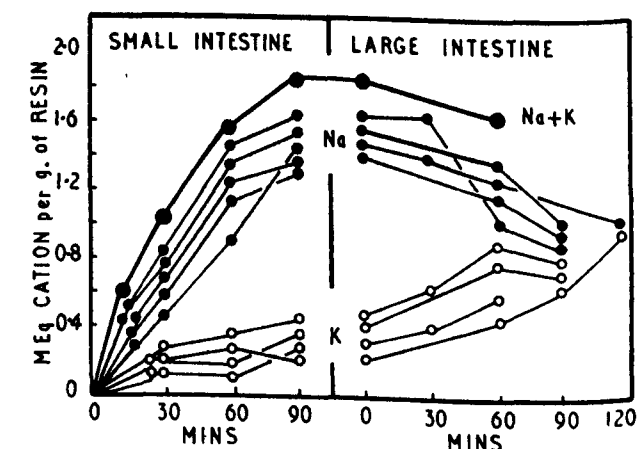


FIG. 2.—Net uptake of sodium potassium by a cation-exchange resin in the small and large intestine of the rat.

In the small intestine, 1 g. of resin took up 1.2-1.5 mEq of sodium and 0.3-0.45 mEq of potassium. When the resin in this state was transferred from the small to the large intestine it gradually lost sodium ions, but continued to take up potassium. The total Na^+ and K^+ bound to the resin fell, owing to the uptake of Mg^{++} and Ca^{++} . The ratio of sodium to potassium was 3-4:1 in the small intestine, 1:1 in the large intestine, and 0.4:1 in the faeces. The rates at which sodium and potassium were exchanged in the small intestine between the resin and its surrounding fluid after the attainment of a dynamic equilibrium were also determined. From these results it was calculated that all the sodium on the resin was turned over once every 60-75 minutes. With 5 g. of resin in the rat's small intestine, the turnover of sodium ions to and from the resin would

approximately equal the exchangeable body sodium every two hours. The turnover rate of potassium was one-half to one-third that of sodium.

Discussion

When a cation exchange resin is shaken up with an electrolyte solution in a simple container, such as a test-tube, an equilibrium distribution of ions between the resin and the solution is quickly reached. In the present experiments more than 90 minutes was required before a steady state was reached between the resin and the fluid in the rat's small intestine. The presence of resin in the gut introduces, in effect, a further electrolyte-containing compartment into the organism, the sodium and potassium of which require time to come into equilibrium with the exchangeable sodium and potassium of the body.

Even when the concentration of cations on the resin has reached the maximum for that section of the intestinal tract, there is a constant exchange of ions to and from the resin and the surrounding fluid. A series of dynamic equilibria are established between the cations on the exchange resin, those in the intestinal fluids, and eventually with those in the total exchangeable pool of cations in the body. In the rat the total exchange of sodium to and from the resin in two hours was found to be approximately equal to the entire sodium content of the body. The turnover rate for sodium was about three times greater than that for potassium. Exchange rates in the colon were slower and more variable than those in the small intestine.

However, the final concentration of cations on the exchange resin in the gut appears to depend only on the type of resin, the pH, and the concentration and physical properties of the different ions in the surrounding fluid. When an exchange resin was placed in solutions of the same pH and electrolyte concentration as the fluids of the small intestine and the colon, it took up cations in approximately the same proportions as those found on resin actually removed from these sections of the intestinal tract.

As the cation-exchange resin passes along the intestinal tract it undergoes a sequence of changes (Fig. 3). These net changes in the concentration of ions on the resin are the resultant of the simultaneous movement of cations on and off the resin.

In the fasting stomach, at a pH of 2 or less, the resin remains largely in the hydrogen phase. If ingested in the ammonium and potassium forms some of these ions are exchanged for hydrogen ions. When there is a simultaneous ingestion of exchange resin and food, the net uptake of cations by the resin will vary greatly according to the electrolyte content of the diet and the pH of the stomach. The hydrogen-ion concentration is important for two reasons. First, the uptake of cations by carboxylic resins, and to a much smaller extent by sulphonic acid resins, is dependent on the pH (Nachod, 1949). Secondly, in the presence of phosphate ions the availability of calcium and magnesium ions for exchange is greatly increased in acid solutions. Under these conditions there is a considerable uptake of calcium and magnesium from the diet of an acid stomach (pH 3-6). Because of the great affinity of exchange resins for these ions, they are not subsequently displaced to any considerable extent by sodium or potassium ions.

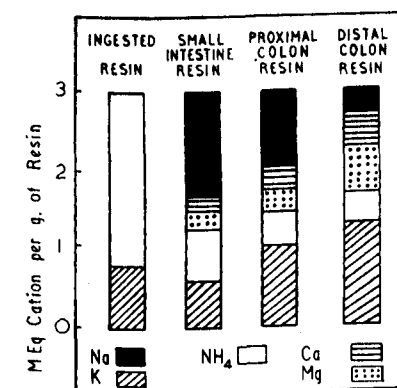
In the small intestine there is a net uptake of sodium reaching up to 1.5 mEq/g. of resin in our experiments, and of potassium 0.3-0.5 mEq/g. of resin. Here the concentration of sodium in the intestinal fluid (86-134 mEq/l.) is much greater than that of potassium (6-17 mEq/l.), and this more than compensates for the smaller affinity of the resin for sodium as compared with potassium. If the ingested resin contains more potassium than 0.5 mEq/g. of resin the excess is exchanged for sodium. The concentration of electrolytes in the jejunal fluids is altered by ingested food, and this factor influences the net uptake of cations by the resin at this level of the intestinal tract. With a low-sodium, high-potassium diet, the resin takes up a preponderance of potassium ions in the jejunum, most of which is displaced by sodium lower down in the small intestine. Resin ingested in the ammonium phase continues to lose this ion.

By the time the resin has reached the proximal colon a net loss of sodium is already apparent, largely in exchange for potassium ions. This process continues as the resin passes along the colon to the rectum, the concentration of cations on the resin in the proximal colon being 0.9 mEq of sodium per g. of resin, and 0.8 mEq of potassium per g. of resin; and in the stools 0.4 mEq of sodium and 1.1 mEq of potassium per g. of resin. The concentration of electrolytes, expressed as mEq/l. of water of the gut contents, gradually changes along the course of the large intestine. In the caecum the values were similar to those in the small intestine—sodium 93-118 mEq/l., potassium 12-21 mEq/l. In the sigmoid colon and in the stool water, however, there was generally more potassium than sodium, the concentrations being sodium 6-38 mEq/l., potassium 14-44 mEq/l. Throughout the length of the gut the cations in the intestinal fluids compete for the free valencies in the resin. In the colon the net exchange of sodium ions bound to the resin for potassium and other ions merely results from the change in concentration and relative proportions of these ions in the fluids of the large bowel. It is possible that this exchange of sodium for potassium may begin in the distal part of the small intestine. When resin is ingested in the ammonium phase some 10-20% of the resin in the stools is still in this phase. The low-salt diet used in these studies was also comparatively low in calcium and magnesium, but resin in the stool contained up to 0.3 mEq/g. of resin of both these ions, the quantity actually bound to the resin varying with the pH of the stools when analysed.

When dietary sodium is low there is a reduction in the excretion of sodium bound to exchange resin in the stool (Dock and Frank, 1950; Greenman *et al.*, 1951; Martz *et al.*, 1952), and this decrease is most conspicuous in salt-depleted subjects (Emerson *et al.*, 1951). Berger and Steele (1952) have suggested, therefore, that the electrolyte content of the intestinal fluids is altered by salt depletion, in response to increased secretory activity of the adrenal cortex. The observation that injections of deoxycortone acetate decrease the faecal excretion of sodium bound to resin (Berger *et al.*, 1951) appears to support this concept. While it is true that McCance (1938) has reported change in the electrolyte content of the salivary and gastric juices during severe salt depletion, there does not appear to be any direct evidence of similar alterations in the composition of the fluids in the small and large intestines.

In the present studies the patients were maintained on a low-salt diet, but were not seriously depleted of sodium. Under these conditions, exchange resin removed from the small intestine was still predominantly bound to sodium. Salt restriction did not materially alter the sodium content of the fluid in the small intestine. In the same patients the excretion of sodium bound to resin in the stool was low. It would therefore seem that the effect of salt restriction was to make the colon more efficient at removing sodium from the resin. The reabsorption of sodium is a normal function of the colon, and the increased efficiency of this mechanism during salt restriction is comparable to that exhibited by the sweat glands and the kidneys.

FIG. 3.—Mean concentration of cations bound to an exchange resin during its passage along the human gastro-intestinal tract.



By the use of laxatives it was possible to increase the faecal excretion of sodium during the ingestion of cation-exchange resins. However, a great increment in sodium excretion was obtained only when the stools were kept fluid. Vigorous treatment of this kind is not recommended, as, besides the discomfort, purgatives greatly augment the excretion of potassium in the stool water. During treatment with cation-exchange resins the aim should be to keep the motions loose but not actually fluid, and to supplement the dietary intake of potassium. Saline laxatives, the cations of which become bound to the resin, and liquid paraffin, which coats the resin with a water-repellent film, must of course be avoided.

Summary

The net uptake of cations by an exchange resin was determined at different levels of the intestinal tract in man. The rates of turnover of Na^{24} and K^{42} to and from the resin were also measured in the small and large intestines of the rat.

A series of dynamic equilibria are established between the cations on the exchange resin and those in the intestinal fluids. These transfers are continuous throughout the gut, but the rates of turnover and the net uptake of cations by the resin change as it passes onwards from the stomach to the rectum.

Cations throughout the body continually exchange with those on the resin by way of the intestinal fluids.

These concepts have been used to interpret the results obtained during the treatment of patients with cation-exchange resins.

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The Minister of Food, Major Gwilym Lloyd-George, M.P., has approved for publication a report presented to the Food Standards Committee by its Metallic Contamination Subcommittee on the amount of zinc that should be permitted in food. The report recommends that no exception need be taken to the presence of traces of zinc in foods in amounts not exceeding, in "beverages ready to drink," 5 parts per million (p.p.m.), and in other foods 50 p.p.m. This recommendation is subject to a few exceptions; thus a limit of 100 p.p.m. has already been prescribed for edible gelatin, and the subcommittee sees no objection to the sale of certain animal and vegetable products with a high natural zinc content—even when it exceeds 50 p.p.m. Attention is drawn in the report to the undesirability of using zinc and galvanized iron containers in the preparation or storage of foods. The subcommittee states that zinc, like copper, has a definite physiological function in the human organism. The normal daily intake of an adult is estimated at 12 mg. It considers that public health requirements would be met by observance of the limits proposed, and that, in the absence of any new developments, statutory effect need not be given to the limits recommended.

CARCINOMA COMPLICATED BY PROXIMAL MOTOR NEUROPATHY DUE TO VITAMIN-B DEFICIENCY

BY

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Though the number of cases of neuropathy associated with cancer is not so far very great, it is probable that many are overlooked, and that patients who might otherwise have lived useful lives for months or years suffer unnecessarily or come to an untimely end. The general practitioner must usually undertake the care of the patient with incurable malignant disease, and he is unlikely to be aware of this particular complication, still less that it responds well to the correct treatment if given promptly.

The Literature

Spillane (1947) reviewed the effects on the central nervous system of deficiencies of the various members of the vitamin-B group. Cases of neuropathy associated with carcinoma, including many cases of true peripheral neuropathy with sensory disturbances, are reviewed by Denny-Brown (1948) and by Lennox and Prichard (1950). The cases of true peripheral neuropathy are not dealt with here.

Five cases of neuropathy associated with carcinoma of the bronchus were reported by Lennox and Prichard. Two actually under their care (Cases 1 and 2) were typical of peripheral neuropathy with motor and sensory phenomena. The other three (Cases 3, 4, and 5) seem quite different, and may have been similar to the cases reported below from the Royal Cancer Hospital. The points of difference which stand out include:

Cases 1 and 2

1. Sensory symptoms early.
2. True peripheral weakness—for example, foot-drop.

Cases 3, 4, and 5

1. Absent or minimal sensory phenomena, subjective and objective.
2. An early symptom, at any rate in Cases 3 and 5, was inability to sit up in bed; perusal of the clinical description leaves a very real doubt regarding the main sites of weakness. The evidence suggests that the proximal musculature bore the main brunt. In Case 4 the details given are insufficient to throw light on this aspect.
3. Palatal weakness, dysphagia, and, in Case 5, facial weakness were involved—that is, the brain-stem was rapidly and severely affected.

Heathfield and Aldren-Turner (1952) described a case of neuropathy associated with presumed carcinoma of the bronchus. In this case no sensory symptoms and few sensory signs were elicited, and the weakness seems to have involved the hips and knees as well as the ankles and, only slightly, the

grip. Here, therefore, the proximal muscles were involved significantly. It is of note that a pyruvate-tolerance test done before treatment was abnormal, and returned to normal later. The sensory abnormalities and the peripheral element of the weakness responded to aneurine, nicotinic acid, and riboflavine therapy, though some weakness, especially of the hips, remained. No pantothenic acid or pyridoxine was used.

It is worth recalling that Spies *et al.* (1940) reported that patients who recovered from pellagra after treatment which did not include pyridoxine were significantly helped by the intravenous administration of this substance; the symptoms relieved included muscular weakness and difficulty in walking.

Experimental Work

With regard to experimental work on animals, Follis and Wintrobe (1945) reported peripheral nerve lesions without posterior root ganglion damage in pigs deficient in pyridoxine. With pantothenic acid deficiency, however, the posterior root ganglia were early affected. An interesting description is given of the gait of pigs affected. With pyridoxine deficiency "a swaying of the hindquarters and twisting of the legs with a broad base" was seen, but with pantothenic acid deficiency "a jerky military goose-step" with no twisting was observed. Follis and Wintrobe failed to produce nerve lesions with aneurine deficiency alone.

Swank and Adams (1948) confirm the above to a large extent, particularly the twisting movements of the hind legs, and later the forelegs, with pyridoxine deficiency, and the stiff "goose-step" gait with pantothenic acid deficiency. They also demonstrated with rough tests the preservation of sensation in pyridoxine deficiency, at any rate in the early stages. The final pictures of both deficiencies when prolonged are reported to be similar.

This peculiar swaying gait of the pigs I would interpret as due to weakness of the proximal musculature and comparable with the trick movements noticed so often in true myopathies. The "military goose-step" is presumably due to peripheral weakness with, possibly, tenderness and paraesthesiae contributing; but other explanations are equally plausible and cannot be excluded.

Meiklejohn (1940) and Wintrobe *et al.* (1944) reviewed the evidence on the part played by aneurine in neuritis, and concluded, in brief, that its deficiency was not the cause. Swank and Adams reviewed the evidence again, and concluded that aneurine did have an antineuritic property. This point seems to be far from settled, and further experimental work will be needed before a definite decision can be made. Similar doubts exist about the role of nicotinic acid and riboflavine in the pathology of neuritis.

Two Distinct Types

There does not appear to be any previous record which distinguishes two distinct types of neuropathy associated with cancer—one primarily affecting the proximal musculature and the other primarily peripheral and associated with sensory disturbances. An account is given of two cases of the former seen at the Royal Cancer Hospital.

Case 1

A painter aged 61 had had pain in the left side of the face for seven months before admission, and for six weeks had noticed swelling of the left cheek and a discharge from the left nostril. Ten days previously an x-ray examination at the Royal National Throat, Nose, and Ear Hospital had revealed destruction of the bony walls of the left antrum, and a fenestration of the palate had been performed by Mr. Maxwell Ellis. A biopsy taken then was reported by Dr. J. W. Whittick as showing very active, poorly keratinizing squamous-cell carcinoma. The patient had noticed weakness, of fairly sudden onset, particularly of the spine and arms, about a week before admission to hospital, and had developed oedema of the arms and a rash. Prior to this the only neurological symptoms were those attributable to pressure of the growth on the floor of the orbit—namely, slight proptosis of the left eye with diplopia; numbness to pinprick and cotton-wool of the first and second divisions of the left fifth nerve but sparing the upper branches of the first division which supply the scalp and forehead; and diminution of the left corneal reflex. A slightly lower motor neurone weakness of the left facial nerve affecting the mouth may also have been due to local involvement.

Examination on the fifth day showed gross weakness of the axial spinal muscles, including the sternomastoids, trapezius, pectoral girdle, and ilio-psoas muscles, but little or no weakness of grip, or dorsiflexion of the ankle or other peripheral muscles. The patient was unable to sit up in bed, to hold his arms horizontally in front of him, or to raise a leg off the bed unaided; only with difficulty could he lift his head off the pillow. No sensory changes could be detected, except those mentioned above in the first two divisions of the left fifth nerve. There was no significant wasting, and the reflexes were present in the right arm but not in the left. The knee-jerks were diminished, the ankle-jerks brisk, and the plantar flexor. There was slight oedema of both arms, the left more than the right; at the time this was attributed to drooping of the shoulders leading to compression of the venous return from the arms. Undoubtedly this was part of the truth.

The skin eruption was described by Dr. H. W. Gordon as "curious telangiectatic papular areas on the back of the neck behind the ears, on the sides of the neck, on the outer side of the left arm, and on the right side of the face, which appeared about two weeks before admission. I am at a loss for an exact diagnosis." It was also noticed that there was a mucopurulent conjunctivitis of the left eye, which recovered with routine treatment.

On the third day his serum globulin was 3.12 g.%, albumin 3.25 g.% (total protein 6.37 g.%), and an x-ray film of the chest showed a normal heart shadow. On the sixth day R.B.C. were 4,520,000; Hb, 77%; W.B.C., 19,000. The day after this a Caldwell-Luc operation was performed by Mr. W. A. Mill, and a swab of the pus obtained at that time showed a profuse growth of coagulase-positive *Staphylococcus aureus*, insensitive to penicillin. On the seventh day a lumbar puncture produced a clear C.S.F. under normal pressure. There was no block, and the total protein was 15.2 mg. per 100 ml., there was no increase in the cell count, and the Lange and Wassermann reactions were negative. Up to this time his weakness and oedema had increased, but there was no other change. He had a temperature each night of 99° F. (37.2° C.) for the first ten weeks, after which it subsided.

He had been receiving, in addition to his food, 5,000 units of vitamin A, 30 mg. of vitamin C, 600 units of vitamin D, 1 mg. of aneurine, 1 mg. of riboflavine, and 15 mg. of nicotinic acid daily, with some ferrous sulphate, this being a routine at the Royal Cancer Hospital. On the 20th day this was supplemented by "becozym" injections, providing in all 11 mg. of aneurine, 5 mg. of riboflavine, 55 mg. of nicotinamide, 4 mg. of pyridoxine, and 6 mg. of pantothenol daily.

From the 21st day a remarkable change began—namely, his weakness rapidly decreased so that he was able to hold up his arms and almost sit upright unaided. The oedema, however, increased and involved the legs, and did not begin to improve until about the 36th day, certainly not earlier. On the 30th day the dose of aneurine was raised to 111 mg. daily, and given intravenously. Owing to a misunderstanding it was omitted on the 31st to 33rd days inclusive, but was continued thereafter until the 39th day. By the 37th day his recovery of power was complete, and he gave a demonstration of shadow boxing in mistaken enthusiasm, before being promptly confined to bed again, as he still had an increased venous pressure and oedema. A brisk diuresis occurred between the 39th and the 46th day, resulting in a fall of 19 lb. (8.6 kg.) in weight, and his venous pressure returned to normal. An x-ray film of the chest on the 31st day showed a slight increase in the diameter of the heart, and an early effusion in each costophrenic angle. On the 48th day the x-ray picture was back to normal. Between the 27th and the 30th day he received 500,000 units of penicillin twice daily, but as the organisms were proved insensitive to this, and it had no effect on his temperature, this may be regarded as ineffective and omitted from the discussion.

Ever since admission he had been receiving regular x-ray treatment to the antrum and secondary nodes in the left side of the neck, the dose increasing almost linearly until on the 59th day he had received a maximum of 5,100 r and a minimum of 3,660 r to the antrum and about half of this amount to the glands.

An electromyographic examination was carried out by Dr. P. Bauwens about seven months later, but nothing abnormal was found. He regarded the diagnosis of myasthenia gravis as excluded by this examination. A fractional test meal done at about the same date showed free acid in the resting juice and a hyperchlorhydric curve after histamine.

There can be no doubt that the patient suffered from a vitamin-B deficiency, leading to cardiac weakness and a proximal motor neuropathy. The time relations strongly suggest that either pyridoxine or pantothenic acid affected the neuropathy beneficially, and that aneurine hydrochloride in large doses intravenously cured the myocardial weakness. The patient was still alive when this report was drafted, and there had been no recurrence of the neuropathy, but further radium treatment for his carcinoma had been necessary.

Case 2

A woman aged 56 had for nine years noticed a lump in her right breast which, two months before attending hospital, ulcerated and was subsequently so typical of an advanced scirrhous carcinoma with secondaries in the axilla that biopsy was omitted as unnecessary. Just before x-ray treatment was started she noticed aching in the upper part of her back and weakness, particularly of the muscles used to hold up her head. There were no sensory symptoms or signs. On examination about one month after starting x-ray treatment there was definite weakness of the sternomastoids, trapezii, the extensors and flexors of the whole spine (but particularly of the cervical spine), deltoids, supraspinati and infraspinati, serratus anterior, and the ilio-psoas groups. The distal limb muscles were not affected at all. The triceps-jerks were absent, but other reflexes were present. She was unable to sit up without using her arms, and exhibited trick movements when extending her neck and thoracic spine. She had a sad "myopathic" facies, but no definite weakness of the facial muscles could be demonstrated. There was considerable generalized loss of subcutaneous fat, attributed to the ulcerating carcinoma.

Two months after starting radiotherapy an x-ray film of the cervical spine showed no evidence of secondary deposits, only early osteoarthritis. At the same time screening of the chest showed marked impairment of movement of the anterior portion of the left diaphragm. A month later a lumbar puncture showed a normal C.S.F. with no block and

under normal pressure: total protein 31 mg. per 100 ml., globulin negative, no increase in cells, Lange and Wassermann reactions negative. Electromyography, performed about the same time, showed no spontaneous activity in the right trapezius, right deltoid, or left trapezius, but, on volition, the pattern of motor unit activity was decreased and the units were broken up as is seen in neurogenic lesions.

Radiotherapy to the breast and associated lymph nodes lasted three months and the maximum total dose approached 6,000 r to the breast and axilla. One month after the end of this treatment the mass of malignant tissue had almost completely disappeared and her muscular weakness began to decrease. At the same time as this was noted she was also given aneurine hydrochloride by mouth, 9 mg. daily. Looking back, one can see that it would have been much more helpful if this had been prescribed two or three months earlier, as, anyway, improvement would be expected with the suppression of the carcinoma; therefore the effect of the aneurine at that particular time cannot be assessed one way or another. This improvement in muscular weakness continued slowly but fairly steadily.

Ten months later her right shoulder had become "frozen," despite physiotherapy, and the right trapezius was seen to be almost totally denervated, owing to local extension of the growth. Her other muscle weakness still existed, but to a less extent. Pyridoxine, 50 mg. intravenously twice weekly, was given until a total of 200 mg. had been reached. The patient stated that she had noticed a great improvement during this period, much more than in any other two weeks; and examination confirmed this: there seemed to have been complete recovery of the ilio-psoas group. The cervical spinal muscles were still detectably weak, however. She has continued to take 50 mg. of pyridoxine daily by mouth since then and has become almost normal, apart from the "frozen" shoulder and right trapezius paralysis.

A fractional test meal showed no free acid in the resting juice or until 30 minutes after an injection of histamine (0.5 mg.), but specimens withdrawn 30 to 50 minutes after the injection contained free acid in normal amounts.

The patient was still alive and reasonably well when this account was written, despite the presence of the carcinoma in the breast, axilla, and supraclavicular region.

Discussion

There seems to be no doubt that both conditions were causally related to the carcinoma, and in one case there is incontrovertible evidence of return to normal following vitamin-B therapy; in the other case the evidence is less strong. In both cases the weakness began before treatment with x rays and therefore cannot be attributed to irradiation. The possibility of erroneous diagnosis seems excluded by electromyography, which showed no evidence of myopathy, myasthenia, or anything other than neuropathy. Fasciculation was not seen in either case, nor was muscle tenderness a feature. It is possible that hypochlorhydria played some part in predisposing to vitamin-B deficiency in Case 2, but it seems more reasonable to suppose that the condition really arose from competition by the tumour for the vitamin, leading to a bodily deficiency.

Taken in conjunction with the other evidence quoted above, these two cases seem to be examples of a nosologically distinct disease due to a deficiency of vitamin B and caused by cancer indirectly. An attempt has been made to combine all these facts by the simplest hypothesis, outlined as follows:

Vitamin-B group deficiency occurs in many forms of carcinoma, but most often in carcinoma of the bronchus. At least two distinct types exist: (1) Proximal motor weakness, often with brain-stem lesions and no sensory component, and no abnormality in the C.S.F. (2) Peripheral mixed motor and sensory neuropathy with sensory phenomena predominating, and often with abnormal C.S.F. (cf. Guillain-Barré syndrome).

The first I would attribute mainly to pyridoxine deficiency; the second to deficiency of some other member of the vitamin-B group, pantothenic acid or riboflavin being the most likely. No doubt mixed types occur, since nearly always when one member of the vitamin-B group is deficient, others are also. It is not surprising, therefore, that pyruvate-tolerance tests are abnormal in most cases. Solely from the point of view of therapy, it follows that the ideal treatment is daily intravenous injections of aneurine, with other members of the vitamin-B group, including pantothenic acid and pyridoxine, in large doses. For the purpose of elucidating these syndromes, however, it would be of great value to treat some cases with pyridoxine or pantothenic acid alone, and to observe the results, being prepared to add the other vitamins if necessary.

With regard to animal experiments, a different approach is indicated. The feeding trials of Follis and Wintrobe and of Swank and Adams need to be repeated, but with the emphasis on function, not histology, and with careful assessment of motor and sensory changes by clinical examination of the living animal and by electromyography. This is really only a special case of the generalization that in medicine, except to the anatomist, details of structure are significant only in their relation to function. Swank and Adams report, for example, that the motor roots of certain pyridoxine-deficient animals were normal, but this gives no information about the presence or absence of muscle weakness, since the motor nerves might well be functionless at some point distal to the motor root, and retrograde degeneration of nerves does not occur to any great extent (though one might have expected chromatolysis of the anterior horn cells to be visible).

Summary

The importance of recognizing neuropathy in cancer patients is mentioned, and two cases of proximal motor neuropathy in association with carcinoma are described. In the first, there was also cardiac weakness similar to the mixed type of beriberi. Both cases subsequently recovered neurologically, and there is definite evidence that vitamin B was responsible, particularly pyridoxine. In both the carcinoma is still present, although it has responded to irradiation. These cases should be differentiated from cases of true peripheral neuropathy. A hypothesis based on competition for the vitamin by the tumour cells is suggested. It is also suggested that pyridoxine should be included when treating these cases in future.

My thanks are due to Mr. Maxwell Ellis, Mr. W. A. Mill, Mr. A. H. Hunt, and Dr. Worster Drought for permission to publish case reports of patients under their care. I am also indebted to Dr. M. Lederman and many of my colleagues for their co-operation, and also to Dr. Frank Sargent, who first suggested to me the theory of substrate competition.

[Since this paper was written an account of eight cases of proximal motor neuropathy in association with carcinoma of the bronchus has been published by R. A. Henson (*Proc. roy. Soc. Med.*, 1953, 46, 859).]

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METHOD OF ESTIMATING ISONIAZID IN BIOLOGICAL FLUIDS

BY

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Several colorimetric methods have been proposed for estimating isoniazid (isonicotinic acid hydrazide) in biological fluids (Kelly and Poet, 1952; Rubin *et al.*, 1952; Ginoulhiac, 1952; Smolarek and Stahl, 1953; Wojahn and Wempe, 1953; Jacobs, 1953).

The following method was developed in an attempt to improve the specificity of isoniazid estimations. It depends on the reaction between isoniazid and picryl chloride (2-chloro, 1,3,5-trinitrobenzene) to form a coloured compound, which may be measured photoelectrically.

While our work was in progress a method for the estimation of isoniazid with picryl chloride was described (Kirschbaum, 1952), but not its application to biological fluids.

Method for Plasma

Reagents.—Whenever available, all reagents used were of analytical reagent grade.

10% (W/V) sodium tungstate.2H₂O

2/3N sulphuric acid

N sodium hydroxide

N/10 hydrochloric acid

Ammonium sulphate

n-butanol 1 part, diethyl ether 3 parts

Phosphate buffer pH 7: 60 ml. of M/5 disodium hydrogen phosphate added to 40 ml. of M/5 potassium dihydrogen phosphate.

Phosphate buffer pH 6.5: 30 ml. of M/5 disodium hydrogen phosphate added to 70 ml. of M/5 potassium dihydrogen phosphate

5N acetic acid

Picryl chloride (Hopkin and Williams). This reagent should be washed twice in distilled water, recrystallized twice from chloroform, and air-dried. It is stored in a dark bottle in the refrigerator.

A freshly prepared solution—35 mg. of picryl chloride in 10 ml. of ethanol—is required for the estimation.

Procedure

Plasma (heparinized) from 10 ml. of blood is required for the estimation.

Protein Precipitation.—8 ml. of distilled water, 4 ml. of plasma, and 2 ml. of sodium tungstate solution are measured into a 1-oz. (30-ml.) screw-capped bottle. After mixing well, 2 ml. of 2/3N sulphuric acid is slowly added, with constant shaking. The lid is screwed lightly in position, and the bottle placed in a boiling-water bath for five minutes, cooled, and centrifuged for 10 to 15 minutes—that is, enough to make possible the withdrawal of 12 ml. of supernatant protein-free fluid.

Extraction of Isoniazid into Butanol-Ether Mixture.—11 g. of ammonium sulphate, 0.5 ml. of N sodium hydroxide

solution, 1 ml. of phosphate buffer pH 7, 40 ml. of butanol-ether mixture, and 12 ml. of supernatant protein-free fluid are measured into a glass-stoppered 2-oz. (60-ml.) bottle. The bottle is shaken vigorously for five minutes (mechanically) and then allowed to stand until the butanol-ether and aqueous phases separate. The butanol-ether phase is transferred as completely as possible to a fresh 2-oz. glass-stoppered bottle.

Extraction of Isoniazid into Hydrochloric Acid.—The butanol-ether extract is shaken for two to three minutes with two separate volumes of 5 ml. of N/10 hydrochloric acid. The combined acid extracts are then placed in a 6 by 1 in. (15 by 2.5 cm.) test-tube.

Colour Reaction.—1 ml. of N sodium hydroxide and then 2 ml. of phosphate buffer pH 6.5 are added to the acid extract. After mixing well, 0.5 ml. of freshly prepared picryl chloride solution is added and the tube heated for 20 minutes in a boiling-water bath. The tube is cooled and 0.4 ml. of 5N acetic acid is added, followed by 6 ml. of *n*-butanol. After being shaken for approximately one minute the tube is centrifuged and the butanol phase transferred to a test-tube, two drops of ethanol being added to prevent any cloudiness due to water droplets.

Colour Measurement.—Readings are made against water in a Hilger absorptiometer, using a 4-cm. (8-ml.) light-path cell and an Ilford blue-green filter No. 603 (absorption maximum 485 m μ).

Standard Curve.—Results are calculated by comparison with a standard curve. This is prepared from readings obtained by applying the method to known freshly prepared solutions of 0, 4 μ g., 8 μ g., and 16 μ g. of isoniazid, each level in 4 ml. of pooled, non-haemolysed plasma from blood transfusion material. The reproducibility of the method is satisfactory: the absorptiometer readings are linearly related to the amounts of isoniazid present within the range 0 to 20 μ g. The standard deviation of a single estimation is about $\pm$ 10%. It is necessary to estimate unknown samples and standard samples concurrently.

Method for Urine

The same method is used as for plasma, but protein precipitation is omitted.

Test samples are read against standard aqueous isoniazid solutions treated in the same way.

Specificity of Method

Metabolic Products of Isoniazid Ingestion

The urine of human subjects after isoniazid ingestion is known to contain isoniazid, isonicotinic acid, and isonicotinoyl glycine (Cuthbertson *et al.*, 1953). Isonicotinamide was not detected, but could have been present undetected in amounts of up to about 5% of the dose. The reactions of these substances with picryl chloride have been described (Cuthbertson *et al.*, 1953). Quantities of 150 μ g. of each of the last three substances do not interfere in the recommended method.

Another metabolic product of isoniazid ingestion is also present in human urine, but its nature is unknown. By paper chromatography of concentrated urine solutions using water-saturated *n*-butanol as developing solvent, this substance has approximately the same *R_F* value as isonicotinamide. It reacts with picryl chloride to form a red-coloured compound at alkaline pH and a yellow-coloured compound at acid pH, but does not react with the cyanogen bromide-pyrazolone or cyanogen bromide-benzidine reagents in the same way as isonicotinamide (Cuthbertson *et al.*, 1953).

Since this substance reacts with picryl chloride similarly to isonicotinic acid and isonicotinamide, it is unlikely to interfere in the determination of isoniazid by our method. This assumption is supported by the fact that after isoniazid ingestion some 24-hour human urine samples contain little or no isoniazid, as shown by this method, but do contain appreciable amounts of the unidentified substance, as shown by chromatography.

Wojahn and Wempe (1953) have shown that isoniazid combines through its hydrazide group with an unknown substance or substances in plasma and urine to form micro-biologically inactive or less active compounds. We have no direct evidence to show whether or not these compounds, if different from the unknown metabolite described above, interfere in our method. Circumstantial evidence indicates that they interfere only slightly, if at all. Smolarek and Stahl (1953), using a method that does not measure this type of "bound" isoniazid, found that the average 24-hour urine excretion of free isoniazid in five human subjects receiving a single 500-mg. oral dose of isoniazid was 17.5% of the dose. The individual values varied between 13.6% and 22.5% of the dose. We found that the 24-hour urine contents of isoniazid in two human subjects each receiving 250 mg. of isoniazid orally every 12 hours were 21% and 22% of the dose. Furthermore, approximate assessments of the isoniazid content of urine samples from chromatographic evidence agree with actual estimations.

Since isonicotinic acid is a metabolic product of isoniazid ingestion in human subjects, hydrazine could also be liberated. Hydrazine reacts with picryl chloride to form hexanitrohydroazobenzene (Kulberg and Cherkosov, 1952), the light absorption of which would be measured by this technique. However, Kelly and Poet (1952) and Kelly *et al.* (1952) have not detected the presence of free hydrazine in the body fluids of the animals they studied. Using their method, we were unable to detect free hydrazine in the plasma of human subjects receiving orally 200 mg. of isoniazid per subject, or in the plasma of guinea-pigs (body weight 380 to 420 g.) receiving orally 10 mg. of isoniazid per guinea-pig, at $\frac{1}{2}$, 1, 2, 4, or 7 hours after the dose. Also 24-hour urine samples from human subjects receiving 500 mg. of isoniazid orally contained no free hydrazine.

Streptomycin and *p*-Aminosalicylic Acid

Experiments were performed to detect any possible interference with the picryl chloride method by streptomycin or *p*-aminosalicylic acid.

In aqueous solutions of isoniazid the addition of 500 μ g. of streptomycin per ml. caused no increase in the readings obtained.

p-Aminosalicylic acid was found to interfere even in relatively low concentrations. For this reason it was possible to perform isoniazid assays only on patients not at the time receiving any *p*-aminosalicylic acid, but streptomycin therapy was not a factor of importance in this connexion.

Results

Plasma

Isoniazid was estimated in the plasma of 24 patients. Twenty-two received 100 mg. and two 150 mg. of isoniazid orally every twelve hours. Table I gives each patient's dose in mg. of isoniazid per kg. body weight.

Blood samples were taken by venepuncture shortly before the morning dose of the drug, and three further samples were withdrawn at intervals of 30, 60, and 120 minutes afterwards. Preliminary tests had soon shown that the picryl chloride method was not sensitive enough to detect any isoniazid in plasma twelve hours after the last dose, and so it was considered permissible to treat the early morning plasma of each patient as a "blank."

Table I shows the results obtained from these patients. In general, the plasma levels are somewhat lower than the figures quoted in previous publications (Elmendorf *et al.*, 1952; Rubin *et al.*, 1952), and the highest level was almost always found 30 or 60 minutes after the dose.

In 10 patients receiving 1.15 to 1.5 mg. of isoniazid per kg. body weight the average level of isoniazid estimated 30 minutes after the dose was 0.7 μ g./ml., 60 minutes after the dose 0.8 μ g./ml., and 120 minutes after the dose 0.4 μ g./ml. For 14 patients receiving 1.55 to 3.65 mg. of isoniazid per kg. body weight the corresponding 30-minute,

TABLE I.—Concentrations of Isoniazid in the Plasma of Patients After Oral Administration

Case No.	Dose in mg./kg. Body Weight	Plasma Level of Isoniazid in μ g./ml. at Intervals, after the Dose, of		
		30 Minutes	60 Minutes	120 Minutes
1	1.15	1.6	0.8	0.5
2	1.35	0.8	1.0	0.9
3	1.35	1.6	1.3	0.8
4	1.35	0.0	0.0	0.0
5	1.35	0.0	1.3	0.5
6	1.35	1.1	0.9	0.0
7	1.35	0.0	1.0	1.1
8	1.45	1.1	0.9	1.2
9	1.50	0.5	1.0	0.0
10	1.50	0.0	0.0	0.9
11	1.55	1.0	1.1	0.5
12	1.55	1.0	0.7	0.8
13	1.55	2.0	1.5	3.2
14	1.55	2.8	4.0	1.0
15	1.55	0.6	1.5	0.6
16	1.65	1.3	0.5	0.8
17	1.65	0.5	1.5	2.6
18	1.75	0.9	1.2	0.4
19	1.80	0.2	0.9	0.6
20	1.95	2.0	0.0	0.0
21	1.95	0.0	1.9	2.1
22	2.05	0.8	1.9	0.6
23	2.60	0.2	1.0	0.6
24	3.65	1.0		
10 R	1.50	0.5	0.2	0.0
21 R	1.95	0.0	0.0	0.5

The plasma isoniazid concentration of Cases 10 and 21 were redetermined three months later as shown under 10 R and 21 R.

60-minute, and 120-minute values were 1.0 μ g./ml., 1.3 μ g./ml., and 1.0 μ g./ml.

Three of the 24 patients (Cases 4, 10, and 21) had no detectable isoniazid in any of the blood samples. Nothing in their clinical condition suggested a disturbance of intestinal absorption, and examination of urine for isoniazid and its metabolites was undertaken in Cases 10 U and 21 U (Table II). This subject is considered in the discussion of

TABLE II.—Urinary Excretion of Isoniazid. (a) 100 mg. Isoniazid, Administered Orally 12-hourly; (b) 250 mg. Isoniazid, Administered Orally 12-hourly

Case No.	mg. Isoniazid per kg. Body Weight	μ g./ml. Isoniazid in Urine	Total Isoniazid Excreted in 24 Hours (mg.)	% of Dose Excreted in 24 Hours
(a) 25 U	3.3	13	9.7	4.8
26 U	3.5	20	35.0	17.5
27 U	2.7	18.5	32.0	16
28 U	2.3	6.2	11.5	5.7
29 U	3.2	8.0	17.4	8.7
30 U	3.1	8.4	8.0	4.0
31 U	3.9	4.3	5.3	2.6
10 U	3.0	2.0	3.0	1.5
21 U	3.9	2.6	5.7	2.8
			Average	7.1
(b) 28 U	5.7	61	103	21.0
29 U	8.0	42	110	22.0

results of urine assays. Three months later, blood curves were repeated on two of these patients (Nos. 10 R and 21 R), who were still in hospital. These two curves are very similar to those obtained on the first occasion. In both patients the highest level attained was 0.5 μ g./ml., and this was present in only one specimen from each patient.

Urine

The results shown in Table II (a) were obtained from nine patients receiving 100 mg. of isoniazid 12-hourly. Whenever possible a 24-hour specimen of urine for use as a "blank" was collected before isoniazid therapy was begun, and the test estimations were performed on aliquots of 24-hour specimens of urine collected during treatment.

The amount of the dose excreted as isoniazid during 24 hours varied widely (1.5% to 17.5%, average 7.1%). These values are appreciably lower than those found by Elmendorf *et al.* (1952), using the assay method of Kelly and Poet (1952). In six patients receiving 3 mg. of isoniazid per

kg. body weight, they found the 24-hour urinary excretion of isoniazid lay between 47.8% and 70.7% of the dose. Our results thus confirm that the method of Kelly and Poet measures something besides isoniazid (Smolarek and Stahl, 1953; Wojahn and Wempe, 1953; Cuthbertson *et al.*, 1953). Samples 10 U and 21 U (Table II (a)) are urine samples from the patients whose blood values are shown in Table I as 10 and 21 and 10 R and 21 R. In these two patients the very low excretion values, together with the low blood levels suggested some defect of absorption, but chromatographic analysis (Cuthbertson *et al.*, 1953), of the two urine samples revealed the presence of the metabolites of isoniazid (isonicotinoylglycine, isonicotinic acid, and the unidentified metabolite) in approximately the same amounts as contained in the urine of patients with higher isoniazid levels in blood and urine. Assessment of their clinical response to isoniazid was rendered difficult, for both the patients were also receiving streptomycin.

Patients whose urine samples are given as 28 U and 29 U were subsequently given 250 mg. of isoniazid twelve-hourly. There was an appreciable rise in percentage of the dose excreted as isoniazid during the succeeding 24-hour period (Table II (b)).

Further assessment of the method is desirable and should lead to improved evaluations of results obtained by it. It is hoped that the description given here of both method and results may be of use to those who wish to carry the matter further.

Summary

A colorimetric method is described for estimating isoniazid in biological fluids by means of picryl chloride.

The specificity of the method is assessed with reference to the metabolites of isoniazid.

Results are given for the amounts of isoniazid in plasma and urine from patients receiving the drug.

We wish to thank the physicians and surgeons of the Brompton Hospital for permission to investigate the samples from their patients; Dr. R. N. Johnston, medical registrar, for his great assistance in the collection of samples; and Miss E. Harris and Mr. F. W. Price for technical assistance.

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The professor of medicine at Duke University, North Carolina, Dr. James V. Warren, is to visit Kenya to perform research work on giraffes. The object of this research is to aid those who are designing "G-suits" (gravity suits) worn by the pilots of high-speed jet aeroplanes. In pulling out of power dives or other manoeuvres at high speeds pilots are subjected to pressure eight or nine times the force of gravity. It is generally believed that a pressure of 8 G is the maximum that a pilot can withstand. The G-suits are pressurized and designed to offset the violent pressure changes which cause a reduced flow of blood to the brain and consequent black-outs. Dr. Warren believes that the giraffe, with its head a considerable distance from its heart, has at all times to meet the situation that man faces when he is subjected to centrifugal force in military planes making fast turns and dives. "Maybe," Dr. Warren is reported to have said, "the giraffe has some sort of booster mechanism that helps its heart."—*U.S.A. in Review*, February 24, 1954.

VALUE OF STRICT DIETING, DRUGS, AND "ROBADEN" IN PEPTIC ULCERATION

BY

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Recent papers on gastric and duodenal ulceration express conflicting views on the value of many of the therapeutic measures customarily used in the conservative (non-surgical) treatment of the two diseases. Nicol (1939), Ronald (1939), and Lawrence (1952) found that rest in hospital on a light diet or even a normal hospital diet gave results as good as those obtained in hospital on a strict "ulcer" diet with antacids and belladonna, whilst Doll and Pygott (1952) found that cases treated on a "gastric" diet in hospital fared better than those on ambulatory treatment with a "convalescent" diet. They were undecided whether the physical and mental rest or the supervised strict dieting was the important factor, although they showed that phenobarbitone and vitamin C had no influence on the rate of ulcer healing. Martin and Lewis (1949), as a result of a 10-14-year follow-up of cases, concluded that medical treatment had no influence on the natural history of gastric and duodenal ulceration. Morton Gill (1947) found that the treatment of gastric ulcers with subcutaneous injections of sterile water whilst the patients were ambulant and on a normal diet gave results as good as those achieved with orthodox treatment.

The great importance of anxiety and mental stress in the pathogenesis and in the precipitation of relapse of peptic ulceration, and particularly of duodenal ulceration, is now generally accepted (Davies and Wilson, 1937; Nicol, 1939, 1942; Gill, 1947).

Many authors have stressed the importance of controlling gastric acidity. Nicol (1939) and Douthwaite (1939, 1947) showed that full doses of belladonna and the usual antacids, given by mouth, have no great effect on the diurnal gastric acidity, and Douthwaite and Thorne (1951) showed that hexamethonium was equally ineffective by day. Nocturnal acid secretion is, however, largely governed by neural mechanisms, and night acid can be controlled by hexamethonium (Kay and Smith, 1950) and full doses of belladonna (Riddell, 1951). Diurnal acid secretion can be controlled effectively by a continuous milk drip (Winkelstein, 1932) and by the continuous sucking of milk-alkali tablets (Douthwaite and Batty Shaw, 1952).

Regarding the prognosis of peptic ulceration most authors are gloomy. Nicol (1942), in a four-year follow-up of 389 cases, found that only 17% remained symptom-free, although a further 41% were well enough to remain at work on a diet. Martin and Lewis (1949) in a 10-14 year follow-up found 44% of gastric ulcers and 33% of duodenal ulcers inactive (no ulcer dyspepsia for the preceding five years). Barsby (1951) followed up her gastric ulcer subjects with the gastroscope until complete healing had taken place, but found that 43% had a recurrence at the original site and a further 9% at other sites.

It is therefore not surprising that many clinicians are sceptical of the value of many of the traditional

drugs and regimes used in the treatment of peptic ulceration. Todd (1949, 1951, 1952) cast doubt on the value of rest in bed, absence from work, strict dieting, sedation, and the avoidance of alcohol and tobacco. He advocated the liberal use of antacid tablets.

The possibility that in peptic ulcer subjects a "mucosa protecting" substance might be lacking has excited the interest of clinicians for some years, and recently "robaden" has been claimed by many Continental authors to possess ulcer-healing and mucosa-protecting properties (Neumann, 1948; Barfred, 1950; Schmassmann, 1951; Burghartz, 1951; etc.). Robaden is described by the makers as protein-free extracts obtained from the stomach and small intestine of freshly slaughtered young animals. The water-soluble part of the extract is used by injection and the water-insoluble part is taken by mouth in tablet form. The British literature contains few references to robaden. Hubacher (1946) claimed very good results in a 16-months follow-up of 54 patients treated with robaden whilst ambulant on a normal diet. There was, however, no control series. Stolte (1950) gave, impartially, robaden or a placebo to 101 patients with gastric or duodenal ulceration whilst they carried on with their normal work and diet. He found that, from the clinical and radiological points of view, there was no difference in the percentage of success. A possible criticism of this work is, however, that the injections and tablets of robaden were not given concurrently, as recommended by the makers.

In 1948 I decided to investigate the value of robaden in treatment and also whether strict dieting together with the usual gastric drugs whilst the patient was on strict rest in bed in hospital had any advantages over treatment in hospital on a light diet and partial ambulation.

Material and Method

I had the use of a male gastric ward of 10 beds, into which I admitted proved or suspected ulcer cases from the out-patient department. Those considered to be in need of surgery when first seen were not included in the series. The final diagnosis of peptic ulceration was made on radiological evidence supported, in a few cases, by gastroscopy. On admission, if not already done in the out-patient department, a barium-meal x-ray examination and an alcohol-histamine fractional test meal were performed, and during the fourth week in hospital three consecutive stools were examined for occult blood and the barium-meal examination was repeated. Almost all the radiology in the series was done by one radiologist.

The series comprised 27 patients with gastric ulcer, of whom five were female and three also had a duodenal ulcer, and 87 patients with a duodenal ulcer, of whom two were female and three also had a gastric ulcer.

On the patients' admission their names were put on a rota which decided by which of four methods they were to be treated. The four methods were: (i) strict gastric diet plus drugs, on strict rest in bed (bathroom freedom allowed once a day); (ii) as above, with the addition of robaden; (iii) post-ulcer diet whilst allowed up and about two hours daily; and (iv) as in (iii), with the addition of robaden. (Details of the diets and drugs used are given in the Appendix.)

Patients on robaden were given each morning for 21 days 1 ml. of the appropriate injection (for gastric or duodenal ulcer as the case might be) intramuscularly into the lateral aspect of the thigh, together with one robaden tablet three times a day before meals for seven weeks and then one tablet daily for the first ten days in each month for three

months. Patients on robaden whose pain persisted for longer than a few days after admission had their daily injection increased to 2 ml. for a week. Cases not on robaden were given placebo injections and tablets on the same schedule as the robaden cases. After four weeks' in-patient treatment the patients were sent home on their allotted regime (see Appendix) for three weeks, following which they were seen by me personally. If all was well they were then advised to return to work while keeping to their treatment. They were asked to come and see me every three months, and were encouraged to come up earlier if they had a recurrence of symptoms.

The following study deals with those patients whom I followed up for at least six months. The final information about the patients was obtained by interview in half the number. The remainder, who did not respond to an invitation to attend, replied to a questionnaire (see Appendix).

It is thought that the patients in each therapeutic group are comparable, as can be seen from Table I.

TABLE I

Treatment Group	No. of Cases		Average Length (Years) of Ulcer Symptoms		Average Age (Years)	
	G.U.	D.U.	G.U.	D.U.	G.U.	D.U.
1. Robaden + strict diet	6	20	7	5½	49	39
2. Strict diet	10	28	5	6	46	40
3. Robaden + post-ulcer diet	7	19	5	8	46	43
4. Post-ulcer diet	4	20	5	9	46	46

The history of previous treatment and complications, and also the alcohol and tobacco habits, were comparable in each of the groups.

Results

A. Patients with Gastric Ulceration

Comparison of the results between the four therapeutic groups was made in a number of ways. The disappearance of pain and tenderness was not found to be helpful, as these almost always disappeared within a few days of admission, whilst the absence of occult blood during the fourth week in hospital (at least two specimens examined) and the return of the radiological picture to normal were not of much value in assessing the prognosis. Thus, of those followed up for at least six months, only five had negative occult blood tests, and two of these had a recurrence of ulceration after 30 and 32 months (average follow-up time in those with no recurrence, 29 months), while 20 patients returned to radiological normality, of whom 5 relapsed (average time to relapse, 14 months; average follow-up time, 28 months). It is, however, of interest that of the 20 patients who returned to normal, 9 were on post-ulcer diet and robaden or post-ulcer diet alone, and none relapsed (average follow-up time, 30 months).

The figures in Table II give no indication that robaden expedites healing.

TABLE II.—Details of Radiological Results

Treatment Group	No. Followed until Healed Radiologically	Average Healing Time	Average No. of Barium-meal X-ray Examinations
1. Strict diet + robaden	4	9 weeks	4
2. Strict diet alone	8	9 "	4
3. Post-ulcer diet + robaden	6	19 "	3.2
4. Post-ulcer diet alone	3	7 "	2.3

1. Clinical relapse rate amongst the cases followed up for at least six months, severe enough to need dieting while they were off work (Table III). Those who were referred for surgical treatment during their initial admission to hos-

pital, and also those who, because they did not respond to the allotted regime, were given stricter treatment, are excluded.

The figures in Table III can be treated in another way—dividing the cases into four further groups: (A) those treated on diet alone (strict diet alone and post-ulcer diet alone);

TABLE III

Treatment Group	No. of Cases Followed Up at Least 6 Months	No. of Cases which Relapsed	Average Length of Follow-up in those Not Relapsing	Average Time to Relapse	Relapse
1. Strict diet + robaden	5	3	20 months	7 months	60%
2. Strict diet alone	7	3	26 "	12 "	43%
3. Post-ulcer diet + robaden	5	0	34 "	—	0
4. Post-ulcer diet alone	4	1	25 "	23 months	25%

(B) those given robaden (strict diet+robaden and post-ulcer diet+robaden); (C) those treated with a strict ulcer diet (strict diet+robaden and strict diet alone); and (D) those given a post-ulcer diet (post-ulcer diet+robaden and post-ulcer diet alone) (Table IV).

TABLE IV

Group	No. of Cases Followed Up at Least 6 Months	No. of Cases which Relapsed	Average Length of Follow-up in those Not Relapsing	Average Time to Relapse	Relapse
A. Diet	11	4	26 months	15 months	36%
B. Robaden	10	3	29 "	7 "	30%
C. Strict diet	12	6	23 "	9½ "	50%
D. Post-ulcer diet	9	1	31 "	23 "	11%

2. Two patients were given stricter treatment because they were not responding to their allotted regime. One was in group 2 and the other in group 3. Two cases came to surgery during their initial admission—one in group 1 and the other in group 3.

3. It is considered fair to compare each therapeutic group on the number of "failures" in each group. By failures is meant those who had a clinical relapse, those who came to surgery during their initial admission, and those who, because they were not responding to the allotted treatment, were put on to a stricter regime (Table V).

TABLE V

Treatment Group	Average Length of Follow-up	"Failures"	
		No.	%
1. Strict diet + robaden	20 months	4 out of 6	67
2. Strict diet alone	26 "	4 " 8	50
3. Post-ulcer diet + robaden	34 "	2 " 7	29
4. Post-ulcer diet alone	25 "	1 " 4	25

Treating these figures in a different way gives the results shown in Table VI.

TABLE VI

Group	Average Length of Follow-up	"Failures"	
		No.	%
A. Diet	26 months	5 out of 12	42
B. Robaden	30 "	6 " 13	46
C. Strict diet	24 "	8 " 14	57
D. Post-ulcer diet	31 "	3 " 11	27

The average gain in weight from the first to the last interview among those treated on a strict diet was 3 lb. (1.4 kg.) (average of 16 cases), whilst those treated on a post-ulcer diet gained 13 lb. (5.9 kg.) (average of 10 cases).

Comment.—These figures suggest that, of the regimes tested, a post-ulcer diet at rest in hospital gives the best results, and no evidence was found that robaden was of value in treatment. It is realized, however, that the series is a small one.

B. Patients with Duodenal Ulceration

1. Very strict radiological criteria were used before pronouncing a duodenal ulcer as having healed—namely, a cap normal in shape and with no demonstrable spasm or ulcer crater. Table VII gives details of the radiological results.

TABLE VII.—Details of Radiological Results

Treatment Group	No. who had Repeated Barium Meal X-ray Exams	No. Followed Until Healed Radiologically	Average Healing Time	Average No. of Barium Meal X-ray Exams
1. Strict diet + robaden	18	3	6 weeks	3.2
2. Strict diet alone	23	10	15 "	2.6
3. Post-ulcer diet + robaden	17	3	10 "	3.0
4. Post-ulcer diet alone	16	5	8 "	2.9

2. **Clinical Relapse Rate.**—Amongst the cases followed-up for at least six months, severe enough to need strict dieting while they were off work. Those who were referred for surgical treatment during their initial admission and also those who, because they did not respond to the allotted regime, were given stricter treatment are excluded.

TABLE VIII

Treatment Group	No. of Cases Followed Up at Least 6 Months	No. of Cases which Relapsed	Average Length of Follow Up in those Not Relapsing	Average Time to Relapse	Relapse
1. Strict diet + robaden	13	6	27 months	21 months	46%
2. Strict diet alone	17	4	27 "	9 "	24%
3. Post-ulcer diet + robaden	9	2	35 "	7 "	22%
4. Post-ulcer diet alone	15	7	25 "	16 "	47%

Treating these figures in a different way, by dividing the cases into the four groups: (A) "diet" (strict diet alone and post-ulcer diet alone), (B) "robaden" (strict diet + robaden and post-ulcer diet + robaden), (C) "strict diet" (strict diet + robaden and strict diet alone), and (D) "post-ulcer diet" (post-ulcer diet + robaden and post-ulcer diet alone), the results shown in Table IX are obtained.

TABLE IX

Group	No. of Cases Followed Up at Least 6 Months	No. of Cases which Relapsed	Average Length of Follow Up in those Not Relapsing	Average Time to Relapse	Relapse
A. Diet	32	11	26 months	13 months	34%
B. Robaden	22	8	31 "	17 "	36%
C. Strict diet	30	10	27 "	16 "	33%
D. Post-ulcer diet	24	9	29½ "	14 "	37½%

The figures in Tables VIII and IX do not demonstrate a clear-cut advantage of any of the four therapeutic regimes used.

3. Ten patients, because they were not responding to their allotted regime, were given stricter treatment (strict diet + continuous milk drip): one was in group 1, two were in group 2, five were in group 3, and two were in group 4.

In this series the prognosis in cases given continuous-milk-drip treatment was poor, but these patients, together with the nine described below, represented the hard core who did not respond at all to their allotted treatment.

4. Nine cases, owing to lack of response to treatment, came to surgery during their initial admission: three were in group 1, three in group 2, one in group 3, and two in group 4.

5. **Failures in Each Therapeutic Group.**—The figures comprise those who relapsed clinically, those who came to surgery during their initial admission, and those who, because they were not responding to the allotted treatment, were given a stricter regime. If in the last four groups in Table X the follow-up time is increased to 31 months the estimated failure rates (simple arithmetical proportions) are: diet, 58%; robaden, 56%; strict diet, 56%; and post-ulcer diet, 59%. As regards efficacy of treatment, these figures suggest that there is little to choose between the four therapeutic regimes.

TABLE X

Group	Average Length of Follow-up in Non-failures	Failures	
		No.	%
1. Strict diet + robaden	27 months	10 out of 17	59
2. Strict diet alone	27 "	9 " 22	41
3. Post-ulcer diet + robaden	35 "	8 " 15	53
4. Post-ulcer diet alone	25 "	11 " 19	58
A. Diet	26 "	20 " 41	49
B. Robaden	31 "	18 " 32	56
C. Strict diet	27 "	19 " 39	49
D. Post-ulcer diet	29 "	19 " 34	56

6. The absence of occult blood in the stool during the fourth week in hospital was not found to be of great prognostic importance, but the return of the duodenal cap to normal carried a good prognosis. With a follow-up of at least six months a total of 18 of the duodenal ulcer cases returned to a normal cap on radiology at some period (average follow-up time, 29 months), and only three of these had a clinical relapse after an average of 25 months' freedom, although there were four radiological relapses (symptomless) after an average of 14½ months.

7. The average gain in weight from the initial interview to the last one among those patients treated on a strict diet was 3.9 lb. (1.8 kg.), whilst the post-ulcer diet group gained 4.9 lb. (2.2 kg.).

Conclusions

These results support the findings of Nicol (1939), Ronald (1939), and Lawrence (1952) that rest in hospital on a light diet gives results as good as those achieved by rest in hospital on a strict "ulcer" diet with belladonna and antacids. As Doll and Pygott (1952) have found that cases treated on a "gastric" diet in hospital did better than those on ambulatory treatment and a "convalescent" diet, the conclusion can be drawn that the important factors in any successful therapeutic regime are mental and/or physical relaxation, together with the natural tendency for clinical remissions to occur in peptic ulceration.

In this country, at present, most people can best obtain this beneficial relaxation in a hospital ward where suitable food is provided, there is freedom from domestic tension, and financial worries are in most cases absent, owing to the National Insurance. It is felt that small gastric wards are an advantage: the patient has a feeling of individuality, whilst at the same time a community spirit is fostered. An occasional patient, of course, never settles down to ward life, and in these instances it is doubtful whether it is worth persevering with in-patient medical treatment.

My present routine is to treat patients with peptic ulceration in hospital on a "post-ulcer" diet. They spend most of their time in bed, but are allowed bathroom freedom and are up and about for two to three hours daily. Each patient has a supply of magnesium trisilicate on his locker, and he is encouraged to help himself to a dose whenever he has pain or discomfort. He spends a month in the ward, after which he continues resting at home on the same diet for a further

three weeks. He is then seen again and almost always advised to restart his work.

The occasional patient who fails to respond to this regime will need stricter treatment, such as a continuous milk drip or the continuous sucking of milk-alkali tablets, but my experience is that most of these refractory cases will need surgery within a few months.

Regarding after-care, it is suggested that the patient continues with his post-ulcer diet while back at work, avoiding excessive smoking and alcoholic indulgence. He should be encouraged to cultivate a calm and philosophical attitude to the stresses and strain of life, and he should, when he has discomfort, take freely of one or other of the harmless antacids as suggested by Todd (1952). In view of the high relapse rate in peptic ulceration, whatever medical treatment one gives, resort to surgery should not be delayed unduly. My practice is to advise surgery (provided there are no contraindications) if the patient relapses after one or at most two courses of medical treatment.

If this simple treatment of peptic ulceration gains favour much labour will be saved in preparing complicated diets and there will be saving on the cost of drugs. A good library, wireless, facilities for card games, and television will help to pass the time. Conventional occupational therapy is, I find, not popular with peptic ulcer patients.

Regarding robaden, I could find no clear evidence of its value. However, the patients treated with robaden were given it for only five months, and it is possible that if it had been given for a longer period beneficial effects might have been seen.

Summary

A total of 111 patients with peptic ulceration were treated in hospital and divided impartially into four therapeutic groups: (1) strict ulcer diet + robaden; (2) strict ulcer diet alone; (3) post-ulcer diet + robaden; and (4) post-ulcer diet alone. As a result of a follow-up study it is concluded that treatment on a post-ulcer diet gives results as good as those obtained with the other three regimes, and it is suggested that the important factors in any successful therapeutic regime for peptic ulceration are mental and/or physical relaxation, which assist the natural tendency for remissions to occur.

My thanks go to Dr. Stanley Nowell for the radiology; to Dr. John Forbes, who originally worked out the diets, for advice; to Professor Scarborough for advice; to the house-physicians who have kept such scrupulous notes; and to Sister J. Roberts, who instilled the right spirit into the ward and saw that the patients kept to their allotted regime.

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APPENDIX

Regime followed by those patients treated on "strict diet."

Regime A: Strict Rest in Bed (Bathroom Freedom Once Daily)

On waking.—A glass of milk to be sipped slowly.

8 a.m.—A lightly boiled, poached, or scrambled egg. Four thin half-slices of toast or bread-and-butter. A cup of milk flavoured with tea and sugar.

10 a.m.—A glass of milk to be sipped slowly. Two digestive biscuits or rusks.

12 noon.—A small portion of boiled or roast chicken; or of steamed, boiled, or grilled white fish; or of tender steak or chop; or of tripe, calf's heart, or liver. Two heaped tablespoonfuls of mashed creamed potato. A glass of milk.

2 p.m.—A glass of milk to be sipped slowly. Two digestive biscuits or rusks.

4 p.m.—A cup of milk flavoured with tea and sugar. Four half-slices of thin bread-and-butter. A portion of plain sponge cake.

6 p.m.—A moderate amount of rice, macaroni, cornflour, arrowroot, or some other milk pudding. A glass of milk.

8 p.m.—A glass of milk to be sipped slowly.

10 p.m. (if awake).—A glass of milk to be sipped slowly.

During the night the patient should be given a drink of milk or cocoa if he wakes up.

No condiments are allowed. All food must be chewed carefully and the month rinsed afterwards and kept clean.

Drugs (No other drugs are to be given without the doctor's orders).—(1) Phenobarbitone, 1 gr. (65 mg.) b.d. (2) Laevohyoscyamine, 1/120 gr. (0.54 mg.) b.d. (3) Olive oil, 1 dr. (3.5 ml.) t.i.d., after the 8 a.m., noon, and 6 p.m. feeds. (4) Soluble amylobarbitone (sodium amytal) 3 gr. (0.2 g.) nocte p.r.n. (if patient awake). (5) Liquid paraffin or an enema may be given for constipation. (6) A teaspoonful of magnesium trisilicate two-hourly, half an hour after each feed, and two teaspoonfuls last thing at night.

After three weeks the patients went on to the following diet:

Regime B: Bathroom Freedom and Up and About Two Hours Daily

Breakfast.—Small portion of porridge with milk or cream and sugar if desired. Bread or toast with butter and marmalade. A lightly boiled, poached, or scrambled egg. A cup of weak tea with milk and sugar.

10.30 to 11 a.m.—A glass of milk with biscuits or rusks.

Dinner.—4 oz. (113 g.) of fish, chicken, game, beef, chop, steak, mutton, or lamb. Boiled, baked, or mashed creamed potato. A small milk pudding. Milk or water to drink.

Tea.—A cup of weak tea with milk and sugar. Bread-and-butter. Jelly or plain cake.

Supper.—Cold meat or tongue, boiled or grilled fish. Bread-and-butter. Puree of prunes, apples, or other fruit, flavoured with milk and sugar. Milk or water to drink.

8 to 9 p.m.—A glass of milk.

Drugs.—As in Regime A.

The patient should eat slowly, chewing all food carefully.

After a week on this regime, sieved vegetables should be added to the midday meal, and, after a further week, ordinary cooked vegetables allowed.

Similarly, after the first week, the fruit at the evening meal need not be sieved, but the patient should avoid all skins and pips.

After a further week the patients went home with a copy of this regime, which they were asked to follow until seen at the out-patient department three weeks later, when they were given a copy of the following "post-ulcer diet," which they were advised to keep to whilst working. This diet is also the one followed from the start by the groups treated on "post-ulcer diet" (one month in hospital and then three weeks at home, spending most of the time resting in bed but from the beginning allowed bathroom freedom and to be up and about two hours a day).

Regime C: Ordinary Food Should be Taken with Certain Reservations

1. **No roughage.** Avoid all pips and skins of fruit, unripe fruit, nuts, currants, raisins, figs, raw vegetables, fibrous vegetables (celery, etc.), and gristly meat.

2. *No irritants.* Avoid such things as hot gravies, spices, vinegar, lemon juice, pepper, mustard, curry, pickles, chutney, and strong hot tea or coffee. Take salt in strict moderation. Take alcohol in strict moderation only. Avoid all drugs and patent medicine, especially aspirins and strong purgatives (see below). Smoking should be indulged in only after meals and in strict moderation (five cigarettes, or three small pipefuls daily).

3. *Overeating at one meal is as bad as going for long periods without food.* Both are harmful, and it is important to supplement the three principal meals by taking a milk drink with chocolate biscuits or bread in the middle of the morning and in the afternoon and last thing at night. All food must be carefully chewed before swallowing.

4. *It is a mistake to avoid certain foods* (with the exceptions mentioned above) on principle because they are supposed to be indigestible. Narrowing the diet down too much leads to a loss of weight and malnutrition, which will tend to cause a recurrence of the indigestion. Eat any food that is available, unless it is found that a certain food always disagrees, in which case it should be avoided.

5. *If constipated* take a teaspoonful of milk of magnesia at night or a dessertspoonful of liquid paraffin morning and evening.

6. *Try to avoid mental and physical overstrain.* Keep regular hours, regular habits, and, above all, regular mealtimes. During unavoidable periods of extra work, intensive activity, or excitement, or when worried or upset, take extra care with diet: avoid beef, pork, pastry, and greasy foods.

7. *If indigestion is felt* take a dose of alkaline powder (magnesium trisilicate if possible), but do not take powder as a routine. Otherwise avoid all medicines, unless ordered by your doctor. If the indigestion is severe and does not clear up in a few days go and see your doctor.

8. *Do not spend all your time worrying about your stomach* and about your diet and about your health generally. Stick to these instructions, but otherwise forget about your stomach and enjoy life.

The following is a copy of the questionnaire sent to each of the patients who failed to keep his final follow-up appointment:

"I am very interested to hear how your indigestion has been since I last saw you, as we are doing some investigations on the subject.

"I should be most grateful if you would write to me in confidence (envelope enclosed) telling me in detail about any symptoms you have noticed, and also whether you have had any further treatment or operations, the date and results of any further barium-meal x-ray films of your stomach, and any complications that have occurred.

"Are you keeping to a diet, are you working, and how much tobacco are you smoking?"

During the last quarter of 1953 the City Analyst of Birmingham carried out a survey of five popular brands of "pocket inhaler." These articles consist of a conical plastic outer case with a smaller inner chamber containing absorbent paper soaked in amphetamine, or a closely related compound, together with menthol and essential oils. Sixty-four inhalers were examined, an average of 13 of each of the five brands. The first of these brands to be put on the market showed a remarkably consistent amphetamine content. Three other brands were very similar, but their content of amphetamine was less constant, sometimes showing an excess of up to 30%, and sometimes a deficiency of as much as 22%. The last brand examined, however, presented a very different picture: of 13 samples examined every one was deficient in amphetamine by amounts varying from 31% to 90%, with an average shortage of nearly 60%. The City Analyst then wrote to the makers, who suggested that the loss was due to evaporation consequent on long storage. However, no particular relationship could be discovered between age and the strength of the samples. As a result of this investigation the firm in question agreed to recall all inhalers issued before last year. In Mr. Bagnall's view, this appears to be yet another case where certain pharmacists have retained stocks of a preparation long after the time when they should have been destroyed or returned to the suppliers.

A PLEA FOR THE LONGER TREATMENT OF CHRONIC PYELONEPHRITIS IN CHILDREN

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Acute pyelonephritis in children responds to sulphonamides so well that its treatment rarely presents a problem. Sixteen cases in infants and children were treated in the Radcliffe Infirmary during 1948 and 1949; all cleared up rapidly and only one relapsed. The latter responded to a second course of sulphonamide, and there was no recurrence.

In chronic pyelonephritis the results are very different. In the same two-year period there were 16 chronic cases at the Radcliffe. Symptoms had been present for at least two weeks, and in most cases for very much longer when treatment was started. They were all given a sulphonamide in full dosage for five to fourteen days. In every case the infection relapsed. In four of these cases further investigation showed lesions requiring surgery, but the other 12 remained essentially medical problems. Our experience since then suggests that these results are in no way exceptional, and it is with the treatment of chronic pyelonephritis without surgically treatable lesions that this paper is concerned. In most cases the infection is due to a coliform organism sensitive initially to all the readily available antibiotics except penicillin. The question to be decided is which antibiotic should be used, in what dose, and for how long.

General Considerations

In 1939 Weiss and Parker reviewed the post-mortem findings in 100 cases of chronic renal tract infection. In only one was inflammation confined to the renal pelvis and ureters; in 99 inflammation involved the renal parenchyma, and the disease was rightly called pyelonephritis. Birchall and Alexander (1950), in a review of the medical aspects of pyelonephritis, accepted this view of its pathology. They pointed out that in treatment it is the concentration of antibiotic in the plasma which is significant, and not the concentration in the urine. Therefore only full doses of a sulphonamide or antibiotic should be given in the initial treatment of pyelonephritis. Furthermore, there is no particular merit in a sulphonamide such as "urolocosil," which has been recommended because of the high concentration of the non-acetylated form obtained in the urine. Birchall and Alexander also draw attention to the fairly general experience that, with streptomycin, organisms become resistant very rapidly. They suggested, for this reason, that streptomycin should never be given for more than five to seven days. They also pointed out that as mandelic acid and related compounds are effective only in an acid medium, which cannot be attained in the interstitial tissues of the kidney, these drugs are unlikely to be of value in pyelonephritis, and should be reserved for infections of the lower renal tract. For the treatment of chronic pyelonephritis they recommended a 21-days course of a sulphonamide in

full dosage, together with intramuscular penicillin and streptomycin during the first week.

At the time their article was published we had no experience of this combined therapy, but we had already been using 14-days courses of a sulphonamide in full dosage, and had had four quite severe drug reactions. Two children on sulphadimidine developed rashes with generalized lymph-node enlargement on the seventh and eighth days of the course respectively. One child on "sulphatriad" developed fever and a rash on the eleventh day, and another on a rather large dose of sulphatriad—0.15 g. per lb. (0.33 g. per kg.) a day; body weight 20 lb. (9 kg.)—developed on the thirteenth day fever, generalized lymph-node enlargement with splenomegaly, and agranulocytosis with complete disappearance of polymorphs from the peripheral blood for nearly a week. This experience made us reluctant to give even longer courses of sulphonamides in full dosage. Furthermore, we already had, in one child, evidence of the value of a small dose of a sulphonamide continued over a very long period. We therefore decided to start treating all cases of chronic pyelonephritis with an initial 10-days course of sulphadimidine in full dosage, followed by a further variable period on a small dose.

It is clearly important to know whether this method of treatment gives better results than the orthodox short course. Only a planned investigation could give this information with certainty, and no such investigation has been made. However, during the last three and a half years we have treated over 40 infants and young children with chronic pyelonephritis in the Babies' Hospital, Newcastle-upon-Tyne, during the first half of this period with short courses of a sulphonamide or antibiotic, and during the second half with long courses. From among these infants it has been possible to form reasonably similar groups, and a comparison of the results of treatment in the two groups follows.

An Investigation

During this investigation the general management, nursing care, and follow-up of infants remained the same; only the length of treatment changed significantly.

Infants admitted before October, 1950, were treated with sulphadimidine, streptomycin, or chloramphenicol for five to fourteen days, seven days being the most usual. Dosage was standard—that is, sulphadimidine, 0.1 g. per lb. (0.22 g. per kg.) a day; streptomycin, 20 mg. per lb. (44 mg. per kg.) a day; and chloramphenicol, 50 mg. per lb. (110 mg. per kg.) a day. If the infection relapsed, a second similar course of appropriate antibiotic was given, and in some cases third and fourth courses. "Mandelix" was used in three cases after antibiotics had failed. If infection still persisted infants were kept on sodium citrate (average 90 gr. (6 g.) a day) for long periods.

After October, 1950, sulphadimidine was given in full dosage for an initial period, usually 10 days; the subsequent period on a reduced dose varied from only 10 days in two cases to over six months. If the infection did not respond to sulphadimidine or if the organism seemed unlikely to be sensitive—for example, *Staph. aureus*—chloramphenicol was used. Rather illogically, in the first case we treated with chloramphenicol (No. 17) this was given for only 16 days. The infection relapsed. Whenever we used chloramphenicol in subsequent cases we gave an initial course, usually of fourteen days, in full dosage and then a reduced dose for a period varying from six to sixteen weeks. Streptomycin was given in most cases during the first week of sulphadimidine. Alkalis were not used.

Only infants with a indisputable pyelonephritis who were under 1 year at the onset of symptoms, whose symptoms had been present for at least two weeks before the start of treatment, who had no evidence of renal acidosis or of hypercalcaemia, and who had no other illness which might have affected the course of the pyelonephritis have been included for analysis. Twelve infants in the early group and 11 in the later group satisfied these criteria.

The duration of symptoms before treatment is probably the most important single factor in determining prognosis. This was similar in the two groups. The results of treatment proved extremely difficult to assess. It was out of the question to use the urinary findings alone as an index of cure, and we therefore had to depend very much on the infant's general progress. Failure to thrive is so constantly present in infants with an active infection that a normal weight gain is a dependable sign of recovery. All weights were therefore graphed, and these, the mother's account of the infant, and the urinary findings were all taken into consideration. To express the results quantitatively, we tried to decide on a definite day, counting from the start of treatment, from which progress was uninterrupted and after which no significant pyuria was found. This was easy when there was a good immediate response to treatment with no relapse. Although there were minor variations in response, for the sake of clarity all such cases have been graded as 10—that is, progress uninterrupted from the tenth day of treatment. It was still fairly easy in the cases which relapsed but made a good recovery after further treatment, and all these have been given a definite grading. It was impossible in those cases in which, after months of ill-health with slow or fluctuating weight gains, gradual and possibly incomplete recovery occurred: in these no attempt has been made to be precise.

The results of this analysis are given in the Table. There is no doubt that the results of treatment are very much better in the later group. Six of the 11 made an uninter-

Results of Treatment

Early Group			Later Group		
Case No.	Duration of Symptoms in Days before Treatment	Days from Start of Treatment to Recovery	Case No.	Duration of Symptoms in Days before Treatment	Days from Start of Treatment to Recovery
1	210	90	13	7184	>120
2	182	>150	14	182	10
3	119	10	15	154	10
4	119	10	16	119	51
5	98	10	17	91	90
6	98	60	18	70	10
7	84	200	19	70	10
8	70	10	20	56	78
9	56	>90	21	49	10
10	35	300	22	42	10
11	35	>60	23	28	110
12	17	60			
Average	93.6	750 9 = 83.3 plus 3 indefinite	Average	95.0	389 10 = 38.9 plus 1 indefinite

rupted recovery, against 4 out of 12. The average time from the start of treatment to recovery was less than half, and there was only one case with an indefinite end-point against three in the early group. However, in 5 of the 11 cases in the later group recovery was slow and interrupted. In two of these the reasons for this are obscure, but in three it is instructive to examine the treatment given in detail.

Case 17.—This child was in hospital at the same time as several infants with a gastro-enteritis due to *Bact. coli* D 433. He passed some loose stools shortly after admission, and it was because of the possible intercurrent gastro-enteritis that he was treated from the start with chloramphenicol rather than sulphadimidine. He responded well to a 16-days course, but the infection relapsed within a week. The infection then failed to respond to sulphadimidine given for 28 days when he was an out-patient, presumably because the organism was insensitive; so he was readmitted to hospital. A coliform organism sensitive to chloramphenicol was cultured from the urine, and he was given chloramphenicol, 250 mg. four-hourly for 14 days, 250 mg. twice-daily for 42 days, and 250 mg. once daily for 84 days. The infection responded promptly and has not relapsed in over a year's follow-up. He was given this very long course

because a persistently raised blood urea and no visible excretion of dye in an intravenous pyelogram suggested severe kidney damage.

Case 16.—This male child was treated initially with sulphadimidine, 0.25 g. four-hourly for ten days, with streptomycin during the first seven days. This was followed by sulphadimidine, 0.25 g. twice daily for seven days. The pyelonephritis had responded to this, but he then developed an abscess at the site of a streptomycin injection. Pus from this cultured *Staph. aureus* resistant to penicillin and streptomycin. Sulphadimidine was stopped and he was given chloramphenicol, 250 mg. eight-hourly for eight days. Total treatment was for only 25 days: the shortness of this course was due to a mistake, and was not in keeping with the general policy. The pyelonephritis relapsed after one week. His urine cultured coliform organisms still sensitive to chloramphenicol, and he was given chloramphenicol, 250 mg. eight-hourly for 21 days, and 125 mg. twice daily for 56 days. The infection responded promptly to this, and has not relapsed in nine months' follow-up.

Case 20.—A female child was treated initially with sulphadimidine, 0.5 g. six-hourly for 10 days followed by 0.5 g. twice daily for 21 days (total treatment 31 days). The infection responded promptly, but symptoms recurred a week after stopping treatment. They were at first attributed to a mild otitis media, for which penicillin was given for a week, but pyuria was found later. Urine culture revealed a chloramphenicol-sensitive coliform organism, and she was given chloramphenicol, 500 mg. eight-hourly for 14 days, and 250 mg. twice daily for 56 days. The infection responded, and there was no relapse in three months' follow-up.

In these three cases it seems probable that relapse could have been prevented by giving a longer course of treatment on the first occasion.

Conclusion and Discussion

From the evidence of this investigation it is clear that the plan of treatment followed in the later group offers a good chance of cure even in very long-standing infections. If the infection responds to the initial course of sulphadimidine or chloramphenicol in full dosage, relapse is most unlikely during the subsequent period on a reduced dose. We have in fact never seen this. The difficult question is how long the reduced dose should be continued. The results in Cases 16 and 20, which relapsed after 25 and 31 days of treatment respectively, suggest that the period must certainly be longer than a month, but we do not know how often we have used unnecessarily long courses.

It is perhaps worth considering at this point why the long period on a reduced dose prevents relapse. The following explanation seems reasonable. It is certain that in every case of long-standing pyelonephritis there is widespread disorganization of renal tissue. It is unlikely that this damaged tissue can be restored to normal in a period as short as two or three weeks, and while it remains incompletely healed it is presumably more liable to infection. The initial course of antibiotic in full dosage must kill most of the infecting organisms, but a few may survive in isolated foci. We imagine that the small dose of antibiotic is enough to protect the damaged tissue from infection spreading from the surviving foci. As the organism found in relapse is nearly always the same as in the original infection, relapse must usually occur by spread of infection from surviving foci rather than by reinfection with fresh organisms.

If this is the correct explanation the protective dose of antibiotic must be continued for as long as the damaged kidney will take to heal, and this will depend on the duration and severity of the infection before treatment was started. There can therefore be no final answer to this question of how long treatment should be continued. The length of history, the extent to which one or both kidneys have already been damaged, and the possible risk of toxic effects from the long course of antibiotic will all have to be taken into consideration.

Sulphadimidine is so cheap and safe that we are sure it should be used first whenever it is likely to be effective. For the same reasons, wherever the initial course in full dosage has proved effective it would seem wise to anticipate relapse and to give the reduced dose for a long period. As an approximate guide we would suggest eight weeks when infection has been present for less than two months, and up to six months or occasionally more in longer-standing infections.

When we have had to turn to another antibiotic we have used chloramphenicol, and our experience with this suggests that the same manner of dosage is needed as with sulphadimidine. We have used it in this way with good results and without any serious ill effects. However, reports (Hodgkinson, 1954) of aplastic anaemia following chloramphenicol suggest that it would be most unwise to make a practice of giving long courses. A final verdict on this question is not possible yet, but for the present it seems preferable to use aureomycin. It is most unlikely that aureomycin will prove effective in a significantly smaller dose or shorter time than chloramphenicol or sulphadimidine, and our very limited experience confirms this view. However, it is more expensive than sulphadimidine and its long-term toxic effects are less well explored. For both these reasons we are reluctant to advise giving really long courses unless they are absolutely essential. In the great majority of cases we believe they will be, but as a small proportion of cases clear up after a short course of treatment (see Cases 3, 4, 5, and 8) it may be wise to start with a 14-days course. If the infection relapses it is still likely to respond to a longer period of treatment as suggested for sulphadimidine.

Although most of those we have treated for pyelonephritis have been infants, limited experience with older children suggests that our conclusions are valid for them too. In older children, however, histories tend to be longer, and one occasionally meets with infections which are distressingly intractable. In such cases persistent treatment with frequent change of antibiotic as bacteriology indicates offers the only hope of cure.

Summary

All cases of pyelonephritis in infants and young children treated during 1948-9 at the Radcliffe Infirmary, Oxford, and in a 3½-year period (1949-52) at the Babies' Hospital, Newcastle-upon-Tyne, have been studied.

Attention is drawn to the possible chronicity of these infections and to the frequency of relapse after orthodox seven- to fourteen-days courses of a sulphonamide or antibiotic.

A new scheme of treatment has been described with an initial ten-days course of sulphadimidine or an antibiotic in full dosage, followed by a long period (two to six months) on a reduced dose.

Two similar groups of cases—one treated in the orthodox manner and the other according to the new scheme—are compared, and the superiority of the long course of treatment is shown.

The wisest plan of treatment to adopt in future is discussed.

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DEEP X-RAY THERAPY IN SPONDYLITIS

BY

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Since late 1947 a joint clinic has been conducted at the Rheumatism Centre and at the Christie Hospital and Holt Radium Institute for the investigation of cases of ankylosing spondylitis and their treatment by x rays. This paper concerns 332 cases seen under this joint arrangement and the changes observed in 275 of these following x-ray therapy.

The clinical picture of ankylosing spondylitis has been fully described in several recent publications (Polley and Slocumb, 1947; Mowbray *et al.*, 1949; Parr *et al.*, 1951), and notably in those of Hart *et al.* (1949, 1950). During the course of the present study patients whose disease conformed to the classical picture were labelled "typical" spondylitics, but there were some patients whose illness differed in various ways from this and who were classed as "atypical" spondylitics in the absence of a satisfactory alternative diagnosis. Some of the patients seen in the spondylitis clinic were found on further investigation to be suffering from conditions unrelated to spondylitis, such as bone disease, disk prolapse, and spinal cord lesions, but these have been excluded from this study. During the analysis of the spondylitic cases a "borderline" group was also introduced between the "typical" and "atypical" groups. X-ray therapy was not advised in a number of the atypical cases although many had been referred for this, and one of our purposes was to find out if that policy was in fact justified. X-ray treatment was also not given to typical cases in which the spondylitis appeared to be inactive.

Of the 332 cases, 242 were considered to be typical, 59 atypical, and 31 borderline. Some of the features of these cases are set out in Table I.

About one-quarter of the patients in each group gave histories of rheumatic complaints among relatives: in the typical group 35% of these were of fairly definite or probable ankylosing spondylitis, compared with 19% in the atypical group, but the difference is not significant ($P>0.16$). The incidence of iritis in the three groups did not differ significantly. The true incidence of involvement of the hands and feet in ankylosing spondylitis may be somewhat higher than is indicated owing to the inclusion of some typical cases in the borderline group, but if these groups are combined the incidence of 34 in 273 cases (12.5%) contrasts with the incidence of 52.5% in the atypical group. Tendinitis and tendon nodules were noted very rarely in typical spondylitics but were found in 12% of the atypical patients. Ball's modification of Rose's serum differential agglutination test (Ball, 1950) gave strongly positive results in 12% of the 50 atypical patients tested. Ball (1952) reported positive results with this test in 44.2% of 642 unselected cases

TABLE I

	Typical	Borderline	Atypical
Total No. of Cases	242	31	59
Males	197	28	45
Females	45	3	14
Family history:			
Definite ankylosing spondylitis	13	0	3
Probable	10	0	0
Miscellaneous rheumatic complaints	43	8	13
Definite history of iritis	19	3	3
Probable	4	1	0
Hands or feet involved	12	22	31
Tendon lesions	2	1	7
Differential agglutination tests	125	22	50
Strongly positive	3	0	6
Weakly or doubtfully positive	118	0	1
Negative	1	22	43
Clinical status:			
Mean disability score* before treatment	6.04 ± 2.24	7.91 ± 1.81	6.4 ± 2.36
after treatment	3.84 ± 2.16	5.31 ± 2.70	4.92 ± 2.75
Duration of symptoms when treated:			
5 years or less	62	8	14
More than 5 years	150	20	21
X-ray grade:†			
I	43	3	6
II	167	25	41
III	31	0	1
Not known	1	3	2
Sacro-iliac joints normal but change elsewhere	0	0	6
X-ray films normal	0	0	3

* Treated patients only (see text).
† Grade I—Sacro-iliac joints only involved. Grade II—Sacro-iliac joints involved + slight or moderate change in spine or elsewhere. Grade III—Sacro-iliac joints involved + severe and extensive change in spine or elsewhere.

of rheumatoid arthritis attending hospital. This suggests that the atypical group is not largely composed of patients with rheumatoid arthritis affecting the spine in spite of the high incidence among them of involvement of the hands and feet.

Technique of X-ray Treatment

The x rays were generated at 250 kV with a half-value layer of 1.63 mm. of copper, the focus-skin distance being 50 cm. It has been our practice, even when symptoms were confined to one level of the back, to treat the whole spine and the sacro-iliac joints through rectangular applicators 7.5 cm. in width, the length being adjusted so as to ensure close apposition of these to the skin.

Previously, smaller fields were used to treat local painful regions of the spine, but this method was abandoned because, although the treated area might be painless after treatment, further lesions in the vicinity often developed or were disclosed during treatment. The sacro-iliac joints were treated through a single applicator, 15 by 12 cm., contiguous with the lowermost spinal field.

Almost all these patients were treated as out-patients, a dose of 150 r (measured with back-scatter) being given to the skin surface of each field at each weekly visit for ten weeks. Serious radiation sickness occurs infrequently with this low dosage, having caused curtailment of treatment in only four of these patients. It was also hoped that this dosage would decrease the likelihood of haematological complications, particularly in patients requiring retreatment at a later date.

Peripheral joints were treated through parallel opposing fields, a maximum skin dosage of 150 r being delivered to each field weekly for ten weeks. In treatment of the carpus and tarsus, as in the spine, large fields covering the whole of these groups of small joints proved most successful. For the tarsus, fields approximately 25 by 12.5 cm., to include the whole foot and ankle-joint, were used.

Localized painful lesions over bony prominences such as ischial tuberosities, adductor tubercles, and iliac crests, and painful costochondral junctions, were given single exposures through small fields to a dose of 500 or 600 r.

Method of Assessment

For analysis, the patient's status was assessed in terms of constitutional disturbance, pain, range of movement, and general functional capacity. In order to obtain some quan-

tative expression of disability before and after treatment for statistical analysis as a check on the general clinical assessment of the case, the patient was given a numerical score for each of these features, scores of from 0 to 2 being awarded for increasing degrees of constitutional disturbance, of from 0 to 3 for pain of increasing severity, and of from 0 to 3 for increasing impairment of spinal movement. Functional capacity was scored in five grades—from grade 1, in which the patient was fully employed or employable in normal work and able to undertake normal physical recreations for his or her type, to grade 5, in which he was confined to bed unable to look after himself. The total or "disability score" was taken to represent a measure of the patient's disability.

Patients considered to be "much improved" had complete or almost complete freedom from pain after treatment, the associated constitutional disturbance was abolished or significantly decreased, and they usually gained weight. The general functional capacity of the patient was increased, and in cases without extensive radiological changes the range of movement often, but not invariably, improved. Photographic records of the range of back movement done in some cases gave valuable objective evidence of this (Figs. 1 and 2).

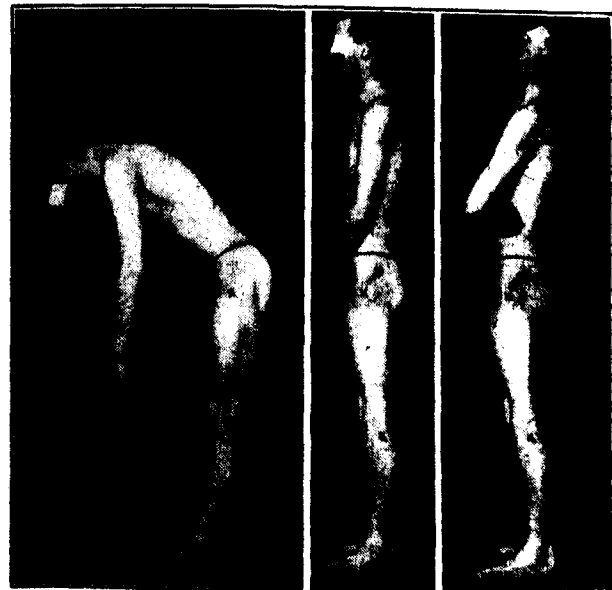


FIG. 1.—Before x-ray treatment.



FIG. 2.—Two months after x-ray treatment

"Slightly improved" signified less improvement in these respects, usually implying persistence of pain of significant degree in the treated area. A smaller number of cases were included in this category, since, although the treated areas were much improved, the beneficial effect was overshadowed by the development of new lesions elsewhere. Improvement was usually first noted about the middle of the course, and maximum improvement within the first two months or so after treatment, though a few cases continued to improve for about six months.

The patients were assessed before and one month after completion of treatment and at intervals thereafter, in the first instance one year, but before this when necessary. They were in all cases instructed to report to the clinic should relapse occur before their appointments fell due.

Results

The numbers of patients treated in the three groups and their status after treatment are shown in Table II.

TABLE II

	Typical		Borderline		Atypical	
	Male	Female	Male	Female	Male	Female
Total No. of cases	197	45	28	3	45	14
No. treated	175	37	26	2	27	8
Much improved after treatment	124	25	16	2	9	2
Slightly improved after treatment	41	10	6	0	9	2
No change after treatment	3	1	2	0	5	3
Unable to assess	7	1	2	0	4	1

As the proportions of males and females much improved after treatment do not differ significantly in either the typical or the atypical groups ($P=0.69$ and $=0.64$ respectively) the figures for males and females have been grouped together in the subsequent analysis.

The proportion of patients much improved after treatment is very significantly higher in the typical than in the atypical group ($P<0.00001$). The distributions of the disability scores in the two groups before treatment tested by the χ^2 method do not differ significantly ($P<0.96$), but a highly significant difference in these is apparent after treatment ($P<0.0008$). This difference is due to a significant increase in the proportions of patients in the typical group in the lower disability classes after treatment, whereas in the atypical group the proportions are not significantly altered.

In Table III a further analysis is made of patients in the typical group much improved after treatment.

Elevation of the blood sedimentation rate above 20/200 mm. Westergren is no guide to whether a patient will be improved after x-ray therapy. Hart *et al.* (1949) came to a similar conclusion. We recommend x-ray treatment only in cases in which the ankylosing spondylitis

TABLE III.—Analysis of Typical Cases

	No.	Treated	Much Improved	P
B.S.R. > 20/200 mm.	162	141	98	>0.7
" 20/200 mm. or less	68	60	43	
" not stated	12*			
Peripheral joints:				>0.6
Treated concurrently with spine		32	17	
Treated separately		30	14	
Age < 45 years when treated:				<.01
Duration 5 years or less		57	47	
" > 5 years		109	71	
Age 45 years or more when treated:				<.01
Duration 5 years or less		5	5	
" > 5 years		41	26	
Radiological Grade I	43	38	33	<0.01
" II	167	149	101	
" III	31	24	14	
" not known	1			

*Eleven of these patients were treated, and eight were considered to be much improved after treatment.

appears "active," as we have been unimpressed by the results of treatment of patients with little pain, either spontaneous or on movement, or constitutional disturbance, though they may have severe limitation of movement and extensive radiological changes typical of the disease. This means that judgment of the "activity" of the disease must be largely based on clinical criteria.

As might be expected, the probability of improvement after treatment is higher in patients whose symptoms are of short duration. That the duration of symptoms rather than the age at which treatment is given is the factor concerned is suggested by the observation that among patients with symptoms of more than five years' duration the proportions much improved after treatment in the age groups above and below 45 years are almost identical. In keeping with this is the finding that significantly fewer patients were much improved after treatment when radiological changes were also present in the spine or elsewhere than when changes were confined to the sacro-iliac joints—a finding similar to that of Smyth *et al.* (1941a). It should be added that no such relationship between duration of symptoms and improvement after treatment can be shown in the atypical group, in which improvement appeared to be related to the age of the patient and unconnected with duration of symptoms, but this impression was not confirmed statistically.

Seventeen patients in the typical group have been given second courses of treatment to previously treated areas, 15 of these to the spine and sacro-iliac joints. Seven of these 17 patients were much improved after treatment, a significantly smaller proportion than after the first course ($P<0.02$).

We do not yet know how long the improvement after treatment will be maintained in most of these patients, but up to February, 1953, 56 of the typical cases had relapsed, and in 44 of these relapses areas treated in the first course were involved.

Thirty-two of the relapsed patients had been regarded as much improved after treatment, and of these none relapsed in the first six months after treatment, whereas five of the slightly improved patients relapsed during this period. Of the seven patients much improved after a second course of treatment, one has so far relapsed in the second six months after its completion; four of these patients have not yet been seen six months after treatment. It is unlikely that many more patients have had major relapses without our learning of these, as relapsed patients have usually been anxious to have further x-ray treatment, which in this region is entirely controlled from the Christie Hospital and the Holt Radium Institute.

Complications of X-ray Treatment

These relate to 301 courses of treatment given to 275 individuals. Twenty-five patients received two courses, 21 of these to the spine, and one patient has had three courses to the spine.

The only serious haematological complication encountered was in a man aged 44 whose haemoglobin prior to x-ray treatment was 64% (9.5 g. per 100 ml.). After seven weekly treatments to the spine and sacro-iliac joints profuse bleeding occurred from a rectal polyp and he rapidly became severely anaemic, requiring repeated transfusion. Sternal marrow examination revealed an aplastic picture, and no improvement in either the blood count or marrow appearances occurred with A.C.T.H. treatment. His spondylitis was little if any improved after treatment, and he was maintained in indifferent health by regular blood transfusions, to which he showed gradually diminishing response, dying with extensive haemochromatosis two and a half years after treatment.

In one patient inactive pulmonary tuberculosis seemed to be reactivated by treatment to the spine, and on being informed of his extensive pulmonary disease he committed suicide in a fit of depression. Since this occurrence routine radiographs of the chest have been taken before x-ray

therapy to the spine, and seven other known cases of inactive pulmonary tuberculosis have been treated without complication.

Two other patients have died. One was a woman aged 57 with atypical spondylitis and features of Cushing's syndrome. Hypertension was present before treatment, and after nine weekly treatments to the spine and a single exposure of 600 r to the sternum and sterno-clavicular joints she complained of increasing weakness, tiredness, anorexia, and loss of weight. Albuminuria, azotaemia, and greatly reduced renal function were detected. She died at home in heart failure two months after treatment.

The other was a man aged 39 whose arthritis appeared typical of spondylitis. He had an associated inactive chronic pyelonephritis with hypertension and azotaemia, and, though much improved in respect of his spondylitis after treatment, he died in uraemia eight months later.

It is possible that in both these patients x-ray therapy may have accelerated the renal failure, although the radiation dosage to the kidneys in these cases was considerably less than that found to produce permanent renal drainage in man by Kunkler *et al.* (1952).

Permanent amenorrhoea after treatment occurred in 13 of the 47 females treated, and probably also in three further cases; 13 of these were below the age of 45. Temporary amenorrhoea lasting up to one year occurred in three other cases, all below 35. Since this high incidence of post-treatment amenorrhoea was disclosed by analysis of these cases, a tangential field method of treatment of the sacro-iliac joints in females has been adopted. Radiation to the ovaries should be less by this technique, but too few cases have so far been treated to assess how often it results in amenorrhoea.

No other serious complications were noted.

Other Treatment

The patients were encouraged to lead as normal lives as possible within the limits of their disabilities. They were instructed in the performance of breathing exercises and simple measures aimed at correction of deformity, such as sleeping supine on a firm bed and gradually decreasing the number of pillows, and were advised to avoid prolonged stooping and heavy lifting in a flexed position. Some of the more severely disabled patients with potentially correctable deformities were also given a more intensive course of reablement as in-patients of the Devonshire Royal Hospital in Buxton. Eight patients, all with severe bilateral involvement of the hips, were referred for hip surgery, and one was referred for spinal osteotomy.

Immobilization

Spinal supports were rarely advised, as we have not been impressed by their value in preventing spinal deformity or relieving pain due to established deformity, although a number of patients had been provided with such supports before coming to the clinic. Patients were confined to bed only in exceptional circumstances. The few patients who had been immobilized, particularly those in whom the lower limbs and spine had been immobilized in plaster sometimes because of a mistaken diagnosis of tuberculosis, were as a group strikingly more disabled than the rest of the patients. A similar experience was reported by Swaim (1939). Nineteen patients in our typical group had at some stage been immobilized in bed, in plaster, or on frames for periods of months to years; of these, five were virtual statues with rigid dorsal and lumbar spines and fixed or grossly limited hips, and two of them had practically fixed knees. Only six similar cases were encountered among the remaining 223 patients in the group, and there was no indication from the histories of the immobilized patients that as a group they were examples of more severe disease than the rest of the cases. On the contrary, whereas all six of the patients who had not been immobilized had completely fixed cervical spines, in those cases in which only the lower limbs and lower spine had been immobilized neck

movement was full or only slightly impaired, the gross loss of movement being confined to the parts immobilized.

The case histories of the five patients mentioned illustrate this point.

Case Reports

Case 1.—Man aged 24. In January, 1944, at the age of 18 he developed pain in the right buttock and milder pains in the left shortly afterwards. In October, 1945, tubercle bacilli were found in his sputum, and in January, 1947, lobectomy was performed. In 1949 he began to lose ground, pain in the right buttock increased, and the sputum was again found to be positive. In September, 1949, tuberculosis of the right hip was diagnosed and he was immobilized from the upper dorsal region downwards in an abduction frame. On removal from this after one year, the dorsal and lumbar spines were fixed, the hips ankylosed, and the knees and ankles very limited in movement. Neck movement was full apart from slight restriction laterally, and there was a normal range of movement in the upper limbs. The patient subsequently underwent Girdlestone's operation on the right hip with good results.

Case 2.—Man aged 20. In 1943, when 15 years old, he developed fleeting pains in the low back, knees, and left heel, and left-sided sciatica. After unsuccessful treatment with salicylates and physiotherapy, ankylosing spondylitis was diagnosed in December, 1945. At this time the lumbar spine was straightened, dorso-lumbar extension was absent, and other movements were about three-quarters of normal range. Neck movements were full. There was minimal painful limitation of hip movement, all other limb joints being normal. He was immobilized in plaster beds from the upper dorsal region downwards from January to August, 1946, and again from January to November, 1947. At the end of this period the lower dorsal and lumbar spines, both hips, and both knees were fixed. Neck movement was full, and, apart from some limitation of external rotation of the right shoulder and slight fusiform swelling of finger-joints, the upper limbs were normal.

Case 3.—Man aged 42. In 1934, at the age of 27, he developed pain in the buttocks, which persisted in spite of physiotherapy and spread to the low back. In 1943 a plaster spica was applied to the right hip for two to three months, and reapplied for a further six months in 1944. On removal of this, the left-sided pain increased, and in January, 1945, he was immobilized in a Pearson bed and later in an abduction frame, and then for nine months from the head downwards on a plaster bed. Contrary to instructions, he continued to move his neck, though the plaster prevented extension. On removal from the plaster bed his lumbar and dorsal spines were stiff; extension of the neck was absent, but he had a useful range of other neck movements. Both hips were fixed, the knees had a full range, and the upper limbs were normal apart from minimal limitation of the shoulders. He still suffered pain of moderate severity, but by perseverance he regained a little movement in the spine and left hip. Deep x-ray therapy to the spine, sacro-iliac joints, and left hip early in 1950 resulted in complete relief of pain, which has been maintained.

Case 4.—Man aged 28. In 1938 at the age of 16 he noted pains in the feet followed shortly by pains in the interscapular region and neck, which spread during the following three years to all levels of the spine and to the hips. He was told nothing could be done, and took to bed for three years. At the end of this time his spine was completely fixed, apart from a trace of cervical movement, and his hips were ankylosed in flexion with severe total flexion deformity. Both shoulders had about half the normal range; the remaining joints appeared unaffected.

Case 5.—Man aged 41. In 1940 at the age of 26 he developed persistent low back pain and his back began to stiffen. After some months he was admitted to hospital and kept in bed for six months. Subsequently he wore a spinal brace for one year; his pain eased during this period. In 1943 the left knee became painful, and after some weeks in bed both legs stiffened, although previously the right

knee had been normal. For the next 18 months he remained on traction without any exercises, and at the end of this time the dorsal and lumbar spines were rigid and he had about half the normal range of neck movement. Both hips were ankylosed and the knees severely limited; movement of the upper limbs was normal. Later he was transferred for cup arthroplasty of both hips.

Discussion

Clinicians dealing with large numbers of patients with ankylosing spondylitis are generally agreed that x-ray therapy is of some value in this disease (Kahlmeter, 1930; Hare, 1940; Smyth *et al.*, 1941a; Scott, 1942; Hilton, 1943; McWhirter, 1945; Kuhns and Morrison, 1946; Hart *et al.*, 1949; Parr *et al.*, 1951), and at least two controlled trials have confirmed this clinical impression (Smyth *et al.*, 1941b; Desmarais, 1953), but x-ray therapy does not completely arrest the ankylosing process. The best long-term results are therefore achieved by combining this with systematic exercises, positioning in bed and at work, and other physical measures designed to retain mobility and prevent or correct deformity.

In Desmarais's trial the effects of various doses of x rays and mock therapy were compared in ankylosing spondylitis, rheumatoid arthritis, and osteoarthritis, and it was found that patients with ankylosing spondylitis showed the greatest improvement, those with osteoarthritis derived some benefit, but the course of patients with rheumatoid arthritis was not significantly different from that of untreated controls. The similarity in behaviour after treatment of peripheral joints treated alone and those treated concurrently with the spine in our typical cases favours the view that the beneficial effect of x rays in ankylosing spondylitis is due to a local action on irradiated tissues and not to an indirect effect mediated through an endocrine or other mechanism, and that the failure of rheumatoid joints to improve is due to a difference in tissue responsiveness to x rays.

The proportion of treated patients with symptoms of over five years' duration is slightly less in the atypical than in the typical group, so that the poor response to treatment in the atypical group cannot be ascribed to longer duration of symptoms, and the similarity of the mean disability scores and the distribution of these scores in the two groups before treatment argue against the results being due to a preponderance of unusually severe cases in the atypical group. The failure of many patients in the atypical group to benefit from x-ray therapy may therefore be due to inclusion in this group of a number of other conditions which resemble ankylosing spondylitis clinically but are unaffected by x-ray therapy.

Conclusion

The results of this study suggest that only patients suffering from typical ankylosing spondylitis benefit from x-ray therapy. It would therefore be desirable to have well-defined clinical and radiological criteria by which typical spondylitis could be distinguished from other conditions which may simulate this disease. Such a differential diagnosis is also desirable, since immobilization usually aggravates typical spondylitis, while it may be helpful in some of the atypical conditions. We are therefore studying the various arthritic conditions which may simulate ankylosing spondylitis with a view to elaborating a satisfactory differential diagnosis.

Summary

On clinical and radiological grounds 332 cases of spondylitis were divided into three groups: 242 "typical" cases conforming to the classical picture of ankylosing spondylitis, 59 cases classed as "atypical" in the absence of a satisfactory alternative diagnosis, and an intermediate group of 31 "borderline" cases. A family history of rheumatic complaints and a history of iritis were found with

CONGENITAL VALVES IN THE POSTERIOR URETHRA

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A valvular formation of mucosal folds in the posterior urethra is the most often encountered example of the group of congenital anomalies which cause urethral obstruction. A full pathological and clinical description of the condition was given by Young, Frontz, and Baldwin in 1919, yet the lesion has never been widely recognized nor has a satisfactory routine for diagnosis and treatment emerged. I have had the opportunity of operating upon 14 of these valve cases, and the present observations are based upon the study of this series, and of the records of 21 further cases in which the diagnosis has been confirmed by post-mortem examination at the Hospital for Sick Children. All but one of the 14 cases have been treated during the past two years, and it may be of interest to record that during the same period eight cases with other forms of congenital urethral obstructions and four cases of bladder-neck obstruction in young children have come under treatment.

Their Origin

In the characteristic form (Young's type 1) a valve is formed on either side of the urethra by a double fold of mucous membrane, the two meeting in the midline sagittal plane of the urethra, leaving only a small channel anteriorly (Fig. 1). The free edges of the valves are continuous above and posteriorly with ridges connected with the verumontanum; below and anteriorly they fade out on the urethral wall at approximately the level of the external sphincter.

Faint ridges with a similar disposition are evident in the normal male urethra, and I have observed that in the embryo they first appear at approximately the 50-mm. stage. The ridges were exceptionally well developed in a 99-mm.

embryo which I have examined; they have no discernible function, and after this stage they appear to shrivel spontaneously, but it is clear that it would require only a slight exaggeration of the normal formation with some adhesion of the free edges to bring about the development of an obstructive valve. We are thus dealing with only a minor deviation from the normal, and we should not therefore expect a high instance of multiple congenital anomalies in this disease. In fact, the accompanying abnormalities are chiefly those consequent upon the obstruction.

From this evidence of their origin, it will be manifest that congenital valves will constitute an obstruction to the urinary passages almost from the time that urine is first formed and long before the complete differentiation of the nephrons. A free flow of urine is not, of course, essential

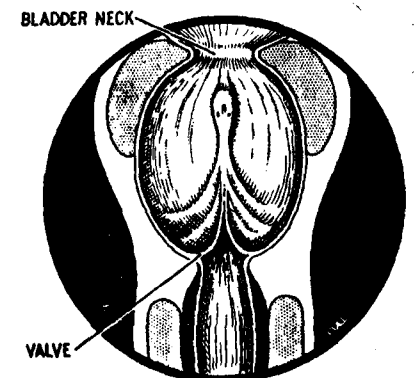


FIG. 1.—Diagram showing the disposition of urethral valves in their most characteristic form. The urethra has been drawn as if it had been opened by a vertical incision of the anterior wall, so that the anterior extremities of the valvular folds are held apart.

equal frequency in the three groups. In spite of a high incidence of involvement of the hands and feet in the atypical group, the comparatively low proportion of patients in this group giving positive results with Ball's modification of Rose's serum differential agglutination test is evidence that the atypical group is not largely composed of patients with rheumatoid arthritis affecting the spine. The adverse effect of prolonged immobilization in typical ankylosing spondylitis is emphasized.

A total of 275 patients received deep x-ray therapy; the proportion much improved after this in the typical group was very significantly higher than in the atypical group. In the typical group, the age or sex of the patient and level of the blood sedimentation rate gave no indication of the probability of improvement after therapy; better results were obtained in patients whose symptoms were of five years' duration or less and in whom radiological changes were confined to the sacro-iliac joints. No significant difference was observed in the behaviour of peripheral joints treated alone and those treated concurrently with the spine, suggesting that the effect of deep x-ray therapy in ankylosing spondylitis is a local one on irradiated tissues.

Complications of x-ray therapy included one case of aplastic anaemia, reactivation of pulmonary tuberculosis in one case, permanent amenorrhoea in 13 of the 47 females treated, and possible acceleration of renal failure in two cases.

Reasons are given for ascribing the poor results from x-ray therapy in the atypical group to inclusion of patients with other diseases simulating ankylosing spondylitis.

We are grateful to the many consultants in this region who have allowed us to study their cases during the investigation; to Professor J. H. Kellgren for much advice and helpful criticism; to Dr. Ralston Paterson for provision of facilities for x-ray treatment and follow-up of the patients; to Dr. O. Janus, who saw many of these patients originally in the clinic; and to Miss Marion Russell for help with the statistics.

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Bracken Hill House, The Woods, Northwood, Middlesex, the pioneer hostel of B.R.A. Homes Ltd. (under the aegis of the British Rheumatic Association), is now open. It is designed to meet the needs of industrial workers with early and serious rheumatic conditions for whom bed accommodation at hospitals with rheumatic units is unlikely to be available in the near future. All medical services are provided by Mount Vernon Hospital. Industrial medical officers or the patient's family doctor can apply for accommodation. Cost of beds ranges from £4 15s. to £7 7s. Further details may be obtained from either Bracken Hill House or the British Rheumatic Association, 11, Beaumont Street, London, W.1.

to the general development of the foetus, and growth can proceed almost normally in the complete absence of kidneys: nevertheless, despite conflicting views, it does seem that urine secretion is a normal foetal activity and that urinary obstruction produces hypertrophy of the detrusor, sacculization of the bladder wall, dilatation of the ureters, and hydronephrosis whether it occurs in the foetus or in old age. The urinary tracts of infants dying from this disease during the first few days of life show all the changes associated with long-standing retention of urine, but it is characteristic of the very early obstructions that they cause relatively less bladder distension with relatively greater dilatation of the ureters, and that differentiation of the nephrons is interfered with so that the cortex of the kidney may contain cysts which show no evident connexion with the renal pelvis.



FIG. 2.—Sagittal section through the bladder and urethra of an infant dying on the third day of life (from the Museum of the Hospital for Sick Children, Great Ormond Street). The enormous dilatation of the posterior urethra is clearly shown, and there is a well-marked valvular fold. A, valve; B, bladder neck; C, verumontanum.

These observations apply to all types of congenital infra-vesical obstruction, but the situation of the valves leads to certain peculiar features. The posterior urethra becomes dilated and considerably elongated (Fig. 2), but the bladder neck remains as a well-defined constriction until a very late stage. The internal sphincter is essentially a condensation of detrusor muscle fibres, and it appears that a general hypertrophy of the bladder muscle must be inevitably associated with bladder-neck hypertrophy.

Clinical Features

On the clinical side, urethral valves present either because of disorders of micturition—incontinence, frequency, haematuria—or because of a deterioration of renal function—failure to thrive, dwarfism, or renal rickets.

Valves scarcely ever cause acute retention. Some urine is always able to dribble away, even though the rapidity of onset of bladder distension may have been sufficient to cause pain. Failure to pass urine during the first few days of post-natal existence is, of course, usually due to dehydration and oliguria, but if the bladder is found distended it is much more likely that the obstruction is an obliteration of the urethra rather than a valve. Overflow incontinence is in fact the most characteristic disturbance of micturition: urine is never passed in a good stream, but the frequent and difficult passage of small quantities or a continuous dribbling makes the child always wet. An infant who is found never to be dry has always some organic disease, and if we can be sure of the truth of this history a most careful investigation is imperative. In older children the incontinence is less easily distinguishable from functional enuresis, though it is usually diurnal as well as nocturnal, and its tendency is to become progressively more severe.

The onset of infection leads to an exacerbation of the obstruction and in the presence of already damaged kidneys

may prove overwhelming. The newer sulphonamides and antibiotics can, however, sometimes sterilize the urine even in the presence of an obstruction, and the rapid amelioration of symptoms may then suggest that no further investigation is required. In two of my cases the bladder and kidneys had been palpably distended during an episode of urinary infection at the ages of 1 month and 2 years respectively, yet because apparently normal micturition was re-established after sterilization of the urine the clinician in charge had felt that no organic obstruction could be present. As a result the children were left, one for three months, the other for seven years, before receiving surgical treatment, and in the latter irreparable renal damage had occurred.

Valvular obstruction is for the most part a slowly progressive disorder; sometimes, as in prostatic disease, there is an exacerbation of obstruction for no very obvious reason, and in such cases pain may be a feature. One of my cases was sent to hospital as a possible case of intussusception, and another, who had a large diverticulum, suffered abdominal pain before micturition.

Renal failure manifests itself in a variety of ways, and it is a curious fact that the cases with the most severe signs are often those with comparatively minor disturbances of micturition. During the first few weeks of life vomiting is much the most common presenting sign, and the infant is often suspected of pyloric stenosis until examination reveals distension of the bladder and a continuous dribble of urine. In later infancy and childhood general ill-health and susceptibility to infection or dwarfism may lead to investigation of renal function. Hypovitaminosis-D rickets is now such a rare disease in this country that the presence of a rachitic deformity must always suggest the need for urological investigation.

Diagnosis

Often the observation of an overdistended bladder and of a dribbling incontinence leaves little doubt concerning the presence of a urinary obstruction, and in a few cases the rectal palpation of a full posterior urethra gives assistance in locating the lesion, but the exact diagnosis of urethral valves can never be made on purely clinical grounds. Certain other causes of chronic bladder distension may, of course, be eliminated by clinical examination: the neurological disorders, for instance, are almost invariably accompanied by a recognizable spinal lesion, by sacral anaesthesia, and by paralysis of the anal sphincter. A meatal stenosis, or occasionally a diverticulum of the anterior urethra, may be seen on examination of the penis, but there remain many other obstructive lesions which can be identified only by radiological and endoscopic methods. Recently encountered examples of such lesions include a congenital stenosis of the membranous urethra, a diaphragmatic obstruction above the verumontanum, a duplication of the anterior urethra, and a ureterocele prolapsing through the bladder neck. Bladder-neck obstruction (Marion's disease) is perhaps the disorder most likely to cause confusion, particularly since hypertrophy of the bladder-neck muscle is the usual concomitant of any congenital obstruction lower down the urethra. This difficulty is illustrated by the following case.

A boy of 3½ years was transferred from an orthopaedic hospital, where he had been receiving treatment for a suspected tuberculous lesion of the left femoral neck. He was immobilized on a frame, with traction on the left leg, and a wide-bore needle had been inserted suprapubically to drain a chronically distended bladder.

His blood urea was 68 mg. per 100 ml. and an intravenous pyelogram showed no shadow in either renal area. His position on the frame rendered endoscopy impossible, and the replacement of the needle by some more satisfactory form of drainage seemed imperative. In performing the cystostomy, however, I palpated the bladder neck, which was clearly hypertrophied and resisted dilatation. A generous wedge of tissue was therefore resected from the posterior lip upon the tentative diagnosis of Marion's

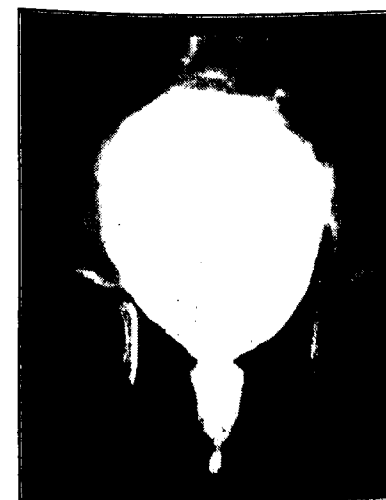


FIG. 3.—Micturating cystogram in a boy of 8 years with a palpably distended bladder and incontinence of urine by day and night since age of 5. The dilated posterior urethra is evident; urethroscopy confirmed the presence of urethral valves. Treated by endoscopic resection with satisfactory results.



FIG. 4.—Micturating cystogram (oblique view) in a boy of 7 with lifelong dribbling incontinence of urine. Residual urine 6 oz. (170 ml.). Endoscopic resection has eliminated the residual urine and he is now continent.

renal function although some dilatation of the upper urinary tract remained.

The most important radiological investigation is the micturating cystogram. A catheter is passed, and the residual urine is drawn off and replaced by a rather larger volume of a 15% diiodone solution. The catheter is then withdrawn and exposures are made during micturition (Figs. 3 and 4). These films may show trabeculation of the bladder, the presence of vesical diverticula, reflux into dilated ureters, and dilatation and elongation of the posterior urethra. It should be noticed that unless micturition is actually taking place the urethra may be shut off from the bladder by the hypertrophied internal sphincter, so that it

is either not filled at all or contains only a trickle of opaque fluid, giving no true idea of its dimensions. In the young baby in whom micturition is not possible, manual expression of the bladder contents under anaesthesia is often an adequate substitute, but this does not hold good for the older children (Fig. 5). The cysto-urethrogram shows the exact site of the obstruction, and occasionally the actual outline of the valvular folds can be seen, but often the differentiation of the valves from congenital stenosis is impossible.

Cystoscopy and urethroscopy give more detailed information but require special instruments and much more experience for their interpretation. In the infant the instruments must be introduced via a perineal urethrostomy, but, provided this is performed, no particular difficulty should be encountered. I have recently urethroscopied a male infant of 10 days in this way. The cystoscope alone will reveal trabeculation of the bladder and the presence or absence of diverticula. The urethroscope, and preferably one which gives a view directly ahead, is required to identify the nature of the obstruction.

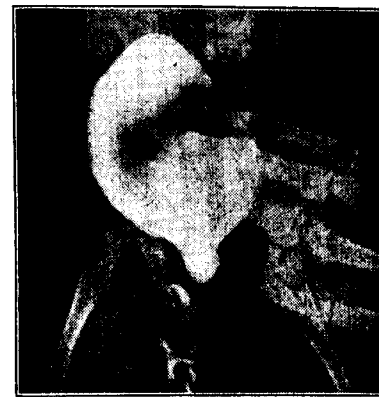


FIG. 5.—Expression cystogram in a boy of 10 months with a blood urea of 212 mg. per 100 ml. Dilatation of the posterior urethra is clearly present, but urethroscopy showed only a congenital stenosis of the membranous region, and there has been a steady improvement, with continuing fall of blood urea, on intermittent dilatation.

Management

The problems encountered in management vary according to the manifestation of the disease. In the infant with a palpably distended bladder, dribbling micturition, and a degree of renal failure, an operation for relief of urinary obstruction will clearly be required, but considerable caution must be exercised in preparing for this operation. It should be realized that drainage of the bladder is not the most urgent need in such a case; the dangers to life are from supervening infection and from a sudden biochemical disturbance, both of which may in fact be precipitated by catheterization. As in the elderly prostatic, the catheter, even when passed with stringent asepsis, may introduce an infection which initiates a rapidly fatal pyelonephritis. Particularly it is dangerous to empty a chronically distended bladder and then allow it to fill up again with a large residual urine. A clear idea of the degree of renal failure and of the presence or absence of other biochemical disturbances is the first essential. The blood urea is the most helpful single investigation, but deceptively high values may be observed if the child is dehydrated, and the estimation should be repeated after adequate fluid has been given.

The range of specific gravity of the urine often gives a useful indication of renal function; commonly the kidneys in severe cases are only capable of producing urine with a specific gravity of 1001 to 1006. Estimations of the bicarbonates, chlorides, sodium, and potassium are important in regulating the fluid and electrolyte requirements, and in long-standing cases with bone changes calcium and phosphorus studies are also required. Once instrumentation has been resorted to, adequate drainage of the urinary tract must be established and, if possible, a definitive treatment carried out. My present routine in such a case is therefore to perform a cystogram and a urethroscopy under anaesthesia, and then, unless the general condition of the child renders it dangerous, to proceed at once to operative removal of the

valve, leaving in a perineal urethrostomy catheter as drainage. In small children an indwelling urethral catheter is scarcely ever an adequate form of drainage: even apart from the danger of stricture formation in the penile urethra, the lumen of the catheter is so small that it easily becomes obstructed.

In the older child who is being investigated for incontinence but who has no serious renal damage, micturating cystography may safely be performed without preparations for immediate operation, provided prophylactic chemotherapy is employed, and full biochemical study may be omitted. The difficulty here is often to know which incontinent boys to investigate, since there is no infallible rule by which they can be segregated. Children with a palpable bladder, those with a continual dribbling incontinence, and older boys who are wet by day as well as by night will clearly be selected, but all enuretics who show no improvement after a fair trial on ordinary treatment should at least be submitted to urethroscopy.

Routine micturating cystography may also be performed during the investigation of recurrent or mild chronic urinary infection. An acute infection complicating an obstruction requires the immediate administration of an antibiotic, and it has seemed wise to give streptomycin while awaiting the bacteriologist's assessment of the susceptibility of the organism. Should there be no response to the antibiotic and if the blood urea is considerably raised, drainage of the urinary tract must be established without delay, and for this purpose a bilateral nephrostomy is far more effective than a suprapubic cystostomy which does not satisfactorily empty the dilated and tortuous ureters.

Operation

Regarding the technique of operation, I believe that the old method of attempting to rupture the valves by passing instruments downwards from the bladder should be discarded: it involves an open bladder, it allows no opportunity for confirmation of the diagnosis, and, as shown by post-mortem examination, often fails in its purpose of destroying the valves. The retropubic operation, in which the urethra is opened by a vertical incision prolonged downwards from the bladder neck to a point well below the verumontanum, can give a beautiful exposure and allows a deliberate surgical removal of the valvular fold, but it is often a prolonged and always a major procedure, it may involve considerable blood loss, and it is a severe tax on a uraemic child. In four cases I have employed an approach through the perineum: the bulb of the urethra is opened up through a longitudinal incision, the membranous region dilated up, and a miniature gorget inserted anteriorly. Then with a flat retractor posteriorly, a sucker, and a headlight the operator is able to get a view of the verumontanum and the valves coming down from it. They can be picked up with a blunt hook and burnt off with the diathermy.

Endoscopic resection, however, constitutes the most satisfactory approach employed so far. The instrument which I have used is an infant version of a simple McCarthy diathermy loop resectoscope, and with it the valvular folds can be scooped off the urethral walls. This type of operation is a comparatively minor procedure which does not place any serious strain on the child, but of course it is never a negligible matter to operate on a case of chronic retention, and the use of the resectoscope must always involve some risk of perforating the urethra, which would lead to a dangerous extravasation of urine, or of damaging the external sphincter and causing permanent incontinence.

Discussion

In discussing the results and complications of the treatment of urethral valves it must again be emphasized that the majority of these children are suffering from long-standing urinary obstruction with severe renal damage. Indeed, those which present during the first month after birth have scarcely ever sufficient functioning renal tissue for survival. In borderline cases it is too often the surgical intervention

which precipitates a rapid deterioration of renal function, either through the introduction of infection or through some other mechanism which we do not understand. Post-operative dehydration is always a danger, since the damaged kidneys put out urine of very low specific gravity and require a large volume of fluid in order to excrete the necessary load of solute.

In one case of congenital obstruction, not in fact a valve, an operation which successfully restored normal micturition was followed some weeks later by the development of a severe renal electrolyte loss of sodium and potassium—a type of salt-losing nephritis—which was ultimately the cause of death. One neonatal case of retention had on admission a biochemical pattern resembling Addison's disease, and it could not be determined for certain whether a renal or an adrenal cause was responsible. Another patient, in whom the electrolyte losses had been carefully followed and found normal, died unexpectedly on the third day with cerebral oedema but without any obvious precipitating cause. The biochemical problems involved in treating the obstructive uropathies are therefore complex and as yet poorly understood. It is in this sphere that we hope to make further progress in the future.

Just as the removal of the obstruction cannot lead to an immediate recovery of renal function because of irreversible changes in the kidneys, so too the urinary passages cannot at once regain their normal function. The ureters are tortuous and elongated, and cannot contract down to their former dimensions; in some cases the kinks and adhesions lead to obstruction in the ureter itself, and in several cases drainage of a dilated and obstructed ureter, or nephro-ureterectomy, has been required after the operation for relief of urethral obstruction. The bladder may be atonic, so that it is unable to empty without residuum even after an otherwise successful operation, and if free reflux into the dilated ureters has been established the bladder contractions will serve to fill these ureters rather than to expel the urine. Thus after micturition urine again flows down into the bladder, and catheterization will demonstrate the presence of an apparently large residuum. The loss of normal sensation in the chronically overdistended bladder is also a troublesome feature, since the child does not notice the filling of his bladder and urine may actually be leaking away before micturition is attempted. This is a matter which is capable of improvement by training, however, and should not be a permanent handicap.

Case	Age	Blood Urea (mg./100 ml.)	Operation	Result
1	19 days	66	Cystotomy and passage of sounds from above	Died next day. Grossly diminished renal parenchyma
2	1½ months	53	Retropubic valvulotomy	Satisfactory recovery from operation, but died of jaundice on 19th day
3	3½ "	74	Perineal valvulotomy and diverticulectomy	Well one year after operation, but blood urea remains at 66 mg./100 ml.
4	4 "	94	Perineal valvulotomy	Died on 7th day with multiple abscesses in kidney
5	4 "	86	Retropubic valvulotomy	Died on 2nd day—mongol
6	4½ "	51	Perineal valvulotomy and right nephrectomy	Well one year later
7	2½ years	134	Endoscopic resection	Died on 3rd day—oliguria
8	3 "	162	Retropubic valvulotomy	Died on 2nd day—oliguria
9	3 "	67	Endoscopic resection	Well 3 months later
10	3½ "	63	Retropubic valvulotomy	" 1 year "
11	7 "	26	Endoscopic resection	" 6 months "
12	8 "	41	" "	" 3 " "
13	9 "	40	Perineal valvulotomy and diverticulectomy	" 9 " "
14	11 "	150	Bilateral nephrostomy and endoscopic resection	Improved, but residual urine still present. Recent case

The Table summarizes the 14 cases of urethral valves which have been operated upon: clearly, the results leave a great deal to be desired. The older children are much more likely to survive than the infants, but this merely indicates that the older children are suffering from a less severe obstruction and in no way contradicts the view that earlier diagnosis will lead to improved results. More careful attention to the urinary abnormalities of the "under-threes" is required if a significant proportion of children with this disease are to grow up to be healthy adults.

ADDENDUM.—In the eight months which have elapsed since this paper was completed the survivors in the series reported have continued to thrive and five additional cases have been treated. Of these, two, aged 9 days and 11 weeks, died of renal failure before operative treatment of the obstruction had been completed; three, aged 3 weeks, 9 months, and 6 years, have made a satisfactory recovery.

My thanks are due to Mr. Twistington Higgins and to other members of the staff of the Hospital for Sick Children, Great Ormond Street, for allowing me to treat their cases, and to Mr. N. Stidolph, of the Whittington Hospital, for inviting me to see the last of the series. Thanks are also due to Mr. Derek Martin and Mr. P. Cull for their assistance with the illustrations.

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CONTINUOUS CAUDAL ANALGESIA EXPERIENCES IN THE MANAGEMENT OF DISORDERED UTERINE FUNCTION IN LABOUR*

BY

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Prolonged labour which results from incoordinated action of the uterus or cervix is a serious problem which confronts every obstetrician from time to time. The occasional grave consequences to both mother and foetus have resulted in an increasing tendency to terminate such labours by caesarean section when vaginal delivery is delayed after 36 to 48 hours of established labour (Munro Kerr and Chassar Moir, 1949).

The purpose of this paper is to record the experience gained from the therapeutic application of continuous caudal analgesia to the management of this problem. The comments and conclusions are based on a study of 74 cases of disordered action of the uterus or cervix which had prolonged the first stage of labour beyond 48 hours. The clinical types treated included hypotonic inertia, hypertonic lower uterine segment inertia, and primary cervical dystocia (Jeffcoate, 1950). The material has been collected from the Department of Obstetrics and Gynaecology at Newcastle-upon-Tyne General Hospital during the past three and a half years, and 22 cases of cervical dystocia reported in a previous publication (Arthur and Johnson, 1952) are included.

Caudal analgesia was originally devised for minor pelvic operations and described simultaneously by Sicard (1901) and Cathelin (1901). The method is therefore not a new one, but Hingson and Edwards (1943) are largely responsible for describing the modern continuous technique and for applying it to obstetric practice, chiefly as a pain-relieving measure. The in-

trinsic difficulties and possible complications of the method, in its present form, however, prejudice its widespread adoption for obstetric analgesia, especially when adequate results are obtainable by simpler means. On the other hand, the satisfactory results achieved by its therapeutic use in the management of disordered uterine function justify a wider trial (Nixon, 1952).

The principle of caudal analgesia in the labouring patient is to block the sacral plexus with a suitable local analgesic agent as it lies within the confines of the sacral canal, and to extend the level of analgesia upwards in the extradural space to the level of the tenth dorsal segment.

By this means both the motor and the sensory connexions to the pelvic floor and perineum arising from the sacral plexus are effectively blocked, together with the visceromotor parasympathetic connexions to the cervix. The upward extension of analgesia to the tenth dorsal segment in the extradural space interrupts the sensory connexions to the fundus uteri which enter the cord at this level, and the uterine action becomes painless. The sympathetic visceromotor fibres of the fundus uteri arising from the cord higher up, in the region of the fifth dorsal segment, are uninfluenced by caudal analgesia, while the opposing parasympathetic fibres from the sacral plexus below are paralysed.

Successful caudal analgesia in the labouring patient is therefore aimed at securing unopposed and painless contractions of the uterine fundus, acting upon a completely paralysed and insensitive cervix and birth canal. These conditions seem very suitable for dealing with the problem of either inert uterine function or cervical dystocia, or a combination of these two conditions, and the principle has been adopted in the management of the labours described below.

Methods Used

The technique of continuous caudal analgesia used in this series closely followed that described by Hingson and Edwards (1943). With the patient lying in the left lateral position, a malleable caudal needle was introduced into the sacral canal and connected by a length of fine pressure-tubing, with a 10-ml. syringe and two-way tap interposed, to a bottle of 1.5% piperocaine hydrochloride ("metycaine") in Ringer-Locke solution. The malleable-needle technique was adopted in preference to the indwelling-catheter method for several reasons. In the first place, suitable nylon catheters were not easily obtained, and complications have been reported from time to time with "polythene" catheters. The risk of introducing infection seemed greater with any catheter technique, together with the added risk of tubing fracture. Furthermore, it is doubtful whether polythene catheters can be sterilized with sufficient certainty to insert into the extradural space with complete safety.

The malleable-needle technique proved completely satisfactory, and the requisite apparatus can now be obtained from Messrs. Thackray, Ltd. It was always ready for use, being autoclaved in a small drum together with the necessary drappings.

Analgesia was induced when labour had been prolonged beyond 48 hours owing either to an intrinsic failure of uterine function or to cervical dystocia without any evidence of cephalo-pelvic disproportion.

A preliminary vaginal examination was always made before caudal analgesia, to assess carefully the stage to which labour had progressed and to ensure that the cervix had reached at least one-third dilatation. Hingson and Edwards state that this degree of dilatation is essential, and failure to observe this rule may result in the inhibition of uterine contractions. It is also emphasized that this method

*Condensed from a paper presented to the Newcastle-upon-Tyne Obstetric Society on December 5, 1952.

should not be contemplated if there is any evidence of cephalo-pelvic disproportion, or non-engagement of the head from any other cause whatsoever, for fear of dangerously overdistending a paralysed lower uterine segment.

An initial dose of 40 ml. of piperocaine, injected down the pressure-tubing described above, gave satisfactory analgesia to the tenth dorsal segment for approximately one and a half hours. Thereafter, maintenance doses of 15 ml. were administered at half-hourly intervals. These injections were given by a midwife specially trained in the technique, and the patient was turned on to her opposite side via the abdomen after each half-hourly dose to maintain a bilateral effect. The blood pressure was recorded after each injection, and 20 mg. of methylamphetamine hydrochloride was administered intramuscularly at the onset of caudal analgesia to prevent any severe fall in blood pressure. Analgesia was maintained for approximately six hours in each case, and was then followed by a second vaginal examination to assess progress in cervical dilatation. The subsequent management of each individual case depended upon the progress made.

The comparative findings of the two vaginal examinations enabled each patient to be placed in one of three categories. Group 1 included all those with fully dilated cervixes who were immediately delivered with forceps. Group 2 comprised those patients who showed definite progress, but who had not achieved complete dilatation of the cervix after six hours of caudal analgesia. Treatment was continued with half-hourly injections of piperocaine in the confident anticipation of complete dilatation of the cervix, which was achieved in an average of nine hours in all the cases in this second group. The longest caudal block lasted fourteen hours. Group 3 included those who failed to respond at all after the six hours, and delivery was completed by a lower uterine caesarean section without further delay.

Results

The results in the 74 patients subjected to the treatment are given in Table I.

Group 1.—Forty-five patients were found to have completely dilated cervixes when the second vaginal examination was performed after four to six hours of treatment. Twenty-seven required simple outlet forceps to complete delivery, the foetal skull lying in the pelvic outlet and the

TABLE I

Method of delivery	Group 1 (45 Cases)			Group 2 (19 Cases)			Group 3 (10 Cases)
	Low Forceps	Anterior Rotation and Forceps	Breech Extraction	Low Forceps	Anterior Rotation and Forceps	Normal Delivery	Lower Segment Caesarean Section
Method of delivery	27	16	2	9	9	1	10
Stillbirths and neonatal deaths	1	0	1	0	0	0	1

occiput anterior. Sixteen required anterior rotation of the occiput in the mid-cavity of the pelvis from a transverse or posterior position before forceps delivery was completed. The two remaining patients were delivered by breech extraction. There was one stillbirth from an intracranial injury following a difficult breech extraction, and one infant died on the fourth day from pneumonia. In this latter case the membranes had been ruptured surgically for severe pre-eclamptic toxæmia arising two weeks before term. The blood pressure was 210/120 at the time of the rupture of the membranes, and the urine contained 5 g. of albumin per litre.

Group 2.—Nineteen patients showed progressing but incomplete dilatation of the cervix when the second vaginal

examination was carried out after six hours of treatment. Analgesia was continued until full dilatation of the cervix was reached. This was achieved in an average of nine hours, the longest duration being fourteen hours. Nine patients were delivered by a simple outlet forceps with an anteriorly presenting occiput, and nine more required anterior correction of the occiput before forceps delivery was completed. One patient delivered herself spontaneously. There was no stillbirth or neonatal death in any patient included in this second group.

Group 3.—Ten patients showed no further cervical dilatation after six hours of caudal analgesia, and all these were selected for lower uterine caesarean section and delivered successfully. One infant was delivered in a state of white asphyxia and died within a few minutes of delivery, but the remainder survived and did well. This death is attributed to an error of judgment, for caudal analgesia had been unwisely employed when the head remained above the pelvic brim from partial extension of an occipito-posterior position. A strong contraction ring developed in the uterus, and the infant presumably died from partial obstruction of the placental circulation. This case occurred early in the series and served to emphasize further the importance of avoiding caudal analgesia when the greatest diameter of the foetal skull still remains above the pelvic brim.

Table II shows, by comparison with other published data, that in the present series of 74 cases there was no increased incidence of prolonged labour—that is, labour exceeding 48 hours—despite a local interest in this problem.

TABLE II

	Total Labours Exceeding 48 Hours	Stillbirths and Neonatal Deaths		Maternal Deaths		Average Duration of Labour	
		N.-C. Group	Caudal Group	N.-C. Group	Caudal Group	N.-C. Group	Caudal Group
Newcastle General Hospital, 6,957 deliveries	241 (3.4%)	19 (11.4%)	3 (4.1%)	2	0	66.5 hours	58 hours
Queen Charlotte's Hospital, 20,000 deliveries	631 (3.1%)	77 (12%)	—	3	—	74.9 hours	—

N.-C. = Non-caudal.

Discussion

The number of patients selected for the treatment gradually increased as technical ability improved and confidence in the method developed. Failures of technique were frequent in the early stages, but, with increasing experience, types of patients—for example, the obese or uncooperative—who had previously been regarded as unsuitable subjects were successfully treated. My recent experience agreed with Hingson's statement that successful caudal analgesia could be achieved in approximately 80% of cases attempted, and the presence of a pilonidal sinus or local sepsis became the main contraindication to the method.

To judge from the results obtained so far, there was a great improvement in the foetal salvage rate in the 74 cases studied. This was doubtless attributable to the overall diminution in the length of labour as shown in the last column of Table II, but a noteworthy observation in the series was the surprising lively condition of the infants at birth (with the exception of the three cases quoted above) despite unmistakable evidence of foetal distress in no fewer than 29 cases before analgesia was started. A suggested explanation of this phenomenon, which is under further investigation, is the dilatation of the uterine arterioles, which might result from blocking their autonomic connexions, thus enhancing the maternal blood supply to the placenta.

Conclusions

The application of continuous caudal analgesia to the management of prolonged labour which resulted from primary failure of uterine function or cervical dystocia has

proved a most valuable addition to the obstetrician's armamentarium.

In many cases the method resulted in speedy dilatation of the cervix to permit earlier delivery of the patient than might have otherwise been expected. Patients showing no response whatever to the treatment were selected for lower segment caesarean section, which was performed on patients who were refreshed by a respite from labour pains. It was deduced from the results obtained that caudal analgesia should be tried when caesarean section might otherwise be seriously regarded as the only satisfactory solution to prolonged and non-progressive labour. By its use many patients will be spared abdominal operation, but, on the other hand, if by failure of response caesarean section is subsequently thought to be necessary, its successful outcome will not have been prejudiced by the previous management.

There were no serious untoward sequelae attributable to caudal analgesia, and this series concludes a pilot study before a more careful statistical investigation is undertaken into the value of the method described in the management of labour exceeding 48 hours.

Summary

The results obtained by employing continuous caudal analgesia as a therapeutic measure in the management of 74 cases of uterine inertia and cervical dystocia, or a combination of these two conditions, are described.

Sixty-four patients were successfully delivered vaginally, with two neonatal deaths, after a period of analgesia lasting from four to fourteen hours.

Ten patients showed no further progress whatever after six hours of caudal analgesia, and were delivered by a lower segment caesarean section.

Continuous caudal analgesia accelerated the progress of labour in a high proportion of cases, and considerably diminished the foetal hazards of this perplexing obstetric problem.

My thanks are due to the nursing staff for preparing the apparatus and managing the patients, and to those obstetricians who have given caudal analgesia a fair chance to see what it can achieve. I am also indebted to Mr. Linton Snaith for his permission to publish the clinical data, and to Professor Harvey Evers and Mr. Hugh Arthur for much helpful criticism and advice in the preparation of this report.

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Medical Memorandum

Supernumerary Pectineus Bursa Causing Femoral Vein Compression

Supernumerary pectineus bursa is a rarity. In the following case recurrent attacks of bursitis had led to femoral vein compression with consequent swelling of the affected leg.

CASE REPORT

A housewife aged 41 was referred to the out-patient department on December 31, 1951, complaining of severe pain in the right thigh which had kept her awake for one night. Her doctor stated that the thigh was greatly swollen and had made a diagnosis of possible venous thrombosis. Two months earlier she had complained only of swelling of the right thigh; there was no pain or tenderness, or any sug-

gestion of a deep vein thrombosis, nor were any inflammatory changes seen in the limb. The doctor thought it was possibly a case of angioneurotic oedema.

On examination her general condition was good. No abnormality was found in the respiratory system, cardiovascular system, or abdomen. The circumference of the right thigh was 2 in. (5 cm.) greater than the left, and the right calf 1 in. (2.5 cm.) greater than the left. There was, however, no evidence of actual oedema. The pulses of the two legs were equal and good. No pelvic abnormality was found on rectal or vaginal examination. There were no varicose veins. X-ray examination of the chest, pelvis, lumbar spine, and femora showed nothing abnormal. No cause could be found for this swelling in the limb and she was asked to report again should she get any further attacks, so that she could be seen during an attack.

She reported back on June 17, 1952, stating that during the previous week a lump the size of a walnut had appeared in the right groin. It had been present for two days and had then disappeared. On examination there was no sign of the lump in the groin, and in view of this she was again asked to attend when the lump reappeared.

Her third attendance, on September 22, 1952, showed a swelling the size of a walnut in the right groin situated below and lateral to the pubic spine. It was cystic and tender; the skin was mobile over it, but the swelling was fixed to the underlying muscle. An irreducible femoral hernia was diagnosed and operation undertaken.

At operation by a Lotheissen approach, dissection below the inguinal ligament revealed a cystic swelling which was found to be lying on the pectineus fascia and intimately adherent to the femoral vein. It was realized that this was not a femoral hernia but a bursa arising from the pectineus fascia. It was excised with the exception of a small portion adherent to the femoral vein.

Pathological Report.—The bursa contained gelatinous fluid and had a smooth lining. On histological examination the material was shown to consist of oedematous and congested fibro-vascular tissue, moderately infiltrated with chronic inflammatory cells, eosinophils predominating. In one edge the material was lined by flattened endothelial cells.

The patient made an uneventful convalescence, and on discharge from hospital on October 7 there was no significant difference in the circumference of the two limbs after exercise. When seen on December 15 she was symptom-free and there was no difference in measurement of the left and right lower limbs.

COMMENT

Supernumerary pectineal bursa is a further lesion to be considered in the differential diagnosis of swellings in the ileo-femoral region. In the case recorded the patient presented with swelling of the thigh, the cause of which remained undiagnosed until the bursa became large enough to appear in Scapa's triangle, when it was diagnosed as a femoral hernia.

Perrigard (1947) recorded this condition under the title of supernumerary bursa of pectineus muscle simulating hernia in the inguinal region. In his patient the bursa was adherent to some of the smaller tributaries of the long saphenous vein, whereas in our patient the bursa was firmly adherent to the femoral vein. In Perrigard's patient there were no symptoms referable to venous obstruction, and the bursa seemed to have been more superficial in its situation. We can find no other reference to this condition in the literature.

A similar condition which may lead to some confusion is the ileo-psoas or ileo-pectineus bursa which lies lateral to the femoral artery and may overlap the arteries and veins to lie anterior to them.

We should like to express our thanks to Dr. K. P. Ball and to Dr. Isobel Finlayson for the detail given in her original letter.

P. WINSTON, F.R.C.S.
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Reviews

CLINICAL ENDOCRINOLOGY

Clinical Endocrinology. Volumes 1 and 2. By Lewis M. Hurxthal, M.D., F.A.C.P., and Natalija Musulin, B.S., M.D. (Pp. 1,599; 482 figures, 146 charts, 1 coloured plate. £9 9s. the set of two volumes.) Philadelphia and London: J. B. Lippincott Company. 1953.

This is a remarkable compilation. It comprises two large volumes totalling some 1,600 pages, all of which are packed full of facts, charts, tables, and illustrations covering the whole wide field of modern endocrinology. It is a difficult work to classify. It is certainly not a textbook; it is not an illustrated dictionary, and it is not an encyclopaedia. It is primarily a work of reference, but one of unusual and indeed impressive type. All who feel that the traditional form of textbook of medicine leaves much to be desired should give this book serious and careful consideration, for it seeks to establish a new form in a most ambitious and comprehensive manner.

The whole work consists of the systematic tabulation and classification of the known facts of endocrinology. After a short chapter on normal growth and development, which contains 19 charts, diagrams, and photographs, there follow six long chapters which together cover 1,000 pages and which deal with the functions and disorders of the traditional endocrine glands. Each of these chapters consists of a preclinical or physiological part and a more extensive clinical section. Throughout, the emphasis is on the systematic classification and tabulation of facts. The text consists almost exclusively of lists under headings and subheadings. The multiple facts seem to have been chosen and sorted with a mature judgment and are supported by a wealth of excellent illustrations, diagrams, and up-to-date references. Indeed, the clarity and profusion of the illustrations and charts are an important feature of this work. Thus the section on cretinism is followed by 39 photographs of high quality and by five charts. The section on gigantism is likewise followed by 33 equally good photographs and radiographs and by four charts. No less thorough are the series of references. For example, those relating to the anatomy and physiology of the pituitary gland number over 1,100—a classified list which alone covers 30 pages. These references appear to be well chosen and include a representative series from European and British authors. Though mainly modern, the historical references are not neglected, for Galen and even earlier authors are referred to. Later chapters in this work are more assorted. They include a comprehensive one on sterility, and others on the pineal gland, dwarfism, hirsuties, the endocrines in hypertension, gastro-intestinal hormones, antihormones, and steroids.

The advantages of a work of this type are the ease with which any particular fact may be found and the ease of access to the wide bibliography. At a test we had no difficulty in finding an answer to the question, Is the thymus enlarged in Turner's syndrome? But there are real disadvantages in a work of this type. It is not always easy to find out what to do in a given clinical situation. Thus we had difficulty in deriving a plan of investigation of the hirsute woman from the data given in the chapter on hair growth. It is also often difficult to learn from the text what is common and what is rare. A good example of this is in the list of toxic effects of antithyroid drugs used in hyperthyroidism. This list gives equal prominence to skin rashes, headaches, jaundice, and agranulocytosis among others, and does not indicate which are common and which rare. The treatment for all these complications is listed as penicillin. Ambiguities of this type can be found in other places.

A stern test of the judgment of a modern author on endocrinology is perhaps in his handling of that controversial subject, the "general adaptation syndrome." A short chapter on this concept shows commendable restraint in avoiding the many speculative developments in this field. He confines

it to the more orthodox aspects of adrenal behaviour under stress, and gives a very fair survey of established facts.

This is an outstanding work conceived in the grand manner. All who have an active interest in endocrinology will find it worthy of a place of easy reference on their own shelves. It should prove particularly valuable also as a reference guide to endocrine literature in all medical libraries.

C. L. COPE.

INTRODUCTION TO PATHOLOGY

Basic Pathology and Morbid Histology. By D. B. Cater, M.A., M.D., F.R.C.S. (Pp. 330; 266 illustrations, including 20 coloured plates. 42s.) Bristol: John Wright and Sons Ltd. 1953.

The author of this book has made a valiant attempt "to help the student who has just begun the study of pathology and finds the subject difficult." He believes that the beginner in pathology, with his inadequate clinical background, comes to regard pathology as a dead science, finds that the microscopical appearances of diseased tissues are meaningless to him, and may eventually be "tempted to abandon the effort to master the subject." To rectify this sorry state of affairs, which is familiar to all those who teach pathology, the author has striven "to graft on to the student's knowledge of Physiology sufficient clinical information to make Pathology live." He tells us that the book, which is based on a one-year course of instruction, "was written for students and not for professors."

Dr. Cater's book is bursting with information, and he may be wrong in expecting the average student to acquire so much detailed knowledge in a year's preclinical course. It is possible that he would be less distressed about his students abandoning pathology if he investigated their attitude to it after three years of bedside experience, during which time they would have built up their knowledge of human pathology on the foundations provided by a preclinical course of general pathology, the success of which is usually considered to rest on the teacher's facility for skilful omission.

There are some omissions in Dr. Cater's book, and a harsh critic might consider it to be unbalanced. The word "tetanus" does not appear in the index and could not be found in the text. Syphilis is allotted a chapter of fourteen and a half pages; diphtheria is dismissed in half a page. Repair surely deserves more consideration than a detailed account of teratomata, hamartomata, and mixed tumours, and even the elementary student would like the account of fracture healing to be longer than nine lines. Regeneration is discussed in eight and a half lines. Hyperplasia does not appear in the index, and a long search in the text produced no more than a definition occupying one and a half lines. On the other hand, the pathology of tumours is most liberally treated and described with a wealth of detail and illustration, as are hypertension, renal disease, heart failure, and the anaemias and leukaemias.

In the early chapters of the book Dr. Cater makes the fullest possible use of analogy in order to fix his facts in the reader's memory, but when the story of leucocyte *versus* bacteria is compared with a full-scale battle, complete with demobilization centres, prisoners, engineers, front-line defence works, and commandos, this superficial analogy becomes rather overstrained. The author changes his literary style about a third of the way through the book, and his writing thereafter becomes quite conventional and less dramatic. One feature of this book deserves the highest commendation; the book contains a series of coloured histological drawings which are not only clear and instructive but have considerable artistic merit.

The perfect introduction to pathology has yet to be written. It may be that Dr. Cater's book will, by popularizing pathology, help in its understanding by undergraduates of average intelligence. They, after all, constitute the final court of appeal, for they alone are able to decide if they have been materially assisted by reading it.

GEOFFREY HADFIELD.

CHROMATOGRAPHY

Practical Chromatography. By R. C. Brimley and F. C. Barrett. Foreword by E. C. Bate-Smith. (Pp. 128; 34 figures. 15s.) London: Chapman and Hall. 1953.

The authors of this book describe in simple terms the various types of chromatography—adsorption, partition, and ion-exchange—and the various ways in which such chromatograms may be used—namely, elution, displacement, and frontal analysis. They then discuss working details at length, with brief references to some of the more common applications of the methods. The book ends with a chapter giving descriptions of the accessory apparatus required, such as fraction collectors and desalting apparatus.

The book fills a gap in the literature and will be found useful for those many medical research workers whose interest lies only in a particular limited application of chromatography. The literature on such a subject usually takes for granted a basic knowledge of chromatography, and without this the unfortunate potential chromatographer is forced to wade through a multitude of earlier papers gleaned little bit by bit here and there as he goes along. It is fortunate that two experienced workers have been persuaded to put aside their filter paper and columns and give us the benefit of their wide knowledge and experience.

C. E. DENT.

FATIGUE

Symposium on Fatigue. Edited by W. F. Floyd and A. T. Welford. The Ergonomics Research Society. (Pp. 196; 47 figures. £1 4s.) London: H. K. Lewis. 1953.

Some of us seem to be less worried by fatigue now that we can eat a steak at home without thinking of the protein starvation awaiting us for the rest of the rationing week. But no doubt this mixed psychological and physiological stimulus will soon pass, and we shall then have to think up other excuses for ourselves. This symposium provides a mass of solid facts on this problem, but some of the contributions are such difficult reading that they are apt to produce the very phenomenon under discussion. This is because they are highly specialized and technical contributions to already specialized aspects of a somewhat confused general problem. It is clear that some of the simplest findings remain unexplained. Psychological aspects tend to be blamed for discrepancies in physiological findings, but physiological changes may ultimately be found responsible for many of the psychological phenomena observed. As the introduction points out, the trouble lies in our present lack of knowledge of how the nervous system really works.

This book will be useful to industry, and the meeting reported was organized by a society interested in bringing together medical research workers and designers of modern machines and equipment. But little basic progress can be expected until psychological factors can be better understood in terms of altered function in the nervous system. Then there will be less need for a dualism of approach which destroys any chance of getting to the roots of the problem.

One contributor stressed the proved physiological value of limbering up before real work is begun. This symposium has the air of being this type of preliminary exercise despite the immense amount of work reported in it. Now we need another Pavlov to stimulate some sort of experimental synthesis.

WILLIAM SARGANT.

ANTIBODY RESPONSE

The Nature and Significance of the Antibody Response. Edited by A. M. Pappenheimer, jun. Symposium held at New York Academy of Medicine, March 21–22, 1951. (Pp. 227, 32s. 6d.) Columbia: University Press. London: Geoffrey Cumberlege. 1953.

This book contains fourteen articles which were presented at a symposium held at the New York Academy of Medicine in March, 1951. The science has advanced rapidly, so that there is a big gap between 1951 and 1953;

but some of the authors have brought their articles up to date—Kabat, for example, quotes papers published in 1952. Chapters 1–5 are on production of antibodies, Chapters 6–9 on kinds of antibodies, and the final chapters on antigen-antibody reaction in tissues. Each article is by an authority on the subject and together they give a most valuable picture of the present state of knowledge and the problems that remain unsolved. Some of the views expressed may be criticized, but the authors have as good a right as anyone to their opinions. As Pappenheimer writes in the preface, "One positive contribution I feel confident the symposium does make: that is to demonstrate how fruitful the application of quantitative immunochemical methods can be in throwing light on the mechanisms of immunological reactions."

J. R. MARRACK.

TREATMENT OF SPINAL INJURIES

Injuries of the Spinal Cord. Edited by George C. Prather, M.D., F.A.C.S., and Frank H. Mayfield, M.D. (Pp. 396; illustrated. 63s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

This book, with seven sections written by different authors, is essentially a manual of treatment of patients with spinal injuries and is based largely on experience of military casualties. In the neurosurgical section little is said about the physiology or the evolution of the clinical condition after complete transections of the cord. This omission is disappointing, for studies of these patients now that infection is better controlled might have added important information to knowledge of the physiology of the divided cord. The two most interesting sections are those on the urological aspects and on the nutritional problems. In the former there is an excellent account of the physiology of the "spinal" bladder and a critical account of the various methods of treatment, the author preferring a tied-in catheter or suprapubic cystostomy, either being connected to a closed drainage system with provision for manual or automatic irrigation. The importance of adequate nutrition, particularly of protein intake, has been increasingly recognized in recent years, and the chapter on nutritional aspects contains valuable information. Writers of other sections discuss in detail the plastic repair of decubitus ulcers and methods of rehabilitation and the treatment of associated injuries, and there is an interesting if somewhat discursive account of the psychology of the paraplegic. This book is a useful manual of treatment.

J. W. ALDREN TURNER.

ELECTRICAL HEART PICTURE

Das Elektrische Herzbild. By Dr. Wilhelm Ernsthausen. (Pp. 231; 227 figures. M.48.) Munich: Verlag für Biophysik, Hermann Rinn. 1953.

"The electrical picture of the heart," to translate the title of this work literally, will in all probability be outside the range of the average clinician. A mathematical equipment beyond the ordinary is needed to follow the arguments. Here and there, however, the reviewer has managed to glean some interesting information. The second chapter on the chemical elements concerned in the contraction of the muscle cells is interesting and illuminating, for there are some good illustrations which give a clear conception of the chemical structure of a muscle cell. The author puts forward the theory that relaxation is really an active process. In the next chapter he describes the movement of ions and the formation of energy. The control of metabolism is discussed from the aerobic and anaerobic aspects. From now on the subject-matter becomes very difficult, not only in itself but in the German. No doubt someone interested in advanced physiology will find it intelligible, but the complexity and multiplication of the hundred or so cardiograms which go to make up the "electrical heart picture" may well prove too obscure for the ordinary cardiologist for a long time to come.

TERENCE EAST.

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THE MEDICAL TREATMENT OF PEPTIC ULCER

No matter how well the cause of a disease may be understood, nor how self-evident the rational treatment may appear to be, the proof of the efficacy of that treatment remains the observation that in practice it works. When, on the contrary, as is the case with peptic ulcer, knowledge of causation is rudimentary, it is all the more essential that treatment should be firmly based on the results of scientific trial. Yet the current medical treatment of peptic ulcer is more dependent on tradition, clinical impression, and armchair speculation than any other branch of therapeutics.

The reason is not difficult to understand. It lies essentially in the natural history of the disease, which is one of a continual succession of relapses and remissions, spread over a lifetime and punctuated on only rare occasions, if at all, by the complications of haemorrhage, perforation, or obstruction. Hence any form of treatment may readily be shown to be followed by improvement in a large proportion of cases. And if it can be shown that the treatment may in certain circumstances neutralize or reduce the secretion of gastric juice, a theoretical explanation for its efficacy has been obtained which may serve to establish it firmly in the body of customary teaching. Physical rest, the avoidance of mental conflict, the ingestion of frequent and bland meals, alkalis, antispasmodics, secretory depressants, and sedatives are all regularly advised as essential parts of a regime which must be adhered to, more or less strictly, if the symptoms are to be kept under control—and this, as Todd¹ has pointed out, despite the recognition that polypharmacy is nearly always a cloak for ignorance.

With increasing appreciation of the natural history of ulcer and of the ease with which therapy may

obtain the credit properly due to time alone, it has become accepted in this country that a fresh treatment must run the gauntlet of a planned clinical trial before it can reasonably be adopted for routine use. Consequently, although more than a score of new treatments (some entirely new,^{2,3} some variants of older methods^{4,5}) have been put forward since the war, none has gained general acceptance. Moreover, the justification for standard therapy is now increasingly often being questioned.

Elsewhere in this issue Dr. P. R. C. Evans reports the results of a trial of the proprietary product "robaden" and of the value of a strict dietetic regime accompanied by a number of conventional drugs. Robaden is a Swiss preparation extracted from the stomach and small intestine of animals: it is free from lipoids and proteins, and is therefore distinct from enterogastrone. It has been claimed that robaden can bring about the healing of ulcers produced by histamine injection in guinea-pigs even when the injections are continued, and numerous enthusiastic reports of its value in man have appeared in the Continental literature (the makers advise the use of robaden for out-patients in conjunction with a normal diet). The conclusions derived from controlled trials have, however, been distinctly different. Bubb⁶ obtained better results with bed rest and standard diet, and Stolte,⁷ in a model investigation, obtained equally beneficial results from an inert placebo. Evans's results are in complete conformity; out of a total of 45 patients given robaden he assessed 24 as failures (53%), while of 53 patients given similar injections and tablets known to be inert 25 were failures (47%).

Evans's more important, and possibly more surprising, observation was that 51% of patients (that is, 27 out of 53) had eventually to be classified as failures after a course of four weeks' hospital treatment on a strict gastric diet, with bed rest and administration of phenobarbitone, hyoscyamine, olive oil, and magnesium trisilicate. In comparison there were 49% of failures (22 out of 45) among those who were given four weeks' in-patient treatment on a simple convalescent regime, allowed up two hours daily, and given no drugs other than magnesium trisilicate when necessary to relieve pain. The comparison is perhaps not quite fair to the stricter treatment, since "failures" included patients who relapsed at any time during the follow-up period of (on the average) two to three years, and for the greater part of the follow-up both groups of patients were given similar treatment regimes. Comparison of the results immediately after the end of the in-patient treatment might have shown a different picture, but so far as

the practical implications are concerned this is of little importance, since within a short interval any presumed advantage was already lost.

Surprising though this result may seem, it is not out of line with other recent work. Rae and Allison,⁸ for example, studied 63 patients with ulcers who were all in the Royal Navy and who were provided with the most suitable environmental and dietetic conditions for a period of a year as part of an experimental scheme for the rehabilitation and employment of men with peptic ulcers. They reinvestigated the group five years later, when all but one had returned to civilian life, and concluded that "in this series of patients the natural history of the disease was not materially influenced by the prolonged medical treatment." In a series of 140 patients Lawrence⁹ found no advantage in strict dieting compared with the use of ordinary hospital food. Among 125 patients with duodenal ulcer treated ambulant with various drugs, including hexamethonium, methantheline, and olive oil, Friendlander¹⁰ was unable to detect any significant beneficial results; and Doll and Pygott¹¹ could find none among gastric ulcer patients treated with phenobarbitone. The last-named workers did, however, observe more rapid healing among patients who were treated in bed in hospital than among those who continued at work, while Lawrence confirmed the value of alkalis for the relief of pain.

On the evidence, therefore, it would seem that the value of any form of dieting or of any drugs other than alkalis (and these only for the relief of pain) must be considered unproved. Even continuous milk-drip has not been shown to accelerate the rate of healing significantly, though it is probably of value for the alleviation of persistent pain. Nevertheless, until further evidence accumulates, the weight of clinical impressions should not altogether be disregarded any more than should the patients' oft-reiterated statement that fried foods (or cheese or apple as the case may be) aggravate their pain.

ION-EXCHANGE RESINS

In 1935 Adams and Holmes¹ published their methods for the preparation of ion-exchange resins. These consist of a highly insoluble organic matrix containing as many centres as possible at which cation or anion exchange can occur. In the cation-exchange resins used in medicine these centres are of two kinds, carboxylic (COOH) and sulphonic acid (SO₃H) groups, the latter being active over a wider range of pH though having a lower exchange capacity than the former.^{2,3} Their affinity for cations decreases in

the following order: Ca⁺⁺ > Mg⁺⁺ > K⁺ > Na⁺ > NH₄⁺ > H⁺.⁴ They yield hydrogen ion in exchange for the cation which they absorb; and, since this tends to cause buccopharyngeal ulceration, when they are used for clinical purposes ammonium is usually substituted for the hydrogen ion, the resin then being said to be in ammonium phase or cycle. Whichever cycle the resin is in, the metabolic effect is the same. Acidosis is produced by the absorption of hydrogen ion in the one case, or in the other results from the absorption of NH₄ and the subsequent conversion of NH₃ to urea in the liver, leaving hydrogen ion to be covered and excreted. The exchange capacity of different resins *in vitro* is conditioned by a number of different physico-chemical factors,⁵ and it has been disappointing to find that *in vivo* they exert only about 25 to 40% of their *in vitro* binding power for cations.^{5,6} There have been various theories to account for this.⁷⁻⁹

In the *Journal* this week at page 603 Drs. A. G. Spencer, E. J. Ross, and H. G. L. Lloyd-Thomas describe their experiments on the uptake of isotopic sodium and potassium by a cation-exchange resin *in vivo*. Their results indicate that the uptake of sodium greatly exceeds that of potassium in the small gut except in the jejunum, where the presence of dietary potassium, especially when this exceeds the sodium intake, favours the uptake of potassium. Lower down in the small intestine the absorbed potassium is displaced by sodium; but in the colon the process is reversed, and sodium is lost from the resin in exchange for potassium. This is more marked in patients on a low sodium intake, partly at least because of the enhanced efficiency of the normal reabsorptive function of the colon which occurs in sodium depletion. The authors liken the presence of a resin in the gastro-intestinal tract to that of an artificial electrolyte-containing compartment in the organism, a compartment which is constantly exchanging its ions with those of the rest of the organism in a continuing series of dynamic equilibria. This emphasis on the dynamic aspects of

¹ *Lancet*, 1952, 1, 113.
² Cheney, G., *J. Amer. diet. Ass.*, 1950, 20, 668.
³ Page, R. C., and Heffner, R. R., *Gastroenterology*, 1948, 11, 842.
⁴ Co Tul, Wright, A. M., Mulholland, J. H., Galvin, T., Bareham, I., and Gerst, G. R., *ibid.*, 1945, 8, 5.
⁵ Kemp, S., *Nord. Med.*, 1948, 40, 1979.
⁶ *Schweiz. med. Wschr.*, 1949, 79, 663.
⁷ *Lancet*, 1950, 2, 858.
⁸ *Quart. J. Med.*, 1953, 22, 439.
⁹ *Lancet*, 1952, 1, 482.
¹⁰ *Ibid.*, 1954, 1, 386.
¹¹ *Ibid.*, 1952, 1, 171.

¹ *J. Soc. chem. Ind. (Lond.)*, 1935, 54, 1T.
² Duncan, J. F., and Lister, B. A. J., *Quarterly Reviews*, 1948, 2, 307.
³ Dock, W., and Ferguson, F. C., *N.Y. St. J. Med.*, 1953, 53, 75.
⁴ Nachod, F. C., *Ion Exchange, Theory and Application*, 1949, New York.
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⁶ McChesney, E. W., and McAuliffe, J. P., *Amer. J. Physiol.*, 1950, 160, 264.
⁷ Hegsted, D. M., *et al.*, *ibid.*, 1951, 164, 695.
⁸ Fourman, P., *British Medical Journal*, 1953, 1, 544.
⁹ Berger, E. Y., and Steele, J. M., *J. clin. Invest.*, 1952, 31, 451.
¹⁰ Steinberg, A., *Proc. Soc. exp. Biol. (N.Y.)*, 1944, 58, 124.
¹¹ Segal, H. L., *et al.*, *Gastroenterology*, 1945, 4, 484.
¹² Spears, M. M., and Pfeiffer, M. C. J., *ibid.*, 1947, 8, 191.
¹³ Martin, G. J., and Wilkinson, J., *ibid.*, 1946, 6, 315.
¹⁴ Segal, H. L., *et al.*, *Amer. J. dig. Dis.*, 1950, 17, 293.
¹⁵ Neuhauser, I., and Gustus, E. L., *Arch. intern. Med.*, 1954, 93, 53.
¹⁶ Segal, H. L., *et al.*, *Proc. Soc. exp. Biol. (N.Y.)*, 1950, 74, 218.
¹⁷ Harkness, J., and Durant, J. A., *J. clin. Path.*, 1953, 6, 178.
¹⁸ Bull, G. M., *Proc. roy. Soc. Med.*, 1952, 45, 848.
¹⁹ *Trans. Ass. Amer. Phys.*, 1946, 59, 282.
²⁰ Payne, W. W., and Wilkinson, R. H., *Lancet*, 1951, 2, 101.
²¹ Lippman, R. W., *Amer. J. Med.*, 1951, 10, 776.
²² Mator, F. M., *et al.*, *J. clin. Invest.*, 1951, 30, 1018.
²³ Greenman, L., and Danowski, T. S., *Penn. med. J.*, 1952, 55, 563.
²⁴ Friedman, I. S., *et al.*, *Amer. J. med. Sci.*, 1951, 221, 672.

the mode of action of resins contrasts with the somewhat static part they have been assigned in many of the theories which have been advanced hitherto.

In the nine years immediately following their discovery the properties of ion-exchange resins were applied solely to chemical laboratory processes. A cation-exchange resin was first used in a medical laboratory to prevent blood clotting *in vitro* by exchanging sodium for the calcium of the blood.¹⁰ Later, anion exchangers were found to neutralize the free acid of the gastric secretion and were used therapeutically in cases of peptic ulceration¹¹⁻¹⁴; more recently complexes of anion-exchange resin and fatty acids have been used for the treatment of intestinal moniliasis.¹⁵ Cation exchangers yielding quinine for hydrogen ion have been used to detect the presence of free acid in the gastric secretion in tubeless gastric analysis,^{16 17} and to deplete body potassium in cases of hyperkalaemia due to renal failure.¹⁸ Following a suggestion by Dock¹⁹ that resins could divert from absorption most of the sodium ingested by patients with oedema, they have been used mostly for this purpose.

On page 597 of this issue Drs. Spencer and Lloyd-Thomas describe their experience with the use of cation-exchange resins in the treatment of 39 patients with oedema, 30 having cardiac and 9 renal disease. Seven patients had only minimal oedema, and of the 32 with gross oedema 65% showed marked improvement after resin treatment. The authors point out, however, that the resins were given as adjuvants to other measures, such as rest in bed, a low sodium diet, and fluid restriction, which in themselves are often sufficient to cause improvement and delivery of the oedema. 67% of the patients complained of discomfort, which was mainly gastrointestinal, and it was more marked in patients treated with the hydrogen-cycle resin given in the early stages of the investigation. A unique complaint of alopecia was made by one patient. 48% of patients developed clinical signs of potassium depletion, some with characteristic electrocardiographic changes and sensitization to digitalis. This was directly related to potassium intake, and occurred less often in patients who received 25% of the resin in the potassium cycle. Apart from this, biochemical distortions were common though rarely serious and included a compensated increase in plasma chloride, which rose to hyperchloraemic levels in only six patients with early renal failure, who developed clinical signs of acidosis, whereupon resin treatment was stopped.

In their renal cases Spencer and Lloyd-Thomas found that resin treatment was not contraindicated so long as there was no impairment of the kidney's

capacity to form ammonia to cover the excretion of acid, but that where initially there was uraemia and renal impairment resin treatment was contraindicated. There are many reports of the favourable effects of adjuvant treatment with resins on the oedema of the nephrotic syndrome,²⁰⁻²³ but most warn of its dangers in patients with a low renal reserve. The dangers are four: first, of causing an acidosis in patients whose ability to form ammonia is impaired; secondly, if an admixture of resin in potassium-cycle resin is given, of causing hyperkalaemia; thirdly, of contributing largely to the nitrogen intake with ammonium from ammonium-cycle resins; and, fourthly, of causing or aggravating structural damage in the kidney, for even healthy subjects taking resins have been shown to pass granular casts transiently in their urine.²⁴ Since Type II nephritis is the most common form of the nephrotic syndrome, and since it is a stage in progressive nephritis, it is questionable whether resin treatment should be used at all in this disease.

It is clear that treatment with ion-exchange resins requires careful biochemical control, and this raises the question whether they can be used safely in domiciliary practice. Spencer and Lloyd-Thomas found that they could, provided the necessary chemical estimations could be carried out every two to four weeks, and the answer really hinges on whether these can be done within a reasonable distance of a patient's home. Without such facilities, resin treatment for oedema, whether of cardiac or renal origin, would be dangerous.

WHOLE-TIME SPECIALIST APPOINTMENTS

The large majority of the medical profession has been consistently opposed to a whole-time salaried service: the plebiscite of the whole profession in 1948 left no doubt about that. Medical men and women entered the Service only on the promise—subsequently written into the Amending Act of 1950—that a salaried service would not be brought in by regulation. It is fair to say that the profession's opposition to a salaried service has been non-political, in so far as that is possible in an issue forced into the political arena, and came from a conviction that such a service would be bad for the public and the profession. The Royal College of Physicians in its evidence to the Guillebaud Committee, which we publish in this week's *Supplement* (p. 69), sums up the pros and cons of whole-time service and clearly presents what is the viewpoint of most doctors. It is the measured answer to Opposition questioners who in the house last week sought to persuade the Minister of Health—and, no

doubt, Mr. Guillebaud too—that a whole-time hospital specialist service would be more efficient and economical (see "Medical Notes in Parliament," p. 653).

Discussing the advertising of whole-time vacancies, the *Lancet* recently remarked on the preference of some boards for whole-time appointments and the preference of most consultants for part-time appointments, and went on to say that, "until a coherent policy has been adopted, there seems to be no reason why a board should not be able to advertise a full-time post if it has 11 sessions which it wishes to be undertaken by one consultant."¹ But, while opinions may differ about individual appointments, the policy on matters of principle has been settled. In 1948 the Ministry sent a circular to hospital authorities in which it was said that in assessing their staffing needs authorities should take into account so far as possible the individual consultant's wishes about his terms of service and that whole-time appointments should be made only where the requirements of the Service made such appointments necessary. This directive, as the Minister made clear in the House last week, has remained the policy of the Ministry ever since. However, in 1952 the Representative Body of the British Medical Association, meeting at Dublin, resolved that advertisements for new whole-time consultant or S.H.M.O. posts should not be accepted for publication in the *Journal* except with the approval of the regional consultants and specialists committee. This resolution rose out of a belief that some regional boards were wilfully misinterpreting the terms of the 1948 circular and were advertising more whole-time vacancies than were strictly necessary for the needs of the Service. It was later agreed between the Joint Consultants Committee and the Ministry that where there was objection by the local consultants to the advertisement of a new whole-time post it should be referred to the Ministry through the Joint Committee for discussion before the Association finally rejected the advertisement.

That is how the matter stands at the moment. Obviously the needs of the Service vary somewhat in different regions, and the boards must have some discretion in the administration of their area. At the same time they should realize that the staffing needs of their hospitals are best known by the hospital specialist staffs themselves. The profession has long sought to establish that hospital administrative bodies at all levels should seek the advice of representative professional committees on specified matters. This position has now

been achieved with hospital management committees and boards of governors but not with regional boards. Regional consultant committees would be suitable bodies to advise boards on such matters as staffing requirements, but, as they are not called into consultation, the present policy of refusing advertisements of whole-time posts at their request is the only way of making their voice heard effectively on a matter of importance. If it checks certain boards in their trend towards creating a whole-time specialist service, it is a check which the majority of the profession would support.

IMMUNIZATION AGAINST POLIOMYELITIS

Recent reports in the daily press that the Queen and the Duke of Edinburgh have been given injections intended to protect them against poliomyelitis in an epidemic area of Australia may have caused a widespread impression that there is now some effective method of active immunization against this disease. We are given to understand that the material used was gamma globulin, which is calculated to afford passive protection for the limited period of the royal visit to the area in question. In these very special circumstances no one will question the wisdom of taking this quite harmless precaution, even though absolute proof of its efficacy does not exist. In a disease with so low an attack rate as poliomyelitis, and one of which the dissemination is so mysterious that we cannot know whether or when any given individual has been exposed to infection, it is not surprising that extensive use of gamma globulin in the United States has failed to afford this proof. On the other hand experimental, as distinct from clinical, test is reassuring. Bodian² found that gamma globulin possessed a high degree of neutralizing power against all three types of virus, as judged by infectivity for monkeys, even though the blood from which it was derived was collected mainly in a part of the United States in which the Leon type of virus has never been isolated.

Active immunization presents the most formidable difficulties, greater perhaps than those for any other infectious disease. There are three immunologically distinct types of virus; they can be propagated only in tissue culture and thus on a very small scale. The use of animal cord suspensions, the only ready source of virus, is not altogether without risk of causing secondary changes in the central nervous system. Moreover, according to McHammon^{3 4} even in an epidemic area it would be necessary to inoculate 11,000 children to prevent one fatal or paralytic case, and in a non-epidemic perhaps 50,000. Many will remember the disaster of twenty years ago when two vaccines were

¹ *Proc. Soc. exp. Biol. (N.Y.)*, 1949, 72, 259.

² *Pediatrics*, 1950, 6, 696.

³ *Ibid.*, 1951, 8, 741.

⁴ *J. Amer. med. Ass.*, 1935, 105, 2152.

⁵ *Ibid.*, 1953, 181, 1081.

⁶ *Amer. J. Hyg.*, 1952, 55, 108.

⁷ *Proc. Soc. exp. Biol. (N.Y.)*, 1953, 62, 277.

⁸ *J. Immunol.*, 1951, 67, 213.

⁹ *Ibid.*, 1951, 67, 219.

¹ *Lancet*, March 6, 1954, p. 527.

introduced in the United States in which the virus was supposed to be attenuated by chemical means, in the Kolmer vaccine with 1% sodium ricinoleate and in the other with 0.1% formalin. A report by the medical director of the United States Public Health Service⁴ describing twelve cases of poliomyelitis apparently resulting directly from injection of one of these vaccines, five being fatal, led to the abandonment of both.

A vaccine now undergoing clinical trial is that prepared by Salk and his colleagues.⁵ It is derived from roller-tube tissue cultures of monkey testicle or kidney, and includes all three types of virus, inactivated by treatment with 0.4% formalin. This has been found to induce antibody formation of similar degree to that resulting from natural infection. A perhaps more promising development, although only in an early stage, is the work of Koprowski and his colleagues^{6,7} on the use of an oral vaccine. It has been known for some years that antibody formation may result from the oral administration of certain strains of living virus in monkeys. Melnick and Ladinko,^{8,9} using the Y-SK variant of Lansing virus, obtained this consistently, although a few animals also developed paralysis. Koprowski and his colleagues have used the TN strain, which, having been adapted to the cotton rat, lost pathogenicity for monkeys. Successful trials in chimpanzees were followed by the administration of a suspension of infected cotton-rat brain and cord orally, first to one non-immune human volunteer and then to nineteen others, of whom fourteen were non-immune. No symptomatic effects of any kind resulted. Of the fifteen non-immunes, twelve had virus in their faeces more than four days after vaccination—that is, at a stage when passive elimination would not account for its presence—and neutralizing antibodies in high concentration appeared in the serum of these subjects and of three others in whose faeces virus was not detected. This trial was then extended to sixty-one non-immune mental defectives with similar results, in which the additional observation was made that virus does not appear in the blood. This method has obvious advantages, as well as the merit of imitating the process by which immunity is naturally acquired.

GREAT ORMOND STREET AND KAMPALA

It is now perfectly feasible for a patient to have afternoon tea in tropical Africa and have breakfast next morning in a London hospital. It follows from this that hospital staffs in this country will be the better equipped to answer any calls that may be made on their services if they possess, through personal experience, a knowledge of tropical conditions and the approach to tropical diseases which is at present largely confined to those who have served in our Colonial Medical Service. This is one of the several important reasons why active co-operation between hospitals in this country and those in the Tropics should be encouraged. Last week plans were announced of an admirable scheme for fostering close relations between the Hospital for Sick Children, Great Ormond Street, and the medical faculty

of Makerere College, Kampala, Uganda. Each year a member of the visiting staff of Great Ormond Street will spend some weeks in Uganda; a senior medical registrar will spend approximately two years in Kampala; and one or two nursing sisters will be seconded to staff the children's ward at Mulago Hospital, Kampala. This hospital is the teaching hospital for the medical school of Makerere College, and is reserved entirely for African patients. It forms part of the Uganda Medical Service, while Makerere College and its medical school are maintained by the three territories of Uganda, Kenya, and Tanganyika. This offers a close analogy to the teaching hospitals at home, which are now the property of the Minister of Health, while the medical schools conform to university standards: the same smooth relationship which exists between the teaching hospitals and the medical schools in Great Britain also animates the hospital and medical school at Kampala.

The study of what may widely be termed tropical paediatrics is still a young subject, to which the work on kwashiorkor carried out at Mulago has given a noteworthy stimulus. While there is no dearth of clinical material nor of paediatric problems in Uganda itself, Mulago Hospital, situated only eighteen miles from the airfield at Entebbe—an important junction on the London-South Africa air route—may well develop an increasing importance for large tracts of the African continent. When, a few years ago, the visitors of the General Medical Council made their report on Makerere medical school, they commented upon the lack of adequate facilities for paediatric education. Last summer, at the time of the Coronation, a meeting was held at the Hospital for Sick Children, Great Ormond Street, between representatives of that hospital and the Uganda Medical Service and Makerere College medical faculty, at which the birth of an association between the hospital in London and the paediatric services at Mulago was planned. Later two members of the Great Ormond Street staff visited Kampala, and were able to give a favourable report on the gestational progress. The liaison is now complete, for already a sister has left London for Mulago to take charge of the children's ward, and in the autumn the first of a flow of senior registrars is to be seconded for a period of two years to take part in the work and teaching of the paediatric department. This association between a London teaching hospital, the East African university, and the Uganda Medical Service will be warmly welcomed.

The Council of the B.M.A. at its meeting on March 9 unanimously decided to award the Gold Medal of the Association to Dr. S. Wand in recognition of his outstanding services to the Association and to the profession. Dr. Wand is chairman of the Representative Body. A member of the Insurance Acts Committee from 1937 to 1948 and of its successor, the General Medical Services Committee, since 1948, he was chairman of the committee during 1948-52. During these years he gave untiring and distinguished service in the negotiations on behalf of general practitioners which culminated in the Danckwerts award.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

TESTS FOR VENEREAL DISEASE—II

BY

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The method of taking serum from a suspected syphilitic primary sore has been described in Part I (March 6, p. 575), and the finding of *Treponema pallidum* by dark-ground examination is proof of the disease. One negative finding is not conclusive evidence that the patient is not harbouring the parasite, and it may be that three or four attempts at daily intervals may be necessary for success. During this time the lesion should be protected and bathed with normal saline as opportunity serves. Should any difficulty arise it might be wise to send the patient to the pathologist.

Blood Tests for Syphilis

Blood tests for syphilis include the standard serum tests and Nelson's treponemal immobilization test. The former tests are usually reported as being negative or positive, with neat serum or dilutions thereof. The strength of a reaction (the higher the serum dilution the stronger the reaction) is no indication of the "amount" of the infection, but rather a reflection of the reaction of body tissues to the disease. Time should never be wasted in taking specimens of blood from the umbilical cord of infants. Such specimens when they arrive at the laboratory are nearly always infected, thus vitiating precipitation tests, or are anti-complementary to such a degree that they cannot be tested by a complement-fixation test.

Standard serum tests for syphilis and their modifications are legion, but all come under two headings: (1) complement fixation—for example, Wassermann tests, using standard or cardiolipin antigens; and (2) precipitation tests (including the clarification tests) such as the Kahn, Meinicke, Venereal Diseases Research Laboratory (Chamblee, U.S.A.), and Price's precipitation reaction.

Most laboratories employ a Wassermann reaction as the standard test, and a precipitation test as a check. It is important to seek the advice of the serologist concerning the relative sensitivity of the tests on which the report is based before attempting to assess the results. Fig. 1, in

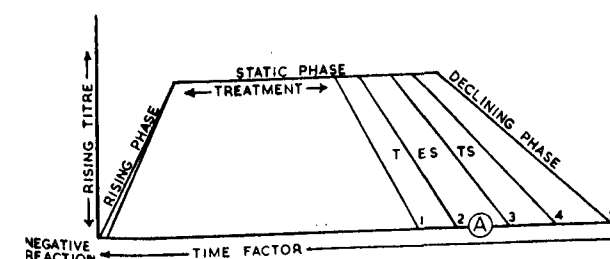


FIG. 1.—Relative sensitivities of five serum tests for syphilis.

which five serum tests for syphilis are depicted, illustrates this point. There is little difference during the rising phase in the sensitivity of any of these tests. Thus in the early stages of the disease one is not likely to become positive much earlier than the others. In the static and declining phases marked differences are evident. Thus test 1 stays static for the shortest time and becomes negative before any of the others. It is followed by tests 2, 3, 4, and 5. If, therefore, a blood were tested by these five reactions at time point A, the report would read: tests 1 and 2 negative, tests 3, 4, and 5 positive. Lack of knowledge of the rela-

tive sensitivities of the various tests would make the interpretation of such a report difficult.

It must be made clear that in the absence of any clinical signs a diagnosis of syphilis should never be made on the strength of positive tests obtained with one blood specimen. When such an occasion arises, it is unwise to inform the patient that he or she is suffering from syphilis. The history and clinical condition should be reinvestigated, and the possibility of a non-treponemal reaction (so-called biological false positive) discussed with the pathologist before any action is taken.

Non-treponemal Reactors

In Britain non-treponemal reactions (approximately 0.3% of all bloods tested) are most commonly obtained with bloods from patients suffering from atypical pneumonia and bronchial infections, from antenatal patients, and from those who have been vaccinated recently for smallpox or inoculated with T.A.B.C. vaccine. It follows therefore that when standard serum tests are being performed for emigration purposes the blood specimen should be taken before vaccination or inoculation is performed. Rarer causes of non-treponemal reactions are haemolytic anaemia and some cases of lupus erythematosus. In my experience glandular fever was possibly responsible for only one non-treponemal reaction when sera from 92 patients suffering from this disease were tested. In the conditions listed above the serum may, on serial testing and in the absence of any antisyphilitic treatment, remain positive at a low titre for a relatively short time (three months) before gradually fading in strength until it becomes negative.

The real difficulty arises in the case of antenatal patients, for time is short. Here Nelson's treponemal immobilization test may be of value, but the pathologist should be consulted before asking for this investigation. The test is so complex and time-consuming that it cannot be regarded as a routine test; it must be reserved for special "problem" sera. At least 10 ml. of blood taken with aseptic precautions into a sterile container is required, and the results are reported in percentage terms of immobilization. Thus 100 to 50% immobilization is a positive reaction, 50 to 20% a doubtful reaction, and 20 to 0% a negative reaction. Because the living *Treponema pallidum* is used as an antigen the test is said to be specific, and so far few non-treponemal reactions have been substantiated. One other serum test can be used with the blood of suspected non-treponemal reactors—the Kahn universal serological reaction. The serum is tested by a series of quantitative reactions using different solutions of saline. The results are read immediately as well as after 4 and 18 hours at 4° C. Different serological patterns are thus obtained, one of which is said to be typical of a syphilitic serum.

Chronic non-treponemal reactions are more difficult to deal with because serial blood testing may consistently yield positive results for years before the test returns to negative, and this in the absence of any family or clinical history, signs, or treatment of the disease. In fact it may be almost impossible to decide whether a patient is suffering from latent syphilis or whether he is a non-treponemal reactor. In such cases the treponemal immobilization test and Kahn's universal reaction may be of help. The decision to treat or not to treat can be extremely difficult, and if confronted with such a dilemma the practitioner is strongly advised to consult a venereologist.

Serological Patterns in Syphilis

Interpretation of serum-test reports depends, therefore, on the knowledge of the methods of reporting and the sensitivity of tests as well as on the behaviour of the tests during the course of the disease. Fig. 2 depicts a typical sero-

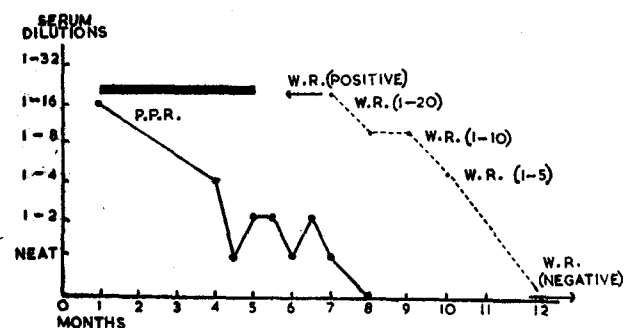


FIG. 2.—Typical serological pattern in a case of untreated latent syphilis of four years' standing, discovered on routine testing at beginning of treatment for gonorrhoea. The black rectangle indicates period of antisyphilitic treatment. P.P.R.=Price's precipitation reaction. W.R.=Wassermann reaction.

logical pattern of a patient with a positive serology tested throughout by means of the standard Wassermann reaction and Price's precipitation reaction. It will be noted that the latter returns to negative four months earlier than the Wassermann reaction in the absence of any further treatment.

Another but more complicated serological pattern of a patient is depicted in Fig. 3. Here, in spite of treatment, two sero-relapses occurred during the course of the disease before the blood tests returned to negative.

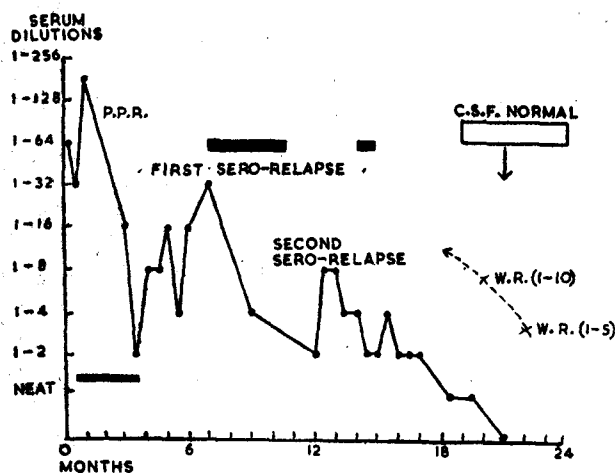


FIG. 3.—A case of late secondary syphilis with a healed pustular rash. Two sero-relapses occurred in spite of treatment.

"Oscillatory" phenomena, mentioned in connexion with the gonococcal complement fixation test, occur also with the standard serum tests for syphilis, and Fig. 4 depicts this phase of syphilitic serology. These types of reactions usually mean that the positive result is well on its way to becoming negative.

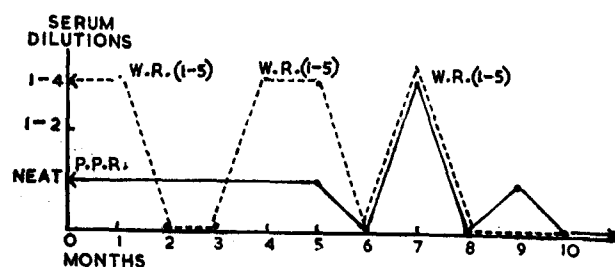


FIG. 4.—"Oscillatory" phase in the serology in a case of early latent syphilis of less than one year's standing.

A serological relapse may be said to have occurred when a series of three consecutive rises in titre are obtained by routine tests at short intervals during the course of management of syphilis. An example of this is shown in Fig. 2. Such a pattern may precede a clinical relapse.

"Carry-over" reagin is the term given to reagin which has passed from a sero-positive mother's blood to that of her newborn infant. Usually the serum titre of the mother is higher than that of the child, but the latter's positive serum reaction rapidly returns to negative in the course of six to eight weeks. Therefore if a child born of a syphilitic mother has no signs of the disease it should not be treated merely on the strength of a positive blood reaction. Quantitative serial blood testing at fortnightly intervals will soon reveal the course of events.

In general, once a diagnosis of syphilis has been made it is necessary to perform routine blood tests at suitable intervals in order to obtain a clear appreciation of the serological pattern, which indicates the response to treatment. The timing of blood tests must be left to the clinician, but it is suggested that the blood should be tested at monthly intervals for three months after treatment; thereafter, provided the clinical condition is satisfactory and the serum tests are negative or the titres are on the down grade, at three-monthly intervals for a year, followed by six-monthly intervals for another year. If all has gone well, a final blood test one year later should be performed. Variations in this scheme must depend on the response of the patient both clinically and serologically.

Cerebrospinal Fluid in Syphilis

All cases treated for syphilis should have their cerebrospinal fluid examined at least twice before being discharged as cured. In primary and secondary syphilis the usual times are at the end of the first six months of treatment and just before final discharge. Patients who come for diagnosis at a later stage of the disease should have their cerebrospinal fluid tested before treatment is given. Tests thereafter are taken at times which will depend on the diagnosis and the clinician's assessment of the effect of treatment.

Earle Moore's Classification of Spinal Fluid Patterns in Syphilis

Group	Cell Count	Protein Content (mg. 100 ml.)	Wassermann Reaction	Lange Test
Normal	9 or less, usually 5 or less	40 or less	Negative	0000000000 to 2111000000 or 0112100000
1	10 or more, usually less than 50	40 or more, usually less than 100	"	As in normal fluid, or, e.g., 3210000000
2	10 or more, usually less than 200	40 or more, usually less than 100	Positive	Variable readings
3	10 or more, usually (except in acute syphilitic meningitis) less than 500	40-200 or more	"	First zone or "paretic" curve, 4321000000 to 5555554321

If the Wassermann reaction is negative, the total protein estimation below 30 mg. per 100 ml., the cell count less than 10 per c.mm., and the Lange colloidal gold test normal, the result can be regarded as satisfactory. Any deviation from these standards may merit a close re-examination of the patient's mental and physical condition. It has been stated, however, that minimal amounts of reagin can leak through from the blood stream into the cerebrospinal fluid (possibly through the choroid plexus) with the result that a patient with a positive blood test may have a weakly positive cerebrospinal fluid (Wassermann reaction positive with neat fluid) in the absence of any clinical signs or increase in the total protein and number of cells. The interpretation of cerebrospinal fluid reports can be extremely difficult, and Earle Moore's* classification will be found to be helpful (see Table).

*J. vener. Dis. Inform., 1949, Suppl. 23, p. 66.

Group 3 is a "paretic formula" and is usually obtained with the cerebrospinal fluid of all untreated cases of paralytic dementia. This pattern can occur with other clinical forms of neurosyphilis, or even with asymptomatic neurosyphilis. When this happens the report should carry a warning to the clinician that unless the patient is treated adequately there is a grave risk that he may develop paresis. It should be realized that the cerebrospinal fluid can be normal in untreated neurosyphilis, especially in tabes dorsalis (20%) or in vascular neurosyphilis. In interpreting the results of the examination of cerebrospinal fluids, it is a good working rule to remember that the degree (or absence) of active inflammation in the nervous system (usually the meninges) is measurable by the cell count and protein content. If either or both remain high after treatment for neurosyphilis the patient should be treated again. On the other hand, if the cells and protein content recede to and remain normal, this is evidence of improvement of the inflammatory condition even if the Wassermann reaction and Lange test remain static. However, the findings in the cerebrospinal fluid of some cases of neurosyphilis (especially tabes) can show improvement in both cell count and protein, even in the absence of any treatment.

In cerebrospinal syphilis, therefore, the pathological report must be appraised with the following facts in mind: (1) the Wassermann reaction is used to exclude or confirm syphilis as the cause of an inflammatory condition; (2) the cell count and protein estimation are used as measures of the inflammation; and (3) the Lange colloidal gold reaction detects changes in the globulin/albumin ratio of the cerebrospinal fluid which occur not only in neurosyphilis but also in other infections of the central nervous system. In neurosyphilis three well-defined types of reactions are usually described—namely, the paretic curve 5555432100, the tabetic 0014321000, and the meningeal 0001234320.

Lymphogranuloma Inguinale (Lymphogranuloma venereum)

Lymphogranuloma inguinale is a disease due to a virus, in the diagnosis of which the laboratory can render considerable help. Of the two tests employed, the Frei skin test is the more important. The antigen (0.1 ml.) is injected in intradermally in the forearm so that a wheal is raised. In positive reactions an inflammatory infiltration or nodule measuring 6 mm. in diameter with a surrounding zone of erythema is present within 48-72 hours. The antigen used is a standardized culture of infected yolk of chick embryo, whilst the control test is made with material from uninfected yolks. The other test is a complement-fixation reaction, and a titre of 1 in 16 or more obtained with the serum of patients who have a positive Frei reaction is strong evidence of infection. Standard serum tests should always be performed to exclude a coexisting syphilitic infection.

Granuloma Inguinale

Granuloma inguinale is a rare disease in this country, and the diagnosis is permissible only when Donovan bodies are found in the smears or when pathognomonic cells are demonstrated by biopsy. If the practitioner suspects that a patient may be suffering from this condition it is suggested that a venereologist should be consulted.

Addenda

Before leaving the subject of tests in venereal diseases one other investigation should be mentioned—namely, that of vaginitis due to the parasite *Trichomonas vaginalis*. This relatively common and distressing condition, so prone to relapse, often coexists with gonorrhoea. The discharge should be inoculated into Stuart's transport medium and delivered to the laboratory as soon as possible. Smear preparations have not proved to be satisfactory in my hands and therefore are not recommended.

Finally, it must be pointed out that the importance of routine blood tests for all antenatal patients should not be overlooked. A recent investigation carried out in London showed that out of a total of 6,809 antenatal patients 44

(0.64%) were found to have positive Wassermann reactions. There should be little objection to this procedure, as serological tests for venereal diseases can be carried out with the same specimen as that used for Rh grouping.

Next article on Clinical Pathology.—"Tests of Thyroid Function," by Dr. Russell Fraser.

Reports of Societies

LOCAL MEDICAL SOCIETIES

Liverpool Medical Institution

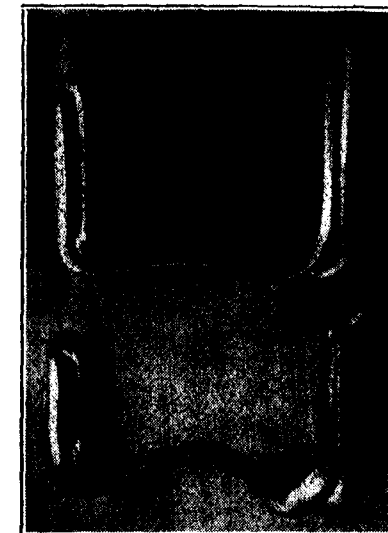
Speaking at a symposium on mitral disease held on February 11 at the Liverpool Medical Institution, Mr. F. Ronald Edwards said that the danger of recurrent rheumatic fever after valvotomy for mitral stenosis had been exaggerated. However, if any considerable mitral regurgitation was present before operation valvotomy appeared to be of little value. Mild aortic stenosis and regurgitation did not contraindicate mitral valvotomy unless the regurgitation was causing lowering of the systemic diastolic pressure. Neither was auricular fibrillation a contraindication to operation, although these cases had a higher mortality. Valvotomy in pregnancy should be undertaken only if the previous obstetrical history indicated it, and then it should be done early. The other contributors to the symposium were Dr. Ronald Ellis, on the medical aspects, and Dr. R. J. Keating, who spoke on radiological diagnosis.

Preparations and Appliances

ST. GEORGE'S MODIFICATION OF SIMS'S VAGINAL SPECULUM

Mr. IAN A. DONALDSON, first assistant, Department of Obstetrics and Gynaecology, St. George's Hospital, writes: A disadvantage of the standard Sims's duckbill vaginal speculum is the relatively short blade, which makes demonstration of the cervix in some patients difficult. The sister of the gynaecological ward at St. George's Hospital designed a modified speculum which has been made by Messrs. Charles F. Thackray Ltd., who have supplied the following technical information about the new speculum.

The whole instrument is shaped from thin material to reduce the total weight, and the overall dimensions of the two blades are: larger blade, 4½ in. (12 cm.) long and 1½ in. (3 cm.) wide; smaller blade, 4½ in. (10.8 cm.) long and 1¼ in. (2.9 cm.) wide. Varying sizes of the modified speculum have been made. The longer and narrower blades and the marked decrease in weight make them far more convenient to use. The accompanying illustration of the largest examples of the specula shows the difference in dimensions.



Correspondence

Diagnosis of Thyrotoxicosis

SIR.—Professor E. J. Wayne, reviewing various methods of assessing thyroid function in his Bradshaw Lecture (*Journal*, February 20, p. 411), refers to the determination of the serum creatine level in such terms as to give the impression that this test has little diagnostic value; this impression is reinforced in the leading article on toxic goitre in the same issue (p. 443). I should like to state that this view is contrary to the experience of my colleagues and myself in more than 400 patients originally diagnosed on clinical grounds as suffering from some form of hyperthyroidism, and to answer the criticisms levelled at the test.

A normal fasting serum creatine level of less than 0.6 mg. per 100 ml., in both men and women, excludes all but the mildest, relatively symptomless, cases of hyperthyroidism and differentiates sharply the anxiety states from true thyroid disorders. A serum creatine in excess of this upper normal limit, if it occurs in association with the signs and symptoms of hyperthyroidism, though not necessarily with a raised B.M.R., is convincing evidence of thyroid disease; if the B.M.R. is also increased the diagnosis is, in my opinion, beyond doubt. When, as may sometimes happen, especially if the B.M.R. is within normal limits, the diagnosis remains uncertain notwithstanding hypercreatinemia, a therapeutic test with Lugol's iodine or thiouracil, given for a few days, will result in a fall in the serum creatine if the increase is due to thyroid dysfunction; other forms of hypercreatinemia remain unaffected.

The method is as clear-cut as is possible with tests of this kind, and the features of other diseases in which the metabolism and serum creatine are raised are sufficiently distinctive to obviate confusion. Contrary to Professor Wayne's statement, overlap of the creatine levels between normal and thyrotoxic men rarely, if ever, occurs; that some apparently normal women may exhibit hypercreatinemia does not detract from the value of the test if the situation is intelligently assessed and a therapeutic trial performed. Peters' method of estimation is capable of a high degree of accuracy given a good photo-electric absorptiometer and using cells of 2 cm. depth; it seems to be immaterial whether all the substance estimated is creatine or not.—I am, etc.,

London, S.E.1.

W. J. GRIFFITHS.

REFERENCE

J. Biol. Chem., 1942, 146, 179.

Weber-Christian Disease

SIR.—As Dr. H. R. F. Macdonald reports (*Journal*, February 13, p. 377), the Weber-Christian disease is not very commonly encountered.

I should like to mention two patients because of the apparent effect of treatment. The first, a woman of 50, married and at the menopause, suffered from typical recurring lesions, mostly on buttocks and thighs and occasionally breasts, over a period of seven years. Several lesions had been excised by a surgeon and the histology was typical. The administration of diphenhydramine hydrochloride, 50 mg. three times a day, cleared the affection within a few days, and there has been no relapse now after three years. The second patient, a female aged 44, had numerous characteristic lesions, mostly over the abdominal wall and breast and occasionally elsewhere, of about six months' duration. The condition was thought by a physician possibly to be leukaemia, but removal of a nodule showed the characteristic picture. This patient was put on promethazine hydrochloride, 25 mg. nightly, and on diphenhydramine hydrochloride, 50 mg. three times a day, while in hospital for a

week. On discharge from hospital the promethazine hydrochloride was continued for several months with some slight improvement but no marked clearance. The administration of cortisone, 25 mg. by mouth four times a day for three weeks, cleared the affection in this period, and there has been no relapse after nearly 12 months.

The results in these isolated cases may be no more than coincidental, but it will be interesting to hear the experience of others.—I am, etc.,

Leeds.

JOHN T. INGRAM.

SIR.—Like most G.P.s, I tend to become fuddled by the rarities that succeed each other in your columns, but the memorandum on Weber-Christian disease (*Journal*, February 13, p. 377) has solved a five-year-old headache for me.

A cheerful, healthy, obese housewife, then aged 42, developed painful nodules in the legs in November, 1948. She was febrile ($\rightarrow 102^\circ$) for three weeks, and there was considerable constitutional upset. Indurated swellings, some as large as bantam's eggs, continued to develop in the subcutaneous tissues of the extremities as far up as the deltoids and buttocks. There was no suppuration. Courses of penicillin and sulphadiazine had no effect. At the end of this time she spent a fortnight in hospital, but nothing significant was discovered. She was now afebrile, and slowly resumed her normal life, but further swellings developed in decreasing numbers every few weeks. In February, 1950, she had a typical lesion in the right breast, the only one to occur on the trunk. In June, 1950, she had a cholecystectomy for multiple stones; this had no influence on her other condition—large, usually solitary nodes appearing at slowly lengthening intervals. On February 5, 1954, she presented herself with one about 5 cm. in diameter on the left calf: previous specimens had been negative, but I decided to send one more for culture. Incision produced blood, and curious amorphous yellow globules.

On February 13 I read your memorandum and telephoned Dr. S. Faulds at the Cumberland Infirmary, to whom, and to his colleagues at the pathological laboratory, I am most grateful for the following report, which seems to clinch the diagnosis: "Wet films show large numbers of fat globules and occasional macrophages. This would fit with Weber-Christian disease as you suggested."—I am, etc.,

Appleby, Westmorland.

PETER DELAP.

Lilliputian Hallucinations

SIR.—Dr. J. Todd's account of Lilliputian hallucination in a case of trichlorethylene poisoning (*Journal*, February 20, p. 439) recalls to my mind two cases of methyl bromide poisoning in which similar phenomena appeared. One was a youth of 17 with mild symptoms who complained of his feet looking very small, and as if they were a long distance away; his environment was unaffected. The other was a severe case, with epileptiform convulsions, in a man of 25. The ward appeared of normal proportions, but the nurses were horizontal. When later on they appeared to assume the vertical position they were less than half their normal size but "fat and squashed, as if you saw them in a mirror at a fun-fair." Visitors had the same appearance and gave him considerable amusement. He recognized the nurses afterwards as the same people who had appeared in caricature. Inquiries of several other patients with the same condition led to the conclusion that microptic phenomena are uncommon features of methyl bromide poisoning.—I am, etc.,

Hornchurch, Essex.

H. WYERS.

Controlled Hypothermia

SIR.—It is pleasant in controversy to find grounds for agreement, and we would certainly support Dr. H. C. Churchill-Davidson's plea for simplicity (*Journal*, March 6, p. 583); not, however, at the price of accuracy. That a general anaesthetic agent may interfere with the thermoregulatory mechanism is unquestioned, but the dose required reduces the patient to a state of deep anaesthesia in which depression of this autonomic function is accom-

panied by depression of every other function, nervous, cardiovascular, and metabolism.

We must insist that thermo-regulation is an autonomic activity. Therefore, if chlorpromazine, or any other drug, proves to have a predominant action on the central synaptic connexions of the autonomic nervous system, including those associated with thermo-regulation and vasomotor tone, for the sake of accuracy, and ultimately of simplicity also, it should be described as producing "central autonomic block." It will then be clearly differentiated from the peripheral acting "autonomic ganglion blocking drug." After all, the general anaesthetics produce widespread muscular relaxation, but that does not invalidate the term "relaxant drug" for substances such as tubocurarine.—We are, etc.,

JOHN W. DUNDEE.
T. CECIL GRAY.P. R. MESHAM.
W. E. B. SCOTT.

Liverpool, 7.

Anaesthesia in Out-patient Departments

SIR.—In your leading article (*Journal*, February 27, p. 305) you did not bring out clearly what I sought to show at the Royal Society of Medicine. You said that I drew attention to the low potency of nitrous oxide, which was well known, and to the hazards that may follow attempts to obtain "more than light anaesthesia" with it. "Even light anaesthesia" would have been nearer the mark, for I showed that, of an unselected sample of adults, less than half could be anaesthetized at all without anoxia, sometimes gross; and I contended that when a "gas" was given the main agent of anaesthesia was, in fact, not nitrous oxide but anoxia—a contention which, in the discussion that followed, was not challenged. In assessing danger, therefore, it is with anoxia, used as an agent of anaesthesia, that cyclopropane has to be compared.

It is true that with cyclopropane there is a risk of explosion which must be constantly borne in mind. But with ordinary care and with the anti-static rubber now available explosions should not occur. But the notion, commonly held, that I wish most to dispel is that cyclopropane is dangerous because it is a powerful anaesthetic. "Overdose" and "respiratory arrest" seem to spring to the mind of anyone who considers its use in the out-patient department. Whilst with nitrous oxide, because of its inevitable anoxia, these are an ever-present menace, with cyclopropane they are far distant and not, in practice, encountered. It is, in fact, precisely because of its power, which enables it to be used throughout with 50% or more oxygen, that cyclopropane, though not perfect, is probably the safest of all existing anaesthetics to administer easily and effectively to out-patients.—I am, etc.,

London, S.E.1.

J. G. BOURNE.

Dental Anaesthetics

SIR.—In a paper recently read before the Anaesthetic Section of the Royal Society of Medicine (*Journal*, February 20, p. 452) Dr. J. G. Bourne advocates the use of cyclopropane in dental anaesthesia. During the discussion that followed, attention was drawn to the possible danger of explosion when using this gas. That this is no mere theoretical objection is well borne out by the following incident which may be of interest to any of your readers who may contemplate trying out the suggested mixture of cyclopropane-oxygen.

A short time ago a dental colleague was engaged in a rather difficult extraction on a patient under nitrous oxide anaesthesia. The forceps accidentally slipped from the tooth, giving rise to a shower of sparks, which, in spite of a well-lit surgery, was plainly visible to myself and the nurse in attendance. Had I been using cyclopropane I am afraid that the result might have been very unpleasant for all concerned.—I am, etc.,

Hove.

H. NEWTON-ANDREWS.

Methylpentynol

SIR.—I was interested to read Dr. A. G. Boag's letter in which he draws attention to the use of methylpentynol for premedication (*Journal*, February 13, p. 393). In addition to the ward procedures that he mentions, I have found this drug of value in allaying anxiety before the administration of a barium enema. Radiological examination is facilitated by the patient's fuller co-operation.

Methylpentynol also seems to be helpful in attacks of asthma. It may be given four-hourly in doses of 0.5 to 1.0 grammes as long as an attack lasts. The reduction of anxiety permits a better response to the usual treatment.

May and Ebaugh¹ reported very favourable results from the use of methylpentynol as a sedative in aged patients. There is no completely satisfactory sedative for such patients and it is well known that barbiturates may induce or increase mental confusion and restlessness. Methylpentynol seems to be effective in certain cases and has advantages over paraldehyde, which is more commonly given. The dose used must often be large. As your annotation (*Journal*, August 22, 1953, p. 435) states, there is no analgesic action in methylpentynol and probably it fails to act in those elderly persons whose insomnia and restlessness are dependent on physical discomfort or pain. Nevertheless, the drug is worthy of further assessment, especially in patients with cerebral arteriosclerosis.—I am, etc.,

London, N.9.

A. N. EXTON-SMITH.

REFERENCE

J. Amer. med. Ass., 1953, 152, 801.

SIR.—I share Dr. A. G. Boag's interest in methylpentynol (*Journal*, February 13, p. 393), as I myself am testing this as premedication for children having tonsillectomy. It is my wish to find a drug with qualities that include production of sleep so that the children know nothing of their visit to the theatre, simplicity and acceptability of administration, minimal depression and cough reflex and respiration, no vomiting, and no post-operative restlessness. Quinal barbitone ("seconal") and pentobarbitone ("nembutal"), of which I have considerable experience, were less than perfect in the fifth of these requirements; rectal thiopentone in the second.

Till now I have used methylpentynol for 62 cases, and have found the requirements generally satisfied except for failure to produce sleep. Instead, however, the children, almost without exception, have arrived in the anaesthetic room calm, quiet, happy and co-operative, and sometimes sleepy. It has proved wise to give the elixir one to one and a half hours pre-operatively in a dosage of 500 to 750 mg. Even so, it is unlikely to be sufficient premedication for undisciplined children and those who are frightened of hospitals. Results with methylpentynol appear so encouraging as to warrant completion of the investigation.—I am, etc.,

London, W.10.

CHRISTINE M. RENDELL.

Cortisone and Manipulation of Knee-joint

SIR.—The report entitled "A Comparison of Cortisone and Codeine Medication as an Adjuvant to Manipulation in Rheumatoid Arthritis" (*Journal*, January 30, p. 233) demonstrates an immense amount of careful work, especially in co-ordination between groups as widely separated as Bath, Sheffield, and the London area. The administration involved to produce this report must have been considerable. But what has it achieved? In the summary to this report it is stated, "A controlled trial has been made of the value of cortisone as a cover to manipulation of the knee-joint in patients with rheumatoid arthritis. . . . In the dosage given there was no evidence that cortisone was in any way superior to tab. codein. co. for the purpose at issue." Yes, certainly, there is much ground for their actual findings, and negative findings are often of real value. Apart from this, my impression on first reading this report was to answer my question by an emphatic "Exactly nothing." But on my second and third reading other thoughts came to me that are, I trust, worthy of consideration.

The first of these is to note that the graph (unnumbered) at the top of page 235 shows steady improvement during the pre-therapy period, rudely interrupted by the treatment, and then further days elapse before the curve initiated during the pre-therapy period resumes its quiet progress. This point can be seen readily by casting the eye across the gap caused by "the trauma of this operation." My second is to note with interest from Table V of the "contralateral knee-joints (non-manipulated)," that the pain, range of movement, and timing tests all show a nearly smooth curve of improvement—thanks probably to a combination of hospitalization, enforced rest, and by "every endeavour was made to get the patient walking as early as possible."

Now I come to two quite different thoughts. It is stated: "In a proportion of cases these contractures cannot be corrected by conservative methods, and manipulation under a general anaesthetic is required." What evidence does this paper produce for the clinical accuracy of this *ex cathedra* statement? Absolutely none. Again, there is no description of the method or extent of the manipulation. Anyone with the smallest experience of manipulating joints in active cases of rheumatoid arthritis, such as those treated in this survey, knows that the technique is critical. Indeed there are many physicians and surgeons who would hesitate to manipulate (presumably under an anaesthetic, though this is not stated) a knee in a patient whose E.S.R. averaged 20 mm. Since when has it been a good form of therapy in joint disease cases to subject an actively ill patient to a form of therapy that increases their pain and diminishes their mobility as shown by the authors' graph?

Is it not time that a halt was called to these so-called methods of research, where every care is taken to leave no loophole for criticism of the methods employed or the deductions made? To cease, also, this unnatural way of regarding patients as so many pieces of machinery or guinea-pigs, and return to those methods of simple clinical judgment and observation where results are gauged by the method of presentation and by the individual's reputation for accurate and humane genuine medicine. Harvey, Lister, Mackenzie, Banting, Fleming, and many others secured the real advances that stand for ever to their credit by the very individuality of their work.—I am, etc.,

Chipping Campden.

C. B. HEALD.

Changes in Skin Response in Asthma

SIR.—I have read with great interest Dr. A. G. Ogilvie's article on changes in skin response in asthma (*Journal*, February 13, p. 370). These variations have for long been recognized, but have been all too little discussed.

A positive skin response merely demonstrates that specific antibody is present either in the epidermal cells or in the blood contained in the capillary loops. It is probably true that specific antibodies can at times be concentrated in other tissues—e.g., the bronchial or gastric mucosa—without being present in either skin or blood, in which case there will be no "immediate" weal and flare reaction when the sensitizing agent is applied to the skin. Conversely, it is well recognized that some patients give positive skin reactions to allergens with which they are no longer in contact, and which therefore cannot be the present cause of their attacks. In such cases the causative factor or factors must be sought elsewhere, and they may be found to be other than allergic. For these reasons I think that it is unsound to accept positive skin reactions as the criterion of a dominant allergic aetiology, without reference to the history, environment, and physical examination of the patient.

A number of diverse factors—hormonal, psychogenic, infective, for instance—can affect the concentration of antibodies, and therefore the intensity of the skin reaction. Dr. Ogilvie found that all his cases that had been "desensitized" gave negative reactions at the end of their courses of injections. This is a common finding, and is presumably due to the production of a blocking or inhibitory antibody. With regard to the development of fresh sensitivities, one has often found this to occur, sometimes dramatically. It has usually been demonstrated in the course of a reinvestigation when a case has relapsed. There are therefore several comprehensive reasons why there may be variations in the skin reactions in the same patient over a number of years, and I quite agree with Dr. Ogilvie that it is futile to attempt to

assess clinical progress solely on the basis of these reactions without consideration of the case as a whole.

Nevertheless, skin testing is a procedure without which it is impossible to make an adequate aetiological diagnosis in the majority of cases of asthma. It should, of course, be properly carried out by an experienced person, with negative and positive controls, using extracts of individual allergens (rather than groups) of known concentration and of reliable origin.—I am, etc.,

York.

HAROLD ROYLE.

SIR.—Dr. A. G. Ogilvie's observations in his paper on "Changes in Skin Response in Asthma" (*Journal*, February 13, p. 370) are so much at variance with general experience that an attempt must be made to explain them. I should like to comment under the following headings.

Technique of Testing.—The technique of skin-testing has now been more or less standardized for many years. The quantity of extract usually injected in the intradermal method is 0.01–0.02 ml., just five to ten times less than the amount injected by Dr. Ogilvie. The disadvantage of using relatively large volumes of extract is well recognized. I quote from two well-known textbooks. Cooke¹ states: "The common practice of injecting as much as 0.05 to 0.1 ml. in the performance of an intracutaneous test should be condemned. The initial trauma resulting from the injection of such a large amount of fluid into the skin is sufficient to produce non-specific wealing. This is not only misleading in itself but impairs the diagnostic value of many tests which produce only slightly positive reactions but which, nevertheless, are specific and of diagnostic significance." Vaughan and Black,² in discussing the technique of the intradermal test, say, "... Then press on the plunger introducing 0.01 or 0.02 cc. of the extract into the epidermal layer."

It is small wonder that many of Dr. Ogilvie's patients quailed at the thought of a second assault by his "energetic young skin-testers," and he may be accounted fortunate that this procedure was not followed by any serious results. A number of deaths have been recorded following skin tests with smaller quantities of extract than he employed. Presumably, the frequency of false positive reactions obtained by this technique explains his criterion for a positive reaction—namely, "a definite weal of at least the size of a silver threepenny-piece with pseudopodial irregularities and surrounding erythema." This would exclude many significant reactions and would explain why he has been unable to confirm sensitization in patients with strongly positive histories. It would also probably account for the apparent change from negative to positive and vice versa, when patients were retested after several years: many of those considered negative were probably still positive but not up to threepenny-bit standard—in other words the responses may have varied in degree rather than changed from positive to negative or negative to positive.

Variation in Potency of Extracts.—Dr. Ogilvie does not state whether fresh extracts were used from time to time, but, since the potency of few, except perhaps the pollens, would have remained unaltered during the time of his investigations, one assumes that he has done so. Unfortunately, we still have only rough methods of standardizing our extracts so that no two preparations made at different times can be regarded as identical in potency or quality. This applies especially to mixtures of extracts as used for "group testing." I habitually employ commercial extracts and find that they vary considerably in potency: this is not a reflection on the firms who put them up but an indication of the crudity of our methods of preparing extracts. I am at present using an extract of cat hair which gives a high proportion of positive reactions, many of which cannot be justified from the history: a short time ago the cat hair extract from the same firm rarely caused reactions. In other words, a change in the extract rather than a change in the patient may account for some of Dr. Ogilvie's observations.

Site of Test.—The site at which skin tests are carried out is important: if the forearms are used larger reactions are obtained near the bend of the elbow and smaller ones near the wrist using the same amount of the same extract. If the arm was in fact employed as the testing site, were precautions taken to ensure that the same relative positions were used for each test substance at the time of the original and subsequent tests?

Effect of Drugs.—Dr. Ogilvie does not state if precautions were taken to ensure that drugs such as adrenaline, ephedrine, or anti-histamines were not taken on the day the tests were carried out. These drugs are well known to cause reductions in skin sensitivity.

My own observations³ have shown a remarkable consistency in the skin responses of a small group of pollen-

sensitive patients tested repeatedly over three years. The reactions invariably diminished immediately after treatment and when the scratch test was employed sometimes disappeared, but they had almost returned to the pre-treatment level four months later: there was little variation from year to year. No one would deny that changes in skin responses do occur sometimes apparently "inconsequently"—new sensitivities develop and old sensitivities fade away. Like Dr. Ogilvie, I have always been sceptical of the value of skin-tests, but in investigating their vagaries one must stick to the rules. The really odd thing about his paper is his final comment (with which I am in full agreement) that "skin-testing . . . in the individual case may give valuable information if used with discretion."—I am, etc.,

London, W.1.

R. S. BRUCE PEARSON.

REFERENCES

- ¹ *Allergy in Theory and Practice*, 1947, p. 501. Philadelphia and London.
- ² *Practice of Allergy*, 1948, p. 184. St. Louis.
- ³ *Guy's Hosp. Rep.*, 1940, 90, 65.

The Prevention of Pulmonary Embolism

SIR.—Your annotation on pulmonary embolism (*Journal*, January 23, p. 202) prompts me to report a method designed to prevent this post-operative complication.

At the conclusion of the operation the surgeon and his assistant raise the patient's legs through an angle of 80 degrees. The powdered palm of the hand is then used to massage the patient's calves from the tendo achillis to the popliteal fossa. The patient's feet are then passively flexed and extended at the ankle. The legs are lowered on to an inclined plane of 45 degrees, which is placed on the stretcher canvas on the operating table; the tendo achillis rests on a sorbo-rubber bridge—a rubber loop fixed to the top of the inclined plane is slipped over the feet to prevent the legs from rolling off. When the patient is returned to bed the legs are kept at an angle of 45 degrees by a wider inclined plane which is slipped in under the mattress until active toe and foot movements are possible.

This treatment is based on the belief that most cases of post-operative pulmonary embolism result from clots which have their origin in the veins of the calf, and which begin to form during and shortly after operation; although the coagulability of the blood is altered, the venous stasis and endothelial trauma are all-important. By making use of gravity, massage, and the venous pumping action of the calf muscles it is ensured that no early thrombotic changes occur in the veins of the lower limbs before the patient regains consciousness, after which active toe and foot movements are possible.

The writer has been impressed with the incidence of pulmonary embolism among patients who have been in bed for any length of time pre-operatively, and, although it is not intended to list other prophylactic measures in general use, the precaution of keeping patients who are admitted to hospital for pre-operative treatment or investigation ambulant, whenever possible, will bear repetition. In passing, it may be mentioned that following operations in the lithotomy position, particularly in middle-aged and more elderly patients with atheromatous changes in the cerebral vessels and in whom a sudden lowering of blood pressure predisposes to cerebral thrombosis, and following obstetric operations in the lithotomy position when a lowering of the legs to the horizontal is not immediately desirable, the inclined plane has proved its value.

In conclusion, Sir, this simple piece of apparatus will help to reduce the incidence of post-operative venous thrombosis and its sequelae, and the complications resulting from a sudden fall in blood pressure, and will later form the subject of a more detailed communication.—I am, etc.,

Chelmsford.

ANTHONY PEARSON.

International Nomenclature for ABO Groups

SIR.—Before the adoption of the international nomenclature for the ABO groups, considerable confusion between the British and Continental literature occurred between groups I and IV as a result of using Moss and Jansky

terms respectively. It was hoped that the international notation would avoid all future errors; nevertheless, this has not proved to be the case. Before the international terms were instituted sera for grouping were issued as II and III, whereas for a time after the inception of ABO, the sera issued were labelled A and B. Some time ago the labels on sera for grouping were altered to anti-A and anti-B, the contents of which were respectively B and A, an apparent reversal to the uninitiated. Why this change took place, apparently without international agreement, is not clear.

Arising out of this change we have recently had a young house officer who previously held an appointment in the U.S.A., where, she stated, the previous method of labelling—that is, A and B—continues. One night recently, as an emergency, she grouped a patient preparatory to blood transfusion, and made the group B instead of A as a result of the labelling anti-A and anti-B. It was entirely new to her, and she had not seen this notation before. The mistake was corrected in time to avoid any possible transfusion disaster. Surely, however, the whole circumstance raises an important question of principle; the labelling of material of this kind should be a matter of international agreement. This will avoid confusion in the literature and, further, avoid possible disasters to patients. It seems to me to be entirely wrong that any change of nomenclature should be permitted unilaterally in one country. In short, an international agreement, once accepted, must not be broken by any individual country without due notice to all affected by such a decision.—I am, etc.,

London, S.E.18.

W. SMITH.

Improved Hearing by Re-education

SIR.—I feel it important that everyone interested in deafness, and especially otologists, general practitioners, and the lay hard-of-hearing public, should be careful about accepting unreservedly the claims made for improved hearing by re-education methods without hearing-aids. The claim is made concerning persons ranging from the hard-of-hearing (but not requiring an aid) to those with marked high-tone deafness, and even for some too deaf for an aid to help at all. An increase of ability to listen is denied; it is considered a definite improvement by releasing "latent" hearing. This may be so, but the principle needs medical and scientific investigation before the practice is recognized as of true value.

At present, the sponsors assess improvements only with a "live" voice and uncalibrated "complex" sound tests; any change in pure-tone audiometry is disclaimed and speech audiometry is not used. The value of the gain in hearing is also gauged by letters from grateful patients and clients, which, though enlightening, are in fact unscientific evidence and all too reminiscent of advertisements for patent medicines or "cures" in the Hunterian era.—I am, etc.,

London, W.1.

IAN G. ROBIN.

Atelectasis as a Complication in Artificial Pneumothorax

SIR.—In the first paragraph of Dr. R. L. Sadler's article on atelectasis as a complication of artificial pneumothorax (*Journal*, February 13, p. 359) we read: "... Some authorities seem to regard it as a dangerous procedure which should be used only in exceptional cases (Harris *et al.*, 1952 . . .)." We are at a loss to understand how Dr. Sadler can interpret anything we wrote in our paper¹ which can even remotely resemble the sentiments he attributes to us. If we may quote a sentence of our paper which appears to be relevant: "We think that the over-all results are good. With better selection, chemotherapy, and thoracoscopy, we believe that the artificial pneumothorax still has an important role to play provided that it is well maintained and that it is looked upon purely as a temporary collapse measure."

Does Dr. Sadler really suggest that he understands from that that we regard an artificial pneumothorax as a dangerous procedure? Even in our review of the literature we quoted no authority to suggest that the procedure was dangerous, although we did suggest that it was losing favour in many centres.—We are, etc.,

W. C. HARRIS.
FAITH C. POLES.
A. W. ANDERSON.

Edgware, Middlesex.

REFERENCE

¹ *Quart. J. Med.*, 1952, 21, 447.

A Naval Occasion

SIR,—I was greatly entertained by your reviewer's reaction to my book *Our National Ill Health Service: An Essay on the Preservation of Health* (*Journal*, February 20, p. 441). Of course it is generally the author's lack of perspicacity if he fails to get a reviewer to follow his thesis. My subject was social health, in which, I tried to explain, I did not include clinical medicine. Therefore I hope you will not mind correcting the suggestion of Dr. Ffrangcon Roberts that the care of social health in the Royal Navy "had to be buttressed by the appointment of civil consultants who were given the rank of [rear] admiral." One is truly grateful to the eminent consultant clinicians who have given their services to the sick and wounded seamen, in peace as well as war. During the war the Navy expanded sevenfold, which, of course, needed a proportionate increase of "doctors" of all sorts. In fairness to the regular naval medical officers, it was not necessary to buttress their health duties by entering a single high rank consultant in social or preventive medicine, or give any "hostilities-only" medical officers of health a relatively higher rank than their permanent colleagues.

I can only cry *Touché* to my slip about the authorship of *Ecclesiastes*. It was deplorable; and not to be excused by the bad old custom of casually attributing all the "wisdom books" of the Hebrew scriptures as a matter of course to Solomon.—I am, etc.,

Leamington Spa.

SHELDON F. DUDLEY.

Myelomata of Bone

SIR,—With reference to the article by Mr. A. Naylor and Dr. F. E. Chester-Williams (*Journal*, January 16, p. 120) I should like to make some observations about the use of electrophoresis in demonstrating abnormal proteins in serum or urine.

In the past seven months at Kingston Group Laboratory, eight cases of multiple myelomatosis have been diagnosed by pathological investigations, and the part shown by electrophoresis of serum and urine is shown by the following chart. Dr. K. G. Cuming of this laboratory has confirmed some of these cases by marrow puncture and Dr. J. C. Lees by necropsy and tissue section. Although for final and undisputed diagnosis several criteria are necessary, those of first importance during life are positive marrow biopsy and the demonstration of an "abnormal" globulin in the blood or urine. The cases show that where an "abnormal" protein is not present in the serum it may be demonstrated in the urine. (I am indebted to Dr. F. V. Flynn, of University College Hospital, for urine electrophoresis in some of these cases). The case of J.O. suggests that in spite of the presence of a small round-celled solitary neoplasm of the femur, the failure to demonstrate "abnormal" proteins indicates that plasma cell myelomatosis is unlikely.

Since electrophoresis is an easy laboratory technique it would be important to know if cases exist of proved plasma cell myelomatosis where no protein abnormality can be demonstrated by this method. There is no doubt that electrophoresis may demonstrate what may be called false positives, since there has been one case in this hospital where a typical γ -globulin band has been seen with no other evidence of myelomatosis. The three-tube heating test for Bence Jones protein in urine has been demonstrated to be inadequate in the above cases, especially in the hands of

CASE	SEX	AGE	ELECTROPHORETIC PATTERN PLASMA	URINE	T.P.	GLOB.	E.S.R.	WESTERNGREN
NORMAL			ALB α_1 α_2 β γ					
C.B.	M.	55	α_1 α_2 β γ	MOTILITY OF β	6.0	1.5	7.0	
C.D.	M.	56	α_1 α_2 β γ	δ	9.4	6.3	108	
H.E.	M.	58	α_1 α_2 β γ	δ	7.5	3.5	92	WINTROBE
H.H.	F.	48	α_1 α_2 β γ	δ	9.2	6.2	100	
J.H.	M.	52	P.M. DIAGNOSIS					
J.O.	M.	60	α_1 α_2 β γ		6.5	2.0	?	
W.R.	M.	69	β SIDE OF β γ	δ	7.0	1.6	25	
B.W.	M.	68	α_1 α_2 β γ	δ	9.3	5.3	137	
S.C.	F.	84	P.M. DIAGNOSIS					

■ = HEAVY BAND
 ■ = NORMAL LIGHT BAND
 ■ = MODERATE HEAVY BAND

PROTEIN IN URINE WITH MOTILITY β γ — BENCE JONES

more junior technicians. In no case has the test been absolutely typical of the text-book criteria—e.g., disappearance above 80° C. and reappearance on cooling. I would suggest that urine electrophoresis should always be done in cases of proteinuria and anaemia with back or leg pain over the age of 40 if cases of myelomatosis are not to be missed. Even the mode of death, sometimes in uraemia, does not necessarily suggest marrow dyscrasia.

The excretion of these abnormal globulins is interesting in relation to Professor Squire's recent article on protein excretion and reabsorption in the normal kidney. What is the normal method of metabolizing and excreting the very large γ -globulin molecule? The relation of plasma cells to globulin antibodies may be investigated in these cases of myelomatosis, since it can be demonstrated that several different globulins of different electric charge and molecular size are formed. The so-called neoplastic cells seem to form abnormal substances, but it is possible that an excess may accumulate (or be excreted) in response to an unusual antigen, or because of failure in the normal metabolism and excretion. With these new methods of diagnosis more cases of plasma cell multiple myelomatosis are found, and it can no longer be considered to be a rare disease.—I am, etc.,

Kingston-on-Thames.

PHYLLIS DAGNALL.

Press Publicity

SIR,—As a public representative I have been very interested in the letters and comments in your columns on the subject of press publicity about the Health Service. It is unfortunate that some persons in authority still fail to appreciate that the Service belongs to the community and that ordinary citizens are entitled to know all about its progress and problems. The attitude of "Theirs not to reason why" dies hard, and it remains a cause of deep resentment to intelligent citizens wherever they come in contact with it.

The average layman is certainly reluctant to complain about or to experts with professional qualifications. He is not quite so reluctant to complain to his Member of Parliament. A study of Parliamentary Questions and of M.P.s' correspondence would, I know, reveal numerous ex-

amples of the failure of boards, councils, and committees to let the public know what they are doing and why. By neglecting the regular supply of information, such authorities not only create suspicion and mistrust but lose the potentially powerful support of public opinion for the greater funds and resources they often need.

It is in the interests of all who work in the Service, as much as of those who require its facilities, that every citizen should feel a full sense of responsibility for its efficiency. But this relationship cannot develop unless the administrative and medical powers—that take the public into their confidence, stop being secretive about their decisions, and improvements and reforms. The best are doing this already, and I am confident that all who have tried this approach have found that there is a substantial fund of goodwill for the Health Service on which to draw.—I am, etc.,

House of Commons, S.W.1.

STEPHEN SWINGLER.

Infant B.C.G. Vaccination

SIR,—Dr. H. M. Purser's account of 2,500 B.C.G. vaccinations in newborn infants (*Journal*, February 13, p. 368) is of special interest in view of the exclusion of this age group mentioned in Memorandum 324/B.C.G., British Ministry of Health, November 5, 1953). As B.C.G. vaccination has been part of the Local Authority Anti-tuberculosis Service in Dublin since October, 1948, and 4,507 newborn infants have been vaccinated here, perhaps we may be permitted to comment on our experience.

When our scheme commenced attention was concentrated on contacts. From study of the annual childhood tuberculosis mortality in Dublin, we realized that children under 5 years of age had the highest mortality. For this reason it was decided to make B.C.G. vaccination available for all infants born in the maternity hospitals irrespective of contact. By kind permission of the Master of the Rotunda and Dr. W. R. F. Collis, paediatrician, the scheme for B.C.G. vaccination of the newborn began at the end of September, 1950. The scheme was later extended to the Coombe Maternity Hospital with the kind consent of the Master and Dr. W. Kidney, paediatrician, and each month has shown an increase of the number of vaccinations. Dr. Purser has raised the question of congenital tuberculosis, and we agree that a pre-vaccinal test is desirable if the mother is an open case, otherwise we dispense with pre-vaccinal testing in newborn infants.

We have not used the double dose of vaccine in infants—we use the same technique and method of administration as in the older age group. We subdivide 0.1 ml. of Danish vaccine into three intradermal injections made slightly apart over the middle of the left deltoid. The subdivision of the dose minimizes the risks of ulceration and adenitis. Dr. Purser refers to multiple adenitis. It is not clear if these occurred in both axillae as a result of both deltoid areas being used. This appears to be one of the disadvantages of the double dosage. The incidence of axillary adenitis and abscesses is somewhat less in our series using the single dose technique.

Incidence of Regional Adenitis—Comparison Belfast and Dublin

	Total Vaccinations New-borns	Total Regional Adenitis	Simple Adenitis	Abscesses
Belfast	2,500	46 (1.84%)	28 (1.12%)	18 (0.72%)
Dublin	3,429	52 (1.51%)	31 (0.9%)	21 (0.61%)

The above Dublin figures relate to vaccinations completed to the end of June, 1953, as complications occurring in vaccinations carried out since July, 1953, may not show until 1954. Many cases of adenitis do not appear until six to nine months following vaccination. The complication figures in the above table are at variance with those reported by Gaisford and Griffiths,¹ who reported 50 abscesses in 1,461 vaccinations—i.e., 3.4%. These workers used two different vaccines, and varied the dose with the object of expediting the conversion time. Many of their vaccinations were made in the buttock—we have avoided the use of the napkin area, and our invariable site of injection is into the skin over the left deltoid.

Dr. Purser has omitted to state what post-vaccinal tests were used, and at what time tests were applied by the practitioners on infants domiciled outside Belfast City area. In Dublin we prefer

to use a post-vaccinal Mantoux of 0.002 purified protein derivative in infants. Jelly or ointment tests are liable to be washed off, and, due to the sensitivity of the skin of infants, erythema without papules may give rise to misleading results when read by various readers. We find that the conversion rate depends on the time allowed to elapse between vaccination and post-vaccinal tests. A number of mothers fail to bring their infants in eight weeks' time for these tests. This entails much follow-up work, but has the advantage that the longer the delay to do post-vaccinal testing the better the conversion rate. We agree with Dr. Purser's findings on annual tests. In a random sample of 203 annual tests of newborn infants vaccinated prior to 1952 only one had become negative, so it would appear better to retest at school entry.

In this total of 4,507 vaccinations in Dublin and 2,500 in Belfast, little of the distressing complications envisaged in Memorandum 324/B.C.G. have appeared. Because of the conflicting attitudes to B.C.G. vaccination of newborn infants and the rarity of reports in the literature, Dr. Purser's article is worthy of study.—I am, etc.,

Dublin.

M. DUNLEVY.

REFERENCE

¹ *British Medical Journal*, 1951, 2, 702.

Prolonged Hypotension Following Hibernation Anaesthesia

SIR,—The papers in the *Journal* of December 5, 1953, by Dundee, Gray, *et al.* (pp. 1237 and 1244), and Smith and Fairer (p. 1247) have been most interesting and stimulating. One of the complications of hibernation anaesthesia not mentioned by either groups has been that of "failure to rewarm," as discussed by Huguenard.¹ This complication, he states, is commoner in the older patient. One of the associated features of failure to rewarm may be that of prolonged and possibly progressive hypotension. We should like to quote the following case as an example.

A female of 78 years, weighing 120 lb. (56.3 kg.), was admitted to hospital with a closed fracture of the upper third of the shaft of the femur. It was proposed to carry out an open reduction of the fracture with fixation of the fragments by cross-screwing. The patient's condition was fair for a woman of her age. The blood pressure was 150/100 mm. Hg, pulse 100/min., regular in character, haemoglobin 13.5 g.%, and the red cell count 4,320,000 c.mm. The heart sounds were of good quality and the chest clear. Premedication consisted of morphine gr. $\frac{1}{4}$ (11 m.g.) and atropine gr. 1/100 (0.65 mg.) given one hour before operation. It was decided, however, later to use hibernation technique in this case.

Accordingly, the patient was given 10 ml. over a period of 10 minutes of a mixture of pethidine, 50 mg., promethazine, 25 mg., and chlorpromazine, 25 mg., which had been diluted to 20 ml. in saline. At the end of 10 minutes the patient was asleep and she was intubated with ease. She was then given a mixture of 4 litres of nitrous oxide and 4 litres of oxygen, using a semi-open circuit. At this stage the blood pressure had fallen to 80/45 mm. Hg, and the pulse had risen in rate to 120/min. Bleeding was minimal throughout the operation, despite the fact that severe surgical handling of a difficult fracture took place. In all some 40–50 ml. of blood was lost. The blood pressure and pulse rate remained steady throughout the operation. One hour later at the end of the operation the patient objected to the endotracheal tube as soon as the nitrous oxide-oxygen mixture was withdrawn and the tube was removed and replaced by an ordinary airway.

On return to the ward the blood pressure had fallen to 70/40 mm. Hg, and two hours later, despite elevation of the foot of the bed, to 50/20 mm. Hg, the pulse remaining steady at 120/min. The colour at this stage was not good, the skin being waxy-white in appearance. The ears, however, were quite pink on rubbing and the arteriolar-capillary refill time seemed satisfactory. The respiratory rate and depth seemed adequate at this stage. A clinical thermometer placed in the rectum did not register, the temperature having fallen to under 95° F. (35° C.). As suggested by Huguenard, the intravenous administration of atropine gr. 1/50 (1.3 mg.) followed by neostigmine 5 mg. was carried out without much success. Except for slight fibrillary twitching of the fingers and eyelids, little was observed, and the blood pressure remained at 50/20 mm. Hg and the pulse rate at 120/min. The foot of the bed was now raised to a twenty-degree tilt and hot-water bottles were applied cautiously to the trunk. An intravenous transfusion of 1/250,000 solution of L-noradrenaline was now set up. After a few ml. of this solution

was run in, the blood pressure rose to 120/80 mm. Hg, and the pulse slowed to 80/min. The patient now began to warm slowly and there was a marked return of muscular tone. She answered to her name some 10 hours after her return to the ward and was wide awake in 12 hours. Altogether some two pints (1.1 l.) of the L-noradrenaline solution was given over a 10-hour period. Recovery has been uneventful and the patient is now well, but of course not yet walking due to her orthopaedic condition. The temperature was slow to rise, and after two days was still only 96° F. (35.6° C.) rectally, although she felt well and did not complain of cold.

The administration of atropine and neostigmine, which, according to Laborit,² induces the liberation of adrenaline, had little effect in this case. Atropine blocks the cholinergic muscarinic effects, while neostigmine elicits a stimulation of the pre-ganglionic fibres. Recourse therefore had to be taken to supportive adrenergic therapy as hibernation was obviously reaching an irreversible phase.—We are, etc.,

FRANK S. PRESTON.
HUGH Y. WISHART.

Glasgow, W.I.

REFERENCES

- ¹ *Anaesthet. Analg.*, 1953; 10, 16.
- ² *Presse méd.*, 59, 1329.

Utero-tubal Insufflation

SIR,—Despite Dr. A. Sharman's statement ("Some Lessons from 4,000 Utero-tubal Insufflations," *Journal*, January 30, p. 239) that no harm arises from insufflation of the fallopian tubes with carbon dioxide in the pre-menstrual phase of the cycle, it seems likely that more patients will be found to have patent functioning tubes on first investigation if kymography is carried out about mid-cycle or before.

The annotation on this subject (p. 265) repeats the assertion that the variations on insufflation may be due to other factors than tubal patency and motility; all the work of Rubin and Sharman is based on the proven fact that the information obtained is definitely attributable to the fallopian tubes alone, and, if this is not assumed, then our conclusions from kymography at present are based on a false assumption.—I am, etc.,

Cheltenham.

STANLEY A. BOND.

SIR,—Mr. Albert Sharman in his interesting survey of utero-tubal insufflations (*Journal*, January 30, p. 239) refers to the question of failure of passage of the gas resulting from tubal spasm, and describes failure of action of spasmolytic drugs. In this unit we have, for the past three years, used amyl nitrite in all cases where the gas has failed to pass at a pressure of 200 mm. This is administered in the usual way by inhalation from a fractured glass capsule, and in a large proportion of cases has led to relaxation of tubal spasm and the passage of the gas, with subsequent demonstration of normal peristalsis at low pressures. In such cases the use of diphenhydramine before intercourse at mid-cycle has subsequently been recommended and a number of pregnancies have followed.

Amyl nitrite has also been used where difficulty has been encountered in passing a biopsy curette for endometrial biopsy, and in many cases relaxation of cervical spasm has been demonstrated which has enabled the biopsy to be completed. The action of amyl nitrite in these cases is similar to that seen in retained placenta with contraction ring. I would recommend the use of this drug in all cases of apparently negative insufflation, since it may avoid repeated interventions and also the false diagnosis of tube blockage. I may add that we have generally used it without anaesthesia, but that it appears to be equally effective with anaesthesia.—I am, etc.,

Worcester.

J. A. CHALMERS.

The Cerebrospinal Fluid in Diagnosis

SIR,—In his article on the cerebrospinal fluid (*Journal*, February 20, p. 449) Dr. J. N. Cumings has made several statements about the C.S.F. protein which are not supported by modern work.

He states that the protein is almost all albumin with only a trace of globulin. This is not true. Merritt and Fremont-

Smith, using chemical methods, found an A:G ratio of about 5:1. They probably measured only the γ globulin present. Kabat *et al.*,² using an immunological technique, found a similar value for the albumin: γ globulin ratio. However, Schneider and Wallenius³ found that cerebrospinal fluid subjected (after concentration by dialysis) to paper electrophoresis gave patterns similar to normal sera with A:G ratios of 1-2:1. Parallel examination of C.S.F. and serum from the same patient showed the protein components of the two to be similar.

Dr. Cumings gives the value of the C.S.F. protein for children as 10-15 mg.%. As long ago as 1928 Stewart,⁴ in 50 normal children, found an average value of 35 mg.% (S.D. 11), using a turbidimetric method. Dr. Cumings also gives the normal values for adults as up to 30 mg.%, although he admits that in elderly people values of 50-60 mg.% are sometimes found. Kabat gives a mean for adults of 37 mg.% (S.D. 8), also measured turbidimetrically. It is now well known that all turbidimetric methods are unreliable. When turbidities are read visually against standards, a common method, considerable errors occur sometimes of the order of 50% or more. Greater accuracy is got by using a photo-electric absorptiometer to read the turbidity, but when compared with Kjeldahl protein determinations on the same normal samples, the turbidimetric method gives an answer lower by about 10-20% (Hall, 1954, in press).

During the past five years I have used a biuret method employing a modified Weichselbaum reagent for C.S.F. proteins. The method gives excellent correlation with Kjeldahl determinations. Protein values for adults and children are a little higher than reported by previous workers, the average value being 40-50 mg.%. Values of 60-70 mg.% are not uncommon.—I am, etc.,

Isleworth, Middx

M. I. UBRAN.

REFERENCES

- ¹ *Cerebrospinal Fluid*, 1937, Saunders, Philadelphia.
- ² *Amer. J. Med.*, 1948, 4, 653.
- ³ *Scand. J. clin. Lab. Invest.*, 1951, 3, 145.
- ⁴ *Arch. Dis. Childh.*, 1928, 3, 96.

Prevention of Bovine Tuberculosis

SIR,—We were surprised to read Drs. R. W. Kind and M. C. Brough's suggestion (*Journal*, February 13, p. 372) that their cases of bovine tuberculosis emphasize the need "either for ensuring that the milk supply throughout the country must eventually come from accredited tuberculin-tested herds or the general pasteurization of milk." Surely the boiling of milk offers the only certain preventive measure and pasteurization but a reasonably safe alternative. Tuberculin-tested milk carries no guarantee; only in the past few months have we seen a larger but similar outbreak to the one in Leicestershire occur amongst children given milk from an accredited herd, the damage commencing shortly after a routine check of the cows.

We beg to suggest as an immediate preventive measure that, wherever possible, only pasteurized milk be issued to schools. In those instances where this is impractical parents should be notified so that those who wish may make alternative arrangements.—We are, etc.,

Marlborough.
Oxford.

T. R. MAURICE.
HUGH ELLIS.

Depression Treated by E.C.T.

SIR,—I was most interested in the article entitled "Prognosis of Depression Treated by Electric Convulsion Therapy" by Dr. Hugh F. Jarvie (*Journal*, January 16, p. 132), and agree most strongly with his enunciation on the importance of critical assessment of the long-term results of this treatment. From his study of 114 cases of depression, Dr. Jarvie concludes that E.C.T. is an effective form of treatment in most cases of depression, but adds the rider that "its limitations in some 30 to 40% of cases should be recognized." He therefore shows himself to be far from an uncritical advocate of E.C.T. and it may therefore seem somewhat tendentious to submit his study to criticism. Nevertheless, the data on which he bases his conclusions

show one serious omission in that he has no adequate control group wherewith to compare his results. He has therefore, in my opinion, failed to prove how E.C.T. has altered the rate of recovery and prognosis, since he does not take into account the tendency to spontaneous recovery in depression—a factor unfortunately often suppressed or forgotten by many advocates of this form of therapy.

Dr. Jarvie's report is based on 114 cases of various types of depressive illness, but his conclusions on the effectiveness of therapy are drawn from 97 of these 114 patients, whom he regards as his "treated group." The number of convulsions administered to individuals in this series of 97 patients varied from a minimum of 2 to a maximum of 14 convulsions. The remaining 17 patients do not, however, provide an adequate control series, since Dr. Jarvie, in describing them, states that they "either did not receive E.C.T. or received such small amounts that it was regarded as not affecting the course of the illness" (italics are mine). One at least of these 17 received four convulsions before cardiac complications during administration dictated discontinuation of treatment. Four convulsions represent double the minimum number given in his "treated" series, and the elimination of such unsuccessful cases from the treated group obviously tends to weight the evidence in favour of E.C.T. as a form of treatment. Dr. Jarvie also does not give the time relationship between treatment with E.C.T. and recovery. Many patients submitted to E.C.T. do not show any amelioration of symptoms till some weeks or months after cessation of treatment, which gives rise to the suspicion that their recovery is not directly attributable to such treatment.

Some years ago I carried out a survey of 923 patients with a depressive illness admitted to the Royal Edinburgh Hospital for Mental and Nervous Disorders between the years 1930-48.¹ This period covered both the era preceding the introduction of E.C.T. and that following its utilization as a method of therapy. Many of the patients had been admitted on more than one occasion with recurrent depressive episodes, so that the total number of hospitalizations reviewed was 1,611. Eighty per cent. responded to a follow-up questionnaire by a personal visit or letter. The results of this survey—which were quite contrary to those envisaged by me at the commencement of the study—showed that (a) the percentage rate of recovery did not vary greatly whether patients with depression were treated conservatively or by E.C.T. Such slight differences as did exist were not statistically significant; (b) the use of E.C.T. did not shorten the duration of the depressive illness; and (c) did not prevent its recurrence. (Space does not allow of the quotation of figures, for which the original article can be consulted.)

This investigation emphasized the importance of having good control groups in the assessment of any therapy for depression, since the figures for the pre-E.C.T. era showed that 80% of the patients recovered. Of all the major psychoses, depression is recognized as having the best prognosis. An interesting finding was the considerable number of patients discharged "recovered" or "improved" within two months of admission without being submitted to E.C.T. Had E.C.T. been given as a routine measure within the first few weeks of their hospitalization, the recovery of these patients would no doubt have been attributed to its use. The clinical evaluation of E.C.T. showed that in some there was symptomatic improvement, and that recovery occurred only if treatment coincided with spontaneous recovery.

In conclusion, the findings emphasized the high expectation of recovery in depressive states and in turn underlined the necessity for the application of stringent criteria in the evaluation of any form of therapy which claims to accelerate this process of natural recovery. The need for a critical review of all physical methods of treatment in psychiatry has been long overdue, and it is hoped the profession will soon undertake such a study.—I am, etc.,

Montreal, Canada.

REFERENCE

- ¹ *J. ment. Sci.*, 1950, 96, 1060.

Galactosaemia

SIR,—Dr. B. Laurance is quite right to emphasize the frequency and possible severity of umbilical haemorrhage in babies with galactosaemia (*Journal*, February 20, p. 459), but we have no reason to suppose that bleeding from other sites is common. This possible tendency need not in any case interfere with investigations, for all blood samples that are needed can be obtained from a heel prick. We cannot agree that the diagnosis of galactosaemia can be confirmed by urine examination only. We recently investigated a 10-day-

old baby with severe jaundice and a large liver. The urine contained 0.95 g.% of reducing substance, almost all being galactose. The blood sugar, however, was only 85 mg.%. Some galactose is often found in the urine of neonates; the frequency of this is at present being investigated.—We are, etc.,

F. PIERCE HUDSON.
J. T. IRELAND.

Liverpool, 12.

Medico-Legal

CARBON DIOXIDE TEST IN MURDER INVESTIGATION

The use of carbon dioxide to cause abreaction in a murder investigation was described during medical evidence at the Old Bailey last week. The trial was of Raymond Harold Barker, aged 35, an operator, who on March 4 was found guilty but insane on a charge of murdering Mrs. Beatrice Elizabeth James.

On December 15, 1953, Mrs. James was found dead at her house suffering from 60 stab wounds. A bloodstained bent vegetable knife was found in a hall-stand drawer. Barker was arrested two days later.

Giving evidence for the defence, Dr. Arthur Paterson said that Barker was suffering from mania-a-potu, and Dr. A. Rossiter Lewis said he had formed the view that Barker was suffering from manic-depressive insanity.

Replying to defending counsel, Dr. Paterson said he did not think that Barker had any control over the measure of his anger. If he was only angry with the woman he would have stabbed her in the heart or if there had been any carnal lust he would have mutilated her.

The judge said he did not follow entirely, and Dr. Paterson said there were three possibilities for a killing. One was that it was done in a state of automatism, the second that it was a sadistic attack, and the third was that he was sane and wanted to kill her. If Barker was sane at the time and simply wanted to kill the woman, then he would probably have aimed at a vital part such as the heart or the throat. In a case of lust, a man would kill a woman out of jealousy, or in a case of sexual perversion it would not be uncommon for him to rip a woman or mutilate her. The most probable explanation of the attack was that he was in a state of automatism and did not know what he was doing, because he stabbed her 60 times, only three being in vital places. He thought the state of the man's mind was due to acute alcoholism combined with a hereditary history of mental instability.

Dr. Rossiter Lewis said he decided first of all he would try to restore Barker's memory by questions, but was unsuccessful in getting details. On February 21, in the presence of the medical officer at Brixton prison, he gave Barker a mixture of oxygen and carbon dioxide (30%). Its object was to create an abreaction. It was done in two parts, the first lightly and the second more deeply, bordering on actual unconsciousness. On neither test was he able to restore the memory for the actual stabbing or what had been carried out immediately after the stabbing. His conclusion from this was that Barker's mind was so deranged at the actual time that the memory was non-existent in detailed form. "Based upon that, I came to the conclusion that at the time this offence was committed he was suffering from a form of insanity." He took the view that Barker's was a case of manic-depressive insanity which had shown itself as a result of the effect of alcohol on his brain.

Dr. J. C. McI, Matheson, principal medical officer at Brixton Prison, was called by the prosecution to give evidence of rebuttal. He said he had seen no signs of any mental abnormality. In his opinion Barker was sane at the time he killed the woman and knew what he was doing.

Dr. Desmond Curran, psychiatrist, was also called by the prosecution in rebuttal of medical evidence given by the defence.

Obituary

N. G. HORNER, M.A., M.D., F.R.C.P., F.R.C.S.
Editor, *British Medical Journal*, 1928-46

We announce with deep regret the death at the age of 72 on March 7 of Dr. N. Gerald Horner, Editor of the *British Medical Journal* from 1928 to 1946. He had been in ill-health for some time.

Norman Gerald Horner was born on January 1, 1882, at Tonbridge, Kent. His father, Arthur Claypon Horner, after serving with a Red Cross ambulance through the Franco-Prussian war, had been surgeon and naturalist to two Arctic expeditions before settling down

to general practice in Tonbridge, where he was medical officer to Tonbridge School. In later years Gerald Horner used to maintain that to be born and bred in a working doctor's home was a most valuable foundation to the life and work of a medical editor. He showed an early taste for journalism, and in his schooldays at Tonbridge produced 156 numbers of a weekly comic magazine, largely written and illustrated by himself, for family circulation. From the scientific sixth form he went to Caius College, Cambridge, and graduated B.A. in the Natural Sciences Tripos of 1902. After three happy and successful years at St. Bartholomew's Hospital he qualified M.R.C.S., L.R.C.P. in January, 1906, and served a term as house-surgeon at the Westminster Hospital. On return-

ing to Bart's as house-physician to his godfather and good friend Sir Norman Moore, he became editor of *St. Bartholomew's Hospital Journal*, of which he had already been assistant editor. Some of the many light pieces he wrote for its pages are still remembered, including "A Vision of the Second M.B.," "The Night Dresser's Dream," "The Keen Man," and "An Echo of the Past."

About this time Sir Henry Burdett had the idea of making the *Hospital*, hitherto largely concerned with administration, into a weekly paper for general practitioners, and he persuaded Horner to write for it and to join him later as assistant editor. This occupation, with interludes of general practice in town and country,

and clinical assistantships at Bart's and the Children's Hospital in Shadwell, lasted for two or three years. The technical experience in weekly journalism proved useful and led to his engagement in 1911 as assistant editor of the *Lancet* under Squire Sprigge, who had succeeded to the editorship two years before. He thus entered upon whole-time work in the office of a leading professional journal at the opening of the long-drawn-out National Insurance struggle, and he attended every one of the stormy Representative Meetings of the British Medical Association that began with the introduction of the Bill. The indoor staff of the *Lancet* were then, as now, on friendly terms with their colleagues of the *British Medical Journal*, while the close association with Squire Sprigge was full of profit and entertainment. But the proprietorship of the paper was changing hands,

and the war upset things further, so that when Horner took a temporary commission in the R.A.M.C. early in 1915 he parted company with the *Lancet*. While waiting for his commission he joined the Special Constabulary and he did night duty at Buckingham Palace for a time. He served in France for two years—with No. 14 Stationary Hospital at Wimereux, with No. 36 Casualty Clearing Station and the 97th Field Ambulance on the Somme, and as registrar of No. 10 General Hospital at Rouen. In 1917 he returned to England as assistant editor of the *British Medical Journal* and began to share with Sir Dawson Williams the conduct of the paper through a period of stress and strain and of readjustment to changing circumstances. Perhaps the heaviest test during

those early years came in 1920, when for five months Sir Dawson was incapacitated by the first and worst of the heart attacks that troubled him at intervals for the remainder of his life. After the lean years of the war, with their shortage of space and staff, the *Journal* gradually expanded, the *Epitome of Current Medical Literature* started again, and the editorial staff had to keep pace with reawakened activities of every kind both at the centre and locally. By the middle of 1927 it had become painfully apparent to those whose business brought them to Headquarters that advancing age and precarious health were taking heavy toll of the editor's strength. Sir Dawson Williams had lived for the *Journal* for the greater part of half a century and



[Elliott & Fry, Ltd., London]

shrank from the prospect of idleness; but, in accordance with arrangements made by the Council at its December meetings, he retired formally on January 18, 1928, the thirtieth anniversary of his appointment as editor, and Horner was appointed in his place.

Horner had graduated M.B., B.Ch. at Cambridge in 1910 and took the M.A. in 1919. He proceeded M.D. in 1922 with a thesis on the growth of the general practitioner in England, and read a paper before the International Congress of the History of Medicine, which met that year in London. For two sessions he was secretary of the History of Medicine Section of the Royal Society of Medicine and afterwards vice-president. At the Centenary Meeting of the British Medical Association in 1932 he opened a discussion on medical journalism in the British Empire with a paper which his friends of the *Lancet* published in the following week. The ready pen of youth was severely disciplined as time went on, so that from being fluent he became rather a fastidious writer, more concerned with lucidity and precision than he had been formerly. Beyond two short poems published during the war and a few historical papers, he wrote little after the age of 30 outside his own journal. No doubt his approach to the craft of letters was influenced by daily intimate contact for over ten years with Dawson Williams, for whom he felt a deep regard and admiration. While never trying to mould himself upon a man so different in habit of mind and intellectual texture, he nevertheless followed "the D.W. method" in the literary and business sides of an editor's work, and strove to impart this to his junior colleagues. For a piece of writing or of editorial revision he could give no higher praise than the word "workmanlike," which stood for him, as for his great predecessor, as the sovereign quality. The *Journal* certainly gained from his wide reading and constant thought and care for the English language.

Dawson Williams had been such a strong influence in the counsels of the Association for so many years, and more than anyone had been responsible for establishing the *British Medical Journal* as the outstanding general medical journal in the English-speaking world, as to make it difficult for anyone to succeed him with a feeling of equanimity. Horner had for his predecessor a deep respect which amounted almost to veneration. For years he had been Dawson Williams's right-hand man, and in one sense it can be said that even after his chief's death he still felt the force of this relationship. Extremely diffident by nature, he was almost at times too conscious of his predecessor's pre-eminence. Apart from this, when Horner succeeded to the editorship in 1928 the editorial department was in his view much understaffed, and ill-health in the small staff that there was doubled a burden that was already heavy enough. Between 1928 and 1931, three of his medical assistants had to resign because of illness, and there is no doubt that Horner felt that he could not have taken over the reins of office under greater disadvantages. It is true to say also that, rightly or wrongly, he thought the Association did not fully appreciate the difficulties under which he was then working. From 1930 onwards conditions gradually became more stable and he could be assisted by a small staff, who, under his guidance, had to gain their experience while working on the job. In 1934 the Association was able to appoint a deputy editor—the first time in the history of the *Journal* that such an appointment had been made.

During Horner's long editorship a number of important changes were effected in the management and printing of the *Journal*, all of which benefited from his help and experience, though in fact he took little part in initiating them, being by nature inclined to see in change disadvantages rather than advantages. About 1934 criticisms were voiced in different quarters about the physical appearance of the *B.M.J.* There was, for example, the sham gothic type on the cover, the rather grey effect of the printed page, the preponderance of printer's rules and other typographical devices which some described as old-fashioned. After the Journal Committee had made a preliminary survey of the situation it sought, at Horner's suggestion, the help of Mr. Stanley Morison, who was typographical adviser to the *Times*, the Monotype Corporation, and the Cambridge University Press, and the designer of the *Times* New Roman type. Work on the typographical reform of the *B.M.J.* extended over a period of months, and under Mr. Morison's inspiration and guidance a complete change was effected and the *Journal* appeared in its new dress on January 2, 1937. The device which has appeared on the cover since that date was designed by Mr. Eric Gill. In the discussion that went on round this subject it soon became evident that this change of format brought obviously to the front the need for a change in the method of printing the *Journal*. Up to the end of March, 1937, the Association had had its own composing room on the fourth floor of the North wing of B.M.A. House, and each week the formes were loaded on to a van in Burton Street to be taken to Fetter Lane for the final machining to be done. The *B.M.J.* must have been one of the few remaining periodicals of any size or standing which still maintained its own separate composing room. After much debate in committee and Council, the Association finally decided to dismantle its composing room and to have the *Journal* composed and printed in one and the same place. Undoubtedly this made for economy and efficiency, and speed of production, though many of the older members of the Council and, indeed, Horner himself, viewed with much regret the disappearance of the composing room of which they had every reason to be proud. When the printing works of Messrs. Eyre & Spottiswoode, who were responsible for printing the *Journal* from 1937 to 1941, were destroyed in an air raid on May 10, 1941, those responsible for the conduct of the *Journal* were relieved not to have a composing room on their hands. Monday, May 12, 1941, was a memorable day in the experience of the editorial department and, in particular, of the editor. When Horner arrived at his office on that day he and his staff were faced with the fact that they were without a printer and that blocks and type which had been prepared for that week's *Journal* had flowed down Norwich Street in a flood of molten metal. Under Horner's guidance, he and his much-depleted war-time staff gathered together bits and pieces of copy by lunch-time and by the middle of the afternoon had secured the willing co-operation of the Temple Press in Clerkenwell. A *Journal* was "made-up" by the end of the afternoon and went to press on time on the Wednesday, every member receiving his copy that week by the usual post. Horner happily christened this issue the "Phoenix Number." The risks of continuing to print the *Journal* in London were vividly brought home by this event, which at the time it was the fashion to describe as an "incident," and a decision was quickly made to transfer,

if possible, the printing of the *Journal* outside London. Horner himself had always been used to having a printer near at hand, and he was indeed dismayed at the difficulties that might arise if the *Journal* was printed outside London while it continued to be edited from B.M.A. House. When a decision was finally taken and Messrs. Fisher, Knight & Co. agreed to print the *Journal* at St. Albans, Horner had no wish to follow the printing into the relative security afforded by a town nineteen miles from B.M.A. House. To the end of the war he continued his work as editor in London.

On top of the stress and strain inseparable from an experience shared by all other Londoners, Horner had the grave misfortune, in the winter of 1942, to suffer a detachment of the right retina. He decided not to take the chance of partial recovery of sight in that eye which operation might have given him. Thereafter his health suffered and he was compelled by illnesses to remain away from work for months at a time. Nevertheless, even when in hospital he still continued to do what work he could for the *Journal*.

In spite of these difficulties—if the evidence of outside observers is to be accepted—the *Journal* gained in support and prestige throughout the war years. Not only that, but during these years it was found possible for the Association to undertake the publication of new quarterly journals. In 1939 the Association was publishing the *Archives of Disease in Childhood*, the *British Heart Journal*, and the *Journal of Neurology*. During the war, in conjunction with the Association of Industrial Medical Officers, the *British Journal of Industrial Medicine* was launched in 1944. In 1944, too, in co-operation with the Empire Rheumatism Council, it began publishing the *Annals of the Rheumatic Diseases*. It laid plans for the publication of *Thorax*, the first issue of which was published in 1946. Before the war ended a scheme was worked out for establishing an abstracting service, and *Abstracts of World Medicine* and *Abstracts of World Surgery, Obstetrics and Gynaecology* as a result of this made their appearance at the beginning of 1947. Although because of ill-health Horner was able to take little part in the initiation of these, he gave all these various projects his help, encouragement, and guidance, and was the author, for example, of the title under which the abstracting journals were finally brought out. When he retired at the end of 1946 under the age limit, he was able to pass on to his successor a *Journal* that had grown in prestige and circulation, and an editorial structure that had stood the test of time. More important still, he handed on a sound tradition of responsible editorship which he himself had inherited and had maintained intact from the corrosion that is sometimes the result of the passage of time. He was scrupulous, perhaps at times over-scrupulous—if this is, indeed, possible—in the use of the English language, and nothing could ruffle him more than an infelicitous phrase, an apparent breach of etiquette, or work that was in any way slovenly or unfinished.

Horner suffered from a sensitivity that made him vulnerable to the criticisms and attacks to which any editor of any responsible journal is always exposed. Extremely diffident by nature, he felt at times overburdened by the responsibility of his post. Yet to the outside world he showed little of this, his philosophy being, as he used to say, that of the stoic. Of the many tributes paid to him in his career he valued above all his election as F.R.C.P. (under by-law xxxix (b)) in

1939: he was made F.R.C.S. in 1942. His attachment to the B.M.J. and all its fortunes was deep and abiding, and though he knew he had to retire at the age limit, to leave his office even though his health was poor was a severe wrench. To his colleagues he was unfailingly courteous and helpful. His mastery of the English language was a continuing example to them. Whatever difference of opinion there might be, Horner always remained patient, and was, above all, just and fair in his dealings.

Outside the *Journal* Horner's other strong attachment was to his club, the Savile. To meet him there was really to meet a different person—to meet someone who was a kind and considerate host and a witty and light-hearted companion. Towards the end of the war he began to live at his club and there he remained until his last illness. Above all he used to enjoy meeting there men eminent in other walks of life. He had a wide interest in literature and art, and a skill in writing that was the envy of his colleagues. It is a matter for great regret that on his retirement ill-health made him, no doubt, disinclined to put down on paper his reflections on the medical scene of which he had been for so long a detached and judicious witness. For a time after 1947 he lent a hand in the compiling of the medical history of the war, thus returning to an early interest. His wife, Grace Malleon Fearon, died in 1950. He leaves one son.

Sir ROBERT YOUNG writes: Gerald Horner was appointed assistant editor of the *Lancet* when I was a member of its staff. It was quickly apparent that he was a man with great charm of manner and a kindly personality. I came to regard him as a friend, and he was always helpful in suggestions and ideas. He was an excellent sub-editor, and I know that Sir Squire Sprigge, who was at that time the very distinguished editor, had a high opinion of him and found him a valuable and reliable member of his staff. Horner had a wide knowledge of medical matters, a keen and incisive mind, and considerable literary gifts.

His work for the *British Medical Journal* is well known to readers and to the Association, which has been very fortunate in its sequence of editors. Horner was well worthy of his place in that distinguished roll. Ill-health had for some years handicapped his activities and allowed his friends the chance of meeting him but seldom. I saw him some months ago at the Savile Club, when he greeted me in his old friendly manner and expressed his pleasure at reviving old associations. He was a good friend, and I have happy memories of him.

Professor ALAN MONCRIEFF writes: Horner set and himself maintained a high standard of medical journalism. Nearly 30 years ago he purged my early efforts of clichés and got rid of superfluous or repetitive matter. He was always kind to juniors and encouraging, although as I got to know him better I realized that he could be almost blistering if he liked. He had a very subtle and caustic wit, and loved a good verbal quip. He had indeed a real interest in words and their use. I do not think he liked committee work. He preferred to get on with his direct editorial duties, but it was sometimes surprising to realize how little of the business side really escaped his notice. He had a difficult task to follow Dawson Williams, but I should judge that he left the *Journal* at a higher standard than when he took on, with a better standing in the scientific world.

Dr. HENRY ROBINSON writes: There is no doubt that Horner's apprenticeship under, first, the late Sir Henry Burdett, editor of the *Hospital*, and then under Sir Squire Sprigge, of the *Lancet*, taught him much about the technical side of newspaper production—type, paper, format, etc.—

which, together with what he learned from Sir Dawson Williams later, was to prove of great service to the B.M.A. and to the *Journal* later on. At the numerous meetings of (the late) Dr. Ronald Gordon's subcommittee in 1935–6 his advice was often sought, and never in vain: he rarely intervened in the discussions unless appealed to by Gordon, but whenever he did speak his contribution was always very much to the point. The outstanding success of the reorganization which followed was due, in part, to his sage counsel and loyalty.

Horner was never a robust man, physically or constitutionally, and his many friends at the Savile noted two years ago with deep concern a gradual but steady deterioration of his health. To celebrate his seventieth birthday the members entertained him at a complimentary dinner, where poems composed for the occasion were recited in his honour—one was entitled "An Ode on a Distant Prospect of Gerald Horner." But he was already too much indisposed to make a reply such as a few years earlier would have been full of *bons mots*. A notable characteristic of the Horner touch was that his wit was never malicious and never left a sting. Though impatient of anything slipshod in the use of the English language, he was not pedantic: his appreciation of a felicitous touch or allusion in the work of his contributors or subordinates was genuine and warmly expressed.

T. JENNER HOSKIN, M.D., F.R.C.P.

By the untimely and sudden death of Dr. Jenner Hoskin on February 27, the Royal Free Hospital has lost a well-loved senior physician, its staff and students a wise and kindly friend. He was 65 years of age.

Theo Jenner Hoskin was born into a medical family on December 12, 1888, and after receiving his early education at Charterhouse proceeded to Trinity College, Cambridge, and the Middlesex Hospital, from whose medical school he graduated in 1914. After a few pre-liminary house appointments he joined up and served with distinction throughout the remainder of the first world war, taking part in such historic events as the landing at Suvla Bay. At one time or another he served in Egypt, Gallipoli, German East Africa, and Sierra Leone, and he was mentioned in dispatches.

After demobilization he embarked on further post-graduate study and training, notably at the Heart Hospital, where for years he worked in association with the late Dr. Strick-



(Elliott & Fry, Ltd., London)

land Goodall. Success came with his appointments to the honorary staff of Queen Mary's Hospital for the East End and, very shortly after, in 1924, as honorary assistant physician to the Royal Free Hospital. Owing to a succession of retirements he rose unusually rapidly in seniority, and for the last 16 years of his life was senior physician to the hospital. Further appointments included that of cardiologist to St. Paul's Hospital for Genito-urinary Diseases, physician to the Royal National Throat, Nose, and Ear Hospital, and chief medical adviser to both the Pearl Assurance Company and the Friends' Provident and Century Life Office. He belonged to many learned societies: one he appreciated most was the Medical Society of London, of which he

was president in 1948. The climax of his distinguished career came in the latter part of last year, when he was elected to the council of the Royal College of Physicians, an honour which gave him unusual pleasure. Not a prolific writer, he contributed from time to time to specialist journals, his words carrying both good sense and authority. One of the first papers he wrote (entitled "Five Hundred Cases of Malaria in Pensioners") was published in this *Journal* in 1921. Beyond his professional sphere he enjoyed a full and active life, being a liveryman of the Skinners Company and at one time master of the Worshipful Company of Playing Card Makers. His interest in all forms of sport was well known, and until latterly he was himself an active and keen golfer.

One of the first to appreciate the need and value of specialist departments, he speedily succeeded in building up a cardiological department in the Royal Free, deciding at the same time, in his natural humility, to limit his private patients to the cardiological field in order to give the best, and only the best, advice to both family doctor and individual patient. His art—for medicine with Jenner Hoskin was always an art rather than a science—was perhaps best demonstrated by his management of patients. Ever more interested in people than in disease, and recognizing the futility and frustration of invalidism, he had a special skill in helping the handicapped back, if not to perfect health, to as full and active a life as was practicable.

In the Royal Free Hospital he found himself for the first time in the unfamiliar surroundings of a women's medical school and training hospital. After a few hesitant teaching rounds he speedily established that attitude of easy and genial informality that lastingly endeared him both to students and to junior medical staff, while losing him nothing in respect. From then on he identified his interests with those of the hospital which he was so long to serve. He taught assiduously and skilfully and was noted both for punctuality and for regular attendance. Nothing would have ever caused him to neglect his hospital duties for private concerns. It might have been thought that the Royal Free Hospital was his life if it were not known that he brought an equal interest and enthusiasm to the claims of his wide consultant practice and to his insurance work.

He was a man of complete integrity, of unswerving high standards, and a stickler for good taste. As a colleague he was all that anyone could want and more. Unfailingly loyal, disarmingly courteous, striving to promote harmony and to discourage acrimony, exerting always a moderating influence, he became the trusted counsellor to many who knew his quality and his wisdom. The reliance placed on his judgment and experience was illustrated in this last year by his re-election as chairman of the medical committee of his hospital. Possessing a remarkable memory for people, he had the reputation of being able to name every student who had ever passed through his hands. Equal to this splendid memory was an astute and almost faultless judgment of persons, by which he managed time after time to appropriate the outstanding student for his own house-physician, sometimes to the chagrin of his colleagues. All who ever worked for him became bound in affectionate respect and thereafter could count on his continued and wholehearted support. No effort was wasted, no time ill spent, that furthered the career of his protégées.

In his home life Jenner was singularly fortunate. His wife, Maisie—daughter of Mr. William Stewart, of Skelmorlie, Ayrshire—whom he married in 1920 and who survives him, was the perfect partner, and their happy and contented home life was not only an inspiration to all who enjoyed their hospitality but provided the peaceful background essential to his restless spirit. Maisie Hoskin devoted herself completely to his interests, and not a little of his success and the freedom with which he spent his gifts and energies depended on her. To Mrs. Hoskin, his daughters Margaret and Mary, and his son, Christopher, still at his own old school, we extend deep sympathy.—U. C. L.

We are indebted to Dame LOUISE McILROY for the following appreciation: The sudden death of Dr. Jenner Hoskin has come as a shock to all his friends, of whom he had very many. All who knew him had a great regard for him and an appreciation of his distinguished work as a physician. He devoted much of his time and skill in helping in the diagnosis and treatment of the cardiac conditions of women in pregnancy and childbirth in the Royal Free Hospital. I have always been grateful to him for the infinite trouble he took over patients not only in London but when he served on the consulting staff of the Officers' Wives Maternity Hospital at Fulmer Chase, Bucks, during the war. Dr. Hoskin always took a very personal interest in the teaching of students, and his influence on the training of young graduates was profound. His endearing personality will long be remembered. The sympathy of all his friends will go out to his devoted wife and family in their irreparable loss.

Dr. G. CATHERINE EVANS writes: Others will have written about Dr. T. Jenner Hoskin's professional and academic achievements, not only as an outstanding cardiologist, but as a physician whose breadth of vision and interests were unusually wide. Some will have mentioned his election a few months ago to the council of the Royal College of Physicians, an honour which gave such pleasure and satisfaction to his colleagues and friends. But I would like to pay tribute to his memory not only as an old student but as a patient of his for the last 34 years. Dr. Jenner Hoskin was an excellent teacher. His ward rounds were deservedly popular, for he had the happy knack of using a homely simile to impress some particular point, which consequently became indelibly printed on his students' minds. His devotion to his hospital work was unstinted, and he gave full measure in furthering the interests of the students and nurses. Every patient I sent to him without exception came back gratefully impressed by the scrupulous care and trouble he took in assessing their case. He had the gift of putting his patients quickly at their ease and giving them complete confidence in his judgment. Knowing him as his patient for so many years, I always found him to be not only a skilled clinician but a never-failing wise counsellor and kind friend.

T. W. MORGAN, M.B., B.S.

Dr. T. W. Morgan, a former member of the Council of the British Medical Association, died on February 27 in Westminster Hospital. His untimely passing at the age of 53 after a short illness is a sad blow to his many friends and patients.

Thomas Walter Morgan, who was born on June 20, 1900, received his medical training at Cardiff and at St. Thomas's Hospital, qualifying M.R.C.S., L.R.C.P. in 1927 and taking the London degrees of M.B., B.S. three years later. After a series of resident appointments at the Westminster Hospital, where he was also assistant surgical registrar and radium officer, he became a general practitioner and for twenty years conducted a large general practice in New Malden and district with

exceptional ability and skill. He gave himself unsparingly to the best interests of his patients, and throughout the years was the family counsellor and friend of many of them. His efforts to bring to the aid of his patients in all walks of life, at home or in hospital, the expanding resources of modern medicine and surgery occupied nearly the whole of his time and energies; and his patients, once the first encounter with him had been successfully achieved, stuck to him with fierce loyalty. His quick and discerning mind always sought to reach the heart of any problem brought to him.

Dr. Morgan had a ready grasp of medico-political matters. His clarity of thought and happy ability to speak well in public opened to him a wide field, in which he worked hard to preserve and maintain the highest ideals of medical ethics. His energy and organizing powers were remarkable, and with these he combined a sense of humour and good fellowship which won him many friends. These gifts he put generously at the service of the British Medical Association, his local hospitals, and National Health Service committees. He was a member of the Council of the Association from 1947 to 1952 and represented his constituency at all the Annual Representative Meetings from 1942 up to last year. Among the many committees on which he served, the Central Ethical, the Private Practice, and the Health Centre Committees benefited most, in length of time, by his membership. Locally, he acted as honorary secretary of the Kingston-on-Thames Division from 1945 to the time of his death; he was chairman of the Division from 1942 to 1945; and president of the Surrey Branch in 1951-2. His work for the Kingston Victoria Hospital, of which he was chairman of the medical board for many years, brought him into nation-wide prominence and will be remembered as long as the re-organization of the hospitals under the National Health Service Act is discussed. Although he did not succeed in saving the Victoria Hospital from absorption, when the decision that it should be taken over was made he showed his sterling qualities by immediately deciding to give of his best under the new regime. Largely owing to his efforts another general-practitioner hospital now exists in place of the old Kingston Victoria Hospital.

His influence on local medical affairs was great. At the time of his death he was a Treasury medical officer, medical officer to the Borstal reception centre at Latchmere House, Ham, member of the Surrey Executive Council, and a co-opted member of the Surrey County Council's health and ambulance committee. He served the Wimbledon Hospital as an honorary physician and as vice-chairman of the medical staff committee and was vice-chairman of the Surrey Local Medical Committee. He was a past master of the freemasons' lodge at Westminster Hospital and had recently joined the Malden rotary club. During the last war, as a member of the local air raid precautions service, he was one of the first medical officers to be called into action as a result of enemy air attacks.

At the memorial service held on March 4, Christ Church, Malden, was crowded by a gathering of all his associates, representative of every section of the community in which he lived and worked. In the address a remarkable tribute was paid by his old friend, the Rev. H. E. Baldwin, and for many the memorial service lightened the shock and sense of loss of his passing, leaving instead a feeling of gratitude and encouragement from his great example. He leaves a widow and two sons, to whom we extend our deep sympathy.—J. W. S.

Medical Notes in Parliament

Service in the Colonies

Mr. JOHN TILNEY asked the Secretary of State for the Colonies on March 3 what arrangements there were for seconding doctors from the National Health Service to the service of Colonial governments; and how many were at present seconded to Nigeria and the Gold Coast respectively.

Mr. J. G. FOSTER, the Under-Secretary for Commonwealth Relations, said that hospital authorities had power to second members of their medical staffs in suitable circumstances to overseas and other posts. In addition, Health Service hospital doctors might take up employment in the Colonial Medical Service for periods up to six years, with continuing participation in Health Service superannuation. The salaries and general conditions of service of doctors so employed were similar to those for doctors on the permanent establishment. On reversion to employment in this country a gratuity was payable. One doctor was serving in Nigeria and three doctors in the Gold Coast under these latter arrangements.

Mr. TILNEY said that in Northern Nigeria there was only one doctor for every 64,000 people. He asked the Minister to discuss with the Minister of Health what might be done to make seconding better known and more popular. Mr. FOSTER agreed, and said the trouble was partly due to the recent creation of the posts and partly to reluctance to accept a new idea.

Fowl Pest Infection in Men

Mr. DENYS BULLARD asked the Minister of Health on March 4 if his attention had been drawn to the danger that four men in Norfolk might have contracted fowl pest after helping with the slaughter of chickens among which the disease had occurred. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, said the Minister was advised that this disease, although in a limited sense transmissible to man, was not readily passed on among human beings. The only known clinical form of the disease in man was a mild inflammation of the eyes without constitutional disturbance. In the instance referred to the men were back at work. She added that, while it was not unreasonable to attribute the eye condition in the men concerned to contact during work with diseased fowls, laboratory tests did not confirm the association.

Consultant Service

The MINISTER OF HEALTH, having told Dr. BARNET STROSS on March 4 that all regional boards, in suitable cases, allowed transfers from whole-time to part-time medical service, was asked for his own view about this. Dr. Stross had expressed the view that the service was not best served by full-time consultants transferring to part-time. Mr. MACLEOD suggested that no such generalization could be drawn. The policy that all boards allowed transfers, subject to the needs of the service, was based on the 1948 circular, and there had been no change in that. He believed that a part-time consultant service was a very good thing, and he certainly had no evidence to show that there was any deterioration in the service provided.

Mr. A. BLENKINSOP said that some regional boards were offering the maximum number of part-time sessions, as an alternative to full-time sessions, to the greater detriment of the service. Mr. MACLEOD replied that boards might well interpret circulars, and particularly the 1948 circular, in different ways. There were different trends in different regional boards, but he had no reason to think that boards were not applying their general policy to individual cases—which was what mattered—in a reasonable manner.

Answering another question by Dr. STROSS, Mr. MACLEOD said the financial effect of such a hypothetical circumstance as the abolition of the part-time consultant service and its replacement by a full-time service could not possibly be assessed.

Dr. STROSS suggested that the saving would be considerable. Full-time consultants, he said, were not allowed any of the perquisites, such as expense allowances, of part-time service. If there could be a switchover to full-time service, would it not be possible to make the service more attractive financially? Mr. MACLEOD pointed out that matters of remuneration went back to the Spens Report. Any suggestion of abolition of the part-time service would be a breach of faith with the profession. Mr. SOMERVILLE HASTINGS said the payment for travelling time and expenses inflicted great cost on the service. The withdrawal of these facilities, which applied only to part-time officers, would save a lot of money and give the opportunity to improve the service in other ways. Mr. MACLEOD replied that he understood the point, but did not agree with it.

Mr. BLENKINSOP asked if the Minister was aware of the financial advantages enjoyed by part-time specialists employed by hospital authorities in comparison with those employed full-time, and whether he would refer the matter to the Guillebaud Committee for their consideration in view of the heavy cost of payments for travelling time and domiciliary visits charged by part-time specialists. Mr. MACLEOD replied to this that he was aware of the arrangements which were agreed in 1949. It was open to the committee to consider the point made by Mr. Blenkinsop, but it would not be appropriate for him, as Minister, to ask them to inquire into particular topics. He added in a further reply that any adjustment in terms and conditions of service was far better left to the medical Whitley Council, where it could be fully discussed.

Consultants' Salary Claim

Mrs. JEAN MANN asked the Minister of Health on March 4 what negotiations were in progress regarding salary scales to consultants, S.H.M.O.s, and registrars.

Mr. IAIN MACLEOD replied that a claim was before the Whitley Council, and the hon. Member would not expect him to make a statement while it was under consideration.

Mrs. MANN said that it had been under consideration since the Spens Report a number of years ago. General practitioners had had their pay settled under the Danckwerts award more than a year ago. Could the Minister not do something to speed this matter up, or did he enjoy the delay? Mr. MACLEOD replied that it had not been under consideration for quite as long as that, although it had been under consideration for a very long time—some 16 or 17 months, which was a very long time indeed. "I had a meeting on this subject this morning. There will be no unnecessary delay, and I think we are now nearing conclusion on the matter. . . . This is a matter of the most profound importance, which will have repercussions in many other fields."

Cotton-wool for Cushions

Five questions, concerned with the use of cotton-wool obtained under a Health Service prescription for stuffing cushions, were addressed to the Minister of Health on March 4. Mr. GEORGE JEGE, who had tabled the first three, wanted to know: (1) what action was taken against doctors who prescribed medical and surgical material without inquiring for what purpose it was required; (2) what instructions were given to doctors to ensure that they ascertained that medical supplies were necessary before they prescribed them; and (3) if he was aware that a doctor in the East Midlands had prescribed cotton-wool in large quantities, without satisfying herself of the purpose for which it was requested, and that it was afterwards used for stuffing cushions, and if he would instruct the appropriate executive committee to investigate and take action.

Mr. IAIN MACLEOD answered that a practitioner should prescribe only what was necessary for proper treatment, and if the cost of his prescribing was in excess of the amount necessary on this basis a sum might be withheld from his remuneration. "I am sure that practitioners are co-operating

in an endeavour to avoid excessive prescribing. I see no necessity for any special action in this case."

Mr. JEGGER asked if the Minister would investigate this case, in which Lady Barnett, while acting as a doctor, prescribed cotton-wool in excess of the amount required; and whether any action had been taken, as she was a well-known Conservative worker, while other doctors who had prescribed cod-liver oil and malt had been fined for excessive prescribing. Mr. MACLEOD said that Mr. Jeger sought to show, on the basis of one case, that there had been abuse. What he had not said was that this happened in the autumn of 1948.

Mr. NORMAN SMITH said that this story was told by Lady Barnett a few weeks ago. Mr. HORACE KING said the Opposition had always taken the view that abuse in the Health Service could take place only with the connivance of doctors, dentists, and opticians. Was it not wrong that a Tory doctor should use her professional shortcomings as propaganda against the Health Service? Mr. MACLEOD said there was nothing in the reports he had read to justify the Opposition statements.

Dr. EDITH SUMMERSKILL asked whether the Minister did not think it would be in the interest of the Health Service for him to say that this case was unique, and that no similar case had been brought to his notice. Mr. MACLEOD said that certainly no similar case had been brought to his attention. Both he and the executive council had better things to do than inquire whether or not seven years ago a patient had or had not used appliances correctly.

Vital Statistics

Week Ending February 27

The notifications of infectious diseases in England and Wales during the week included pneumonia 869, scarlet fever 1,463, whooping-cough 2,098, diphtheria 11, measles 2,099, dysentery 910, acute poliomyelitis 24, paratyphoid fever 5, and typhoid fever 3.

Infectious Diseases

Infectious diseases were slightly more prevalent in England and Wales during the week ending February 20. The increases in the number of notifications included 183 for whooping-cough, from 1,916 to 2,099, 98 for measles, from 1,846 to 1,944, 85 for dysentery, from 669 to 754, and 62 for scarlet fever, from 1,161 to 1,223.

The largest variations in the incidence of measles were an increase of 58 in Norfolk, from 328 to 386, and a decrease in Cumberland, from 200 to 143. The largest fluctuation in the trends of whooping-cough was a fall of 47 in Kent, from 120 to 73. 19 cases of diphtheria were notified during the week, being 8 more than in the preceding week. The chief feature of the returns of diphtheria was a rise in Lancashire from 1 to 5. Only small variations were recorded in the local trends of scarlet fever.

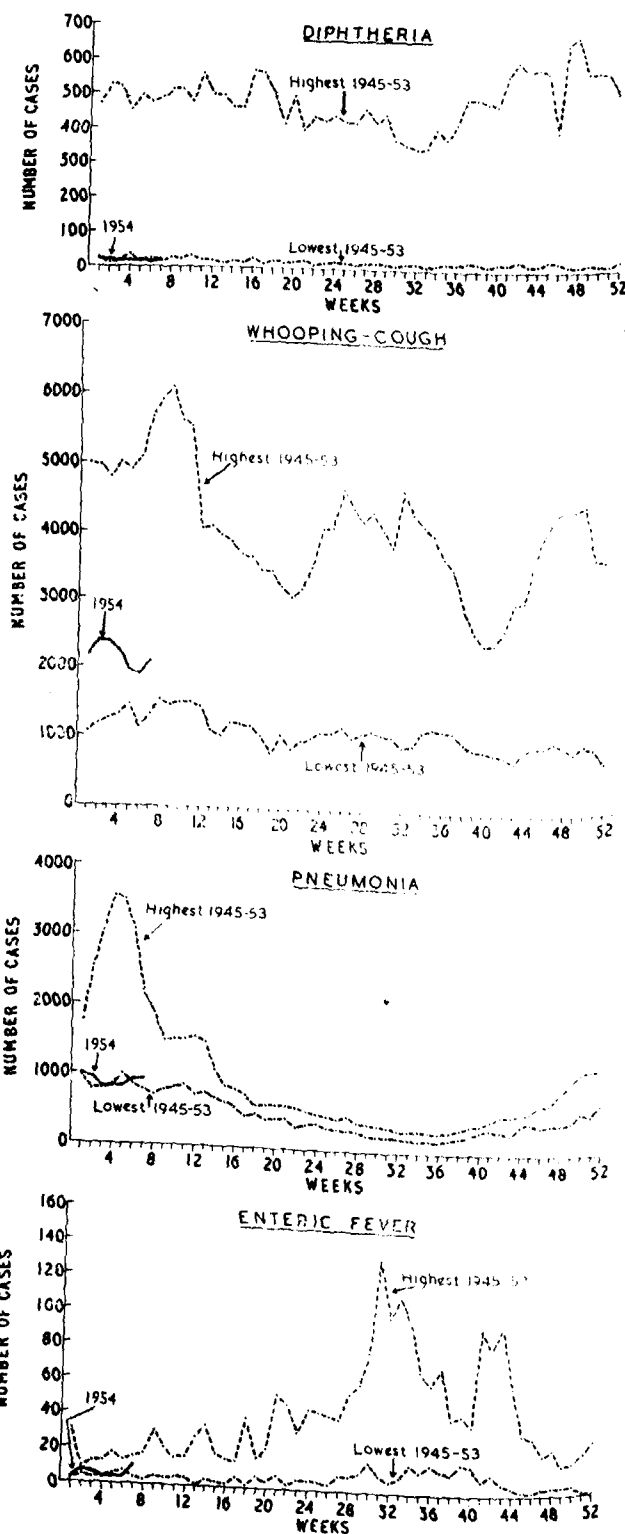
19 cases of acute poliomyelitis were notified. These were the same number for paralytic and 2 fewer for non-paralytic cases than in the preceding week. The largest returns were Devonshire 4 and Yorkshire West Riding 3. The only administrative area with more than one case was Plymouth C.B. with 4.

The continuous rise in the incidence of dysentery during the present year has resulted in the notifications reaching a level that has not been exceeded for almost two years. The rise during the week reviewed was mainly contributed by established outbreaks, and no new outbreak of any size was reported. The largest centres of infection were Lancashire 185 (Bolton C.B. 43, Eccles M.B. 30, Preston C.B. 23, Preston R.D. 17), Yorkshire West Riding 114 (Leeds C.B. 37, Bradford C.B. 34, Keighley M.B. 19), London 90 (Islington 31, Hackney 21), Staffordshire 68 (Cannock U.D. 52, Cheadle R.D. 10), Kent 59 (Tonbridge R.D. 19, Sevenoaks

R.D. 18), Middlesex 50 (Ealing M.B. 15, Enfield U.D. 14), Norfolk 32 (Norwich C.B. 29), and Essex 25 (Waltham-stow M.B. 13).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus ———, the figures for 1954 thus ———. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 20 (No. 7) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	19	1	5	0	1	16	2	19	0	4
Dysentery ..	754	90	184	9	7	241	29	136	10	
Encephalitis, acute ..	3	0	0	1		8	0	1	0	
Enteric fever: Typhoid ..	1	0	1	0	2	8	0	1	0	
Paratyphoid ..	10	0	3	0		4	0	7(B)	0	
Food-poisoning ..	224	18		0		194	23		0	
Infective enteritis or diarrhoea under 2 years ..				11	28				5	22
Measles*	1,944	29	65	10	291	32,890	1832	447	119	399
Meningococcal infection ..	51	8	17	2	4	63	8	28	7	2
Ophthalmia neonatorum ..	20	2	4	0		44	1	8	0	
Pneumonia†	932	48	262	4	1	2,142	117	475	30	17
Poliomyelitis, acute: Paralytic ..	15	0	0	0	4	25	3	0	0	2
Non-paralytic ..	4	0	0	0		2	0			
Puerperal fever‡	225	35	4	1		258	33	8	4	1
Scarlet fever ..	1,223	54	187	35	24	1,550	83	264	39	73
Tuberculosis: Respiratory ..	792	98	174	33				158	29	
Non-respiratory ..	127	8	18	7				28	4	
Whooping-cough ..	2,099	71	354	50	61	2,197	121	253	29	126

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	1	0	0	0	0	0
Dysentery ..	0	0	0	0		0	0	0	0	
Encephalitis, acute ..	0	0	0	0		0	0	0	0	
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	12	0	4	0	2	9	4	1	1	2
Influenza ..	45	2	2	0	2	521	79	27	2	4
Measles ..	0	0	0	1		0	0	1	1	
Meningococcal infection ..	2	0				4	0			
Pneumonia ..	421	53	29	8	13	772	109	40	10	17
Poliomyelitis, acute ..	1	0			0	3	0			0
Scarlet fever ..	0	0	0	0		0	0	0	0	
Tuberculosis: Respiratory ..	126	20	19	1	7	151	24	34	5	7
Non-respiratory ..	0	0	0	1	1	2	0	1	3	
Whooping-cough ..	3	0	0	0	1	9	0	0	0	0
Deaths 0-1 year ..	258	25	48	5	23	316	41	36	10	17
Deaths (excluding stillbirths) ..	7,161	1020	715	123	222	9,038	1345	808	128	206
LIVE BIRTHS ..	8,072	1136	963	251	460	8,047	1179	925	217	335
STILLBIRTHS ..	204	23	30			190	20	23		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

A Great Benefaction to Nottingham University.—Boots Pure Drug Company Ltd. has given Nottingham University £100,000 to endow two new Chairs in honour of Lord and Lady Trent. The Chairs are the "Lord Trent Chair of Pharmaceutical Chemistry" and the "Lady Trent Chair of Chemical Engineering." Lord Trent, son of Jesse Boot, the founder of Boots, has only recently resigned from the chairmanship of the company, a position he had held for 26 years. When in 1948 Nottingham University College was raised to the status of a university, Lord Trent became its first Chancellor. Before that he had been in turn a member of the University College Council (since 1923), its chairman, and in 1945 President of the College. The two new Chairs commemorate the work which he and Lady Trent have done both for the company and for the City of Nottingham. On March 3, when the gift was announced, the Court of the University heard with very great regret of the resignation of their Chancellor because of ill-health.

Annual Meeting of Irish Medical Association.—The programme for the annual meeting of the Irish Medical Association, which is being held at Killarney this year, starts with the opening of the medical exhibition by the president of the I.M.A. at 3.30 p.m. on July 6. On the next day, after religious services, there are the annual general meeting itself and in the evening the President's Reception. On July 8 and 9 there will be papers and discussions on the subjects "Drug Eruptions: Old and New," "Genito-Urinary Emergencies in General Practice," and "Recent Advances in Paediatrics." The annual dinner will be held on July 8, and a dance in aid of the Royal Medical Benevolent Fund on July 9. On the last day of the meeting, Saturday, July 10, there will be clinical demonstrations at the Mental Hospital, Killarney. Further information may be obtained from the Medical Secretary, 10, Fitzwilliam Place, Dublin.

Exchange of Teachers.—The Foreign University Interchange Scheme provides each academic year for an agreed number of visits each way between members of university staffs in the United Kingdom and those in 13 other European countries. The purpose of the visits is to promote academic contacts and to facilitate the exchange of information about recent research. The cost is shared equally between the participating countries, and in Britain the scheme is administered by the British Council. Among the medical teachers visiting Europe this month under the scheme are Professor J. McMichael from the Postgraduate Medical School, London (to Vienna, Graz, and Innsbruck universities), and Professor J. H. Burn, professor of pharmacology at Oxford (to the universities of Louvain and Liège).

Special Number of "Family Doctor."—The March issue is a bumper number to coincide with the venture of taking a *Family Doctor* stand at the Daily Mail Ideal Home Exhibition. Apart from the bright reader-winning picture of a baby on the cover, there are 49 pages of text and 58 pages of advertisements in this issue, and the whole magazine shows a high professional finish which should put it on good competing terms with its rivals. The principal medical articles are those by Sir Allen Daley on preventive medicine, Dr. Walter C. Alvarez on "How to Live with Your Blood Pressure," Dr. Greville Park on rashes, Dr. T. Traherne on schizophrenia, and Dr. G. K. Selborne on the psychology of breast-feeding. Other attractive features are an opening article by Elizabeth Bowen, the novelist, and a useful six-page guide to the keeping qualities of various foods at room temperature or in the refrigerator, ice-chest, or deep-freeze. *Family Doctor* costs 1s. 6d., and is published every month.

Royal College of Surgeons in Ireland.—On the occasion of the Charter Day Dinner of the Royal College of Surgeons in Ireland on February 13, the President, Mr. M. P.

Burke, conferred the Honorary Fellowship of the College on Sir Cecil Wakeley, President of the Royal College of Surgeons of England. The introductory oration was delivered by Mr. William Doolin, Secretary and Councillor.

Chair of Biochemistry at Oxford.—Sir Rudolph Peters, F.R.S., is retiring from the Whitley Professorship of Biochemistry at Oxford at the end of September. Applications for the chair are invited, not later than April 29, in the March 4 issue of the *Oxford University Gazette*. Sir Rudolph Peters, who will be 65 next month, is particularly noted for his studies on vitamin B₁₂ which paved the way for his work on arsenic poisoning and the discovery of B.A.L.

Dr. Daniel Merlin Pryce, reader in morbid anatomy at St. Mary's Hospital Medical School, has been appointed to the London University chair of morbid anatomy tenable at St. Mary's. Dr. Pryce will take up his appointment on October 1 in succession to Professor W. D. Newcomb.

Basildon and District Medical Society.—This society held its inaugural meeting recently. Any doctor interested in joining the society should get into touch with the honorary secretary, Dr. John Z. Garson, 48, Worthing Road, Laindon.

Dr. T. M. Ling, who led the B.M.A. mission to Latin America in 1951 (*Journal*, April 5, 1952, p. 756), has been made a Member of the Order of Carlos J. Finlay by the President of Cuba.

COMING EVENTS

Professor Max Rosenheim will deliver the Oliver-Sharpey Lectures on March 16 and 18 at 5 p.m. at the Royal College of Physicians. His subject will be "The Treatment of Severe Hypertension."

Christian Medical Fellowship.—The Fellowship will hold an open meeting on March 16 at 8.15 p.m. in the hall of the Royal Empire Society, Northumberland Avenue, London, W.C.1. The chairman will be Sir James Paterson Ross and the speaker Dr. D. Martyn Lloyd-Jones. Further details may be obtained from the Secretary of the Fellowship, 39, Bedford Square, London, W.C.1.

London Marriage Guidance Council.—A course of five lectures on marital problems for postgraduate medical students is being held at the Royal College of Nursing, Henrietta Place, Cavendish Square, W.1, weekly on Wednesday evenings at 7 p.m., starting on March 17. The speakers are Dr. P. L. Backus, Dr. Ethel Dukes, Dr. Clifford Allen, Dr. Philip M. Bloom, and Dr. H. V. Dicks. The fee is one guinea, and applications for enrolment should be made without delay to the Secretary, London Marriage Guidance Council, 78, Duke Street, Grosvenor Square, London, W.1.

The United Hospitals' Festival Choir.—A special performance of the *Messiah* will be given at the Royal Albert Hall on March 23 at 7.30 p.m. Tickets at 10s., 7s. 6d., 5s., and 3s. 6d. are available from the Royal Albert Hall and the usual agents.

London Medical Orchestra.—The orchestra will give its first musical evening for members of the medical and dental professions, and their friends, at B.M.A. House on April 3 at 8 p.m. The programme will include a rarely heard oboe concerto by Haydn, a concert aria by Mozart, and Schubert's Unfinished Symphony. Admission will be by programme obtainable at the door, price 2s. 6d.

The Boat Race.—Messrs. Vitamins Ltd. announce that they have available a number of tickets for doctors who may wish to view the Boat Race on April 3 from the Bemax premises. Early application should be made to Dept. B.R.1, Vitamins Ltd., Upper Mall, Hammersmith, London, W.6.

Course in Child and Family Psychiatry.—The department of child psychiatry, Ipswich Group Hospitals, offers a refresher course for school medical officers and other medical practitioners from April 5 to 9 inclusive. There is no fee. Places in the course will be allocated in order of application to 11, Fore Street, Ipswich.

Brompton Hospital Association.—The third dinner of the association will be held on April 23 at the Waldorf Hotel, Aldwych, London, W.C.2, at 7.15 for 8 p.m. Dr. A. Hope Gosse, the president, will be in the chair. The cost of the dinner will be 25s., and as accommodation is limited early application is advised. Informal dress.

NEW ISSUES

Abstracts of World Medicine.—The March issue (Vol. 15, No. 3), which is now available, contains abstracts of important papers drawn from medical and other scientific journals published in some 20 different countries and in all five continents. The subjects covered range over the whole field of clinical medicine and include pathology, pharmacology, and chemotherapy; there are also sections dealing with public health, industrial medicine, forensic medicine and toxicology, anaesthetics, radiology, and the history of medicine.

Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; a specimen will be sent free on request.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, March 15

●HUNTERIAN SOCIETY.—At Talbot Restaurant, 64, London Wall, E.C.4, 7 for 7.30 p.m., dinner meeting. Discussion to be opened by Professor L. P. Garrod and Dr. O. B. Mitchell-Heggs: The Misuse of Antibiotics.

Tuesday, March 16

HARVEIAN SOCIETY OF LONDON.—At Royal College of Surgeons of England, 8 p.m., Harveian Lecture by Dr. A. H. Douthwaite: Problem of Duodenal Ulceration.

ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., Dr. H. C. Faulkner: Group Practice.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. Wade: Treatment of Epithelioma of the Skin.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Oliver-Sharpey Lecture by Dr. M. L. Rosenheim: Treatment of Severe Hypertension.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE: EDINBURGH BRANCH.—At West Medical Theatre, Edinburgh Royal Infirmary, 5 p.m., annual general meeting. Dr. C. A. Hopkins, Ph.D.: Filariasis in the West African Rain Forest.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Mr. Aleck W. Bourne: Restraint in Obstetrics.

SOUTH WEST LONDON MEDICAL SOCIETY.—At Bollingbroke Hospital, Wandsworth Common, S.W., 8.30 p.m., Dr. P. A. B. Raffe: Use of Medical Statistics.

WEST END HOSPITAL FOR NERVOUS DISEASE.—5.30 p.m., neurological demonstration by Dr. C. C. Edwards.

Wednesday, March 17

●FACULTY OF ANAESTHETISTS: ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Joseph Clover Lecture by Dr. T. Cecil Gray: Disintegration of the Nervous System.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Precancerous Conditions of the Skin.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. G. Sandrey: Vesical Neoplasms.

LIVERPOOL MEDICAL INSTITUTION.—At David Lewis Northern Hospital, Liverpool, 3 p.m., clinical meeting. Symposium on Diabetes.

●LONDON MARRIAGE GUIDANCE COUNCIL.—At Royal College of Nursing, 7 p.m., Dr. P. L. Backus: Psychology of Marital Adjustment.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., Dr. H. F. Humphreys: Magic and Medicine.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Joseph Clover Lecture by Dr. T. Cecil Gray: Disintegration of the Nervous System.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Miss Isabel Macdonald, S.R.N.: Royal Nurses in History.

ROYAL MICROSCOPICAL SOCIETY.—5.30 p.m., Dr. F. J. Aumonier: Regeneration of Striated Muscle Following Coxsackie Infection.

●ROYAL SOCIETY OF ARTS.—2.30 p.m., Trueman Wood Lecture by Dr. E. D. Adrian, O.M., P.R.S.: Recent Developments in the Study of the Sense Organs (illustrated by lantern slides).

Thursday, March 18

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Mr. D. Innes Williams: Urinary Obstruction in the Early Years.

●CHANCING CROSS HOSPITAL MEDICAL SCHOOL.—5.30 p.m., Huxley Lecture by Sir Lionel Whitby: Dynamics of Haemopoiesis.

EDINBURGH CLINICAL CLUB.—At 7, Drumshough Gardens, 8 p.m., Dr. John Thomson: Care of the Neonatal Infant.

INSTITUTE OF PSYCHIATRY.—5 p.m., Dr. G. M. Carstairs: Attitudes to Death and Suicide in an Indian Cultural Setting.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., discussion: Minor Injuries of Joints. Opener, Sir Reginald Watson-Jones.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Dr. F. Avery Jones: Clinical Problems of Gastroenterology.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture by Professor A. C. Lendrum: Pulmonary Changes due to Cardiac Disease.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Oliver-Sharpey Lecture by Dr. M. L. Rosenheim: Treatment of Severe Hypertension.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At Royal Army Medical College, 7.30 p.m., laboratory meeting. Demonstrations.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Sir Paul Mollinson.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—At Lecture Theatre, 5 p.m., Sydney Ringer Memorial Lecture by Professor G. L. Brown, F.R.S.: Studies on the Sympathetic Nervous System.

Any Questions?

Intradermal T.A.B.

Q.—An American textbook of preventive medicine refers to immunization with T.A.B. by the intradermal route. Is this an effective route for inoculation, and are there any special hazards? Is it recommended for routine use?

A.—Vaccination against the enteric fevers by intradermal inoculation of T.A.B. vaccine has been studied particularly by American investigators, who have shown that the antibody response is essentially equal to, or even greater than, that obtained following subcutaneous inoculation, even when the dosage is markedly reduced. However, it was considered that this method was more suitable as a booster injection in previously immunized persons rather than a method for primary immunization. The recommended dose is 0.1 ml., and there do not seem to be any associated risks. Intradermal inoculation is seldom used in this country, but may be useful for people who have reacted severely to previous subcutaneous injections.

Deep Anaesthesia for Domiciliary Midwifery

Q.—I use a standard gas-oxygen machine for domiciliary maternity work. For forceps deliveries a vaporizer is plugged into the gas circuit, containing either "vam" (25% vinyl ether with 75% ethyl ether, by weight) or trichlorethylene according to whether any source of ignition is present. Vam gives much more satisfactory operating conditions, but is often contraindicated owing to open fires; trichlorethylene has to be "pushed" for anything but easy outlet forceps deliveries, and then the recovery period is undesirably long. Is a small dose of intravenous pethidine (25 mg.) combined with gas and oxygen in any way contraindicated for this sort of situation? Alternatively, is any other technique recommended for use when there is a definite explosion risk? Positive pressure is available but no suction, so relaxants are too dangerous to use.

A.—Only the most simple obstetric operations should ordinarily be carried out in the patient's own home, and for these the type of anaesthesia mentioned in the question should be adequate. Any complication or situation calling for deeper anaesthesia is generally an indication for transferring the patient to a fully equipped maternity hospital. There are a few exceptions to this rule; manual removal of the placenta, for example, should be carried out wherever the patient is situated.

In the event of an additional anaesthetic agent being required in domiciliary practice, then the question arises as to its object. If more relaxation of the muscles of the pelvic floor and vagina is required, local infiltration or pudendal block with an analgesic solution followed by episiotomy is safe, effective, and easy. If, however, the object is to relax the uterus in order to rotate the foetal shoulders or to remove an imprisoned placenta, then the most suitable anaesthetic is probably open ether. Indeed, there is much to be said for using this as a routine rather than the gas, oxygen, and trichlorethylene mixture mentioned in the question.

The risk of fire and explosion should be eliminated not by recourse to an anaesthetic agent which involves other dangers, but by removal of the fire. If the practitioner is dealing with booked cases he might advise all his patients antenatally against having a fire (other than one easily extinguished) in the room during labour. If he is called to an emergency case in which he has had no opportunity to give this advice, then it is not a difficult matter to clear the fireplace with a shovel and bucket.

Women vary considerably in their sensitivity to pethidine, and even a small dose given intravenously can have a major effect, especially if other forms of anaesthesia are in use.

Friday, March 19

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members. FACULTY OF RADIOLOGISTS: RADIODIAGNOSIS SECTION MEETING.—At Royal College of Surgeons of England, 2.15 p.m., Dr. Roy Astley and Dr. J. W. Gerard: X-ray Diagnosis of Coeliac Disease; Dr. R. E. Steiner and Dr. Ian Donald: Respiratory Diseases in the Newborn.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. L. Forman.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor R. A. Willis: Metaplasia.

Saturday, March 20

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, University College, 10.45 a.m., A.G.M. followed by scientific papers.

APPOINTMENTS

DRUMMOND, R. GORDON, M.B., Ch.B., D.P.H., Medical Officer of Health for the City of Durham, Durham Rural District, Brandon and Byshottles Urban District, and Assistant County Medical Officer, Durham County Council.

DUNN, MICHAEL J., M.B., Ch.B., Assistant County Medical Officer and School Medical Officer to the Isle of Ely County Council, March, Cambridgeshire.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—C. R. Savage, M.B., B.S., F.R.C.S., Part-time Surgical Registrar; Gwendolyn R. Tapp, M.B., B.S., D.C.H., Assistant Resident Medical Officer, Tadworth Court.

LIVERPOOL REGIONAL HOSPITAL BOARD.—A. V. Clemmey, B.M., B.Ch., D.O.M.S., Part-time Assistant Ophthalmologist to hospitals in the Warrington area; W. M. Owen, F.R.C.S., D.L.O., Part-time Consultant Ear, Nose, and Throat Surgeon, St. Helena area.

NORTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD.—J. W. Lewis, M.B., B.S., D.A., Part-time Anaesthetist (Consultant), Harris Hospital, Woodford Green; E. Hacker, M.R.C.P., D.A., Part-time Anaesthetist (Consultant), St. Andrew's Hospital, Bow, and St. George-in-the-East Hospital, Wapping; Sheila Millar-Danks, M.B., B.S., D.A., Part-time Anaesthetist (Consultant), St. Andrew's Hospital, Bow; C. D. Wilson-Sharp, M.B., B.S., D.M.R.D., Full-time Radiologist (Consultant), Colchester Group of Hospitals; A. Giordani, M.R.C.S., L.R.C.P., D.M.R.D., Part-time Radiologist (Consultant), King George Hospital, Ilford; Ella Preiskel, M.B., B.S., D.M.R.D., Part-time Radiologist (Consultant), St. Mary's Hospital, Plaistow, and Forest Gate Hospital.

ROTH, MARTIN, M.D., M.R.C.P., D.P.M., Visiting Director, Laboratory of Experimental Therapeutics, Allan Memorial Institute of Psychiatry, McGill University, Montreal, until September 1, 1954.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—L. C. Bell, M.B., B.Ch., B.A.O., F.R.C.S., Senior Registrar, Department of Thoracic Surgery, Frenchay Hospital, Bristol; R. R. Knowles, M.B., B.S., D.P.M., Senior Registrar in Psychiatry, Bristol Mental Hospital; Beatrice E. Sleight, M.B., Ch.B., D.A., Anaesthetic Registrar, Frenchay Hospital, Bristol; E. A. W. Houghton, M.B., Ch.B., Medical Registrar, Southmead Hospital, Bristol.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bauer.—On February 25, 1954, to Gitta, wife of Jacob Bauer, M.D., a son—Eran Nicodemus.

Donohoe.—On February 26, 1954, at The Firs, Mansfield Road, Nottingham, to Ursula Donohoe (formerly Wilkin), wife of Dr. T. W. G. Donohoe, a sister for Mollie.

Radecki.—On February 16, 1954, at the Middlesex Hospital, London, W., to Lois, wife of Carl Radecki, M.B., B.S., of the Repatriation General Hospital, Concord, New South Wales, Australia, a daughter—Carole.

DEATHS

Deane.—On February 20, 1954, Reginald Neville Deane, M.B., B.Ch., of 2, Canterbury Road, Croydon, Surrey.

Douglas.—On February 18, 1954, at Old Manse, Lockerbie, Dumfries, John Primrose Douglas, M.B., Ch.B.

Gibson.—On February 18, 1954, at The Gables, Grimsby Road, Cleghampton, Lincs, Robert Ernest Stewart Gibson, M.B., Ch.B.

Grills.—On February 16, 1954, at Craybrook, Whitbarrow Road, Lymm, Cheshire, Galbraith Hamilton Grills, M.D., aged 82.

Hues.—On February 13, 1954, at Lobden Cottage, Colwall, Malvern, Worcs, Herbert Walter Hues, L.S.A.

Jeffrey.—On February 11, 1954, at his home, Sandon House, Heywood, Lancs, Harry Foster Jeffrey, M.B., Ch.B., J.P.

Jeffrey.—On February 21, 1954, at 24, Stevenson Street, Dalmeir, Dunbartonshire, John Edward Jeffrey, M.B., Ch.B.

McKay.—On February 8, 1954, at the General Hospital, Burnley, Lancs, Charles McKay, M.B., Ch.B., of The Lindens, Manchester Road, Burnley.

Marradi.—On February 22, 1954, at the Cambridge Hospital, Aldershot, Hants, Arthur Trevor Marradi, D.S.O., M.R.C.S., L.R.C.P., Lieutenant-Colonel, R.A.M.C., aged 44.

Merrill.—On February 10, 1954, at 20, Hornsey Rise, London, N., William Spence Merrill, M.B., Ch.B.

Miles.—On February 11, 1954, at Bewdley, Worcs, Usher William Newton Miles, M.R.C.S., L.R.C.P., aged 82.

Mitchell.—On February 19, 1954, at 22, Warrander Park Terrace, Edinburgh, James Mitchell, L.M.S.S.A.

Nightingale.—On February 12, 1954, at Uppingham, Rutland, John Nightingale, M.D., D.P.H., Lieutenant-Colonel, R.A.M.C., T.D., retired.

Porter.—On February 4, 1954, at the City Hospital, Exeter, Arthur Edward Porter, M.D., D.P.H., late of Budleigh Salterton, Devon, aged 80.

Reid.—On February 8, 1954, at Dunmar, Tigh-na-brath, Argyll, Spence Reid, M.B., Ch.B., Colonel, late R.A.M.C., retired.

Rogers.—On February 9, 1954, at 4, Queensborough Studios, London, W., Frederick Colin Rogers, M.R.C.S., L.R.C.P., Lieutenant-Colonel, I.M.S., retired.

Sweet.—On February 16, 1954, at Westholme, 10, Victoria Drive, Troon, Ayrshire, Robert Sweet, D.S.O., M.B., Ch.B., F.R.F.P.S., Colonel, I.M.S. (retired), aged 66.

Webster.—On January 16, 1954, at 75, Sandon Road, Birmingham, Kathleen Mary Webster, M.R.C.S., L.R.C.P., D.P.M., late of Whitley Bay, Northumberland.

Wynne.—On February 7, 1954, at Midhurst, Avenue Gardens, Cliftonville, Kent, Albert Edward Wynne, M.D., F.R.C.S.I., formerly of 27, Westland Road, Dublin, aged 88.

at the same time. The margin of safety is increased if pethidine is given in dilute solution and in divided doses—or even in the form of a drip infusion. This sort of complicated procedure is, however, clearly unsuited to domiciliary midwifery. Likewise, as the questioner suggests, relaxant drugs have no place. Safety demands that these be given only by an expert working under hospital conditions. Moreover, their application to obstetric operations is limited. They promote relaxation of pelvic floor muscles, but this can be more safely achieved by local analgesia. They do not, however, relax the uterus, and for this reason they may hinder rather than help obstetric manoeuvres. Moreover, they appear to encourage silent regurgitation of stomach contents, probably by relaxing the diaphragm. Since they also suppress the cough reflex, they increase the risk of inhalation asphyxia and pneumonia.

It remains to be added that many obstetricians still hold the view that chloroform, if properly administered on an open mask with no gamgee to interfere with a generous intake of air, still has a place in domiciliary midwifery. Those who have been trained to use it will probably regard it as the obvious and simple solution to the problem posed in the question. It should not, however, be given for more than a short period of time, nor should its administration be repeated. It is also to be avoided if labour has been much prolonged and if the patient shows evidence of ketosis.

Mepacrine Stains

Q.—How can mepacrine stains be removed from clothes?

A.—Mepacrine stains are chemically similar to proflavine stains, and in his book on the acridines Albert¹ says that stains on fabrics can be lightened by washing with alcohol until no more colour is removed; the residual stain should then be smeared with oleic acid and immersed in alcohol containing a small amount of ammonia. Probably the simplest procedure of all, which might be tried first, is to rub the stain with 1% ammonia and then treat it with 80% alcohol. This should remove it.

REFERENCE

¹ *The Acridines*, 1951. Arnold, London.

Should Mothers Leave their Babies?

Q.—Is it psychologically harmful to leave a baby of 6 to 12 months with its grandparents while its parents are away for a month?

A.—Some interesting observations have been made, especially by Dr. John Bowlby, on the emotional reactions of young children removed from their mothers—for example, when they have had to go into hospital. These reactions not only occurred while the child was away but also after his return home. Apart from the anxiety and estrangement which one might expect, a variety of behaviour disorders were also seen. Bowlby found that the age of greatest susceptibility to such reactions was rather older than in the case described in the question, 18 months to 2 years being the peak. Control studies and more prolonged follow-up than has so far been possible are needed to show just how seriously these reactions are to be taken. Until further work brings greater understanding, practical problems are best solved in a common-sense way.

Thus in the case described it is unlikely that any harm would arise to the child. The period of parental absence is short, and the child should be able to get over it quickly. Furthermore it is very young, and at that stage of development, apart from being less aware and less discriminating than a child of 2, is unlikely to have the fixation on one person which it would normally have later. The most important psychological needs of a young child, affection and security, will presumably be supplied by the grandparents, and any severe emotional reaction during or after its stay with them is improbable. It is the anonymous atmosphere of a hospital or institution which appears to be deleterious.

Mercury Poisoning in Dentists

Q.—Is there any evidence that the habit of some dentists of mixing amalgam filling material in the palm of the hand may, in the course of years, cause symptoms of chronic mercurial poisoning?

A.—While theoretically the danger does exist, there does not appear to be any case reported where chronic mercury intoxication has arisen in a dentist in the way suggested by the questioner. The work of Storlazzi and Elkins¹ tends to show that some mercury absorption does occur from newly inserted silver-amalgam fillings. But the maximum temporary concentration is less than that found continuously in the urine of workers exposed regularly to quantities of mercury apparently too small to cause chronic poisoning. However, symptoms of mild chronic mercury poisoning are difficult to distinguish from irritability and anxiety due to other causes, and often have to be sought for specifically. In short, the risk to dentists, though theoretically real, must be very small indeed—if it exists at all.

REFERENCE

¹ *J. Industr. Hyg.*, 1941, 23, 459.

Dry Heat Sterilization in General Practice

Q.—What are the disadvantages of dry heat sterilization in general practice? Is it suitable for sterilizing suture materials and dressings? Could a domestic electric oven be used for the purpose?

A.—Dry heat sterilization is unsuitable for either of these purposes; it is indicated only for syringes, glassware, powders, and oils. Any fabric (dressings or thread, the latter being presumably the form of suture material meant) is charred and rendered brittle. Any oven which attains throughout (temperature may vary by many degrees in different parts) a temperature of 160° C. will serve; 180° should not be exceeded. The melting point of the solder used on syringes and needles is about 200° C., so any higher temperature than this would cause the solder to flow and the mounts to separate. A suitable thermometer would decide whether the oven in question is suitable. Most cooking ovens normally attain too high a temperature, but when regulation is possible they may be used.

NOTES AND COMMENTS

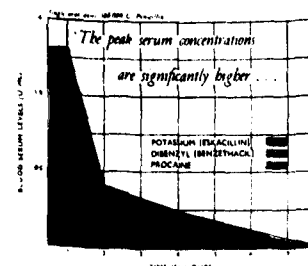
Smoking Cures.—Colonel H. W. DAUKES (Bethnal Green Hospital, London, E.2) writes: With reference to your answer to the question on smoking cures ("Any Questions?" February 20, p. 471), I feel that the answer given, while correct, is not very helpful. I have found a really good way to cut smoking down easily and effectively without undue nervous strain. Having lived much abroad, I developed the habit of smoking about 35 cigarettes a day regularly over many years. On returning to this country I found I could not afford this, so I tried making my own cigarettes first with a "rizla"-type maker; then, when I found this was effective, with one of the box type in which the closing lid rolls the cigarette, using a filter tip (mainly to give a neat end to the cigarette) and only making a cigarette when I actually wanted to smoke one. I have cut down to half an ounce of tobacco a day, which, when added to the cost of the filter tips and paper, results in a saving of £70 per annum. The two most important points are: (1) Not to sit down and roll a whole batch of cigarettes but only to make one when actually wanted—this cuts out a large number. (2) When you can have a cigarette whenever you want it sufficiently to go to the trouble of making it, this cuts out any element of nerve strain.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 20 1954

PAUL EHRLICH*

BORN MARCH 14, 1854

BY

Sir HENRY DALE, O.M., G.B.E., F.R.C.P., F.R.S.

This week there was held, in Frankfurt-on-Main and in Marburg, a joint centenary commemoration of the births of Paul Ehrlich and Emil von Behring. They appear to have been born on successive days, March 14 and 15, 1854; but the combined celebration recognized also, of course, the fact that both had contributed to a great and historic achievement in medical science. Their direct association lasted, indeed, for only a few years; but their names will always be linked together by the fact that von Behring discovered the antitoxins against diphtheria and tetanus in the opening years of the 1890s, and that Ehrlich, in the immediately following years, was largely responsible for the rapid development of that discovery. Ehrlich's work, indeed, played a part of central importance, not only in the early production of the antitoxins as effective and exactly controlled remedial agents, but also in the rapid opening which ensued, of a new vista of fundamental knowledge concerning the nature and the mechanisms of the reactions of immunity in a much wider field.

An essential preparation for such a new science of immunology had, of course, been made earlier by the work of Pasteur, of Koch, and of those who immediately followed those great leaders—and even much earlier, perhaps, by the observations of Edward Jenner, nearly a century before that time. There can be no doubt, however, that the study of the nature of immunity to infections entered a new phase of rapid progress with the discovery and further investigation of the antitoxins. Von Behring himself was doubtless concerned to find an immediate application for his sera in practical treatment, especially of diphtheria. So far, however, he appears to have made little more than a qualitative and empirical, though a fundamentally

*A lecture delivered at a centenary celebration in Amsterdam, on March 20, 1954, to the Genootschap ter Bevordering van Natuur-, Genees- en Heelkunde.

important, observation. His first sera cannot have contained, in a cubic centimetre, more than a fraction of what was later defined as a unit of antitoxin, and he had not discovered the appropriate technique for so raising the acquired immunity as to obtain an antitoxin of a therapeutically useful potency. Ehrlich, on the other hand, was already in possession of at least some of the knowledge required for this next and immensely

important step. In work on which he had already been engaged quite independently, on the specific immunity acquired by animals which had been given sub-fatal doses of the poisonous plant proteins, ricin and abrin, from castor-oil and jequirity seeds, he had discovered that this immunity could be raised by stages to a high level if a suitably spaced series of increasing injections were given.

Collaboration with von Behring

When von Behring's discovery of the diphtheria and tetanus antitoxins was announced, it was natural, then, for Ehrlich and his co-workers to apply their method of progressive immunization to the production of these, with potencies likely to make them practically effective in treatment, or in prophylaxis. Such records as are available suggest that the first serum of this kind to be used with a convincing

remedial effect, in human diphtheria, was one which Ehrlich had prepared in a sheep or a goat, at a time when von Behring's attempts had not yet produced an antitoxin with a recognizable therapeutic action; a result which, indeed, was to be expected, if we can accept Ehrlich's statement that the serum from his immunized goats already contained up to 100 units of antitoxin per ml., while von Behring's still showed less than one unit. It is certain, in any case, that von Behring invited Ehrlich's collaboration, and that, as the result of their work together, antitoxin of good potency was soon

Ehrlich in 1905.



obtained from the horse—in all ways a more suitable animal—and was thus made ready for large-scale production in Germany, and then in other countries.

A position of this kind, in which one investigator has been responsible for a primary and fundamental though essentially an empirical discovery, and another for giving it a quantitative and scientific basis and thereby making it effective in practical therapeutics, must always be apt to cause some division of opinion on the proportion of credit due to each of these different contributions to a common result. We know that the collaboration between von Behring and Ehrlich did not last very long, and that misunderstandings of some kind arose between them. On an occasion like the present we may be well content, I think, to leave the matter of the personal relations between these great men of science where it was left some 20 years later by von Behring himself, when at the side of Ehrlich's grave he said:

Nun ruhest auch Du, Du lieber Freund . . .
Du hattest stets eine empfindliche Seele . . .
Und wenn wir Dir wehgetan haben—Verzeih!

For our present purpose I think that it is more important to recognize that the direct collaboration between men of such different aptitudes and ideals probably lasted as long as it could render its best service to science. It had left Ehrlich deeply engrossed for more than 10 years with the fundamental nature of the immunity reaction, and of the relation between the specific immune substances and the corresponding antigens, to the immeasurable gain of scientific immunology.

Von Behring, on the other hand, was less concerned with these deeper problems. His primary discovery of the antitoxins remained the only one of that status calling for a special centenary commemoration of his life and achievements. He made, indeed, in later years, another contribution to immunology which has acquired a comparable importance in practical medicine. This, however, may be regarded as an extension of the earlier one; it was his recommendation, as a safe and effective inoculum for producing an active immunity to diphtheritic infection, of a suitable dose of diphtheria toxin combined with the amount of antitoxin required to neutralize it. In this case, however, I think that we are bound further to recognize that the mere trial of such a method would not have become practicable until Ehrlich's work had made clear the complexity of the factors concerned in this neutralization of toxin with antitoxin, and especially the presence in any toxin of "toxoid," combining specifically with the antitoxin and able to evoke its production, but free from the toxicity of the unmodified toxin. It would scarcely have been possible, indeed, until Ehrlich had further established, for diphtheria antitoxin, the first of all the biological methods for measuring the specific activity of a remedy, and probably still the most accurate of any. He had based it, as all later valid methods of biological standardization have been based, on the definition of a unit of activity as that of an exact weight of a permanently dried, stable, standard sample of the active substance, in this case of the antitoxin itself.

Ehrlich knew from the first, what one or another worker in quantitative biology from time to time forgets, and falls into trouble by forgetting, that a biological measurement, like any other measurement, has no real meaning unless it is made in relation to a fixed, invariable standard. And it may be noted yet further

that von Behring's contribution to the practice of active immunization against diphtheria did not extend much beyond the initial discovery and recommendation; so that in any account of its practical and systematic application, now so widely successful, it would be necessary to mention also the names of a number of others who were responsible for its first trials on an extensive scale, for the methods of controlling its efficacy, or for the introduction, as the inoculum, of a toxoid prepared by treating the toxin with formaldehyde, and for the modifications of this which are now prevalently used, with greater success and safety than the toxin-antitoxin mixture which von Behring had suggested. I think, however, that we may be glad to have the opportunity which this occasion affords of saluting the memory of Emil von Behring, as a pioneer whose initiative played a very important part in the origin of an immunological therapeutics, which has now at its disposal the means for both passive and active immunization, used for a preventive or a curative purpose, with all that those resources mean for the effective control of infectious diseases, in any modern, scientifically developed community.

A Predominating Influence

In the case of Paul Ehrlich, whose personal and scientific career forms my real subject to-day, it seems to me that we are concerned with achievements of a different order, which for more than half a century have had a predominating influence upon almost every aspect of the medicinal treatment of infections, and upon its aims as well as its methods and materials. In 1896 Ehrlich was appointed to the directorship of a small "State Institute for the Investigation and Testing of Sera," in Steglitz, a suburb of Berlin; and his progress there, with the fundamental study of problems arising more or less directly from the fulfilment of this official duty of control, was certainly but little checked by the relatively small dimensions and meagre equipment of the Steglitz Institute. It was from there, in 1897, the year following his appointment, that he published his famous memoir on "Die Wertbestimmung des Diphtherie-heilserums und deren theoretische Grundlagen" ("The Standardization of Diphtheria Antiserum and its Theoretical Basis"), which remains to this day the classical treatise on the subject. It laid the foundation, indeed, not only for all future work on the standardization of the diphtheria antitoxin, but for standardization in general by biological methods, in practically all of its now multitudinous applications. Even when the more imposing Royal Prussian Institute for Experimental Therapeutics in Frankfurt-on-Main was opened three years later, in 1899, with Ehrlich as its director, it was planned essentially for an extension of the work at Steglitz, though the change in title suggested a somewhat broader conception of its functions. Its first responsibility, however, to the Government which provided the money for its support, continued to be the organization and control of the testing of the new antitoxins, in order to give a public guarantee of the potency and safety of every batch which was issued in Prussia for practical use. To Ehrlich this was no merely tiresome obligation of routine, as many an investigator might have regarded it; on the contrary, he eagerly seized the opportunity which it presented for new scientific enterprise in many directions.

And for more than 10 years, from 1893 onwards, the natural flow of his inventive and speculative genius followed the course thus given to it by the requirements of a public responsibility. It led him, in the first instance, into a detailed study of the diphtheria toxin itself, in which he recognized a series of components, with different affinities for the antitoxin, and contributing to different phases of the toxic action—components to which, characteristically, he liked to give a pictorial representation, in what he called

the "spectrum" of a toxin. This dissection of a toxin into its components was needed, of course, before a really scientific method could be elaborated for titrating against it the potency of an antitoxin, with an animal reaction to show the end-point. And such studies led Ehrlich naturally to examine the nature of immunity-reactions over a much wider range. In the later part of this period, and especially in conjunction with his principal colleague at that time, J. Morgenroth, Ehrlich extended these studies to the more complex immune lysins, formed in response to the injection of intact foreign cells, such as red blood corpuscles from an alien species, or bacteria; and in these lysins they found two components, both needed for the lytic action—a specific "amboceptor" and a non-specific "complement"—present also in normal serum. Bordet, who had studied the phenomenon independently and from a somewhat different angle, had also recognized these two components and had named them "substance sensibilatrice" and "alexine."

The Side-chain Theory

And when Ehrlich's brilliant scientific imagination had occupied itself actively for some years with the meaning of these variously complicated phenomena, the famous "side-chain theory" emerged. It would be far beyond the scope of my present purpose to deal with that theory in detail; it may be that some other contributor to this celebration will make it the main theme of his address. Others also will probably be noting that one principal feature of the theory, in which receptor-groups are pictured as forming side-chains of a protoplasmic macromolecule, figures also in Ehrlich's way of thinking about other reactions than those of immunity, and particularly about the specific localization of chemotherapeutic agents.

In no case, I think, could the side-chain receptors, in the form in which Ehrlich had conceived and pictured them, have retained all their first convincing appeal, or the stimulating influence on further investigations which they so long exercised. The theoretical background has, of course, since those early days been transformed by great advances in biochemical and physico-chemical knowledge. And in Ehrlich's rather rigid conception of an immune antibody, with its closely specific affinity for a particular foreign substance, as originating from preformed side-chain receptors, kept ready, as it were, to combine with an antigen which they had never yet encountered, must surely have become more obviously inadequate as evidence accumulated. For it was soon to become clear that the cells of the body would produce these intensely specific antibodies in response to a practically unlimited variety of natural antigens. Landsteiner was later to show that a really unlimited number of artificial antigens could be prepared, by attaching pure chemical substances, natural or synthetic, by diazo-linkages to large-molecule proteins. And so it became clear that the antibodies must be formed, not from pre-existent receptors, but from some indefinitely adaptable cell constituent, which would respond to contact with any antigen by acquiring a new surface contour, conforming to that of the antigen with the detailed precision of a cast fitting into its mould. And, since all the immune antibodies appear to belong to the group of the gamma-globulins, Linus Pauling has pictured the long molecules of these as coiled into skein-like macromolecules, presenting surfaces which can be moulded to fit those of any number of different antigens. Such an ideal will obviously correspond more readily with the present state of knowledge than Ehrlich's diagrammatic conception in its original form.

Ehrlich's mind, however, though tenacious and combative in the face of criticism which he regarded as unfair, was readily receptive and versatile, eager to welcome any real illumination of his problems from sources outside the range of his own knowledge and experience. And I feel sure that, if he could have lived to survey all the evidence now available about the reactions of immunity, he would have

been ready to incorporate any new and more elastic interpretation of their meaning into the general structure of his own theory, and even to assume, perhaps, that this would involve a modification only in detail, and not in principle, of his own conception of the source of the antibodies. I myself believe, indeed, that there would be a substantial justification for such a claim. For there was another and by no means a less important feature of Ehrlich's original theory, which no more modern conception of the protoplasmic precursors of the antibodies has been able to replace, or even to modify. That was Ehrlich's application to the special case of an immunity reaction of a more general pathological principle, first propounded, as he was always proud to acknowledge, by his own distinguished cousin, Carl Weigert.

Weigert had drawn attention to the regular tendency of a living tissue, in its repair of the effects of an injury, to produce new cells, and eventually new tissue, in excess of what is required for mere replacement; and Ehrlich conceived that the cell constituents—the protoplasmic side-chains, as he pictured them—which were first occupied and put out of action by specific combination with an antigen, would then, in accordance with Weigert's principle, be reproduced in such an excess that they would be shed freely into the body fluids as circulating antibody. And whatever more modern conception may now be acceptable to account for the initial specific union with the provocative antigen, the idea which would attribute to such a reparative overproduction, not only the first appearance of the antibody as a freely circulating constituent of the blood plasma, but also the rapid rise of its concentration there, in response to successive, appropriately spaced and graded injections of the antigen, seems to me to have lost none of its original validity. That idea was an original component, a central feature indeed, of Ehrlich's side-chain theory of the immunity reaction. And even to-day, after more than half a century, it still provides the only interpretation yet available for an essential aspect of the complex reaction of immunity, and still retains its power as a stimulus to further experimental inquiry. Will anybody yet discover, we may ask, why the metabolism of the body cells, when once it has been thus constrained to the overproduction of a protein with such a newly imposed specificity, should continue indefinitely to produce such a specific antibody, though in a diminishing quantity, even without further antigenic provocation? It is a question, I feel, which would have been congenial to Ehrlich's own alert and ingenious imagination.

And it seems to me that, whatever permanence we may be inclined to predict for the details of some of his theories and speculations, Paul Ehrlich's manifold permanent achievements in this field alone would give us an abundant justification for commemorating the centenary of his birth.

Although, however, the joint commemoration with that of von Behring has led me thus to deal first with Ehrlich's work on problems of immunology, and although this had, as we have seen, a great and intrinsic significance of its own, it had no such primacy of importance in his total scientific achievement. If we take a longer view of his scientific career as a whole, this concentration of his interest during a middle period on the phenomenon of immunity, and on its practical applications in therapeutics, assumes the appearance rather of a diversion, made first in response to a call of public duty, from the line of the researches which he had been following till then on his own natural initiative, and to which he was to return with an undiminished enthusiasm, and with an augmented equipment of knowledge and ideas, when this immunological phase was coming to an end. To obtain a more comprehensive and balanced appreciation, therefore, of Ehrlich's work in the medical sciences as a whole, we ought at this stage to go back to the beginning, so that we may consider his researches and his contributions to knowledge in relation to his life and career, and in their natural, chronological sequence.

Early Activities in Research

We should note then, in the first place, how early Ehrlich's activities in research began, and how, from the very first, he was led by the natural line of his interest to study the way in which chemical substances become distributed in the body, in accordance with their varying affinities for the different tissues. From a statement made by Ehrlich himself, in a still unpublished address which he delivered at the opening of the Georg-Speyer Haus in Frankfurt in 1906, we learn that his attention was first attracted to such problems during his first year as a student of medicine in Strasbourg, under Waldeyer, when at the age of 19 he read a book by Heubel on lead-poisoning. This described the distribution of lead in the body, as revealed by chemical analyses of the different organs. The young Ehrlich evidently began then to think of the possibility of following the unequal distribution of other substances in the body, due to their varying fixation by organs and tissues having different affinities for them. Lack of chemical methods for their detection would make an investigation of such distributive variations impracticable in the case of many substances. The distribution of dyestuffs, however, could be followed by direct observation, either with the naked eye or under the microscope; and the German industrial production of synthetic dyes, then in its early stages, gave the young enthusiast his opportunity.

His cousin, Carl Weigert, shared to some extent his interest in the new dyes, but was more concerned with their uses as conventional stains for microscopical specimens. Ehrlich appears from the first to have had in view the possibility of using them as selective, histochemical reagents; and there are incidents on record which suggest that he was apt to arouse comment from his teachers, by the amount of time which he spent on experiments of this kind with the new dyes, to the detriment of his studies of the more normal subjects of a medical curriculum, on which he would presently have to face his examiners.

Already in 1877, as an undergraduate of 23, he published a paper on the use of staining with aniline dyes in microscopical technique; and in the following year, 1878, he presented his graduation thesis to the medical faculty of the University of Leipzig. This has never yet been published, but, most fortunately, a copy of it in typescript has been preserved. It is entitled: "Beiträge zur Theorie der histologischen Färbung" ("Contributions to the Theory of Histological Staining"); and it is full of precocious speculations concerning the meaning of the selective staining of different tissue elements. Little imagination, indeed, is required to detect in this thesis by the 24-year-old Ehrlich the germs of nearly all the ideas which were to guide his scientific activities, and to lead him eventually to his great discoveries, during the whole of his active career.

By the next year, 1879, he had begun to use the dyes to classify the wandering white cells of the blood and the tissues, by the different and chemically significant staining-reactions of their granulations; and he had thus opened the way for his classical series of researches on the anaemias and the leukaemias, extending from then onward over many years, through which he became one of the principal founders of the modern science of haematology. As a student of physiology, I myself first heard of Ehrlich as the discoverer of the different types of leucocytes, with their oxyphil, basophil, and neutrophil granulations. In 1883, while holding a clinical appointment in Berlin, he discovered the acid-fast staining property of Robert Koch's then recently discovered tubercle bacillus, and the colour-reaction given by the urine in certain diseases with diazo-benzene-sulphonic acid.

And then, in 1885, came his remarkable treatise entitled: "Die Sauerstoffbedürfnisse des Organismus" ("The Avidity of the Organism for Oxygen"). This is truly a precocious classic of functional biochemistry, in which the comparative avidities for oxygen, of the still normal cells of the different organs of a living animal, are measured by their

power of converting one, both, or neither of two dyes with different reduction-potentials, indophenol blue and alizarine blue, into the corresponding, colourless reduction products. Even to-day, when oxidation-reduction potentials and the intracellular systems of oxidizing and reducing enzymes are matters of daily experiment and discussion in so many laboratories, this little book remains full of stimulating suggestions, and many have found in it, again, the germs of ideas which were to be given more definite form in the side-chain theory.

Work on Methylene Blue

In the same year, 1885, Ehrlich published his first observations on the biological uses of methylene blue, which was to play such an important part in more than one phase of his further investigations. He had observed that it also was readily reduced by some tissues to a colourless leucobase, and that it showed a selective affinity for nerve cells and nerve-fibre endings. Three years later, in 1888, he was experimenting with Leppmann on its possible use to interfere with nerve conduction, and thus to act as an analgesic. And from about this time, or more probably two years later—after his return from a longish absence due to a threat of tuberculous infection—there are undated copies of letters which he wrote to leading dyestuff chemists, inquiring about the possibility of obtaining analogues and derivatives of methylene blue for trial, and even suggesting the details for a possible synthesis of a cyano-derivative, with an astonishing knowledge of chemistry in this range for one who had had no formal training in any kind of chemistry beyond the mere rudiments.

The same letter, to Professor A. Bernthsen, contains a request of particular significance. Bernthsen had earlier supplied a specially purified sample of methylene blue, and Ehrlich reports that this has all been used by him with Leppmann in the clinical trials of its efficacy in neuralgia; and he now asks for a further supply, "which is again to be used for therapeutic experiments, but in this instance they are to be extended in a new direction." There can be little doubt of the nature of the new experiment which he had in view. As Ehrlich recalled in later years, in a paper dealing with his chemotherapeutic experiments with trypanosomes, Leopold Landau had already recommended him, about 1880, to try methylene blue as an internal antiseptic, since Ehrlich had himself shown it to be a specially good stain for bacteria. It was not, however, until his experiments with Leppmann had further encouraged him that he decided to try it on human malaria—the malaria parasites having also, of course, a strong affinity for methylene blue, as could be seen in a stained blood film. This clinical trial was actually carried out in 1891 with Professor Guttman, who had a patient suffering from malaria under his care; and the result was not, in itself, at all discouraging. Methylene blue appeared to have a definite remedial action on the malarial paroxysms, but not better than that of quinine, and not certainly even as good.

This clinical trial of methylene blue as an antimalarial remedy seems to me, however, to have been one of the decisive events in Ehrlich's scientific career, and one of the principal landmarks in the history of modern therapeutics. For it appears to have been the very first occasion on which an artificial substance, or, indeed, a medicinal substance of any kind, was made the subject of a deliberate test of its power to cure an infection by a direct action upon the infecting organisms. Here, then, Ehrlich adopted for the first time what he later claimed to be a new principle in therapeutic research, and called "chemotherapy"—a quest for remedies which would specifically kill or eliminate the parasitic organisms responsible for infectious diseases, without detriment to the patients; in contrast to the then current pharmacology, which only concerned itself, as he alleged, with the symptomatic or toxic effects which a supposed remedy produced on the patient or on an

experimental animal. Ehrlich's effective campaign on these new lines was not to begin till some 12 years later; but the delay is not to be attributed to disappointment with the result of this first trial. Methylene blue had shown, in fact, sufficient promise as a specific antimalarial agent to have qualified it for use as the starting-point of a systematic attempt to find better ones. And when, many years later, and long after Ehrlich's death, the research staff of the Bayer Company undertook such a campaign, using the transmissible malaria-like infections of birds to test their synthetic products, and were thus led to discover plasmoquine and atebirin (mepacrine), their starting-point was, in fact, methylene blue rather than quinine. There is even evidence on record of a successful use, as recently as 1946, of methylene blue itself for the treatment of certain cases of chronic malaria.

A Diversion

Ehrlich, then, abandoned further attempts at chemotherapeutic research for the time being, not because the result with methylene blue was unpromising, but rather because the experimental requirements were not yet available. He could not wait for opportunity on the chance of encountering another case of human malaria, or test an indefinite series of new compounds on human patients for curative efficacy and toxicity. The effective opening of his chemotherapeutic campaign had therefore to wait till the opportunity was presented by Laveran and Mesnil's discovery that trypanosome infections could be transferred to rats and mice, and maintained indefinitely in series by subinoculations.

We must remember, moreover, that it was not long after the trial of methylene blue in malaria that Ehrlich's activities were diverted, and fully occupied then for more than a decade, by the enlistment of his interests in the production and standardization of the new antitoxins, and by his eager pursuit of the fundamental problems of immunity with which he thus came into contact. I doubt, indeed, whether Ehrlich himself would have regarded this interlude as a diversion. For him, I believe, the antitoxins and other immune substances would already have presented themselves as the ideal chemotherapeutic agents: with maximal specific affinities for the parasites and their poisons, and none for the tissues of the host, they must surely have been for him the perfect realization of the "magic bullets" which had figured in his therapeutic dreams.

Systematic Chemotherapy

But when Laveran and Mesnil showed that trypanosome infections in small laboratory animals could be made available in any numbers required for experimental treatment, Ehrlich seized the opportunity to return to his study of the remedial effects of artificial substances, and in the first place of synthetic dyes, and thus to make an effective beginning of his systematic chemotherapy. For this he obtained the co-operation of Dr. Shiga, known to all the world for his work on bacillary dysentery, who was on a visit to the Frankfurt Institute from Japan; and they began to explore the possibilities of finding a synthetic dyestuff with the desired selective affinity and the consequent high toxicity for the infecting trypanosomes, and relatively little for the tissues of a mouse. Ehrlich's friend, Dr. von Weinberg, of the Cassella dyestuffs firm, was ready to place its resources at the disposal of the new enterprise; and when I myself was working in the Frankfurt Institute for a short period, in 1903-4, Ehrlich and Shiga had just reached an initial success with the discovery that trypan-red, a sulphonated benzidine dye, would definitely cure an artificial trypanosome infection in mice. In the event, it was not found to be similarly effective in the natural trypanosome infections of man and the larger animals, as they occur in tropical Africa; but its discovery had shown the potentialities of the chemotherapeutic approach to the problem and given great encouragement to further explorations by the same method.

All the world knows about Ehrlich's discovery of salvarsan, which has even been made the subject of a popular

film; and it has, indeed, a proper claim to such wide recognition, as the first great practical success of chemotherapy, and one which brought new hope of an effective campaign against what had been one of the most resistant of the microbial enemies to human health in all the world. But it seems to me that the debt of medicine, and of humanity, to Ehrlich's dedicated genius would have been but little diminished if he had never discovered salvarsan, or any other chemotherapeutic remedy with a comparable importance for practical treatment. For there are other important practical successes, achieved by Ehrlich's methods long after his death, the origins of which can be traced in fairly direct line to pioneer observations which he had made many years before, without any such directly practical results. We have seen already how the scientific pedigree of the first artificial remedies for malaria can thus be traced to Ehrlich's trial of methylene blue; and, similarly, trypan-red, though it was not itself effective as a practical remedy, can be recognized as the founding ancestor of the line leading to germanin (suramin). I am sure that other examples of such particular derivations could be found; but in addition to them all, and surpassing them by far in its claim upon our grateful recognition, we should remember how large a part of all the great and still expanding advance in the direct and specific treatment of infectious diseases can be traced at its beginning to the inspired vision, the brilliant initiative, and the invincible scientific enthusiasm of Paul Ehrlich.

An Unusual Personality

Paul Ehrlich was a man not only of rare scientific genius but of a very unusual personality. His waking thoughts and attention were concentrated upon his scientific activities and speculations with a burning intensity. Any visitor, if he could be thought to have some kind of contact with such interests, was likely to find himself abruptly plunged into a flood of enthusiastic and exclamatory exposition, though he could hardly fail to retain some stimulus and inspiration from the immersion. Within his special range Ehrlich's knowledge was profound and comprehensive, and his memory prodigious; but beyond the sharply drawn limits of that range he made no secret, but rather a parade, of the astonishing completeness of his ignorance. Anything electrical, for example, was entirely beyond his ken, and he would confess to, or boast of, his inability to remember the direction of the earth's rotation. Apart from his unremitting concentration on his scientific work, his small remainder of interests and activities had a remarkable simplicity.

He seemed to read very little outside his own scientific range. I have heard him speak with enthusiasm, indeed, of the Sherlock Holmes stories, and a portrait of Conan Doyle hung on his study wall; but that was because he prided himself on a supposed resemblance between Holmes's detective methods and those of his own researches. His tastes in the fine arts were those of a child; and there were many other child-like aspects of his character. He had no trace of the pomposity which men of his eminence in the Germany of those days were apt to display; and his freedom from many normal inhibitions could be endearing or exasperating, according to the circumstances. He seemed to be generous and petty, open-hearted and secretive, culpably careless of his own interests, and fiercely, explosively resentful of anything which he felt as an encroachment, or even as unfair criticism—all in turn and unpredictably. His character seemed, indeed, to have a heavy dose of what is commonly called the artistic temperament, but without any faculty of artistic appreciation.

With it all, nobody who had the privilege of knowing him, and of working at any level under his stimulating influence, can have had any doubt of his essential greatness. The world has abundant reasons of gratitude for his achievements and his inspiration, and for celebrating the centenary of the birth of one of its great benefactors.

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PAUL EHRLICH—MEMORIES OF 1905-7

BY

C. H. BROWNING, M.D., LL.D., F.R.S.

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Paul Ehrlich merely as a figure of a man was not conspicuous; he was of moderate build and slightly under average height; but often, as the proverb goes, "good gear is small bulked." As I saw him first, his features are well conveyed by the frontispiece of Bolduan's translation of the *Collected Studies in Immunity* and the volume published under the title of his name to celebrate his 60th birthday (Jena, 1914)—the frontispiece of Miss Marquardt's book is like the latter. A Scottish friend on seeing these pictures remarked, "He might have been a Scotsman." In repose his expression had something finely spiritual, but the lean, stressed, and wistful face of later photographs was that of an ill and harassed man. What cannot be adequately reproduced is the intense alertness and animation which informed his looks, voice, and movements. His absent-mindedness, illustrated in so many stories, true or apocryphal, had no influence on his deepest interests, which comprised not merely his investigations in a restricted sense, but everything bearing even remotely on them. To direct his attention successfully to any matters which lacked this appeal required strenuous persistence. The preoccupation was intense; at whatever place or time he might encounter an assistant the talk quickly turned to experiments on hand or in the future.

Fellow guests casually met would be told about published work in a lucid and entertaining way which can be glimpsed from the formal lectures. For visitors to the "Institut" he would demonstrate with the stub of the broadest make of crayon pencil the structure of an antigen and antibody by bizarre shapes (somewhat modified, although still recognizable, in the hands of present-day investigators of the subject) or the constitution of a drug by benzene rings like irregular ovals. He was as a rule kindly and humorous, appreciative of help and quite tolerant of criticism provided it was not expressed polemically. But then, as the French say, he became "the savage beast; when attacked it defends itself." Some of the controversies, like that with Gruber, illustrate this, or an earlier reminder to an objector that but for his (Ehrlich's) discovery of the acid-fast method of staining the tubercle bacillus he would not recognize one on meeting it face to face.

A Happy Period

The period I refer to was a happy one for Ehrlich; his reputation with scientists throughout the world stood very high (although, of course, his greatest fame with the general public was still to come): his work on the blood and on immunity and the discovery of trypan red had aroused the widest interest and respect, and there was a continuous stream of visitors distinguished in biology, chemistry, or medicine. Work went on actively and with an absence of the hurry and strain which developed later when the practical application, or in many cases misapplication, of salvarsan involved Ehrlich in worry and frustration. I had been received as a voluntary assistant at the Königliches Institut für Experimentelle Therapie on the recommendation of Professor Robert Muir after participating in his work on haemolytic sera, etc.; but I found that Ehrlich's interest in the subject of immunity had ceased to be active. However, Sachs was carrying on this line of investigation with distinction, and I took part with him for some months and

have warm memories of his kindness and impartiality of outlook. Stabsarzt Otto, a genial and able man, was in charge of the statutory control of antisera and also carried out fundamental research on the recently discovered Theobald Smith phenomenon of serum anaphylaxis in guinea-pigs.

Ehrlich was more concerned with cancer research, in which his co-operator was Apolant, a gifted musician as well as investigator, while Roehl, in a suite of two small rooms, continued what was fast becoming Ehrlich's chief interest, the chemotherapy of trypanosome infections, begun with Shiga and Franke. Berthelm, the organic chemist, who came almost at the same time as I, and then Miss R. Gulbransen, along with several visitors and the veterinarians Sticker and later Schöne, and Bechhold, a physical chemist, made up the research staff during the two years that I was in Frankfurt, except that when the Georg Speyer Haus, built adjacent to the Institut, was opened and the work on chemotherapy removed to it, additional chemists came there. As Ehrlich said, he did not like too many doves flying in and out. Max Neisser's bacteriology department, housed in the Institut, was largely self-contained.

Soon after my arrival Roehl was due to leave for another appointment, and to my great good fortune I was asked to succeed him, and became an official assistant. This entailed one or more talks with Ehrlich on most days and the receipt of at least one of the notes which he wrote, chiefly at home, whenever ideas struck him, on thin cards of the size of a single sheet of notepaper, usually of canary yellow colour. These "blocks" were copied and laid on the laboratory table first thing in the morning; they contained comments, suggestions, or requests arising out of the work and were signed with a sprawling E. When one could half-guess the contents it was possible to read them; but Sachs alone could decipher them at first sight. Conversations were held at unspecified times when Ehrlich made a round of the departments. Two exclamatory formulae invariably were associated with his entrance to a laboratory—"Fenster zu" (his dislike of draughts was intense; as a young man pulmonary tuberculosis had been diagnosed and he spent some time in Egypt, but the open-air cure had no place in his regime) and the famous "takko" (as it sounded to me), which, I imagine, was a portmanteau word composed of "guten Tag" telescoped into "nun was gibt es neues"—a courtesy greeting smothered by an impatient desire to learn at once the latest progress of experiments; his writing, too, consisted largely of abbreviations. On other occasions one was called to his narrow room in the Institut, with shelves, table, and chairs crowded with a disarray of books and papers, where visitors were received. It might happen that on arrival Ehrlich was dictating a letter to his secretary; then he fixed his eye on the newcomer and continued as if delivering a personal message to the latter.

His Liking for Aphorisms

The talks arising out of the researches were an intensely stimulating experience for any young assistant. They ranged widely over every aspect and were accompanied by comments on other investigators and their work in similar fields and filled with allusions the appositeness of which was a mark of Ehrlich's powers. Talk was enriched with lively and thought-provoking aphorisms which were unforgettable. I quote several as nearly as possible in the original words (translated), and, I feel sure, true to their spirit. "When taking a journey in a balloon you can't tell what the scenery will be like where you land, but you can keep your eyes open and see what is there" (he always insisted on the importance of observing what happened under fresh conditions). "My researches on the leucocytes were like a fisherman setting his net—something had to get into it." "Work like that of Emil Fischer [i.e., the synthesis of polypeptides] has the great disadvantage that the more amino-acids one successfully unites, the more difficult it becomes to add another." "The use of refined methods to measure something liable to uncontrollable variations is pseudo-

exactitude," or, put in another way, "If you succeed in eliminating 19 fallacies, there will always be a twentieth which you cannot get rid of." "The chemists remain riveted to their theories" (he was often at odds with the academic chemists and disapproved of their satisfaction with reactions which after months of work yielded only a few milligrams of product). "The pharmacologists have been content to chart only the dangerous shoals and sunken reefs of therapy, but never a safe haven" (his comment on the then prevalent toxicological studies of drugs).

Ehrlich was much given to thinking aloud and, I believe, whetted his mind on a listener. Such time as he had free for personal work in the laboratory was spent in performing chemical reactions, the apparatus being test-tubes and a Bunsen burner on a large table, which, like the shelves, was covered with bottles of chemicals and reagents, many of them without labels other than those he carried in his head. I guess that the elucidation of the constitution of atoxyl began when he found it could be diazotized and so was not an anilide as then supposed. A credible story was that a monkey which had the run of the laboratory could shake a test-tube over an imaginary flame with precisely the attitude of the master.

The work required of an assistant, at that time at least—investigations on the arsenobenzenes, including salvarsan and arsenophenyglycine, were only beginning when I left—was not heavy, and a great part of the day was free to use or waste at one's own discretion. Provided Ehrlich's moderate requests were met no questions were asked or available materials grudged. One lesson, however, was learned early—never to state the intention to carry out any line of experiment on one's own initiative, but to try it and if something of interest emerged to demonstrate the findings to him. In that event the highest reward came in seeing the satisfaction with which he accepted the result.

Some Personal Characteristics

Ehrlich was a sedentary man; he always drove in a cab to the laboratory in the morning and home again at a variable time after 3 p.m. There must once have been an accidental fire which had impressed him strongly, because he would come, even upstairs, before leaving, to say, "Lampen aus," although work was going to continue for several hours longer. His scientific reading was done with great rapidity and an unerring eye for the important points, and his memory was immense. His recreations, apart from the time passed with his family, included detective novels, Sherlock Holmes was a favourite, and H. G. Wells's *Food of the Gods* pleased him very much. Also, he worked mathematical exercises; he told his younger daughter's husband, a mathematician, "I do mathematics when I am tired." Then there was the inevitable succession of cigars throughout the waking day. Music and art made no great appeal, possibly because they would have taken up time required for thought on his own work, which was almost incessant.

Ehrlich's genius lay in his art of devising experiments which yielded important results, his faculty for correlating facts from his profound knowledge of biology and chemistry and thereby effecting syntheses unnoticed by others, and his capacity for getting things done. He seemed to be able to rid himself of preconceived ideas. As he said, "It is absurd, but we shall try it," meaning by absurd not foolish, but contrary to prevailing opinion. When new facts were discovered, they were stringently verified by repetition and modification of experiments. Publications were made in the light of added knowledge far in advance of that revealed; thus he was usually saved from the need to retract afterwards. While the facts might be largely contributed by his co-workers, the pattern of theory woven attractively round them was his own. He had the gift of holding attention and making what was highly complex sound clear and understandable to those less informed on the subject than himself, and, I believe, he obtained great pleasure from exercising this power. Some of his predictions were inspired, such as that of the side-chain (receptor) theory of nutrition,

recently established firmly by Whipple, according to which direct entrance of protein molecules into cells, as well as their exit, occurs. Like a diviner, he seemed to sense the presence of treasure, and a generation following him has been engaged in digging out a part of it. His self-reliance was supreme, but it was based on a vast amount of skilfully conceived work. Is it surprising if he occasionally missed something, made a slip, or spoilt an experiment? Truly he was a Master Builder.

PAUL EHRLICH
SOME REMINISCENCES

BY

MARTHA MARQUARDT

Secretary to Paul Ehrlich, 1902-15

I regard it as a great and most lucky episode of my life that I was allowed to work for Ehrlich as his secretary day by day for 13 years; and that, observing his actions and hearing him speak to his friends and colleagues, I was given an insight into the wonderful riches and greatness of his soul. Paul Ehrlich appointed me his secretary in November, 1902, "on approval," for he declared that he did not know whether he would get accustomed



In the laboratory.

to dictating his thoughts, letters, and scientific papers. Much later I learned the true reason: once, in Berlin, he had engaged somebody to help with his writings, but the typist, writing down all his interjections and repetitions, produced a strange sort of script. Finally, getting nervous, she was unable to take down his dictation and ran away. Of course, Ehrlich wanted to protect himself against another such experience.

Ehrlich liked to read detective stories, for they could "almost" distract his attention from his work; but even these, as all other books he read, bore on the inside and the covers his notes written in coloured pencil—a proof of not being distracted. He could not return borrowed books when asked for, but had to order new ones to replace them. Scientific articles sent to Ehrlich by their authors would, having been read, show in the margin or on the cover Ehrlich's judgment, such as "good," "important," "must be read carefully"; but sometimes quite frankly "miserable." Once somebody applied for a position and sent to Ehrlich a copy of one of his publications. Later on, having received no

answer, he asked a friend who was working with Ehrlich to say a word about him. When this friend spoke with Ehrlich about the applicant, Ehrlich merely pulled out of the piles of books on the big sofa a small reprint and handed it to him. In large letters there was but the remark on the cover: "Quatsch" (bosh). Both laughed heartily, and the case was dismissed.

"606"

In 1905 the discovery of the microbe causing syphilis was announced. This event was of great importance in medicine. The Kitasato Institute for Infectious Diseases was founded in Tokyo, on his return to Japan, by Kitasato, a friend of Ehrlich's since the time of their studies at the laboratory of Robert Koch in Berlin. And now, after the discovery of the syphilis spirochaete, one of the most talented of Professor Kitasato's pupils, Dr. Hata, started at once with experiments to produce syphilis in rabbits by inoculation, gaining great skill in his work. In the spring of 1909 Dr. Hata was sent to Ehrlich to continue work on these lines at the Speyer-Haus, producing infections in rabbits experimentally and then testing on these infected animals the curative properties of the preparations worked out by Ehrlich. Dr. Hata was delighted to do this work, took all the small bottles Ehrlich gave him, with inscriptions on the labels, and said proudly, with a nod, "418," "606." Dr. Hata, after his first trials of all the substances given to him, soon came to show Ehrlich his records, and said: "Believe 606 very efficacious." Ehrlich would not believe it, and Hata, untiring, did not shrink repeating the experiments again and again until a clear and definite result was obtained that 606 was best. Ehrlich then confessed that he always had had a strong feeling—yes, had been convinced for two years—that 606 must be good. Trial treatments of patients had now to be made again by those collaborators who had already been working with 418 successfully, and finally Ehrlich consented to announce the invention of 606 to the world, following a number of publications showing good results.

Ehrlich had to receive all medical visitors asking for 606, telling him personally what observations they had made, asking his advice about special cases; he had to listen to patients who wanted to be treated by him, and sent them to one of the clinics where treatment was given. Untiring, he had a kind word for everyone and helped wherever he could. Besides all the urgent work at the laboratories, in the chemical section, and in the biological section where continued series of animal experiments required his presence and help, he had to watch over the process of manufacture with every precaution, to safeguard 606 from the influence of oxygen. Later on Ehrlich said himself: "Without the strictest observance of all necessary precautions it would have been impossible to introduce 606 into human medicine."

In addition, something quite different required Ehrlich's attention: from everywhere crazy ideas for treatments and cures were sent in. In spite of all his urgent work, Ehrlich found time to answer inquiries politely. People seeking positions asked for work; many beggars implored his help; children told him that their birthdays were on the very same date as his; people with the same name inquired if they were not relations. To those who asked for help Ehrlich sent a sum of money; he was the kind of helper who did not let his left hand know what his right hand was doing. He simply wanted to help and could not say "no," for this "no" may have made unhappy somebody who urgently needed help. He was always ready to assist members of the medical profession or their families who were temporarily or really in want. Large sums were often involved, and it was understood that they were gifts, not loans.

During the seven months or so following the Wiesbaden Congress until the Congress in Königsberg in September, 1910, much experience with 606—which had been given the name "salvarsan"—had been gained, but Ehrlich did not cease to advise everybody at the Congress not to be content

with a momentary success, but to observe strictly all precautions in using 606.

In the meantime, as was also the case previously, trouble had arisen when using salvarsan, and when Ehrlich returned from Königsberg more unfavourable experiences were reported. Ehrlich now called out in distress: "Those wretched scoundrels are really going to smash salvarsan entirely, because they will not pay attention to any of my instructions," and, clenching his fists, he went on: "But I shall force my will upon them! I shall introduce intravenous injection and insist upon it for all treatment with 606, to put an end to this hoggish, dirty behaviour once and for all!" "They will all object to it," remarked Dr. Sachs critically, "they are not used to intravenous injection—it is given only in cases of extreme emergency." "Then they must learn it . . . I shall demand it and compel them to do it . . . the blood will get the better of all the dirt." And Ehrlich succeeded, though only after another grave incident.

In December, 1910, the chemical works completed big installations for the manufacture of 606, tried it out, and produced quantities sufficient to cover the requirements of all pharmacies for some time. Supplies from the Speyer-Haus were now no longer necessary. Since the announcement of the invention of 606 at the Wiesbaden Congress in April, 1910, more than 65,000 doses had been sent out free of charge.

Honours and Celebrations

On March 14, 1914, Ehrlich's 60th birthday, the daily papers had long articles about him and his wonderful work; some issued richly illustrated special numbers in his honour. The scientific periodicals also celebrated the occasion. Hundreds of telegrams and letters from all countries came in, and many of his friends from abroad arrived to take part in a simple friendly celebration, and all his family and relations were there. His assistants and former pupils had compiled a special book on his work, a volume of 668 pages (*Paul Ehrlich, Eine Darstellung seines wissenschaftlichen Wirkens*, Gustav Fischer, Jena). Dr. Arthur von Weinberg, a helpful and appreciative friend of Ehrlich's for many years, announced that, on his suggestions, the pupils and friends of Ehrlich planned, as a gift to him, to found a new wing to the Serum Institute, with a large laboratory, equipped in the most up-to-date way, and, adjoining it, a pleasant study with armchairs, large writing-desk, book-cases, and an office for me. Paul Ehrlich was deeply touched by these generous gifts and shook hands all round, with a few kind words for everybody. Of course, Ehrlich stayed in his old rooms, as nothing was as yet finished. Later on, the laboratory being almost ready, Ehrlich went over—but once—to see what it was going to look like. Taking a deep breath, he then went back to his old rooms which he loved and where he was happy to work.

In 1908 Ehrlich and Professor Metchnikoff, of the Institut Pasteur, Paris, were awarded the Nobel Prize for their successful studies in immunity. That was for work dating back almost 20 years. When Ehrlich, in December, 1908, went to Stockholm to deliver his lecture before the Nobel Committee, he spoke of "Chemotherapy." On his return to Frankfurt Ehrlich's friends organized a party to celebrate this honour. As his friends knew of his dislike for big official ceremonies, this party was arranged in a big hall in Frankfurt as a so-called beer-party, with much mirth and informal gaiety. Ladies were not admitted, but Ehrlich's wife and daughters, and those of his friends, were allowed to look on from the galleries above. Dr. Adickes, the Lord Mayor of Frankfurt, made an enthusiastic speech, saying that Ehrlich would be capable, if required, of working at and managing any number of institutes for research besides the two he already had. The audience showed their approval by great applause.

Wartime Activities

In August, 1914, war broke out. Newspapers came out with enormous headlines; crowds gathered round the news-

stands, some looking sceptical, some sad, some pugnacious; marching men were everywhere; there were endless goings to and fro. I shall never forget! In the Serum Institute there was great activity preparing serum for the army on a large scale. Every room was used for this work, and every worker. Ehrlich's new laboratory was immediately requisitioned as a control centre for all sera which the chemical works had to produce. In Ehrlich's "reception room" and my office in the new wing cases and chests were piled up, filled with sera ready for use, waiting to be dispatched. Ehrlich had really never liked the idea of leaving his old rooms and moving into the new surroundings. It seems he had a presentiment that he would never work there. Very exhausted from his labours and depressed by continuous attacks from his enemies, Ehrlich had once again gone to Baden-Baden for a holiday; and once again he had to come back to Frankfurt when war broke out.

I shall never forget the distressed look in his face as he put his hands up and cried out: "But this war is pure madness! No good can come of it!" Ehrlich felt quite lost and strange in the noisy bustle at the institute—people running hither and thither, and large cases being continually dragged along the corridor. Only in his old laboratory and his study could he find refuge and a quiet place to think. His staff had planned to take advantage of his absence on holiday to move all his collections and belongings into the new rooms. When he heard of this plan before he left he protested very decidedly: "In my absence nothing is to be touched; I want to take care of all that myself." If this plan had been carried out Ehrlich would not have been able to find anything on his return, and would have had no place to stay; it is impossible to imagine how unhappy he would have been. Once or twice he went into the new wing to see what they were doing there: I can always see how desolate he seemed on coming back, walking slowly down the long corridor into his old rooms, deep in thought, closing the door behind him with resignation.

There were many changes in the Speyer-Haus as well as in the Serum Institute as a result of the war, especially through the call-up for military service. Dr. Bertheim was summoned to his cavalry corps at once, and on the first day in Berlin, going down the stairs in the house where he was billeted, caught his spurs in the carpet and fell, fracturing his skull and dying instantly. Ehrlich now had only Dr. Paul Karrer, whom he had invited shortly before the outbreak of war to come from Zurich and work with him. Ehrlich could discuss all his test-tube experiments with him and entrust to him the detailed working out of his ideas. They were on friendly terms, and some articles on silversalvarsan were published. Later on Dr. Karrer returned to Zurich, and in 1939 was awarded the Nobel Prize for Chemistry.

Failing Health

During the first year of the war—the last of his life—Ehrlich's health grew worse, and he had to follow strict medical advice with regard to diet. Long years of heavy smoking of strong imported cigars, irregular meals, in fact almost complete disregard of proper food—these combined to produce a disastrous effect on his system. He had to give up smoking, and this he found very hard, though he always pretended that leaving off a habit was really not difficult. But with a complete lack of appetite he found it "an absolute torture" to take the prescribed amount of nourishment. He knew it was necessary, and tried the best he could. About Christmas, 1914, Ehrlich had a slight stroke, but recovered from the obvious effects in a few days. It was a first serious warning; his grave illness progressed imperceptibly, without giving him or those around him any suspicion that catastrophe was near.

Shortly before the war Ehrlich was at last persuaded by his friends to buy a car for more comfortable travel between his house and the institutes. War came, and immediately his car was requisitioned by the military authorities and he had to go back to his old custom of using a horse-drawn cab. In this last year of his life I used to call for Ehrlich

every morning at his house to accompany him to the institutes. In fine spring weather we went by cab only as far as the Hippodrome Riding-School, where the Paul Ehrlich-strasse begins, and then walked down the street. On one side there were no houses, only building sites, the plots surrounded by fences, with bushes of acacias and elder, grass and trees. Ehrlich was always very fond of gay flowers with bright colours and strong scents, and he would pause and breathe in the fragrance of a flower or bush in bloom, his eyes delighted. He paused and looked, and with a slight nod would pass on, saying simply: "Nice, isn't it?" In the car rumbling along the streets, passing the railroad station, over the Wilhelms Bridge, he often sat silent, and I did not venture to disturb him. He was depressed and discouraged by the war, which he said could not end well and ought to have been avoided. Also he was deeply distressed by the interruption of his scientific relations with all his foreign friends. He spoke affectionately of his grandchildren, who often came to see him; he would even laugh at a funny street scene or an odd notice at a shop in passing by.

Sometimes he talked quite cheerfully about his future scientific plans. Once he said to me: "You know, I need never work out anything new at all. If I followed up all the thoughts and problems I have noted down in 'blocks' and put aside in favour of other more urgent work, if I took up all that again, I could keep a dozen chemical assistants busy with work for years. Those 'blocks' are a real gold-mine of discovery." But Ehrlich was now more often in a depressed state of mind. His elasticity had never failed him in overcoming even the greatest difficulties; with tenacious perseverance he had always piled experiment upon experiment to find a really scientific foundation for his theories; his titanic, heaven-storming optimism had inspired all his collaborators and pupils; but now he was discouraged, tired out, and too weary to fight any more.

Last Days

At the beginning of August, 1915, Ehrlich went to Bad Homburg, near Frankfurt, for a holiday and treatment in the sanatorium of a friend, lovingly cared for by his wife, his daughter Marianne, and his grandchildren. It had been arranged that I should go there now and again, to avoid a too great accumulation of work during his holiday. When I was asked to come I was told on arrival the terrible news: Ehrlich had had a second stroke during the previous night and was sinking rapidly. He still recognized me and was able to exchange a few kind words. His elder daughter Stefanie and the two sons-in-law hurried to him when summoned by telegram. His wife, the true companion of his life, and all his family were with him when—on August 20—he drew his last breath and his eyes closed for ever.

Paul Ehrlich is buried in the Jewish Cemetery of Frankfurt. On top of the two high columns at the entrance of the box-edged tomb are, visible from afar, the Star of David and the Snake of Aesculapius. A large slab of marble from the quarries of his native Silesia covers the tomb, upon which only his name and the dates of the beginning and end of his remarkable life are engraved. On a high stone carved from a natural block of marble, at the head of the tomb, was a large vase of porphyritic rock containing trailing rose-bushes with an abundance of blossoms. His resting-place was covered with the falling petals. Despite the ravages of war Paul Ehrlich's resting-place has not been damaged.

Ehrlich dedicated and sacrificed his whole life to the welfare and healing of mankind, never failing in his idealism, his optimism, and his faith, until he finally broke down from exhaustion. Nothing on earth mattered to him except scientific research aimed to overcome suffering and disease, and to increase the happiness of mankind. His unshaking and unwavering faith in the progress of his work was like a warming flame which filled his whole nature and shone forth in all his actions.

Paul Ehrlich will never be forgotten.

EMIL VON BEHRING

BORN MARCH 15, 1854

BY

Sir ARTHUR S. MacNALT, K.C.B., M.D., F.R.C.P.
F.R.C.S.

Formerly Chief Medical Officer of the Ministry of Health

The Army Surgeon

Emil von Behring, "one of the greatest benefactors of humanity" (*British Medical Journal*, 1929), was the son of a schoolmaster, who had 11 other children. He was born at Hansdorf, Deutsch-Eylau, West Prussia, on March 15, 1854, the day following the birth of Paul Ehrlich. He took his doctor's degree at the University of Berlin in 1878 and passed the State examination in 1880. He began his career as a military surgeon, serving in the Army Medical Corps, first at Posen, then in 1887 at Bonn, as staff surgeon, and lastly in the same rank in 1888 at the Army Medical College, Berlin. His first published paper (1887) dealt with iodoform as an antiseptic.

While still an army surgeon Behring was impressed by the discoveries in bacteriology which were revealing the cause of a number of diseases, and especially by the great work of his compatriot Robert Koch. In the early 'eighties, therefore, he began a series of investigations which were the precursor of his main life-work. Bacteriologists had noted already that white rats were immune to anthrax, while wild rats were susceptible. Behring took the fresh serum of white rats and tested it on anthrax bacilli *in vitro*. In a short time the bacilli were killed. Nuttall had made similar observations on the bactericidal powers of the fresh sera of man and of several animals, and his observations, together with Behring's findings, led to the humoral theory of defence against the invasion of germs into the animal body.

Discovery of Diphtheria Antitoxin

By 1889 Behring had left the army and had become an assistant to Koch at the Institute of Infectious Diseases, Berlin, then a stimulating and productive centre of bacteriological research. In 1884 F. Loeffler had been deeply immersed in the study of diphtheria and had issued his exhaustive work on the bacillus of the disease, which he identified with the bacillus described by Klebs in the preceding year. Kitasato had discovered the bacillus of tetanus. Both diphtheria and tetanus were shown to be diseases caused by the local multiplication of the organism without

penetration into the body generally. The hypothesis was then advanced that these two bacilli secreted soluble poisons which, being absorbed, acted on the cells of the central nervous system and other organs of the body.

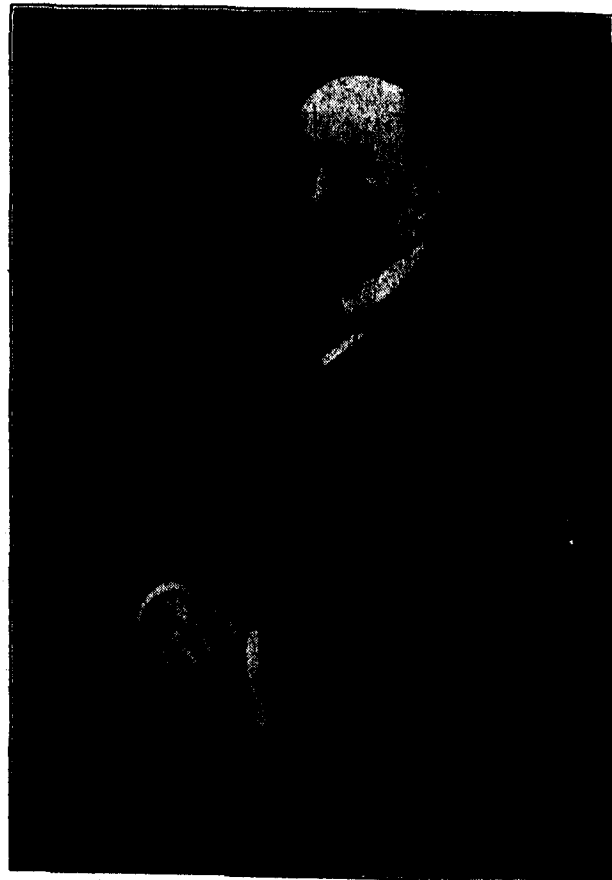
Loeffler's work had been subsequently confirmed by many observers, but particularly by Roux and Yersin at the Pasteur Institute in a series of three important memoirs (1888-90). They also announced that they had grown diphtheria bacilli in broth and removed the bacilli by filtration through unglazed porcelain; the resulting sterile filtrate on injection into animals produced the characteristic symptoms of diphtheria; this soluble poison they termed a toxin.

These important results aroused universal interest. Loeffler had also been engaged in searching for the hypothetical toxin, and in 1890 Brieger and C. Fraenkel prepared a toxic substance from cultures of the diphtheria bacillus in bouillon, which they called "toxalbumin." By injections of this toxalbumin into guinea-pigs, Fraenkel established an immunity, so that 14 days later the animals were resistant to a virulent living culture of *C. diphtheriae*. These results were published in the *Berliner klinische Wochenschrift* on December 3, 1890, and on the following day, December 4, there appeared in the *Deutsche medizinische Wochenschrift* Behring and Kitasato's classical paper, entitled "Ueber das Zustandekommen der Diphtherie-Immunität und der Tetanus-Immunität bei Thieren." One week later (December 11) Behring, alone, published another paper, in the same journal, dealing with immunity against diphtheria and enumerating five different methods by which this could be obtained.

These papers announced the great discovery that an animal immunized against tetanus and diphtheria by graduated injections of killed broth cultures of these bacilli produces in its blood substances which are capable of neutralizing the toxic action of these bacilli. It was also

shown that an animal previously injected with the serum of such an immunized animal was resistant to an otherwise fatal dose of bacilli or toxin; and, in addition, that an animal when treated with the serum, even if symptoms developed, could be cured. The substance in the serum of immunized animals was given the name of "antitoxin" by Behring and Kitasato. As the treatise on diphtheria of the Medical Research Council (1923) states: "In these papers we have the details of one of the greatest discoveries ever made in medicine. . . . History must assign unchallenged to E. Behring the merit of the discovery of antitoxin. It came at the end of a long period of research in which the bactericidal action of the blood had been very thoroughly studied."

These experimental results opened the gate of the new field of serum therapy for mankind. In quick succession many papers appeared confirming and amplifying Behring's discovery, including further papers by Behring himself and by Ehrlich.



Emil von Behring.

Treatment of Diphtheria in Man

The practical application of the discovery to the treatment of diphtheria in man was advanced by the further work of Behring and Baer and of Behring and Wernicke. The antitoxic serum was tested in children with favourable results. The first child treated by antitoxin was a patient in von Bergmann's clinic in Berlin, the injection being made by Geissler on Christmas night, 1891. The firm of Meister, Lucius, and Bruning began to immunize animals in their factory at Hoechst in 1892.

In 1893 Behring had the title of professor conferred upon him. In this year with Kossel and Heubner he recorded the first cases in man treated with the new remedy.

Emile Roux, with his fellow-workers Louis Martin and Yersin, was mainly responsible for bringing diphtheria immunization from the experimental to the practical stage. Roux and Martin were the first to immunize horses, and were thus enabled to produce antitoxic serum in large quantity. In the hospitals of Paris serum treatment of diphtheria was established by 1894. In that year Roux was able to announce in his famous address at the International Congress of Hygiene and Demography at Budapest that the case mortality in children suffering from diphtheria in the Paris children's hospital had already been reduced from 52 to 25%.

In England in the summer of 1894 E. W. Goodall first treated by the new method some 20 patients suffering from diphtheria with favourable results, in the Eastern Hospital, Homerton; he used serum supplied to him by Sir Joseph Lister, who had obtained it from Roux. Goodall stated in his book (*A Short History of the Epidemic Infectious Diseases*, London, 1934) that in the autumn of the same year Armand Ruffer prepared antitoxin at the British Institute of Preventive Medicine, now the Lister Institute, and this serum was first used at the Eastern Hospital on October 23, 1894. It has lately been put on record that Sir Charles Sherrington used the first antidiphtheric serum made in this country on October 15, 1894. The serum was prepared by Ruffer and himself at the Brown Institution. The patient, a boy of 8 years, was regarded as dying from diphtheria. He recovered. (See *Marginalia* contributed by Sir Charles Sherrington to *Science, Medicine, and History: Essays on the Evolution of Scientific Thought and Medical Practice* written in honour of Charles Singer. Oxford University Press, 1953, Vol. II, 550).

Ehrlich's Standardization

In 1895 a control station was set up in Berlin for testing antitoxin; in 1896 this became an institute for serum research and testing, first at Steglitz (Berlin), and from October 1, 1899, at Frankfurt under the direction of Paul Ehrlich. He produced a quantitative method for determining the antitoxic value of any sample in units defined in relation to a stable standard of reference; his method is still the most accurate of all such biological titrations, and, incidentally, he laid down the main principles for all standardizations by the use of biological tests, which subsequently provided a basis for the accurate dosage of many different types of new remedies (Dale, 1950). By Ehrlich's work a good antitoxin with a precise measurement of its activity was made available to mankind, and antitoxin could be given in an adequate dose at the onset of diphtheria. The mortality of the disease, in such cases, fell to insignificant proportions. Ehrlich therefore greatly extended the practical application of Behring's discovery to the cure of diphtheria in man.

International Recognition

Within a few years the administration of antitoxic serum to patients suffering from diphtheria became a routine method of treatment. In an address, "The Aims and Achievements of Serum Therapy," delivered at the Naturalists' Congress in 1895, Behring said: "I have no fear that the thought which forms the basis of serum therapy will ever disappear out of medicine!" He estimated that antitoxin treatment produced a reduction of 75% in the mor-

tality from diphtheria in Germany, an annual credit of 45,000 human lives. For this work Behring shared with Roux the 25,000 francs prize of the Paris Academy of Medicine and the 50,000 francs prize of the Institute of France. In 1901, when he received with Roux the Nobel Prize for medicine, he delivered an address at Stockholm on serum therapy. Orders and distinctions in the years following 1895 were showered upon him by learned societies of all European countries. Nor was the prophet without honour in his own country. In 1895 he received the title of Medical Privy Councillor and in 1901 a patent of nobility.

Researches on Tuberculosis

In 1894 Behring became Professor at Halle, and in 1895 was appointed to the Chair of Hygiene at the University of Marburg and Director of the Institute of Hygiene. Ill-health compelled him to give up systematic lecturing and teaching, and he gave only an occasional public lecture. After 1901 he turned his attention to the problem of immunization in tuberculosis. His premises were that human and bovine tuberculosis were but varieties due to the same organism; that infection in man and animals takes place in early life in the alimentary canal and pulmonary tuberculosis is a sequel to such intestinal infection; and that few human or bovine subjects escape infection before reaching adult life. The first two premises were not generally accepted. He attempted to immunize calves against tuberculosis with an attenuated strain of human tubercle bacilli, but the results were disappointing. His bovo-vaccine was largely used in Germany, Russia, Sweden, and America, and for a time aroused much interest. It has not withstood the test of time and prolonged experiments.

For the treatment of human beings von Behring prepared a form of tuberculin, named "tulase," by the action of chloral on tubercle bacilli. The exact method of preparation of tulase was unfortunately kept secret. It was eventually found not to be superior to any other form of tuberculin. He also did experiments on human immunization with killed tubercle bacilli.

As already mentioned, von Behring believed at first that human and bovine tubercle bacilli were identical, and, though there was a time when he favoured their dual nature, he returned in the end to his original belief. He also considered that tuberculosis was a lifelong affection; and contemporaries often quoted his aphorism that "phthisis is but the end of a lullaby sung at the cradle of the prospective consumptive." His experimental work in tuberculosis, although disappointing, was an introduction to the problem of immunization against tuberculosis in man and bovines.

Von Behring was financially interested in the manufacture of antitoxic sera by the great commercial firm of Farbwerke Höchst, which built and equipped laboratories on a well-planned and extensive scale for him. Here he conducted researches in which were used 7,000,000 oz. of cultures of tubercle bacilli. He was also interested in another commercial enterprise, the Behringwerke, which manufactured his bovine-vaccine. As a consequence of these interests von Behring rose to affluence and became the owner of a large estate on which grazed herds of cattle, which he also used for experimental purposes.

In 1905 he had investigated the collection of milk by aseptic methods and its preservation by formalin and hydrogen peroxide. He was the author of numerous articles on the experimental therapeutics of anthrax and streptococcal infections, the hygiene of the milk supply, water, and other subjects. He also wrote books on blood serum therapy (1892), the aetiological treatment of infectious diseases (1893), the history of diphtheria (1893), and the general treatment of infectious diseases (1898).

Discovery of Toxin-Antitoxin

In the study of diphtheria von Behring had achieved fame, and in 1913 he introduced his new preparation for protection against the disease. With Wernicke he had shown in 1892 that immunity to diphtheria was produced

by a protective dose of antitoxin. Later work by Goodman, Lohr, and others showed that such immunity does not persist after two to three weeks from the inoculation. It appears that Behring and Wernicke discovered in 1898 that immunity against diphtheria could be produced by doses of diphtheria toxin neutralized by antitoxin in experimental animals, but it was not until 1913 that von Behring gave his "new" preparation to the world. Theobald Smith in 1907, as the result of successful experiments upon guinea-pigs, had suggested that a toxin-antitoxin mixture might be used for preventive inoculation in man, but it was left to von Behring to achieve this. The preparation of his nearly neutral mixture of diphtheria toxin and antitoxin was varied from time to time, and gradually rendered less toxic.

Active Immunization in Diphtheria

Von Behring's toxin-antitoxin mixture was the forerunner of modern prophylaxis in diphtheria, and here again he must be acclaimed as a pioneer in immunization. The practical application on a large scale in New York City was due to the work of W. H. Park and to Bela Schick's skin test with a small dose of diphtheria toxin, which gave evidence of the need of the individual for immunization and of its success when applied. Sheldon Dudley's work and tests on young naval personnel assisted in establishing the value of the method in Great Britain. The immunizing reagent (toxin-antitoxin) has been modified in various ways—for example, the production of toxoid by treating the toxin with formaldehyde (toxoid-antitoxin mixture), etc. In Hamilton, Ontario, the incidence and mortality from diphtheria had shown little change for years up to 1925, when general immunization began. Thereafter, both fell so rapidly that there has been no death from diphtheria since 1930 and no case of the disease since 1933. Similar excellent results have been secured in other parts of Canada and in the United States of America. In this country successive Chief Medical Officers of the Ministry of Health have advocated artificial immunization since 1922, but, in spite of official memoranda and the co-operation of a number of medical officers of health, both incidence and mortality of diphtheria continued high. The incidence varied between 69,480 cases in 1920 to 46,281 in 1940 (England and Wales). At the end of 1940 the Ministry of Health undertook the free provision of prophylactics, the cost of which had been borne by local rates. This provision undoubtedly aided the campaign for immunization, which during the war years and subsequently has been vigorously pressed. In 1952 only 376 cases of diphtheria and 32 deaths in England and Wales were recorded, as compared with 23,199 cases and 934 deaths in 1944.

Such are the encouraging sequelae of von Behring's pioneer work in diphtheria immunization.

Von Behring in his later years was subject to severe periods of mental depression, which the advent of the first world war exacerbated. He died at Marburg of an acute attack of pneumonia on March 31, 1917.

The Significance of von Behring's Work

In the course of this paper reference has already been made to the significance of von Behring's work. In general terms it can be said that he was one of the founders of immunology as a science, and that Ehrlich's standardization of diphtheria antitoxin augmented its potentialities. Tetanus antitoxin, the discovery of von Behring and Kitasato, was another striking example of passive immunization, and its value has been proved in the prophylactic treatment of the disease. The specific sera which neutralized the other sporing anaerobic bacteria causing gas gangrene, together with tetanus antitoxin, helped to reduce these deadly complications of soil-contaminated wounds in two world wars. Antisera have also been used in dysentery due to the Shiga bacillus, and in the treatment of pneumococcal pneumonia and cerebrospinal meningitis. The use of all these antibacterial sera has largely given place to chemotherapy. In 1935 came the sulphonamides and later penicillin, streptomycin, and other antibiotics. It is of interest here to note that von

Behring at first attempted to produce a disinfection in the body by a great variety of chemical substances. With trichloride of iodine he partially succeeded in curing some cases of experimentally produced diphtheria in animals, and his comparison of their blood with normal blood may have aided him in the discovery of antitoxin.

It is a far better thing to prevent disease than to cure it. Active immunization against disease began with Jenner and was applied by Pasteur. Koch and von Behring were unsuccessful in tuberculosis, but Wright's typhoid vaccine has helped to abolish typhoid fever as a scourge of armies. The B.C.G. vaccine of Calmette and Guérin, involving the administration of a living culture of the tubercle bacillus rendered avirulent, has now become the subject of experimental trial in this country. The assessment of the real value of antibacterial vaccines is very difficult. Von Behring's initiation of toxin-antitoxin immunization and its later triumphs have already been described in this paper. Immunization with tetanus toxoid is a more modern instance of successful prophylaxis. Immunization against virus infections, of which the most successful is that against yellow fever, is another recent advance, and work is proceeding on vaccines designed to overcome the viruses of influenza and of poliomyelitis. Much of this successful work in the conquest of disease during the present century has followed from von Behring's pioneer researches, and his discovery of diphtheria antitoxin and toxin-antitoxin. Remembering the great boon he conferred upon mankind by these discoveries and the way he opened to the prevention of this killing disease of childhood, it is fitting, therefore, that the centenary of his birth should be honoured in Great Britain.

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The spread of certain diseases from one country, and even from one continent, to another is facilitated by air travel. Insects such as mosquitoes, flies, fleas, and lice may carry diseases dangerous to man. Perhaps most serious are malaria, yellow fever, virus encephalitis, sleeping sickness, typhus, and plague. According to Dr. P. H. Bonnel, of the epidemiological services of World Health Organization, the behaviour of insects in aircraft in flight has been the subject of close scientific observation. Such observations have shown that altitude and changes in air pressure and temperature during long flights do not permanently affect the activities of the insects. The vibrations in modern aircraft are reduced to a minimum, and insects which penetrate into a plane can live there for as long as they can exist without nourishment—that is, if they cannot find what they need in the aircraft itself. It was noted that certain insects laid their eggs on the outside of aircraft, on the wings, the fuselage, the rudder, and even on the propellers. These eggs were found to be still there at the end of the journey: neither the wind nor the altitude nor yet changes in temperature had affected their capacity for survival. On one single plane thousands of larvae emerged from the eggs and swarmed over the surface of the aircraft. Strict surveillance of aircraft and of aerodromes is therefore absolutely essential. This passive defence can be effective, however, only if it is complemented by more active measures which remove all possibility of transporting live insects in aircraft. Active control measures consist in spraying aircraft with insecticidal aerosols containing pyrethrin or D.D.T., but countries vary in their methods and in when "disinsectization" is performed. The application to the interior of aircraft of certain new resinous varnishes in which are incorporated residual insecticides is perhaps the best and simplest means of control. This important aspect of international prevention of disease is one of the subjects dealt with by the W.H.O. committee on international quarantine.

INFECTIOUS MONONUCLEOSIS

A SYNDROME OR A DISEASE?

BY

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The difficulty of defining any criteria for the clinical diagnosis of infectious mononucleosis is emphasized by the frequency with which the word "protean" occurs in accounts of the features of this disease. Tidy (1934) divided his cases into three groups—anginose, glandular, and pyrexial—and mentioned the frequent overlapping which occurred. This classification has been expanded to include those cases in which meningitis, haemorrhagic phenomena, jaundice, or nephritis is the main feature (Bernstein, 1940; Wechsler *et al.*, 1946). A respiratory form in which cough and nasal discharge predominated was mentioned by Vander Meer *et al.* (1945), while Chevallier (quoted by Bernstein, 1940) described an inguinal form in which lymphadenopathy was restricted to the inguinal region.

It is evident that the clinical criteria for the diagnosis of infectious mononucleosis are limited solely by the ever-increasing number of syndromes recognized as being caused by the disease. Halcrow *et al.* (1943) and Vander Meer *et al.* (1945) added the subclinical or asymptomatic form (*British Medical Journal*, 1947) which they encountered during a haematological and serological survey of apparently healthy contacts during an outbreak of the disease among military personnel. These authors also noted that, apart from these subclinical cases, many mild cases were seen which, if the presence of the outbreak had not been known and laboratory investigations not carried out, would have been diagnosed as colds, influenzas, or sore throats. The problem of diagnostic criteria is not limited to the clinical aspect, but is met in assessing the laboratory findings of suspected cases. Since the causative organism has not yet been isolated, confirmation of the diagnosis rests upon haematological and serological investigations.

In 1942 Paul and Bunnell discovered their non-specific test for the demonstration of heterophil antibodies. Soon after the introduction of this test it became apparent that many cases were occurring which, on clinical and haematological grounds, warranted a diagnosis of infectious mononucleosis but in which the Paul-Bunnell test yielded consistently negative results. Paul (1941) reported the test positive in 90% of 50 cases, but he mentioned a report by Erf, who found the test positive in only 40% of a series of cases. In the outbreak investigated by Halcrow *et al.* (1943) 68% of the patients had titres of 1 in 64 or more. However, in many such reports no mention is made of differential absorptions, and had differential absorption of the antibodies with guinea-pig kidney and ox-blood cells been done it is possible that the number of patients with significantly raised titres might have been even less.

Serology

Attempts have been made to explain the negative serology of otherwise characteristic cases of infectious mono-

nucleosis. Tidy (1952) stressed the significance of the time factor in the development of the antibodies, as did Kaufman (1944), who mentioned one patient who was seronegative on the tenth and eighteenth days, and who became seropositive five months later without any intervening illness. Hoagland (1952), however, found the test positive by the twenty-first day in all but 3 of his 56 cases. The possible effect of chemotherapy in preventing the development of antibodies was discussed by Fuller (1941), Tidy (1941), Paul (1941), and the *Lancet* (1941). The severity of the disease seems to be unrelated to antibody production, as patients may remain seronegative after a severe illness (Barber, 1941). Himsworth (1941) suggested that antibody development might be related to the absolute number of monocytes, while Warren (1941) thought that the percentage of abnormal lymphocytes might be the determining factor. Davidsohn (1937), Fuller (1941), and Whitby and Britton (1950) favoured the opinion that the seropositive and the seronegative cases were caused by different, though closely related, viruses. It is evident that the significance of a negative Paul-Bunnell test in an otherwise typical case varies with different authors. Hoagland (1952) insists on a positive test before calling the disease infectious mononucleosis, whereas others will accept the diagnosis so long as the clinical and haematological pictures are suggestive—in spite of a negative serology.

The characteristic blood picture of infectious mononucleosis has been fully described by Tidy (1934) and Bernstein (1940), and consists of an absolute and relative lymphocytosis accompanied by the appearance of numerous abnormal lymphocytes. Not infrequently this classical picture may be absent. Early in the disease a polymorphonuclear increase may occur, or the initial picture may be one of leucopenia. In some instances a lymphocytosis does not appear at any stage of the illness. The presence of abnormal lymphocytes is a constant feature of the disease, and in those cases without a lymphocytosis it may be the only suggestive finding. Reyersbach and Lenert (1941) reported a symptomless, seronegative outbreak of infectious mononucleosis in a children's convalescent home which has often been quoted as supporting evidence for the existence of a subclinical form of infectious mononucleosis (*British Medical Journal*, 1947). The complete absence of abnormal lymphocytes in all of these cases is against such a diagnosis, and suggests that the authors were, in fact, observing an outbreak of acute infectious lymphocytosis (Moyer and Fisher, 1950). Although the presence of abnormal lymphocytes is a characteristic finding in infectious mononucleosis, it is not pathognomonic. Similar cells have been described in association with many conditions, including mild upper respiratory infections (Stuart *et al.*, 1936; Warren, 1941), tonsillitis (Wilson and Cunningham, 1929), allergic conditions (Randolph and Gibson, 1944), brucellosis (Wise, 1943), measles (Benjamin and Ward, 1932), infective hepatitis (Thewlis and Middleton, 1925; Havens and Marck, 1946; Horstmann *et al.*, 1947), and rubella (Whitby and Britton, 1950).

The situation would appear to be that, although the blood picture is not pathognomonic of infectious mononucleosis, the characteristic changes associated with an upper respiratory infection, tonsillitis, or abdominal pain, together with generalized lymphadenopathy and often splenomegaly, frequently complete a syndrome for which the

diagnosis of infectious mononucleosis seems to be warranted and is often made. In a variable percentage of such cases this diagnosis is confirmed by the Paul-Bunnell test.

Present Investigation

The present paper describes an investigation of 27 cases in which the diagnosis of infectious mononucleosis was made on clinical and haematological evidence, but in all cases the Paul-Bunnell test was consistently negative. The nature of these infections is discussed and their features are compared and contrasted with those of infectious mononucleosis.

All of our patients were seen at the medical centre of an Army camp. Apart from one case, that of a boy aged 6, the ages ranged from 17 to 30. This investigation was initiated by the observation that cases of minor upper respiratory infections, sore throats, abdominal pains, or rashes were noticed to have a moderate generalized lymphadenopathy and blood changes suggestive of infectious mononucleosis. The cases were drawn from about 500 military personnel in the camp. It was decided that patients having lymphadenopathy in association with their illness should be further investigated haematologically and serologically. Many patients who would have qualified for further laboratory examination (because lymphadenopathy was present) were subsequently excluded because of the limited time available to carry out the investigations together with routine duties. Our cases occurred during September to November, 1952, after which they became less frequent and eventually uncommon. In view of the short period over which a large number of cases were observed, had a similar basic clinical picture, and gradually became less frequent, we concluded that we were dealing with a localized epidemic of the disease. In three instances—a medical orderly, one of the authors, and his wife—there was direct evidence that the cases were related by history of personal contact. Twenty-seven patients were examined and submitted for full haematological and serological investigations.

Clinical Features

Rhinitis.—Twenty-four patients complained of "stuffiness of the nose" and had copious nasal discharge. This was one of the presenting symptoms in 10 cases, the remaining 14 having had a marked rhinitis during the week preceding their reporting sick.

Sore Throat.—Six patients had an initial complaint of sore throat. Two of these had tonsillar and pharyngeal injection without exudate, two had follicular tonsillitis, and two had an ulcerative tonsillitis resembling Vincent's angina, although *Sp. vincentii* was isolated from only one of those ulcerative cases. Eight other patients had mild sore throat.

Headache.—This was not a prominent symptom, and occurred in only eight patients.

Cough.—Five patients had a cough, and in two of these the signs of mild bronchitis were noted.

Abdominal Pain.—In four patients this was the initial complaint. In one case pain in the left hypochondrium was accounted for by the presence of a tender palpable spleen. In another patient suprapubic pain and frequency of micturition suggested a cystitis, but this was ruled out by subsequent urinary examination. The pain was epigastric in the remaining two patients, and in all instances abdominal pain subsided within 24 hours.

Bowel Upsets.—Two patients complained of diarrhoea, and a further case had marked constipation. Gastro-intestinal upsets, nausea, and anorexia were not features of our cases.

Lymphadenopathy.—The presence of enlarged glands was, by selection, a constant feature of all cases. The cervical glands were most commonly involved and adenitis was almost invariably restricted to the posterior triangles of the neck. As has been observed previously, the left posterior triangle

Halcrow *et al.*, 1943). Twenty-four patients had enlarged glands in the left posterior triangle of the neck, and the right posterior triangle was involved in only 13 cases. In four cases the enlarged cervical glands were tender. Initially the glands were characteristically small and firm. They tended to become larger and softer during the first week, increasing to the size of a marble. Enlargement of the axillary glands was noted in 15 patients, and inguinal glandular enlargement occurred in 21 patients, in two of whom the glands were tender.

Splenomegaly.—The spleen became palpable in nine cases, and in three of these was tender. In five patients splenomegaly was noted at the first attendance. In three cases the spleen became palpable during the next few days. In the remaining case the spleen first became palpable during a recurrence of the disease six weeks after his first attendance. In four of these cases the period over which splenomegaly was noted to persist was 1 day, 5 days, 6 days, and 10 weeks respectively.

Pyrexia.—Fever was not a constant feature of our cases, as was the experience of Halcrow *et al.* (1943). Seventeen patients were pyrexial at some stage of their illness, with temperatures varying between 99 and 102° F. (37.2 and 38.9° C.). In 16 cases the pyrexia subsided after two to four days. The remaining patient, a young boy of 6, had a prolonged low-grade pyrexia for 38 days.

Rash.—In three cases a rash was the presenting feature and two others developed a rash during their illness. The rash was urticarial in two cases and rubelliform in three. The eruptions all subsided within two days.

Herpes Labialis.—Three patients developed a mild herpes labialis.

Meningismus.—In one patient, a boy aged 6, an initial diagnosis of meningitis was made in view of the findings of neck rigidity and bilateral Kernig's signs, which subsided within 24 hours.

Case Reports

The following case-histories illustrate the variety of the clinical pictures we encountered in this series.

Case 9.—A recruit aged 18 complained of a head cold, present for one week. He was apyrexial, and had marked nasal congestion, and numerous enlarged lymph nodes were palpable in the left posterior triangle of his neck. One week later he was well, but the glandular enlargement persisted. Three weeks later he complained of a recurrence of his cold, and had a mild herpes labialis. The cervical lymphadenopathy had increased and glands were palpable in the right posterior triangle, axillae, and groins. He remained apyrexial. During the next 14 days his symptoms cleared and his glandular enlargement subsided.

Case 10.—A warrant officer aged 30 complained of nasal congestion and a painful neck. He was apyrexial and there were several small tender glands in the left posterior triangle of his neck. His spleen was firm and easily palpable. His inguinal glands became enlarged four days later. Six weeks after his first attendance the enlarged cervical nodes had almost resolved, but the spleen was palpable on deep inspiration.

Cases 5 and 13.—These were admitted with diagnoses of follicular tonsillitis. Both had a typical follicular tonsillar exudate. Their temperatures on admission were 100.8 and 99.4° F. (38.8 and 37.4° C.) respectively. Case 5 had enlargement of the lymph nodes in the right posterior triangle of his neck, in the left axillae, and in both groins. A rubelliform rash of bathing-trunk distribution was present, lasting three days. Case 13 had glandular enlargement in the left posterior triangle of his neck, axillae, and groins, and, in addition, both tonsillar glands were enlarged and tender. Case 5 became apyrexial after two days with penicillin therapy, and in Case 13 sulphonamides were effective in the same time.

Case 3.—A recruit aged 17 complained of suprapubic pain and frequency of micturition. His temperature was

multiple small cervical glands in the left posterior triangle. After two days some larger glands were palpable in his left axilla. A mid-stream specimen of urine, obtained on admission, was sterile. He became apyrexial on the third day of his illness.

Case 11.—An N.C.O. aged 19 presented with tender inguinal adenitis. He was apyrexial. The glands subsided within a week. Two weeks later he developed herpes labialis, nasal congestion, and sore throat. Forty days after his first attendance he returned with pain in the right side of his neck. The cervical glands of both posterior triangles were much enlarged, and in addition moderate axillary and inguinal lymphadenopathy was noted. His spleen became palpable two days later. Fifty-seven days after his first attendance he was admitted with a recurrence of his coryzal symptoms and rubelliform rash of bathing-trunk distribution. He had generalized lymphadenopathy and his spleen was again palpable. His temperature was 99° F. (37.2° C.). His rash, splenomegaly, and fever subsided within three days, when he was fit to return to duty.

Case 1.—A soldier's son aged 6 became suddenly ill and complained of headache. His temperature was 101.8° F. (38.8° C.), and the only other abnormal findings were some slight neck stiffness and bilateral Kernig's sign. His younger brother had been in hospital two weeks previously with a lymphocytic meningitis which, in view of the prevailing outbreak of poliomyelitis, had been labelled as non-paralytic poliomyelitis. On the following day our case was much brighter and his signs of meningismus had disappeared. Although he remained asymptomatic a low-grade pyrexia (99 to 99.4° F.—37.2 to 37.4° C.) persisted. On the seventh day of his illness small beadlike glands appeared in both posterior triangles of his neck, with larger nodes in his axillae and groins. He was then seen at regular intervals, when his pyrexia was noted. An x-ray film of his chest, and the Mantoux reaction, urine examination, and Paul-Bunnell test, yielded no positive results. He remained apyrexial until the 38th day, and his lymphadenopathy persisted. He made a good recovery and has had no recurrence to date.

Serology

The number of serological tests and the period covered by them (as calculated from the first day of the illness) are shown in Table I.

TABLE I.—Showing the Number of Paul-Bunnell Tests Done in Each Case, the Period Covered, and the Highest Titre Obtained

Case No.	No. of Tests Done	Period Covered by Tests (Days)	Highest Titre Obtained
1	3	29	Negative
2	2	26	"
3	2	25	"
4	2	24	"
5	3	27	"
6	3	23	1 in 16
7	4	56	1 in 32
8	2	16	Negative
9	2	29	1 in 16
10	4	46	1 in 8
11	2	56	Negative
12	1	10	"
13	1	21	"
14	2	13	"
15	0	0	1 in 16
16	2	33	Negative
17	2	21	"
18	1	13	"
19	2	28	1 in 4
20	1	24	Negative
21	1	23	"
22	1	26	1 in 4
23	2	38	Negative
24	1	28	1 in 4
25	1	16	Negative
26	1	16	"
27	1	16	"

In Cases 7, 10, and 16 a titre of 1 in 16 was obtained, and Dr. A. G. Messer suggested that absorption tests should be carried out after initially increasing the titres by altering the concentration of the sheep-cell suspension from 1% to 0.2% and substituting centrifugation for incubation. With this altered technique a titre of 1 in 128 was obtained in

each case and this was reduced by guinea-pig kidney to less than 1 in 4, showing that the antibodies were not of the type associated with infectious mononucleosis.

Although in most cases the Paul-Bunnell tests were repeated, they yielded consistently negative results. In all cases the tests were carried out when the lymphadenopathy was at its height and when one would expect the test to be positive (Tidy, 1952).

Haematology

The blood changes are analysed in Table II. Although the lymphocyte count exceeded 50% of the total white-cell count in only 10 cases, all of our patients had a maxi-

TABLE II.—Analysis of Blood Changes

Max. White-cell Count	No. of Cases	Max. % of Lymphocytes	No. of Cases
11,000—	9	30—39	8
16,000—	10	40—49	9
20,000+	8	50—59	8
		60—69	2
Max. Absolute Lymphocytes		Max. % Abnormal Lymphocytes	
4,000—	8	10—19	12
5,000—	2	20—39	8
6,000—	9	40+	7
8,000—	6		
10,000+	2		

mum total lymphocyte count of over 4,000 per c.mm. These results are comparable with those recorded in other epidemics of infectious mononucleosis.

The morphology of the abnormal lymphocytes has been well described by Downey and McKinlay (1923). The lymphocytes which we classed as abnormal had the following features: (1) Their size varied from that of a small lymphocyte to that of a monocyte; the majority were large. (2) The cytoplasm was basophilic and in most cases showed vacuolation, which often gave the cells a foamy appearance. (3) The nuclei were frequently lobulated or had other morphological abnormalities; increased staining of the nuclear chromatin was often seen. The abnormal cells which we encountered belong to Downey's classes I and II.

Discussion

While many features of our cases resemble those of infectious mononucleosis, the differences are worthy of consideration.

Evans and Robinton (1950) commented on the apparent scarcity of reports of epidemics of infectious mononucleosis. They attempted to determine the degree of infectivity of the disease by examining the 63 close contacts of five seropositive cases of the disease at a girls' college. Only one of the contacts showed any abnormal lymphocytes and none had antibodies in diagnostic titre. It is of great interest that, although 21 of the contacts had recently suffered from such conditions as sore throat, upper respiratory infection, primary atypical pneumonia, and mumps, none showed the presence of abnormal lymphocytes. Evans and Robinton concluded that these results and the inability to transmit the disease experimentally (Evans, 1947, 1950) showed that infectious mononucleosis was essentially a sporadic and not an epidemic disease.

Hoagland (1952), from a study of 56 seropositive cases, concluded that infectious mononucleosis had a restricted clinical picture and that the concept of the disease as one of protean manifestations arose from the inclusion of seronegative cases, which he did not regard as true examples of infectious mononucleosis. He surveyed the clinical picture as described in other reports where all the cases were seropositive. Thus acute abdominal pain was not a symptom of any of his cases, nor was meningitis noted. Read and Helwig (1945) recorded only three examples of meningitis out of 300 seropositive cases. None of Hoagland's patients had a rash, and Milne (1945) encountered a rash in only 3.6% of a seropositive group of patients.

It may be doubted whether it is possible in practice to classify patients in the older age groups, even under broad diagnostic headings, for it is the exception rather than the rule for elderly patients to suffer from one disease alone. There are, without doubt, patients who present a clinical picture indicative of a combination of "functional" disorder and organic dementia. Affective disturbance is often the leading symptom in cerebral arteriosclerotic dementia, and less frequently in senile dementia, and this association may not be purely due to chance as is sometimes suggested. On the other hand, the occurrence in aged patients of uncomplicated functional psychiatric illnesses in contradistinction to organic psychoses has been clearly recognized since the days of classical descriptive psychiatry, and it is not surprising that, using case records alone, it was possible to differentiate between psychoses showing predominantly either organic or functional features (Post, 1951). Similarly, Roth and Morrissey (1952) were able to point out that senile dementia and depressive psychosis occurring during the senium are two quite separate conditions.

It is contended that for practical purposes most elderly patients with psychiatric disorders can be allocated to one of the three groups given above, and that, as a result of an out-patient consultation, one of the following recommendations can be made: (1) admission to hospital for active psychiatric treatment or attendance for out-patient psychiatric treatment, or (2) home care under supervision of a general practitioner without special psychiatric treatment or admission to chronic wards of mental hospitals primarily for nursing care.

In this study the term "active psychiatric treatment" is not reserved only for those patients who received physical treatment, but also includes those for whom a planned course of psychiatric therapy designed to ameliorate the clinical condition was recommended. It has been thought desirable to include in the same treatment group both home care under supervision of the general practitioner and admission to chronic wards in mental hospitals primarily for nursing care, because these recommendations depended not only on the patient's clinical condition and its severity but also on other factors such as suitability of home accommodation, economic status, and the existence of relatives willing to undertake care of the patient. In effect, treatment recommendations have been classified into two main categories: active and other. If on follow-up these recommendations proved to have been suitable in a significantly high proportion of cases, one might be led to conclude that the diagnostic and prognostic classifications on which they were largely based were also, on the whole, correct and useful.

Method of Investigation

Since 1949 most of the patients over 60 referred to the Maudsley Hospital for consultation have been examined by one of us (F.P.), who has also been responsible for recommending their treatment. Patients thus referred do not form a representative sample of old people with psychiatric illnesses, as acutely disturbed patients are rarely seen in an out-patient clinic, and for this reason examples of acute toxic confusional psychosis were not encountered. Many patients were quite fit to attend the hospital, but had been a problem to their doctors for some time; the behaviour of most did not make the need for any particular type of care or treatment imperative. This study is based on 192 patients over 60 personally examined during 1949 and 1950. Table I shows their age and sex distribution.

TABLE I.—Age and Sex of Patients Included in Survey

Age	Males	Females	Total
60-64 years	27	54	81
65-69	21	43	64
70-74	10	20	30
75-79	3	12	15
80 years and over	1	1	2
Total	62	130	192

$\chi^2=0.9$; d.f.=3; $P=0.80$ when $\chi^2=1.005$.

The assessment of a patient took between 45 and 75 minutes, and usually began by obtaining information from the accompanying friend. In the examination of the patient, behaviour, mood, and thought content were noted, and a brief assessment was made of the degree of intellectual preservation, with special reference to orientation, past and recent memory, and retention. A physical examination focusing attention on neurological and cardiovascular abnormalities completed the examination. Where possible the patient's own account of the development of symptoms was obtained. The opportunity was taken for a discussion of the patient's troubles, so that even in those cases in which no positive treatment was offered the interview was useful. The co-operation received from the patients and relatives in the follow-up seems to indicate that they regarded the interview as worth while.

In allocating patients to one of the three diagnostic categories whose usefulness is under investigation, evidence

coming from the life history and development of symptoms was given prime consideration. The history of the illness and its relationship to the previous adjustment of the patient were particularly helpful diagnostic pointers. Evidence of gradual decline of the ability to deal with everyday tasks and of impairment of memory was a good indication of dementia, which was almost always confirmed on examination of the patient. On the other hand, it was held that apparent intellectual impairment evinced during the stress of examination was less reliable than the description of intellectual decline given by the informant accompanying the patient. Special inquiry was usually needed to elicit a history of fainting turns, transitory pareses, or speech disturbances; and this, even in the absence of neurological signs or patchy intellectual defects, was regarded as indicative of cerebral arteriosclerosis. In doubtful cases the occurrence of perseveration and failure in manipulating and recalling recent personal and general events were thought to provide more convincing evidence for dementia than the repetition of numbers, addresses, or test stories.

On the whole, it was found that most cases of organic dementia were sent for consultation at a time when the condition had become well established, and the diagnosis only rarely presented a real problem. By contrast, the onset in affective illnesses was as a rule much more recent, and presented a clear-cut and rapidly evolving change from the patient's previous level of adjustment. The most valuable pointers in the subject's life history were previous affective reactions or dysthymic tendencies, in the sense either of lifelong mood swings or of moroseness often associated with so-called obsessional character traits. Difficulties encountered with patients of this type of make-up when exhibiting both affective and organic mental symptoms have already been mentioned.

The differentiation of mild affective states occurring in persons with long-standing neurotic difficulties from the group of chronic psychotic, neurotic, or character disorders was problematical in a number of instances; but on the whole this last group stood out clearly in terms of biographies rather than of clinical pictures defined on examination. To what extent the "caricaturing" in old age of previously unsatisfactory and unstable personalities, as seen in this group, may mark the beginning of a dementing illness did not have to be considered during this investigation, which was concerned only with the usefulness of our three diagnostic categories for short-term prognosis and choice of treatment. Only four patients were excluded from classification: a woman with an arrested G.P.I.; a woman with a hemiplegia without psychological symptoms; a woman with a doubtful conversion hysteria, denying previous neurosis; and a man with an advanced cerebral tumour.

Unless the patient had been kept under observation, a letter was sent after the lapse of at least one year to the relative who had accompanied the patient or, if he had originally come alone, to the patient himself asking for information in general terms. In the rare instances in which this letter remained unanswered, the family doctor or the hospital to which the patient had been recommended was approached, and in this way failure to elicit information occurred in only 14 of 192 cases. Though in a number of instances the patients were followed over longer periods, for the purposes of this study their status has been recorded as between 12 and 18 months after the first consultation. A postal follow-up was regarded as reliable enough to discover whether the patient was still alive, at home, or in hospital. No analysis has been made of the descriptive statements concerning the subject's mental state; these qualitative accounts are briefly considered later.

Assessment of Results

Among the patients examined there was a marked preponderance of affective disorders. There was only one hypomanic man in this group, which otherwise ranged from severely agitated, deluded, and perplexed patients to mildly anxious and dejected people, and which also included

patients with some paranoid symptoms. Recent development of the disorder, either for the first time or, more often, in repetition of similar attacks throughout life or late maturity, was common to all in this group. Most patients had illnesses of moderate severity, retaining "insight" and a wish for help, and it is not surprising that this group should preponderate at an out-patient clinic. There were 46 patients with organic psychoses of old age. Finally, 33 others were regarded as long-standing cases of psychoses (mainly paranoid schizophrenia), neurosis—for example, chronic obsessional states and various types of hysteria—and character disorders—for example, paranoid personalities.

Recommendation of long-term institutional care had to be made in only 11 cases, including nine with advanced senile dementia. Seventy-five patients were referred back to their doctors with advice for future management. Some of them were seen on two or three occasions, and assistance was given by the psychiatric social worker in many instances. Active psychiatric treatment was recommended in 102 cases. In-patient treatment was advised for 95 of these, and most patients were admitted on a voluntary basis to the Bethlem Royal Hospital or to the regional mental hospital; there were only six refusals. Regular out-patient attendance for social and psychological treatment was advised in only seven cases. This unsatisfactory state of affairs was partly owing to the fact that at the time the geriatric service of this hospital was still in the process of gradual development. At present, much larger numbers of patients are given out-patient supervision, but, even so, in a considerable proportion admission to hospital has to be recommended ultimately, possibly because there is reluctance among general practitioners to send old people to a psychiatrist unless they feel admission should be considered. Mildly deteriorated, anxious, depressed, and lonely old persons who made up 11.2% of the random sample of the aged population examined in Sheldon's (1948) field study are only rarely seen in the psychiatric out-patient clinic.

In determining the utility of this diagnostic classification two main issues arise: (1) Does the diagnostic classification help to decide the appropriate treatment? (2) Are the results of treatment in accordance with the clinician's expectations? It must be stressed here with regard to the first question that we do not expect a diagnostic classification to fix automatically the appropriate treatment. It can do no more than help the clinician in his decision. There are some patients who are not easy to classify into the three categories used here because they show features of more than one diagnostic category. These patients have been arbitrarily assigned to one or other category and may require different treatment from that given to others in the same diagnostic group.

If it is not possible in elderly patients to differentiate clearly between diverse diagnoses, and if their treatment recommendations are based on other criteria, we should expect to find equivalent proportions of patients receiving the various treatments in each of our diagnostic groups. Table II shows the treatment recommendations by psychiatric diagnosis.

TABLE II.—Treatment Recommendations by Psychiatric Diagnosis

Disorder	Active Psychiatric Treatment	Other Treatment	Total
Recent affective	85	24	109
Long-standing	7	26	33
Organic	10	36	46
Total	102	86	188

$\chi^2=56$; $P<0.0001$.

tric diagnosis. There are obvious differences with respect to treatment between diagnostic groups and these are too large to be due to chance ($\chi^2=56$, $P<0.0001$). It may be argued that age might have been a determining factor in recommending treatment. Table III shows recommendations by age; the proportions of patients receiving active

TABLE III.—Treatment Recommendations by Age

Age	Active Psychiatric Treatment	Other Treatment	Total
60-64 years	42	37	79
65-69	33	30	63
70 years and over	27	19	46
Total	102	86	188

$\chi^2=0.9$; $P=0.3$.

treatment in each of the age groups are similar ($\chi^2=0.9$, $P=0.30$). There seems reason to believe, therefore, that the diagnostic classification did determine on broad lines the type of treatment recommended. Thus for affective disorders of recent onset we find that the predominant recommendation is active treatment; for each of the other diagnostic categories the most frequent recommendation is reference back to general practitioner or institutional care. As stated earlier, in each diagnostic group there were some patients who showed atypical features. If the grouping of the cases by diagnosis gives positive guidance on treatment recommendation to the clinician we should expect to find that the typical case in each diagnostic group receives the typical treatment—for example, active treatment for affectives—and, *mutatis mutandis*, atypical cases receive atypical treatment. Table IV shows for each group the treatment recommendations for the typical and atypical cases. The differences are significant (in each case P is less than 0.02) and thus support this contention.

TABLE IV.—Treatment Recommendations by Psychiatric Diagnosis

Treatment Recommendation	Psychiatric Disorder					
	Acute Affective		Long-standing Psychotic, Neurotic, or Personality		Organic	
	Typ.	Atyp.	Typ.	Atyp.	Typ.	Atyp.
Active psychiatric treatment	76	9	2	5	2	8
Other treatment	15	9	22	4	31	5
χ^2 using Yates's correction. Probability (P)	9.836 0.01 > P > 0.001		5.544 0.02 > P > 0.01		12.92 0.001 > P > 0.0001	

To test the validity of the advice given at consultations, and, indirectly, the usefulness of the diagnostic categories on which it was based, each case was scored either as *recommendation successful* when the outcome after one year was in accordance with expectation, or *recommendation unsuccessful* when this was not so. All patients whose follow-up has been unsuccessful were classed as failures, as were all who had been recommended for active treatment but who had remained in hospital continuously throughout the follow-up period. Admissions to hospital or institution in all cases in which supervision by the general practitioner had been advised were scored as failures. Deaths were scored as indicating faulty disposal when they were unexpected in the sense of being intimately associated with the psychiatric illness whose nature or severity had not been correctly assessed—for example, suicide in a patient returned home, or death from cerebral thrombosis in a person diagnosed as suffering from a recurrent depressive psychosis. Cases of affective illness which responded to active treatment but had to be readmitted during the follow-up period were counted as successful predictions in view of the well-recognized tendency of affective illnesses to recur.

The next problem is to see whether the patient's response to treatment was in accordance with the clinician's expectations. If classification by diagnosis aids the clinician to make an appropriate treatment recommendation, then we should expect to find that, on the whole, typical cases responded in accordance with expectation and that the outcome of atypical cases was more difficult to predict. In all, there were 148 cases which were so clear-cut as to be

easily classifiable into the three diagnostic groups used. Of these the clinician was able to predict correctly in 83%. The remaining 40 cases, which although assigned to one of the three groups showed symptoms of one or two of the other categories, had an accurate prediction rate of only 52.5%. This difference is highly significant ($\chi^2=16.5$, $P<0.0001$).

The outcome (Table V) was successfully predicted in 83% of the affective disorders, and it was found easier to predict the outcome of typical rather than atypical cases, for the success rates (proportion of successes to all cases) were 88% and 55% for typical and atypical cases respectively; this difference is highly significant, as the likelihood of obtaining

TABLE V.—Result of Predictions by Psychiatric Diagnosis

Result of Prediction	Psychiatric Diagnosis					
	Acute Affective		Long-standing Psychotic, Neurotic, or Personality		Organic	
	Typ.	Atyp.	Typ.	Atyp.	Typ.	Atyp.
Successful	80	10	18	5	25	6
Failed	11	8	6	4	8	7
χ^2 using Yates's correction. Probability (P)	7.987 0.01 > P > 0.001		1 P > 0.30		2.6 P > 0.10	

so large a difference by chance is less than 1 in 100. In the long-standing disorders the overall success rate was 70%, with 75% in the typical and 55% in the atypical cases. For all organic psychoses the success rate was 67%, with rates of 76% and 46% for typical and atypical cases respectively. These differences are not large enough to be considered due to other than to chance. If we compare the success rates for typical cases only in each of the three diagnostic groups—that is, 88% for affectives, 75% for the long-standing, and 67% for the organic—the differences are not significantly large. The outcome of recommendations in 69 out of 76 (91%) typical affectives receiving active treatment, and in 17 out of 22 (77%) typical long-standing cases, and in 24 out of 31 (77%) typical organic cases receiving other treatment were successfully predicted. On the other hand, in only five out of nine (55%) of atypical affectives receiving active treatment were successful predictions achieved. The difference between results in typical and atypical affectives is statistically significant (χ^2 , using Yates's correction, =5.5; $P=0.02$). Thus it would seem that when a diagnosis of typical affective disorder is made the outcome of treatment can be predicted with good likelihood of success. The numbers of atypical cases in the other two diagnostic groups are very small, but similar results are obtained—that is, in atypical long-standing cases receiving other treatment only one out of four successes was obtained, and one success out of five atypical organic cases receiving other treatment was achieved.

Additional support for the claim that most patients were assessed correctly at the out-patient consultation is provided by a comparison of the death rates. During the follow-up period 12 of the 30 senile demented and 3 of the 16 cerebral arteriosclerotics had died—that is, 1 in 3 of the patients classified as afflicted with one of the old age organic psychoses, or 1 in 2½ if the two patients who could not be traced are presumed dead. By contrast, only 2 of the 33 people with long-standing personality disorders had died (1 in 17, or on the unjustified assumption that all 5 whose follow-up had failed were dead, 1 in 4½). Finally, of the 109 patients with affective disorders only 7 were known to have died—1 in 15; or, if all 7 failed follow-up cases are assumed to have died, 1 in 8. As the age distributions for the three diagnostic groups are different the mortality rates should be age-standardized. This is hardly meaningful for the small numbers involved, but in each age group the mortality rates are higher for the organic disorders than for the other two groups (Table VI).

TABLE VI.—Deaths by Age Group and Psychiatric Diagnosis

Diagnosis	60-64 Years	65-69 Years	70+ Years	Total
Affective disorders: No. of patients	46	42	21	109
" " deaths	3 (6.5%)	4 (9.5%)	0	7 (6.4%)
Long-standing neurotic, psychotic, and personality disorders: No. of patients	20	8	5	33
" " deaths	0	1 (12.5%)	1 (20%)	2 (6.1%)
Organic disorders: No. of patients	13	13	20	46
" " deaths	1 (7.7%)	4 (30.8%)	10 (50%)	15 (32.6%)

Our follow-up method is not reliable enough to allow qualitative assessment of the patients' state of health, but a brief examination of adequate statements given in 144 surviving cases demonstrates for each diagnostic category a pattern in accordance with expectation. Of the surviving organic patients only 3 were reported to be much improved (this includes 2 arteriosclerotics), 12 were unchanged, and 13 had become more severely demented. Twenty of the people with long-standing disorders were unchanged, only 3 had grown worse, and 3 were claimed to have improved in mental health. The mental health of the patients with affective disorders had definitely deteriorated in only 6; 52 were described as free from symptoms, and 32 either had not recovered at all or had shown frequent recurrences without a downward trend having become apparent.

Conclusions

An evaluation of our follow-up results would be incomplete without recording some of the errors of clinical judgment which were brought to light. One patient committed suicide and another one attempted it while awaiting admission as voluntary patients, and a suicidal attempt by a patient diagnosed as suffering from a mild depressive reaction in a setting of arteriosclerotic dementia and recommended for continued home care must also be recorded. A chronic drug addict died of accidental poisoning and ought to have been placed under supervision. Less serious mistakes, though more humiliating for the prognostician, were (1) the man diagnosed as suffering from a mild hypochondriacal depression who died four days later of a cerebral haemorrhage (post-mortem report); (2) the woman assessed as a paranoid senile dement who was described as much benefited by a prefrontal leucotomy, though still in hospital. Further errors have become evident in cases followed for more than 18 months, but long-term prognosis was not attempted in this investigation, as we know too little about the natural history of the psychiatric illnesses of old age, and in any case will never be able to predict the occurrence of external stresses which may influence their course and outcome.

While not making light of these errors of judgment, it is claimed that as a rule the correctness of the original assessment was confirmed by the subsequent course of the disorder. Patients who were classified as suffering from affective reactions or phasic mood-disorders, and who were thought likely to benefit from active psychiatric treatment, responded in the great majority of cases with recovery or at least temporary remission of symptoms. Patients categorized under the heading of long-standing personality disorders did not deteriorate into more seriously disturbed states because specialist treatment was withheld, nor did they improve very much in the few instances in which hospital admission was advised. In the organic groups some success can be claimed in picking out patients likely to respond to active hospital treatment—for example, on account of affective components—and in deciding the question whether institutional care was necessary or could be postponed without inflicting undue hardships on the patients or their families.

The results of this study seem to support the claim made initially that, even at a single out-patient consultation, clinical assessment of aged patients in terms of transitional

reactions, or long-standing personality disorders, or dementing illnesses is possible. It is useful in allowing us to concentrate our limited facilities for active treatment on the patients most likely to benefit. But classifying our patients with a view to "disposal" does not mean that we subscribe to a watertight system of disease entities, or assume that affective illness precludes insidious organic dementia. The fact that active treatment was advised in 17 patients belonging to groups thought to be therapeutically unrewarding indicates that we have not been using our three types rigidly, but merely as points of orientation. To an increasing extent we are attempting to treat elderly patients as out-patients whenever possible. Apart from the obvious advantages, this furnishes us in doubtful cases with a period of observation during which to assess the relative importance in the individual patient of irreversible dementia, lifelong or long-standing personality disorder, or of affective, and thus mostly reversible, reaction.

Summary

Of 192 patients over 60 attending consecutively for psychiatric consultation at an out-patient clinic, 188 were allocated to one of three clinical groups: (a) organic psychoses of old age; (b) long-standing neurotic, psychotic, or character disorders; and (c) affective illnesses of recent onset. Corresponding recommendations for their treatment were made.

The status of the patients 12-18 months later demonstrated that these categories had been useful pointers towards making prognostic assessments and recommendations for treatment.

The assumption was supported that affective illnesses in aged patients show a favourable immediate response to active treatment.

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PREMATURE DELIVERY IN HAEMOLYTIC DISEASE OF THE NEWBORN

BY

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Premature delivery of the baby with haemolytic disease of the newborn has been widely condemned (Allen, Diamond, and Vaughan, 1950; Mollison and Walker, 1952; Bourne and Williams, 1953) because the premature baby with haemolytic disease is less likely to survive and more likely to develop kernicterus than is the full-term baby. However, in our experience, individual cases do arise in which there are definite clinical indications for premature delivery of the baby. This is exemplified in the following case.

Case Report

A married woman aged 33 attended Solihull Hospital in August, 1951, and gave the following obstetric history. Her first pregnancy, in 1939, ended in a stillbirth at 28 weeks

gestation; her second pregnancy, in 1941, ended in an abortion at 24 weeks; her third pregnancy, in 1943, ended in a stillbirth at 38 weeks gestation (at this time she had a blood transfusion, but the full details are not available, and, of course, this was before the days of routine rhesus grouping); her fourth pregnancy, in 1945, ended in a stillbirth (spina bifida) at 36 weeks; and her fifth pregnancy, in 1950, ended in a stillbirth at 36 weeks; there was an associated mild toxæmia, and antirhesus antibodies were found early in this pregnancy. Her last menstrual period was April 3, 1951. She was blood group A Rh-negative (cde/cde), and blocking antirhesus antibodies were present in the serum. The husband belonged to blood group O Rh-positive; the most likely genotype being CDE/cDE.

The pregnancy continued normally, and serological examination showed virtually no change in the antibody titre. At the thirty-third week of pregnancy she described a reduction in the frequency and strength of the foetal movements. She stated: "The baby moves as if it is tired." When questioned further she said that the other babies had behaved similarly prior to the intrauterine death of the foetus. It was therefore thought that unless the baby was delivered within a short time it would die *in utero* like its predecessors, and that nothing more would have been achieved than in the previous pregnancies. The spur to action was the symptom of diminishing foetal movements.

Accordingly, on November 27, lower segment caesarean section was performed, and a living male child weighing 4 lb. 6 oz. (2 kg.) was delivered. It was noticeably pale at birth, and the findings on examination of the cord blood were: Group O Rh-positive; genotype cDE/cde; haemoglobin, 4.8 g.%; direct Coombs test positive.

A replacement transfusion was given three hours after birth and 430 ml. was exchanged (100 ml. per lb.—220 ml. per kg.). Next day the jaundice had deepened, but an attempt at a second replacement transfusion failed. At this stage the haemoglobin was 18.2 g.%. During the following month it was necessary to give three small "topping-up" blood transfusions. At 21 months the baby was normal in every respect.

In September, 1952, the mother returned to the antenatal clinic when 12 weeks pregnant. Serological examination confirmed the presence of blocking antirhesus antibodies of approximately the same titre as in the previous pregnancy, and it remained so throughout this pregnancy. At the thirty-fourth week of this pregnancy the foetal movements again diminished, and the patient was immediately admitted to hospital and caesarean section again performed. A living male child weighing 3 lb. 10 oz. (1.6 kg.) was delivered. The spleen was just palpable and the liver edge was 2 cm. below the costal margin. There was slight oedema of the legs, and jaundice developed within one hour of birth. The findings on examination of the cord blood were: Group O Rh-positive; genotype cDE/cde; haemoglobin, 6.5 g.%; direct Coombs test positive. A replacement transfusion of 600 ml. (166 ml. per lb.—365 ml. per kg.) was given four hours after delivery. Jaundice became more severe on the following day and lasted 24 days. "Topping-up" blood transfusions were given on the eighteenth and the sixtieth days. At seven months the baby was completely normal.

Discussion

It is obvious from the mother's history that she belongs to the group of women who in each pregnancy have infants severely affected by haemolytic disease of the newborn, and it seems that if a mother's first affected infant is stillborn or hydropic, subsequent infants delivered at term are unlikely to be viable (Davies, Gerrard, and Waterhouse, 1953). Our patient had had five successive stillbirths or abortions, and the outlook for further pregnancies seemed even more hopeless. We considered that the only chance of having a viable infant was by premature delivery. The serological findings, the diminishing foetal movements, and the condition of these two babies at birth indicated that premature delivery was a life-saving procedure. The indication for premature delivery

was diminishing foetal movements, and caesarean section was thought to be the ideal method for this patient. Mollison and Walker concluded that premature delivery was contraindicated from the consideration of the mortality rates in a series of cases, "the choice of treatment being determined by random numbers" (Mollison, Mourant, and Race, 1952). We feel that each case should be treated individually according to its clinical merits.

In view of this case, it would seem that there is still a place for premature delivery of the infant in cases of haemolytic disease of the newborn. The indication for such treatment would be a patient with a history of two or more stillbirths, whose husband is homozygous, Rh-positive. We suggest that diminution of foetal movements is a symptom of importance, that it requires the case to be treated as an emergency, and that premature delivery should be carried out in a hospital equipped both for replacement transfusion and for the care of premature babies. It also demands the daily supervision of the patient in the last weeks of pregnancy, especially in cases that show by the pattern of their history that they are liable to produce severely affected infants. Mollison and Walker showed that "the total death rate in the 'induced' group is higher than in the group allowed to go to spontaneous delivery." However, in our experience premature delivery can produce a live birth instead of a stillbirth; and, even though the baby is premature, kernicterus can usually be prevented by one or more adequate replacement transfusions. In the group of severely affected cases of haemolytic disease of the newborn there is the opportunity of rearing a normal living child by premature delivery, and to achieve this the complete co-operation of the obstetrician and paediatrician is essential.

Summary

A case of rhesus iso-immunization of severe type is described.

After several stillbirths, two living babies were delivered prematurely by caesarean section.

The symptom of diminution of foetal movements in two severely affected babies is described.

This symptom is an indication for premature delivery of the foetus in order to prevent another stillbirth and in the order to give a possibility of survival.

With the close co-operation of the obstetrician and paediatrician this can be achieved.

We acknowledge the help given by Dr. W. Weiner, of the Birmingham Regional Blood Transfusion Service, and the medical and nursing staffs of Solihull and Sorrento Hospitals, who so willingly assisted in the care of this patient and her babies.

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Last July the Standing Conference of Societies Registered for Adoption held a conference at Roehampton, a report of which is now available. Papers were read and discussed on co-operation between adoption societies and local authorities, co-operation in case work, the point of view of the natural mother, heredity as it concerns adoption, and difficult placement. Discussion centred on legislation that is required to prevent the private placing of children for adoption (even by the children's own mothers), the complex factors entering into any estimate of heredity, the placing of older and handicapped children, and a plea for greater confidence in placing children in good adoptive homes even though their social background is poor. The report is obtainable from the honorary secretary, Gort Lodge, Petersham, Surrey, price 5s.

INCARCERATED AND STRANGULATED INGUINAL HERNIA IN THE FIRST YEAR OF LIFE

REPORT ON 45 CASES

BY

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The incidence of strangulated hernia in the first year of life is variously reported by different authors, perhaps owing to the lack of uniformity in the definition of "strangulation." It is usually considered that an incarcerated hernia is an irreducible hernia in which there is obstruction to the passage of intestinal contents, and that a strangulated hernia is an irreducible hernia in which there is interference with the blood supply of the bowel, irrespective of whether or not the gut is viable. If, therefore, in any series, only those cases are recorded in which the gut is strangulated, the incidence is obviously lower than if incarcerated hernias are also included. But, clinically, incarceration can prove as dangerous as strangulation, and, in fact, in three out of five fatal cases in the present series no strangulation was present.

Incidence

The incidence of strangulation in inguinal hernia in infancy varies from the statement by Stammers (1951) that "in a long experience of children's surgery I have never seen a strangulated irreducible inguinal hernia" to those of Potts *et al.* (1950), who say that 19% of their series were incarcerated. Thorndike and Ferguson (1938), in a series of 1,740 herniorrhaphies in children, found "strangulation" in 106, of which 45 occurred in the first year of life—"true strangulation," however, was present in only five cases.

According to Potts *et al.* 70% of all congenital inguinal hernias occur on the right side. Strangulated inguinal hernia is also much more common on the right side, Thorndike and Ferguson reporting an incidence of 80% in children up to 12 years of age.

The sex incidence is even more striking. Uncomplicated inguinal hernia is nine times more common in male than in female infants (Herzfeld, 1938), while strangulation was reported by Thorndike and Ferguson to occur in 25 males to every one female. When strangulation does occur in the female, the Fallopian tube and ovary are often found in the sac.

The age incidence of strangulation is remarkably constant, the greatest number of cases up to the age of 12 years being found in the first year of life, and most of these occur in the first three months; about 50% of Thorndike and Ferguson's 45 cases were under 3 months of age.

Presentation of Cases

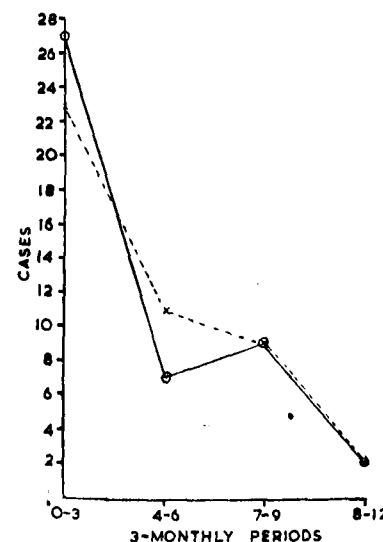
The present series comprises 45 infants under 1 year of age: 43 were treated in the United Cardiff Hospitals during the past six years, one was seen at St. David's Hospital, Cardiff, and one at the East Glamorgan Hospital, Church Village. Fifteen of the children were seen personally by one or other of us.

The sex ratio was similar to previous series; only once did the condition occur in a girl; in this case the hernial

sac contained the right ovary. In all but three cases the offending hernia was on the right side, although in four cases a left inguinal hernia which could easily be reduced was present. In one of the left-sided cases a right-sided hernia was also found, but this was reduced by taxis. The age incidence is given in Table I.

Age in Months	No. of Cases	Age in Months	No. of Cases
0-1	11	6-7	6
1-2	12	7-8	2
2-3	4	8-9	1
3-4	3	9-10	0
4-5	1	10-11	1
5-6	3	11-12	1

In the accompanying graph the age incidence is arranged so as to be comparable with the figures given by Thorndike and Ferguson. The cases in our series may be divided into two groups.



Showing age incidence of the 45 cases of the present series (O—O—O) compared with the 45 cases of Thorndike and Ferguson (X—X—X).

Group 1

This group consisted of infants who presented with signs and symptoms of intestinal obstruction—vomiting, abdominal pain and distension, and constipation or sometimes the passage of blood-stained mucus. There were 29 children in this group. Most of them were under 2½ months old, and the hernia had sometimes been present for only a few hours before the onset of the obstructive symptoms.

Indeed, in about one-third of the cases the symptoms started before the hernia appeared. This often led to difficulty and delay in diagnosis. Table II shows the various diagnoses with which the children in Group 1 were sent into hospital.

TABLE II.—Diagnoses on Admission to Hospital of Children in Group 1

Diagnosis	No. of Cases
Strangulated or irreducible hernia	22
Diarrhoea and vomiting	2
Vomiting, ? cause	2
Intestinal obstruction	2
Pyloric stenosis	1
	29

It is possible that the hernia was sometimes missed because it was not searched for. Babies tend to have a roll of fat in the groins, and an inguinal hernia is quite small and easily overlooked, as the following case illustrates.

Case 6.—A 14-day-old baby, birth weight 6½ lb. (3.1 kg.), was admitted to hospital with a diagnosis of gastro-enteritis. He had been well until two days before admission, when he started to vomit his feeds and have screaming attacks in which he drew up his legs. The vomit soon became blood-stained. He was constipated at first, but just before admission passed two pink liquid stools. On examination (J. R.-S.), he was seen to be a moribund dehydrated baby, vomiting foul yellow fluid. His abdomen was very distended, but no hernia was noticed. When seen by a surgeon (Mr. Foster) about half an hour later, a right inguinal hernia was observed which reduced quite easily. Despite this the child died within a few hours. At necropsy the peritoneal cavity contained 2-3 oz. (57-85 ml.) of sero-sanguineous fluid. A Meckel diverticulum ½ in. (1.3 cm.) long was present which was normal, but the adjoining gut was covered with petechial haemorrhages and had probably been contained in the hernial sac.

All the five deaths (18% of Group 1) in this series occurred in Group 1. Brief details of these are given.

Case 11.—A premature twin boy, birth weight 3 lb. 1 oz. (1.6 kg.), was admitted when 10 weeks old with a history of three days' vomiting, constipation, and abdominal distension. He had had bilateral inguinal hernia for three weeks. The child was so ill that a blind ileostomy was performed, but seven days later he suddenly died. At necropsy the bowel was found to be loosely obstructed in a right inguinal hernia.

Case 16.—A 4-months-old boy was admitted with a history of vomiting, constipation, and a lump in the right groin for two days. The child was very ill, and at operation the gut in the hernial sac was found to be gangrenous, and was resected. The child died a month later from an abscess at the site of the gut resection.

Case 17.—A 2-weeks-old boy, birth weight 5½ lb. (2.5 kg.), was admitted with a history of two days' vomiting and constipation. A small right inguinal hernia was noticed; this was reduced, but as the child's condition did not improve a laparotomy was performed. This revealed an annual constriction at the terminal ileum, caused by the hernia, but no obstruction was then present. The child died four days later. Necropsy revealed a generalized peritonitis.

Case 27.—A 5-weeks-old boy was admitted with a history of vomiting for three days. His stools had been a mixture of blood and mucus and his abdomen was distended. Apparently no hernia was noticed, but at laparotomy a loop of gut was found to be entering the right hernial orifice. It was thought that the baby also had a volvulus. He died eight days later, and at necropsy gangrenous areas of small gut were found and a volvulus was still present.

In this series successful gut resection was performed only once, and this was on a child in Group 1.

Group 2

Group 2 consisted of 16 children with an irreducible hernia, without obstruction or with only minimal symptoms of obstruction. The babies were all over 2 months old, and the hernia had in almost every instance been noticed previously. There were no deaths in this group.

Discussion

To facilitate comparison the total number of patients with intussusception under 1 year of age operated on in the United Cardiff Hospitals during the comparable six-years period was computed. These amounted to 67, of whom only five were under 3 months of age. Apart, therefore, from congenital abnormalities of the intestine, which are usually manifested within the first week of life, strangulated hernia is the commonest cause of intestinal obstruction under 3 months. Pyloric stenosis should not be confused with it, as the onset is less abrupt, abdominal distension is confined to the upper abdomen, and a pyloric tumour is always palpable. The only other cause of intestinal obstruction in this age group is acute infantile Hirschsprung's disease—again a condition which is almost confined to boys. This rare disease can present as intestinal obstruction, with vomiting, constipation, and gross abdominal distension. After rectal examination there is often a dramatic improvement with the passage of quantities of wind, the abdomen deflating visibly. The diagnosis may be confirmed by a barium enema.

If a hernia is not easily reducible the child should be given chloral, the foot of the cot elevated, and a cold pack placed on the hernia. It is probably justifiable to persevere with these measures for three hours. At the end of this time, or as soon as a severely ill baby has been resuscitated, operative reduction of the hernia should be performed.

Summary

Forty-five cases of incarcerated inguinal hernia under 1 year of age have been studied; of these 44 were in boys, and 42 were on the right side.

The cases have been divided into two groups: Group 1, presenting with symptoms of intestinal obstruction, comprised mainly the younger babies, in whom often

no hernia had been noticed before. There were 29 babies in this group and 18% of these died.

Group 2 consisted mainly of older babies in whom an easily reducible hernia had been observed previously, but in whom the hernia had suddenly become irreducible; obstructive symptoms were minimal. There were 16 babies in this group and no deaths.

It has been shown that, in the age group 1 week to 3 months, strangulated inguinal hernia is the commonest, almost the only, cause of intestinal obstruction.

Owing to the ease with which an inguinal hernia can be missed in a baby, it is essential that the inguinal region should be carefully examined in every infant presenting with symptoms of acute intestinal obstruction.

We wish to express our thanks to the surgeons of the United Cardiff Hospitals for permission to use the notes of cases under their care, and to Professor A. G. Watkins for his criticism and advice.

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CHANGES IN DENTAL HYPOPLASIA AND CARIES AMONG THE CHILDREN OF FINNISH LAPPS, 1939-50

BY

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AND

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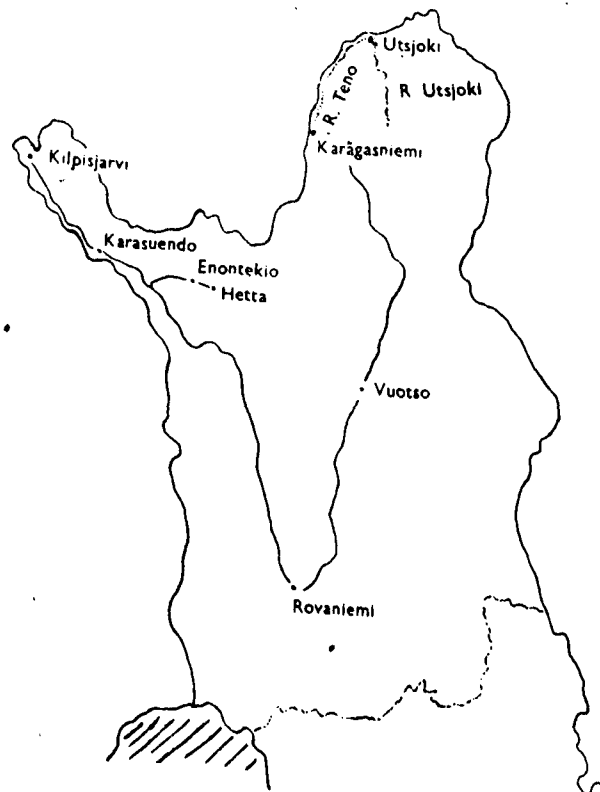
(From St. Thomas's Hospital Medical School)

In 1939 a small survey of Finnish Lapps was made in order to discover the state of dental health among children living a semi-nomadic existence far from civilization (H. Mellanby, 1940). Since that time Europe had been at war for six years and for seven more has enjoyed a precarious peace. It was thought that these disturbed living conditions might be reflected among other ways in alterations in the structure of the children's teeth and their susceptibility to decay. For this reason the present survey was undertaken during the summer of 1950.

Most of the children examined belonged, as before, to the Inari Lapps, but a few families of nomadic Fell Lapps were also inspected. Since the ceding to Russia in 1944 of the Petsamo area in the far north of Finland, the Skoltje Lapps have ceased to exist as a separate entity. Some have become Russian subjects, while others are scattered throughout the rest of Finnish Lapland. The Fell Lapps inhabit the Enontekio and Kilpisjärvi districts, sandwiched between Sweden and Norway (see Map). In this area a walk was made from Hetta northwards to the Norwegian border in the company of the local postman, three "summer villages" being visited. A few more children were seen in schools at Karasuendo, on the Finno-Swedish border, the total number of Fell Lapps inspected being ten. Ninety-two Inari Lapps were seen in Vuotso and in Lapp huts scattered along the length of the Utsjoki river and the Finnish bank of the Teno river from Utsjoki to Karagasniemi.

Methods

Only the deciduous teeth of pure Lapp children between the ages of 2 and 14 years were examined, a distinction being made between pure Lapps and half-castes. Some of these half-castes were Finno-Lapps (whose numbers are steadily increasing as the Lapp population becomes less isolated), but



FINNISH LAPLAND, 1950

the majority were German-Lapps, a permanent reminder of the German occupation between 1941 and 1944.

Each mouth was inspected with an illuminated mirror and a standard probe. The structure of the teeth was estimated by the method described by M. Mellanby (1927a, 1927b, 1934), the grades of M-hypoplasia being judged by rubbing a sharp pointed probe over the labial surface of the teeth. The extent of caries in each tooth was also judged by the same method as that used by Mellanby (1934), the Dental Disease Committee (1936), and Mellanby and Mellanby (1948), being estimated as caries 0, 1, 2, or 3 according to the size of the cavity. To obtain average hypoplasia and caries figures the total hypoplasia and caries figures for each group were added up separately and divided by the number of teeth examined for structure and caries. This gave the average hypoplasia figure (A.H.F.) and average caries figure (A.C.F.). A measurement of the extent of healing caries was not attempted.

Results

The results are compared throughout with those obtained in the 1939 investigation by Dr. Helen Mellanby.

Structure of Inari Lapp Children's Teeth.—When the structure of the deciduous teeth of these Inari Lapp children is compared with that found in 1939 (Table I), there is seen to be a slight increase in the A.H.F. The considerable deterioration in structure of the complex teeth (molars) since 1939 has been incompletely counterbalanced by the improvement found in the incisors and canines. However, further analysis of the results into various age groups, as set out in Table II, shows that this general picture is erroneously simple. While the A.H.F. of the 2-5-years age group was slightly below the 1939 total average of 1.09, that of the 6-9-year-olds was higher. There were too few children

TABLE I.—Structure of Teeth of Inari Lapp Children Aged 2-14 Years

	Total No. of Teeth Examined		M-Hy ₀		M-Hy ₁		M-Hy ₂		M-Hy ₃		% Gross		A.H.F.	
	1939	1950	1939	1950	1939	1950	1939	1950	1939	1950	1939	1950	1939	1950
Incisors and canines	216	736	32.4	45.5	54.0	38.9	12.9	12.5	0.4	2.0	—	1.1	0.81	0.70
Molars	221	641	15.4	5.6	40.2	33.2	38.5	44.3	5.8	13.1	—	3.4	1.35	1.67
Total	437	1,377	23.7	27.0	47.3	36.2	25.8	27.3	3.1	7.3	—	2.2	1.09	1.13

Teeth with gross hypoplasia for 1950 are included in the percentages, but are excluded from the calculations of the A.H.F.

TABLE II.—Average Hypoplasia Figure for Teeth of Inari Lapps, 1950, Arranged in Age Groups

	2-5 Years	6-9 Years	2-14 Years
No. of children	48	23	92
Incisors and canines	0.59	0.98	0.70
Molars	1.63	1.81	1.67
All teeth	0.97	1.39	1.13

between 10 and 14 years with teeth whose hypoplasia could be assessed to obtain representative figures for this age group.

Caries in Inari Lapp Children's Teeth.—The incidence and extent of caries in the different age groups of Inari Lapps are set out in Table III. Of the 92 children studied, only 6

TABLE III.—Incidence and Extent of Caries in Deciduous Teeth of Inari Lapp Children

Age Group	No. of Teeth Examined		% Carious		A.C.F.	
	1939	1950	1939	1950	1939	1950
2-5 years	208	843	24.0	22.9	0.39	0.36
6-9 "	313	452	68.3	42.8	1.57	0.85
10-14 "	(57)	(66)	(43.9)	(57.6)	(0.92)	(1.07)
Total	578	1,361	50.0	30.9	1.15	0.55

were caries-free. Nevertheless, this is an increase on the number reported by H. Mellanby—namely, 3 out of 70. When the total number of teeth is considered comparison shows that the incidence and extent of caries have sharply decreased over the intervening years. This change has occurred almost entirely in the 6-9-years age group.

Relationship Between Structure and Caries.—Table IV shows that teeth with good structure—namely, those with no surface hypoplasia—are less liable to be attacked successfully by the carious process than those showing M-hypoplasia. This relationship has been demonstrated in all previous surveys using M-hypoplasia standards (notably M. Mellanby, 1923, 1934; Mellanby and Coumoulos, 1946; Mellanby and Mellanby, 1948, 1950, 1951; King, 1940). Furthermore, from a comparison with the 1939 figures it will be seen that the percentage of hypoplastic teeth which are carious is significantly lower in 1950 than in 1939.

Teeth of Fell Lapp Children from Enontekio.—Although only 10 children in the Enontekio area were inspected (owing to the great difficulty in reaching the nomadic families) and eight of these were between the ages of 8 and 11 years, the difference between the teeth seen in this group and those of the settled Lapps was so pronounced that the figures seem worth mentioning: 81% of the deciduous teeth were decayed, as compared with 46% in the same age group (8-11 years) of the Inari Lapps.

TABLE IV.—Percentage of Caries in Normal and Hypoplastic Deciduous Teeth of Inari Lapp Children

	Teeth with No Hypoplasia		Teeth with 1-3 Hypoplasia*	
	No.	% Carious	No.	% Carious
Simple, 1939	79	7.6	170	24.7
" 1950	335	3.3	393	11.5
Complex, 1939	40	52.5	203	70.9
" 1950	37	(43.2)	582	53.9
Total, 1939	119	22.7	373	49.9
" 1950	372	7.3	975	36.4

* Teeth with gross hypoplasia have been excluded from this and other tables dealing with structure.

Discussion

The chief finding of this survey is the decrease of caries incidence amongst the 6-9-year-old Inari Lapps, although the structure of their teeth, as judged by surface hypoplasia, is worse than just before the war. As diet is believed to be largely responsible for determining the structure of the teeth (Mellanby, 1934; Mellanby and Coumoulos, 1947), and also to influence the rate and extent of dental decay, the changes of food habits among these Lapps during and after the war have been investigated.

Dr. H. Mellanby (1940) found that the staple foods among the Inari Lapps in 1939 were reindeer meat, dried fish, potatoes, rye bread, and margarine. The universal drink was coffee liberally sweetened with sugar. Two noteworthy points are that almost all the salmon was at that time sold to the tourist hotels and that very little fresh fruit was eaten.

Although the Russo-Finnish war of 1939 did not appreciably alter the food habits of the Inari Lapps, throughout the second war (1941-4) and the German occupation, in the final stages of which 200,000 well-paid German troops were present in Finnish Lapland, much more "European food" was imported. Moreover, during this period the Lapps enjoyed an economic boom, working for the Germans and supplying them with meat and fish. So during the years 1941-4 the Lapps lived on a diet containing more cereals, sugar, and potatoes than in 1939 but much less meat and fish. In view of this it seems probable that the calcifying power of their diet at this time was low. However, in 1944, as one condition of the Finnish peace treaty with the Russians, the Germans were driven from North Finland. As the Germans retreated they employed a scorched-earth policy. In order to escape some of the consequences of this action the Inari and Utsjoki Lapps were evacuated to Kalajoki in central Finland, while many of the Enontekio Lapps moved over into Sweden. In the Kalajoki community the Lapps existed on a subsistence diet, and diseases such as typhoid were rampant, whereas in Sweden and Enontekio Lapps were well housed and fed. When they returned to their own country in mid-1945 almost all the buildings had been burnt or blown up (we saw only one house left standing since 1939) and living conditions were extremely crude for the next two or three years. During this time the Lapps lived largely on fish and meat, and food supplied by various philanthropic organizations.

Since 1948 the diet has gradually been reverting to the 1939 pattern. The main differences to-day are that less fish is sold to tourists, and that the Lapps seem more conscious of the value of eating fresh fruit. In addition, expectant mothers through Finnish Lapland are now visited by the district nurses and considerable prenatal care is exercised.

Although representative figures were not obtained, the teeth of the 10-14-year-old children might be expected to show a similar structure to those inspected in 1939, these teeth having been formed between 1936 and 1940. The period of formation of those aged 6-9 years coincided with the German occupation of Lapland, and it seems possible to account for the defective structure of the teeth of the children in this age group as being due to the particularly low calcifying power of the diet at this time. The children aged 2-5 years have recovered and slightly improved upon the pre-war structure, as would be consistent with a diet of higher calcifying power.

When considering factors which might be expected to influence decay it will be realized that the teeth of the oldest group have had a chequered existence since eruption. The effects of these factors have been so balanced that the caries figures are now the same as in 1939. Teeth in the youngest group, with slightly better structure, show slightly less decay than in that year. But the striking change is that the A.C.F. of children aged 6-9 is only just over half its 1939 counterpart in spite of the teeth having a worse structure. In broad terms, therefore, the post-eruptive influences since 1945 must have been less damaging than in the previous years. This can be explained either by an increased tooth resistance due to a higher post-eruptive dietary calcium intake or by a decrease in the factors favouring decay. However, if the calcifying power of the diet during this time is reflected in the tooth structure of the children under 5, the dietary calcium since 1945 has been substantially the same as before the war. Therefore it seems that the teeth of the 6-9-year-olds are less carious, not because they are more resistant, but because there are fewer external influences favouring decay. Although more meat and fish was eaten during those years the one factor in the diet which is known to have decreased is sugar. A tentative conclusion on this evidence must be that a low-sugar diet decreases the chance of caries.

With regard to the caries figures of the Enontekio and Inari Lapps it is significant that in 1945 the former moved over to Sweden, where they fed well by European standards (with plenty of sugar and vitamin-fortified margarine), while in their homes after their return they were able to trade with smugglers travelling between Norway, Finland, and Sweden who largely carry spirits, sugar, and margarine. So in addition to their vitamins A and D intake (contributed mainly by the margarine and fresh fish) being as high as, or possibly higher than, that of the Inari Lapps, their sugar consumption also was much higher. Now since the state of their teeth is so much worse than that of the Inari Lapps, they must have been subjected to factors favouring decay to a much greater extent than the Inari Lapps' teeth. In this case a high-sugar diet might be incriminated.

Summary and Conclusion

The changes found in both Fell and settled Lapps fall in line with other wartime studies and the conclusion of Toverud (1951) that "the knowledge gained through the greatest dietary experiment forced upon us strengthens the value of more natural foods and less of easily fermentable carbohydrates in the prophylaxis against dental caries."

The teeth of 92 settled and 11 nomadic Lapp children were inspected for caries and surface hypoplasia.

The state of the teeth is compared with that existing in 1939.

An attempt is made to correlate the changes found in the teeth with the alterations in diet during the intervening period.

We would like to thank Lady Mellanby for her guidance and instructions before undertaking this survey; and to express our gratitude to Dr. H. Mellanby for her help, advice, and encouragement.

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CHILDREN'S NURSING UNIT

BY

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Following on a high infant death rate in Rotherham during the winter of 1948 and early 1949, considered to be largely due to cross-infection in hospital, the health committee in March, 1949, approved a scheme for the establishment of a children's nursing unit as part of the home nursing service. It was to be at the disposal of the family doctor as a first line of defence so that a child could be nursed at home in its own environment, except when conditions were such as to make this impossible, or when special treatment necessitated removal to hospital. It was also appreciated that the value of the education of the mother in practical preventive methods and treatment during illness, with the necessary equipment, even in what might appear at first sight to be hopeless domestic conditions, would ultimately be of benefit to the community and that such action would help to reduce the pressure on hospital accommodation.

Preparations for the Scheme

Authority was given to obtain special nursing equipment, including infants' clothing, treasure cots, the necessary gowns, masks, storage cupboard, and nursing bags. Some of this equipment was given to the service, the treasure cots being presented by the Rotherham District Nursing Benevolent Association; and the children's nightgowns, coats, vests, etc., were either knitted locally or received in gift parcels from New Zealand, the remainder being purchased.

One of the Queen's Nursing Sisters on the home nursing staff undertook a postgraduate course covering children's diseases, and she was made responsible (under the direction of the home nursing superintendent) for this special service. Later on in the year, a second nurse received similar training. During 1952 both nurses undertook further hospital duty as refresher courses.

The doctors practising in the town were informed of the facilities available and the unit began to function in June, 1949. Cases are notified direct to the superintendent, usually by telephone by the general practitioners, and the special home nurse visits the home to assess whether the case is suitable and what equipment is needed. The equipment is kept in the nurses' home and special containers are packed and sterilized ready for use in infectious cases.

During the winter months cases are so numerous that the two special nurses are unable to deal with them all, and each home nurse attends the overflow cases on her district, giving a specially detailed report on all cases after each visit. Additional assistance is also given to the unit by the Queen's candidates as part of their training. The frequency of visiting depends on the child's condition; often it is necessary to pay three or four visits daily. The home nurse is in frequent consultation with the general practitioner, who is informed immediately if the child does not appear to be responding to treatment. The parents are encouraged to contact the nurses' home if they are unduly worried about their child's condition, and a nurse (usually the superintendent) pays a visit immediately. Night calls have been very few, and it is felt that the assurance of a visit from the nurse at any time removes a good deal of the parents' anxiety.

Equipment

Details of the equipment now used by the unit are as follows: 4 treasure cots; 1 dozen sheets; 2 pillows; 3 enamel pails; 6 wash basins; 6 enamel trays, 6 by 4 in.

(15 by 10 cm.); 6 "stay bright" measures, 1 pint; 6 receivers and 6 gallipots; thermometers; rubber gloves; masks; gowns; nightgowns and vests, 1 dozen of each (to be loaned out); 1 dozen towels (to be loaned out); nightgowns and vests to be given away (these are gifts from the Women's Voluntary Organizations in Australia and New Zealand). All new garments are made specially for us.

The special tins for use in infectious cases, such as measles, scarlet fever, ophthalmia neonatorum, and pemphigus, contain all the necessary equipment for nursing the child, so that the nurse's bag need not be taken into the sick-room. The tins contain: gown, mask, gloves, envelopes, message papers and chart, syringe and needles, thermometer and lotion, boric crystals, surgical spirit, powder, "dettol," undine, and pipette. Relatives usually send to the nurses' home for the cot (which folds up and is easily carried), sheets, and pail. In infectious cases the special tin is either taken by the nurse or called for by a relative of the patient.

When the child is convalescent the nurse ceases to attend and all the articles on loan are returned to the nurses' home, with the exception of clothing for small infants, which the parents are allowed to keep, much of it having been received as gifts from New Zealand and from interested local people. All returned articles and equipment which have been into the child's home, whether used or not, are soaked in 5% solution of dettol for 24 hours and then removed and boiled. The cot canvas, sheets, and towels, after being hung outside to dry, are sent to the laundry in the usual way.

Details of Work Done

This children's nursing unit, which has now been in operation for over three and a half years, has proved to be very popular with the general practitioners in the area, and is widely used by them. Table I gives details of the patients

TABLE I

	1949	1950	1951	1952
Cases nursed	435	621	508	713
Visits paid	4,151	5,870	4,150	5,837

under the age of 15 years who have been treated, and of visits paid by this unit from its beginning in 1949 up to December 31, 1952.

Details of the work of the children's unit during 1952, when 713 cases were nursed, are given in Table II.

TABLE II

	Under 1 year	1-5 years	6-15 years	Total
Brought forward at Jan. 1, 1952	1	8	1	10
New cases, 1952	225	284	194	703
Total	226	292	195	713
Result of treatment:				
Convalescent	192	276	184	652
Removed to hospital	19	4	6	29
Died	—	—	—	—
Removed or transferred	1	5	3	9
Remaining on books Dec. 31, 1952	14	7	2	23
Total	226	292	195	713
Visits paid	2,038	2,268	1,531	5,837

Table III gives details of the "infectious" cases nursed during 1952 and their disposal.

A comparison of the infant deaths occurring in 1948 with those of 1952 is given in Table IV. When considering these figures it must be pointed out that the establishment of a premature baby unit some two years ago has effected some reduction in the number of deaths from prematurity, but there has also been a most striking reduction in the number

TABLE III

	Cases	Visits	Convalescent	Hospital	Died	Removed	Remaining on books 12/12/52
Pneumonia	67	537	59	3	—	—	—
Bronchitis	119	990	109	5	—	—	—
Gastro-enteritis	6	62	6	—	—	—	—
Measles	23	197	22	—	—	—	—
Measles and pneumonia	9	76	9	—	—	—	—
Measles and bronchitis	1	1	—	—	—	—	—
Scarlet fever	1	1	1	—	—	—	—
Chicken-pox	1	7	1	—	—	—	—
Pemphigus	3	11	2	—	—	—	—
Ophthalmia neonatorum	1	12	1	—	—	—	—
Whooping-cough	5	56	5	—	—	—	—
Whooping-cough and pneumonia	1	3	—	—	—	—	—
Polio-myelitis	1	3	—	—	—	—	—
Totals	238	1,956	215	8	—	1	14

TABLE IV

	1948	1952 (provisional)
Total infant deaths	114	43
Infant mortality rate	70	32
Deaths from prematurity	27	12
Deaths from enteritis	31	—

of infant deaths since the establishment of the children's nursing unit. It is worthy of note that the overall incidence of enteritis in Rotherham also fell during the same period, possibly due to the nursing of cases at home instead of in hospital.

Apart from figures, the experience gained has shown that it has been well worth while to undertake this special children's work, some of its advantages being: (1) the child remaining at home in familiar surroundings is less liable to fret; (2) the danger of cross-infection is lessened; (3) the mother is encouraged to help in the nursing of the child, and the health teaching to parents and relatives done in these cases is considerable; (4) the call on hospital beds for sick children has been reduced.

Sixty delegates attended the seminar on foot health organized recently by the Central Council for Health Education at St. John House, Collingham Gardens, London. The seminar was for medical officers of health. The first lecture was given by Mr. T. T. Stamm, F.R.C.S., on "Development and Function of the Foot." Mr. Stamm followed this lecture with another the following day on "Foot Examination and Foot Defects." In the afternoons parties of delegates toured two factories to see shoes made by machine mass-production and hand methods. Lectures and demonstrations on foot health education methods and media were given by Dr. W. Emrys Davies. The discussion panel took as its subject "Foot Defects—Where Does the Cause Lie?" Members of the Panel were Dr. E. K. Macdonald, Medical Officer of Health for Leicester; Dr. Doris Craigmile, Assistant Medical Officer of Health, Ealing; Mr. Edward Rayne, Director of H. & M. Rayne, Ltd. (shoe manufacturers); Mr. J. Korn, Principal of the Cordwainers Technical College, London; and Mrs. Alice Buxton, Liaison Officer to the Foot Health Educational Bureau of the Central Council for Health Education. One group queried whether any available footwear was suitably shaped or priced for the growing child, economy and high prices being a recognized cause of shoes being worn too long until they are outgrown. Lieutenant-Colonel J. M. Milne, Adviser in Physical Medicine, R.A.M.C., reported that 80% of the Army intake showing foot defects were handed over to the physical training instructor, and that 60% of defects were postural or connected with the feet. Foot infections, he said, were not a major problem.

AN OUTBREAK OF FOOD-POISONING
DUE TO *CL. WELCHII*

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It has been shown that heat-resistant *Cl. welchii* may be the cause of food-poisoning (Oesterling, 1952; Hobbs *et al.*, 1953). The clinical picture of this condition is described by these authors as that of a pure lower-bowel affection—that is, diarrhoea and griping—without the vomiting and general symptoms, such as pyrexia and headaches, seen in food-poisoning due to staphylococci and salmonellae. The usual medium of infection is a meat dish which has been prepared the day before being consumed and has been kept under conditions favourable to the multiplication of bacteria. The relatively mild and short course of this illness and the fact that it is caused by an anaerobe which will escape detection in the usual tests for intestinal pathogens probably explain why this type of food-poisoning has attracted little attention before.

Description of Outbreak

We recently had an opportunity of investigating such an outbreak in a general hospital in which 44 persons were affected—39 patients and 5 staff. The number of persons at risk was approximately 360. The cases were distributed among seven wards of the 450-bed hospital. The persons affected fell ill about 8–16 hours after consumption of some roast pork served for lunch. The pork had been cooked the day before and was allowed to cool for about three to four hours in the open before being stored in the refrigerator. The next morning it was sliced in the kitchen, and freshly prepared hot gravy was added before it was distributed in closed hot trolleys to the wards.

The same night a number of patients fell ill with diarrhoea and acute abdominal pain; the stools were watery and only occasionally some mucus was present; one person had blood in the stool. There was no vomiting, but some patients complained of slight nausea; no pyrexia was noted. Most of the patients recovered by the following midday or evening.

Bacteriological Investigations

Stool samples of all persons affected and of the kitchen staff were cultured. In addition a remnant of the suspected roast pork and 12 random samples of raw pork from the kitchen refrigerator were examined; the latter were taken from joints which were derived from five different sides; the side from which the remnant of roast pork came could not be identified. None of the gravy was left. The faeces, in addition to being subjected to the routine examination for intestinal pathogens, were inoculated into bottles of meat broth; these were steamed for one hour, incubated overnight, and then subcultured on to anaerobic blood-agar plates. In positive cases an almost pure growth of *Cl. welchii* was obtained. The colonies had the characteristic appearance of this organism except for the initial absence of haemolysis, which, however, developed after a few days' standing. They gave a positive Nagler reaction which was suppressed by *Cl. welchii* type A antitoxin.

Smears prepared from the remnant of roast pork and the samples of raw pork revealed numerous Gram-negative and Gram-positive bacilli, some of the latter containing sub-terminal spores. Portions weighing about 1 g. were removed from the inside and outside of the pork and after being minced were suspended in 10 ml. of meat broth. The suspensions were plated direct on to aerobic and anaerobic blood-agar plates and then incubated overnight. Next day the meat-broth cultures were heated for five minutes at 80° C. and then subcultured on to anaerobic blood-agar plates.

Results

The stool specimens were somewhat slow in coming in, so that on the first day only 14 samples were examined; 10 of these were found to contain *Cl. welchii*. Specimens from 26 other patients were examined during the following two weeks and of these only eight were positive. None of the kitchen staff was found to carry this organism.

A small number of *Cl. welchii* colonies were found in the direct anaerobic culture from inside the roast pork. They were heavily outgrown by coliforms and some anthracoid bacilli; there were also some coagulase-positive staphylococci present. A better growth of *Cl. welchii* was obtained after overnight enrichment of the roast pork in meat broth.

The strains isolated from the faeces and pork were submitted to Dr. Hobbs, who kindly typed them. She reports that 6 out of 17 faeces strains and the two cultures isolated from the remnant of the roast pork served belong to her provisional type 1. The remaining 11 faeces strains do not fall into any of her types 1–10. Two strains isolated from the 12 random samples of raw pork belonged to type 6 and 10, and one strain was not typable. Dr. Hobbs suggests that this outbreak might have been due to a mixed infection with at least two types which she occasionally has observed (Hobbs *et al.*, 1953: outbreaks 6, 13, and 14 in Table 2).

Discussion

The high incidence of heat-resistant *Cl. welchii* found in faeces, particularly in the early specimens, and the recovery of organisms of the same serological type from the faeces and roast pork leave little doubt about the aetiological significance of this bacterium in the present outbreak. The proportion of positive findings would probably have been higher still if more specimens had been examined earlier. On the other hand, the recovery of heat-resistant *Cl. welchii* in 8 out of 26 patients up to 14 days after the symptoms had subsided serves to demonstrate that some bacteriological evidence of the nature of the outbreak can be obtained even one to two weeks after the acute illness. Owing to difficulties in obtaining repeat specimens no precise information is available on the duration of the excretion of this organism. Five out of 10 patients were, however, found to be carrying it three weeks after the onset of disease, and two gave a positive repeat culture after five and six weeks respectively.

It is not possible to state with certainty at which stage of preparation the meat became infected, and, unfortunately, owing to the method of marketing, the pork could not be traced beyond the slaughterhouse. The pork consumed on the day of the outbreak was derived from three and a half sides which formed part of a consignment of five sides kept in the hospital cold store. The origin of the remnants of the raw and roast pork could not be traced, as all the meat had been jointed the day before the outbreak. The finding of serological types in the raw meat different from that found in the roast meat probably indicates that the latter was derived from a different side. The recovery of *Cl. welchii* in 3 out of 12 samples of raw pork is in agreement with the high incidence (20%) reported by Hobbs and her co-laborators. The absence of *Cl. welchii* carriers among the kitchen staff exonerates them from having contaminated the meat. It is therefore likely that the pork was already infected in the raw state with *Cl. welchii* and that the spores, which, owing to their great heat-resistance (Hobbs *et al.*, 1953) survived heating in the centre of the joint, germinated under the favourable temperature conditions during the

prolonged cooling. There was further opportunity for bacterial multiplication on the following day, when the sliced pork was warmed with hot gravy.

The disproportion between the high number of persons apparently at risk and the number of people affected may be due to chances of distribution of contaminated and non-contaminated joints, or to variations of individual susceptibility as observed by McClung (1945).

The evidence presented emphasizes the danger of consumption of meat dishes prepared the previous day. Ideally, meat should be eaten on the day it is cooked. When this is not practicable provision should be made for rapid cooling after cooking, adequate refrigeration, and speedy serving of the meat after removal from the refrigerator.

Summary

An outbreak of food-poisoning due to heat-resistant *Cl. welchii* is described.

The organism was recovered from roast pork which had been consumed and from the faeces of 18 out of 40 persons affected.

Cultures isolated from the roast pork and from 6 out of 17 stools were of identical serological type. Other evidence, however, suggested that the outbreak was due to a mixed infection with at least two serological types.

The risk involved in the serving of meat dishes prepared the day before their consumption is emphasized.

We are indebted to Dr. Betty Hobbs for carrying out the typing of the cultures isolated from this outbreak. Our thanks are also due to Dr. M. W. Hutchings for help in following up these cases and to Mrs. E. Arnold for valuable technical assistance.

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Medical Memoranda

Multiple Mongolism in a Family

Mongolism as a rule occurs only sporadically in family pedigrees, and it was formerly believed that there was never more than one mongol born in a family. This theory usually holds good, as Warner (1949) could collect from the world literature only 42 families in which two siblings were affected, excluding instances when twins were involved.

The birth of three mongoloids in one generation of a family is rarer still, and we have failed to find a previous instance in British literature. The first description of such an occurrence was that of Herrman (1917). Reports by van der Scheer (1919), Fantham (1925), Malkin (1928), Bixby (1940), and Benda (1947) followed. Recently the following came to our notice.

FAMILY HISTORY

The father, a farm cowman, was born in 1905, and the mother, formerly a domestic servant, was born in 1909. They married in 1925, and are known to belong to the dull group of a rural population, the maternal family being of poorer stock than that of the father. There is no consanguinity or history of mental disease in the ascendants. Both parents are virtually feeble-minded and are unable to remember the year of their marriage, the dates of birth of their children, or the years in which three children died. They could recall the sequence of the children's birth only with mutual prompting and with the assistance of one of their daughters. The mother has had five miscarriages,

but is uncertain when two of them occurred. Known miscarriages took place in 1939, 1942, and 1946.

The birth order of the children is as follows: girl, D, 1926; girl, B, 1930; girl, K, 1931; girl, E, 1932; boy, H, 1934; girl, M, 1937; girl, F, 1941; girl, P, 1943; boy, R, 1945; girl, C, 1948. Of these, the girl, P, died at the age of 14 months from tuberculous peritonitis and the boy, R, at 6 months from pneumonia. Apparently no unusual symptoms were experienced during any of the pregnancies.

H is now employed as a cowman, K and B as factory hands in semi-skilled work, and F attends school, having an intelligence quotient of 101. D, who was admitted to a certified institution in 1933, is a mongol imbecile with an intelligence quotient below 30. M was admitted to the same institution in 1941, and is likewise a mongol imbecile, with an intelligence quotient of 30. E was recognized as a typical mongol by the family practitioner shortly after birth and died aged 4½ months, the cause of death being certified as mongolism and bronchitis.

COMMENT

Such families have aroused interest from two aspects. Firstly, it was hoped that their study might lead to an eventual elucidation of the condition, and, secondly, they should be borne in mind when the mother of a mongol seeks advice about whether future pregnancies may result in the birth of further mongol children.

This case well illustrates the contention that hereditary factors indicative of germinal inferiority are evident in the majority of instances of multiple mongolism. It further supports the thesis that in such cases there is an increased tendency to miscarriages; indeed, some of these may be abortions of mongols. It is suggested that if advice is sought by the mother of a mongol child and the family background and medical examination of both parents prove satisfactory, then the "mother can be encouraged to have more children without risk" (Benda, 1947).

Our thanks are due to Dr. T. W. E. Royden, the family practitioner, for his help in the study of this family.

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Chlorcyclizine Hydrochloride Poisoning in an Infant

Toxic effects with antihistamine drugs are common in adults, but are seldom severe enough to require hospital treatment. Children have frequently been the subject of acute accidental poisoning by these drugs, probably because of the attractive presentation of the pills, and the effects have often been extremely serious. A number of fatal cases have been described. The main clinical feature of them all has been convulsions. The increased liability to fits in epileptics taking diphenhydramine hydrochloride ("benadryl") and tripeleminamine hydrochloride ("pyribenzamine") was shown in E.E.G. studies by Churchill and Gammon (1949). In large doses the antihistamines appear generally to act as central convulsants.

Rives *et al.* (1949), in their fatal case due to methapyrilene hydrochloride, reported the occurrence of cerebral oedema with petechial haemorrhages, which might account for this clinical picture. Their case also showed an acute nephrosis. Tobias (1949) reported the first fatal case in this country. It showed similar clinical features to the present case, but the patient died in three hours. There was no necropsy report. In two cases the necropsy findings were confined

to lung congestion, acute emphysema, and early bronchopneumonia (*British Medical Journal*, 1951). The latter three cases were all due to mepyramine maleate ("anthisan") poisoning, as were the cases reported by Miller and Pedley (1950) and by Prain (1950), in which the findings were essentially the same, with the addition of cerebral congestion. The mepyramine cases all showed a massive catarrhal discharge from the upper respiratory tract. This does not seem to have been seen with other antihistamines.

Davis and Hunt (1949) reported a fatal case due to diphenhydramine poisoning in a child aged 2 years. The clinical picture was again similar, except that respiratory depression occurred and was the eventual cause of death. The necropsy findings were generalized congestion of the lungs, brain, and other organs, with some petechial haemorrhages into the thymus and myocardium.

Various lines of treatment have been suggested, one of them being the use of histamine itself (*Lancet*, 1950). The value of this would seem doubtful, since direct antagonism between the substances in question has never been demonstrated, although it is possible that free antihistamine might be rendered harmless in this way. Gaddum (1948) suggests that antihistamines may act by blocking the histamine receptors, and this is also the view held by White (1950), who states: "Antihistamines do not antagonize histamine by combining with it chemically or by inducing opposite pharmacological responses, as does adrenaline . . . they block histamine receptors in the tissues. It therefore seems doubtful whether histamine can be effective. . . . In some people, notably asthmatics, even though saturated with an antihistamine, it is possible that injections of histamine would produce severe reactions."

The use of various histamine-releasing drugs has also been advocated, but such a view can gain little support from the generally accepted theory of antihistamine action as briefly stated above. Geiringer (1952) states that morphine might well be of value on account of its histamine-releasing property. The danger of morphine in children on account of their peculiar sensitivity to its respiratory depressant action is well known, and would make one extremely reluctant to use it.

Both atropine and adrenaline hasten death from mepyramine poisoning in experimental animals. Overdosage with histamine also hastens death, although small doses appear to be beneficial; the ratio of histamine to antihistamine required for this beneficial effect varies greatly from species to species (Geiringer, 1952). The amount likely to be of value in man is at present unknown. It would therefore seem unjustifiable to administer histamine in cases of antihistamine poisoning, at least on present knowledge.

The following case would seem to be the first serious toxic effect reported due to chlorcyclizine hydrochloride ("histanin"). The treatment adopted was similar to that used in the case reported by Snyderman (1949), who described poisoning by methapyrilene hydrochloride ("thylene hydrochloride") in a child of 16 months. There was a convulsive stage lasting four hours, controlled by soluble phenobarbitone and chloral. The child had completely recovered after 24 hours. A short period of cardio-respiratory depression was successfully overcome with rectal caffeine.

CASE REPORT

At noon on January 14, 1952, a boy aged 16 months took 18 tablets of chlorcyclizine hydrochloride (50 mg. each, total 900 mg.) which had been prescribed for his mother for nausea of pregnancy. He was almost at once discovered to have done so. At 12.45 p.m. he began to look vacant and was taken to the doctor's surgery, where he vomited. He was sent to the casualty department, where he arrived at 2 p.m. He was then having incessant generalized convulsions and was cyanosed.

His stomach was washed out with sodium bicarbonate solution, and intramuscular paraldehyde, 0.25 ml., was given every ten minutes. At 3 p.m. soluble phenobarbitone, 1 gr. (65 mg.) every 20 minutes, was substituted for the paraldehyde, and atropine, 1/200 gr. (0.32 mg.), was given, as his

secretions were becoming excessive. His condition had improved sufficiently at 4.30 p.m. for him to be transferred to the children's ward. On arrival there at 5.15 p.m. he was slightly cyanosed. There were continuous generalized convulsive movements. Respiration was rapid (55 a minute) but full.

Treatment was continued on similar lines, with both paraldehyde, 1 ml. intramuscularly every 30 minutes, and sodium phenobarbitone, 1 gr. intramuscularly hourly. Prophylactic penicillin, 100,000 units six-hourly, was given. Convulsions ceased at 8.30 p.m. and did not recur. Anticonvulsants were discontinued.

The next day he remained extremely sleepy. His eyes were open and he appeared to watch events without much interest. His blood picture showed: Hb, 110%; white cells 22,000 (polymorphs 58%, eosinophils 2%, lymphocytes 32%, monocytes 8%); red cells appeared normal. His progress over the next three days was slow: the level of consciousness gradually improved, but he appeared very ataxic. There were no localizing signs in the central nervous system. On January 18 he remained still drowsy and his actions were rather automatic. Dexamphetamine sulphate, 2.5 mg. twice daily, was started. This resulted in some speeding up in the process of recovery. On January 23 the patient was sitting up, but very unsteadily. There was no nystagmus. His expression was vacant at times; his intelligence did not appear to be great. Blood picture showed: Hb, 82%; red cells, 4,500,000; C.I., 0.9; white cells, 7,000 (polymorphs 52%, eosinophils 1%, lymphocytes 43%, monocytes 4%).

On January 26 dexamphetamine sulphate was omitted and he was discharged from hospital. He was due to be seen at the out-patient clinic on February 14, but was unable to attend, as he had pulled a pot full of nearly boiling tea over himself a week before and had suffered severe scalds. When seen on February 21 he was perfectly fit and appeared normal in all respects, having completely lost his vacant expression. A further blood picture showed: Hb, 75%; white cells, 22,000 (polymorphs 41%, eosinophils 4%, lymphocytes 51%, monocytes 4%). The raised white blood count was of doubtful significance in view of his recent burns, but no abnormal cells were seen.

There was no albuminuria or other evidence of renal damage at any time.

COMMENT

This was a severe case of poisoning by an antihistamine drug, the main features of which were the prolonged convulsive stage of nearly seven hours, unassociated with any respiratory depression, and the slow recovery, with lethargy and ataxia.

When the child was first seen the most pressing problem seemed to be to stop the convulsions, for it was felt that their continuance would inevitably lead to cerebral damage. Treatment was therefore confined to anticonvulsant drugs.

The child made an uninterrupted recovery despite the use of several drugs which have an adverse effect in experimental animals, and it seems doubtful whether laboratory tests in these animals are applicable to man.

I wish to thank Dr. S. D. V. Weller for permission to publish this report on his patient; Dr. W. E. Budd for assistance in the treatment; and Dr. D. Finlay, of Burroughs Wellcome and Co., for supplying much valuable information.

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Reviews

THE NAVY AT WAR

The Royal Naval Medical Service. Volume 1: Administration. By Surgeon Commander J. L. S. Coulter, D.S.C., R.N. History of the Second World War, United Kingdom Medical Series, Editor-in-Chief Sir Arthur S. MacNalty, K.C.B., M.A., M.D., F.R.C.P., F.R.C.S. Prefatory Note by Editor-in-Chief. (Pp. 512; 13 plates. 50s.) London: Her Majesty's Stationery Office. 1954.

The Medical Department of the Royal Navy are to be congratulated on the appearance of this history of the administration of the Royal Naval Medical Services in the second world war. Every medical officer who served with the Senior Service will be pleased to read this book, for it has much to interest him, and when we remember the very small and quite inadequate volume which appeared after the first world war our gratification is accentuated. Although several medical officers have served on the editorial committee for varying periods and have acted as the editor of the *History* from time to time, the person who has really been responsible for this volume is the official editor, Surgeon Commander Coulter, and all who know him realize what a great job he has done.

The Navy in wartime is quite a different thing from that in peace, and in the ships themselves there is often a 60% increase of the normal complement of personnel. When this fact alone is considered, together with the possibility of the ship serving in any of the seven seas, sometimes in tropical climates and sometimes in arctic, this makes the life of a ship's medical officer a busy one. With every new war there are bound to be new weapons for fighting the ship, and new conditions and new problems arise for the medical officer. The administration of a self-contained unit such as a battleship is quite a different problem from that of a unit ashore. The black-out conditions and the rigid requirements of damage-control organization in wartime have to be seen to be appreciated.

The second world war necessitated a vast expansion of the Naval Medical Service both in personnel and in hospitals. The Royal Naval blood transfusion service in Camden Town came into being in 1942 and with it the blood transfusion units which were to do such excellent service as the war progressed. Some of the large Naval hospitals at home suffered extensively from enemy bombing, and auxiliary hospitals had to be equipped and staffed. All this was carried out while various research problems were being pursued, such as underwater blast, immersion foot, and the prevention of burns. The Naval medical establishments abroad increased as the war progressed and patients were evacuated by air from many of these. This volume enumerates all these establishments and hospitals and gives the number of patients treated in each and the capital expenditure involved. We look forward to seeing the second volume, to be devoted to campaigns, for we know Surgeon Commander Coulter will give us another very interesting book.

CECIL WAKELEY.

A BIOLOGIST'S PHILOSOPHY

The Mind and the Eye: A Study of the Biologist's Standpoint. By Agnes Arber, M.A., D.Sc., F.R.S., F.L.S. (Pp. 146. 16s.) Cambridge: The University Press. 1954.

Dr. Arber is an eminent botanist and historian of botany, already well known to students of medical history for her volume on herbals. Her experience as a research worker extends over fifty years, and for the past twenty she has been reading widely in philosophy ancient and modern. This experience and reading are here synthesized in language clear and simple but weighty with thought and close reasoning. The result may be aptly termed a testament of biology. It is a work of high excellence that will delight all research workers, and not merely biologists.

The author begins by outlining the research worker's evolution from tiro to philosopher. His first job in life is to find a clearly defined problem, or a field in which such a problem may emerge. The second stage is to find the requisite facts by observation or experiment, and the third is to interpret the facts. The fourth stage is the testing of the conclusions, and the fifth is the publication of the results. The sixth stage is a broadening of interest that leads the worker to consider his results in the wider context of thought in general—in other words to philosophize—a stage most likely to be reached late in life, when the urge to contemplate surpasses the desire to garner.

In the first half of the book the author discusses the five pre-philosophic stages, and includes a fascinating chapter on the art of scientific writing, preserving Gauss's splendid dictum: "I have had my results for a long time; but I do not yet know how I am to arrive at them." The second half of the book is a discussion on the relations between biology and philosophy, and will stretch the pia mater of anyone unfamiliar with Plato and Aristotle, Dante and Descartes. The topics dealt with include biology and truth, the fundamental assumptions of biology, biological antitheses, and antitheses and dialectic. The general theme is that many paired concepts, such as form and function, body and mind, and mechanism and teleology, are artifacts and therefore imperfect representations of a higher unity, the final aim of biology being the fusion of metaphysical and scientific thinking. If this book were mediaeval its author would have been concisely designated (and justly renowned as) *Agnes Conciliatrix*.

RAYMOND WHITEHEAD.

CIRCULATORY DYNAMICS

Circulatory Dynamics: Physiologic Studies. By Professor Carl J. Wiggers, M.D., Sc.D., F.A.C.P. Modern Medical Monographs No. 4. (Pp. 107; 44 figures. \$4.) New York: Grune and Stratton. 1952.

The young cardiologist of to-day is more or less forced to make use of techniques for which he may have had little basic training. To him especially this short monograph by a famous physiologist should prove invaluable. It incorporates the essence of many of the author's contributions to the field of circulatory dynamics over the past forty years, his own original interpretations being re-evaluated in the light of subsequent work. The basic laws of haemodynamics are stated and carefully explained in simple language and with helpful illustrations. The classical contributions of Bowditch (1871), Howell and Donaldson (1884), Frank (1895), Henderson (1906), and Starling (1914) are described in sufficient detail, followed by a short summary of the author's own data. In the last chapter he discusses the heart's adaptations to abnormal conditions in various diseases—which he regards as "experiments performed by nature on animals and human beings."

It was a very great pleasure to read this delightful monograph, which is a perfect model of its kind. The author's name is its best recommendation, but had it been written by an unknown worker no praise could have been too high for it.

PAUL WOOD.

TOXAEMIA OF PREGNANCY

Toxaemias of Pregnancy. By John Sophian, M.D., F.R.C.S., M.R.C.P., M.R.C.O.G. Foreword by F. J. Browne. (Pp. 230; 37 figures. 25s.) London: Butterworth & Co. Ltd. 1953.

Those who take an interest in recent work and views on the cause and nature of pre-eclampsia and eclampsia will be aware of the hard work and enthusiasm which Mr. Sophian has brought to bear on these problems during the last ten years. He has long been a staunch advocate of the Trueta renal shunt as the mechanism underlying the manifestations of these diseases, and, with Professor K. J. Franklin, has demonstrated by animal experiment a utero-renal reflex which might bring the shunt into operation. In this monograph he presents a clear and full statement of his views, supported partly by personal observations but mainly by a

review of the literature. The latter is extensive and intensive, although it sometimes savours of selection and interpretation to suit a particular theory. For strong conviction and an urge to spread a gospel are rarely compatible with complete impartiality.

The clinical aspects of toxæmia of late pregnancy and allied states such as hypertension and renal cortical necrosis are discussed in the light of biochemical and pathological changes in the affected organs, the whole being introduced by accounts of the embryology, anatomy, and physiology of the kidney. These are detailed and will be best appreciated and evaluated by those who are experts in the particular fields. An unfortunate slip which the clinician will notice is the statement that the "Bull, Joekes, and Lowe diet" for anuria has a high protein content.

The author discusses other modern theories of the cause of toxæmia of pregnancy, though most attention is naturally given to his own concept. Not everyone will agree that this offers the complete answer to the problem, but the book is none the less valuable in that it cannot fail to be both a source of reference and a stimulus to thought and discussion among all workers in the diseases with which it is concerned, and thus indirectly, as well as directly, further the search for the cause and logical treatment of what still remains one of the greatest hazards of childbearing.

T. N. A. JEFFCOATE.

MODERN TREATMENT

Modern Treatment Yearbook 1954: A Yearbook of Diagnosis and Treatment for the General Practitioner. Edited by Sir Cecil Wakeley, Bt., K.B.E., C.B., LL.D., M.Ch., D.Sc., F.R.C.S., F.R.S.E., F.R.S.A., F.A.C.S., F.R.A.C.S. Published for the Medical Press. (Pp. 352; 69 illustrations. 21s.) London: Baillière, Tindall and Cox. 1954.

This is an attractive and reasonably produced volume in a series that has been appearing yearly with slight variations of title and format for the last twenty years. The volumes were originally entitled "Modern Treatment in General Practice," but the convention that it is only the general practitioner who finds it difficult to keep up to date has now happily been abandoned. The present volume contains 35 articles on a variety of topics which range from common scalp infections to injuries of the semilunar cartilages, from congenital clefts of the lip to carcinoma of the cervix.

A high proportion of the writers belong to the younger generation, and the articles are crisp and informative. The book performs well what it sets out to do, which is to describe in simple terms some practical forms of treatment where there have been advances in recent years. Nevertheless, it is noteworthy that two out of every three contributors are surgeons and there are only two articles which do not deal with gross physical disease—one on enuresis and one on the aftercare of the mental patient. This last article mentions that there are approximately 200,000 patients receiving mental hospital care in the United Kingdom, other than mental defectives, and that between one-third and one-quarter of all absence from work in factory workers may be due to neurotic illness. We must hope that in years to come Sir Cecil Wakeley may be able to find young and vigorous authors who can divert our attention to these important fields.

L. J. WITTS.

TEXTBOOK OF PHARMACOLOGY

Pharmacology. By J. H. Gaddum, Sc.D., F.R.S., M.R.C.S., L.R.C.P. Fourth edition. (Pp. 562; 89 illustrations. 35s.) London: Geoffrey Cumberlege. 1953.

The arrival of the fourth edition of this textbook may not attract much attention except from those directly concerned with teaching or learning the subject, and if this should be so it is a pity. The book is primarily written for medical students, but it is of real value for all who are teaching clinical medicine. Indeed, it is difficult to think of another book of a similar convenient size which so well summarizes the advances in basic knowledge of importance for the clinical teacher.

Professor Gaddum's sentences are short, and this gives great precision to his statements. His exposition is none the less graceful, and the certainty of touch with which he picks out the essential points makes the book admirable for reading by the fire, a page or two at a time, to re-cement our basic knowledge and to promote our reflection. One may doubt, indeed, whether some medical students will sufficiently appreciate and enjoy a book where information is so closely packed.

Much attention is given to quantitative studies, and the chapter on general pharmacology, with its discussion of the calculation of error and explanation of frequency distribution from the fate of the marbles which were given by a rich man to his friends, forms an excellent introduction to statistical methods. A fair amount of attention is paid to the chemical structure of related substances, though this is done unobtrusively. The difficulty of showing convincing similarities is at once apparent when the formulae for the antihistamines or for the atropine-like substances are considered.

The serious problem of nomenclature remains as far from solution as ever. There is now a list of international non-proprietary names (I.N.N.), which Professor Gaddum, as in duty bound, has followed. Thus he describes the new remedy of the thiouracil group as thiamazole. However, a recent paper in this *Journal* described it as methimazole, which is the approved name of the B.P. Commission, and this paper informed the reader that the substance was sold as "tapazole." It is also known as "mercazole"!

The book is one of the Oxford Medical Publications, and is printed and illustrated beautifully. It is unfortunate, however, that this new edition has been so slow in appearing, for the third edition was exhausted some time ago.

J. H. BURN.

INDUSTRIAL MEDICINE AND HYGIENE

Outlines of Industrial Medicine, Legislation, and Hygiene. By James Burnet, M.A., LL.B.(Lond.), M.D., F.R.C.P.Ed. Second edition. (Pp. 122. 10s. 6d.) Bristol: John Wright and Sons. 1953.

Dr. Burnet, in his preface to the second edition of this book, anticipates the criticism most likely to be levelled—the inevitable compression of so many subjects into so small a space. He remarks that it is meant only to serve as an introduction to their study for students of industrial medicine. In some respects the book achieves this object; the section on industrial legislation especially will be found useful to anybody who may later have to acquire a detailed knowledge of the complications of the Factories Acts and the National Insurance (Industrial Injuries) Act. The whole section on industrial diseases, however, especially "Poisons," is so severely curtailed that many essential facts are omitted, while some of the information given is misleading and inaccurate. Dinitrophenol, for example, is said to owe its industrial prominence to its use as an explosive, with no mention of its principal modern use as an insecticide, and in the list of toxic symptoms caused by it one of the most characteristic, extreme loss of weight, is not mentioned. The statement that tetrachlorethane may be used for "doping" aeroplanes was correct up to 1918 but is certainly not so now, and few authorities would regard bleeding from the gums as an early sign of benzene poisoning.

Preventive measures are described at the end of each account of an industrial poison so vaguely as to be almost valueless. Under "Amyl Acetate," for example, the statement that "these consist in limiting the amount of exposure and in reducing the concentration of this liquid" means little or nothing. While it is quite impossible in a book of this size to give anything like a full account of the many subjects touched upon, it is a pity that space should be devoted to non-essentials instead of to some of the more important aspects which have been treated very sketchily.

ETHEL BROWNING.

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EHRlich AND VON BEHRING CENTENARIES

The strange coincidence of the births of Paul Ehrlich and Emil von Behring on successive days in 1854 afforded a unique opportunity for a twofold centenary celebration. This took place on March 13 to 16 at Frankfurt-on-Main—the scene of their collaboration during the 'nineties in the study of diphtheria antitoxin. Delegates representing universities and medical schools and organizations all over the world attended the celebration, which began with a tour of the Paul Ehrlich Institute on March 13 and a reception by the Frankfurt municipality. At a ceremony on the following day the Paul Ehrlich Prize for 1954 was presented to Professor E. B. Chain, scientific director of the International Research Centre for Chemical Microbiology at Rome. On March 15 a visit was paid to Marburg, where the rector of the Philipps University presented three von Behring Prizes—for 1948 to Professor Hans Schmidt, of Marburg, for 1952 to Sir Macfarlane Burnet, of Melbourne, and for 1954 to Professor M. Heidelberger, of New York. Finally on March 16 a scientific session—arranged jointly by the Paul Ehrlich Institute, the Philipps University, and the Johann Wolfgang Goethe University at Frankfurt—was held under the presidency of Dr. Th. Madsen and Sir Henry Dale, and papers were read on a variety of subjects by distinguished contributors from several countries. Earlier in the proceedings Sir Henry Dale, on behalf of the Medical Research Council in London, had handed over to the Paul Ehrlich Institute a number of historical documents relating to Ehrlich and his work.

This issue of the *Journal* contains papers on Ehrlich by three authors who all worked with him—Sir Henry Dale, Professor Carl Browning, and Miss Martha Marquardt—and one paper on von Behring by Sir Arthur MacNalty. The chief claim of von Behring to everlasting fame is as the discoverer of antitoxin. That the diphtheria bacillus produces an exotoxin was proved by Roux and Yersin in 1888. Two years later von Behring and Kitasato proved the

presence of a protective and transferable antibody in the blood of animals immunized with killed cultures of diphtheria and tetanus bacilli, and gave the name of antitoxin to it. It was in the application of this discovery to therapeutics, particularly of diphtheria, that his collaboration with Ehrlich took place. Von Behring must also be credited with having laid the foundations of active immunization against diphtheria: it was he who actually introduced the use of toxin-antitoxin mixtures for this purpose, although these were to be entirely supplanted not many years later by preparations of toxoid. Among his other achievements none ranks with these: in some of his beliefs about tuberculosis he was frankly mistaken, and his methods of immunization against this disease were of doubtful value.

No one will dispute that Ehrlich was the greater of the two men: he was indeed one of the very greatest that medical science has ever produced. As will be evident from these accounts of him—and particularly from the intimate and purely personal account of Martha Marquardt, his biographer, and his secretary from 1902 until his death at the age of only 61 in 1915—he was a man of a quite different type from von Behring: the qualities accounting for that difference were evidently among those which most inspired affection among his associates. Of his long record of achievements Sir Henry Dale's paper gives a most illuminating account, which deserves to be read by all those not fully familiar with its subject. The astonishing feature of this career is its separation into three parts, each devoted to a subject quite distinct from the other, and any one of which would have sufficed for lasting fame. The main outcome of the first of these periods, during which he was concerned largely with reactions between dyes and components of living cells, may be said to be nothing less than the foundation of the modern science of haematology. Ehrlich not only perfected methods of staining blood cells, but described them and traced their development with a thoroughness to which the still frequent use of his name in connexion with the cytology of the blood and marrow is a fitting tribute. Out of this work came the idea of using aniline dyes as drugs. This was to be developed only in the third stage of his career.

What intervened here was von Behring's discovery of antitoxin, and the task of applying this in therapeutics. It was Ehrlich who was responsible for the production of diphtheria antitoxin of sufficient potency for clinical use by a prolonged course of immunization. But out of these efforts grew much more; indeed, in three separate directions these studies provided a basis for all later work in this field.

Three forms of toxin were identified, including toxoid, which was later to provide the means of active immunization. Methods were devised for measuring the specific activity of an antitoxic serum, and the use of a reference standard for the first time was the model for all subsequent methods of biological standardization. Finally, as an outcome of studies of immunity, the scope of which extended far beyond the single problem of diphtheria, Ehrlich developed the famous side-chain theory. However our views of this may have been modified by subsequent observations, the pictorial conception of interlocking parts on the surface of molecules has become a commonplace in the literature of immunology.

In the third phase of his career, which developed out of the first, Ehrlich was almost solely responsible for creating a new therapeutic method which was to revolutionize the whole of medicine. He had invented the word "chemotherapy" years earlier in connexion with a by no means unsuccessful attempt to treat malaria with methylene blue: this experiment, conducted in 1891, was, as Sir Henry Dale points out, a landmark of the highest significance, since it was the first attempt ever made to treat an infection by means of a synthetic substance acting directly on the micro-organism causing it. The principle that dyes, with their high affinity for constituents of the microbic cell, should have a selective action on them underlies much of Ehrlich's subsequent work and that of his successors at Frankfurt. Eventually, indeed, it led to the discovery of the sulphonamides, although almost by accident, since in fact the dye moiety of the "prontosil" molecule was soon proved to be therapeutically inert. Although the discovery of prontosil was not announced until twenty years after Ehrlich's death, it can properly be regarded as an outcome of his work. Of his own direct achievements—the demonstration of the action of trypan red in trypanosomiasis and the discovery of salvarsan—the former was only a stage on the way to the subsequent discovery of "germanin," but the second was of the highest immediate practical significance, and placed chemotherapy with synthetic drugs for the first time on an assured footing. Had Ehrlich not lived, it is quite possible that chemotherapy, except with quinine and emetine, would still be unheard of at the present day, for without the encouragement given by the results obtained with their forerunners even the antibiotics might have remained mere microbiological curiosities, their therapeutic powers unsuspected. Bulloch's¹ uncompromising verdict on Ehrlich, "The greatest scientific worker in medicine in the last fifty years," is not likely to be disputed.

HAEMOLYTIC DISEASE OF THE NEWBORN

In 1952 haemolytic disease of the newborn caused the deaths of 435 infants in England and Wales:¹ this is in addition to the 30% of affected babies who are stillborn with hydrops foetalis.² Apart from this mortality and the crippling effects of kernicterus among those who survive this complication, the possibility of the condition is an anxiety to the parents in the one in eight of all pregnancies where a rhesus-negative mother lacks a factor, usually D, present in the father and foetus. In these pregnancies there is a risk of maternal immunization from a foetal source and of the subsequent passage of antibodies across the placenta, with the destruction of the infant's red blood cells. It is still not clear why only 5% of rhesus-negative mothers become sensitized by pregnancy, but the danger of previous blood transfusion with rhesus-incompatible blood is now well known: Levine³ found that the mother had received a transfusion in 180 out of 220 affected first pregnancies, and that this doubled the stillbirth rate in this group. In spite of the increasing complexity of blood groups, over 90% of haemolytic disease of the newborn is still found to be due to sensitization to the Rh-positive D antigen. The great majority of the remaining cases are due to foetal-maternal ABO incompatibility, while other blood antigens—such as c, E, and Kell—are rarely to blame.

There is still no method of true prophylaxis against immunization to the Rh factor. Unsuccessful efforts in the past at inhibiting antibody formation by administration of vaccines,⁴ ethylene disulfonate,⁵ and haptens⁶ have their modern counterpart in the administration of A.C.T.H. and cortisone, which have been given both antenatally to the mother and after birth to the affected baby. Published results⁷⁻⁹ show

- ¹ Registrar-General's Statistical Review of England and Wales, 1952.
- ² Pickles, M. M., *Haemolytic Disease of the Newborn*, 1949, Oxford.
- ³ Levine, P., Vogel, P., and Rosenfield, R. E., *Advances in Paediatrics*, 1953, Chicago.
- ⁴ Wiener, A. S., and Sonn-Gordon, E. B., *Amer. J. Dis. Child.*, 1946, 71, 25.
- ⁵ Karliher, D. H., *Amer. J. Obstet. Gynec.*, 1947, 54, 1.
- ⁶ Carter, B. B., *J. Immunol.*, 1949, 61, 79.
- ⁷ Geppert, L. J., Akeroyd, J. H., and Simpson, J. W., *Pediatrics*, 1953, 12, 72.
- ⁸ Hunter, O. B., Jun., and Ross, J. B., *Sth med. J. (Bgham, Ala.)*, 1952, 45, 732.
- ⁹ *Lancet*, 1952, 1, 429.
- ¹⁰ *Arch. Dis. Child.*, 1953, 28, 466.
- ¹¹ Davies, B. S., Gerrard, J., Hatchuel, W. L. F., and Howarth, B. E., *Bgham med. Rev.*, 1953, 18, 77.
- ¹² *Lancet*, 1950, 2, 792.
- ¹³ Hsia, D. Y. Y., Allen, F. H., Jun., Gellis, S. S., and Diamond, L. K., *New Engl. J. Med.*, 1952, 247, 668.
- ¹⁴ Mollison, P. L., and Cutbush, M., *Blood*, 1951, 6, 777.
- ¹⁵ *Amer. J. Dis. Child.*, 1953, 86, 484.
- ¹⁶ Quoted by Levine, P., Vogel, P., and Rosenfield, R. E., *Advances in Pediatrics*, 1953, Chicago, p. 97.
- ¹⁷ *Lancet*, 1953, 2, 1226.
- ¹⁸ *Amer. J. Dis. Child.*, 1953, 86, 483.
- ¹⁹ *Lancet*, 1950, 1, 979.
- ²⁰ *J. exp. Med.*, 1953, 88, 509.
- ²¹ Crawford, H., et al., *Lancet*, 1952, 2, 219.
- ²² *Blood*, 1953, 6, 620.

that treatment with cortisone and A.C.T.H. is disappointing as a routine measure, preventing neither haemolysis nor kernicterus. It remains to be seen whether there is a place for their carefully controlled use in severely affected pregnancies in an effort to reduce sensitization and promote the birth of a liveborn infant suitable for exchange transfusion. Efforts to ensure a live baby by early induction of labour in affected pregnancies have been shown by Mollison and Walker⁹ to carry a disproportionate risk of kernicterus in the prematurely born infant. The case for premature delivery in certain circumstances is argued elsewhere in this issue by Drs. H. B. Watson, V. Mary Crosse, and W. L. F. Hatchuel; and the combination of early induction and exchange transfusion has recently been advocated by Davies and her colleagues¹⁰ in cases where there has been a previous hydrops foetalis and the father is homozygous. In a group of eleven such pregnancies they obtained a live-born infant in every case after induction at 30-36 weeks. Further, these authors believe that the birth of stillborn or hydropic babies may be predicted from the pattern of past disease in the previously affected sibling: after the birth of an infant with hydrops foetalis 80% of the next affected babies were also born hydropic, while after a live-born infant the subsequent affected baby was born alive in 83% of cases. This observation is at variance with the commonly held opinion that there is a steady deterioration with each successive pregnancy, but, if it is confirmed, it may be of great use in prognosis and in the planning of treatment in individual families.

Routine examination for antibodies in saline and albumen or detection of sensitization by the indirect Coombs test is now used more for planning of hospital delivery and treatment than as a guide to prognosis in the infant. Though high incomplete antibody titres, and particularly a rapid rise or fall, are generally of serious significance, sometimes mothers of gravely affected infants show low titres, while in a recent Birmingham series¹¹ titres of 1:512 or more indicated either a rhesus-negative or a hydropic baby.

Treatment of the affected infant aims at the prevention of anaemia and kernicterus: replacement transfusion of at least 90% of the infant's blood by fresh Rh-negative compatible donor blood meets this purpose in all moderately or severely affected infants with a positive Coombs test. The necessary quantity of blood can be calculated from the nomogram of Veall and Mollison¹²: this aims at leaving a packed cell volume of 50%, and a further transfusion should not be necessary. Ideas differ about the exact indi-

cations for exchange transfusion, but most authorities agree that it should be given whenever there has been a previous pregnancy ending in hydrops or kernicterus, when the baby weighs under 5½ lb. (2.5 kg.), or when the cord haemoglobin level is below 15.5 g.% in full-term babies. As the risk of kernicterus has been shown to bear a close relationship to the serum bilirubin level in the first few days after birth,^{13 14} all untreated babies must be watched carefully for the onset of jaundice and should be treated by exchange transfusion if the serum bilirubin rises above 20 mg. per 100 ml. or if any early signs appear of brain damage from kernicterus. Criteria for re-exchange transfusion are similar. Working on these principles, Hsia¹⁵ has reported no case of kernicterus after 250 successive exchange transfusions, thus virtually eliminating this complication. However, lesser degrees of kernicterus may possibly occur in deeply jaundiced babies without the usual signs of brain damage: Gerver and Day¹⁶ found that the intelligence quotient in a group of children who had been deeply jaundiced at birth and who had not had an exchange transfusion was 16.8 points lower than that of their older siblings who had escaped haemolytic disease; whereas in a group of children only slightly jaundiced at birth there was no depression of the intelligence quotient.

The mechanism of damage to the basal ganglia in kernicterus remains obscure, but the nature of the pigment has been investigated extensively. Claireaux¹⁷ and Waters and his colleagues¹⁸ have both isolated bilirubin from kernicteric brains, while Kuster and Krings¹⁹ induced kernicterus experimentally in kittens by intravascular injection of bilirubin. Vogel²⁰ believes that bilirubin after crossing the blood-brain barrier is converted into mesobilirubin within an already damaged brain cell. The variety of bilirubin responsible in these cases would appear to be the indirect-reacting type, present in excess in haemolytic disease of the newborn. It is uncertain whether the pigment has a direct toxic effect on cells of the basal ganglia made more susceptible by prematurity or liver immaturity, or whether it merely stains nerve cells already damaged by anoxia, anaemia, or antigen-antibody reaction.

Haemolytic disease due to ABO incompatibility can also be an important cause of jaundice in the first 36 hours of life. There is a risk of ABO incompatibility in one-third of all pregnancies, and up to half of the affected infants are firstborn. Although ABO sensitization has been found to follow administration of antitoxins containing horse serum,²¹ vaccines, pooled plasma, and even group O neutralized blood, not one of the eleven cases

recently described by Crawford, Cutbush, and Mollison²² gave such a history. Since soluble ABO substances are actively secreted by the infant's tissues and cross the placental barrier freely, high maternal anti-A or anti-B titres often occur in heterospecific pregnancies with normal infants. In the absence of a previously affected infant, antenatal diagnosis is thus very difficult. After birth, a combination of early jaundice, negative or weakly positive direct Coombs test, and, usually, moderate anaemia with spherocytosis and increased fragility in the infant's blood suggests "icterus praecox." This is confirmed by the presence of a high anti-A titre in the mother's serum which can haemolyse the infant's cells *in vitro*.²² Although stillbirth is rare in such cases, kernicterus may occur; therefore exchange transfusion is advisable if the infant becomes jaundiced in the first 24 hours or the bilirubin rises above 15 mg. per 100 ml. in that time.

CHANGE OF SEX

During recent years the medical profession has shown an increasing awareness of the plight of those unfortunate individuals whose genitalia do not correspond precisely to the normal for either sex, and has attempted by more accurate diagnosis at birth to avoid a later change of established sex. Very few of these cases are true hermaphrodites—that is, possessors of both ovarian and testicular tissue; most are pseudohermaphrodites. In the ordinary terminology male pseudohermaphrodites have testicles together with external genitalia of partly or wholly feminine character; they are often pronounced at birth to be girls and brought up as such until increasing masculine physique or behaviour leads to the suspicion of error. In female pseudohermaphrodites virilization of the external genitalia in an individual having ovaries, uterus, and Fallopian tubes commonly results from adrenal cortical hyperplasia beginning during foetal life. The subject of intersexuality as a whole is a complex one, and apt to provoke much unprofitable speculation, but its practical aspects are of importance to all those who treat infants and children. A brief summary has been given by Williams¹ in this *Journal*. A full diagnosis cannot always be made on simple clinical examination, even by the most experienced observer, and later embarrassments may be avoided by careful investigations undertaken during the first weeks of life. A change of the accepted sex may be advisable in some male pseudohermaphrodites who have been regarded as girls and, especially since the introduction of cortisone, in some female pseudohermaphrodites brought up as boys. Such changes

should be accomplished as early as possible in the child's life, and the diagnosis should be established beyond doubt by exploration and gonadal biopsy. In each individual case the surgeon must feel confident that the chances of ultimate gain outweigh the immediate risks of psychological injury, and the whole-hearted co-operation of the parents is indispensable.

Some of the "changes of sex" which have been reported in adults fall into an altogether different category. The change has been effected in transvestists—individuals who are both anatomically and physiologically normal males or females, but who suffer from a psychological aberration which leads them to adopt the clothes and habits of the opposite sex, to which they feel they should properly belong. The classical example of transvestism is provided by the case of the Chevalier d'Eon, who, although remarkable for his gallantry in battle, was accustomed to frequent the court of Louis XV in the garments and finery of the women of that time. There is no doubt that a streak of exhibitionism was a feature of his and subsequent cases of transvestism. The phenomenon is most often encountered in males during the third and fourth decades of life, and, although the attitude may be permanent, some transvestists have been content in their later years to return to the ordinary conventions. In modern times all the resources of plastic surgery and of endocrinology have been used, or perhaps sometimes misused, in assisting transvestists to acquire, in irrevocable fashion, the superficial aspects of the opposing sex, and the publicity which has accompanied such transformations has brought to light an unexpected prevalence of the desire for change of sex. All surgeons whose interest in the subject is known have received pathetic letters from these unhappy people, and Hamburger² has recently analysed a series of no fewer than 465 demands for his assistance after the details of one of his cases were published in the lay press. While afflicted individuals deserve the utmost sympathy, many medical men will endorse the view expressed in a recent report³ that a sublimation rather than a direct satisfaction must be found for abnormal sexual urges; and it is hoped that workers in this field will give as much consideration to the social and legal implications as to the individual and technical aspects of the problem.

TETRACYCLINE

The introductory paper by Dr. Maxwell Finland¹ of Boston at the Symposium on Antibiotics² held in Washington last October included some observations on tetracycline, the newly discovered substance of which chlortetracycline (aureomycin) and oxytetracycline (terramycin) are both minor modifications. A fuller account by Finland and his colleagues³ of a study of this new drug has now appeared, and is fully characteristic of the combined thoroughness and celerity of these workers in appraising any new development in antibiotic therapy. Their laboratory studies confirm the greater stability of tetracycline, and the almost exact

parallelism of its inhibitory activity with those of the two other drugs against various species of bacteria: the only differences, and these were of small degree, were that oxytetracycline was most active against *Ps. pyocyanea*, chlortetracycline against staphylococci and certain streptococci, and tetracycline against *Bact. coli*, *Shig. sonnei*, and *Proteus vulgaris*. Cross-resistance between the three was complete. Single doses of tetracycline were given intravenously and both single and repeated doses orally to volunteers, and serial blood assays were carried out. Although the results show a fairly wide scatter which seems to be inevitable in tests of this kind, it is evident from them that fully adequate blood levels are not only regularly attained but sustained for many hours after each dose. The drug was excreted in the urine in high concentrations, but the few observations on cerebrospinal fluid levels were less promising, only two out of seven subjects having a detectable level, one-eighth and one-thirty-second of that in the blood.

Tetracycline was used for the treatment of 118 patients, in most of them for infections of the air passages or urinary tract, the former including pneumonia, "chronic bronchopulmonary infections with acute exacerbations," and acute pharyngitis, and the latter being divided into "acute" and "acute exacerbation of chronic"—an important distinction, since the latter are much less susceptible to any treatment. Although the results are stated in brief detail, they are summed up simply as equivalent to those obtainable with either of the other tetracyclines, and more attention is given to side-effects. It has appeared from the first that the only substantial advantage of tetracycline is its lesser liability to cause gastro-intestinal disturbances, and this the present observations bear out. These disturbances include not only nausea and other subjective effects, vomiting, and simple diarrhoea, but a severe enteritis apparently produced by the multiplication of antibiotic-resistant staphylococci: this condition has even been fatal in the experience not only of Finland and his colleagues and others in the United States but of various authors in Europe. Finland, Grigsby, and Haight⁴ have recently reported a study of the relationship between dosage and the drug used to the frequency of this complication; they found that this could be approximately halved by a moderate reduction in dose, and that the overall frequency of diarrhoea in patients given oxytetracycline was 19%, whereas with chlortetracycline it was 10%. Among the former patients staphylococci were regularly found in the faeces, whereas chlortetracycline diarrhoea was often not staphylococcal. In the present series of 118 patients given tetracycline, 5 had diarrhoea, which was "mild and brief except in one patient, in whom it lasted for two days"; only 2 had staphylococci in their faeces. It thus seems that this drug may well be preferred to its forerunners as better tolerated and less liable to cause a dangerous form of superinfection, particularly in patients requiring prolonged treatment.

"HOSPITALISM"

In 1869 there appeared in the *Edinburgh Medical Journal* a series of articles by Sir James Young Simpson on hospitalism (as he called it) and its effects, in which he described "the hygienic evils which the system of huge and colossal hospital edifices has hitherto been made to involve."¹ In the course of his discussion he referred to the suggestion made by him some 20 years earlier² that these "crowded palaces" should be replaced by villages or cottages with one or at most two patients in each room and which, if made of iron instead of brick or stone, could be taken down and rebuilt every few years—"a matter apparently of much moment in hospital hygiene." Many changes have taken place since that time, but one of the most difficult decisions the general practitioner may be called upon to make is when to send a sick child to hospital and when to let it be nursed at home. He has to balance, for example, the distress caused by separation against the lack of facilities for proper care in the home, and hitherto the absence of skilled and readily available nurses has often tipped the balance in favour of the hospital. For this reason alone the account of the Rotherham experiment described by Dr. J. A. Gillet on page 684 deserves study by other local health authorities. In 1949 the health committee of that county borough approved a scheme for the establishment of a children's home nursing unit which made it easier for a sick child to be nursed at home and remain under the care of the family doctor.

The wise step was taken of suggesting to general practitioners that they should telephone directly to the home nursing superintendent for assistance: special equipment was kept in the nurses' home, and the service was designed to deal with infectious as well as non-infectious cases. Parents were encouraged to inquire at the nurses' home if worried about the child's condition, and night calls are said to have been very few, probably for the reason that the parents knew that help was available immediately if required. By 1952 a total of 713 children under the age of 15 years, three-quarters of whom were under the age of 5, had been nursed without a death, and only 27 children had to be removed to hospital. Dr. Gillet, in his account of the scheme, includes among its advantages the familiarity of home surroundings, the lessened danger of cross-infection, the encouragement of the mother to help in the nursing of the child, and the reduced call on hospital beds. He might have added two other points. First, that this service demonstrates effectively the part which can be played by a local health authority in aiding the general practitioner and relieving the hospital, and secondly that if the mother is permitted to take a central place in the care of the sick child the sense of family responsibility as a whole is greatly strengthened.

A memorial service to the late Dr. N. Gerald Horner, editor of the *British Medical Journal* from 1928 to 1946, will be held at St. Pancras Church on Friday, March 26, at 12 noon.

¹ *British Medical Journal*, 1952, 1, 1264.

² *Acta endocr. (Kbh.)*, 1953, 14, 361.

³ *The Problem of Homosexuality*. Produced for the Church of England Moral Welfare Council by the Church Information Board.

¹ *British Medical Journal*, 1953, 2, 1115.

² *Ibid.*, 1953, 2, 1043.

³ *J. Amer. med. Ass.*, 1954, 154, 561.

⁴ *Arch. intern. Med.*, 1954, 83, 23.

¹ *Edinb. med. J.*, 1868-9, 14, 816.

² *Edinb. mon. J. med. Sci.*, 1848, November, p. 328.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

TESTS OF THYROID FUNCTION

BY

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At times the diagnosis of disordered thyroid function is obvious on the first examination, but often the clinical signs do no more than suggest such a diagnosis, and it is then that further tests are needed. Several tests of thyroid function are available for the clinician, a fact which itself indicates that none is both easy and universally valid alone. However, if the best test is chosen for the problem which the patient presents, the laboratory can usually supply a useful measurement. But misleading inferences may be drawn unless the test is chosen in the light of the patient's clinical condition, and its results interpreted in the light of both the patient's history of recent drugs and his or her general clinical condition.

Not all hospitals can have facilities for all the tests; radio-iodine tests, in particular, require costly apparatus. In the larger centres where the latter is available, radio-iodine offers the simplest initial test for most patients; but careful use of the other tests can usually circumvent the need for this test. Where all tests are available one may summarize their uses as follows. With nervous patients the basal metabolic rate (B.M.R.) is apt to be high and the radio-iodine test is therefore preferable for assessing thyroid function. With patients who have had, within the six previous months, some thyroid operation or treatment or antithyroid or iodine-containing drugs, radio-iodine tests are difficult to interpret and are best avoided. Otherwise radio-iodine is the best test for recognizing or excluding thyrotoxicosis, and the B.M.R. combined with plasma cholesterol the best test for recognizing or excluding myxoedema.

Basal Metabolic Rate Test

This test measures the main effect of the thyroid hormone. It is most commonly done on in-patients; but with suitably equipped laboratories the out-patient can be tested, after being instructed on the day before. The patient attends fasting on the morning of the test, and has the measurement made after half an hour's rest on a bed or couch in a suitably screened and quiet alcove of the laboratory or ward. The usefulness of the test depends on the technician's ability to get the patient calm and restful both before and during the test. To achieve this it is usually necessary to have a routine involving two or more measurements on successive mornings, the first test being preceded by a trial run to accustom the patient to the procedure. The two main readings should agree within 10% of each other and the patient should have been calm, otherwise it is likely that the reading has not been "basal." The test consists in recording the patient's oxygen consumption during a period of six or more minutes. This is usually done with a spirometer connected by two wide-bore tubes to a mouthpiece, into and from which the patient breathes with a nose-clip applied; soda lime is in the apparatus to remove the carbon dioxide, and a drum records the change in spirometer level and so the oxygen consumption.

The result is calculated with the aid of tables; first the oxygen consumption is converted to its equivalent in heat production per unit of surface area (calories per square metre per hour), and then by reference to age and sex tables this is usually converted to "percentage normal."

Till recently the standards commonly used were from American surveys (Dubois, Benedict, or Boothby) based on the tests made on the first visit to the laboratory—that is, with little special effort to make the patient basal. Recently Robertson has published an English series of standards based on duplicate tests agreeing within 5%. With equivalently careful technique the latter standards should be used; their values are about 10% lower than the American standards. With careful technique the normal range is $\pm 10\%$, but in most laboratories it is $\pm 15\%$. The laboratory should therefore state on its report the normal limits for its technique and standards.

There are two main limitations to the usefulness of the B.M.R. test—the difficulty of ascertaining whether the patient really was basal during the test, and the possibility of non-thyroid causes of raised or lowered B.M.R.; the former is the more serious. The "basal" state means as nearly as possible at complete muscular, mental, and digestive rest (12 hours after food covers the last requirement); with nervous patients, in whom the problem commonly arises, this is difficult and sometimes impossible to achieve, and the nearness of the achievement is always hard to assess; inadequacies here can only raise the result. The important non-thyroid factors which may also cause a truly raised B.M.R. are fever, increased respiratory effort (notably that of circulatory failure, in which the rate may be raised up to +25%), phaeochromocytoma, leukaemia, and polycythaemia. The non-thyroid causes of a lowered B.M.R. are usually readily recognized—starvation, severe oedema, and Addison's disease. Obesity also alters the B.M.R., mainly by affecting the standards; if the standard is derived from the actual weight a lowering down to -25% is usual, while it will be nearly equivalently raised if the previously normal weight is used. With seriously abnormal general nutrition it is usually unsafe to infer the level of thyroid function from the B.M.R., except when it is raised in a wasted patient showing no evidence of another primary disease.

Clearly it is difficult definitely to diagnose hyperthyroidism on the basis of a raised B.M.R., but such a suspicion can usually be eliminated by finding a normal result, and a lowered value confirms a suspicion of myxoedema. Thus the B.M.R. is a good screening test for confirming myxoedema or for eliminating the suspicion of thyrotoxicosis when other tests are impracticable; however, if the rate is raised one must be sure that it was basal before accepting it. With nervous patients when this is in doubt it is helpful to estimate a "somnolent B.M.R."—that is, an estimate after an intravenous sedative given to induce sleep—there can then be no doubt that the patient was basal, and if the value is still raised or still normal it can be accepted.

Radio-iodine Tests

These tests assess thyroid-cell activity by measuring the speed of iodine metabolism. During the past ten years radio-iodine tests have become an important addition to the tests of thyroid function. Fortunately their limitations are largely covered by previously available tests, and radio-iodine tests are reliable and particularly useful where the other tests tend to be unsatisfactory.

There are various methods by which radio-iodine may be used to measure the speed of movement of iodine atoms through the body, and so the thyroid cellular activity; all these methods differ only in lesser detail—the important advantages and disadvantages of this type of test apply to

them all. The great advantage of this type of test is its independence of the nervous condition of the patient, and its great disadvantage is its liability to modification by previous drugs. The radiation given to the patient does not exceed that given the patient in such standard x-ray diagnostic investigations as a barium meal. The procedure for the patient is equally simple: after drinking what appears to be water or receiving an intravenous injection, he usually attends for two measurements comparable to having an x-ray examination (see Fig. 1), for a blood sample, or collects some urine samples (see Fig. 2).

The principle of the test is to "label" the body's extracellular fluid (E.C.F.) iodide pool by an intravenous or oral "tracer" dose of radioactive iodide—that is, a dose so small in weight that it is an insignificant addition—whose radioactivity, however, permits its subsequent measurement in various sites such as the thyroid region of the neck, the



Fig. 1.—Apparatus used for measuring radioactivity in the neck. (1) Counter at standard distance from neck. (2) Ratemeter activated by counter which records on both dial (3) and paper (4). The "standard" (1/10 of the dose to be given intravenously) (5) is being counted in front of the patient's neck: later the counter will record over the neck alone.

thigh, or in blood or urine samples at chosen times. This test is really measuring the speed of the movement of iodine atoms through their cycle in the body (Fig. 3); usually by measuring the speed of thyroid uptake (the rate at step B in Fig. 3) or sometimes by measuring the speed of thyroid uptake plus secretory discharge (step B + step C). A simple but clinically adequate theory of the functional basis is as follows. The administered radioactive iodide rapidly comes into equilibrium with the circulating iodide of the E.C.F., whence it is extracted at constant rates (expressed as percentage of the pool per hour) only into the urine and thyroid; after mixing with the thyroid's store the latter is discharged from the thyroid at a rate (percentage of store discharged per hour) depending jointly on the size of the thyroid store and on thyroid secretory activity. As radio-iodine tests involve no measurement of the absolute amount of natural iodide in the body they can give no measure of the absolute amounts of iodine involved; but useful inferences can be derived merely from the rates of these percentage transfers. Two or more measurements are usually taken from which can be calculated these rates of percentage transfer, or, in the simpler

tests, a single measurement may be made of the concentration reached in one site by a standard time, which will give a less specific index of these rates.

There are three main procedures by which radio-iodine is used clinically to assess thyroid function: (a) Measurement of the uptake in the neck (this is the most sensitive), the thyroid clearance (rate at step B), or, as a fairly adequate test, the total thyroid concentration reached at 24 or 48 hours; if the last is used, it is assumed that renal function is approximately normal. (b) Equivalent measurements of the urinary excretion—that is, to obtain either a rate index or a total excretion in a standard time, each of which gives a reflection of thyroid uptake. From three samples of the 48-hour excretion can be derived the "T" index, a rate index of thyroid uptake independent of renal function. (c) Measurements of the appearance of hormonal or protein-bound radio-iodine in the plasma; a sample at 48 hours suffices for this test. Provided a type of test giving a rate is used, the two former are equally sensitive with patients who can collect urine accurately; for recognizing hyperthyroidism the third test is equally sensitive, but it involves too small amounts of radio-iodine for use in the recognition of myxoedema. Thus the tests are approximately equivalent, and are subsequently considered together.

All clinically confirmable, untreated thyrotoxicosis is readily recognized, the average uptake being about 10 times the normal (cf. a B.M.R. of 1,000%). Some other hyperplastic glands, apparently non-toxic goitres, may give similarly raised uptakes; but little harm would come if these were treated as toxic glands, which they may become later.

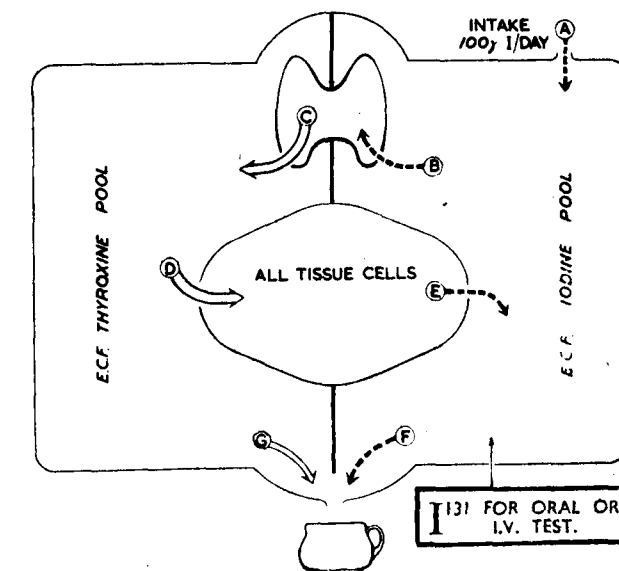


FIG. 3.—The body's iodine cycle. Radio-iodine tests measure the speed of this cycle, usually by measuring at step B, C, or F.

Slightly increased uptake by this test is therefore probably best treated as a normal value. However, any patient who has taken an antithyroid drug such as thiouracil for some months, or has had a recent thyroidectomy, will also show a high thyroid uptake owing to iodine depletion. And conversely any patient who has had iodine in any form will show a lowered uptake—thus thyrotoxicosis may be masked for this test. This inapplicability after iodine, antithyroid drugs, or other thyroid treatment is the main limitation of tests with radioactive iodine; but the B.M.R. test is valid in these circumstances. The test can also be used for the recognition of thyroid deficiency, but here it is not as sensitive; while all patients with absent thyroid function will be recognized, a proportion of those with partial failure will not give abnormal results. Again the results may be invalidated by previous drugs. The test cannot therefore be used to exclude myxoedema, though it may help to confirm its presence; but the B.M.R. test can be safely used to recognize myxoedema not discernible by this test.

Serum or Plasma Protein-bound Iodine

This test measures the level of circulating thyroid hormone, but is technically difficult because of the small amounts involved—the normal range being 4 to 8 µg. per 100 ml. plasma—that is, about 1/1,000 of the range of most



FIG. 4.—Multi-centred epiphyses at left femoral head in a girl of 5 with hypothyroidism.

plasma estimations. As the test can usually only be accurate to about ± 1 µg. per 100 ml. doubtful results may be found in doubtful cases; and it is also lowered in diseases with low plasma proteins. For these reasons, though theoretically possibly the best test of thyroid function, it is best regarded as a research tool rather than one for routine clinical work.

Other Tests

Plasma Cholesterol.—This is a useful test by which to supplement the B.M.R. estimation for the recognition of hypothyroidism. In this condition it is usually, but not always, raised (over 250 mg. per 100 ml. plasma), though of course it may also be raised from other causes—for example, in obstructive jaundice and in diabetes mellitus. In doubtful cases confirmation of the thyroid deficiency may be obtained by re-estimation of this value after two to four weeks of thyroid, 1 gr. (65 mg.) per day, when a fall of over 30% of the previous value should be expected in myxoedema, but not when plasma cholesterol is raised for other reasons. This test is of no value for the recognition of raised thyroid function.

Urinary Creatine Excretion or Plasma Creatine.—Most but not all thyrotoxic patients will show increased excretion of urinary creatine (over 200 mg. per 24 hours) or an increased plasma creatine level (over 0.6 mg. per 100 ml. plasma); but so also will patients with some other conditions involving muscular wasting. A creatine-tolerance test, based on either of these measurements, is also used but it has the same limitations.

Electrocardiographic Evidence.—Complete or nearly complete myxoedema leads to non-specific changes in the

electrocardiogram, flattening of T waves, and a general lowering of voltage. These changes can help to confirm the diagnosis, particularly if they are reversed after two to three weeks' thyroid therapy.

Radiography of Bone in Children.—Before growth is completed, x-ray pictures will always show the growth-retarding effect of thyroid deficiency, three to five or more years' retardation in bone age tending to confirm this diagnosis. In the very young a specific x-ray finding may be used to confirm the diagnosis of myxoedema—epiphyseal dysgenesis and stippled epiphyses; epiphyses formed during the deficiency will show multiple instead of single centres (Fig. 4).

Next article on Clinical Pathology.—"The Assessment of Adrenal Cortical Activity," by Dr. F. T. G. Prunty.

Reports of Societies

ANALYTICAL PSYCHOLOGY

The Section of Psychiatry of the Royal Society of Medicine, met on March 9, with the president of the section, Dr. E. B. Strauss, in the chair, for a discussion on "The Theory and Practice of Analytical Psychology."

The Collective Unconscious

After referring to Frankfurt University's decision to confer the degree of Dr. nat. Phil. on Dr. Strauss, Dr. E. A. BENNET began by emphasizing the tentative nature of certain important formulations in Analytical Psychology. The hypothesis of the collective unconscious, for example, although a distinctive feature of Professor Jung's contribution to psychiatric thought, was not propounded as a dogma but as an attempt to explain the existence of impersonal elements in the mind. The symbolism found in schizophrenic thought processes had suggested to Jung that the basic structure of the human psyche was as little personalistic as the body.

Dr. Bennet, tracing the origin of this hypothesis, said that it first occurred to Jung in 1909. In that year Freud and Jung were visiting the United States to give a series of lectures. During the voyage and while in America they analysed each other. Jung, at this time, had a notable dream, containing material of an archaic character, and this he produced in the analytical sessions with Freud. Their mutual efforts, however, failed to bring meaning to the dream. Freud's interpretation, indeed, seemed not to do justice to the dream. In the dream, Jung was in an ancient house and, wondering what was downstairs, he descended to a cellar and thence to a second cellar. Gazing through a square hole in the floor of the second cellar he saw skulls and prehistoric remains. Further reflection led Jung to see in the dream a picture of the developmental stages of the human mind: the rooms, the cellars, and prehistoric remains being the cultural periods through which mankind has passed—the germ of the Collective Unconscious.

Freud, although he never accepted Jung's developed work on the impersonal collective unconscious, was well aware of non-personal psychic elements—material, he observed, which could not originate from the dreamer's adult life or from his forgotten childhood. Yet the concept of the collective unconscious played no part in the theory or the practice of psycho-analysis.

Biological motives or instincts, Jung maintained, were accepted by all, and yet the assumption that there are instincts was about as daring as the hypothesis of the collective unconscious. The Jungian archetypes, or pre-existent forms in the psyche, were close analogues of the instincts and might indeed be thought of as the unconscious images of the instincts themselves. The evidence in support of the theory of the collective unconscious came in part from the study

of dreams and symbolism. One method used to link the conscious ego with this impersonal, objective region of the mind was the procedure of "active imagination." Spontaneous drawing and painting were used in this work and had proved of much value in therapy.

Cybernetics and the Psyche

Dr. ANTHONY STORR said that Jung regarded all psychological theories as being largely subjective confessions, not as creeds which must be believed. We were a long way as yet from building up a universally valid psychology.

One of Jung's basic ideas was that the psyche was a self-regulating system, with a reciprocal relationship between conscious and unconscious. The physiologists propounded a similar point of view in cybernetics, which was based on the idea that the body was also a self-regulating system with homeostatic mechanisms which kept the internal environment on a middle course between various pairs of opposites such as hot and cold, acid and alkaline, etc. A neurosis could be regarded as an attempt on the part of the psyche itself to remedy a disturbance in equilibrium.

The unconscious had a compensatory function in relation to consciousness, and this could be detected by the study of dreams. Examples were given of dreams which illustrated this compensatory function. The first example was of a woman whose maternal instinct was repressed and who had a dream of a child being run over: this revealed her unconscious desire to have children. The second example showed the unconscious reaction to a too great dependence on the mother: the patient had a dream in which the mother appeared as intensely hostile and threatened to crush her.

One had to consider the goal towards which the psyche was aiming in trying to understand unconscious material. Jung believed that there was a possibility of reconciling the opposing elements in the psyche, and that this was the goal towards which all psychological activity was ultimately directed. The reconciliation between conscious and unconscious was known as the Self in Analytical Psychology and represented a fusion of opposites. The exponents of cybernetics regarded the body as goal-seeking in much the same way, the goal in that case being the maintenance of homeostasis.

The Analysis

Dr. F. O'DONNELL FINIGAN described the procedure in analysis in some detail. Analysis was a joint endeavour, whereby a human situation and a technique became complementary to a mentally creative process. Early on the analyst made the patient feel that he was valued for himself and that the extent of his difficulties and the degree of his achievements were recognized. A series of interviews took place, each of 50 minutes, two or three times a week for several months or longer; a couch was rarely used.

Dreams were spontaneous expressions of the human psyche, expressing both conscious and unconscious attitudes of the individual, and their interpretation was an essential part of analysis. A dream series could be more readily understood than an isolated dream, and later dreams might intimate the need for amplification or re-interpretation of earlier dreams. To the patient was commended the value of writing down each dream on waking, the ideas he associated with it, the current circumstances of his life, the place and date of the dream.

Transference, the ascription by the patient of aspects of his own unconscious mind to the analyst, was usual though not invariable, and it had to be recognized at once, but only be interpreted where necessary. The art came in recognizing the right moment and the right way, in saying neither too much nor too little. Counter-transference, the analyst being affected by the patient in spite of himself, had similarly to be watched for and understood, and even on occasions to be interpreted to the patient. The analyst had to be ever vigilant and aware of what was happening in analysis, and of his own limitations.

LOCAL MEDICAL SOCIETIES

Devon and Exeter Medico-chirurgical Society

The fenestration operation for otosclerosis was the subject of an address by Mr. Philip Scott to the Society on February 18. Otosclerosis, he said, was a common disease afflicting perhaps 1 in 250 of the population. It was seen more often in females than males, and there was a family history of the disease in perhaps half the cases. The disease usually became apparent in early adult life or young middle-age, but might occur from the age of 10 upwards. Pregnancy appeared to accelerate the condition.

Loss of appreciation of high frequency notes or loss of bone conduction contraindicated operation, and usually it was unwise to operate on those over 50. Otherwise, in selected cases and experienced hands, fenestration could be expected to give very considerable improvement in 70% of cases, and some improvement in almost all. Successful fenestration gave the patient hearing as good as that provided by the best types of hearing-aid. Initial failures which had brought the operation into some disrepute had been caused by gradual closure of the fenestrae over a period of months and unsuccessful attempts to disarticulate the stapes.

Manchester Medical Society

Speaking at a meeting of the Section of Medicine on February 24 on dyspnoea, Professor Ronald V. Christie said that from simultaneous records of the tidal air and intrathoracic pressure it could be shown that in health, whether at rest or on exercise, we breathe at the rate and depth which is most economical in terms of respiratory work. The rapid, shallow breathing associated with heart failure and pneumonia was just another illustration of this rule; this change in rhythm should therefore be considered as a beneficial compensatory phenomenon which occurs when the lungs become more rigid.

Nova et Vetera

SOME MORE RARE BOOKS

The name of John Banester, the Elizabethan surgeon who was recently the subject of a note in these columns (February 6, p. 329), appears again in a book to be sold on March 24 from the library of the Earl of Derby. It is the first edition of the (posthumous) *Workes of that famous Chyrurgian, Mr. John Banester*, London, 1633. The second of the three volumes is entitled *An Antidotarie Chyrurgicall: or Storehouse of all sorts of medicines*, and the third *A Storehouse of Physicall and Philosophicall Secrets*. Other old medical books in the same sale include Philip Barrough's *Method of Physick*, 1639; Thos. Bonham's *The Chyrurgions Closet: or, an Antidotarie Chyrurgicall, furnished with varietie and choyce of Apophlegms, Balmes, Baths, Caps, Cataplasmes, Caustiks . . . Diets, and Wound Drinks, Defensatives, Dentifrices, Electuaries, . . . now drawne into method and forme by Edward Poeton of Perworth, London, 1630*. Jacques Guillemeau is represented by *Child-birth, or the Happy Delivery of Women*, London, 1635, of which the *Short Title Catalogue* lists only one copy, that in the British Museum. William Harvey's *Anatomical Exercitation concerning the Generation of Living Creatures*, London, 1653, is a translation into English of the *De Generatione Animalium* published in 1651. Another unusual textbook, with engraved portrait of Queen Elizabeth I, is *The Closet of Physical Secrets with certain approved medicines . . . and supplied with the Child-bearers Cabinet*, London, 1652. It calls itself a "Treatise concerning the Plague and the Pox." The remaining medical books in the sale are of less interest.

Correspondence

Rh Antibodies and Domiciliary Midwifery

SIR.—As Dr. M. Chalk says in his concluding remarks (*Journal*, February 20, p. 457), it is a very great thing to have given the mother peace of mind and happiness. It is a greater thing to have given her the conditions in which she is most likely to have a successful outcome to her pregnancy and labour, and the greatest thing of all is to give her both peace of mind and a happy outcome. The decision whether she is to be confined at home or in hospital should have this combined end in view, and this decision can only be made by the practitioner, who knows all the facts.

No laboratory worker, reporting on a sample, will presume to "instruct" the clinician who sent the sample for investigation, because only the clinician is in a position to correlate all the information on which the decision should be based. But the clinician would not be obtaining the best result from the laboratory investigation which he requested unless the laboratory worker, as well as baldly reporting the result, were to offer his suggestions in regard to the interpretation of the result, and the various lines of action arising out of it. To deny this is to reduce the laboratory worker to the status of a medical auxiliary, and to deprive oneself of the benefit of the accumulated experience of one's laboratory colleagues.

Both Dr. Chalk and Dr. C. W. Walker (*Journal*, March 6, p. 580) agree that a patient with rhesus antibodies should be delivered under conditions providing for (a) a clinical examination of the infant at birth, (b) facilities for an immediate Coombs test and Hb estimation, and (c) facilities for an immediate exchange transfusion if indicated. If these conditions can be fulfilled at the patient's home, there is no need to override her wish to be delivered there. If they cannot, it is for the practitioner to decide, as in other obstetrical abnormalities, whether he can advise her to take the risks to the infant arising from their absence.

If there is some ground for criticism of the psychological approach to the patient at certain hospitals, as seems to be suggested by Dr. C. W. Walker's last paragraph, the remedy would seem to lie in a representation to the hospital clinicians concerned, rather than to deprive the patient of facilities which she needs.—I am, etc.,

Cambridge.

C. B. V. WALKER.

SIR.—In view of the interest in this subject aroused by Dr. M. Chalk's letter (*Journal*, February 20, p. 457) and the subsequent correspondence, I feel that the experience of one hospital's obstetric and paediatric departments may be worth reporting. The obstetric department handles 600–700 deliveries per year, and a total of 34 mothers with rhesus antibodies have been delivered here during the last five years. Of these, 27 (79%) gave birth to living rhesus positive babies showing a positive Coombs test on the cord blood. All these received either exchange transfusion or simple transfusion through the umbilical vein, and some received subsequent transfusion when a fall of haemoglobin made it necessary. The remaining seven cases (21%) comprised one (3%) with an Rh-positive child having a negative Coombs test, three (9%) with Rh-negative children, and three (9%) foetal deaths, including a case of hydrops foetalis, a macerated stillbirth, and a therapeutic termination of pregnancy.

A follow-up on the 27 affected living children shows that there have been five deaths, a mortality of 19%, one of these occurring during replacement transfusion of a child found subsequently to have a cardiac abnormality which probably contributed to its death. The remaining four deaths were from kernicterus, and all of these had received only one or more simple transfusions, usually because an attempt at exchange transfusion had failed. I may add that none of these deaths due to failure of exchange transfusion occurred during the past two years. Among the 18 babies surviving exchange transfusion there were no deaths. Three babies

have so far shown signs of permanent brain damage, and of these one had a simple transfusion only, one had a partial exchange transfusion, and the third had an exchange transfusion and a subsequent simple transfusion.

Although this series covers a comparatively small number of cases, it bears out strongly the advantages of immediate exchange transfusion through the umbilical vein as recommended in the M.R.C. memorandum No. 27 on "The Rh Blood Groups and Their Clinical Effects." Our figures suggest that a mother with Rh antibodies in her serum has about an 80% chance of producing an affected living child, and that immediate exchange transfusion will give such children the best chance of survival. The fate of these children may be compared with that of three affected babies born of mothers who for one reason or another did not have antibody titrations performed during pregnancy. Two of them received no treatment because the condition was not recognized until the second or third day of life, and the third received an exchange transfusion which was not started until nine hours after delivery. All these babies died with kernicterus. While it is true that a certain proportion of babies will survive with no treatment or with a small transfusion about the tenth day, these do not constitute the majority, as Dr. Chalk suggests in his letter. Rapidly developing jaundice, which occurred in about 70% of our cases, with a progressive anaemia is the rule rather than the exception, and the risk of death from kernicterus in the untreated or inadequately treated case is considerable.

While it is of course true that the patient, advised by her own doctor, must decide whether the confinement is to be conducted at home or in hospital, I feel that it is only right that the above figures should be taken into account in coming to such a decision. Even where 24-hour laboratory facilities are available to the practitioner, and immediate admission of the affected child can be arranged, valuable time will be lost which may make all the difference between recovery and death. Exchange transfusion as soon after delivery as the performance of the necessary laboratory tests will allow seems to give the babies the best chance of survival, and this usually means delivery in hospital.—I am, etc.,

Maldenhead.

F. E. T. SCOTT.

The Lucid "I"

SIR.—Conciseness and the avoidance of ambiguity are held to be the principal requirements of any literary style to be employed in scientific writing. "I" is both concise and precise, but is studiously avoided by single authors except in written versions of work first presented orally. I should be interested to learn from you, Sir, or from any of your readers, what contributions to lucidity are considered to be made by the avoidance of the first person. Much of the matter recorded in a paper is the intimate concern of the author. He often makes the observations he records; he forms the impressions he describes; he draws his own conclusions, adds his comments, and makes his suggestions. Now most authors are only too anxious to put their names on contributions. Why this seemingly bashful avoidance of "I" in the text? If an author feels free to write "Brown's results," surely Brown himself, discussing these same results, can write "my results."

The disadvantages of avoiding "I" on principle are numerous. The use of the passive voice sometimes introduces literary difficulties which are solved either by making literary blunders or by resorting to clumsy circumlocutions. One of the worst results of using "it" and the passive is the confusion that is liable to arise as soon as the work of another author is referred to. Having mentioned "Brown, 1953," a writer who follows up with, "It is concluded that . . ." is in danger of attributing his own conclusion to Brown, who might have none of it. If an author is stating his own conclusion, why doesn't he make that clear by using "I" as fearlessly as he uses "Brown"? Having heard the views of some of my colleagues on this matter, I am inclined to believe that the prejudice against "I" is rooted in a pretence of objectivity where no such ideal is in

fact achieved, or in the vague notion that scientists should appear to be impersonal even when they are not being objective. A single author who writes phrases like "it is felt that" or "it is recommended that" is attempting to give a veneer of universality to feelings and activities peculiar to himself. I should class such phrases with "It broke," used by careless housemaids to explain a disaster.

Multiple authors appear not to be as anxious to avoid "we" as the single author is to avoid "I." This seems to me to indicate that the avoidance of "I" is founded upon those very personal and emotional factors which the objectors claim to be trying to avoid. If two can say "we," nothing but squeamishness can prevent one from saying "I." It is true that many of the technical operations reported by an author may have been carried out by assistants and that the passive best serves in their description. On the other hand, conclusions, impressions, intentions, expectations, suggestions, and especially feelings, expressed by the author, if they be his, should be properly described as his own. If accuracy really is desired let us have "I," "me," and "my" wherever necessary.

Even scientists are subject to phenomenalism; and every observation, since it involves perception, is partly subjective. Disagreements, failures to confirm, and reinterpretations are so common in science that the subject deserves to be mentioned whenever this is a significant ingredient. Either let us hear a sound case for the avoidance of "I" or let us revert to the forthright style of Boyle or Leeuwenhoek.—I am, etc.,

London, S.W.1.

HAROLD B. HEWITT.

Intra-arterial Transfusion

SIR.—The letter of Mr. W. G. Mills (*Journal*, February 13, p. 393) inquiring about cases of intra-arterial transfusion in obstetric patients prompts me to record a case which I encountered in August last year in which the technique appeared to be life-saving.

A fit woman, aged 24 with two children, was at term and the foetus was lying transversely. No apparent cause could be found for this and the lie was easily corrected to a longitudinal one. It was felt that when her labour began gentle external version should be done to correct the lie. Her labour began early in the morning, and the house-surgeon gently performed external version. The patient complained of some abdominal discomfort and shortly after this she suddenly collapsed. On my arrival the registrar had begun an intravenous transfusion with blood and the third pint was being given. The patient's condition when I first saw her was such that at first I had difficulty in deciding whether she was alive or not. There was no palpable pulse, respiratory movements were just perceptible, the patient was deeply unconscious, and the blood pressure was unrecordable. Rapid abdominal examination convinced me that the uterus had ruptured. I hastily exposed the radial artery at the wrist, but its calibre was so small that I was quite unable to put a cannula into it. The possibility of intra-aortic transfusion was not considered, as the necessary needle was not readily available and it would have, in my opinion, harmed the patient to move her on to her side at this stage. Two pints (1.1 l.) of blood were transfused under pressure using a sphygmomanometer bag into the brachial artery within a matter of about six minutes. Towards the end of the second pint the patient's pulse once more was palpable and respiration became more regular. She was still unconscious. While transfusing the third pint she was moved to the theatre, and her condition was such that I was able to open her abdomen with the expert aid of my anaesthetist, Dr. I. Gow. The uterus had ruptured from the fundus to the lower uterine segment in the mid-line along the posterior wall. There were about five pints (2.8 l.) of free blood in the peritoneal cavity and the foetus had escaped from the uterus.

I performed a rapid subtotal hysterectomy, and during this time a further two pints (1.1 l.) of blood were given intra-arterially under pressure. An hour later the patient was conscious and her condition was much improved. The skin temperature of the hand was a little low for about 36 hours and then reverted to normal. The puerperium was uneventful and the patient was discharged on the fourteenth post-operative day. She has remained well since.

In retrospect I am convinced that intra-arterial transfusion was life-saving here, and in similar circumstances where

profound shock was persisting or becoming worse in spite of adequate intravenous transfusion I would be prepared to do the same thing again, although I feel that if the radial artery can be entered at the wrist this is a safer procedure than using the brachial artery.—I am, etc.,

Manchester, 20.

R. W. BURSLEM.

Methylpentynol

SIR.—With reference to Dr. A. G. Boag's disappointment in methylpentynol as an alternative to the barbiturates (*Journal*, February 13, p. 393), a few impressions from general practice might not go astray. When this substance first appeared it was hailed and acclaimed as the answer to "the barbiturate problem," even attracting the attentions of the lay press. Unfortunately it now seems difficult, if not impossible, to wean on to methylpentynol those patients who have been taking barbiturates for anything but a short time; such patients take as much as four capsules—that is, 1 g.—in place of half a grain (32 mg.) of phenobarbitone, with little or no effect, save a possible stomach-ache. Patients with bona-fide anxiety states derive little help from methylpentynol, as do those whose sleep is prevented by pain or the malaise of serious illness. Yet methylpentynol is almost invariably successful where sleep is disturbed by the activity of a mind which never ceases to churn over the problems of everyday life. Two capsules, in such cases, taken in bed, and preferably with a warm drink to minimize the possibility of gastric irritation, usually result in a patient peacefully asleep within half an hour. Those who are helped in this manner rarely feel undue drowsiness; they just fall asleep, usually having felt more contented for a short while, with a lightening of anxiety which never amounts to euphoria. It seems that methylpentynol permits sleep by counteracting mild emotional tension, rather than by inducing sleep after the fashion of the barbiturates.

Methylpentynol in elixir form should be valuable in paediatrics, where its indications are similar to those of chloral hydrate; as with the latter compound, it is of little avail as an anticonvulsant. It seems justifiable to suggest that methylpentynol is neither superior nor inferior to the barbiturates; their indications differ, and methylpentynol will earn its place in therapeutics as did the barbiturates. Poor results will be forthcoming if it is anticipated that methylpentynol will do the heavy work of the barbiturates; on the other hand, barbiturates are frequently employed when methylpentynol would do a better job, with less depression and less risk.—I am, etc.,

London, N.11.

NEVILLE DAVIS.

Anaesthetic Explosions

SIR.—Some suspicion has been directed recently to the reservoir bag, on being disconnected from a Boyle's anaesthetic machine, causing explosion of cyclopropane and oxygen. The following seems to me to be the explanation.

The inside of the bag becomes dry owing to fresh gases continually entering it. Friction of rubber and talc of adjoining surfaces by continuous movement causes an electrostatic charge to develop. On sudden deflation on disconnecting, the bag collapses to a flattened shape by infolding of the opposite sides. The area on which the charge is spread is suddenly halved, and the voltage of it thereby suddenly doubled, according to well-known laws. Sparking potential is reached near the neck, which is bathed in inflammable vapours issuing from the collapsing bag.

The obvious solution is to keep the inside of the bag damp by passing the gases over water in the trichlorethylene or ether bottle.—I am, etc.,

Birkdale.

N. S. WALLS.

SIR.—When we were taught our anaesthetics 25 years ago we were told that it was unwise to use chloroform, because if a death occurred whilst this was being used the coroner would request a full explanation as to why this agent had been selected. Explosions in operating theatres occur too

frequently—sometimes with loss of life. If cyclopropane and ether were removed from all theatres we could have few explosions in this country. Whilst in no way suggesting that these anaesthetics should be abolished, I do suggest that ether bottles should be removed from machines and from the theatres when not wanted for the case being anaesthetized. A bakelite screw cap will cover the bottle, leaving it ready for use when required. These caps can be found in most hospital pharmacies. I am sure that little inconvenience would be caused if cyclopropane cylinders were similarly removed. This would make impossible the accidental turning of the handle which has happened to most of us. The simpler suggestion of removing the handle is not so effective, as others have a habit of replacing it. These steps, which can be taken without cost, are more practical than many of the very expensive alterations which are now advocated.

As many anaesthetists no longer give ether to adults it is possible to eliminate the risk of explosions in at least 50% of our cases. In any hospital where these precautions were instituted a real appreciation of the explosion risk would soon become widespread and as a result still greater care would be taken when explosive mixtures were used. I am sure that all concerned will give these points their serious consideration.—I am, etc.,

Portsmouth.

H. B. C. SANDIFORD.

Anaesthesia in Out-patient Departments

SIR,—The suggestion in your leading article on anaesthesia in out-patient departments (*Journal*, February 27, p. 505) that the "out-patient department sees little of trained anaesthetists" is not quite accurate. You have not taken into account the attendance of consultant anaesthetists at dental out-patient sessions. In the London area alone there are well over 100 sessions each week where anaesthetics are given by consultant anaesthetists. Many anaesthetists at teaching hospitals make a point of attending out-patient sessions, as they rightly consider that this is by far the best place to teach simple anaesthetic techniques to students. It is comparatively useless for a student to watch the anaesthetic for, say, a gastrectomy. He will not learn anything which will subsequently be of use to him in general practice, and his presence is a distraction to the anaesthetist. How different it is in the dental out-patient department, where the signs and symptoms of anaesthesia may be repeated 20 or 30 times at each session. One way of avoiding accidental death in minor anaesthetic procedures is to use local analgesia instead of general anaesthesia. In the out-patient department of University College Hospital 94% of all minor surgery is done under local analgesia. This of course further reduces the opportunities of students in learning simple general anaesthesia, but it is safer for the patient when the anaesthetist is unskilled.

With regard to trichlorethylene ("trilene"), Professor Webster was quite right in stressing the importance of premedication.¹ Sudden deaths from trilene anaesthesia where premedication had not been given have already been reported in this *Journal* by more than one observer.² This is without doubt the reason why, in the interest of maternal safety, the Central Midwives Board still withholds permission for midwives to use it when they are not under medical supervision.—I am, etc.,

London, W.1.

MASSEY DAWKINS.

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- ² Cope, R. W. (1949). *British Medical Journal*, 1, 454.
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Erythromycin

SIR,—With dismay I read your leading article (*Journal*, January 30, p. 261) saying that yet another antibiotic had been released freely on prescription. I am a general practitioner trying, when I have time to remember, to maintain and raise my clinical standards. I have been taught, and from my own experience believe, that penicillin is the best

antibiotic for all staphylococcal, streptococcal, and pneumococcal infections, and in my opinion it works best when injected. Penicillin is cheap, it costs no dollars, and it is without toxicity. If I have a patient with some condition that does not respond to penicillin, then to me this is an indication for a second opinion or for laboratory testing of sensitivities. It is not an indication to embark upon a new expensive antibiotic.

Since erythromycin covers the same range of organisms as penicillin, it would seem that one can treat one's patients either by mouth with erythromycin or by injection with penicillin. After a time the doctor who uses the needle will be unpopular.

It is argued that erythromycin will be of use, since it will deal with organisms resistant to penicillin, but, since this can only be determined through a hospital laboratory, it will never concern a general practitioner. Furthermore, inadequate doses of any antibiotic may lead to resistant strains. A course of penicillin injections prescribed and given means that much penicillin in the body, but a box of erythromycin tablets may be anywhere. I urge that erythromycin be kept for hospital use only.—I am, etc.,

Gorleston-on-Sea.

H. A. EVANS.

A Cosmetic Amputation

SIR,—I have followed the correspondence on this subject with considerable interest, and am now emboldened to raise a few points that have not been elucidated by your contributors. The first: what is a cosmetic amputation? I imagine it to be an amputation that is less likely to offend the aesthetic sense of the beholder than another. This, of course, is a subject on which I hesitate to express an opinion, because I may myself be deficient in artistic sense since I still prefer Michelangelo to Henry Moore. It has apparently been assumed by all the correspondents that the hand in which the head of the metacarpal bone has been removed together with the finger leaves a better cosmetic result than a hand in which the same finger has been amputated at the metacarpo-phalangeal joint.

Now I venture very humbly to question this as a fact. In my view the hand that has had a carefully planned operation for removal of the head of the metacarpal, with the scar invisible, becomes a grotesque object. There is something abnormal about it. It is now malformed rather than deformed, and it demands a second look: is it a congenital abnormality, or what is this strange thing? Only by careful scrutiny can the casual observer see that the man has suffered an injury. Contrast this with the impression made upon the observer of the man who has had a finger amputated at the knuckle-joint. It is accepted for what it is, the result of injury, and it does not demand a second thought. Human nature has been injured to injury from the birth of time. But there has always been horror at the thought of congenital malformation.

A second point: in planning his operation the surgeon must take into consideration that the hand on which he operates is the complement of the other hand, and that, in fact, almost one-third of its function is to act in opposition to and in collaboration with the other. The third point is the balance of the hand—a book could be written on this subject. Suffice it for me at the moment to draw attention to the fact that the middle finger acts practically along the middle line of the palm, and its action must be distributed evenly over the metacarpal heads. The fourth point is the function of the flat hand, as opposed to the hand used in one of the various grips. The flat hand is used in very many types of occupations from paper making and press operating to charring. Any interference in this function by disturbance of the metacarpal arch may be a serious handicap. The fifth point concerns painful nerve endings. These, of course, should not occur after any operation. But, if they do occur, they cause far more disability if they are placed up in the palm of the hand than over the end of the metacarpal head.

In a final paragraph, Sir, may I venture to sum up many years' personal experience in the treatment of industrial injuries in this way: I do not know of any case justifying the amputation of the head of the fifth metacarpal bone. I do realize that on very rare occasions the hand is improved in function for a particular industry after amputation of

the head of the second metacarpal bone. One such case may be the working jeweller who has to handle light forceps in the affected hand.

Finally, I have not seen a case of a patient with an amputation through the metacarpo-phalangeal joint who has asked to have the head of the bone removed, except for pain.—I am, etc.,

London, W.1.

HUGH GRIFFITHS.

The Cerebrospinal Fluid in Diagnosis

SIR,—May I comment on one or two points arising from Dr. J. N. Cumings's article "The Cerebrospinal Fluid in Diagnosis" (*Journal*, February 20, p. 449)? In discussing the sugar content of the C.S.F. in meningitis of tuberculous and viral origin, he states that in "virus meningitis" the sugar is normal or only very slightly reduced, while in tuberculous meningitis it is decreased to 20–35 mg./100 ml. Although this is undoubtedly true in the majority of cases, there are exceptions in which errors of diagnosis and treatment will result if these figures are accepted as diagnostic criteria.

In the period 1950–2 I was able to study a number of patients suffering from meningitis of both types who were admitted to the Whittington Hospital under the care of Dr. Michael Ashby. In three cases of "benign lymphocytic meningitis" the C.S.F. sugar was reduced to the levels quoted above as being typical of tuberculous meningitis. The actual ranges found in the different patients were 30–45 mg. and 28–42 mg. and 33–37 mg./100 ml. The first two patients had positive complement fixation tests for the mouse lymphocytic choriomeningitis virus, while the third had a virus meningitis of unknown origin. A woman of 55 who was eventually found to be suffering from meningo-vascular syphilis had before treatment C.S.F. sugars varying from 17 to 27 mg./100 ml.

A recent paper¹ has reported low C.S.F. sugars in about 10% of cases of meningitis due to lymphocytic choriomeningitis virus, and less often in mumps meningitis and meningitis caused by the and less often in mumps meningitis and meningitis caused by the virus of herpes simplex. Conversely, although it is usual for the C.S.F. sugar to be reduced substantially in tuberculous meningitis, this is not an invariable finding. In some early cases the sugar is within normal limits, and this finding should not be allowed to prejudice the clinician against a diagnosis of tuberculous meningitis. I have also seen a case in which, while there was no difficulty in finding the tubercle bacillus in the C.S.F., in the fortnight before death the sugar was normal (46–72 mg./100 ml.). This patient was having the usual systemic and intrathecal streptomycin during this time.

Apart from the demonstration of the tubercle bacillus in the C.S.F., there is no single aspect of the findings in the fluid which can, of itself, be regarded as diagnostic of tuberculous meningitis. As Dr. Cumings states, it is only when the clinical pathologist is willing to spend considerable time in examining films for acid-fast bacilli that treatment can be started in the certain knowledge that the meningitis is tuberculous. The finding of a low C.S.F. sugar in a patient with a lymphocytic meningitis should not automatically result in the patient starting the long ordeal of streptomycin therapy with all its dangers and discomforts for the patient.

Finally, Dr. Cumings states that a "paretic curve in the absence of a positive Wassermann reaction only occurs in disseminated sclerosis, inclusion-body encephalitis, and a few cases of encephalitis lethargica." Two patients with virus meningitis were seen who had strongly paretic Lange curves for short periods at the height of their illnesses. A male of 32 developed lymphocytic meningitis 17 days after an attack of chickenpox, but his serum showed a rising titre in the complement fixation test for lymphocytic choriomeningitis. His Lange was strongly paretic on the 8th and 10th days of the meningeal illness, but had returned to normal on the 15th day. A male of 28 with lymphocytic meningitis had a paretic Lange on the 14th day of his illness, and the Lange had returned to normal on the 19th day. Complement-fixation tests for the virus of lymphocytic choriomeningitis were negative. In both these cases the C.S.F. contained large numbers of lymphocytes (500–2,000), raised protein (200–650 mg./100 ml.), and sugars of about 35 mg./100 ml. In both patients the W.R. in blood and C.S.F. was consistently negative. In another patient, in whom the complement-fixation test for lymphocytic choriomeningitis was negative on the 8th day and mildly positive on the 31st day, the Lange was normal on the 9th day.

Thus it appears that the Lange colloidal gold curve may be of the paretic type for short periods in the acute phase

of some forms of virus meningitis. A paretic Lange with no serological evidence of syphilis has also been reported in some cases of subacute cerebellar degeneration 'on association with carcinoma of the breast,' ovary, and bronchus.²—I am, etc.,

London, E.1.

P. B. CROFT.

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- ⁴ Henson, R. A. (1953). *Proc. roy. Soc. Med.*, 46, 859.

Abbreviations

SIR,—Early in my professional training I was taught that it was most provincial to use local names, colloquialisms, and abbreviations in technical papers and presentations. Even the development of an alphabet Government under the late Mr. F. D. Roosevelt did not change this basic idea as far as I know.

In reading British publications of all kinds I am constantly plagued by abbreviations. A typical example is in the very well done report on immunization against diphtheria given by Butler, Barr, and Glenn in the February 27 issue of the *Journal* (p. 476). I still would like to know what A.P.T., P.T.A.P., F.P.T., and Lf are, even though I can hazard a good guess at some of them. To me, at least, a much better way to write is illustrated in the same issue in an article by Bayliss and Steinbeck (p. 486) in which they say, "In certain diseases corticotrophin (A.C.T.H.) . . ." Henceforth, A.C.T.H. could be used without any doubt of its meaning.—I am, etc.,

U.S.A.F. Hospital,
Arrington, Herts.

CHARLES H. MORHOUSE.

Child Life and Health

SIR,—Members of the public health service will be greatly cheered by Professor Charles McNeil's Fleming Memorial Lecture (*Journal*, March 6, p. 533) in which he expresses the opinion that success in the promotion of health in childhood in the future rests with the child welfare services.

Your leading article in the same issue (p. 569) accepts this view provided that the importance of the family doctor in such services is fully recognized. The foundations of child life and child care are in the home rather than in the hospital, and you therefore rightly express the opinion that "the need is for an increasingly close link between the general practitioner and the children's services provided by the local health authorities." By a happy coincidence, one valuable means of furthering this aim appears in the *Supplement* of the same issue of the *Journal* (p. 61) in the form of the B.M.A. statement encouraging co-operation between general practitioners and health visitors. I should like to suggest that therein lies a real opportunity for further success in the sphere of child health.—I am, etc.,

Oxford.

J. F. WARIN.

Advice on Weight-lifting

SIR,—I have occasion to see a fairly large number of men who have attended hospital, and in many cases have been operated on, for back injuries due to lifting. They have returned to work, often with corsets, and usually advised to avoid heavy lifting. In no single instance has any one of them been shown how to lift properly and avoid further injury. Might it not be a good thing, not only that factories, but also hospitals, should give advice on this matter?

The Home Office Industrial Museum, Horseferry Road, S.W.1, has a special display and posters illustrating the right and wrong way to lift.—I am, etc.,

Farnham Royal.

M. E. M. HERFORD.

Toxicity of Pyrimethamine

SIR,—I write to report two further cases of overdose with pyrimethamine, as I feel all such episodes with new drugs should be given as wide publicity as possible.

In view of Dr. R. Y. Taylor's report (*Journal*, August 1, 1953, p. 285) of a fatal case, all parents to whom these

tablets are issued are warned to keep them well out of the reach of small children. Despite this, two small girls aged 18 months and 3 years obtained possession of the household supply and are estimated to have disposed of 25 tablets, each of 25 mg., by 8 a.m. on January 30, 1954. When seen at 9 a.m. they had already begun to vomit and were encouraged to continue vomiting with doses of salt and water and of tinct. ipecac. Apart from pallor and an expression of apprehension, probably caused by the mother's scolding, they appeared to be free of other symptoms. The elder child had a convulsion at 11 a.m. Five minutes later she had fully recovered and was co-operative. Vomiting at intervals continued until 1 p.m., when she fell asleep, and on waking at 4 p.m. she was normal in every respect. Apart from vomiting, the younger child showed no ill effects, though she is believed to have had much the smaller share of the missing tablets.—I am, etc.,

Swaziland.

W. G. DAVIDSON.

Overdosage of Teething Powders

SIR,—In your issue of December 12, 1953, p. 1330, you publish the account of an inquest on a child whose death was attributed to mercury in teething powders, and append a note to the effect that one large firm of manufacturers had informed you that they had discontinued mercury as an ingredient. This morning I have seen in hospital a child of 15 months with a very extensive and vivid eruption which I diagnosed as a drug-rash from phenolphthalein (in all probability) before I even asked about teething or other powders. The child had, in fact, had several powders made by the firm in question. The percentage incidence of idiosyncrasy towards this drug must be low, because laxatives containing it are taken in enormous numbers, but actual cases of phenolphthalein eruption are by no means rare, and they can be very severe. It may be doubted if it is much of an improvement on mercury for administration to young children. *Incidents in Scyllam cupiens vitare Charybdim.*—I am, etc.,

Glasgow, C.S.

J. FERGUSON SMITH.

Incidence of Cancer of the Cervix

SIR,—Having for some time believed that the usual textbook statements about the relative frequency of carcinoma of the cervix and of the body of the uterus bear little relation to fact, I was pleased to note the paper by Dr. J. W. Mager and Professor W. Kearney (*Journal*, February 20, p. 434) giving their rather unusual findings. This stimulated me to analyse the records of the Department of Pathology of the Women's Hospital, Liverpool, for the two years 1952-3, and I found that during that period 1,817 endometrial curettings, 757 uteri (the vast majority total hysterectomy specimens), and 679 cervixes (including biopsies and those removed in the course of repair operations) were examined. In this material 92 cases of carcinoma of the body were discovered, 4 of which were epidermoid in type, and 88 cases of carcinoma of the cervix, 2 being adenocarcinomas. Thus it can be seen that the incidence of each type was virtually equal.

Consulting the Registrar-General's returns for England and Wales for 1951 and 1952, it was found that during this period 5,132 women died from carcinoma of the cervix, 2,422 from carcinoma of the body, 68 from other forms of carcinoma of the uterus, including chorion epithelioma, and 461 from "carcinoma of the uterus," site unspecified. This 2:1 ratio in favour of carcinoma of the cervix as a cause of death does not necessarily mean that it is twice as frequent as carcinoma of the body, as the former affects, in general, younger women and is less amenable to treatment. I feel there is quite enough evidence for us to modify textbook figures of relative frequency to read that carcinoma of the cervix is at the most twice as common as carcinoma of the body, and would be interested to hear the opinion of others on this matter.—I am, etc.,

Liverpool, 8.

ROBERT P. TOWERS.

Doctors' Handwriting

SIR,—Mr. Geoffrey Keynes (*Journal*, February 20, p. 458) raises the question whether prizes for good handwriting might be awarded in the medical schools. Perhaps my own experience may be worth contributing to the discussion.

I joined the Society for Italic Handwriting and read all the books, and the first question was whether I should go back to the beginning and learn italic or whether I should set to work and rebuild my own hand. In either case it would be quite futile to work hard for half an hour or so every day at a new hand and then spend the rest of the day writing my old one; and it was obvious that I could never get through my work if I had to write everything all day very carefully and very slowly. The only solution was to learn to type; then if I typed all my letters I ought to be able to manage my prescriptions and certificates in a new hand. So I set to work with a typewriter, but I soon discovered that learning to type would take all the time I could spare for many months. It was very hard work, but it was surprisingly interesting, partly because it was so very like learning to play golf. I then wrote to one of the italic handwriting authorities and I was told that that also took a lot of learning. And that is not the end of it; it seems to be pretty certain that in the case of an adult both accomplishments have to be kept up by daily work or the skill is soon lost. And even daily work is not quite enough, the adult beginner will always have to write his italic or use his machine with a good deal of care. If that is so, it seems extremely doubtful whether any general practitioner could find time and energy to become good at both. If the choice is between learning a new hand and learning to type I think the doctor is bound to choose the latter: typewriting is always easier to read than any handwriting; a good typist can type very much quicker than anybody can write; and it is a great advantage to be able to make two or three carbon copies.—I am, etc.,

Wetherby, Yorkshire.

R. L. KITCHING.

Diabetes Insipidus Associated with Pulmonary Disease

SIR,—I have recently seen a case very similar to that described by Dr. R. B. Raffle in his article (*Journal*, February 20, p. 436), which was likewise referred to me through the mass radiography department, for which I am grateful to Dr. E. E. Mawson.

This woman, 52 years of age, was complaining of some dyspnoea on exertion which made her rather easily exhausted. She had never wheezed, nor had she had any cough or sputum; at times, especially in the cold, she experienced some paroxysmal chest pain. On careful questioning, she decided that her breathlessness had not greatly increased since 15 years previously when she first reported it to her doctor. After an x-ray at that time she was sent to a sanatorium, where she was told, after five months' observation, that no active tuberculosis could be found. In the following year she developed diabetes insipidus. Recent examination showed her to be in good general condition, slightly overweight at 10½ stone (66.7 kg.). Clinically her heart, lungs, skeleton, and skin seemed normal. There was no lymphadenopathy or enlargement of the spleen. X-ray of her chest showed widespread miliary mottling with slight reticulation, and the appearance was identical with the sanatorium film taken 15 years before. X-ray of her pituitary fossa was normal, and her blood cholesterol 255 mg. per 100 ml.

I considered that the diagnosis lay between xanthomatosis and sarcoidosis. As the patient was disinclined to come into hospital for any attempt at confirmatory measures such as liver biopsy, I tested the tuberculin neutralizing powers of the serum. In five patients giving an average diameter of 8 mm. reaction with 1 in 10,000 old tuberculin intradermally, this patient's serum produced complete inhibition of the reaction. This finding would seem to point very strongly, although not certainly, to a diagnosis of sarcoidosis, and I feel that this test merits a further clinical trial in attempting to establish such a diagnosis when no biopsy is practicable.—I am, etc.,

Bristol.

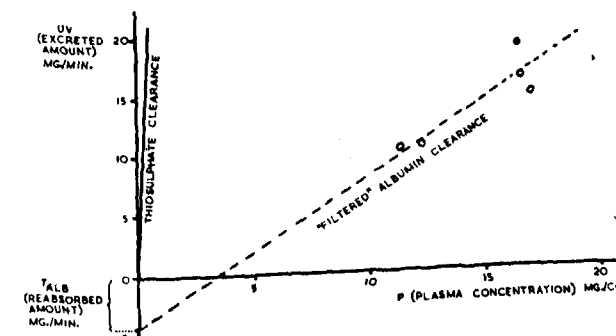
J. E. G. PEARSON.

REFERENCE

¹ Wells, A. Q., and Wylie, J. A. H. (1949). *Lancet*, 1, 439.

The Nephrotic Syndrome

SIR,—In his article on "The Nephrotic Syndrome" (*Journal*, December 26, 1953, p. 1389) Professor J. R. Squire claims to have devised a new method of calculating the "true" clearance and the reabsorbed amount of protein by the nephrotic kidney. I think his material is very valuable, but his way of presenting it not too illuminating. I do not see why it should be necessary to mix albumin and total protein clearance together in order to calculate the filtered clearance of albumin. This can be achieved very simply by plotting UV_{AIB} (excreted amount of albumin) against P_{AIB} (plasma concentration of albumin) or against $P_{AIB} \times$ glomerular filtration rate, if the "relative" clearance is to be determined. Assuming that the experimental data



are on a straight line, the reabsorbed amount of albumin may be calculated by extrapolation, the filtered clearance being given by the slope of the tracing. The same operation may be done on every protein fraction, even on total proteins. According to the theory the experimental straight line will intercept the vertical axis at the origin if the substance is only filtered, above if it is filtered and excreted, and below if it is filtered and reabsorbed. But of course this kind of speculation should be accepted only with great reserve, as long as the shape of the experimental curve cannot be determined accurately near the intercept on the axis.—I am, etc.,

Berne.

F. C. REUBI.

REFERENCE

¹ Lambert, P. P., et al. (1952). *Arch. Int. Physiol.*, 60, 506.

Controlled Use of Nasal Decongestants

SIR,—It is desirable, apparently, to remind colleagues engaged in family practice that the use of nasal decongestant medication, whether inhaled, by spray, or by drops, should be suitably controlled. I have seen four patients in the last 10 weeks whose nasal symptoms disappeared when the use of a decongestant was discontinued. The latest patient stated that she had been using "fenox" at the rate of a bottle per day, for about nine weeks. She was advised to stop the instillations at once. She spent an extremely miserable 24 hours thereafter, and was barely able to be restrained from using the drops. After this, the recovery was rapid and complete.

In my experience, the use of decongestant drops in acute rhinitis is of doubtful value, as the mucosal congestion and consequent hypersecretion of mucus are the result of the action of the body's defence forces, and should not be retarded. In my view, decongestants are of value only if there is interference with sinus drainage, or if Eustachian congestion is present. Certainly decongestants should not be used in nasal allergy, as this so often proves to be a long-term condition, and it is in such cases that the disadvantages of their use tend to manifest themselves.

The foregoing has long been common knowledge among rhinologists, but it is perhaps less widely appreciated among general practitioners. It is in their hands, to some extent, to warn patients against long-continued use of these drugs. In addition, although many of the manufacturers of these drugs warn patients as to the frequency of use advised, they do

not always warn them as to the duration over which use may be continued. These cautions should certainly be emphasized.

According to Martindale,¹ the drug mainly used is naphazoline hydrochloride or nitrate.—I am, etc.,

Glasgow.

REFERENCE

¹ *Extra Pharmacopoeia*, 1952, 23rd ed., vol. 1, p. 128, London.

GAVIN YOUNG.

College of General Practitioners

SIR,—At the inception of the College most of us who joined did no more than give it a good start in life with a little cash and a lot of good will. A few have carried the burden of work that really made the venture live, and I have been amazed at their efforts in so short a time. It ill becomes any of us to raise an imagined grievance to the status of an issue of "general interest to actual or prospective members" (Dr. D. G. Berry, *Journal*, February 27, p. 520). If "general lethargy" there has been, who is guilty? Not the College Council.—I am, etc.,

Gateshead.

K. T. BROWN.

The Basis of Sensation

SIR,—Referring to Dr. E. D. Adrian's Banting Memorial Lecture (*Journal*, February 6, p. 287) requesting new light in the physiology of sensation, I should like to submit the following suggestion. The anatomical structure of the central nervous system seems to indicate one definite difference between the centrifugal and centripetal pathways—that is, the number of links being much more numerous in the afferent leads—besides the more complicated stratification of most of their intermediaries like retina, corpora geniculata, etc., and cortical representations with their densely packed small cells, especially if compared with the efferent, much simpler organized system. As a preliminary explanation one might accept the supposition that motor stimuli arise intrinsically and do not need a lot of translation on their journey to the peripheral neurons. On the other hand, sensation is started by extrinsic, heterogeneous stimuli which require quite a bit of being "taken in."

What I should like to know is whether there is such a difference marked in the electrical currents as produced by the two kinds of pathways, or are there other means of differentiating them histologically and/or physiologically? I am, etc.,

Cardiff.

R. BAUER.

Treatment of Subacute Bacterial Endocarditis in a Patient Sensitive to Penicillin

SIR,—In a recent article (*Journal*, February 27, p. 500) Drs. H. W. Balme and A. E. Dormer emphasized the need for using an effective bactericidal, as opposed to a bacteriostatic, antibiotic as early as possible in subacute bacterial endocarditis. This restricts the number of available antibiotics, and if it happens that the patient is already sensitive to the one of choice a difficult problem arises. Drs. Balme and Dormer have described a method of overcoming this sensitivity, and as we have recently applied the same method with success to a similar case we believe that it deserves to be more widely known.

The patient was a business man of 58 who was admitted to hospital in June, 1953, under the care of Dr. A. L. Jacobs. He had had an obscure febrile illness for some weeks; at first negative results were obtained from all the usual investigations, but it soon became clear that he was suffering from subacute bacterial endocarditis as he developed an early aortic diastolic murmur and the blood cultures became positive at the same time. The organism grown was a *Staphylococcus viridans* which was sensitive to the usual antibiotics, including aureomycin. It is important to note, however, that aureomycin had no effect on the fever and that, although the organism was sensitive to aureomycin *in vitro*, positive cultures were obtained while the patient was having maximum doses of this drug. It was evident that penicillin was the agent of choice in this case, but unfortunately the patient was known to be sensitive to it; he informed us that he had been given penicillin in 1952, when he was treated for

dermatitis, and he reacted with oedema of the face. As we felt it imperative to give penicillin he had an injection of the sodium salt, and he promptly reacted with an erythematous rash of the limbs and oedema of the face and eyelids. We therefore gave him full doses of mepyrmine maleate by mouth in the hope of suppressing his sensitivity and followed this with 50,000 units of penicillin, but a similar reaction occurred associated with some dyspnoea. Dr. Dormer now kindly suggested to us the method of Maslansky and Sanger¹; treatment was accordingly begun again with crystalline penicillin 100,000 units and mepyrmine maleate solution 50 mg. mixed in the same syringe and injected intramuscularly. This was given twice a day and subsequently six-hourly. The penicillin was then slowly increased to two mega units and the mepyrmine maleate was reduced and, after a fortnight, finally discontinued. Evidently the patient had become desensitized. No untoward reaction either local or general occurred at any time. The effect on the bacterial endocarditis was immediate; fever ceased after the second day of treatment and did not return and the patient slowly became well enough to leave hospital. The ultimate result was disappointing, as cardiac failure eventually supervened and the patient died in January of this year. This was not altogether unexpected in view of the aortic incompetence, and necropsy showed a large perforation of the right posterior cusp of the aortic valve, leaving no more than a rim of this cusp intact. There were some vegetations on the free edges of the other two cusps, attributed to a terminal recurrence of this infection of which there was evidence shortly before death. On his final admission large doses of penicillin were given without reaction.

Glaxo Laboratories Ltd. kindly examined for us mixtures of penicillin and mepyrmine maleate solutions and found that they were compatible, and that there was no loss of potency of either drug in 24 hours at room temperature. The penicillin was found to dissolve satisfactorily directly in the mepyrmine maleate solution, but it took slightly longer than in water. It appears that this method of overcoming penicillin sensitivity may be of value in similar infections in which penicillin is the antibiotic of choice; it is noteworthy that the patient preferred the mixed injection to penicillin alone, as he found that there was less local pain.

We wish to express our thanks to Dr. A. L. Jacobs for his assistance with this case, and to Dr. Dormer for his helpful suggestion.—We are, etc.,

K. C. ROBINSON.
T. B. BINNS.

London, N. 19

REFERENCE

- ¹ Maslansky, L., and Sanger, M. D. (1952). *Antibiot. and Chemother.* 2, 385.

Abdominal Testicles and Fertility

SIR,—In "Any Questions?" (February 13, p. 409) under the heading of "Abdominal Testicles and Fertility" you state: "The view which is becoming generally accepted now is that treatment for undescended testicles should begin at an early age, perhaps at 3 to 5 years."

Denis Browne¹ divides this condition into two groups: (1) the retractile testicle, which represents 80% of all undescended testicles, and (2) congenital deformities—ectopic testicles. Group 1, which can be brought into the upper scrotum by bimanual palpation, will descend normally before puberty without treatment. Group 2 is unaffected by hormone treatment and requires operation. The age recommended for operation is 9 years.² At Great Ormond Street and at the Boston Children's Hospital the endocrine treatment of undescended testicle is never used.—I am, etc.,

NICHOLAS S. CRAIG.

REFERENCES

- ¹ *Proc. roy. Soc. Med.*, 1949, 42, 643.
² *Lancet*, 1949, 1, 448.

Neomycin in Pyogenic Skin Diseases

SIR,—In recounting his experiences with neomycin and terramycin in the treatment of skin infections, Dr. G. A. Grant Peterkin (*Journal*, February 27, p. 522) makes a valuable comparison of the efficiency of these antibiotics. From his, and other accounts, terramycin (oxytetracycline) at least equals the undoubted effectiveness of aureomycin (chlorotetracycline) as might be expected from their closely

similar formulae. There is, however, a more sinister resemblance, in that Gram-positive cocci resistant to one are invariably resistant to the other. At the present time new antibiotics are discovered almost before one has learnt the names of their predecessors, to be used and discarded when they have lost their effectiveness as though the supply is inexhaustible. In my recent series of cases of pyoderma (*Journal*, February 6, p. 314) 51% of *Staph. pyogenes* isolated were resistant to penicillin, 20% resistant to chloramphenicol, and 2% resistant to aureomycin. During the past year 7% of strains isolated from skin out-patients have shown resistance to aureomycin and terramycin. Aureomycin and terramycin remain the most potent weapons we have against penicillin-resistant staphylococcal infections.

In France up to 23% of staphylococci resistant to all antibiotics are recorded,¹ while in America up to 61% of staphylococci resistant to aureomycin and terramycin have been found in hospital infections.² It seems unlikely that erythromycin will prove of more lasting value in combating staphylococcal infections. The ease with which bacterial resistance to it can be acquired *in vitro* has been demonstrated by Dr. D. Hobson (*Journal*, January 30, p. 236), evidence which is supported by the production of a carrier rate of resistant strains of staphylococci which reached 75% five months after adoption of erythromycin for general use in an American hospital.³ Fears are already being voiced in America⁴ that ointments which contain erythromycin may rapidly increase the incidence of resistant strains of bacteria. In a recent authoritative account of the principles of treatment in pyogenic skin infections Pillsbury and Kligman⁵ advocate the avoidance of topical application of compounds which might be required later for the treatment of some serious internal affection, and state that for this reason they do not use terramycin or aureomycin locally. They find bacitracin and neomycin reasonably safe and having a wide enough spectrum of antibacterial effect to yield extremely satisfactory results with the added advantage that they are unsuitable for internal use.

To suggest that aureomycin and terramycin should never be used locally is unrealistic, since they yield such excellent results when all else fails in sycosis barbae and other deep staphylococcal infections. If used judiciously we should succeed in preserving their usefulness. If they are used as a routine for all cases of pyoderma, what now acts as a tempest among bacteria may become no more than a mouse's sneeze.—I am, etc.,

Sheffield.

REFERENCES

- ¹ Chabbert, Y., and Terrial, G. (1952). *Ann. Inst. Pasteur*, 83, 499.
² Kirby, W. M. M., and Abert, J. J. (1953). *Antibiot. and Chemother.* 3, 831.
³ Leeper, M. H. (1953). *British Medical Journal*, 2, 1044.
⁴ Martin, W. J., et al. (1953). *Proc. Mayo Clin.*, 28, 609.
⁵ Pillsbury, D. M., and Kligman, A. M. (1954). In *Modern Trends in Dermatology*, 2nd series. Butterworth, London.

Dangers of Induced Hypotension

SIR,—A recent article in your *Journal* (February 6, p. 324) deprecated the use of hypotension in surgery and published figures showing a mortality of one in 500. Every new drug, every new treatment, immediately produces the fervent protagonist and the equally fervent antagonist, and time and experience must be allowed to effect their mellowing influence on both. Is it not possible that the figures of one in 500 may have been arrived at by the over-enthusiastic use of these drugs?

My own personal experience (250 cases) is too small to be reliable, but so far I have had excellent results. Patients submitted to sub-mucous resection of the nasal septum are incomparably more comfortable if the nose is not packed. Such operations as external ethmoidectomy, and dacryocysto-rhinostomy are indeed made much less difficult, and this also applies to thyroidectomy and radical mastectomy. Surely here is a weapon in the armamentarium of the anaesthetist which should not be lightly discarded.—I am, etc.,

Folkestone.

HARRY F. GRIFFITHS.

Obituary

H. A. BRITTAIN, O.B.E., M.Ch., F.R.C.S.

The sudden and unexpected death on March 4 of Mr. H. A. Brittain, senior orthopaedic surgeon to the Norfolk and Norwich Hospital, has deprived orthopaedic surgery of one of its most able surgeons and original thinkers. He was 50 years of age.

Herbert Alfred Brittain was the son of the late Mr. J. W. Brittain, of Dublin. He was educated at Sedbergh School and Trinity College, Dublin, where he graduated M.B., B.Ch. in 1926, and five years later he obtained both the M.Ch. and the F.R.C.S. After holding the post of house-surgeon at Bristol Royal Infirmary, he became senior house-surgeon at Leicester Royal Infirmary and later at the Royal National Orthopaedic Hospital. In 1932 he was appointed assistant general surgeon to the Norfolk and Norwich Hospital, and in 1935 he became the first orthopaedic surgeon to that hospital. In addition to being a brilliant surgeon with a distinguished academic career, he had an original turn of mind, and as early as 1935 introduced a method of insertion of a triffin nail for the fixation of fractures of the neck of the femur, an account of which was published in this *Journal* in 1938. This method has stood the test of time, as it is still practised extensively to-day. At about the same time he started developing new methods of arthrodesis, especially of the hip-joint, and eventually perfected a method of ischio-femoral arthrodesis, which is particularly applicable in cases of tuberculous disease of the hip and which is generally known as the "Brittain operation" not only in this country but all over the world, for it has become the standard operation for dealing with this crippling disease both in children and in adults. The operation is fully described in his book *Architectural Principles in Arthrodesis*, and was the subject of his Hunterian Professorship of the Royal College of Surgeons in 1940.

Mr. Brittain was a Fellow of the British Orthopaedic Association, serving on the executive committee, and was also a member of the International Orthopaedic Association, having many friends among his colleagues both in this country and abroad, particularly in America and Portugal. In fact he was known to a wide circle of orthopaedic surgeons in almost every country in the world where this type of surgery is practised. During the last war he served in the R.A.M.C., attaining the rank of lieutenant-colonel, and was awarded the O.B.E. for his services.

Brittain, known to his friends as "Tommy," had exceptional vigour, both mentally and physically. His professional activities and the writing of many contributions to orthopaedic literature would have been sufficient to exhaust most men, but in addition, while he was in Norwich, he became a keen hunting man, and in 1946 had the misfortune to sustain a fracture-dislocation of his cervical spine as a result of an accident while taking part in a point-to-point race. He not only survived this and the major operation which followed, but actually returned to the hunting field again, a demonstration of his enthusiasm, bravery, and determination. It was this spirit—not to be overcome by any obstacle—that was dominant in his work and in his play. In 1952 he was seriously ill with thrombosis for many months, but again managed to recover from this and actually returned to his work and his hunting once more.

His name will live for many years on account of his outstanding work as an orthopaedic surgeon. He leaves a widow, formerly Miss Sonia Barclay, and two daughters, to whom our deepest sympathy is extended.—G. K. M.

Mr. R. C. HOWARD writes: I would like to pay tribute to my late chief, Mr. H. A. Brittain, with whom I was closely associated as a registrar and later as a junior colleague. I owe my present position to him, and seldom has a young surgeon had a more stimulating and happy discipleship. Wherever he went he left his mark—here was a man who could not be ignored. Loved and almost worshipped by countless patients, he must have become used to adulation, and yet, strangely enough, humility was one of his virtues. But it was the right sort of humility—private not public. He was a gifted conversationalist and writer of the English language, with an incisive mind; and he loathed pedantry and plagiarism. Loving life with a youthful zest, he always made it exciting for others: dullness and boredom were alien to him. The orthopaedic department here in Norwich has lost its first and probably its greatest orthopaedic surgeon, but his memory will live on in the basic principles of orthopaedic surgery that he taught so thoroughly, and in the enthusiasm for the truth which he has bestowed on all those who came under his influence.

A. M. CLARK, M.C., Ch.M., F.R.F.P.S.

Mr. Alfred M. Clark, who was on the surgical staff of the Glasgow Royal Infirmary, died on February 13, after a very brief illness, at the age of 60.

Alfred Mackenzie Clark was educated at Glasgow Academy and Glasgow University, where he graduated M.B., Ch.B. in 1915. He then entered the R.A.M.C. and served continuously on the Western Front in the first world war until demobilization. In 1918 he was awarded the Military Cross for services in the field. After the war he studied law at Balliol College, Oxford, and was called to the Bar by the Inner Temple in 1921. However, his real interests lay in surgery, and after holding resident surgical appointments at the Radcliffe Infirmary and the post of assistant demonstrator in anatomy in Oxford University he returned to Glasgow and joined the staff of the Royal Infirmary in 1922. In 1929 he became a Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow, and five years later received the higher degree of Ch.M., with high commendation, from Glasgow University. During this period he was specially interested in the problems of surgical shock and the treatment of burns, and he wrote several papers on these subjects.

In 1938 Mr. Clark was appointed surgeon in charge of wards at Glasgow Royal Infirmary and honorary lecturer on clinical surgery in the University. In addition to his general surgical commitments, he assumed control and direction of the wards for the treatment of burns. In collaboration with Professor J. P. Todd, of the Royal Technical College, Glasgow, he was one of those primarily responsible for the research work which culminated in 1944 in the Medical Research Council's publication, *Studies of Burns and Scalds*. From the outbreak of war in 1939 he added to his already onerous duties that of visiting surgeon to Law Junction Hospital. This appointment he relinquished in 1945. In the same year, but most regretfully and reluctantly, the pressure of general surgical work made him give up the direction of the burns unit. Thereafter he devoted much time and energy to the surgery of the thyroid gland, a branch of surgery to which he brought singular skill and judgment.

N. G. HORNER, M.A., M.D., F.R.C.P., F.R.C.S.

Dr. O. C. CARTER, chairman of the Journal Committee of the British Medical Association, writes: There is little to add to the worthy tribute which the *Journal* paid last week to the memory of a former editor, except perhaps a postscript from the present chairman of the Journal Committee, who served on that committee in the days when Horner was editor. The first impression one would have was his extreme courtesy and kindness to all who came into contact with him; at the same time it was so transparent that he was an outstanding medical man of letters and only accepted the very best both from himself and from those who worked around him. Furthermore, Horner was of an exceedingly retiring and shy disposition, and yet anybody who went to him for advice and help always came away feeling that they had seen someone who had taken an interest in their problem and wished to give them all the help that was possible.

Although Horner was quiet and reserved, he had a great sense of humour and a very ready wit, and his writing showed the elegance and style which was so characteristic of the man. During his editorship the reputation and status of the *British Medical Journal* grew, and, although during the last few years that he held his high office he suffered a great deal from ill-health, he carried on for longer than most men with his affliction would have done; and when the time came for him to go, it was with a very sad heart. His death has deprived the profession of one of their colleagues who was pre-eminent in the world of medical journalism, and the Association has lost a member who was one of its officials of outstanding eminence and unfailing loyalty. We salute his memory.

We are indebted to H.C., an old contributor, who writes: May one who served under Gerald Horner during the whole of his editorship, and of his assistant editorship before that, add a word of sincere tribute to a man of unusual quality? I vividly remember my first interview with him, on November 9, 1917, shortly after he joined the staff of the *Journal*. He was instructing me about a special piece of work, and some of his ideas of the journalistic craft which he expressed then I have never forgotten; but, such was his modest and diffident manner, he hardly glanced at me during the whole of the briefing, but kept his eyes on the Lord Mayor's procession which was passing under his window looking down on the Strand.

Horner was often contrasted with his great predecessor, Sir Dawson Williams, but the contrast was less marked than was supposed. It was a contrast of manner rather than of substance. Dawson Williams was feared by those who did not know him, and inspired extraordinary devotion among those who did. Horner was feared by no one, though he could be caustic, but to those who broke through the circle of his shyness he showed affection which was returned. The editorial office in Dawson Williams's time resembled the deck of a battleship, with a good deal of shouting of orders and running about; in Horner's time it was more like an Atlantic liner, with captain, crew, and passengers never raising their voices.

The skill of an editor is largely in his excisions. When my own "copy" was cut by Dawson Williams I had to acknowledge that he had removed what was platitudinous and repetitive, but I mourned the ragged edge. What was left did not "read." This divinity did not shape our ends, he rough-hewed them how he would. Horner's method was much more precise. His knife was as briskly at work, but it was more fastidious, and the cut ends were not left gaping.

I cherish a long letter from Dr. Horner, dated May 29, 1942, and rescued from the blitz. In it he lamented the restrictions of paper control, which had cut down the editorial pages of the *Journal* to 32 a week. But he did not

stress the mortification this must have meant to himself. Instead he spoke with regret of the diminution of work which it must entail for an old contributor, and the letter contained such compliments and pleasant words as are too personal to quote. But it was significant of the man who was labouring under the great strain of editorship of an important journal in those days, and towards whom even then the shadows of a long illness were approaching. He was a man who did not disdain to praise, and yet his praise was always so discerning that it left one with the curious feeling that one had still to deserve it.

Mr. JOHN KEITH HAMILTON BENSON died in Warrington on January 12 at the early age of 35. A student at Manchester Dental School, he had a brilliant career, graduating B.D.S. in 1940 with first-class honours. He was in quick succession house-surgeon, demonstrator, assistant clinical lecturer, and then lecturer in dental surgery at Manchester. His main interest was oral surgery, and for a time he was in charge of the oral surgery clinic there. In 1948 he was graded as a consultant, and to equip himself better he then took the unusual course of resigning his appointment and becoming again a student—this time of medicine. He graduated M.B., Ch.B. in 1952, having obtained the F.D.S. R.C.S. in 1949. Last year he was appointed lecturer in dental surgery at Queen's University, Belfast, and he held a consultant appointment at the Royal Victoria Hospital. Almost immediately afterwards he became the victim of a malignant growth, and after a long illness, borne with great bravery and without complaint, he died at his home in Warrington. Better known, perhaps, to his former colleagues in Lancashire, he had a rapidly extending circle of friends in Northern Ireland. His brilliance in both clinical and academic fields was matched by his technical skill, and all were combined with an unassuming friendliness that was masked by a natural reserve. His death is a great loss, and to his parents and brother we offer our heartfelt sympathy.—P. J. S.

Dr. H. L. MILLES, consultant physician to Worcester Royal Infirmary, died on January 18, after a short illness, at the age of 55. Herbert Leslie Milles, who was born on June 27, 1898, was educated at King's School, Worcester. Anxious to serve in the first world war, he left school as soon as he could and enlisted as a regular officer, being posted to the 1st battalion of the Buffs. He served with distinction, and won the Military Cross in March, 1919. Leaving the Army soon afterwards, he went up to Christ's College, Cambridge, to read medicine. After taking an arts degree in 1923 he entered King's College Hospital Medical School to receive his clinical training, and while at King's he was a member of the senior lawn tennis team which won the inter-hospitals tennis cup in 1924 for the first time. He qualified M.R.C.S., L.R.C.P. in 1926, proceeded to the M.A. in the following year, and was elected M.R.C.P. in 1931. After holding the post of resident accoucheur at King's College Hospital he was appointed Sambrooke medical registrar there, a post he held until 1932. Prior to that he had worked for a time at the Edinburgh Royal Infirmary as senior house physician. Thus he had wide hospital experience before finally settling in practice at Droitwich Spa, where he became consultant physician to Highfield Hospital for Rheumatic Diseases and St. John's Hospital for Rheumatic Diseases. He was also honorary physician to Worcester Royal Infirmary. During the last war he was deputy medical superintendent and physician in charge of the medical division of Barnsley Hall E.M.S. Hospital. A few years ago he published in the *Journal* one of the first reports in this country of poisoning by one of the organic phosphorus insecticides, and he had also written papers on the subject in which he was specially interested, rheumatology.

We are indebted to Mr. F. R. KITTERMASTER, headmaster of the King's School, Worcester, for the following appreciation: Herbert Milles was a brilliant and devoted doctor, but what made him universally beloved was not so much his

Medico-Legal

CRIPPLED GIRL AWARDED £5,000

A 6-year-old girl, who, it was stated, will be a cripple for life, was awarded a total of £5,000 damages at Notts Assizes on March 10 against a children's hospital matron and a hospital management committee. It was claimed that a plaster cast was put on her left leg too tightly and that the leg would remain shrivelled.

The child, Christine Margaret Bayliss, of Mansfield, Notts, sued, through her father, Mrs. Bertha Blagg, aged 57, matron of the Gringley-on-the-Hill Children's Hospital, and the Nottingham No. 5 Hospital Management Committee, alleging negligence. The allegations were denied.

Opening the case for the girl, Mr. Fearnley-Whittingstall said that the result of wrapping the leg in a plaster spica which was too tight, or was left on too long, was "a most appalling necrosis of the tissues, deformity of the left foot, paralysis of the muscles controlling toes, foot, and ankle, and the grossest possible disfigurement." The child's illness began in November, 1949, and the only cure was to immobilize the hip. In June, 1950, she was taken to the hospital and was first put on a frame to keep the hip still. In January, 1952, she was put into her plaster case by the matron.

Normally she was a bright and happy child, but when her father called to see her on January 5, she had "completely and absolutely changed." He saw her again next day and said that "the baby had changed into an adult overnight." Mr. Fearnley-Whittingstall said that when Mr. Bayliss suggested to the matron that the plaster was too tight, she said: "This is not the first plaster I have put on." He was completely snubbed. On January 16, the plaster was removed, and Mr. Bayliss received a letter which stated that Christine was now all right, and that the doctor had said that the hip was almost recovered and would not require being put into plaster again. It was not until June 27 that the father was told for the first time that his daughter was going to be a cripple for life.

Mr. Frank W. Holdsworth, orthopaedic surgeon at two Sheffield hospitals, said that the only reasonable explanation for the condition of the leg was that under the plaster there was a small sore which became infected. Most of the calf muscle was destroyed. He thought the change in the child's appearance and manner would be a warning of this, and it would be reasonable to think something was wrong and the plaster should be removed.

Parent's Right to Know

Opening the case for the defendants, Mr. R. C. Vaughan said that the charge brought against the matron was a grave one. She had been matron for 18 years and in the nursing profession all her working life.

Mr. Vaughan was questioned by the judge on the long delay in telling the parents of their child's deterioration. "I would like to know if this is the system under our State medical service. The parent has a right to know—this isn't Russia."

Mr. Vaughan: Nurses and doctors will shut up like clams, and you'll never get any information out of the hospital as to what is wrong with yourself, far less your child.

Judge: If it were a child of mine, I would change my doctor.

Mr. Vaughan: One can't get facts from hospitals. They are grossly impertinent when you ask.

Giving evidence, the matron said that after putting on a plaster they were able to tell if it was too tight by seeing whether the child could still wiggle its toes. She did not agree there was an obvious change in Christine; her demeanour was the same, only a little subdued. The matron said that on January 14 she examined the foot and it was normal. It was not until the next day when the toes turned blue that she gave orders for the plaster cast to be removed. On January 29 when the leg became discoloured and turned a greenish-blue they realized they had "a bad leg."

achievements and successes as a doctor, but the way he lived his life—his achievements and triumphs as a person. He began his career as a regular soldier, and, though he soon turned his talents to medicine, he had two great qualities essential to a soldier—courage (to which not only his Military Cross but his whole life bore witness) and abundant physical energy. Up to five years ago he took great delight in all kinds of bodily exercise; and in such things as games, dancing, and skiing he found great pleasure and refreshment, as well as an outlet for his physical energy. Then came the first of his heart attacks, and he found himself cut off in a moment from many of the things that had given him most delight. Without a word of complaint he turned his energy and enthusiasm to other things, and began to develop his interest in books, music, and painting—a wide range of quite different activities, that filled with interest every moment of his busy life. And what was still more remarkable, he retained his interest and enthusiasm for what others were doing in the things he could no longer do himself. What an effort this cost him we do not know, but it is certain that this acceptance and conquest of his limitations caused him to grow in spiritual stature. Then, as the years went by, and he had more serious illnesses, he knew that his time here was not likely to be very long; but, still cheerful and uncomplaining, with no grudge against the cruelty of circumstance, he devoted himself unsparingly to his work and to his many other interests, particularly painting, with never-failing excitement and enthusiasm.

No doubt the love he inspired was due in part to his unfailing enthusiasm, which welled up, continually renewed, from some inexhaustible source. It made no difference whether it was his medical work, his painting and other interests, or the interests and doings of his friends. There was just as much delighted and delightful enthusiasm for the interests of others as there was for his own, and his frequent "By Jove!" and "I say" were not just habits of speech; they were the hallmarks of the infectious interest and enthusiasm that he showed for every side of life. In the sense that Rupert Brooke used the phrase, he was a great lover, and he left the world much richer in love than when he came to it.

By the death of Dr. J. E. JEFFREY on February 21 at the age of 64, Dunbartonshire has lost one of the best type of family doctors. Born at Aytoun, Berwickshire, where his grandfather and father had practised, on August 19, 1889, John Edward Jeffrey was educated at Duns Academy. After leaving school he spent a few years in business before he turned to medicine, beginning his medical studies at Glasgow University early in 1914. In the following year he volunteered for service with the chemical section of the Royal Engineers and served in France for nearly four years, latterly being attached to the R.A.M.C. He was awarded the D.C.M. for gallantry in rescue work. Returning to his studies in 1919, he graduated M.B., Ch.B., with commendation, in 1922. After holding a resident post at Stobhill Hospital, Glasgow, he spent a year at Hartwood Mental Hospital, Shotts, Lanarkshire, but the inherited desire for the work of a general practice asserted itself, and in 1924 he took over a small practice in Dalmeir and Clydebank. So devoted was he to his work that he soon built up a large and successful practice and joined in partnership with Dr. L. Crombie. A man of high principles, he was always methodical and painstaking in his work, and while he did not suffer fools gladly, freely gave of his best to help those in need. For many years he was the efficient honorary secretary of the Clydebank Burgh Panel Committee. In middle age he married Miss Margaret M. Craig, then matron of the Western Infirmary, Glasgow, and this was a most happy union. For nearly a year he had been in failing health, but he carried on his work almost to the end and bore with fortitude what he knew was an incurable malady. At the cremation service many colleagues and friends attended to pay their tribute to his memory, and their sympathy goes out to his widow, his mother, and his sisters.—L. C. and W. G.

Dr. William Thomson, the medical officer attending Gringley Hospital, said that he visited the hospital twice a week, sometimes more. He saw the plaster put on Christine's leg, and examined it. It was then satisfactory, and on other visits during the next two weeks he did not see anything unsatisfactory in her condition. On January 16, when the plaster was removed, there was swelling in the calf and foot. The skin had an unhealthy look and there was a grey pallor in the calf. He thought there had been some pressure on that area. The leg began to improve after the plaster was removed, but at the end of January it became discoloured and the tissues of the calf started breaking down. He began to be more worried about the outcome, and Mr. Sydney A. S. Malkin, the orthopaedic surgeon, saw the child on February 24. Looking back on it, he would have preferred to have called in Mr. Malkin sooner to share the responsibility.

Circulatory Defect

Mr. Malkin, the surgeon, told the court that it was a circulatory defect which caused the wasting of the child's calf muscles. His considered opinion was that there had been a spasm of the blood vessels in the calf, perhaps caused by the cold weather. Describing Mrs. Blagg as an extremely good matron, Mr. Malkin said that he would be proud to have a plaster as good as this to his name. Of Dr. Thomson's treatment Mr. Malkin said: "On the whole I think he did extremely well."

Mr. Vaughan: Do you feel you could have been of any help in saving this child's eventual leg condition if you had been called in earlier?—I don't think I could have done anything at all.

Mr. Malkin said that Dr. Thomson was one of the two best students, among 400 in his year, when he qualified at Glasgow. The Judge: I know dog doesn't eat dog, but were you shattered when you were shown this leg on February 24?—I certainly was.

Would you have liked to have seen it sooner?—I should.

Mr. Malkin said that in 30 years' experience he had never known another case in which such a deterioration had taken place without his being called in, or one in which so much deterioration had taken place in so short a time.

In his final address for the defence Mr. Vaughan said the position had been crystallized by his Lordship in unmistakable terms that there was a deliberate attempt by the hospital to conceal and misrepresent to the family the condition of the child.

The judge said that he was quite satisfied the plaster was put on with care and skill—it was the subsequent events that were in issue.

Mr. Vaughan said that there was nothing whatever on the plaster cast which could have caused a pressure spot. The matron and nurses had sworn that the skin on the leg was unbroken when the plaster was taken off. That left only the theory that there was some disease which caused the leg to swell, filling up the original space between the leg and the plaster, and causing constriction.

The judge said he thought that Dr. Thomson was on the horns of a dilemma, and it was a question of up to what point the doctor considered that the child's trouble was trivial. He did not expect doctors to be prophets, but they should be able to assess the possibilities.

The judge criticized the hospital authorities for their secrecy towards the child's parents.

Mr. Vaughan: While these people have the power it must remain so.

Judge: Maybe they will not always have the power.

Mr. Vaughan: I think it has lasted too long and become too settled.

The judge said, "When we had assisted voluntary hospitals, if I was brought in from the street a dying pauper, any treatment I received—no doubt of the best that science could provide—was an act of charity. Now we have gone over to the State system and it is a matter of right for which every citizen has paid. The hospital authorities are just as much his paid servant as anybody else. If anybody has got a different idea they had better think again."

The judge said that the matron had given four explanations for her reticence: (1) she did not realize how bad the child was; (2) she did not have an opportunity of telling

the parents; (3) she thought the parents had already been told; (4) she thought they would worry if they knew. Commenting on the written reports of Dr. Thomson's hospital treatment of Christine, the judge said: "While the appalling deterioration was taking place—and it was nothing short of appalling—there was no note anywhere of it."

Judgment

In his judgment, given on March 13, Mr. Justice Stable referred to tributes paid to the matron and the doctors and said it was well that in addition to this particular case they should recall the hundreds of happy, useful men and women who were walking about to-day, and whose health was largely attributable to the devoted service of these two persons. The particular failure in this case did not detract at all from the countless successes, or from the indefatigable work by the matron which resulted in these successes.

He was satisfied that there was a high degree of negligence over a protracted period of time. The matron did not observe for herself or heed the warnings she received of the marked deterioration in this child's condition practically from the moment the plaster was put on. Was Dr. Thomson led into a sense of optimistic security by the over-optimism of the matron, or was he really blind to the rapid deterioration of the child's condition? Although he despaired of finding out what was going on in the doctor's mind, the judge said he thought the attitude of the matron was easier to explain. She was so confident of her skill that, when she discovered she had been wrong, although in the back of her mind she knew exactly what the truth was, and what potentialities there were in this child's condition, she shut her own mind to the truth and deliberately refused to believe what she knew to be true. Of late they had seen a number of actions brought by dissatisfied patients or parents against hospitals, surgeons, and doctors. Now that the national health had become a matter of national concern he thought that, if a policy of covering up a bad mistake was pursued, the result must be a diminution in public confidence and an increase in the number of claims of that sort.

SEX AND THE LAW

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Very early in the law student's career his consideration of the sovereignty of Parliament in England is illuminated by the aphorism of De Lolme: "It is a fundamental principle with English lawyers that Parliament can do everything but make a woman a man, and a man a woman." This reflects the fact that one of the fundamental assumptions of any legal system has been that man is man and woman is woman, and that metaphorically never the twain shall meet.

From time to time the advance of medical science drives a coach and four through the fundamental assumptions which lawyers may perhaps be forgiven for having cherished, and raises novel problems which are not easily solved. For example, until the recent spread of artificial insemination it was regarded by lawyers as self-evident that if there was a child of a marriage that marriage must have been consummated, since without coitus children would not be born. It has now been held that a child born as a result of artificial insemination with the husband as donor remains legitimate even though its parents' marriage is subsequently annulled on the ground that it was never consummated.

Even more tortuous legal complications might arise from a change of sex. English law does not cater specially for someone who in the ordinary sense is neither a man nor a woman, although with predominantly male or female characteristics, nor does it for someone who from being what is ordinarily called a man becomes what is ordinarily called a woman. There seems to be no legal attempt anywhere to define what a man or what a woman is, and, though medical men may express good common-sense views of what the legal determining factor in intersex cases should be,¹ until the question arises directly for determination in

¹ See for instance Armstrong, C. N., *Proc. roy. Soc. Med.* 1953, 46, 301.

the courts or is determined by Parliament it is not possible to forecast the law's answer. If present knowledge of hormone control of sexual characteristics turns the problem into one which the community can no longer treat in its law as non-existent, then it will be for Parliament to disprove De Lolme's limitation on its sovereignty and define what is to turn a man into a woman.

Medical Notes in Parliament

Visits by Full-time Consultants

Dr. BARNET STROSS asked the Minister of Health on March 11 if he would permit consultants who were engaged on a full-time salaried basis to make domiciliary visits when requested, and to receive payment on the scale applicable to consultants working part-time. Mr. IAIN MACLEOD replied that under the arrangements agreed in 1949 additional payment must not be made for domiciliary consultations by whole-time officers. Any alteration of this provision would be a matter for the Medical Whitley Council.

Dr. STROSS said that men working full-time in consultant service had no perquisites and no allowances, and on the average their income was somewhat less than the income not only of part-time men but of general practitioners. Would the Minister do something to see that their status was recognized? Mr. MACLEOD said he recognized the justice of a good deal of what Dr. Stross had said, if not necessarily agreeing with it all. Part of the complications arose out of the 1949 agreement, and part by the operation of the ordinary income-tax laws relating to whole-time appointments. It was precisely matters of this kind that would come before the Whitley Council.

Mr. ANEURIN BEVAN hoped that the Minister would not solve the problem by converting all the full-time salaried staff to part-time. Mr. MACLEOD replied that there were varied trends and different views in the different regions about this. Dr. STROSS pointed out that people like himself recognized the excellent work done by the full-time men, but the last thing they wanted was to reduce the status of the part-time people. Mr. MACLEOD said he recognized that, but they should not pretend that the standard of conduct or anything else was higher or lower among part-time or full-time men. They were all members of the same profession.

Waiting-time for Hospital Out-patients

Mr. GEORGE JEGER asked the Minister of Health on March 11 if he would issue instructions to remedy out-patients at hospitals being kept waiting unduly long by consultants arriving late for appointments. Mr. IAIN MACLEOD said that he was aware there were complaints from time to time, and he was always prepared to look into any allegation of serious mismanagement; but generally he regarded these matters as primarily for hospital authorities themselves to manage.

Mr. JEGER pointed out that hospital authorities might be loth to take action because they would not want to have any bad feeling between themselves and the consultants, although they grumbled privately. Appointments systems were no use if the consultants did not keep to them. Mr. MACLEOD said that he was looking into the matter to see if they could collect any useful information which might be sent to the hospitals in the form of circulars.

Mr. KENNETH ROBINSON said that patients were summoned a quarter of an hour before the first could be seen, and always arrived a quarter of an hour before they were summoned. Mr. MACLEOD added that there were a number of other complications, one of which was that some places were so pleasant and attractive and the canteen so delightful that many patients arrived early and treated the place as a club. Mr. J. RANKIN added the opinion that the root of the trouble was that the consultant was also in private practice.

Hospital Capital Expenditure

The MINISTER OF HEALTH announced on March 11, in reply to a question by Dr. R. F. B. BENNETT, that it was no longer necessary for him to require that capital expenditure on projected hospital works from non-Exchequer funds should count against capital allocations made to hospital boards. It would still be necessary for him to scrutinize proposals to incur such expenditure by reference to any Exchequer maintenance expenditure that might be involved, the effect on the development of the hospital concerned, and the needs of the hospital service.

Replying to Mr. ANEURIN BEVAN, the MINISTER stated that there was no intention of raiding the capital of the Hospital Endowment Fund. There were three sources from which the hospitals had money: the endowments of teaching hospitals; the comparatively small amount issued annually as income from the Hospital Endowment Fund to non-teaching hospitals; and the gifts they might have accumulated since the Act came into force, under the provisions made by Mr. Bevan, including such possibility, for example, as the use of funds made available by the King Edward's Hospital Fund, or anything like that. The moneys for the sort of expenditure he referred to would be those coming in either the first or third categories. They had been used from time to time, but it had always been insisted, as a matter of Government policy, that any money so used for capital investment should count against the total allocated to the Ministry of Health and sub-allocated to the regions. It was that provision that had been removed.

Factors in Air Pollution

The City of London (Various Powers) Bill afforded the House of Commons another occasion for discussing smoke pollution on March 10. It was referred to a select committee after second reading, and a general debate took place on two proposed instructions (both afterwards withdrawn) to the committee: Dr. BARNET STROSS wanted the committee to insert a provision that the Common Council should publish an analysis of the atmosphere annually for at least 10 years, beginning with 1954; and Sir HERBERT WILLIAMS wanted the committee to delete Clause 4, which empowers the City Corporation to establish a smokeless zone.

These proposed instructions were simply the machinery by which each of them sought to secure a debate on atmospheric pollution. Sir Herbert Williams asserted that scientific knowledge was inadequate, and his purpose was to advocate extended research. A major tragedy such as that of December, 1952, occurred only occasionally, but a lot of people died all the year round, in small numbers, from the same cause.

Dr. BARNET STROSS said that in Iceland the capital and the surrounding area was free of smoke, and the incidence of cancer of the skin there was exceedingly low; there had only been four cases in the five years 1944-9.

Mr. WALTER ELLIOT said that what was really wanted was greater application of existing laws against pollution of the atmosphere. It was no use simply saying, "Let us take action."

Mr. SOMERVILLE HASTINGS thought that merely to develop smokeless zones would not mean much, because there was as much sulphur oxides given off from coke or smokeless fuel, and nearly twice as much from oil, as from coal. Smokeless zones might even do harm, because in fog it was cold as much as "smog" that was dangerous.

Mr. ERNEST MARPLES, Parliamentary Secretary to the Ministry of Housing and Local Government, expressed Government support of the Bill and the project of a smokeless zone in the City. He said that the Government was determined to do all in its power to conquer the evil of air pollution. That was no lukewarm intention; the Government was enthusiastic about it. But the diagnosis must be thorough and accurate before action was taken, and the action must then be undertaken with determination and imagination.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 27 (No. 8) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	11	1	6	0		27	2	7	0	1
Dysentery ..	910	116	222	3	4	252	50	124	3	
Encephalitis, acute ..	1	0	2	1		9	0	1	0	
Etiotic fever:										
Typhoid ..	3	0	0	0	2	4	0	0	0	4
Paratyphoid ..	5	1	1	0		2	0	10	0	0
Food-poisoning ..	160	10		0		101	15		1	
Infective enteritis or diarrhoea under 2 years ..				6	28				14	22
Measles*	2,099	33	66	23	422	30,884	1,624	388	101	360
Meningococcal infec- tion ..	49	4	15	3	4	47	5	14	1	6
Ophthalmia neona- torum ..	36	8	7	0		24	4	8	0	
Pneumonia†	869	53	249	16	4	1,897	83	456	20	13
Poliomyelitis, acute:										
Paralytic ..	17	1	1	0		{ 12	2		1	2
Non-paralytic ..	7	2				{ 1	0			4
Scarlet fever†	293	49	19	1		278	23	14	2	
Scarlet fever ..	1,463	53	171	42	31	1,455	88	208	49	78
Tuberculosis:										
Respiratory ..	841	84	123	34				153	33	
Non-respiratory ..	125	4	22	3				27	5	
Whooping-cough ..	2,098	72	327	38	76	2,746	149	250	68	139

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0	0	0		1	1		0	
Encephalitis, acute ..		0		0		0	0			
Etiotic fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	7	1	0	0	0	13	3	1	2	
Influenza ..	23	4	1	0	1	314	28	20	1	1
Measles ..		0	0	0	0	1	0	0	0	0
Meningococcal infection ..		2	2			3	1			
Pneumonia ..	375	65	24	11	7	578	81	45	8	
Poliomyelitis, acute ..	0	0			1	8	0		0	
Scarlet fever ..	0	0	0	0		0	0	0	0	
Tuberculosis:										
Respiratory ..	101	10	26	2	9	131	9	10	1	8
Non-respiratory ..	2	2	1	0	2	1	5	1	1	
Whooping-cough ..	1	0	0	0	0	3	0	1	0	3
Deaths 0-1 year ..	246	31	34	8	17	284	40	47	12	23
Deaths (excluding stillbirths) ..	6,651	939	728	132	187	7,575	1,003	754	145	179
LIVE BIRTHS ..	8,181	1,277	949	203	311	8,101	1,208	914	227	367
STILLBIRTHS ..	229	34	25			195	16	21		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Paratyphoid in Cardiff

We are indebted to Dr. W. P. PHILLIPS, deputy M.O.H. of Cardiff, for the following information: On March 5 the Public Health Department was notified by the City Isolation Hospital that four cases of paratyphoid B infection had been admitted the day before. Four additional cases, admitted for other conditions over the three previous days, were probably also infected. Up to March 12 93 patients have been admitted.

Within two hours field inquiries gave the probable source of infection and the food which was the common factor. Doughnuts, buns, and slices containing artificial cream have been constantly recurring in the history of almost every case. The probable date of infection was February 18 20. The bakery was visited immediately and samples of artificial creams and finished confectionery were taken for bacteriological investigation. Results have so far been negative. Forty members of the staff had blood taken for agglutination tests. Specimens of urine and faeces were obtained from all. Two members of the staff, who two years ago were known to have had positive stools, but later had repeated negatives, were stopped from work as an immediate precaution. They have since proved negative. Eight others on the staff showed some agglutination, but of no diagnostic significance. They were stopped from work and one of them has since been found to be excreting paratyphoid B in the faeces. All of the others are clear so far.

There have been no unusual clinical features, except that in six patients there was a history of abdominal pain and vomiting 24 hours after eating the suspected food. These symptoms cleared up in a few hours and the typical illness developed four or five days later.

Infectious Diseases

The largest fluctuations in the trends of infectious diseases in England and Wales during the week ending February 27 were increases of 240 for scarlet fever, from 1,223 to 1,463, 156 for dysentery, from 754 to 910, and 155 for measles, from 1,944 to 2,099, and a decrease of 63 for acute pneumonia, from 932 to 869.

A small rise in the number of notifications of scarlet fever was reported from every region of the country. The largest local increases were 38 in Essex, from 107 to 145, and 30 in Lancashire, from 157 to 187. The largest increases in the incidence of measles were 48 in Somersetshire, from 62 to 110, and 43 in Kent, from 51 to 94. 11 cases of diphtheria were notified, being 8 fewer than in the preceding week. 2,098 cases of whooping-cough, 1 less than in the preceding week, were notified. The largest fluctuations in the number of notifications of whooping-cough were rises of 41 in Kent, from 73 to 114, and 32 in Southampton county, from 78 to 110, and falls of 27 in Derbyshire, from 62 to 35, and 25 in Yorkshire West Riding, from 179 to 154.

24 cases of acute poliomyelitis were notified; these were 2 more for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were London 3 (Lewisham 2), Warwickshire 3 (Birmingham C.B. 3), and Essex 3 (Clacton 2).

A rise in the incidence of dysentery was reported from most outbreaks; the only large exception was a fall in Kent from 59 to 12. The largest increase was in Lancashire, from 180 to 235. The largest centres of infection during the week were Lancashire 235 (Bolton C.B. 53, Eccles M.B. 53, Preston C.B. 38, Ormskirk U.D. 18, Wigan C.B. 11, Liverpool C.B. 10), London 116 (Islington 42, Chelsea 14, Hackney 11, St. Pancras 10), Yorkshire West Riding 116 (Leeds C.B. 29, Bradford C.B. 19, Halifax C.B. 16, Royston U.D. 16), Staffordshire 70 (Cannock U.D. 58), Essex 69 (Walthamstow M.B. 38), Middlesex 49 (Enfield U.D. 14, Hendon M.B. 11), Norfolk 42 (Norwich C.B. 40), Warwick-

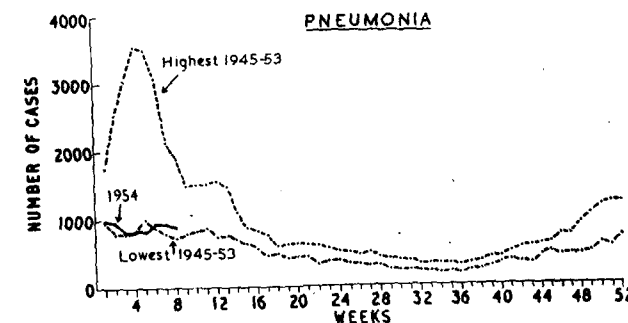
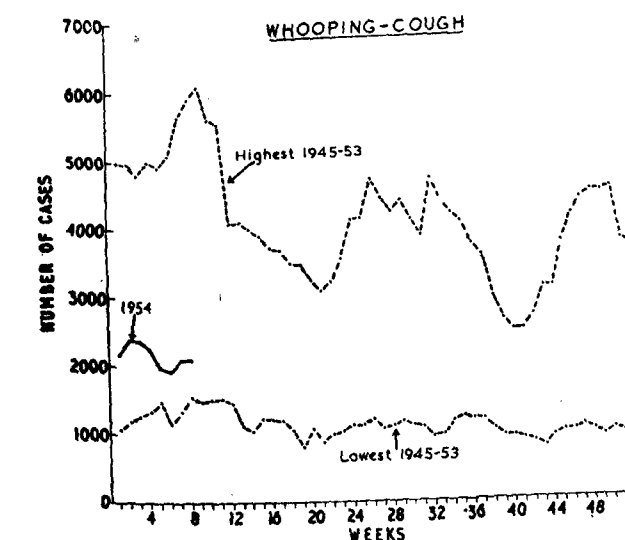
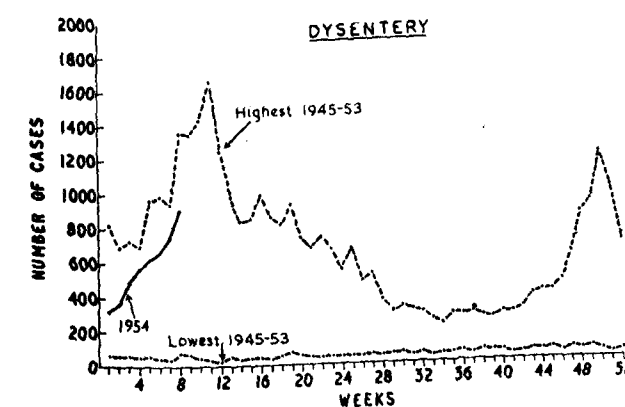
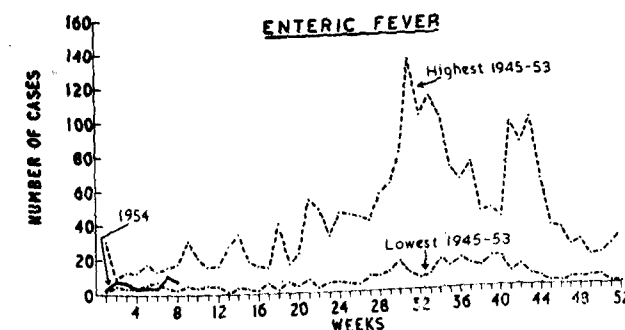
shire 33 (Birmingham C.B. 27), Durham 31 (Sedgefield R.D. 17), Surrey 20, and Gloucestershire 19 (Bristol C.B. 19). The notifications of dysentery in Scotland rose to 222. The largest returns were Glasgow 103, Dundee 30, Lanark county 25, and Edinburgh 24.

Week Ending March 6

The notifications of infectious diseases in England and Wales during the week included pneumonia 709, scarlet fever 1,379, whooping-cough 2,034, diphtheria 34, measles 2,449, dysentery 1,007, acute poliomyelitis 18, paratyphoid fever 15, and typhoid fever 1.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus -----. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Salmonellae in Duck Eggs

The need to cook duck eggs very thoroughly is emphasized once again by two articles published recently (*Monthly Bull. Minist. Hlth (Lond.)*, February, 1954). The first is a report from the Salmonella Subcommittee of the Public Health Laboratory Service. During the years 1950-2 over 13,000 duck eggs were examined in England, and it is estimated that the salmonella-infection rate of individual eggs was about 0.15%. The second article, by Dr. C. R. Murdock, from the Northern Ireland Hospital Authority, Central Laboratory, is concerned with large batches of eggs examined in Northern Ireland in 1951-3. Salmonellae were isolated from 48.2% of the batches of duck eggs, and they were also isolated from 2.1% of batches of hen eggs. These percentages must depend in part on the size of the batches, which varied between about 4,000 and 20,000 eggs.

Medical News

Sims Commonwealth Travelling Professors.—At a meeting of the Council of the Royal College of Surgeons on March 11 Professor R. I. Harris and Dr. Donald Hunter were appointed Sims Commonwealth Travelling Professors for 1955. Professor Harris, who until recently was assistant professor of surgery at Toronto University and specializes in orthopaedics, has been asked to visit Great Britain, Australia, and New Zealand. Dr. Hunter, director of the Department for Research in Industrial Medicine at the London Hospital, has agreed to visit Canada and Rhodesia.

Medical Society of London Dinner.—The Medical Society of London on March 9 at Claridges Hotel carried out the instructions of its founder, Dr. J. C. Lettsom, that it should hold an anniversary dinner meeting on or about March 8. The chair was taken by the president, Mr. E. W. Riches. The guest of honour was Colonel the Hon. J. J. Astor, and among the guests present were Sir Cecil Wakeley, P.R.C.S., Mr. A. A. Gemmell, P.R.C.O.G., Sir Heneage Ogilvie, President of the Hunterian Society, and Dr. R. Cove-Smith, President of the London Harveian Society. Colonel Astor proposed the toast of the Society. Saying that health came high on the list of priorities, he remarked that it involved an incredible amount of work for an incredible number of people, not to mention that 2,000 journals and periodicals were necessary to disseminate the output of medical knowledge. He answered in the negative his own question, "Is any institution of greater national importance than the teaching hospital?" with authority and conviction as chairman of the Middlesex Hospital. Mr. Riches, replying, referred to the growth of the Society, founded in 1773 for "the advancement of the science of medicine and surgery exclusively." There were now 589 fellows—considerably more than the strength of 30 physicians, 30 surgeons, and 30 apprentices that the founder laid down. Mr. Riches thought that not the least of the Society's achievements was the unity and friendship which it created among medical men. He paid tribute to the officers, Dr. Hope Gosse, Dr. Cuthbert Dukes, Sir James Walton, and Dr. Johnston Abraham, and the work of the Hon. Secretaries, Mr. Nils Eckhoff and Dr.

W. R. M. Drew. The toast of the visitors, proposed by Sir Harold Boldero, was acknowledged by Dr. R. Cove-Smith. Some 200 fellows and guests were present.

Royal Commission on Mental Laws.—The Royal Commission on the Law Relating to Mental Illness and Mental Deficiency (see *Journal*, January 23, p. 221, and February 13, p. 417) is now ready to receive evidence on subjects within its terms of reference, which are:

"To inquire, as regards England and Wales, into the existing law and administrative machinery governing the certification, detention, care (other than hospital care or treatment under the National Health Service Acts, 1946-52), absence on trial or licence, discharge and supervision of persons who are or are alleged to be suffering from mental illness or mental defect other than Broadmoor patients; to consider as regards England and Wales the extent to which it is now or should be made statutorily possible for such persons to be treated, as voluntary patients, without certification; and to make recommendations."

Any persons wishing to submit evidence should send a memorandum of evidence in writing to the secretary of the Royal Commission at 23, Savile Row, London, W.1.

Ciba Foundation.—The Ciba Foundation continues to fulfil admirably its function as an international centre where medical and chemical research workers can meet for informal discussion. Its home in Porton Square, London, gave hospitality to over 500 guests last year. There were five symposia during the year and 28 discussion meetings. The outstanding features of the symposia are that speakers are carefully selected so as to bring together active workers from several countries, current research is freely discussed, and the proceedings are published with little editing as quickly as possible. The subjects of last year's symposia were: "Preservation and Transplantation of Normal Tissues," "The Peripheral Circulation in Man," "The Kidney," "Hypertension: Humoral and Neurogenic Factors," and "Leukaemia Research." Another useful function of the Foundation is the running, with the Institut National d'Hygiène in France, of the Anglo-French Exchange Bursary for recently qualified medical men. In 1953 six British doctors went to France and five French doctors came here.

Germ Warfare Exercise.—In Bahaman waters this year at least 20 miles away from the nearest land and clear of normal shipping routes there will be trials of British defences against biological warfare. There have already been trials off the coast of Scotland to obtain technical data for this year's exercise. This announcement comes from the Ministry of Supply, which maintains the research station at Porton, Wiltshire, where work of this nature is done. Biological warfare could be waged directly against man himself or against his food supplies. For the former virulent micro-organisms (or their toxins) might be used, but presumably these would have to be resistant to chemotherapy and antibiotics and the victim population non-immune. Crops could be attacked by insects or fungi as well as by bacteria and viruses. In either case there would remain the problem of delivering enough active material to the target.

Canadian Journal of Microbiology.—In August the National Research Council of Canada will start publication of the *Canadian Journal of Microbiology*. The journal will appear bimonthly under the editorship of Dr. R. G. E. Murray, Department of Bacteriology, University of Western Ontario. It will publish papers describing original research in all phases of microbiology, regardless of country of origin, and in either English or French. Review papers will not be accepted. The subscription rate will be \$3 a year.

Faculty of Anaesthetists.—The following have been elected by postal ballot to the Board of the Faculty of Anaesthetists of the Royal College of Surgeons: Dr. Frankis T. Evans (London), Dr. William W. Mushin (Cardiff), and Dr. H. J. V. Morton (Hillingdon).

Chair of Bacteriology at Aberdeen.—Dr. Alexander Macdonald, reader in bacteriology at Liverpool University, has been appointed professor of bacteriology at Aberdeen

University. He will succeed Professor John Cruickshank, who has held the chair since 1926. Dr. Macdonald, who is 43, graduated in medicine at Aberdeen in 1937. He takes up his new appointment in the autumn.

Sir John H. Parsons, F.R.S., the ophthalmologist, who is now in his 86th year, has had conferred on him the honorary membership of the Illuminating Engineering Society. Sir John is the oldest living founder member of the society and a past president of it.

Mr. Geoffrey Keynes is to receive from Edinburgh University the honorary degree of Doctor of Laws at the graduation ceremonial on July 8, for his distinguished work as a bibliographer and editor.

Professor A. C. Frazer, professor of pharmacology at Birmingham University, has been appointed honorary consultant in metabolic diseases to the Army.

Dr. Honor Vivian Smith has been elected to the May Readership in Medicine at Oxford for a period of seven years from October 1, 1954.

Mr. E. S. Perkins, Wernher Research Fellow at the Institute of Ophthalmology, has been appointed to the London University Readership in Ophthalmology tenable at the institute.

COMING EVENTS

The Physical Society.—The 38th annual exhibition will be held at Imperial College, South Kensington, London, S.W.7, from April 8 to 13.

Conference of the British Occupational Hygiene Society.—The conference will be held at the London School of Hygiene and Tropical Medicine on April 6. The theme will be the problems arising in industry from the use of materials which present a danger to the health of workers. Further details may be obtained from the honorary secretary, Mr. P. C. G. Isaac, Public Health Engineering Laboratory, King's College, Newcastle-upon-Tyne, 1.

European Association against Poliomyelitis.—A symposium on the hospitalization of poliomyelitis cases during the acute phase will be held at the Clinique Médicale des Enfants, 149, rue de Sèvres, Paris, on April 8 and 9. The general assembly of the association will take place on April 10 at the Institut Pasteur. Further information may be obtained from the Secrétaire-général, Association Européenne contre la Poliomyélite, 130, rue de Linthout, Bruxelles.

Tour of Israel.—The Medical Association of Israel is organizing a 25-day tour of Israel for European physicians and their families, both Jewish and Gentile. The tour will take place in June or July this year, and will include visits to Jerusalem, Tel-Aviv, and Haifa. Travel will be by plane and the inclusive cost about £200. In addition to expeditions to places of historical and contemporary interest, the Israel Medical Association is arranging a medical programme. Further information may be obtained from Dr. Eustace Chessier, 92, Harley Street, London, W.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Friday, March 19

ABERNETHIAN SOCIETY, St. Bartholomew's Hospital.—4.30 p.m., Professor W. Melville Arnott: Aetiology of Cardiovascular Disease.
MIDDLESEX COUNTY MEDICAL SOCIETY.—At Hillingdon Hospital, 3 p.m., clinical meeting. 4.45 p.m., Dr. J. H. Bullen: Medical Curiosities Arriving at London Airport; Dr. H. V. L. Finlay: Urinary Infection in Childhood.

Monday, March 22

INSTITUTE OF NEUROLOGY.—5 p.m., Professor D. Denny-Brown (U.S.A.): Positive and Negative Factors in the Cortical Contribution to Movement.

Tuesday, March 23

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. E. Billingham: Experimental Handling of Skin.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor D. M. M'Phersey: Treatment of Obliterative Vascular Disease.
WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Mr. G. C. Knight: Investigation of Cerebral Tumour.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Dangers of Fowl Pest to Man

Q.—What is the nature of fowl pest prophylactic? Is the eating of a chicken which has fowl pest or has recently been inoculated against the disease likely to cause illness in man?

A.—The two conditions which come under the general term of fowl pest are fowl plague and Newcastle disease. The latter is endemic in this country at the present time. It is, however, a notifiable disease under the Diseases of Animals Acts, is controlled by a slaughter policy, and it is hoped that eventually it will be completely eradicated. The immunization of birds by live virus obtained from the developing egg and by formalinized virus with and without adjuvants has been investigated in America and elsewhere with varying degrees of success. Vaccination is, however, unlikely to be used in this country unless other measures for the control of the disease are unsuccessful, since it is held that its adoption would inevitably lead to the perpetuation of fowl pest as an endemic disease.

There are no authenticated reports of a generalized disease in man. But it has been demonstrated that the virus will set up an acute bilateral conjunctivitis which lasts from three to seven days and may be accompanied by slight systemic disturbance. In one case a veterinary surgeon engaged in poultry diagnostic work developed a Newcastle disease infection of the eye two days after handling chickens in the active stage of the disease. There is no evidence that the virus can infect man through the ingestion of an infected carcass: moreover, the virus is easily destroyed by moderate heat.

Sepsis among Butchers

Q.—My butcher tells me that the superficial pricks and abrasions suffered by his men when handling frozen Argentine meat invariably suppurate and healing is prolonged—a condition which does not occur when dealing with home-killed meat. Can you explain this, and advise how to prevent it?

A.—This experience is not confirmed by the chief meat inspector of a large metropolitan market. Only the bacterial content can explain this effect; there are no chemical or other changes in frozen meat which could account for it. Meat is a good culture medium, and in so far as it becomes contaminated and is held at a temperature permitting the growth of potentially pathogenic bacteria it may come to harbour increasing numbers of them. This rule applies both to frozen and to home-killed meat, and the latter unless very fresh (possibly the butcher mentioned has his own slaughter-house and thus deals in exceptionally fresh meat) can contain as many bacteria as the former.

Presumably the question does not refer to specific infections which can be acquired from meat, such as erysipeloid due to *Erysipelothrix rhusiopathiae*. This is a very intractable condition unless treated with penicillin. For ordinary non-specific sepsis no precautions or treatment can be suggested other than those dictated by common sense—protection of the hands so far as possible against injury, the antiseptic treatment of cuts, etc., and thorough washing after work. If the problem is serious the use of a germicidal soap with a persistent action, such as one containing hexachlorophene, might be worth while. It is as well to mention that a person with staphylococcal skin sepsis should not be permitted to handle meat: staphylococcal food-poisoning can be caused in this way.

Wednesday, March 24

●BRITAIN-CHINA FRIENDSHIP ASSOCIATION: CULTURAL AND SCIENTIFIC COMMITTEE.—At 45, Russell Square, W.C., 7.30 p.m., Dr. H. Joules: Social Medicine in China.
EUGENICS SOCIETY.—At Burlington House, Piccadilly, W., 5.30 p.m., Dr. J. M. Tanner: Physique and Choice of Career.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Viral Diseases of the Skin.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. C. Morson: Non-tuberculous Infection of the Renal Tract.
●LONDON MARRIAGE GUIDANCE COUNCIL.—At Royal College of Nursing, 7 p.m., Dr. Ethel Dukes: Effect of Early Environment on Marriage.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. T. Rowland Hill: Diseases of the Nervous System in Relation to the Public Health (illustrated).
SOCIETY OF APOTHECARIES OF LONDON.—5 p.m., Seventh Joseph Strickland Goodall Memorial Lecture by Dr. Paul Wood: An Appreciation of Mitral Valve Disease.
WEST LONDON HOSPITAL MEDICAL SCHOOL.—At Medical Society of London, 5 p.m., Seventh Simpson Smith Memorial Lecture by Professor C. G. Rob.

Thursday, March 25

●INSTITUTE OF CARDIOLOGY.—9.30 a.m., Sir John Parkinson: Radioscopy of the Heart.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Viral Diseases of the Skin.
INSTITUTE OF NEUROLOGY.—5 p.m., Professor D. Denny-Brown (U.S.A.): Visuo-Motor Mechanisms in the Cerebral Cortex.
LIVERPOOL MEDICAL INSTITUTION.—7.30 p.m., annual meeting of members. 8.15 p.m., Sir Henry Cohen: The Collagen Diseases and their Response to Cortisone and A.C.T.H.
LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8.30 p.m., annual general meeting, followed by a Brains Trust: "What is the Future for Medical Women?"
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Dorchester Hotel, 6.45 p.m. to 1 a.m., annual dinner dance.
ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Professor Ian Aird: Medical and Other Trends in the Union of South Africa (with lantern slides).
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor J. B. Kinmonth: Lymphangiography in Clinical Surgery and particularly in the Treatment of Lymphoedema.
●WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At South Kensington Hotel, 7.30 for 7.45 p.m., Dinner meeting: Sir Hugh Griffiths: The Doctor in the Witness Box.

Friday, March 26

●INSTITUTE OF ALMONERS.—At B.M.A. House, 6 p.m., annual general meeting. Professor A. Leslie Banks: Clients and Patients.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. B. F. Russell: Epidermal Tumours—Naevoid, Benign, and Malignant.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., Professor F. C. Ormerod: Foreign Bodies in the Food and Air Passages.
INSTITUTE OF NEUROLOGY.—5 p.m., Professor G. H. Monrad-Krohn (Oslo): Emotional Innervation with special regard to Facial Hyperemia.
MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—7.30 p.m., papers by Dr. F. Lancoley, Dr. J. G. Feinberg, and Dr. M. G. McEntegart: Laboratory Aspects of Trichomonas Vaginalis. A discussion will follow.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Urology Lecture by Professor Raymond Darget (Bordeaux): Treatment of Malignant Diseases of the Bladder.
ROYAL SANITARY INSTITUTE.—At Library Lecture Hall, School Street, Darwen, Mr. E. P. McGlynn: Housing; Dr. R. C. Webster: Old Age.

Saturday and Sunday, March 27 and 28

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.—Saturday and Sunday, March 27 and 28, 10 a.m. each day, concentrated week-end course on the Rheumatic Diseases.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—A. E. Gibbs, M.B., B.Chir., Senior Medical Officer (Assistant Physician in Geriatrics), St. Leonard's and Walnutree Hospitals, Sudbury; P. J. Dwyer, M.B., B.S., M.R.C.O.G., Registrar in Obstetrics and Gynaecology, East Suffolk and Ipswich Area.
COWELL, T. R., Wymn, M.B., Ch.B., House-physician, Clatterbridge General Hospital, Bebington, Wirral, Cheshire.
WESTON, JOSEPH W., M.R.C.S., L.R.C.P., D.T.M.&H., Senior Hospital Medical Officer, Royal Infirmary, Halifax (Leeds Regional Hospital Board).

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Caldwell.—On February 28, 1954, at Aberdeen, to Margaret, wife of Dr. T. S. Caldwell, Kinlairs, Aberlour, Banff, a son.
Duncan.—On February 14, 1954, to Marjorie, wife of Dr. E. H. Duncan, 69, Norbury Court Road, London, S.W., a second daughter—Julia Mary.
Ecob.—On February 24, 1954, at Southampton General Hospital, to Ann (formerly Griffiths), M.B., Ch.B., wife of Colin Ecob, M.B., Ch.B., a daughter—Elizabeth Ruth.
James.—On February 23, 1954, at the Woolwich Memorial Hospital, London, S.E., to Joyce (formerly Johnson), wife of Dr. C. W. L. James, a brother for David and Rosemary—Brian.
Owen.—On March 3, 1954, at St. David's Hospital, Bangor, to Dr. Gwen Ellis Owen (formerly Hughes), wife of Arthur W. Owen, of Caernarvon, a son.

DEATHS

Ord.—On February 25, 1954, at his home, Bell Close, Marlborough, Wilts, Reginald Whistler Ord, M.R.C.S., L.R.C.P., formerly of Dover, Kent, aged 86.
Pearse.—On February 20, 1954, at Colwyn Bay, Denbighshire, Herbert Henry Pearse, M.R.C.S., L.R.C.P., Surgeon Captain, R.N., retired, aged 86.
Pearson.—On February 24, 1954, at St. Mary's Hospital, Eastbourne, Sussex, Allan Campbell Pearson, M.C., M.B., B.Ch., D.P.H., late of London, S.W., aged 79.
Smith.—On February 23, 1954, at Moseley Bank, Cheshire, Henry Elkington Smith, M.D., aged 81.
Williamson.—On January 8, 1954, at Dumfries, Joseph Bannister Williamson, M.B., Ch.B., Captain, R.A.M.C., retired.

Detergents

Q.—What are detergents and what is their general composition? Have they any harmful effect on plants if applied to the leaves?

A.—The term detergent is often used as synonymous with wetting agent; its true meaning is a cleansing agent. All wetting agents are not good detergents. If the term is used in its broad sense there are three main classes of wetting agents. Nearly all have long carbon chains, and these fatty groups may be negatively or positively charged or the substance may be uncharged. Amongst the former are soaps and the sulphonated fatty alcohols or petroleum sulphonics acids. A well-known example of one with a large positively charged group is cetrimide, which is mainly trimethylcetylammonium bromide. The two groups of charged wetting agents are incompatible and mutually precipitate one another. There is now a large group of uncharged wetting agents such as "Tweens" (polyoxyalkylene derivatives of fatty esters of sorbitan) and the "Tritons" (polymers of derivatives of polyoxyethylene phenols). Wetting agents are very widely used as vehicles for insecticides and other chemicals applied to growing crops. Any phytotoxic effects that have occurred are not usually attributed to the wetting agents contained in the preparations.

Blood Picture in Children

Q.—In what way does the normal blood picture of children differ from that of adults? Is there any difference between the sexes? Please give figures for children aged 3, 6, 9, and 12.

A.—The normal blood picture of children, as distinct from infants, is very little different from that of the adult with regard to the haemoglobin level and the red cell and total leucocyte counts. The differential leucocyte count, however, shows a higher proportion of lymphocytes, the normal adult differential count not being attained until about the 6-9th year. Sex differences in childhood are negligible. The haemopoietic system of the child is more sensitive to extraneous influences than that of the adult. For example, in acute infections, where an adult will respond with a moderate leucocytosis the child may react with a very high count and show a number of myelocytes in the peripheral blood. Sometimes a lymphocytosis may follow a pyogenic infection. Fluctuations in the leucocyte count are often rapid. The following are average normal blood findings at different ages:

Age (Years)	Hb (g per 100 ml.)	Red Cells (in Millions)	White Cells (per c.mm.)	Poly-morphs (per c.mm.)	Lymphocytes (per c.mm.)
3	12.4	4.5	10,000	4,500	5,000
6	13.6	4.7	8,000	4,500	3,000
9	13.5	4.8	6,000	3,500	2,000
12	14.0	5.0	6,000	3,500	1,800

Keeping Qualities of Ether and Chloroform

Q.—For how long will ether and chloroform remain safe and reliable to use for anaesthesia when kept in glass-stoppered bottles away from the light?

A.—It is generally recommended that ether in bottles should not be used after having been kept in store for longer than a period of about 12 months. In copper-lined tins, the period is a little longer. There is still considerable doubt, however, about the possible harmful effects, so far as clinical anaesthesia is concerned, of using ether which has been stored for longer periods. In one important paper on the subject,¹ comparison between the clinical effects of samples of pure and "impure" ether on over 2,000

patients failed to show any significant difference in the course of the anaesthesia or in the frequency of complications.

Similarly for chloroform, one year should be regarded as the safe upper limit for storage.

REFERENCE

¹ Lindaren, G. (1946). *Acta chir. scand.*, 94, Suppl. 110.

Multiple Sebaceous Cysts

Q.—Would you please suggest treatment for multiple sebaceous cysts? The man in question has widespread sebaceous cysts over the face and body.

A.—Multiple sebaceous cysts, usually a familial, naevoid affection, may be removed surgically. An alternative treatment is by diathermy needle. The needle point of the active electrode is passed into the cavity through the follicular orifice and a current passed until there is blanching of the skin round the needle up to 3 mm. diameter. A crust forms which in the course of a week can be removed, often bringing the sac away with it. The treatment is described by Robbins and Pensky.¹

REFERENCE

¹ Arch. Derm. Syph. (Chicago), 1950, 62, 411.

NOTES AND COMMENTS

Hazards of Fluoroscopy.—Dr. W. H. TATTERSALL (Bournemouth) writes: I am surprised that you should suggest that a diagnostic chest fluoroscopy session might be continued for as long as three hours ("Any Questions?" February 27, p. 532). In my experience, after about an hour of such work the concentrated mental effort, and the considerable physical exertion involved in moving the patient about behind the screen, call for a rest. Fatigue and the risk of error may increase insidiously after that time; I cannot recollect continuing such a session beyond an hour and a half. For such work the operator must be dark-adapted. Although 65-70 kV at 3 mA may be adequate for the examination of many individuals, it is better to use up to 80 kV and 5 mA so as to examine the patient quickly and confidently, rather than to protract the examination because of hesitation to use a brighter beam. It is then possible to scan the whole chest thoroughly from all possible angles in 60 seconds or so. Allowing another minute for patients to change places, and to record one's findings, it is feasible to examine about 30 persons an hour. Certainly if a fluoroscope is adequately protected and properly used there is no risk to health, but anyone doing this sort of work regularly should make sure that such conditions do exist. It is not difficult to arrange for a physicist to estimate the scattered irradiation with ionization chambers, while the National Physical Laboratory supply test film for the quantitative measurement of an operator's exposure to cumulative irradiation. It seems prudent to avoid approaching the maximum safe dose if one is specializing in this kind of work.

OUR EXPERT writes: The figures I gave are those in current use at hospital and are more than adequate for anybody properly adapted. They are, in fact, those used for barium meal examination. The risk of scatter at the higher kV and mA is, of course, greater. Two or three hours are the usual screening sessions in x-ray departments, provided the sessions and the rota of patients are well organized.

"Any Questions?" Book.—The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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RESULTS OF METHONIUM TREATMENT OF HYPERTENSIVE PATIENTS*

BASED ON 250 CASES TREATED FOR PERIODS UP TO 3½ YEARS, INCLUDING 28 WITH MALIGNANT HYPERTENSION

BY

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Except in malignant hypertension, the outlook of the individual hypertensive patient treated only by rest, sedation, and the amelioration of complications is difficult to assess unless the prognosis has evidently deteriorated because of substantial cardiac failure or renal impairment.

Individual prognosis is hazardous, especially in milder cases, but the expectation of survival among large groups of hypertensive patients has been well worked out in terms of their presenting clinical features. Among such groups of patients the expectation of survival is related to the extent of hypertensive changes in the retina, the presence or absence of heart failure, cardiac asthma, breathlessness, substantial electrocardiographic changes and, in a general way, with the height of the blood pressure, especially the diastolic pressure. The age at which the patient begins to show such abnormal manifestations, and the sex, have a strong bearing on outlook. While different views are expressed, a scrutiny of the manner in which authors have gathered their clinical material, and of the age and sex of the patients, reveals that the divergencies are less than would appear at first sight. Differences in case selection, not always of an obvious kind, influence comparisons of the results of medical and surgical treatment.

In many publications on groups of patients submitted to sympathectomy, those who have impaired renal function, who have had heart failure or a previous stroke, or who are 60 years or more may be rejected. The selection may be such that the patients who are operated on have in any case a better outlook than the generality of cases, or a worse one if patients with malignant hypertension constitute a large proportion of the sympathectomy cases. It is important, therefore, to divide up hypertensive cases into a sufficient number of age groups and clinical categories, as these differ greatly in their outlook. Perhaps the clearest demonstration of the importance of subdividing the classes of hypertensives comes from Keith, Wagener, and Barker (1939), who showed the re-

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lationship between retinal changes and outlook in a series of hypertensive patients collected at the Mayo Clinic. Their series comprised 146 cases of malignant hypertension (grade IV), 37 of grade III, 26 of grade II, and only 10 of grade I. Possibly the preponderance of severe cases is related to the fact that patients are sent from a distance to the Mayo Clinic. My experience has been that cases referred from a distance are on average more severe.

The object of the present paper is to give an account of our experience with methonium treatment of hypertensive cases, mostly of substantial severity, over a period of three years and seven months. Over 250 patients have been treated. The effects of treatment upon the clinical manifestations secondary to hypertension have been of the same kind irrespective of the cause of high blood pressure. Later results confirm and to some degree improve on those published earlier (Restall and Smirk, 1950; Smirk and Alstad, 1951). This paper mainly concerns problems which could not be dealt with adequately at an earlier stage. Results in malignant hypertension (excluding nephritis) and in patients with hypertensive heart failure or cardiac asthma are given in detail. In the mortality studies on malignant hypertension we have reported on 28 patients, including all who died and all living patients on treatment for five months or more. In mortality studies on patients in grades III, II, and I, almost all the 142 patients have been on treatment for periods between one and three and a half years. For comparison there is a series of 71 untreated patients investigated by the same methods. These control cases were mainly patients who presented themselves for investigation and possible treatment on or after November, 1949, and were judged suitable for methonium treatment. They were not treated, either because of shortage of supplies or because they decided against treatment. On the whole these cases were somewhat milder than those treated.

It has become clear that there is a significant improvement in the life expectation of malignant hypertension cases. Other groups also show an improvement, but further observation will be needed before definite conclusions can be drawn.

Reports of clinical improvement with effective methonium treatment have been published by Rosenheim (1952), McMichael (1952), and Morrison (1953). There is general agreement concerning the character of clinical improvement when it occurs.

Method

The technique of treatment and the methods of determining the adequacy of control over blood-pressure levels have remained the same in principle but have improved in detail in the course of the past three and a half years. The methods used have been described elsewhere (Smirk, 1950, 1952b, 1952c; Smirk and Alstad, 1951; Kilpatrick and Smirk, 1952). The method at present advocated has been described recently (Smirk, 1953a, 1953b). Greater detail is available in the latter paper.

1. Mortality Experience in Treated and Untreated Patients

Survival Times of Patients with Malignant Hypertension

All cases classified here as malignant hypertension have shown a clear-cut papilloedema, with some other retinal manifestations, such as circumpapillary oedema, hard and soft exudates, retinal haemorrhages, etc. In case of doubt the binocular ophthalmoscope was employed. No case diagnosed as malignant hypertension has been excluded from the series, but cases of nephritis are not included even though the fundal changes are of the grade IV type. Our malignant hypertension patients comprise 28 who have been on continuous treatment with methonium salts; four others who were on treatment for a time and then stopped; and 11 patients who were untreated, these having been seen mostly in the years before methonium treatment started. The results are set out in Tables I and II.

TABLE I.—Mortality Experience in Malignant Hypertension

Group A				Group B				Group C			
Died		Survived		Died		Survived		Died		Survived	
Case No.	M. S.	Case No.	M. S.	Case No.	M. S.	Case No.	M. S.	Case No.	M. S.	Case No.	M. S.
Treated with Methonium											
206	6	33	43	None	40	37	49	31	51	39	
		34	39		204	24	52	15			
		41	37		207	23	76	10			
		123	33		220	24	227	4			
		124	32		306	14	337	4			
		161	28		357	19	E.8	1			
		216	23		361	11					
		336	12		364	9					
		371	7								
		382	8								
		400	5								
		E.7	21								
Controls Untreated											
L.C.	6	135	24	A.S.	1	None	S.C.	1	None		
		150	32*	P.R.	1		R.G.	2			
				E.A.	4						
				F.M.	2						
				160	3						
				A.H.	1						

M.S. = Months of survival. * Sympathectomy.

TABLE II.—Average Periods of Survival

	Group A				Group B				Group C			
	Died		Survived		Died		Survived		Died		Survived	
	No.	M.S.	No.	M.S.	No.	M.S.	No.	M.S.	No.	M.S.	No.	M.S.
Treated with methonium	1	6	12	24	0		8	18.9	6	10.3	1	39
Controls (local)	1	6	2	28	6	1.87	0		2	1.25	0	
Controls (Keith <i>et al.</i> 1949)	5	13.3	4	26	8	1.8	2	9	4	1.3	0	

M.S. = Months of survival.

Of the treated patients seven died after periods of treatment lasting 10, 15, 31, 6, 2, 4, and 1 months. The clinical state and reaction to treatment of the patients who died are set out below:

Case E8 was admitted in a moribund condition. Case 227 was close to uraemia with repeated vomiting and high total N.P.N. He improved for a time, but died in three months from uraemia. Cases 76, 52, and 49 were admitted in advanced congestive failure with severe cardiac asthma. They improved for a time: Cases 76 and 52, up to the time of their deaths by cerebral haemorrhage, were active, able to climb stairs, and looked after their own homes. Case 49 recovered from heart failure and was able to climb stairs, but developed bilateral pneumonia, from which she died. She had poor renal concentrating capacity, and the underlying condition was partly responsible for a fatal outcome. Case 206 had extreme dryness of the mouth and loss of appetite under effective methonium treatment which had cleared his papilloedema. During attempts to modify and improve the regime he got out of control and developed acute pulmonary oedema, from which he died. Case 337 had advanced renal changes and died from intercurrent infection. Of the patients who were not treated, 9 out of the 11 were dead in six months; two are alive, one at 24 months and one at 32 months, the latter having had a sympathectomy. The four additional patients who had a period of treatment and then stopped treatment had 3, 3, 17, and 7 months under methonium treatment and showed the usual degrees of clinical improvement while on treatment; they survived periods of 3, 15, 1, and 2 months without treatment before death occurred.

Of the 21 surviving patients, 15 are leading productive lives: 11 men are at work, and 4 women are doing housework. Two male patients are expected to return to work within a few weeks (Tables III and IV).

One female patient who managed her house and garden for 28 months became completely incapacitated by a hemiplegia during the last nine months.

Mortality Figures in Patients Who Could Have Been Considered for Surgical Treatment

A high proportion of our patients with malignant hypertension presented in a condition in which sympathectomy could not have been contemplated (group A on the classification of Keith, Woolf, and Gilchrist, 1949). There were others with disabilities which would not have altogether prevented sympathectomy—such as a previous major cerebral accident (two cases), an older age group than is ordinarily accepted (two cases), or a degree of cardiac failure or cardiac asthma (four cases) which, though it does not prevent sympathectomy in less serious cases, is associated with a worse prognosis in malignant hypertension (group B on the classification of Keith *et al.*, 1949). Seven patients presented with advanced cardiac or renal changes (group C).

When, however, we consider the results of adequate methonium treatment in patients who do not have any of the above-mentioned objections to sympathectomy, we find that up to the present only one patient out of a total of 13 has died. This patient lived for six months. The surviving patients in group A have lived for an average of 24 months. In a group of patients selected in a similar way by Keith *et al.* (1949) and treated by rest and sedation, five died at

13.3 months and four survived for an average of 26 months. We had eight patients who came to us before methonium treatment was available and also three patients with malignant hypertension who refused treatment or came when supplies were insufficient. Of these 11 patients, nine died at an average of 1.8 months, and two, including a sympathectomy case, have survived for an average of 28 months after the first diagnosis of malignant hypertension was made.

TABLE III.—Occupational State of Malignant Hypertension Patients Under Treatment

Case No.	Sex	Additional Clinical Features Before Treatment	Age Starting Treatment	Occupation During Treatment	Months Survived on Treatment
Leading a Productive Life					
41	M	—	48	Accountant	37
53	M	—	46	In general medical practice	43
123	M	—	56	Business executive	33
204	M	Left ventricular failure	45	Railway employee	24
207	M	"	57	Engineer—active	23
216	M	"	42	Sheep shearing, wool classing	23
336	M	Minor cerebral accident	47	Farmer	12
371	M	Encephalopathic attacks	46	Stokes furnace	7
382	M	"	43	Garage work	8
400	M	Left ventricular failure	41	Priest—educational work	5
E7	M	"	45	Farmer	21
124	F	Subarachnoid haemorrhage	46	Housewife	32
161	F	2 minor cerebral accidents	32	"	28
220	F	Encephalopathic attacks	63	"	24
337	F	Left ventricular failure	52	"	9
Partially or Potentially Productive					
51	M	Congestive failure. Low I.Q. Osteoarthritis	59	Worked 2 years on farm. Now in old men's home; sweeps and cleans up	39
306	M	Left ventricular failure. One leg amputated	55	Return to work expected soon	14
361	M	Cerebral accident before treatment. Recovering from aphasia	47	Physically fit. Return to work expected soon	11
Leading a Productive Life up to Time of Death by Stroke					
52	F	Severe heart failure	47	Housewife	14
76	F	"	43	"	10

TABLE IV.—Occupational State of Malignant Hypertension Patients Under Treatment

Case No.	Sex	Additional Clinical Features Before Treatment	Age Starting Treatment	Reason for Not Working	Months Survived on Treatment
Incapacitated by Conditions Arising Before Treatment Started—Substantially Free from Original Hypertensive Symptoms					
364	M	Cerebral vascular accident	44	Stroke	9
Incapacitated by Hypertensive Condition Developed During Treatment					
40	M	Heart failure	58	Well for 34 mths. Mental confusion 2 weeks	37
54	F	Severe encephalopathy	46	Ran her own house for 33 months, then incapacitated by severe stroke	39
Much-improved Activity, But Remaining Semi-invalid up to Time of Death					
49	F	Severe heart failure and renal insufficiency	52	Lassitude	31
Died in Hospital Without Making Substantial Improvement					
206	M	—	48	In hospital	6
227	M	Uraemia	44	"	2
337	F	Diabetes. Kimmelstiel-Wilson disease	41	"	4

Comparison of the Groups with the Series of Keith *et al.* (1939)

Our control series of untreated malignant hypertension cases is only 11 in number, but our experience has corresponded with that of Keith *et al.* (1939) in a much greater series. In the present series of untreated patients 18% were alive at 18 months; in the methonium-treated group 75% were alive at 18 months.

Comparing similar groups of patients with malignant hypertension, methonium treatment has been associated with extension of the survival period.

Survival Times of Patients with Essential Hypertension (Grades III, II, and I)

The grades of hypertension referred to above are those of Keith *et al.* (1939). Grade I cases show minimal or no retinal changes; grade II show distinct hypertensive changes in the retinal arteries, such as nipping of the arteriovenous crossings or waist-like narrowings of arteries, but no other changes; grade III show haemorrhages, hard or soft retinal exudates, retinal oedema, or some combination of these but without papilloedema. In certain cases retinal oedema encroaches on the disk edge and blurs its outline, but does not lead to actual elevation of the disk: such cases have been classified as grade III, the doubtful cases being examined for papilloedema by the binocular ophthalmoscope. Thirty-four patients and 15 controls were classified grade III; 89 treated patients and 38 controls were grade II; 20 treated patients and 7 controls were grade I. A total of 142 were treated (the great majority for 12 to 42 months). The 60 controls were collected over the same period of time.

The deaths are set out in Tables V and VI. With both treated and control patients it is evident that the mortality experience with grade III is less favourable than with grade II, and grade II less than grade I, in which latter there were no deaths in either the treated or the control series. The results of treatment in grade II may be approaching statistical significance, but the results in grade III as set out in Table V do not seem so promising. The number of patients in this group and the duration of experience are insufficient to justify any conclusion. It should be mentioned, however, that seven of the grade III cases were of much greater severity than any of the control series, and four of the deaths occurred in this group. Were these seven patients not counted, so making the treated and control

TABLE V.—Mortality Experience With Hypertension of Grades III, II, and I

Age	Grade III		Grade II		Grade I	
	Died	Survived	Died	Survived	Died	Survived
Controls						
70+	0	0	1	0	0	0
60-69	1	2	4	5	0	2
50-59	2	3	1	11	0	3
40-49	2	5	4	11	0	1
30-39	0	0	0	0	0	1
20-29	0	0	0	0	0	1
Total	5 (33%)	10	10 (26.3%)	28	0	7
Treated						
70+	2	0	0	4	0	0
60-69	1	2	1	14	0	1
50-59	2	10	7	28	0	4
40-49	3	7	3	25	0	8
30-39	0	4	0	6	0	6
20-29	1	1	0	1	0	1
Total	9 (27.3%)	24	11 (12.3%)	78	0	20

TABLE VI.—Mortality Experience Grades III and II Combined

	Died	Survived	Total
Controls	15 (28.2%)	38 (71.8%)	53 (100%)
Treated	20 (16.4%)	102 (83.6%)	122 (100%)

series more comparable, the difference in mortality would still not be great—33% deaths among controls and 22% among treated patients.

When grades II and III are considered together the mortality difference shows that more experience is needed before a definite pronouncement can be made. The obvious betterment in health and the statistical significance of the results in malignant hypertension give grounds for hope that the figures may be improved by the use of more effective methods of obtaining control over blood-pressure levels—as, for example, by the use of M. & B. 2050A orally or in a solution of polyvinylpyrrolidone for subcutaneous injection (Smirk, 1952a, 1953a, 1953b).

2. Changes in the Physical State of Patients with Malignant and other Forms of Hypertension

Effect of Control of Blood-pressure Level on Retina in Malignant Hypertension

Papilloedema cleared in 21 out of 23 patients who were on effective treatment for five months or more; the two who have not cleared at five and six months are much improved and look like doing so. Eight other patients showed improvement, but papilloedema was still perceptible at the last observation made. These include patients who did not maintain treatment (two cases) or went off treatment (two cases) or died within six months (three cases with renal insufficiency). The remaining patient has been on treatment about three months. In most instances disappearance of papilloedema takes three to four months, sometimes six months, of intensive treatment; and a reduction of blood pressure to normal or near normal levels at the trough of the fall is necessary. With the better control obtained latterly, it has been our experience that papilloedema can be dispersed in almost all instances and that failure to do so after four months' treatment is usually an indication that the blood-pressure reduction is insufficient in degree and duration. A clear reduction in the amount of papilloedema should be evident in three to four weeks, with reappearance of a physiological cup or of a part of the disk edge. The last residues of oedema take longest to disperse. It often happens that one disk is entirely clear of papilloedema and the other has lagged behind in improvement.

Within the first month of effective treatment soft exudates should have disappeared, there should be no fresh haemorrhages, and as a rule old haemorrhages have been dispersed. Hard exudate at this stage usually stands out shiny and with sharp edges. With effective treatment the hard exudate begins to soften at the edges and loses some of its shiny clear-cut delineation, looking more like soft exudate in some instances. Substantial dispersal of hard exudate is unlikely under six months and some may remain after 12 months, but it will be absorbed in most patients who have been under effective treatment for 12 to 18 months. In a few instances the edge of the disk will remain a little fuzzy as the result of post-papilloedema changes.

Examinations of such patients with the binocular ophthalmoscope have been made in most cases by Dr. Rowland Wilson in order to be sure that this was not residual papilloedema. New blood vessels round the edge and sometimes on the disk are a common residual finding after the papilloedema. In some instances the disk is pale, suggesting a minor grade of optic atrophy even though vision is good. The generalized vasospasm of so many patients with malignant hypertension tends to disappear and the general calibre of the arteries returns almost to a normal level. Such arterial changes as nipping of the arteriovenous crossings and waist-like narrowings in the course of arteries remain behind, but I am unable at this stage to comment on the question of whether any recession in such changes occurs or not.

At an early stage of our work a few patients with malignant hypertension were treated by continuous subcutaneous administration of hexamethonium bromide over a period of approximately 12 days, using an electrically operated power-driven syringe (Smirk, 1951). By this means the blood

pressure was kept only a little above the normal level day and night. Papilloedema then seemed to clear much more rapidly than with intermittent blood-pressure falls from thrice-daily injections of aqueous hexamethonium bromide. Preparations have been devised which are absorbed more slowly owing to admixture with polyvinylpyrrolidone or dextran. The most satisfactory of these is the longer-acting methonium compound M. & B. 2050A dissolved in 20% aqueous polyvinylpyrrolidone, ephedrine hydrochloride being added to 1 in 200 concentration in order to prolong absorption by local vasoconstriction. With two, or at times three, injections daily of this preparation it has been possible to obtain a much better control than with three injections daily of aqueous hexamethonium bromide. In most instances oral administration of M. & B. 2050A is equally satisfactory. Under these conditions, apparently related to the better control over blood-pressure levels, dispersal of papilloedema and of other retinal manifestations seems to be accelerated.

Effect of Control of Blood-pressure Level on Retina in Patients with Grade III Changes

The appearance in these patients is similar to that in malignant hypertension except that there is no elevation of the optic disk. The disappearance of retinal haemorrhages, soft exudate, retinal oedema, and finally of hard exudate takes place in much the same way as in malignant hypertension.

Effect of Control of Blood-pressure Level in Heart Failure, Cardiac Asthma, and Simple Breathlessness

Hypertensive congestive heart failure or cardiac asthma was relieved by methonium therapy without the use of digitalis, mersalyl, or salt-free diet in 20 of the 36 cases. In most instances patients returned to the degree of activity appropriate to their time of life. Of the remaining 16 cases, seven required digitalis or mersalyl initially; but later, when methonium therapy was well-established, digitalis and mersalyl were withdrawn without recurrence of failure. In one patient who went into heart failure while on digitalis the failure was controlled by blood-pressure reduction; digitalis was omitted, but it was not possible to manage without a salt-free diet. In five other patients who went into failure while on digitalis (ages 51, 71, 70, 60, and 80) the breathlessness was considerably lessened, but remained an important disability and the digitalis could not be withdrawn. In three patients there was deterioration. In one we had been unable to establish an effective regime because of side-effects; in another case necropsy revealed that an extensive left ventricular infarction had maintained heart failure; in another uraemia and left heart failure were associated.

Of 27 patients under 60 years, six did not work, 11 men returned to gainful employment (one died later from a stroke), and 10 women were engaged in housework (two died later from a stroke).

With a few exceptions it has been possible to remove cardiac asthma and congestive heart failure and to render breathlessness unimportant without recourse to digitalis, mersalyl, or salt-free diet, except that a regime of "no added salt except in cooking" is sometimes advised. In a few instances where digitalis was in use before the patient came into hospital the dose was maintained at the level on which the manifestations of congestive failure had developed.

Attacks of cardiac asthma can be cut short by the administration of an appropriate dose of hexamethonium bromide or one of the other effective methonium salts, the patient being propped up in the sitting posture. If by fractional administration the blood pressure is reduced to as near normal as the patient will tolerate, a great degree of relief from breathlessness is commonly encountered as the blood pressure falls, even in cases of severe cardiac asthma. Fractional administration is advised because, were the dose given an excessive one, the normal counter-measure of

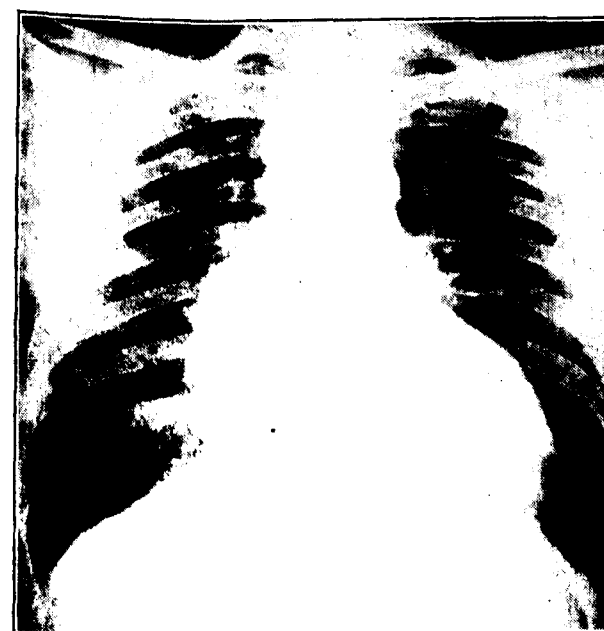
lowering the patient to the horizontal position in order to re-elevate the blood pressure could scarcely be applied if there was considerable orthopnoea.

It is a considerable advantage to heart-failure patients if the use of digitalis, mersalyl, or salt-free diets can be avoided because in most cases heart failure due to hypertension can be relieved without these measures. Recurrence of breathlessness provides a very useful warning that the degree of control over blood-pressure levels is insufficient. Sometimes, however, it is not possible to dispense with additional measures at the outset. It is better then to supple-

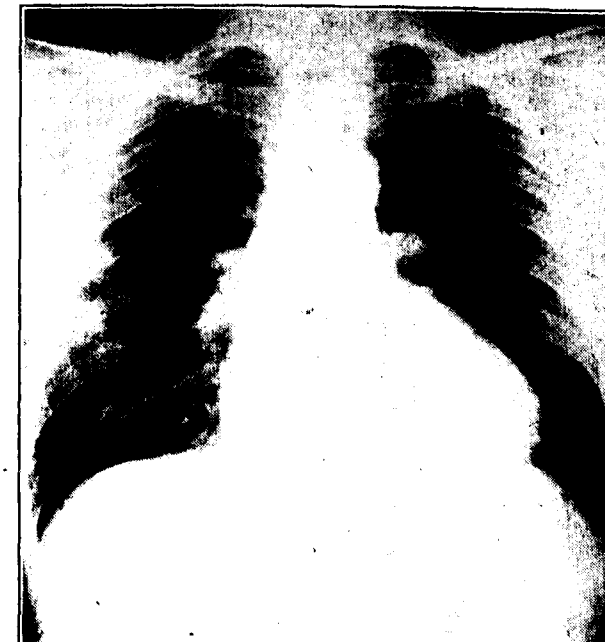
ment methonium treatment by occasional injections of mersalyl, since when these are omitted it will soon be discovered whether the regime has allowed a sufficient recovery of the cardiac muscle. In about one in four cases, and especially in the elderly, a digitalis regime may be required as well as blood-pressure control.

Effect of Control of Blood-pressure Level on the Electrocardiogram

Reference was made in an earlier publication (Smirk and Alstad, 1951) to improvement in the electrocardiogram



Before



After

FIG. 1.—Case 204, male aged 45. The x-ray film prior to treatment was taken August 28, 1951, and corresponded with mild congestive heart failure and attacks of cardiac asthma. These cleared on methonium treatment without other measures. The patient returned to work. Second film was taken May 4, 1953.



Before



After

FIG. 2.—Case 14, male aged 46. Before treatment there was mild breathlessness but no congestive failure or cardiac asthma. The first x-ray film was taken on January 27, 1950. Breathlessness cleared on methonium treatment. The second film was taken on June 12, 1953.

following effective blood-pressure reduction. These changes did not take place at once in response to the lower blood pressure, but were progressive over a period of up to a year or more. The results in our series of cases have been analysed since by Doyle (1953), and his report on hypertensive patients in general applies equally to malignant hypertension cases. With effective blood-pressure reduction of sufficient duration, the voltage of the R and S waves is decreased; the depressed ST segments in leads reflecting left ventricular potentials ordinarily return to the isoelectric level; inverted T waves in the left ventricular leads either become less inverted or become positive; raised ST segments and over-average T waves in leads reflecting right ventricular potentials and the cavity side of the left ventricular potentials show a return of the ST segment towards the isoelectric level and a decrease in the height of the T waves. A useful working rule is that if electrocardiographic defects show no improvement within a few months there is need for a more substantial control over blood-pressure levels. At a later stage any relapse of electrocardiographic signs has the same significance. Necropsy evidence has shown that, at least in some instances, gross muscular hypertrophy remains even though the electrocardiogram has returned almost to normal.

Effect of Control of Blood-pressure Level on Heart Size

It has been reported already that an unequivocal decrease in heart size is encountered not only in patients who have had congestive heart failure but in a small proportion of

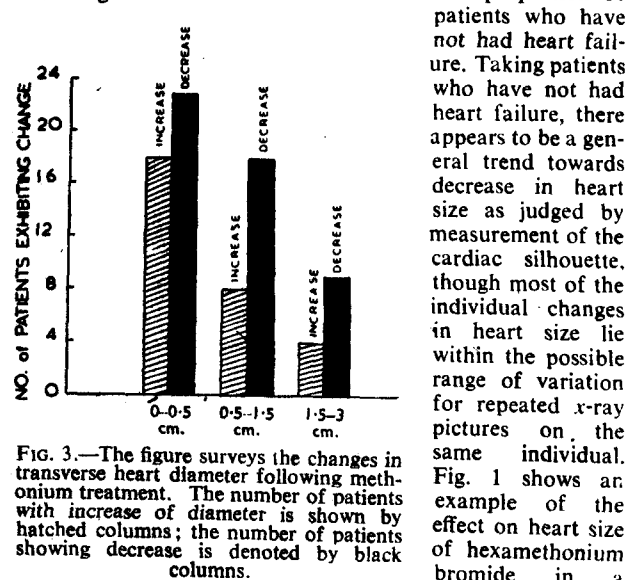


FIG. 3.—The figure surveys the changes in transverse heart diameter following methonium treatment. The number of patients with increase of diameter is shown by hatched columns; the number of patients showing decrease is denoted by black columns.

patients who have not had heart failure. Taking patients who have not had heart failure, there appears to be a general trend towards decrease in heart size as judged by measurement of the cardiac silhouette, though most of the individual changes in heart size lie within the possible range of variation for repeated x-ray pictures on the same individual. Fig. 1 shows an example of the effect on heart size of hexamethonium bromide in a patient with congestive heart failure; Fig. 2 an example of decrease in heart size in a patient who had no heart failure. Fig. 3 shows the changes of heart size in 76 patients after periods of several months to three years on treatment. It will be seen that when the change is outside the usual limits of variation it is more usually in the direction of decrease.

Effect of Control of Blood-pressure Level on Headache and Giddiness

The effect on headache and giddiness was referred to in earlier papers (Restall and Smirk, 1950; Smirk and Alstad, 1951), where it was indicated that failure to relieve headache and giddiness with an adequate regime was most exceptional. In preliminary discussions with patients the prospect of such relief may be mentioned as highly probable if they are prepared to take an amount of trouble comparable to that of a diabetic patient on insulin. In order to obtain such results the regime must be adjusted in terms of the reaction of the individual patient to the hypotensive agent. Thus, three adequate injections daily of hexamethonium bromide subcutaneously with adoption of

the sitting posture throughout the night (body inclined at 45 degrees from the horizontal) commonly relieves headache. Some patients, however, still have morning headaches on this regime. The administration of an extra dose of hexamethonium bromide before retiring or the administration of an appropriate number—say 1 to 4—tablets of hexamethonium bitartrate with a little food to prolong the absorption will often, when combined with the sitting posture, prevent the development of headache the next morning. The administration of hexamethonium bromide in 20% polyvinylpyrrolidone proved more effective than the simple aqueous solution.

Latterly a further advantage has been obtained by the use of M. & B. 2050A in polyvinylpyrrolidone with 1 in 200 ephedrine hydrochloride incorporated in the mixture in order to delay further the absorption from subcutaneous tissues. A suitable injection at night commonly prevents morning headache. Alternatively or additionally an appropriate dose of M. & B. 2050A by mouth, usually taken with a little food so as to delay the absorption further, will relieve morning headache. From what has been said it should be clear that, in order to obtain relief from headache in almost all cases, a number of clinical trials have to be made and individual regimes devised to suit particular patients.

Discussion

Our results represent, at the most, the experience of three and a half years, and with the majority of patients a shorter time; but, even so, if our data be accepted there has been a fundamental change in the immediate outlook as regards survival of malignant hypertension patients as well as amelioration of symptoms and signs as reported previously (Restall and Smirk, 1950; Smirk and Alstad, 1951). This is achieved by methods which unfortunately need scrupulous long-term control and great expenditure of time, and which in general are not, but sometimes are, hard on the patient because of side effects.

The object of treatment is to reduce the blood pressure to near normal levels for as much as possible of the 24-hour day. A few patients have been treated by hexamethonium bitartrate by mouth, others by three daily injections of appropriate doses of aqueous hexamethonium bromide. Later the hexamethonium bromide was dissolved in 20% or 25% polyvinylpyrrolidone in order to prolong the period of absorption, and in some instances a further prolongation was effected by the addition of 1 in 200 ephedrine hydrochloride to the injection mixture. In the last fifteen months several patients have been treated by a new methonium compound, M. & B. 2050A (Smirk, 1952a, 1953a, 1953b; Wien and Mason, 1953; Maxwell and Campbell, 1953). This substance, dissolved in 20% polyvinylpyrrolidone, particularly when 1 in 200 ephedrine hydrochloride is added to prolong absorption by local vasoconstriction, acts more effectively than some 12 other methonium compounds which we have tested. The substance has the advantage that it may be administered also by mouth in most cases, with effective reduction of blood pressure. The detail of the method of controlling the dose of a methonium compound has been simplified (Smirk, 1953a, 1953b), but the method of control here advocated does not differ in principle from the more cumbersome methods used at an earlier stage in the treatment of this series of patients. Without control over the blood-pressure level of sufficient degree and duration the results of methonium therapy are most disappointing.

Common errors include: neglect of day and night control of posture; control of dosage in terms of occasional casual blood pressures; neglect of drug toleration; use of oral hexamethonium in cases in which this is ineffective; in injection treatment the use of syringes graduated in 0.2 ml. instead of 0.01 ml.; and the absence of effective instruction to patients with a written account of their regime.

In our patients, blood pressures are measured by technicians throughout six or seven hours of the day at approximately half-hourly intervals for five or six days of the week

and for three weeks. During this period each dose is adjusted in terms of response to previous doses—a kind of biological assay. The patient thereby gains a considerable insight into the principles underlying treatment. After the initial three weeks the patient attends the hypertensive clinic—weekly at first and later at longer intervals. Occasional all-day tests are made, but most of the control at this stage is in terms of hypotensive symptoms. Casual blood pressures are taken, but they are of very little use in the control of dosage. Quite high blood pressures may be encountered in out-patients whose blood pressure, with methonium, is satisfactory under home conditions.

Summary

On three and a half year's experience it appears already that the prognosis of malignant hypertension is much improved by effective control over the blood-pressure level by the administration of methonium salts.

The result of treating all of 28 malignant hypertensive patients, including seven with substantial renal insufficiency or advanced heart failure, is that 21 are living and seven dead. The average survival time of those who died is 9.7 months and of those who are still alive 22.8 months. A considerable majority of the survivors are leading productive lives, the men working at their previous occupations and the women doing housework.

In hypertensive patients with retinal grades II and III, taken together, the mortality figures are better in 122 treated cases (16.4%) than in 53 controls (28.2%), but no claim of statistical significance is made.

Objective improvements include: (a) the disappearance in most cases of such changes as papilloedema, retinal oedema, soft exudates, haemorrhages, and, after long treatment, of star-shaped macular figures; (b) the return to work of most patients under 60 presenting with malignant hypertension, cardiac asthma, or congestive heart failure, including in most instances the elimination of the use of digitalis, mersalyl, or substantial salt restriction; and (c) the electrocardiographic improvement and tendency to decrease of heart size. The consistency with which these results have been reproduced during three and a half years leads me to state that less satisfactory degrees of improvement are usually due to inadequacy of the regime used.

In a minority of patients the doses of methonium salts which relieve hypertensive manifestations lead to much discomfort from side-effects. Methods of alleviation which have helped some cases are suggested.

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ORAL CORTISONE TREATMENT OF HYPOPITUITARISM

BY

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In early trials of the therapeutic value of cortisone in hypopituitarism, the hormone was given in large dosage (75 to 100 mg. daily) for periods of about one to three weeks. The results were encouraging, but in some ways not satisfactory (Summers and Sheehan, 1951). Other workers using this dosage observed no beneficial effects (Robertson and Kirkpatrick, 1951; Brown and Greenblatt, 1952). Since then, a much lower dosage of cortisone has been tried for the continued treatment of these patients. Originally the cortisone was given either by injection or by implantation of pellets, but more recently oral therapy has been found just as efficient and far more convenient. Reports of single cases treated for long periods with doses of 12.5 to 25 mg. daily have been published by Thorn *et al.* (1950, 1951), Clark *et al.* (1951), Levy (1952), Perkins and Rynearson (1952), Roberts *et al.* (1952), McCullagh and Schaffenburg (1953), Tardy (1953), Dontigny (1953), Mathisen (1953), and Fourman and Horler (1954). More recently, a series of three cases treated in this way have been recorded by Hart (1953), and two cases by McCullagh *et al.* (1954). All these workers have reported good results from prolonged therapy at low dosage.

A few investigations have been made of the therapeutic value of cortisone in the treatment or prophylaxis of hypopituitary coma (Allott and Simmons, 1951; Sheehan and Summers, 1952; Paniagua *et al.*, 1952; Caughey *et al.*, 1952; Hijmans, 1952; Heyde, 1953). In addition there have been several reported studies of the effects of cortisone administered for very short periods for diagnostic tests or physiological studies, but these are not of direct relevance to the subject under consideration here.

Treatment of Present Cases

The following account concerns four patients with severe hypopituitarism who have been given small doses of cortisone orally over periods of about two years. Three of these were typical examples of severe hypopituitarism due to post-partum necrosis; the fourth was a man with hypopituitarism of unknown aetiology, probably due to some form of atrophy and scarring of the pituitary.

The patients were studied for a preliminary observation period of two to three weeks without treatment, and for a further control period of five weeks, during which 3 gr. (0.2 g.) of thyroid siccum was given daily. No significant effect was noted from the administration of thyroid. (This point merits a short interpolation. The warnings given in almost all textbooks about the dangers of thyroid therapy in patients with hypopituitarism appear to be overstated. Most of these patients tolerate ordinary dosage of thyroid without any recognizable ill effect. From a study of the occasional cases reported in the literature where the administration of thyroid was followed rapidly by coma, it seems probable that the patients were already on the point of developing coma in any event. Nevertheless, when

thyroid treatment is given, reasonable care should be taken. If the dosage is raised too much because of the lack of response, gastro-intestinal upsets and loss of weight can be produced; these two effects are serious in any patient suffering from hypopituitarism.)

After these periods of preliminary study, cortisone was given orally as "cortone" without any other treatment. The initial dosage was 12.5 mg. daily for one to two weeks, followed by 25 mg. daily for two to four weeks. In one patient it was increased to 37.5 mg. for two weeks and to 50 mg. for one week. Subsequently the amount was gradually reduced in all cases to 12.5 mg. daily as a maintenance dose. When the dosage was raised to 25 mg. one of the patients began to complain of insomnia. Another patient slept satisfactorily with this amount but had insomnia when the dose was increased to 37.5 mg. daily; she recovered when it was reduced to 25 mg. again. In all subsequent treatment the dosage was maintained at a level low enough to allow normal sleep.

Clinical Effects of Treatment

In all four cases there was a marked improvement in the general condition within three or four days. The patients became mentally alert and took a normal interest in their surroundings. They had an obvious sensation of well-being, became physically energetic, and were no longer sensitive to cold. Thus they were able to resume all their ordinary activities in the home and outside. The improvement was maintained satisfactorily on a daily dose of 12.5 mg.

The initial period of treatment with 25 mg. produced in all cases a normal capillary flush of the cheeks, a return of axillary secretion, and the occurrence of sweating on exercise. This improvement, once established, was maintained by 12.5 mg. daily. No changes developed in the face or elsewhere suggestive of a Cushing syndrome, even after two years' treatment. An experimental increase of the dosage to 50 mg. daily in one patient caused excessive perspiration.

Two of the female patients had no change in body hair, but the third female patient developed a small amount of pubic hair and some thickening of the head hair after six months' treatment. The male patient, in the course of six months' treatment, developed a slight amount of pubic hair and a slight return of hair on the legs; his beard became stronger, so that he needed to shave daily instead of once or twice a week.

The amenorrhoea was not affected in any way. No exact details are available about the libido of the female patients, but there was a return of a normal degree of pudor. Striking changes were, however, observed in the male patient, who for the previous five years had been completely without libido and had had no erections or other evidence of sexual activity. During the first three weeks of treatment with 12.5 mg. and 25 mg. of cortisone daily there was no obvious change. When he was given 37.5 mg. daily he began to have erections two or three times a week. After discharge from hospital on a maintenance dose of 25 mg. daily he continued to have frequent erections and had coitus two or three times a month, although no emissions occurred.

In two patients the blood pressure remained unchanged, the levels before treatment having been 130/80 and 140/90. In the third patient there was a slight rise, from 125/75 before to 140/75 during treatment. The fourth patient developed an irregularly increasing hypertension. The blood pressure was 130/80 previously and rose slowly during the first year of treatment to levels fluctuating between 150/90 and 180/130; subsequently it gradually returned to its original level.

Two of the patients had a definite increase in weight during several months' treatment; one rose from 104 to 135 lb. (47.2 to 61.2 kg.), and the other from 107 to 130 lb. (48.5 to 59 kg.). The third patient had a slight weight gain, rising from 92 to 96 lb. (41.7 to 43.5 kg.). The fourth patient lost weight during the thyroid treatment, falling from

162 to 151 lb. (73.5 to 68.5 kg.); on cortisone treatment she gradually regained this lost weight, and remained at 160 to 165 lb. (72.6 to 74.8 kg.).

Biochemical Changes

With these small and slowly increasing doses of cortisone there was none of the gross polyuria which follows immediately after parenteral treatment with high dosage. Nevertheless the urine volume slowly increased. Three of the patients had the following mean urine outputs before treatment and while on maintenance dosage respectively: (a) 1,120 and 1,680 ml., (b) 1,150 and 1,730 ml., and (c) 1,100 and 1,900 ml.

Kepler water diuresis tests were made on two of the patients. One whose maximum diuresis on the morning of the test had been 30 ml. an hour before treatment had a maximum of 140 ml. after treatment. The other had a previous maximum hourly excretion of 100 ml.; this increased during treatment to 165 ml. an hour.

It is well known that there is a great increase of nitrogen excretion in the urine when large doses of cortisone are given. This did not occur in the present series with low dosage. In one case the daily output of urea was unaffected by the treatment; in another there was a slight fall in the output of urea and creatinine, possibly in relation to nitrogen storage in the muscles.

There was always an increased output of 17-ketosteroids in the urine. Before treatment the output in the four patients had ranged between 0.2 and 1 mg. a day. On the maintenance doses of 12.5 to 25 mg. daily the urinary excretion of 17-ketosteroids ranged between 2.1 and 2.8 mg. a day. The increased output of 17-ketosteroids expressed in mg. daily corresponds to about 6% of the daily dosage of cortisone.

No significant changes were observed in the serum chemistry. The serum sodium remained at about the low range usual in these patients (280 to 300 mg. per 100 ml.) and the serum potassium fluctuated between 17 and 20 mg. per 100 ml. The serum cholesterol showed the usual wide fluctuations between 105 and 355 mg. per 100 ml., without any recognizable effect of treatment. The blood urea was rather high (commonly about 35 to 65 mg. per 100 ml.), but again there was no constant change related to the administration of cortisone.

There was no very significant alteration in the sensitivity to insulin, but the patients commonly showed some improvement in their response to hypoglycaemia. Several insulin-tolerance tests (using 0.03 unit per kg.) were performed in three of the patients; the mean blood sugars, expressed in mg. per 100 ml., were as follows:

Patient	Minutes:	0	20	40	60	120
A	Before treatment	72	52	37	40	42
	During "	77	49	49	54	66
B	Before treatment	95	67	50	63	65
	During "	96	61	63	73	74
C	Before treatment	102	57	66	73	88
	During "	86	63	64	68	81

The basal metabolic rate was studied in detail in only one patient. It had been -20% before treatment and continued in the range of -20% to -30% during cortisone treatment.

There was a definite though variable improvement in the anaemia. One patient with R.B.C. 4,100,000 and Hb 80% improved gradually to R.B.C. 4,700,000 and Hb 93%. The second patient, with R.B.C. 3,400,000 and Hb 70%, rose to an average of R.B.C. 4,200,000 and Hb 82%. The third patient with R.B.C. 4,000,000 and Hb 72%, rose to R.B.C. 5,000,000 and Hb 100%.

Effect of Cessation of Treatment

In three of the patients the cortisone therapy was stopped for a period of three months after about nine months' treatment. This produced a gradual but progressive deterioration in the

clinical state, so that at the end of a month they were almost back to the same condition as before treatment. They complained of marked asthenia, lack of perspiration, sensitivity to cold, and low urine output. The female patient who had had some return of pubic hair and thickening of head hair during treatment showed considerable regression of this hair growth after cessation of the cortisone. The male patient noticed that he required to shave very much less often, and his libido and erections had disappeared entirely within about two months. Two of the patients began to complain of rheumatic pains in the knees and ankles about two months after stopping treatment, though there were no recognizable physical changes in the joints.

After the three months without cortisone these three patients were put back on the maintenance dosage of 12.5 mg. daily, as it was clearly necessary for their continued health. Their condition improved rapidly, and within about a week they were as well as they had been when under cortisone therapy previously. All the patients have continued in remarkably good health for the past year on this maintenance dosage, and there is nothing to suggest any loss of effect of the cortisone after two years of treatment. It is important to note that none of the patients have, up to the present, developed hypopituitary coma or any of the symptoms which accompany its incipient stages. This may possibly be related to the improved responsiveness to hypoglycaemia.

Effects of Large Dosage

As was recorded in our previous paper, though large dosage of cortisone produced a striking improvement in the physical condition, psychological disturbances changed the patient's attitude so much that prolonged treatment with large dosage was impossible. Similar observations have been made in three further cases given large doses during the past two years. Two of these patients were typical severe cases of post-partum hypopituitarism; the third patient, also female, suffered from hypopituitarism of uncertain aetiology. These patients were given cortisone orally in a dosage of 50 to 100 mg. a day for one to three weeks. There was usually an improvement in the physical condition for two or three days, but then various psychological disturbances occurred. One of these patients had previously been mentally normal, though dulled by the pituitary deficiency. When she was given large doses of cortisone she developed insomnia and had mild delusions. The second patient had always had a psychotic personality. During the control period she suffered from a variety of delusions, though she had lucid intervals lasting a few days. While on treatment she became definitely worse mentally and was very negativistic. The third case is of particular interest.

A woman aged 58 had had typical severe post-partum hypopituitarism since the age of 33. She had been receiving 100 mg. of testosterone weekly for two years before the present admission. During the last few months she had gradually developed, in addition to her hypopituitarism, what appeared clinically to be a true myxoedema (not what is sometimes called pituitary myxoedema), with coarse scaly skin, gross oedema of the orbits and lips, a croaking voice, and a rapidly progressive loss of head hair. Psychologically she varied between torpor and vulgar abusiveness; her behaviour became what is commonly described as "nasty drunk." She was given 100 mg. of cortisone daily for two weeks. This had no recognizable effect on the physical signs of myxoedema, and her mental condition deteriorated further. She was then given 3 gr. (0.2 mg.) of thyroid siccum daily. Within a week the appearances of myxoedema were much diminished and her mental state was improving. At the end of three weeks she had returned to her condition of six months before; she appeared clinically to be an ordinary case of hypopituitarism and was a peaceful and placid woman again. Continued treatment with this dosage of thyroid and testosterone kept her in reasonable health for several months. After this, cortisone (12.5 mg. daily) was then added to the other treatment. This rapidly produced the characteristic improvement in the general condition.

After about three or four days she developed a transient diuresis, and within the next two weeks she became able to do all her housework and go out shopping.

Conclusions

Several aspects of the syndrome of hypopituitarism could reasonably be considered as manifestations of the secondary thyroid hypofunction. These include the mental slowness and lack of interest, the physical sloth, the extreme sensitivity to cold, and the absence of sweating; symptoms which are characteristic of myxoedema. It is therefore very interesting that these particular aspects are influenced by cortisone, which is an adrenal hormone, but not by thyroid.

Until ten years ago a variety of treatments were used in hypopituitarism, but, apart from the effect of pregnancy, the results were not impressive. When testosterone was first introduced its value was obvious, and the patients and their relatives usually insisted that the treatment should be continued. Cortisone in small dosage produces even greater enthusiasm, and all the patients treated so far have invariably returned for a further supply of tablets well before their last supply is exhausted.

Testosterone produces in patients with hypopituitarism a sensation of well-being and improves the physical strength and mental activity. It causes a regrowth of pubic and axillary hair and some return of libido. Cortisone has similar but greater effects on the physical and mental activity, though it does not usually restore body hair. We have therefore tried the effect of giving both substances together, but have not observed any definite additive effect apart from that on the body hair. If after a course of this combined therapy the testosterone is stopped and the cortisone is continued alone, the patient's general condition remains as good as before. On the other hand, a patient who has had cortisone and testosterone together is not nearly so well if an attempt is made to continue treatment with testosterone but without cortisone.

It is a common practice to prescribe a combination of many kinds of treatment for hypopituitarism: thyroid, oestrogens, deoxycortone, sodium chloride, and various vitamins. There are theoretical reasons for administering all of these substances, but detailed studies are required to ascertain what effect is actually produced when each of them is administered singly for a period to patients who are being kept on maintenance treatment with cortisone. The only definite observation we have made is that in certain cases the puffiness of the eyes is reduced by a combination of thyroid and cortisone, but not by either given separately.

From our limited experience up to date it seems that cortisone therapy is the most useful method of long-term treatment of patients with hypopituitarism. A dosage of 12.5 mg. orally each day appears to be adequate for maintenance. A dosage of 25 mg. is equally satisfactory, but it does not produce a proportionate improvement in the signs or symptoms. Larger dosage, such as 50 to 100 mg. a day, is very apt to produce transient mental disturbances; this is in marked contrast to the tolerance of large dosage which is shown by patients with rheumatoid arthritis.

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ANALYSIS OF 1,400 CASES OF ACUTE INJURY TO THE HEAD*

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Between the years 1941 and 1951 2,000 cases of acute injury to the head were admitted to the General Hospital, Newcastle-upon-Tyne, and were treated in the department of neurological surgery. Of these, 1,544 were aged 13 and over (1,281 male, 263 female), and 456 were children up to the age of 12. The death rate in this consecutive series of cases was 10.5%.

In this paper a detailed analysis is given of 1,000 of the adults and 400 of the children; these cases were those of the above series who were admitted to hospital between the years 1945 and 1951. The adults were nursed in the department of neurological surgery; most of the children were nursed in the department of paediatrics.

The primary objects of this study were: (1) to determine the sources and causes of acute head injuries that occur in a provincial city and area engaged in the heavy industries of shipbuilding and mining; (2) to set on record a statistical statement of the severity and the nature of the injuries sustained; (3) to analyse the cause of death and to appraise methods of surgical treatment; (4) to inquire into the long-term results with the object of discovering whether and how morbidity can be minimized; and (5) to bring to the notice of the surgical world once again the magnitude and importance of this branch of medicine.

An analysis of 1,000 adult cases is given (Table I). It will be seen that 444 of them, or nearly half the total, were due to road accidents, and just over 19% of these accidents were fatal. Table II shows the great preponderance of these injuries in the productive period of life, underlining once more the serious social and economic aspect of injuries which for the most part should not happen.

Table III shows, what would be expected, a graver prognosis for patients admitted in a state of semicomma and coma.

*The preparation of this work was assisted by a Research Grant from No. 1 Regional Hospital Board.

TABLE I.—Analysis of 1,000 Consecutive Adult Cases

Cause of Injury	No.	Deaths
Road:		
Car	59	12
Motor-cycle	125	25
Pedal cycle	109	17
Pedestrian	151	33
Industry	248	38
Mines	59	7
Home	77	17
Simple fall outside	59	7
Struck by another	28	2
Sport	29	—
Gunshot wound	4	3
Air crash	2	—
Miscellaneous	10	4
Unknown	40	10
Total	1,000	175

TABLE II

Age	No.		Deaths	
	Male	Female	Male	Female
13 to 20	141	43	16	—
21 " 30	203	23	25	3
31 " 40	159	15	21	2
41 " 50	122	29	25	2
51 " 60	82	33	23	6
61 " 70	67	23	27	7
71 " 80	27	22	13	2
81 " 90	4	7	—	3
Total	805	195	150	25

TABLE III

Level of Consciousness on Admission	No.	Deaths
Consciousness to confusion	724	27
Semicoma	101	27
Coma	175	121
Total	1,000	175

In 940 of the cases the injury was closed, with possible internal compounding; among these there were 151 deaths. Sixty patients had an open injury of the vault, and 24 of them died. There were 221 associated injuries in the 1,000 cases, as follows: abdominal 3 (2 deaths); thoracic 19 (6 deaths); limbs 114 (16 deaths); spine 11 (no deaths); facio-maxillary 74 (9 deaths). Major operations had to be performed in 209 cases (74 deaths) and minor operations in 166 (16 deaths). The duration of stay in hospital averaged 12.9 days. The disposal of those who survived is shown in Table IV.

TABLE IV.—Disposal of 825 Patients

Home	756
Rehabilitation centre	18
Convalescent	12
Military or naval depot	12
Transfer to other centres (thoracic, facio-maxillary, psychiatric)	6
Miscellaneous	21

To complete the analysis of the cases we give (Tables V and VI) some figures relating to the 400 cases of injury to the head in children (up to the age of 12). Of these, 147 were due to road accidents; there were 20 deaths (13.6%). As many as 149 of the 400 children sustained injury as a result of falling from a height: 5 (3.3%) of these died.

Table VII gives details of the level of consciousness on admission. In the great majority of the cases (368) the injury was closed, with possible internal compounding; 26 (7.1%) of these children died. In 32 cases there was an open injury of the vault, with 8 (25%) deaths. Among the 400 cases there were 38 associated injuries, as follows: thoracic, 3 (no deaths); limbs, 20 (2 deaths); facio-maxillary, 14 (no deaths); pelvis, 1 (1 death). A major operation was necessary in 70 cases (6 deaths)

TABLE V.—Analysis of 400 Consecutive Cases in Children (to Age 12)

Cause of Injury	No.	Deaths
Road:		
Car	4	—
Pedal cycle	31	3
Pedestrian	112	17
Home	5	—
Fall from height	149	5
Simple fall	41	4
Sport	12	1
Miscellaneous	40	4
Unknown	6	—
Total	400	34

TABLE VI

Age in Years	No.		Deaths	
	Male	Female	Male	Female
Under 1	12	5	—	—
1	12	5	—	—
2	15	15	1	4
3	23	19	1	1
4	31	10	3	—
5	23	14	1	—
6	27	8	6	1
7	28	7	1	—
8	25	2	2	—
9	22	11	3	2
10	28	5	4	—
11	20	3	3	—
12	19	2	1	—
Total	285	115	26	8

TABLE VII

Level of Consciousness on Admission	No.	Deaths
Consciousness to confusion	322	5
Semicoma	27	9
Coma	51	20
Total	400	34

and a minor operation in 27 cases (no deaths)—that is, out of the total 400. The average duration of stay in hospital was 9.3 days. Of the 366 survivors, 351 were discharged home, 7 to a convalescent centre, and 8 to other hospitals.

Cause of Death in Adult Cases

The cause of death in the 175 fatal adult cases is briefly reviewed below.

Group 1. Admitted in Coma

Of the 175 patients admitted in a state of coma, 121 died (69.1%). A high death rate from head injuries sufficiently severe to render a man comatose is, of course, to be expected, particularly as it is in this group that severe associated injuries are encountered. In 80 cases examined at necropsy cerebral contusions and lacerations, and surface and intracerebral haemorrhages, were found in all varieties of combination, degree, and extent. In every case the macroscopical injuries of the brain tissue were judged to be severe enough either to account for or to contribute substantially to the cause of death. In many there were extensive macroscopical injuries to non-vital areas only; in these, however, the physics of injury were such that vital centres (brain stem, thalamus, and hypothalamus) must, to some extent, have been damaged. In those cases in which there was no vital evidence of macroscopical or microscopical damage to the vital centres it was impossible to judge whether presumed submicroscopical damage could have accounted for death.

In all cases in which there was no gross demonstrable damage to the vital centres there was always gross damage to the non-vital areas; in other words, no patient died of uncomplicated concussion. This does not mean, of course, that a patient could not, in fact, die from injuries to the vital centres of submicroscopical dimensions: this problem is still far from final solution.

In no instance did we come to the conclusion that life could have been saved either by surgical decompression or by the turning of a bone flap, since massive oedema of the brain never occurred without septic encephalitis, and since, in those cases in which there was a local blood clot, there was a contusional or lacerational damage in other parts of the brain. From the surgical point of view we came to the conclusion that the only procedure that might have been of value was drainage of the cerebrospinal fluid, either by lumbar puncture or through a trephine hole in the vault of the skull.

Group 2. Cases Admitted in Semicoma

Of the 101 patients found on admission to be in a state of semi-coma, 27 died (26.7%).

At post-mortem examination 10 were judged to have died as the result of irreversible physical injuries to the brain tissues similar in severity and nature to those found in the coma group.

In a further 10 cases there were obvious contusional injuries in non-vital areas, but these were judged not to be irreversible. We came to the conclusion that in these cases a substantial contribution to the cause of death was the effect of injuries elsewhere in the body. This subgroup particularly calls attention to the importance of the integration of the treatment of a patient as a whole and of the close observation of the minutiae of nursing. When a patient, for example, is in a state of shock it is obviously wrong to inflict further shock by, say, reducing a fracture or submitting him to any other operative procedure before it is absolutely necessary. Also, any kind of asphyxia due to a faulty airway will aggravate the cerebral state, as will overheating or the incorrect administration of fluids.

In the remaining seven cases in which there were no injuries elsewhere in the body to contribute to the cause of death, the extent and degree of the damage to the brain was such that we felt that better-designed surgical therapy might have saved lives; this applied particularly in those cases in which there was a large unilateral acute subdural haemorrhage. We are now coming to the conclusion that when, for some clinical evaluation, open operation is deemed necessary acute subdural haemorrhages can be treated most adequately by the turning of a large osteoplastic flap with wide opening of the dura mater.

In actual practice the difficulty, of course, is to correlate the clinical picture with the pathological happenings. Our objective here is to show that in borderline cases of life and death pathological phenomena amenable to surgical treatment do, in fact, occur in a small percentage of cases. Therefore, skilled and painstaking clinical examinations may occasionally meet with gratifying reward.

Group 3. Cases Admitted in a State of Confusion or Full Consciousness

Of the 724 patients who were either conscious or in a state of confusion, 27 died (3.7%). The causes of death can be classified as follows:

(1) *Injuries to the brain unassociated with extradural haemorrhage.*—There were 19 cases of this type: five patients died from pyogenic infection resulting from massive compound frontal injuries; three died following operations for severe compound frontal injuries (sepsis did not develop); four died from massive intracerebral haemorrhages such as occur from natural processes—although classified as having died from the head injuries, they probably died from apoplexy; six died from lacerations of the brain associated with either subdural or subarachnoid haemorrhages (three of these were over the age of 70); and one died of cerebral thrombosis.

(2) *Mild concussion with severe injuries elsewhere in the body.*—In these three cases severe associated injuries were the obvious cause of death.

(3) *Extradural haemorrhages complicated by injury elsewhere in the brain.*—In the three cases in this group there were (a) a unilateral extradural haemorrhage, associated

with a subdural haemorrhage on the same side, and cerebral oedema; (b) small bilateral extradural haemorrhages, associated with a laceration of the brain and bilateral subdural haemorrhages; and (c) an extradural haemorrhage, associated with a large intracerebral haemorrhage.

(4) *Uncomplicated extradural haemorrhages.*—The following were the findings in the two cases recorded: (a) a large extradural haemorrhage due to laceration of the lateral sinus (the onset of compression in this case was so rapid that operation was not possible); (b) a large extradural clot developed after operation for the lifting of a simple depressed fracture—the result, probably, of faulty surgical technique.

From the above description it will be seen that a patient can lapse into unconsciousness from a wide variety of causes after a latent interval following a head injury. Nevertheless, in clinical practice it is dangerous not to diagnose every case of latent unconsciousness as being due to compression of the brain by a surface haemorrhage that can be relieved by surgery. In all cases in which there had been a history of a latent interval, whether the patient was admitted unconscious or conscious, the presence or absence of an extradural clot was always determined either in life or at necropsy.

Extradural haemorrhages occasionally occur associated with severe intrinsic injuries in which there has been no latent interval. More rarely, bleeding from a torn dural sinus may be so rapid that the latent interval is virtually non-existent.

Mechanical Forces Causing Brain Injury

By the nature, degree, and distribution of the lesions found at necropsy in many of the brains, it was judged that the head at the time of accident had been subjected to a series of forces, each acting differently. For example, a patient's brain may be injured when he is flung from his seat, when his head strikes a resistant object, or, again, when it is jerked violently backwards in a rebound. From the distribution of the major lesions it was obvious that the hemispheres, rather than the brain stem and cerebellum, take the brunt of the injury. It was also clear that the hemispheres of the brain not only move in relation to each other but they both frequently move across the brain stem to injure it. Subdural and subarachnoid bleeding is caused not only by the tearing of veins that drain from the surface into dural sinuses but also as the result of laceration and contusion. Severe lacerations are almost certainly caused by the impact of the brain on the cutting edges of bone or of dural partitions. A ruptured vessel on the surface can bleed inwards to cause an intracerebral haemorrhage. No special structure remains immune from injury. Linear as well as rotational forces are nearly always active. Whatever the acting force, it is distortion that ultimately produces the pathological lesion. From the post-mortem findings it is impossible precisely to reconstruct the physics of the injury.

Analysis of Operations

The details of the 209 major operations and 166 minor operations carried out in the 1,000 cases are as follows:

Major Operations	
Compound fractures of the vault	44
Compound fractures of the base (internal comminuted)	3
Closed depressed fractures of the vault	41
Extradural haemorrhages:	
With latent interval	27
Without	5
Acute subdural haematoma	69
Decompressions	2
Enucleation of eye	4
Major lacerations of the scalp	14

Minor operations for minor lacerations of the scalp were done in 139 cases, and for burr-holes for inspection or drainage in 29.

In addition many lumbar punctures were carried out for drainage and diagnostic purposes.

Extradural Haemorrhages

Among the 1,000 adult cases investigated there were 28 cases of extradural haemorrhage with compression of the brain in which there was a latent interval. Operations were carried out in 27 and one patient died before operation could be performed. Of the 27 patients who were operated on, 17 survived and 10 died. The main details are given in Table VIII.

TABLE VIII.—Massive Extradural Haemorrhages with Latent Period

Sex	Age	Cause	Site	Source
<i>Recoveries</i>				
M	22	Fall of 12 ft.	Right temporal	M.M.A.
M	45	Struck by metal strap	" parietal	Diploic
M	27	Bicycle accident	Occipital	Lateral sinus
M	18	Motor-cycle accident	Right parieto-occipital	M.M.A.
F	55	Knocked down by car	Parieto-occipital	Sagittal sinus
M	43	Fall of stone in mine	Left fronto-parietal	M.M.A. (trunk)
M	13	Knocked down by car	Left frontal	M.M.A. (ant. branch)
M	32	Bicycle accident	Right temporal	M.M.A. (trunk)
M	28	Hit by cricket ball	Left	M.M.A.
M	29	Fall of 15 ft.	" parietal	M.M.A. (post. branch)
M	34	Motor-cycle accident	Right fronto-temporal	M.M.A. (ant. branch)
M	52	Fall of stone in mine	Left fronto-temporal	Diploic
M	23	Bicycle accident	Left temporo-parietal	M.M.A. (ant. branch)
M	33	Fall of 45 ft.	Left fronto-parietal	M.M.A. (ant. branch)
M	40	Struck by metal sheet	Right parietal	M.M.A. (trunk)
F	62	Fell from ladder	" temporo-parietal	M.M.A. (post. branch)
M	50	Knocked down by car	Left fronto-temporal	M.M.A. (trunk)
<i>Deaths</i>				
M	46	Struck by another	Right temporal	M.M.A. (post. branch)
M	44	Fell downstairs	" temporo-posterior	M.M.A. (post. branch)
M	29	Fall of stone in quarry	Left parieto-occipital	M.M.A. (ant. branch)
M	31	Bicycle accident	Right parieto-occipital	M.M.A. (trunk)
M	25	Motor-cycle accident	Left temporal	M.M.A. (trunk)
M	55	Struck by metal bar	Right "	M.M.A. (ant. branch)
M	25	Motor-cycle accident	Left "	Lateral sinus
F	31	Fall of 7 ft.	Right "	M.M.V.
M	23	Bicycle accident	Right fronto-parietal	M.M.A.
M	26	Motor-cycle accident	Right temporal	Diploic
F	25	Dragged by rope	Left "	M.M.A. (post. branch)

M.M.A.—Middle meningeal artery. * Operation was not performed in this case.

Of the 10 patients who died following operation, it was found at necropsy that in five cases there were other injuries in the brain, such as lacerations, and subdural and intracerebral haemorrhages.

In the four cases in which complications were not found in the brain, each patient had been in a state of deep unconsciousness on admission, and death in every instance was due to brain-stem compression resulting from too-long-delayed operation. Death in the tenth case was due to a post-operative extradural clot after elevation of a simple depressed fracture—the result, probably, of faulty surgical technique.

Based on our experience, our guides for operative procedure are as follows: (1) Whenever possible the operation is carried out under local analgesia, care being taken to procure a free airway and full oxygenization. (2) The clot is widely uncovered, if necessary by a bone flap; we now rarely use the classical subtemporal exposure by the muscle-split method. (3) (a) After gentle evacuation of the clot and sealing of the bleeding vessels, care being taken at all stages not to inflict further pressure on the already embarrassed brain, the operation is halted until signs of recovering consciousness are obvious. When this stage is reached the wound can be closed in the usual way. (b) If, half an hour after the removal of the blood clot, there is no sign of returning consciousness the dura mater is widely opened. (c) If there is still no sign of return of consciousness half an hour after the decompression has been provided, then the temporal lobe of the brain is lifted and the edge of the tentorium severed to relieve possible tentorial herniation.

Crushing Injuries of the Head

For the head to be crushed between two external objects without first being put into violent motion must, by the circumstances of accident, be exceedingly rare. After having applied the strictest criteria we found that only nine cases fulfilled the requirements of a true crushing injury.

If a head be crushed heavily enough it will disintegrate and death will be more or less instantaneous. In our short series, in the eight patients who lived we could recognize three degrees of injury: (1) severe compound fracture with laceration of the brain; (2) compression of the brain and fracture of the skull without compounding; and (3) fracture of the skull without brain compression.

The crushing type of injury is particularly apt to inflict irreparable damage on special structures and the cranial nerves.

The following were sequels of the above eight cases: unilateral deafness in three, labyrinthine injury in one, unilateral blindness in two, unilateral anosmia in one, and squints in three.

One of the examples of crush injury to the head was that of a young miner whose head became trapped between two tubs. He tried unsuccessfully to free himself; the tubs moved towards each other and the man heard a loud cracking sound as his skull fractured. He then felt himself going unconscious and remembered no more until he woke up in hospital 36 hours later to find that an operation had been carried out. On admission he was deeply unconscious. X-ray examination of the skull showed that a piece of bone as large as the palm of a hand had been pushed inwards towards the brain. The bone was elevated and the patient made a complete recovery, there being no retrograde amnesia. The particular interest in this case is that forces of compression produced a state of unconsciousness indistinguishable from that caused by change in speed of movement.

Cerebral Injury During Pregnancy

In two instances women were injured when pregnant and in neither case did the injury cause abortion.

One woman aged 20 was two months pregnant when she sustained a compound wound of the frontal bones with laceration of the brain tissue. She also sustained a comminuted fracture of the upper jaw and lacerations about the face. After extensive cerebral, facial, and dental surgical treatment she made a satisfactory recovery. Her child was born at the normal time, was healthy in every way, and remains so at the age of 4 years. Another observation of interest is that the patient's mother has noticed that her daughter has been much more optimistic and even-tempered since the accident, the change no doubt being due to the leucotomizing effect of the injury on the frontal lobes of the brain. Temperamental changes following head injury are almost invariably in the adverse direction.

The second case was that of a woman aged 28 who was eight months pregnant when she was injured. She survived for three and a half days only, but at no time during this period were there any signs of abortion, the foetal pulse being plainly heard until the mother's circulation began to fail on the third day.

Associated Injuries

In cases of head injury associated injuries to the face, body, and limbs are common. Dislocation of the cervical spine with cord contusion is a well-known complication, as are injuries to the pleura and lungs.

We are, however, particularly anxious to call attention to the facio-maxillary problem which occurs in head injuries and to the necessity for co-operation between the neurological and the facio-maxillary surgeon.

Apart from severe lacerations about the face and scalp that necessitated special plastic repair, 17 complicated frac-

tures of the jaw were treated by our colleague Mr. Godfrey Hutchinson, in his dental department.

When a fracture of the jaw is associated with a state of concussion the decision of when to operate is one which requires considerable surgical experience and judgment. As regards concussion it is wiser to delay facio-maxillary treatment until the patient is well on the way to recovery. On the other hand, if repair of a fractured jaw is delayed too long a satisfactory end-result is jeopardized. It has been our experience that when a mouth injury does not immediately interfere with breathing, treatment of a fracture of the jaw can be postponed until the third day, provided systemic antibiotic treatment is started immediately.

Microscopical Examination of the Brain Stem*

Of the brains obtained whole at post-mortem examination and hardened in 10% formalin, the brain stems of 50 have been cut in their longitudinal axis and examined microscopically.

In five cases there was evidence of gross contusions, the microscopical details of which were similar to those found in the hemispheres. In themselves, these contusions were judged to be severe enough to account for death; in other words, the vital centres had been irrevocably damaged. From the sections it was obvious that post-traumatic hemiplegia must, on occasion, be due to brain-stem damage, the crus cerebri in one case having been torn. Brain-stem and basal ganglia damage may occasionally result from the tearing effects of haemorrhages that start at the surface.

Injuries undetectable by naked eye were easily demonstrable in 10 cases by magnification and showed as typical contusions. Indeed, it is becoming increasingly obvious that in many of the cases that end in death the brain stem has been injured in a physical way. Whether these lesser contusions could in themselves have accounted for death it has not yet been possible to judge; they must, however, have substantially contributed to it.

By definition, presumed injuries of submicroscopical dimensions cannot, of course, be seen through the microscope, but this does not mean that they do not in fact exist; newer methods might demonstrate them. Damage to neurones can be direct or indirect through injury to their supplying blood vessels. No uniform pattern of change in angio-architecture can be determined in the brain stem.

Follow-up Reports

An inquiry was made into the long-term results of 250 consecutive adults who were injured during the years 1949 and 1950. The survey was carried out by means of a questionnaire, and 236 replies were received.

Of these, 169 patients reported that they had returned to normal work and 57 to light work, but 38 of these were eventually able to resume their original work, giving a total of 207 who finally were able to return to normal employment. Nineteen have remained on light work up to the time of writing. Ten have so far not returned to any form of work. Of the 226 patients resuming work of any kind only 10 have been unable to work regularly.

Seventy-eight patients were free from symptoms on leaving hospital; the symptoms of the remaining 158 were headache, dizziness, loss of smell and taste, and tinnitus. Four patients reported attacks of black-outs.

Changes in personality were reported in 49 cases, severe changes such as mental delusions occurring in only three, the remainder being lack of concentration, bad temper, depression, nervousness, and loss of memory.

The average length of time after discharge from hospital before starting work and the type of work undertaken are given in Table IX.

*This is a preliminary statement on work being carried out in the Research Laboratory of the Department of Surgery, University of Durham.

A similar inquiry was made into the long-term results of 100 children who had received injuries to the head during the years 1949 and 1950; this group was also consecutive.

TABLE IX

Type of Work	Average Period After Discharge Before Resuming Work
Return to normal work	10½ weeks
Return to light work and then normal work resumed	27 "
Remaining on light work up to date	32 "
Worked irregularly	16 "

The survey was carried out by means of a questionnaire to the parents; 82 replies were received.

Of these children, 51 were of school age when injured, 30 were below that age, and one child was already mentally retarded and unable to attend school.

Forty-three children were able to return to school in their pre-accident class and were able to compete with their age groups. In eight cases the educational standard was affected, the children either being returned to their original class but not moved up with their age group in the normal way or, immediately on return to school, being found to be below standard and placed in a lower class. In these eight cases it is judged that an intellectual injury of some degree has occurred which is likely to influence adversely the scholastic career of these children for the rest of their lives.

Fifty-two children were free from symptoms. Thirty complained of headache and/or dizziness. Fits were reported in four cases.

Changes in temperament were noticed in 27 instances, the main symptoms being nervousness, lack of concentration, faulty memory, bad temper, and bed-wetting, the parents stating in each instance that these manifestations had not been present before the injury.

Discussion

From the figures announced by the Ministry of Transport 5,250 people died during 1951 as the result of injuries received on the roads. So far as can be estimated, at least 60% succumbed as a direct result of injury to the head, and for every death four or five people receive non-fatal injuries.

This subject is important, not only because of the magnitude of these figures but because healthy people, not those already incapacitated by disease, lose their lives or are maimed. Indeed, the economic loss to the nation because of injuries to the head is enormous. Our figures, however, show that road carnage constitutes only 44% of the total number maimed or killed, the remainder being due to accidents in industry, in the mines, in the home, etc.

To meet the increasing needs of cerebral trauma, not only are further facilities for treatment and rehabilitation necessary but postgraduate schools at university level must soon be established for the instruction of those whose responsibility it will be to care for the head injured away from special centres. Whether such centres should be named "head injury" or "traumatic" is of little importance. A seven-day, 24-hour service is necessary, including facilities for radiology and for all other ancillary investigations. Here again we should like to call attention to the necessity for the closest co-operation between the neurological and the facio-maxillary surgeons in the treatment of head injuries.

The imperfect liaison between the hospital and the general practitioner has been, and still remains, a weak link in the problem of head injury. We believe that much advantage would accrue from visits by the general practitioners to patients in hospital during the acute stages of the injury, and this important postgraduate association should be fostered. Also, much waste of man-power could be avoided if, when the time comes for consideration of a patient's

return to work, a conference between the general practitioner and the specialist were held in the patient's home surroundings when every aspect of the case could be reviewed. In this way unnecessary hardships could be eliminated and extremes of judgment tempered.

Finally, our post-mortem studies have shown that in a considerable percentage of deaths the injuries received are of such magnitude that they must be irreversible from the moment of infliction. Therefore, again we should like to stress the importance of prevention in the solution of this problem, which should be constantly in the minds of the medical profession, the ruling bodies, and the general public. The chance of serious injury about the head to the individual remains far too high.

Summary

Between 1941 and 1951 2,000 cases of acute injury to the head were admitted to the General Hospital, Newcastle-upon-Tyne. The results of an analysis of 1,400 of these (1,000 adults and 400 children) are given. In the 1,000 adult cases there were 175 deaths, 87 of them due to road accidents; 38 of the deaths resulted from accidents in industry. Of the 175 patients admitted in a state of coma, 121 died. There were 28 cases of extradural haemorrhage with compression of the brain in which there was a latent interval of consciousness: one patient died before operation was possible; of the 27 operated on 17 survived and 10 died.

Of the 400 cases in childhood (up to the age of 12 years) 147 were due to road accidents and 149 to falling from a height: 34 of the children died, 20 of them having been admitted in a state of coma.

CLINICAL AND EXPERIMENTAL STUDY OF SEGMENTAL PAIN FROM THE SHOULDER

BY

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The pain from diseases of the shoulder such as supraspinatus tendinitis or capsulitis is always referred. Although radiation to the arm and hand has been recorded, the distribution of this referred pain has received scant attention in studies of this common group of diseases from orthopaedic sources, nor indeed has it often been mentioned. The importance of its recognition lies in the differentiation from other causes of referred pain into the upper limb, so that unnecessary mistakes in diagnosis can be avoided. Further, clinical and experimental studies of this sort may shed light on the problem of referred pain and on the segmental supply to the shoulder-joint and related structures.

The pain is diffuse and deep, and can be reproduced by experimental noxious stimuli in several ways: one is by injections of 6% saline into the deep structures around the joint. If carried out accurately this method correlates the structure of origin and the segmental reference arising therefrom. It also closely simulates the pain found in clinical cases. Kellgren (1949), in

an extensive review of this subject, advises that each investigator should become his own guinea-pig, because by this painful experience much can be learned, not the least being the difficulty of finding suitable expressions to describe it. In a series of such experiments carried out on myself, the deep pain had a "metallic" quality, but as this is clearly an ambiguous description, meaning nothing to anyone except to me, the simple term deep pain is adhered to. As its name implies, the pain is felt deep in and not on the skin, because it is due to noxious stimuli acting on the spinal segments. This causes a false localization of the pain through unknown phenomena occurring in the central nervous system. It has a maximum intensity proximally and fades peripherally. Patients have described it as "running down the bone and out through the fingers."

Kellgren (1938) showed that experimentally produced pain from interspinous ligaments was always a diffuse segmental pain if the stimulus was strong enough. This also holds for the short tendons and muscles of the shoulder, even though these structures are not centrally placed, as are the interspinous ligaments. I found that irritation of the supraspinatus tendon or muscle belly produced deep pain on the outer aspect of the arm, and sometimes in the forearm and thumb. After the initial injection, which always produced the diffuse segmental pain immediately, the pain could be reproduced hours later by moving the shoulder. On injection of the supraspinatus muscle belly a spot was found

that produced a continuous band of reference along the length of the limb (Fig. 1). Local tenderness was also noticed. The segmental pattern of this false localization is discussed later.

Present Investigation

The clinical cases and the segmental pain they displayed are here described. During this study a special clinic was opened, so that the questioning and examination of the patients and the charting of the referred pain could be carried out leisurely, which, as every orthopaedic surgeon knows, cannot be done during the hubbub of a routine orthopaedic clinic. In 8 out of 26 patients with supraspinatus tendinitis the pain was referred to the outer aspect of the arm and lower part of the deltoid muscle in an area that reached to just above the elbow (Fig. 2). It was occasionally referred as two narrow bands, on the antero- and postero-lateral aspects of the arm (Fig. 3).

FIG. 1.—The spinal segmental distribution in several injections of 6% saline into the supraspinatus muscle and tendon. Oblique hatching indicates muscle; transverse hatching and stippling indicate tendon. The arrows show points of injection.

In 18 cases the pain radiated down the entire length of the antero-lateral aspect of the upper limb, terminating at the base of the thumb (Fig. 4). The thumb, forefinger, or middle finger was included either singly or together in many cases, with a distinct predominance in the radial fingers.

In 15 patients with spasm of the short rotator muscles associated with tendinitis or injury, and in whom the shoulder was partially stiff, the pain was widely referred to

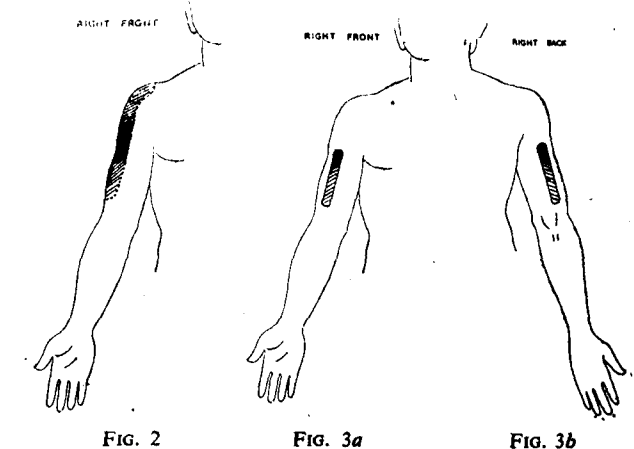


FIG. 2.—The average distribution of pain in eight cases of supraspinatus tendinitis. The dark area indicates maximum intensity. This corresponds to the fifth cervical segment. Figs. 3a and 3b. —A variation in the reference of the pain in supraspinatus tendinitis, as antero- and postero-lateral bands.

the area of the deltoid muscle and outer aspect of the arm to terminate above the elbow (Fig. 5).

In 35 cases of "frozen" shoulder the pain radiated from the epaulette region into the arm, in many spiralling across the dorsal aspect of the forearm to reach the dorsum of the hand (Fig. 6). Occasionally the pain was referred along the antero-lateral aspect of the forearm to reach the palm (Fig. 7). One or all of the fingers were often included, and there was a distinct tendency for predominance in the middle, ring, and little fingers. In a few the pain was referred to the side of the neck and cheek or to the inner side of the arm and chest wall (Fig. 8). In six cases the pain was referred diffusely to the whole arm, but with accentuation in certain segments (Fig. 9). As was to be expected, a quantitative increase of the diffusion of the deep pain occurred in the more extensive lesions, and this will be discussed elsewhere.

Discussion

In other words, despite the diffuseness and difficulty of description and location of this pain, a distinct segmental pattern was displayed.

Head (1893, 1900) and Foerster (1933) depicted the fifth and sixth cervical dermatomes as occupying the antero-lateral aspects of the upper limb, extending to the base of the thumb. If it is assumed that the supraspinatus muscle and tendon are supplied by the fifth and sixth cervical segments through the supraclavicular nerve, then in disease of these and related structures it is probable that the referred pain will appear to be blended and shared in varying degree between them. This is because of the close association of the two spinal segments in the formation of their nerve supply. In any case, the pain may not involve the whole segment of reference (Hilton, 1950). This is borne out by experimentally produced deep pain in the instance of this tendon. Anatomical variations, such as pre- and post-fixation of the brachial plexus and the segmental preponder-

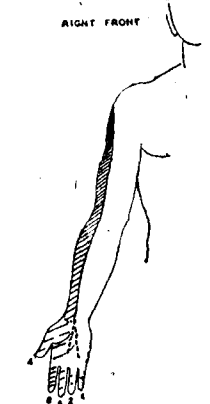


FIG. 4.—The distribution of pain in 18 cases of supraspinatus tendinitis. The fifth and sixth cervical segments are probably involved. The numerals indicate a preponderance of pain in the digits on the radial side of the hand.

ance in the formation of peripheral nerves, must have a considerable influence on the distribution and fluctuation of referred pain in the upper limb, and probably accounts for the surprisingly high or low segmental reference in some cases of shoulder disease. Kellgren (1939) has shown the significance of anatomical variations in the instance of the

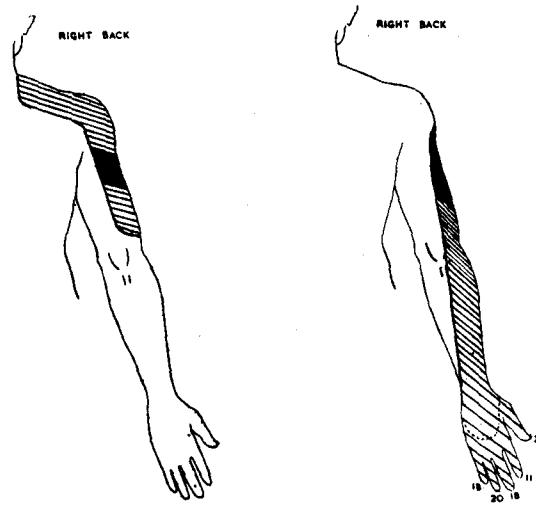


FIG. 5

FIG. 6

FIG. 5.—The average distribution of referred pain in 15 cases of spasm of the rotator cuff muscles. There is a broad band of reference in the fifth cervical segment, and perhaps even wider. FIG. 6.—The average distribution of referred pain in 35 cases of "frozen" shoulder. The numerals indicate a preponderance of pain in the digits on the ulnar side of the hand. The fifth to the eighth cervical segments are represented.

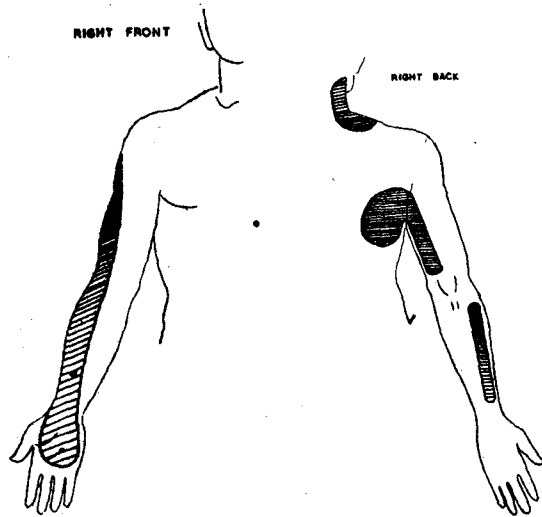


FIG. 7

FIG. 8

FIG. 7.—The distribution of pain in "frozen" shoulder when it radiates to the palm. FIG. 8.—This diagram indicates the wide areas of reference possible in lesions of the shoulder (see text).

lumbar spinal roots. The segmental impression of deep pain from the supraspinatus tendon and related structures corresponds to the dermatome chart of Last (1949) and closely approximates to the segmental distributions of Kellgren (1938) in many injection experiments.

The fifth and sixth cervical segments are usually said to supply the shoulder-joint itself (*Gray's Anatomy*, 1949). In "frozen" shoulder, however, as has been shown, the segmental reference may extend from the fifth to the eighth cervical segments, and sometimes more. The occasional higher or lower reference may be tentatively explained by the anatomical variations mentioned above, or there may be a central spread in the spinal cord, on the basis of the wide intersegmental synapses in the tract of Lissauer, as postu-

lated by Earle (1952). This distribution closely follows the dermatome chart of Last (1949) and the spinal segmental patterns of Kellgren (1938) formed by experimentally produced pain from the interspinous ligaments. It does not conform to the "strip" pattern, so popular nowadays, to be found in papers by Keegan and Garrett (1948), Young, (1949) and Walshe (1952), nor indeed to the map in Lewis's (1942) book, in which the dermatome of the eighth cervical segment occupies territory on the inner side of the arm. It is to be clearly understood that the pain is not actually in the anatomical entity known as a "dermatome," which is an area of skin, but, all the same, diffuse and deep as it is, the central misinterpretation of its distribution is that given above.

These latter conceptions ignore the axial lines. This applies particularly to the dermatome of the eighth cervical segment, which is usually the lower border of the segmental reference. Since all, or mainly the ulnar, fingers were included in referred pain from "frozen" shoulder it does seem that the eighth cervical segment was usually the lowest to be stimulated (Fig. 6). Thus when the capsule of the shoulder-joint was widely irritated and was the source of the noxious stimuli, the pain was falsely located in the territory between and cephalic to the axial lines. Further, Last (1949) and Hilton (1950) suggest that the segmental and the nerve supply of the muscles are the same as those of the joint they move, so, according to this reasoning and from the evidence deduced above, the segmental supply to the shoulder must span the fifth to the eighth cervical segments at least, without allowing for any anatomical variations. This is supported by the charts depicted in *Gray's Anatomy* (1949), but awaits definite anatomical proof.

The explanation of diffuse pain in the "whole" arm is bound up with the mystery of referred pain, and it is not my intention to become involved in this paper in a discussion of the various hypotheses on this abstruse subject, or to discuss the peripheral or central mechanism that may be involved. Those interested will find recent conceptions in Sinclair, Weddell, and Feindel (1948), and Hardy, Wolff, and Goodell (1952). But it is extremely unlikely, as is so often suggested by writers on physical medicine, that the entire brachial plexus becomes "sensitive" in acute lesions of the shoulder, to account for the widespread reference of the pain. It is much more likely to have a neuro-anatomical basis from phenomena occurring within the central nervous system.

Summary

Pain from lesions of the shoulder is usually a referred deep pain. Experimentally produced referred pain from the shoulder closely simulates that found in disease.

The referred pain from various lesions of the shoulder, although diffuse, displays a distinct segmental distribution.

It is suggested that this furnishes evidence to support the opinion that the fifth to the eighth cervical segments supply the shoulder.

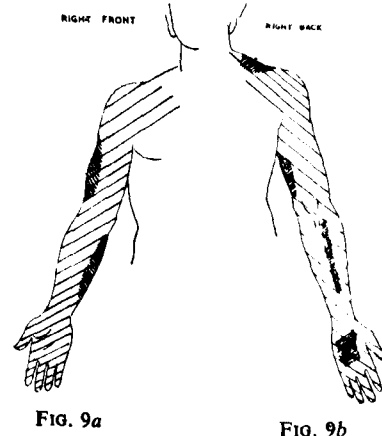


FIG. 9a

FIG. 9b

FIGS. 9a and 9b.—The distribution of pain in the whole arm in six cases of frozen shoulder. The dark shading indicates accentuation in certain segments.

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FURTHER OBSERVATIONS ON THE METABOLIC STIMULATING EFFECT OF SALICYLATE

BY

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It has been shown (Cochran, 1952) that salicylate causes a pronounced and progressive increase in oxygen consumption when given in full therapeutic dosage to normal and subacute rheumatic subjects. It was suggested that this effect of salicylate might be of fundamental importance in the therapeutic action of the drug. The present paper is a continuation of this work and concerns two further aspects. Firstly, it is seemed possible that salicylate might behave in an anomalous fashion in the acutely ill febrile patient, and therefore the effect of the drug on oxygen consumption in the treatment of acute rheumatic fever has been studied. Secondly, it is well known that salicylate (*ortho*-hydroxybenzoate) is effective in the cure of acute rheumatic manifestations, while its isomers (*para*- and *meta*-hydroxybenzoate) are inactive. The effect of these isomers on oxygen consumption has been studied.

Method

Oxygen consumption was measured, using a closed-circuit type spirometer, and the values obtained were corrected

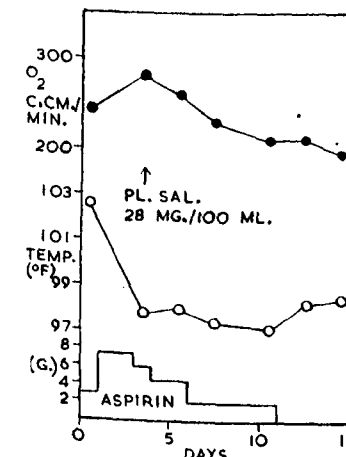


FIG. 1

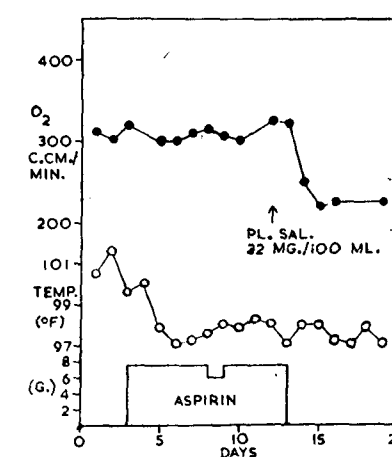


FIG. 2

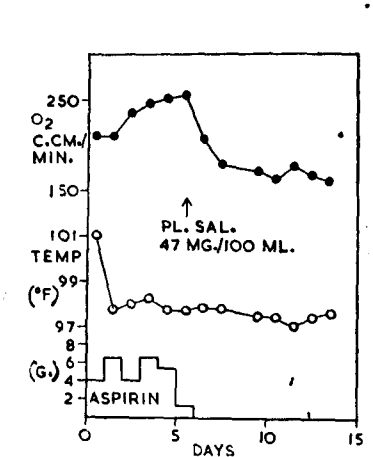


FIG. 3

FIG. 1.—Effect of aspirin on oxygen consumption and body temperature in a patient with acute rheumatic fever. Although the temperature has fallen by 4.8° F. (2.7° C.) the level of oxygen consumption has increased and slowly falls when aspirin is gradually withdrawn. FIG. 2.—Results obtained in a second patient with rheumatic fever. The temperature has fallen by 4° F. (2.2° C.), but the metabolic rate remains at an elevated level until an abrupt fall occurs when aspirin is suddenly withdrawn. FIG. 3.—Results obtained in a third patient with acute rheumatic fever. An abrupt fall in temperature is accompanied by a progressive rise in oxygen consumption, which falls only when aspirin treatment is stopped.

for temperature and barometric pressure. The rheumatic fever patients had three consecutive five-minute tracings taken each morning at a constant time and the results were averaged. This routine was continued throughout the course of treatment. When it was desired to test the effect of a single dose of a drug each subject acted as his own control and was in the fasting state. After two or three consecutive tracings a single dose of the test drug was given by mouth and serial estimations of oxygen consumption were made at roughly 20-minute intervals for two to three hours.

Results

Observations were made on three patients admitted with acute rheumatic fever who received aspirin in full therapeutic doses of approximately 2 g. four-hourly. In each case the expected clinical improvement with relief of arthritis and fall in temperature occurred within 24 to 48 hours of starting treatment. In Figs. 1 to 3 the daily levels of oxygen consumption are plotted with the oral temperature obtained just prior to the oxygen measurement. In Fig. 1 it is seen that although the temperature has fallen by 4.8° F. (2.7° C.) the level of oxygen consumption has actually increased. When aspirin is gradually withdrawn the metabolic rate slowly falls. In Fig. 2 the temperature has fallen by 4° F. (2.2° C.), but the metabolic rate remains at an elevated level until an abrupt fall occurs when aspirin is suddenly withdrawn. In Fig. 3 there is a similar pattern of changes. The abrupt fall in temperature is accompanied by a progressive rise in oxygen consumption, which again falls only when aspirin treatment is stopped.

A fourth patient was treated at first with sodium salicylate and sodium bicarbonate in equal doses of 20 gr. (1.3 g.) four-hourly. The initial clinical response was satisfactory, but on reducing the dosage a relapse occurred and treatment was changed to aspirin. A second relapse followed aspirin withdrawal, and a further course was given. The relationship of relapse to oxygen consumption is shown in Fig. 4. It is seen that recrudescence of symptoms occurred when the oxygen consumption had fallen to low levels, either in reduction of dosage or withdrawal of salicylate.

A comparison was made of the effects on oxygen consumption of single 3-g. doses of sodium salicylate and aspirin and single 5-g. dosage of the *para*- and *meta*-hydroxy isomers of salicylate. The tests were carried out on the same convalescent patient, and the results are shown in the Table. Sodium salicylate and aspirin caused respectively a 12% and 11% maximal increase in oxygen consumption, while the two isomers were without significant effect. Two convalescent patients were given the isomers over a four-day period in doses of approximately 2 g.

four-hourly. There was no significant increase in oxygen consumption with either *para*- or *meta*-hydroxybenzoate (Figs. 5 and 6).

Discussion

Barbour (1919) and Barbour and Devenis (1919) stated that salicylates increase the metabolism in afebrile subjects but lower it in febrile patients. These workers used a Benedict respiration chamber, and observations were made after the ingestion of single 1-g. doses of aspirin. It would

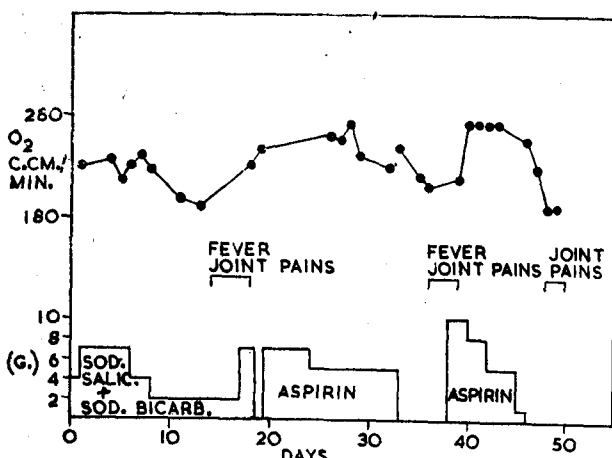


FIG. 4.—The relationship of relapse to oxygen consumption in a patient with acute rheumatic fever treated with salicylate. Recrudescence of symptoms occurs when oxygen consumption has fallen to low levels, either on reduction of dosage or withdrawal of salicylate.

Results Obtained when Single Doses of Sodium Salicylate, its Isomers, and Aspirin are Given on Different Days to a Convalescent Rheumatic Patient. Sodium Salicylate and Aspirin (3 g. Dose of Each) Cause Respectively a 12 and 11% Increase in Oxygen Consumption while the Isomers *Para*- and *Meta*-hydroxybenzoate (one 5-g. Dose of Each) are Without Significant Effect

Oxygen Consumption c.c.m./min., at N.T.P.				
Average 3 Control Values	229	209	219	199
Drug Oral	Sod. Salicylate 3 g.	Aspirin 3 g.	Sod. <i>p</i> -OH-benzoate 5 g.	Sod. <i>m</i> -OH-benzoate 5 g.
20 min.	230	219	204	205
40 "	223	203	206	191
60 "	234	209	206	191
80 "	256	228	206	182
100 "	247	232	210	189
120 "	252	226	215	200
140 "	239	217	205	191
160 "	—	223	210	185
Maximal increase	12%	11%	Nil	3% (20 min. only)

seem that the pharmacology of salicylate, and in particular the effect of the drug on oxygen uptake, would be most profitably studied where full therapeutic doses are being given and are having the desired beneficial effect, as in the present study.

The metabolic rate rises in fever, and it has been estimated that it increases 7% for every degree F. of fever. In the patients studied the acute stage of rheumatic fever was associated with a raised metabolic rate. It is assumed that in an untreated case undergoing natural remission the fall in temperature and subsidence of symptoms would be accompanied by a parallel reduction in the level of oxygen consumption. In the treated rheumatic patients it has been shown that the level of oxygen uptake either increases or remains at an elevated level, while the temperature falls and symptoms are relieved. It is only on stopping salicylate therapy or on reducing dosage that the oxygen uptake falls to normal or near normal levels. There would seem to be

no doubt that salicylate has a metabolic stimulating effect in the febrile acute rheumatic patient; the increase in metabolism due to the drug is equal to or greater than the decrease in metabolism due to the lowering of temperature, and the net result is the maintenance of a high metabolic rate while full therapeutic doses are being given.

It is important to determine if the metabolic stimulating effect of salicylate is an essential part of the therapeutic action of the drug. It has been shown that the effect is not shared by the closely related salicylate isomers, *para*- and *meta*-hydroxybenzoate. There is no significant increase in oxygen consumption when these substances are given over a four-day period in amounts equivalent to full therapeutic dosage of salicylate. The salicylate isomers are known to be quite ineffective in the relief of acute rheumatic manifestations.

Further work is in progress to attempt to elucidate the therapeutic importance and the nature of the metabolic stimulating property of salicylate.

Summary

It has previously been shown that full doses of salicylate greatly stimulate the metabolic rate of normal and subacute rheumatic subjects. The present study concerns the metabolic effect of full therapeutic doses of salicylate in the treatment of acute rheumatic fever. Fall in temperature and relief of symptoms are associated with the maintenance of the original high level of oxygen consumption, and the level falls only when the drug is withdrawn or dosage reduced. It is concluded that salicylate has a metabolic stimulating effect in the acutely ill rheumatic patient.

The isomers of salicylate, *para*- and *meta*-hydroxybenzoate, which are without effect in the relief of the acute rheumatic state, do not significantly alter the metabolic rate of convalescent patients.

I am greatly indebted to Professor Sir John McNee and Dr. James Reid for their constant help and criticism.

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Study Abroad, vol. 6 of which has just been published by Unesco (H.M. Stationery Office, 7s. 6d.), gives information on over 45,000 fellowships, scholarships, and other subsidized opportunities for educational travel. These facilities provide for study in almost every field of learning and in about 60 countries. This new volume appears in a single trilingual edition which replaces the English, French, and Spanish editions of previous years.

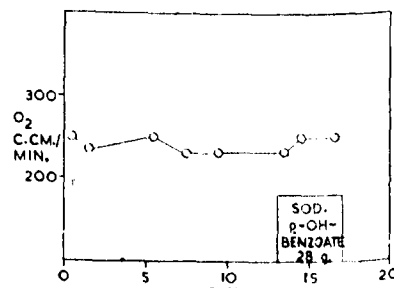


FIG. 5.—Administration of sodium *para*-hydroxybenzoate in doses of 2 g. four-hourly for four days has no significant effect on oxygen consumption.

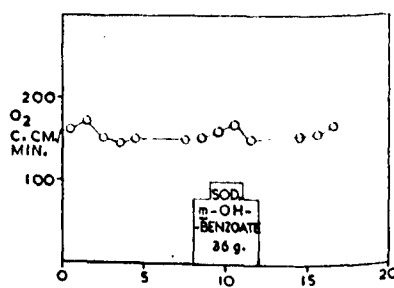


FIG. 6.—Administration of sodium *meta*-hydroxybenzoate in doses of 2 g. four-hourly for four days has no significant effect on oxygen consumption.

"FAILED FORCEPS": A REVIEW OF 100 CASES

BY

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Occipito-posterior positions and deep transverse arrest of the head accounted for over 50% of "failed forceps" cases investigated at the Birmingham Maternity Hospital by Freeth (1950), who found that the maternal death rate was 2% and the total foetal loss was 34%. Earlier, Miller (1928) reviewed a larger series with a maternal death rate of 10% and a total foetal loss of 64%. The reduction in the mortality from failed forceps over two decades has therefore been considerable.

To confirm Freeth's findings and to see if a similar reduction in mortality has taken place in another large maternity hospital, all cases of failed forceps admitted to St. Mary's Hospital, Manchester, during the period January, 1943, to December, 1951, have been reviewed.

Undilated cervix (39%) was the commonest cause of failure. The maternal death rate was 2% and the total foetal loss was 28%.

Incidence

The number of cases admitted each year fell from 17 in 1943 to 1 in 1951 (Table I). As the total number of emer-

TABLE I.—Incidence of Failed Forceps Cases

Year	No. of Cases	% of Total Emergency Admissions
1943	17	3.2
1944	15	2.6
1945	17	2.5
1946	12	2
1947	17	2.8
1948	7	1.5
1949	8	2.4
1950	6	1.9
1951	1	0.5

gency admissions varied considerably from year to year, the failed forceps cases have been expressed as a percentage of the total emergency admissions. There is a decrease from 3.2% in 1943 to 1.5% in 1948, followed, after an increase in 1949, by a fall to 0.5% in 1951.

Aetiology

The causes of failure fall into eight groups, and each group is analysed separately (Table II). In certain cases more than one possible cause for failure was present. When this occurred the case has been classified under the more

TABLE II.—Details of 100 Cases

Group	Aetiology	No. of Cases	No. of Primiparae	Foetal Loss	Maternal Deaths	Baby Dead on Admission
1	Cervix not fully dilated	39	22	14	—	6
2	Occipito-posterior positions	22	19	5	1	1
3	Deep transverse arrest	11	9	2	—	1
4	Brim disproportion (normal foetus)	7	4	4	—	2
5	Contracted outlet (occipito-anterior)	7	7	1	—	—
6	Hydrocephalus	3	1	3	—	2
7	Brow presentation	2	1	1	1	1
8	Unknown	9	6	1	—	—
Total		100	69	31	2	14

important cause. Thus in the presence of incomplete cervical dilatation along with an occipito-posterior position, the case has been classified under the former condition. When spontaneous delivery occurred shortly before or after admission the cause of failure could not be verified. Such cases have been allotted to Group 8.

Group 1—Cervix Not Fully Dilated (39 Cases).—All cases were treated expectantly in the first instance (Table III). If full dilatation of the cervix did not occur, caesarean

TABLE III.—Cervix Not Fully Dilated

Treatment	No. of Cases	Foetal Loss	Baby Dead on Admission	Maternal Deaths
Sedation—caesarean section	4	2	—	—
" rotation, mid-forceps	10	3	1	—
" mid-forceps	8	4	2	—
" low forceps	6	2	1	—
" normal delivery	6	1	1	—
" craniotomy, forceps extraction	1	1	1	—
Internal version—breech extraction	1	1	—	—
Sedation—high forceps	3	—	—	—
Total	39	14	6	—

section or forceps extraction after craniotomy was carried out, depending on whether the foetus was alive or dead. Natural dilatation of the cervix occurred in 33 cases. Of these, six were subsequently delivered by natural forces. In 27 cases forceps were applied. This high proportion is partly accounted for by the 10 cases of occipito-posterior position (including deep transverse arrest), and in the other 17 cases there was perhaps a tendency to apply forceps rather readily in the belief that, once failure with forceps has occurred, it is safer—for the baby—to deliver as soon as possible. The onset of foetal distress in one multipara with a rim of cervix was unsuccessfully treated by internal version and breech extraction.

Group 2—Occipito-posterior Positions (22 Cases).—In one case associated with a funnel-shaped pelvis caesarean section was resorted to when attempts at manual rotation failed. In cases in which the foetal heart was still audible at the

TABLE IV.—Occipito-posterior Positions

Treatment	No. of Cases	Foetal Loss	Baby Dead on Admission	Maternal Deaths
Rotation and mid-forceps	18	4	—	1
Mid-forceps, face to pubes	1	—	—	—
L.S.C.S.	1	—	—	—
Normal delivery	1	—	—	—
Craniotomy and extraction	1	1	1	—
Total	22	5	1	1

Average weight of baby, 7 lb. 13 oz. (3.5 kg.).

time of admission there were two stillbirths and two neonatal deaths from intracranial haemorrhage. The maternal death, which was attributed to shock, occurred after manual rotation and mid-forceps extraction.

Group 3—Deep Transverse Arrest (11 Cases).—All the cases in this group were treated by manual rotation and mid-forceps extraction. Shoulder dystocia caused the only stillbirth among babies alive on admission.

Group 4—Brim Disproportion (7 Cases).—The size of the baby—average weight 9 lb. 4 oz. $\pm$ 11.3 oz. (4.2 kg. $\pm$ 85 g.)—rather than contracted pelvis was the major factor in causing disproportion. In one case with a normal pelvis the baby, which was dead on admission, weighed 13 lb. (5.9 kg.). The treatment of choice for brim disproportion with a living baby is caesarean section. The poor results with the alternative, high forceps, are shown in Table V.

Group 5—Outlet Contraction (7 Cases).—In seven cases, all primiparae, contracted outlet was stated as the reason

for failure. In only one case, in which the single foetal loss occurred, was pelvic outlet contraction definitely established by the recorded measurements. In this case the intertuberos diameter was 3½ in. (8.3 cm.) and the posterior sagittal diameter 2 in. (5 cm.). With great difficulty an 8 lb. 4 oz. (3.7 kg.) stillborn foetus was delivered with for-

TABLE V.—Brim Disproportion

Treatment	No. of Cases	Foetal Loss	Baby Dead on Admission	Maternal Deaths
L.S.C.S.	3	—	—	—
High forceps	2	2	—	—
" " perforation cleidotomy	1	1	1	—
Craniotomy	1	1	1	—
Total	7	4	2	—

Average weight of baby, 9 lb. 4 oz. (4.2 kg.).

ceps. In the other cases moderate traction with forceps effected delivery. In all the occiput was anterior and in none had episiotomy been performed before admission. I believe that soft-tissue resistance, rather than bony disproportion, caused the failure or was an important contributing factor.

Group 6—Hydrocephalus (3 Cases).—The diagnosis was made by the size of the head and the great width of the cranial sutures on vaginal examination. Treatment was by craniotomy. Bilateral episiotomies had been made in one case in which the greater part of the head lay above the brim, but such moulding had occurred that it was also visible at the vulva.

Group 7—Brow Presentation (2 Cases).—One of these cases was treated by caesarean section and the other by craniotomy, as the baby was already dead. In the latter case even after craniotomy great difficulty was encountered in delivering the head. Exploration of the uterus revealed an extensive rupture of the lower segment which was treated by supravaginal hysterectomy. The patient's recovery was complicated by a temporary uretero-vaginal fistula, but this closed by the twentieth day and she eventually did well.

Group 8—Aetiology Unknown (9 Cases).—Normal delivery or an easy low forceps extraction successfully terminated the labour in eight cases. The ninth ended fatally (Table VI). After failing to deliver with forceps the family

TABLE VI.—Aetiology Unknown

No.	Method of Delivery	Primipara	Time Elapsed Since Failure	Foetal Loss	Maternal Deaths
1	Born before arrival	—	2½ hours	—	—
2	Normal delivery on admission	—	1	—	—
3	" " "	1	3½	—	—
4	" " "	1	1	—	—
5	" " "	1	1½	—	—
6	Easy low forceps on admission	1	3	—	—
7	" " "	1	2	—	—
8	" " "	1	1½	—	—
9	Delivery of after-coming head	—	1	+	+

medical attendant performed internal version and unsuccessfully attempted breech extraction. On admission the dead baby was delivered up to the head, and maternal shock was present. The after-coming head was delivered easily by the Mauriceau-Smellie-Veit manœuvre under a general anaesthetic, the third to be administered. The uterus was not explored and the third stage was normal. Twelve hours later the patient's condition deteriorated and death occurred 24 hours later. Necropsy revealed a ruptured uterus which was unsuspected until the general condition was such that surgical intervention was no longer feasible.

Munro Kerr and Chassar Moir (1949) say, "Version (after failed forceps) is never worth while; not one in two children

is saved, and more than 10% of mothers are lost from rupture of the uterus, shock, or sepsis."

Prophylaxis

Many cases could be prevented if the accoucheur constantly kept in mind the criteria for a successful forceps delivery—namely, (1) no cervix palpable; (2) the head deeply engaged; and, if the forceps is to be applied in the home, the head should be visible on separating the labia; (3) the occiput anterior; (4) no marked contraction at the pelvic outlet; and (5) the bladder and rectum empty.

Even with a visible head the abdomen should always be examined to exclude the hydrocephalic which has so moulded that the greater part is above the brim yet is visible at the vulva. If the cervix is palpable (so often said to have re-formed) after the induction of anaesthesia, the interests of mother and baby are best served by graceful retreat without applying forceps. (An exception, however, may be made in respect of a multipara with a rim of cervix which responds easily to manual dilatation.)

Principles of Treatment

Once failure occurs the treatment of shock, if present, should be the first consideration. In this event it is advantageous in domiciliary practice to call an obstetrical flying squad, which should then assume responsibility not only for resuscitation but also for the subsequent delivery.

Failure to deliver with forceps, using moderate traction, should not be regarded with shame. On the other hand, persistent attempts to deliver by brute force constitute bad practice.

Whenever possible the doctor should accompany his case to hospital, giving full particulars of the labour, with special reference to the time of full dilatation, number and type of anaesthetics administered, and the previous obstetrical history. If this is neglected, drowsiness of the patient may lead to the failure to elicit vital information.

In hospital the patient is admitted to a "suspect" ward, as every case must be regarded as potentially infected. (In the present series the incidence of notifiable pyrexia was 18%.) The interests of the individual in such a case demand antibiotics. Unfortunately, however, the routine administration of these drugs may lead to the subsequent production of resistant strains.

It will often be advisable to set up a 5% glucose intravenous drip as soon as possible, in view of the fact that many cases are suffering from acidosis and dehydration. It should also be borne in mind that all of these patients have had some form of anaesthesia, and many have had more than one anaesthetic. It is therefore important to ensure that any further anaesthetic is given by a skilled person, that chloroform is avoided, and that it is the last anaesthetic required. With the latter end in view it is considered advisable after delivery to explore the uterus to discover if any damage has occurred.

Discussion

The fall in the annual number of cases is ascribed to three factors: (1) Improved antenatal care, which has reduced the number of home confinements of such abnormalities as brim disproportion, hydrocephalus, and outlet contraction. (2) The stress laid in the modern teaching of obstetrics on the criteria for successful forceps delivery. (3) The appointment of new consultants in the outlying districts since the advent of the National Health Service in 1948. The number of patients confined in hospital was not a factor in the fall, as there were fewer hospital confinements in the Manchester area in 1951 than in 1945.

Contrary to Freeth's findings, the commonest cause of failure in this series was application of the forceps before the cervix was fully dilated, and in at least 50% of the cases the forceps was applied too soon. Unlike Freeth (1950) earlier reviewers (Feeney, 1947; Stacey, 1931) came

to a similar conclusion. Ovarian tumour, constriction ring, or breech or face presentation were not observed, although Freeth found one of each abnormality.

A maternal mortality of 2% and a foetal loss of 28% are similar to Freeth's figures. In the last 25 cases reviewed the total foetal loss was only 8% and all the mothers survived.

Reference to Table VII demonstrates the progressive improvement in the maternal mortality since 1928. Analysis of the deaths in Miller's series suggests that the reduction

TABLE VII.—Review of Earlier Series

Author	Location	Year	No. of Cases	Maternal Loss %	Foetal Loss %	Minimal Foetal Loss %	No. of Ruptured Uteri
Gadd	Manchester	1952	100	2	28	14	2
Freeth	Birmingham	1950	100	2	34	10	—
Feeney	Dublin	1947	77	16.9	60	56	6
Munro	Glasgow	1933	70	7	51	?	?
Kerr	Sheffield	1931	154	15	52	29	7
Stacey	Manchester	1928	558	10	64	23	8
Miller	Glasgow	1928	558	10	64	23	8

* Does not include any cases in which normal delivery or low forceps without complications to the mother occurred.

in maternal loss is due to the advent of antibiotics and blood transfusion rather than to greater obstetrical skill. Miller's deaths occurred from sepsis (37), ruptured uteri (8), post-partum haemorrhage and shock (6), pneumonia (3). Excluding the deaths from sepsis and pneumonia, maternal deaths were only 2.5%, a figure similar to the two recent series in which none of the four deaths occurred from sepsis.

A similar reduction occurred in the total foetal loss. The minimal foetal loss is the percentage of babies dead on admission. Excluding Feeney's series there has been a change for the better in the type of case. In Miller's and Stacey's series the babies dead on admission were over twice as many as in the two later series. Subtracting the minimal foetal loss from the total foetal loss gives the "actual" loss of babies in hospital. In Stacey's series this was 23% and in the present series 14%. This difference may be accounted for by the more confident and safer use of caesarean section to-day for inertia, brim disproportion, and difficult occipito-posterior positions. Caesarean section was employed only for brim disproportion in Freeth's series, with the result that his "actual" foetal loss in hospital was 24%—1% higher than Stacey's figures 20 years previously.

Summary

A review has been undertaken of 100 consecutive failed forceps cases admitted to St. Mary's Hospital, Manchester, during 1943–51.

The incidence of such cases fell from 3.2% to 0.5% of the total emergency admissions, and reasons for this decline are suggested.

The commonest cause of failure was the undilated cervix (39%).

The maternal mortality was 2% and the total foetal loss was 28%.

Pyrexia was notifiable in 18% of the cases.

A comparative survey of earlier series is presented, and reasons are suggested to explain the gradual improvement noted in the results.

I wish to thank Dr. E. A. Gerrard, Professor W. I. C. Morris, and Dr. J. W. A. Hunter for help and advice in the preparation of this article.

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CRISES IN CONGENITAL SPHEROCYTIC ANAEMIA (ACHOLURIC JAUNDICE)

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Since the observation by Owren in 1948 that in the crises of "acholuric jaundice" the bone marrow showed hypoplasia of the erythron there have been confirmatory reports in America (Dameshek and Bloom, 1948) and on the Continent (Cremer, 1950; Gasser, 1950). Other than an annotation in the *British Medical Journal* (1949) there has been extremely little comment in this country. Whitby and Britton (1950) merely note Owren's views without comment. Changes in the bone marrow as a cause of "crisis" have by no means reached general clinical assent.

Details of the marrow changes in four crises in three children are presented here, and the probable aetiology of the anaemic crisis is discussed.

Case 1

The patient was first admitted to hospital at the age of 1 month with extreme pallor and a history of icterus neonatorum lasting 20 days. Her haemoglobin was 5.2 g.% and she was thought to be a case of congenital hypoplastic anaemia. A blood transfusion was given and she was discharged. When readmitted two months later with further anaemia (Hb 5.6 g.%) her reticulocytes varied between 2.5

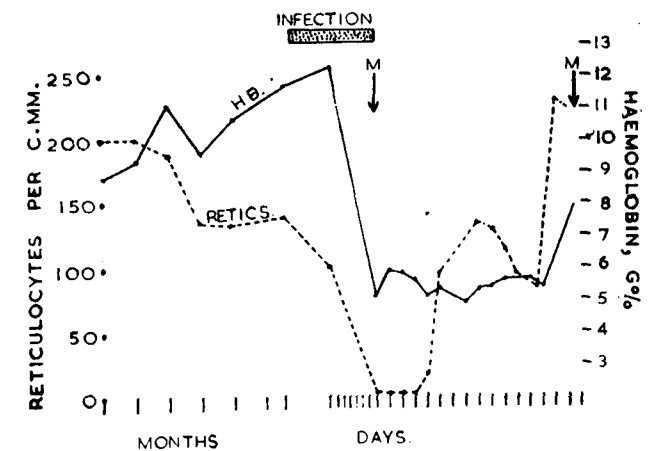


Fig. 1.—Case 1. Showing changes in haemoglobin and reticulocyte level during the first crisis. M = marrow biopsy.

and 4% of 2,250,000 red cells. Spherocytes were seen in the film. She was given a further transfusion and discharged.

She attended the out-patient department for about a year, during which her haemoglobin remained around 8 g.% and her reticulocytes between 3 and 6%.

She then had a crisis. This followed a period of restlessness, fretfulness, cough, and nasal discharge for two weeks, during which time she was seen to become increasingly pale. The course of the crisis may be seen in Fig. 1. No reticulocytes were seen for five days; they then appeared, and increased steadily in numbers over the next nine days, her general condition then returning to the pre-crisis state. Marrow biopsies were taken at the onset of the crisis and after recovery. Marrow pictures were based on counts of

approximately 1,000 cells; the cells were:—At crisis: myeloblasts, 1.0; promyelocytes, 4.0; neutrophil myelocytes, 7.75; eosinophil myelocytes, 0.25; neutrophil metamyelocytes, 8.0; eosinophil metamyelocytes, 0.25; neutrophil polymorphs, 18.5; eosinophil polymorphs, 1.25; basophil polymorphs, nil; lymphocytes, 13.0; mononuclears, nil; proerythroblasts, 3.0; eosinophil normoblasts, 2.0; intermediate normoblasts, nil; late normoblasts, nil; unidentified cells, 2.0; haematogones, 37.0; plasma cells, nil; reticulo-endothelial cells, 1.0; mitotic cells, 0.25. After recovery from crisis: myeloblasts, 0.25; promyelocytes, 1.25; neutrophil myelocytes, 7.0; eosinophil myelocytes, 1.0; neutrophil metamyelocytes, 9.0; eosinophil metamyelocytes, 0.25; neutrophil polymorphs, 4.5; eosinophil polymorphs, 0.75; basophil polymorphs, 0.25; lymphocytes, 6.0; mononuclears, nil; proerythrocytes, 3.25; early normoblasts, 11.0; intermediate normoblasts, 22.0; late normoblasts, 29.25; haematogones, 2.5; plasma cells, nil; reticulo-endothelial cells, 1.0; mitotic cells, 0.75.

The distribution of primitive cells in the erythron (Fig. 2) shows a general depression in the crisis period.

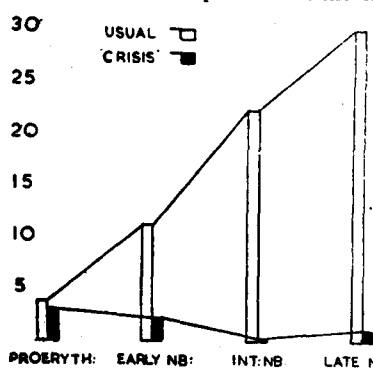


FIG. 2.—Case 1. First crisis. Showing the percentage of cells of the erythroid series seen in the marrow during the crisis period and later in the recovered state ("usual").

marrow again showed hypoplasia of the erythron. Her erythrocyte count fell from 3,800,000 to 2,500,000 in five days, the haemoglobin from 8.2 to 5.5 g.%, and the reticulocytes from 133,000 (3.5%) to 35,000 per c.mm. (1.4%). Her reticulocytes remained low for the next four days and then steadily rose during the next week to 350,000 per c.mm. and the blood count steadily returned to its pre-crisis level of between 8 and 9 g. Hb% with 4,000,000 to 4,500,000 erythrocytes. Her marrow again showed hyperplasia of the erythron—that is, the changes seen in the previous crisis were repeated.

Her spleen was then removed. Since that time her haemoglobin has remained in the order of 10 to 12 g.%, and she has shown no anaemic crisis.

Other Investigations.—During her anaemic crisis no changes were seen in her leucocyte count. Erythrocyte saline fragility curves showed haemolysis commencing in 0.67% and complete in 0.4% saline. Coombs's test was negative. The serum bilirubin during the second crisis was 1.3 mg. per 100 ml., a single level done in a quiescent phase being 1.1 mg. per 100 ml. The child's mother has a spherocytic anaemia with abnormal saline fragility, but gives no history of recurrent anaemic crises.

Comment.—This child, who had typical familial spherocytic anaemia, was observed through two crises. Both episodes were preceded by a clinical disorder, the first by an upper respiratory infection, and the second by an intestinal disturbance which may have been an infection. In both crises the usually hyperplastic erythron was replaced by extremely hypoplastic tissue and there was a great fall in peripheral reticulocytes. The first crisis was severe, and was associated with a depression of the bone marrow which lasted at least 10 days. The second crisis was much less severe, and the duration of the hypoplasia seemed to be less. In both instances

recovery was spontaneous. No depression was seen in the leucocyte either in the peripheral blood or in the bone marrow. During the crisis the child was pale and yellowish but not notably jaundiced, and the blood bilirubin did not appear significantly raised from the resting level. Splenectomy effected a clinical cure.

Case 2

This child was admitted in "crisis" at the age of 6½ years. She had been one of twins and had had spastic quadriplegia since birth. No history of anaemic episodes was available.

Examination revealed severe pallor, Hb 3.4 g.%, R.B.C. 1,300,000, and reticulocytes 5,200 per c.mm. The erythrocytes showed marked spherocytosis. Her saline fragility curve was typical of hereditary spherocytic anaemia; haemolysis began in 0.75% and was complete in 0.40% saline. No evidence of serological blood incompatibility was found. Her bone marrow on admission showed considerable depression of erythropoiesis, particularly in the late normoblast stage (Fig. 3).

Immediately after the marrow puncture she was given a blood transfusion; this raised her haemoglobin to the region of 10 g.%, and coincidental with this her reticulocytes rose to 224,000 per c.mm. and remained at about this level for several days.

Marrow puncture at this time showed hyperplasia of the erythron and a picture similar to that seen in subsequent studies before splenectomy.

The leucocyte counts throughout the crises were above what appeared to be a normal level for the child. She was subsequently discharged for a few weeks and then readmitted for splenectomy, after which her reticulocyte count fell to normal levels, although her fragility curve remained abnormal. She has since then shown no anaemia. Faecal bilirubin excretion during the period of crisis was 19 mg. a day. Later when she came in for splenectomy the level was 62 mg. a day.

Comment.—We were unable to follow the whole course of the crisis in this child. She showed, however, three features: (1) reticulocytopenia and marrow hypoplasia during the crisis; (2) an apparent immediate reticulocyte response to the administration of 2 pints (1,140 ml.) of blood; (3) a relative diminution of faecal bilirubin excretion during the crisis period.

Case 3

This child was first seen when aged 6 years, and was admitted with a history of increasing pallor for about 48 hours. She was extremely pale with a faint yellowish tinge. Her blood bilirubin was 1.8 mg. per 100 ml. Her haemoglobin was 1.3 g.%, R.B.C. 900,000, platelets 47,000 per c.mm., and reticulocytes 14,000 per c.mm. Her erythrocytes showed marked spherocytosis and increased saline fragility. (Haemolysis began in 0.75% and was complete in 0.40% saline.) Her bone marrow showed extreme hypoplasia of the erythron with a few giant proerythroblasts.

A blood transfusion given immediately after the marrow puncture produced a dramatic change in her appearance. Before the transfusion it was a point of bedside discussion whether or not she was icteric; after the transfusion she looked so like the other children in the ward that the question of icterus did not arise.

Her subsequent course is illustrated in Fig. 4. Her platelet count rose within six days to her normal figure, while her reticulocyte count did not rise until several days later.

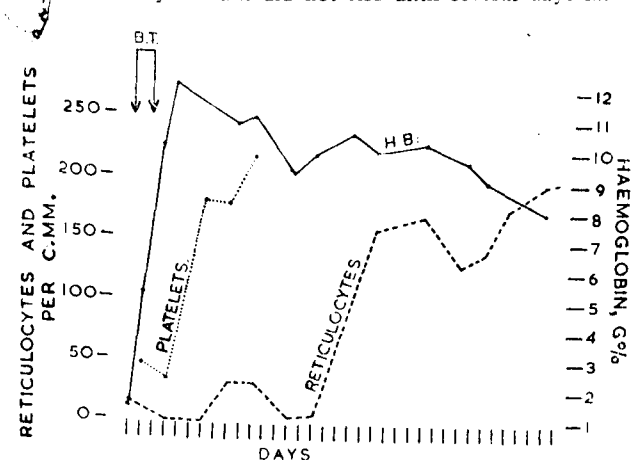


FIG. 4.—Case 3. Showing the changes in reticulocytes, platelets, and haemoglobin during the crisis. Blood transfusions were given at the points marked B.T.

Later marrow studies showed hyperplasia of the erythron (Fig. 5). Bilirubin studies could not be carried out. Her mother's erythrocytes showed increased fragility in saline, but she gave no history of anaemic crises.

After the child's spleen was removed her reticulocytes fell from their apparent usual level of 200,000 to 8,000 per c.mm. Her haemoglobin remained around 14 g.%. She has since then shown no clinical symptoms.

Comment.—This girl was admitted in a severe anaemic crisis which, but for a blood transfusion, would probably have been fatal. Her severe anaemia clinically unmasked her continually raised serum bilirubin, giving her a mild yellow tinge. After transfusion this disappeared. Her marrow showed extreme hypoplasia of the erythron during the crisis, compared with hyperplasia in her usual state. The return of platelets in her peripheral blood preceded the return of reticulocytes. The latter may have been postponed by the adequate blood transfusion.

Discussion

In the three children described here four crises were seen. All of these crises were associated with a reticulocytopenia in the peripheral blood and a period of hypoplasia of the erythroid element of the bone marrow. In the case most carefully studied the two crises were preceded by a period of symptoms suggesting an infection and both crises resolved spontaneously. The other two cases showed more severe anaemia and required blood transfusion. From a biochemical point of view the one case in which faecal bile elimination was studied showed diminished excretion during the crisis period, and in one other case the blood bilirubin was not significantly raised during the crisis.

Owren (1948), in a study of six cases of crises in acholuric jaundice, saw reticulocytopenia in five of them. In one case he followed the marrow picture through the complete crises. He observed that in the crises the red blood cell count fell to about a half of the original level in about six

days. He noted a reduction in serum bilirubin and diminution in urinary urobilin excretion. In the bone marrow he saw a spontaneous recovery of the erythron, beginning on the ninth day of crises. He considered that the aplastic phase of the bone marrow was able of itself to account for the blood changes during the crises. The finding of marrow aplasia during the period of crises was confirmed by Dameshek and Bloom (1948), but they considered the crises to be due to a phase of hypersplenism in which the spleen produced an inhibitory effect on the bone marrow and at the same time itself increased its own haemolytic activity. The aplastic factor in the crises was also confirmed by Gasser (1950), Cremer (1950), and Hermansky (1951). Schrumpf (1950) summarized a group of papers read at the Société Européenne d'Hématologie at Montreux by saying "... it is advised to remove the statement from most textbooks of increased reticulocytic number during haemolytic crises. What really happens is that the number is lowered during the crisis."

It was soon noted that similar aplastic crises occurred in sickle-cell anaemia (Singer, Motulsky, and Wile, 1950; Chernoff and Josephson, 1951). In this condition hypersplenism does not seem to occur and removal of the spleen does not influence the course of the disease.

In discussing the cause of the anaemic crises the most important single factor would seem to be the length of life of the individual cell. It has been shown that whereas the life of a normal red cell is about 100 days that of a red cell in a case of hereditary spherocytosis is about 14 days (Dacie and Mollison, 1943; Owren, 1948). Thus if there was an absolute cessation of red cell production for a period of 10 days in a normal person the effect on the peripheral blood would be a reduction of about 10% of the peripheral count for 100 days. In a case of spherocytosis, on the other hand, a similar cessation of cell production would result in a precipitous fall in red cells. If the aplasia lasted 14 days it would theoretically result in there being no peripheral surviving cells at all. It is this feature which would seem to account for the presence of anaemic crises in spherocytic and sickle-cell anaemia.

Clinically the crises often appear to have a very rapid onset, but this is compatible with the view that the anaemia is due to aplasia. The clinical acute pallor will be associated with a fall of haemoglobin from the regions of 5 g. to around 3 g. This can easily occur owing to the elimination by the spleen of surviving spherocytes in 36 to 48 hours. It is interesting to observe that in Case 1 of our series the two crises were of different severity, the second crisis being much less severe than the first. The milder crisis was associated with a less marked reticulocytopenia.

Three mechanisms that need discussion in the production of the crises are (1) the role of increased haemolysis, (2) hypersplenism, and (3) marrow aplasia.

There is virtually no evidence of increased haemolysis in cases recently studied and reported during crises. No increase in bile excretion occurs. Owren noted an absolute diminution in jaundice and blood bilirubin during the crises. The name "acholuric" attached to the disease is on simple clinical observation that in this type of jaundice an increase in bile elimination does not occur. The theory of two forms of bilirubin used to explain the anomaly is probably false (Gray and Whidborne, 1947).

The role of hypersplenism was largely adopted by Dameshek and Bloom; they had no evidence that the spleen itself produces the marrow aplasia. They noted a relative increase in the number of spherocytes in the peripheral blood during crises and suggested that this was due to splenic activity. A more likely explanation is that in crises there is a relative increase in older and hence spherocytic cells. The presence of aplastic crises in sickle-cell anaemia, in which hypersplenism does not seem to occur, necessitates a different explanation of the crises in the two similar diseases. Further, Freund (1932) refers to cases in which splenectomy did not prevent later death from anaemia.

The evidence suggests that the aplasia of the erythron can itself account for the clinical presentation of an anaemic crisis. In that case why the aplasia?

It has been considered that the crises in spherocytic anaemia are often precipitated by infection (Murray-Lyon, 1935; Scott, 1935; Dameshek, 1941; Horne, Lederer, Kirkpatrick, and Leys, 1945), and recently it has been recognized that certain infections, notably diphtheria and infectious mononucleosis (Gasser, 1950; Chernoff and Josephson, 1951), may be associated with a transient hypoplasia of the erythron.

In spherocytic anaemia we have to consider the effect of an infection upon a bone marrow in a state of prolonged and profound compensatory hypertrophy and therefore especially liable to a conditioned nutritional deficiency. The diversion of essential protein which is thought to be responsible for the anaemia of infection (Cartwright and Wintrobe, 1952), could thus be exaggerated in effect, and a relatively acute deficiency could occur, with resulting aplasia.

Such an explanation would seem to us more likely than the postulation of a hypothetical hypersplenism, and would also account for the apparently increased tendency to crises during pregnancy.

Summary

Four crises in three children with spherocytic haemolytic anaemia were studied.

All crises were associated with reticulocytopenia and with hypoplasia of the erythron in the bone marrow.

Recovery from crises was associated with the reformation of the usual hypertrophic marrow.

No evidence of increased haemolysis was seen in the crises.

It is suggested that the marrow aplasia is the primary cause of the anaemic crises and that the aplasia is due to conditional deficiency states induced by the presence in the body of an infection on a marrow undergoing prolonged compensation hypertrophy.

We are indebted to Dr. T. Colver and Professor R. S. Illingworth, the paediatricians in charge of the cases reported here.

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The C.W.S. Retail Co-operative Society of Manchester was fined £120, with 10 guineas costs, at Hastings, Sussex, on March 18 on five summonses in respect of the condition of premises used for food storage at St. Leonards. The society pleaded guilty to summonses accusing them of (1) failing to provide a sufficient supply of water for persons employed there; (2) failing to see that the walls, ceilings, and doors of the room had been purified; (3) failing to give notice that an infestation of rodents was present in the room; (4) failing to protect food stored in the room; and (5) failing to see that the walls, ceilings, floors, and windows were kept in a proper state of repair. The premises were used for the storage of cereals, rice, and beans in sacks and packages. A spokesman for the society said they deplored this matter and now had very good premises.

FURTHER TRIAL OF AUREOMYCIN IN THE TREATMENT OF CHOLERA*

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In a previous communication (Seal, Ghosal, and Ghosh, 1951) the results of a preliminary trial of aureomycin, administered intravenously, in the treatment of cholera cases were reported. These being unsatisfactory it was suggested that the oral route might be chosen for the administration of the drug if further trial was undertaken in future. Accordingly a trial was organized in the same institution at Calcutta, this time during the prevalence of cholera epidemic in the city between April 30 and July 20, 1951. Only frankly typical cases were chosen at random and were divided into three groups: experimental, sulphaguanidine control (control 1), and saline control (control 2), the number of cases treated in each group being 50, 35, and 35 respectively, total 120. The subjects were all males and were admitted in a stage of collapse, generally within 24 hours of the onset of symptoms, and had received little or no treatment prior to admission to hospital.

Treatment

Dosage.—The drug was supplied in capsules, each containing 250 mg. In the previous study the dosage used for intravenous administration was 100 mg. every six hours, and in a few cases 50 mg. every three hours, the total quantity used being generally 300 mg. Some untoward symptoms were noted with 100 mg., but not with 50 mg. per adult dose. With this experience, and in the absence of any previous knowledge of the dose which would be suitable for oral administration in cholera patients, it was tentatively decided to try one capsule of 250 mg. every three hours. This amount was easily retained with no untoward effect referable to the drug. A few cases which showed complications during the course of the disease will be discussed later. Of the 43 cases which recovered 8 were clinically severe, 23 moderately severe, and 12 were mild, the average doses received by these groups being 6.65 g., 5.5 g., and 4.875 g. respectively. From the nature of response obtained by oral administration of the drug it appears that 500 mg. every three hours or 250 mg. every one and a half hours may be tried as an initial dose, whichever is found convenient, and if the drug is effective at all the total amount actually needed for recovery may be much less than has been used in the present investigation, perhaps about 3 to 5 g., depending upon the severity.

Other Treatments.—As in the previous trial, all cases brought to the hospital in a state of dehydration and collapse were given intravenous saline and glucose in varying

*Presented before the Medical and Veterinary Section of the Indian Science Congress Association at its annual meeting held at Lucknow in January, 1953.

†Dr. S. C. Ghosal has died since the paper was written.

doses before the administration of the experimental drug. In severe cases, this treatment was further supplemented by alkaline saline, coramine, and atropine whenever necessary.

Treatment of Controls.—Two groups of control cases were simultaneously treated, one receiving sulphaguanidine in place of aureomycin and the second receiving no specific drug, the "other treatments" being the same in all the three groups. The initial dose of sulphaguanidine was 4 g., the total doses varying from 4 to 36 g. (average 25 g.) in the cases which recovered.

Laboratory Examinations

Examination of Stool Samples.—The procedures adopted by Chaudhuri *et al.* (1950) were followed for the collection and examination of stool samples, and only specimens collected by means of a sterile rectal rubber catheter or on a burnt earthenware vessel and removed to the laboratory in sterile borate-buffered salt solution were accepted for cultural examination. This had twofold advantages. It eliminated the use of a bed-pan, which could give spurious results due to imperfect washing and sterilization or to the presence of some residual antiseptics; secondly, it gave more reliable

data about the period of excretion owing to the greater chance of isolating *V. cholerae*, if present, by this method than by others. A case was considered bacteriologically negative when at least three consecutive stool samples inoculated into the enriched medium proved negative to *V. cholerae*. Seventy-five or 62.5% of the patients were vibrio-positive, yielding Inaba type in 64 cases, Ogawa in 10 cases, and both Inaba+Ogawa in one case. The vibrio-positive cases were equally distributed in the three groups (see Table II).

Examination of Blood Samples for Non-protein Nitrogen.—As in the previous trial the examination of blood samples from the cholera patients for non-protein nitrogen was carried out in the Biochemistry Section of the Calcutta Medical College. The estimation could be made only in 28 patients, 12 from the aureomycin group and 8 each from the two control groups; these tests were done mostly in the earlier period of the investigation; the difficulty arose out of the gas-workers' strike in Calcutta during the months of May to July, 1951. The amount and distribution of non-protein nitrogen in different groups of cases, according to the nature of complications, are given in Table I.

TABLE I.—Amount and Distribution of NPN (mg./100 ml.) in the Blood of Cholera Patients According to the Nature of Complications in Different Experimental Groups.

Group Treated With	Uraemic Cases		Lung Complication		Typanitis		Jaundice		Vasomotor Failure		Without Complication	
	No. of Cases	Blood NPN in Cases Tested (mg./100 ml.)	No. of Cases	Blood NPN in Cases Tested (mg./100 ml.)	No. of Cases	Blood NPN in Cases Tested (mg./100 ml.)	No. of Cases	Blood NPN in Cases Tested (mg./100 ml.)	No. of Cases	Blood NPN in Cases Tested (mg./100 ml.)	No. of Cases	Blood NPN in Cases Tested (mg./100 ml.)
I	2	3	4	5	6	7	8	9	10	11	12	13
Aureomycin	5	95 (D), 86 (D), 60, 38	2	25 (D)	—	—	2	56	—	—	41	15, 16, 20 (D), 22 (D), 39.2, 42
Sulphaguanidine	4	90 (D), 72.8 (D), 53	—	—	1	18 (D)	1	—	1	39.2	28	24, 28, 45
Saline	1	86 (D)	—	—	1	—	—	—	—	—	33	25, 25, 26 (D), 28, 34, 24, 62 (D)
	10	8	2	1	2	1	3	1	1	1	102	16

The letter D in parentheses stands for death.

TABLE II.—Showing the Clinical States and Progress of the Three Groups of Cholera Patients Treated with Aureomycin (Oral), Sulphaguanidine, and Saline Respectively.

Clinical States	Aureomycin (Oral)-treated Group	Sulphaguanidine-treated Group (Control 1)	Saline-treated Group (Control 2)
Number of cases treated	50	35	35
Age distribution (in years)	10-50 (average 30.5 years)	12-60 (average 31.2 years)	14-80 (average 31 years)
Duration of illness before admission (hours)	14-48 ¹ (average 9.6 hours)	34-48 ² (average 15 hours)	4-72 ³ (average 17.2 hours)
Sp. gr. of blood on admission	1062 (3), 1062 (14), 1063 (3), 1064 (10), 1065 (3), 1066 (9), 1067 (1), 1068 (7); average 1064.2	1061 (1), 1062 (8), 1063 (1), 1064 (8), 1065 (1), 1066 (11); 1068 (3); average 1064.5*	1062 (7), 1063 (2), 1064 (5), 1065 (4), 1066 (10), 1067 (3), 1068 (4); average 1065
Clinical types	Severe 15 (30%); Mod. 23 (46%); mild 12 (24%)	Severe 8 (22.9%); Mod. 16 (45.7%); mild 11 (31.4%)	Severe 11 (31.4%); Mod. 16 (45.7%); mild 8 (22.9%)
Condition of urine on admission	Suppressed 32 (64%); scanty 18 (36%)	Suppressed 16 (45.7%); scanty 19 (54.3%)	Suppressed 19 (54.3%); scanty 16 (45.7%)
Duration of suppression of urine (hours)	6-36 (average 16.0 hours, SD 2.219)	3-34 (average 16.3 hours, SD 2.103)	11-36 (average 22.75 hours, SD 2.207)
Complications	Uraemia 5; lung complications 2; jaundice 2; total 9 (18%)	Uraemia 4; typanitis 1; vasomotor failure 1; jaundice 1; total 7 (20.0%)	Uraemia 1; typanitis 1; total 2 (5.7%)
Blood NPN (mg./100 ml.)	Done in 12 patients (15, 16, 20, 22, 25, 38, 39.2; 42, 56, 60, 86, and 95 mg.—average 42.85 mg.)	Done in 8 patients (18, 24, 28, 39.2, 45, 53, 72.8, and 90 mg.—average 46.25 mg.)	Done in 8 patients (25, 24, 25, 26, 28, 34, 62, and 86 mg.—average 38.75 mg.)
Vibrio positive or negative	Vibrio + 31 (62%); Vibrio - 19 (38%); Inaba 27; Ogawa 3; In. + Og. = 1	Vibrio + 22 (63%); Vibrio - 13 (37%); Inaba 20; Ogawa 2	Vibrio + 22 (63%); Vibrio - 13 (37%); Inaba 17; Ogawa 5
Excretion of vibrios (average duration)	2-75 days (SD 0.132)	3-72 days (SD 0.164)	3-72 days (SD 0.271)
Average number of stools during the first 5 days of admission	10.9 (SD 0.919)	12.3 (SD 1.611)	14.1 (SD 1.902)
Average duration of illness (acute stage)	37.1 hours, SD 1.611 (average of 43 cases); 37.4 (including the dead)	39.7 hours, SD 2.249 (average of 29 cases); 39 hours (including the dead)	47.3, SD 3.530 (average of 29 cases); 43 hours (including the dead)
Average amount of saline used (pints)	6.0 (average of all cases); 5.96 (excluding the dead)	6.0 (average of all cases); 5.7 (excluding the dead)	6.2 (average of 34 cases); 6.3 (excluding the dead)
Specific drugs	4 to 36 capsules (250 mg. each); average 23 capsules (excluding the dead)	4-36 g.; average 26 g. (excluding the dead)	Nil
Number died	7† (14.0%)	5 (14.3%)	5 (14.3%)
Period between admission and death or cessation of acute stage	28.3 hours (excluding the dead); 28.8 hours (all cases)	28.0 hours (excluding the dead); 28.4 hours (all cases)	30 hours (excluding the dead); 27.2 hours (all cases)
Average length of stay in hospital (days)	5.5 (excluding the dead); 6.2 (all cases)	6.5 (excluding the dead); 6.2 (all cases)	5.9 (excluding the dead); 6.8 (all cases)

* Sp. gr. of two cases not estimated.

† One case had only 1 capsule and died within 3 hours of admission and another had 2 capsules and died within 4 hours of admission. Fatality rate excluding the first case = 12.2%.

¹ 48 hours—1 case; ² 48 hours—3 cases; ³ 48 hours—3 cases, and 72 hours—1 case.

Reactions after Oral Administration of Aureomycin

Five cases in the aureomycin-treated group developed uraemia, two cases lung complications, and two cases jaundice, total nine cases (18%). Similarly in the sulphaguanidine-treated group four cases developed uraemia, one case tympanitis, one case vasomotor failure, and one case jaundice with pain in the abdomen, total seven cases (20%). In contrast with this only two cases (5.7%) in the saline-treated group showed complications. It is thus a question whether these complications were in any way the results of drug treatment. Though the appearance of jaundice in two cases and uraemia in five cases treated with aureomycin may be considered as some evidence for the toxic action of the drug it is doubtful whether the latter was directly responsible for the complications: not only did the amounts of the drug administered to the patients who developed complications vary widely—namely, 1, 1.75, 4.5, 4.75, and 7.25 g. in the uraemic cases, 3.5 and 4.75 g. in the jaundiced cases, and 5.25 and 6 g. in cases with lung complications—but also all those who received as much as 9 g. each (two severe, three moderate, and one mild), recovered without any complication. This question will be discussed again later.

Results

The data relating to the clinical states and the progress of the patients in the aureomycin-, sulphaguanidine-, and saline-treated groups are summarized in Table II. As will be seen, the cases in the three groups are fairly well distributed in regard to age, clinical stage at the time of admission, specific gravity of blood, condition of urine, and positive isolation of *V. cholerae*. In so far as the end-results are concerned there is no appreciable difference between the three methods of treatment, but in regard to certain minor points aureomycin treatment showed some advantages.

Unlike the previous trial by the intravenous route the blood non-protein nitrogen was generally within the normal range in the majority of cases treated by aureomycin, being high only in two of the twelve cases examined. The same was true of the control groups. The average duration of the suppression of urine in the aureomycin group was significantly less than that of the saline-treated group by 6.8 hours ($t=2.099$ with 41 d.f., as against 2.021 with 40 d.f. at 5% point of t), but there was very little difference between the aureomycin and the sulphaguanidine groups in this respect ($t=0.105$ with 39 d.f. and 90% point of t with 40 d.f.=0.126).

So far as complications, such as uraemia, lung symptoms, jaundice, and tympanitis, are concerned, the advantage was definitely in favour of the saline controls, there being hardly any difference between the aureomycin and the sulphaguanidine groups. However, a significant advantage of the aureomycin group over the saline controls is found in respect of the duration of excretion of vibrios. Although the difference is small it is statistically significant ($t=3.514$ with 43 d.f., as against 3.551 with the same d.f. at 0.1% point of t). The same advantage is found over the sulphaguanidine group ($t=2.417$ with 45 d.f. and 2% and 5% point of t with the same d.f. are 2.423 and 2.021 respectively). Similarly the average duration of the acute stage was curtailed by 10 hours in the aureomycin group compared to the saline group ($t=2.919$ with 69 d.f. and 1% point of t with 60 d.f.=2.660). In this respect the sulphaguanidine group gave nearly the same results as the aureomycin group. The average number of stools during the first five days of hospital treatment was also less in the aureomycin-treated group than in the sulphaguanidine- or the saline-treated group, though the difference is not statistically significant. Some difference was also noted in the average length of stay in hospital of patients in the three groups, the advantage being in favour of the aureomycin group, but the discharge of the patients from the hospital was not strictly guided by the condition of the patient. There was no difference, however, in the fatality rates of the three groups of patients.

Comments

Although no appreciable reduction in the fatality rate of patients treated with oral aureomycin was obtained, the findings of this investigation are nevertheless interesting. Firstly, the toxicity seen after intravenous administration was practically eliminated, the toxicity being no greater than was observed in the cases treated with sulphaguanidine. It is true, complications were much less without any chemotherapy, but treatment with aureomycin had certain advantages. For instance, there was a significant reduction in the average period of suppression of urine as well as of the acute stage of the disease. Perhaps more important than this, from the point of view of epidemiology and international quarantine laws, is the fact that the patients became vibrio-free earlier than with sulphaguanidine or saline treatment. However, judging from the fatality rates and from the average amount of saline used in each group it is difficult to avoid the impression that the drug had no influence upon the course of the disease. This would appear to support Lahiri's (1951) view that no specific drug has yet been found in cholera. We do not, however, fully subscribe to this. In the experience of one of us (S. C. S.) in the field trial of sulphaguanidine (Seal, 1947) it became quite clear that the secret of success in the treatment of cholera cases lay in their early treatment; once dehydration and collapse set in, the administration of a vibrio-static drug is of no help without saline treatment; and treatment with a vibriocidal drug becomes sometimes positively harmful owing to the release of a large quantity of endotoxin at a stage when the patient is already at a serious disadvantage owing to the extreme loss of fluid.

Another difficulty is the great individual variation in the behaviour of patients against cholera infection. Some people are more apt to develop vasomotor failure or uraemic symptoms than others, and such cases generally do not respond easily to treatment. Again, the fatalities mostly occur in the earlier part of the epidemic and there is proportionately greater chance of recovery in cases occurring after the peak period. Thus, in the present study, deaths in all the three groups occurred during the first two weeks of May, 1951—that is, the early weeks of this investigation. In fact no fatality occurred amongst 35 patients treated with another antibiotic during the period between May 22 to July 18, 1951. The failure of any drug in the advanced stages of cholera does not necessarily mean that it has no action on the cholera vibrio. Aureomycin is vibriocidal *in vitro*, and the quicker disappearance of the organism from the convalescent cases indicates that the drug is also effective *in vivo*. The dose of aureomycin capsules used in the present investigation was probably high. A lower dose of 3 to 5 g. according to the stage of the disease may be found sufficient.

Summary

1. In a trial of oral aureomycin for the treatment of cholera, 50 patients were treated with aureomycin capsules, 35 with sulphaguanidine, and 35 with saline, the last two groups acting as controls.
2. There was no difference in the fatality rates among the three groups, which were all about 14%. In the group receiving aureomycin the acute stage was shorter, and the duration of suppression of urine and the period of excretion of vibrios were reduced. There were no serious toxic effects.
3. The results are discussed.

Thanks are due to Dr. A. K. Dutta Gupta, Principal, Nilratan Sircar Medical College, for kindly providing facilities for this investigation and to Dr. M. Chakrabarti, Professor of Physiology, Medical College, Calcutta, for carrying out the blood examinations for the estimation of N.P.N.

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Medical Memorandum

Spontaneous Perforation of the Colon Due to Alkaline Medication

The following case is reported because, although it is almost unique, it results from a very common combination of circumstances.

CASE REPORT

A man aged 68 was admitted to hospital complaining of severe lower abdominal pain. He had been investigated in another hospital six months previously because a duodenal ulcer was suspected, but a barium meal examination did not confirm this. Subsequently he had taken an unidentified alkaline preparation. On the morning of March 4, 1950, he paid a routine visit to his doctor. There he collapsed with severe lower abdominal pain which led to his admission to hospital. He gave a history of increasing constipation during the previous few months with occasional bleeding at stool.

Examination showed an old man with evidence of recent weight loss. There was a slight degree of shock with cold extremities and perspiration. The temperature was 96.8° F. (36° C.), pulse 66, respirations 20, and blood pressure 140/95. The lower abdomen was very tender, with muscle spasm almost amounting to rigidity. Rectal examination showed the bowel to be full of large hard faecal masses. Immediate laparotomy was advised, though it was some hours before the patient would consent to this.

Under general anaesthesia the abdomen was opened through a right lower paramedian incision. There was a moderate quantity of turbid fluid with a faecal odour in the peritoneal cavity. In the pelvic colon there was a perforation about 1 cm. across on the antimesenteric border. Around its edges was a ring of necrotic tissue about 1 mm. in width. Through the perforation a hard faecalith was protruding. This proved to be a very hard spherical whitish lump of faeces with a rough gritty surface. Palpation showed the whole of the descending and pelvic colon and the rectum to be full of similar material. The perforation was temporarily closed by suture, and the loop in which it lay was then exteriorized through a separate incision in the left iliac region, where it was fixed by passing a glass rod through its mesentery. The temporary suture was then removed so that the perforation became a colostomy opening. Exteriorization was performed under some tension owing to the shortness of the mesosigmoid. The abdomen was closed with drainage of the pelvis.

Intravenous fluids were given and gastric aspiration was continued for four days, and streptomycin, 1 g. twice daily, was administered. The patient progressed satisfactorily until the eighth day, when there was a small secondary haemorrhage from the colostomy, possibly due to the tension of the colon over the glass rod. Bleeding recurred and was fatal on the eleventh day.

Post-mortem examination confirmed the operation findings. In particular, the colon, both throughout its length and at the site of perforation, was normal. The condition was a perforation of an acute stercoral ulcer due to faecal impaction, presumably caused by alkaline medication, and occurring in an otherwise normal colon.

DISCUSSION

Spontaneous perforation of the colon—that is, perforation not due to external injury—is familiar to all surgeons with experience of abdominal emergencies. In discussing the aetiology, apart from malignant disease, Koucky and Beck (1940) mention diverticulitis, foreign bodies, nemata, compressed air, tuberculous ulceration, ulcerative colitis, typhoid, and dysentery, to which may be added simple ulcer of the ascending colon (Wilkie, 1937). Woodruff's 1952 review, apart from mentioning Brown's (1944) case, described below, adds no new predisposing cause to these.

Spontaneous perforation of the colon in the absence of any of these factors is very rare. The only cases at all similar to the present one are those of Brown (1944) and of Hoffert (1946). Brown's patient was a man of 30. A few minutes after rising he had a sudden abdominal pain of great severity. On admission to hospital he was shocked and had the signs of generalized peritonitis. At operation the abdomen contained thin turbid fluid. "In the pelvis was a small quantity of faeces. On the antimesenteric border of the pelvic colon close to the pelvi-rectal junction there was a laceration in the long axis of the bowel about 1 cm. long and with a mass of faeces protruding through it. The edges of the laceration were irregular and the bowel wall, apart from involvement in the general inflammation, was macroscopically normal." This patient recovered, and subsequent radiological examination failed to show any evidence of diverticula or foreign body. Brown was unable at that time to trace any similar case in the literature.

Hoffert's case, described two years later, is very similar to Brown's and almost identical with the case now reported. A male patient aged 63 was receiving treatment for duodenal ulcer. He developed signs of peritonitis, and x-ray examination showed free gas in the abdomen. At operation there were solid faeces throughout the left half of the transverse colon and descending colon. Two faecal balls were lying in the pelvis and there was a 2-cm. perforation in the sigmoid. This patient survived following a Paul-Mikulicz resection of the segment containing the perforation.

These two cases and the present one are remarkable in that the perforation occurred in a normal colon and in the absence of trauma. The mechanism of perforation in Brown's case is unexplained, but the fact that the patient was being treated for duodenal ulcer in the other two cases points to a previously unrecognized danger of alkaline medication. The site of the perforation on the antimesenteric wall in two of the cases suggests that this type of perforation is due to impaction of faeces causing tension gangrene, which appears first at that part of the wall with the poorest blood supply. Constipation is a well-known complication of certain alkaline powders, especially bismuth salts and aluminium hydroxide, and patients who have had these medicines prior to partial gastrectomy often develop post-operative diarrhoea due to faecal impaction in the rectum, a complication which may also occur if operation follows soon after a barium meal.

Even without the interruption of rectal function which follows an operation, old and constipated patients may develop faecal impaction while receiving alkaline powders, as another recent personal case shows. Hunt (1950) says: "Aluminium hydroxide and aluminium silicate are constipating and tend to produce dry hard stools with, in some cases, even troublesome faecal impaction. Magnesium trisilicate, on the other hand, in sufficient dosage to be effective in relieving pain is laxative and irritant to the intestine, so that colic borborygmi and intestinal flatulence make it difficult to use. A mixture of these two is rational . . . and probably the best of the antacids available."

The same principle is already familiar in the balancing of bismuth and magnesia in the older powders. Although this stasis seldom leads to perforation of the colon, minor degrees of impaction, irritation, and even ulceration are probably quite common. It is suggested, therefore, that if alkaline powders play any part at all in the treatment of peptic ulcer the two substances mentioned should be combined with liquid paraffin and a mild aperient (a combination likely to reduce calcium intake); or, better, an alkali which has a mild aperient action, such as magnesium carbonate or trisilicate, should be included in the mixture.

I wish to thank Mr. J. B. Oldham for help and advice in the preparation of this paper.

ROGER BREARLEY, M.B., F.R.C.S.

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Reviews

PRINCIPLES OF PUBLIC HEALTH

The Health of the Community: Principles of Public Health for Practitioners and Students. By C. Fraser Brockington, M.A., M.D., D.P.H., B.Chir.(Cantab.), M.R.C.S.(Eng.), L.R.C.P.(Lond.). With a foreword by Sir John Stopford, M.D., Sc.D., LL.D., F.R.C.P., F.R.S. (Pp. 415. 32s.) London: J. and A. Churchill Ltd. 1954.

This is a well-written and timely book. Professor Brockington has wide experience of the public health service and has maintained over the years a close interest in academic teaching and field research. This book has the great quality of being a personal document. Although much of his material is highly compressed, he never hesitates to use vivid illustrations from his own experience. In fact this is a first-rate example of how to write a short book on a large subject without making it synoptic and dull. It is vivid and interesting, comprehending much in few words. Professor Brockington handles figures with ease, and he might have been tempted to produce acres of tables; instead of this he weaves the figures into the pattern of the story in such a way as to add to their interest. He goes a step further indeed: "The use of numbers in epidemiology," he says wisely, "(and in a book about people) is unavoidable, and, although they may at first sight seem to be impersonal and lacking in human qualities, to those who come to understand them figures are in reality as full of meaning and poignancy as any descriptive writing; each is the record of a human life and in the aggregate of groups of people or of the whole nation."

He is not afraid of verbal imagery even when he is using words with the utmost economy. In discussing mental ill-health, for example, he says, "A large fraction of the time and energy of the State is concerned to cope with the end results—hospitals, institutions, clinics, home care, and supervision; the operation of courts of law in crime, delinquency, and divorce; the problem of absenteeism from work—yet this may be proportionately not more than the visible part of an iceberg is to the whole floating mass." Sometimes the compression is too great, and a comma or two become displaced, with curious results. The reader may be a little startled by the remark about medical officers of health: "He cannot like his colleague, the family doctor . . . until he discovers that the sentence is governed by what follows: 'apply whatever treatment he thinks appropriate.'"

This book is an admirable statement of principles and the author never loses sight of his main objects. He may be a trifle optimistic about the future unification of the health services, but he states his case cogently and shows evidence of a deep understanding of the position as a whole. He restates with great skill and restraint the scope and functions of the medical officer of health, and does battle valiantly to secure the general practitioner in his rightful place. This book should be read by all who are interested in the development of the public health service and particularly in the health of the community in its broadest sense. The blemishes are trivial in a book at once so interesting and comprehensive.

J. M. MACKINTOSH.

GENERAL PRACTITIONERS' SYMPOSIUM

Clinical Medicine in General Practice. Edited by John Fry, M.B., B.S., F.R.C.S. With a foreword by Sir Henry Cohen, M.D., D.Sc., LL.D., F.R.C.P. (Pp. 436. 27s. 6d.) London: J. and A. Churchill Ltd. 1954.

This book is a symposium by eight general practitioners and edited by Dr. J. Fry. The first chapters describe the management of a practice and the work done by rural and urban practitioners. Chapters on cardiovascular diseases (Dr. C. Papp), rheumatic disorders (Dr. A. Talbot Rogers), and the common fevers (Dr. G. O. Barber) are written by experts who are good teachers as well as general practitioners. The reader's enjoyment is slightly marred by some tiresome misprints in the chapter on rheumatic disorders.

It appears that clinical medicine in general practice is based on the same principles as in hospital practice. It is stressed that the general practitioner has special difficulties and responsibilities because he is the first to see the patient and has to distinguish between the trivial and the serious.

Dr. Watts, writing on nervous disorders, insists on the importance of diagnosis. He cuts a path clean through the jungle of psychological undergrowth that besets the general practitioner. One can but marvel at his ability to label his specimens so neatly. It seems too good to be true. Writing on obstetrics he is disappointing. He repeats the hospital teaching on antenatal care, including a fearful pamphlet handed to the expectant mother, and believes the general practitioner's chief function in a normal confinement is to act as anaesthetist to the midwife.

Dr. Fry on respiratory diseases nicely illustrates how a general practitioner is able to take the long view of his patients' disorders. His description of the development of bronchitis and emphysema in a patient over twenty years is of great interest, but he commits the error of dividing the respiratory tract into upper and lower. Nowhere is it mentioned that this particular patient had his nasal sinuses x-rayed. Dr. Fry and Dr. Pinsent on skin disorders and Dr. Barber on drugs in general practice show that treatment can be rational and yet simple and inexpensive.

The general practitioner is seen at his best in two chapters on children (Dr. Lindsey W. Batten) and the aged and incurable (Dr. Finer). Dr. Lindsey Batten in particular happily combines a scientifically detached attitude of mind to the problem with a really imaginative sympathy with the child—and his mother. If he is not already teaching medical students he certainly should.

This is an uneven book. It is, however, a laudable attempt to show how the general practitioner can be of value to clinical medicine.

C. W. WALKER.

SYNOPSIS OF CHILDREN'S DISEASES

A Synopsis of Children's Diseases. By John Rendle-Short, M.A., M.B.(Cantab.), M.R.C.P., D.C.H. (Pp. 620; illustrated. 32s. 6d.) Bristol: John Wright and Sons Ltd. 1954.

Now that paediatrics has become recognized in many universities as a fourth major subject, equal in importance to medicine, surgery, and obstetrics, it is both fitting and timely that a companion volume to Tidy's *Medicine*, Wakeley's *Surgery*, and Bourne's *Obstetrics* should appear in this outstanding synopsis series. This newcomer is particularly welcome, for there is no volume of comparable size available for final-year students revising their paediatrics, or for D.C.H. or M.R.C.P. candidates, and the standard of the contents is admirably suited to these ends. *A Synopsis of Children's Diseases*, which might perhaps better have been entitled "Synopsis of Paediatrics," is a courageous attempt to follow in the steps of the three other masters.

Inevitably a first edition such as this must invite some criticisms, but these are slight. There are commendably few errors and the text is remarkably up to date. Although the author says in the preface that the book is intended for paediatric house-physicians and general practitioners as well as for examination candidates, the details of treatment are, in the main, too sketchy to be of value to residents and general practitioners. The most helpful section, perhaps, is that on diseases of the respiratory system. There are twenty-one tables of differential diagnosis, and these will prove most useful. It is a pity, however, that one of these is devoted to the differentiation between mongolism and cretinism, although this is following tradition. Mongols and cretins are so unlike, and each has such distinguishing characteristics, that there should be no need for this table in future editions.

There is one severe criticism—and that is the use of "etc." This appears—usually more than once—on almost every one of the 554 pages encompassing the 174 chapters. And it is a very bad example to examinees. The height of synopsis is reached in Chapter 168, which reads: "Gonorrhoea. In girls—see p. 393. In boys—very rare. Signs, symptoms and

treatment etc. as for adults." Why the etc.? On page 150, in the indications for tonsillectomy, no mention is made of the importance of enlargement of the tonsillar glands. On page 20, in the treatment of Hirschsprung's disease, ephedrine sulphate 2 gr. is the dose recommended. As no reference is made to the age of the child so to be treated this is certainly a dangerous recommendation.

This is really a most valuable book and is certain of a wide circulation.

WILFRID GAISFORD.

THE CHRISTIE CASE

Medical and Scientific Investigations in the Christie Case. By Francis E. Camps, M.D. Foreword by the Attorney-General, Sir Lionel Heald, Q.C., M.P. (Pp. 244; with 47 diagrams and photographs and 6 coloured plates. 30s.) London: Medical Publications Limited. 1953.

The case of John Reginald Halliday Christie was unusual in several respects, but especially because of the number of women who died from violence in one house. That the details of medico-legal investigation adopted in such cases should be recorded is of high importance for reference and other purposes. In this monograph the story of the finding of the bodies and the ensuing scientific and police investigations, together with the medical evidence, are fully explained. It is a welcome addition to volumes which have already treated similar subjects. Throughout the text and in many illustrations the methods used are fully described. The reader cannot fail to be impressed by the scrupulous care taken by the investigators not only in the collection but in the evaluation of the evidence.

In this case, as in others within recent times, the anatomist plays a predominant part. The appendix to the book, in which the methods of estimating stature from long bones are not only fully described but compared, is of very considerable value to all whose work is concerned with such an undertaking. The formulae devised by Karl Pearson, Dupertuis and Hadden, and Trotter and Gleser are discussed and their comparison illustrated by their application to five subjects. The author indicates that the Pearson formulae underestimate the true height and that those of Trotter and Gleser give the best results. In this work Dr. Camps has received the able assistance of Dr. Richard J. Harrison, reader in anatomy, University of London, and of Professor A. E. W. Miles, professor of dental pathology, University of London, and of others.

Throughout the text the findings are carefully described, and, more important still, the methods whereby the results were obtained are recorded. This record will be of benefit in any future similar investigation. To the medico-legal consultant, pathologist, police surgeon, lawyer, and indeed to all concerned with medico-legal problems this volume will prove of high value. The author and his collaborators are to be congratulated. The illustrations are numerous and well produced and the production is of a high standard, for which the publishers should be complimented.

J. GLAISTER.

RADIOLOGY OF BONE DISEASES

The Radiology of Bones and Joints: An Introduction to the Study of Tumours and other Diseases of Bone. By James F. Brailsford, M.D., Ph.D., F.R.C.P., F.I.C.S.(Hon.). Fifth edition. (Pp. 875; over 725 illustrations. 90s.) London: J. and A. Churchill. 1953.

Radiology, though still a young branch of medicine, is now sufficiently mature to span easily a man's whole professional life. This point cannot be better illustrated than by reference to the book under review. In the preface to the new edition the author writes: "The book now comprises a digest of the work of the author since he was appointed to the staff of the Pathological Department of the University of Birmingham forty-six years ago." The work has grown in size and maturity concurrently with the experience of the writer. The first edition was published in 1934, and this one, the fifth, is about twice as long and contains about twice as many illustrations.

The general structure has changed but little since the last edition five years ago. Rather more space has been devoted to bone tumours, the problem perhaps of greatest interest to the author and that to which he has made his most important contributions. On this theme he has always been stimulating and provocative. There are probably few more worrying problems in the whole of medicine than the accurate diagnosis and correct treatment of bone tumours. Classical medical teaching leads us to rely on the veracity of histological reports, but we are liable to become disillusioned if the subject is a possible bone tumour. When three expert pathologists all differ in their opinion—as can happen—on one section, and when each may ultimately be proved to be wrong, a strong case can be made out for the expert bone radiologist having a casting vote. Dr. Brailsford has done much to reorientate our views in this respect, and for that alone his name would be important. Bone tumours are likely long to remain difficult diagnostic problems, partly because they are sufficiently rare for more than a few to gain sufficient experience to develop a mature judgment.

Brailsford's work is too well known, not only to the English-speaking world, but also to the Spanish, into which language it has been translated, to require further comment. It is a pleasure to see that first-class paper is now being used again so that the blocks may be reproduced to their best advantage, so important particularly for bone lesions.

J. W. D. BULL.

THE NATIONAL HOSPITAL

The National Hospital, Queen Square: 1860-1948. By Gordon Holmes, M.D., F.R.S. Foreword by Sir Ernest Gowers, G.C.B., G.B.E. (Pp. 98; illustrated. 10s. 6d.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

The introduction of the National Health Service marked the end of an epoch, and has naturally led to the recording in book form of the past histories of many of those hospitals which won international fame while still on a voluntary basis. In this well-produced and readable book Sir Gordon Holmes has written the story of the National Hospital, Queen Square, of which he himself has been such a distinguished ornament. The National Hospital was not only the first hospital to be established solely for the treatment of nervous diseases, but for many years it was, and we believe it still is, the leading centre for neurological teaching and research.

It began in a small way. Miss Johanna Chandler, finding that it was difficult to obtain hospital treatment for paralysed persons, determined to remedy the deficiency, and, though not wealthy herself, by her persistent efforts succeeded in getting such a hospital established. It started with only 12 beds, but it filled a need and inevitably grew in size and importance. At present it has about 200 beds and splendid out-patient and research departments. It is in addition a great centre of teaching as a postgraduate school and is recognized as a unit of the University of London.

The author has inserted short biographies of all the chief physicians and surgeons who have been associated with the hospital in the past and are no longer living, and these impress one with the large proportion of truly distinguished men who have worked there. It is an inspiring story, and these great men are not likely to be forgotten. We hope also that the memory of Miss Johanna Chandler will be kept alive.

ZACHARY COPE.

In *Medicine in Oxford* (Basil Blackwell, 10s. 6d.) Dr. Maurice Davidson discourses pleasantly on the general history of the University of Oxford, emphasizing those events and statutes that specially affected the development of the medical curriculum. He draws attention to the "Laudian code" of 1636 and sympathetically portrays the personality of Archbishop Laud (1573-1644). A particular feature of these FitzPatrick Lectures, delivered before the Royal College of Physicians of London in 1952-3, is the very fine series of portraits. The book should be a useful companion to H. M. Sinclair and Robb-Smith's *History of Anatomical Teaching in Oxford*, Oxford, 1950.

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GOOD GENERAL PRACTICE

This week the Nuffield Provincial Hospitals Trust publishes in book form a report¹ by Dr. Stephen Taylor of a survey of 30 general practices in England and Wales. This survey was commissioned three years ago "at a time," as the foreword of the report says, "when there was not perhaps as sympathetic an attitude as now seems usual towards the problems and opportunities of general practice." The survey was to be non-statistical and, also in contradistinction to that carried out by Dr. S. Hadfield on behalf of the B.M.A.,² not of a random sample of practices but of a selected number of good practices. The whole purpose of the report is, in a sense, an attempt to define and describe good practice, and therefore those practices were chosen which were generally regarded by other practitioners as outstanding. It is encouraging to read that such practices proved "surprisingly easy to find." In the 30 practices there were 94 doctors, of whom 81 were principals and 13 were assistants. Dr. Taylor was guided in his investigation by a steering committee under Sir Wilson Jameson with Dr. G. Barber, Sir Ernest Rock Carling, Sir Henry Cohen, Mr. Leslie Farrer-Brown, Dr. J. Revans, Dr. A. Talbot Rogers, and Sir James Spence as members. This was an active body, and though the observations in the report are those of an individual the conclusions drawn from them are not.

Surveying the pattern of general practice, the report comes down firmly in favour of the capitation method of payment. It is said that it avoids the disadvantages of both salary and fee for service in a type of occupation where "checking of work done is undesirable and indeed impossible"; and, again, "the independence of mind and spirit of the G.P.s visited has been a striking feature . . . in substantial measure, this appears . . . to be associated with payment by capitation fee." As might be expected, a notable difference in the amount of work per patient per year and in the daily volume of work per doctor was observed in the practices surveyed—variations as great as 3.5 to 9.6 items of service per patient per year and 24 to 87 items of service per doctor per day.

"On a basis of general observation" it appeared to Dr. Taylor that fatigue and decline in efficiency started to show itself in the surgery after 15 to 20 patients had been seen and on the round after 10 to 15 visits. From this it is estimated that the average number of services a day should be between 40 and 55, and, on the assumption of an average of 5.3 services per patient per year, this suggests that the "average optimal maximum list is between 2,500 and 3,000."

Of the practices visited in the survey, fourteen had three or more members, and of these fourteen ten were conducted from a single practice house and thus fulfilled what is taken as one of the main criteria of a true group practice. The making of a group practice, its advantages and disadvantages, and the details of its administration are carefully examined. While acknowledging that there are many first-class individual practices and partnerships Dr. Taylor gained the impression that doctors in a successful group almost always supply a better medical service than they would if dispersed. Defining a health centre as "a building where general practitioners carry out their work under the same roof as the local authority clinics" the report goes on to say that there is no point in providing health centres for the sake of any abstract dogma. Policy must be adapted to the nature of the need in areas of different types. Where there are keen and competent general practitioners who undertake maternity and infant welfare work there is a diminishing need for clinics, and to build expensive health centres would be foolish. Where there are good clinic buildings actively at work the report says that it is clearly unnecessary to replace them by new health centres. In such places, mainly industrial areas, it is thought that the need is for group practice buildings and for functional links between the general practitioners and the clinics. Where, however, both the clinic buildings and the general practitioners' premises are poor or non-existent, such as the new towns and housing estates, the case for building health centres is strong.

The section devoted to the thorny problem of the general practitioner's place in hospital work will be read with special interest. It is suggested that the development of clinical assistant posts on the widest possible scale is likely to become the key to the whole problem, provided that these posts are regarded as training appointments and as a means of forging personal links between general practitioners and the local specialists and hospitals rather than as an easy way of supplying an extra pair of hands to the hospital. Of general-practitioner beds the experience in the survey suggests that, where general practitioners have

their own beds available and a general hospital with full specialist staff, the use made of general-practitioner beds is very small. From this comes the conclusion that instead of increasing the number of general-practitioner beds where specialist services exist it would be better to improve the facilities for domiciliary care—by increasing, for instance, the home-nursing and home-help services, and through housing policy. But, the report adds, there is no reason why the general practitioner should not look after his own maternity cases in hospital or nursing-home beds. Almost every general practitioner should regard obstetrics as completely within his sphere. The specialist must be prepared to leave normal midwifery to the general practitioner (except for the training of midwives), and general practitioners on their side must be ready to call in the specialist whenever the need arises. No evidence of anything but good relations between the midwives and general practitioners was found in the course of the survey. Arrangements for normal deliveries, on the whole, were found to be good, and there were several examples of excellent co-operation during the antenatal period. Of the health visitor, it is said that if she is to make a useful contribution towards the care of the general sick in the home as well as of mothers and children she must take her instructions from the general practitioner. No systematic attempt was made in the survey to take evidence from medical officers of health, and any picture gained of the local authority health service was seen through the eyes of the general practitioners interviewed. Criticism of the medical officer of health was less common than complete ignorance of him and all his works, but in one county borough general practitioners and the medical officer of health had set up a joint liaison committee. The report considers that this sort of thing can prove successful, but the initiative for co-operation must come from the medical officer of health.

These are but samples of some of the matters dealt with in considerable detail in a long report on the vast and ever topical subject of the day-to-day work of the general practitioner. A whole chapter and an appendix, for instance, are given to a favourable description of rota systems. Much useful information is given about the use of ancillary help and the planning of the surgery accommodation, and about the scope of the general practitioner's work, together with a section on laboratory work in general practice. The report concludes with an attempt to foretell the future. Remarking that medically the greatest change brought about by the National Health Service has been the diffusion of salaried specialists throughout

the country, with a resulting new homogeneity in general practice, it says that "almost all general practitioners must now make domiciliary and consulting-room medicine their primary activity." A future "rich with opportunity" for general practice is envisaged. Open access to the laboratory, to much of the x-ray department, and perhaps to some physiotherapy will enlarge the scope of practice. Within the past fifteen years, it is pointed out, technical advances have so greatly extended that to-day the general practitioner in the gloomiest slum practice can treat pneumonia more effectively than most specialists were able to do before the war. "What has happened once," the report says, "may surely happen again." A society which is changing with increasing speed, and against which the future of general practice must be set, in itself will present new problems and growing points, which will, as the report foresees, occupy the general practitioner to the extent that he has the time, energy, and initiative to cope with them. Of the risks to the future of general practice three are singled out. First, that the general practitioner may become lazy in his work. Next, that he may become a relatively unimportant outpost of the hospital service: this risk is a predisposing cause of the first, and many have seen it as the gravest danger to general practice. Lastly, there is the risk to personal freedom and personal integrity which is liable to develop inside any large-scale organization. It is noticeable that nowhere in the report are administrative details discussed. This is in keeping with the attitude of mind with which the survey was approached—namely, that good general practice begins with the good general practitioner and that its quality depends upon the men and women who are actually doing the job. Organization is described as a means to the end of bringing together those who are sick and those specially trained to help them. Beyond this, organization must not be exalted, for this is the way to a tyranny all the more dangerous because it is cloaked with good intentions. The future safety of the doctor's freedom, as the report sees it, lies in his own hands. By their standards of work general practitioners must deserve to be free—"that is the challenge to general practice to-day."

The declared function of the Nuffield Trust is not to pronounce policies but to make accurate experimental studies of various aspects of the health services so that all concerned may benefit. This report fulfils the traditions of the Trust, and, one may add, is a tribute to the tradition of the branch of medicine which it sets out to describe. It is not always clear which conclusions are based on the observations of the practices surveyed and which come from the

¹ *Good General Practice*, 1954, Oxford University Press, London.
² *British Medical Journal*, 1953, 2, 683.

consideration of other evidence or from the opinions of the steering committee itself. However, this need not detract from the value of an important document which starts with certain assumptions and then by every means possible sets out to find if these were true or false. Taken in conjunction with Dr. Hadfield's survey, to which in many important respects it is complementary and in broad agreement, this latest Nuffield Report will do much to restore confidence in the future of general practice and is likely to achieve the author's hope that many, particularly the young practitioner, may profit from it. It is a report which all general practitioners should read and digest.

ADOLESCENCE

The period of adolescence is one fraught with immense importance for the individual lad and for the community. It is a period of instability, of development and transition, physical and psychological. There is good reason why this period of change should be beset with difficulty for the young people concerned, striving as they are to adapt themselves to the new freedom—and the new restrictions—inherent in the change from school to employment, facing a host of new interests and new temptations, groping for new values, and all the while developing personality. The approach to youth problems in the depressed years of the 'thirties was inevitably overshadowed by the spectre of unemployment. Cameron¹ and his co-workers found that under the circumstances of those times demoralization was at its worst among young adults of poor social background, and they considered that irretrievable damage had often already been done during the first few years after leaving school. Morgan,² in a report to King George's Jubilee Trust, concluded that the voluntary youth movement had so clearly demonstrated the necessities and the possibilities of providing creative leisure activities for youth that its work must go on. "The vague clamour for national fitness," he wrote, "will have meaning when the nation as a whole grasps the fact that only on the bedrock of youth can we lay the foundations of real national fitness." Is it more difficult now for a youth to pass successfully from boyhood to manhood than it was a generation ago? In some ways it probably is; for, while it has never been easier for the school-leaver to step into a comparatively well-paid job, it is equally certain that many of the jobs so readily available are bad, gilded

with a thin veneer of apparent attractiveness. Two important new factors have been introduced: one, the raising of the minimum school-leaving age to 15; the other, the introduction of compulsory National Service. The motives behind the raising of the school-leaving age a few years ago were wholly benevolent, but there appears to be some room for doubt whether facilities yet exist in all parts of the country to provide an attractive and useful training for the young people thus kept at school for a further year. For some of them retention at school may be little more than an unsatisfying frustration. Of the introduction of compulsory National Service it may be argued that Service training and discipline will have a steadying value in a period so often characterized by instability; on the other hand, Service life may be a disturbing influence, possibly aggravating the insecurity of adolescence and deterring youth from settling down to a career. There is not yet available any reliable body of evidence on the subject—an extraordinary deficiency, which should surely be remedied.

The transition from school to industry offers at once new problems to the lad and immense opportunities to the sociologist. Osler deplored the attitude of his day which surrounded the child with protective care, only to throw him, on leaving school, more or less by chance into a maelstrom of hazards that could often scarcely fail to undermine the stoutest constitution. Of recent years things have improved in this respect, and the International Labour Review³ has described the growth of legislation designed to protect the young worker in Britain and other industrial countries; but there is still urgent need for enlightened vocational guidance. Fortunately most young people are likely to be able to do most jobs that come their way nowadays, though some at the extremes of fitness do require help. The crisis of school-leaving is never repeated, and if a young person gets into the wrong kind of work at that stage it is very difficult to get him back on to the rails again. The task of the Youth Employment Counsellor is not an easy one. He has to fit the ability and inclination of the boy to a job in which he is likely to be reasonably happy and successful; and he has to find the appropriate job quickly, for if it is not forthcoming soon there is a probability that the boy may drift into the first opening offered. Among the criteria of success that have been applied to young people in this age group are the ability to get, and to hold, skilled employment; to obtain work which satisfies the young person himself and which he is prepared to accept as his permanent job in life; and ability to conform to the

ordinarily accepted standards of social conduct and to use leisure in a reasonable and intelligent manner. Ferguson and Cunnison⁴ found that, no matter which of these tests is applied, young people who come from a good home get on best.

Fortunately the teenagers enjoy comparative freedom from illness; incapacity for work is lower in this age group than at any later age, though tuberculosis is a problem among these young people. In their series of 1,315 boys who had left school at the earliest permitted age, Ferguson and Cunnison found that 54 had already, three years after leaving school, some degree of disability liable to influence their future working capacity. In a representative group of 74 18-year-old lads studied on the eve of call-up for National Service, Logan and Goldberg⁵ have reported that 43 were stable and well adjusted, 19 were maladjusted in some respect, while 12 were "clearly disturbed"—"emotionally so disturbed that psychiatric help would have been advisable." This is probably a higher proportion than that found by most doctors in the student health services of our universities, though the circumstances are different; and there may be room for difference of opinion about the degree of emotional disturbance that calls for psychiatric help. The problems of youth are many-sided and compelling. To their solution medicine has a contribution to make: this is surely above all in the sphere of the family doctor.

ALCOHOL AND ROAD ACCIDENTS

The drunken driver gets short shrift from both public opinion and the law in Britain nowadays, and there seems also to be a growing awareness that the drinking of quite small quantities of alcoholic liquor can seriously impair judgment.^{1,2} But the extent to which alcohol causes road accidents is unknown; indeed, it can hardly be guessed at. The police are reluctant to assign alcohol as the cause of an accident unless they have good evidence, and the evidence of whether people involved in an accident have alcohol in their tissues is not often obtained in this country. Even if it were, the question whether the amount found was sufficient to account for the accident would often be difficult to answer—impossible sometimes with any certainty. In road accidents recorded as due to drink or drugs 1,278 people in Great Britain were injured during 1952; these were 0.61% of the total road casualties. The corresponding figures for 1951 were 1,704 and 0.79, and for 1949 they were 1,269 and 0.72. These figures must seem surprisingly small in relation to the amount of travelling to and from convivial gatherings to be seen of an evening, whether by car, bicycle, or on foot—for the drunken pedestrian is also a menace. An analysis of the road accidents attributed to drink or drugs in 1951 carried out at the

Road Research Laboratory of the Department of Scientific and Industrial Research³ shows that these accidents composed 0.62% of all road accidents in England, 0.85% in Wales, and 1.98% in Scotland. Of the 1,704 casualties, 636 (37%) were pedestrians; in these 636 cases the pedestrian was to blame in 497 (78%). There were 233 bicycle casualties (14%), and in 180 (77%) of these the cyclist was the culprit. The worst period of "drink or drugs" accidents was Saturday 10 p.m. to Sunday 1 a.m., when 21% of the week's total occurred. The closing of public houses on Sundays in Wales and Scotland was found to be associated with a statistically significant lowering of the Sunday drink accident figures for these countries in comparison with those for England. Such in outline is one part of the rather shadowy background to the many telephone calls that doctors are apt to receive, just as they are dropping off to sleep, asking them to come and examine a man at the local police station. What the doctor should do when he gets there is the subject of a useful booklet published this week by the British Medical Association.⁴

In June, 1951, the Association appointed a special committee to revise and bring up to date two of its previous reports on road accidents and drunkenness, published in 1927 and 1935. The chairman of the committee was Professor E. J. Wayne, and among members were experts in many branches of medicine, including general practitioners, as well as authorities from outside the profession. After explaining the law on intoxication the committee describes in detail the examination of a person detained by the police on the suspicion of being under the influence of alcohol. The report includes guidance on such necessary preliminaries as gaining the person's consent, such questionable concomitants as the presence of a police officer, and such worrying consequences as the giving of written or verbal evidence. Most of this is procedure well tried in practice and here well expressed, a concise record of the exceptionally wide experience which the committee's members have of different aspects of the subject.

The more novel feature of the report is its discussion of estimating the alcoholic content of body fluids. In practice urine is found to be the most suitable fluid to analyse, but considerable experience of the procedure is necessary and facilities are not yet available in every district. Though no particular proportion of alcohol in urine or blood is recognized by the law of this country as signifying that the suspect was culpably drunk or not, an estimate of it can nevertheless, as the report points out, be of value for several reasons. First, a suspect may be conclusively exonerated, and the committee recommends that a suspect who protests he has taken little or no alcohol should be given the opportunity of having his word confirmed by a test of his urine. Secondly, it affords some indication of the trustworthiness of the suspect; and, thirdly, alcohol estimations may point not to a living suspect, for instance, but to a dead victim. Even so, any alcohol estimation could be

¹ Goldberg, L., *Quart. J. Stud. Alcohol*, 1950, 11, 1.

² Pinner, D. W., *Canad. med. Ass. J.*, 1954, 70, 18.

³ Jeffcoate, G. O., *Brit. J. Addict.*, 1953, 50(1), 67.

⁴ *The Recognition of Intoxication*. London: British Medical Association.

1s. See p. 753 of this week's *Journal*.

⁵ See *British Medical Journal*, 1953, 1, 1269.

¹ *Disinherited Youth*. Carnegie Trust, 1943.

² *The Needs of Youth*. Oxford, 1939.

³ *International Labour Review*, 1953, 67, 64, 542. I.L.O., Geneva.

⁴ *The Young Wage Earner*. Oxford, 1951.

⁵ *Brit. J. Sociol.*, 1953, 4, 323.

misleading if the possibility was overlooked that another drug might have been taken as well. The most likely one is a barbiturate, and there is some evidence that it potentiates the effects of alcohol, though the combination if only additive would clearly be a grave risk.⁵

Confining itself to issues of more immediately practical importance, the report does not venture more than a glance at the arguments whether or not a particular level of alcohol in the blood or urine of a person in charge of a motor vehicle should be evidence that he was culpably intoxicated. In this country it is probable that the degree of intoxication below which conviction will not be obtained corresponds to a blood level of about 0.15%. In some countries figures have been agreed at which it is an offence to drive a vehicle. In Norway, for example, it is 0.05%, in Denmark 0.1%, in Sweden 0.15%, and in some states of America 0.15%. Opinion in Britain has usually veered away from making the blood level of alcohol a fixed measure of culpability, and preferred to dwell rather on the fact that people vary much in their response to different quantities of alcohol. Perhaps this has led to some neglect of the value of routine alcohol estimations (of urine) as additional evidence. If so, this report, admirable as a manual of instruction, may also serve the useful purpose of arousing interest in this debatable subject.

ANTIHAEMOPHILIC GLOBULIN

It is now believed that in the early stages of coagulation thromboplastin is formed in the blood itself as the result of a complicated interaction between a factor or factors derived from the blood platelets and several plasma factors—namely, antihæmophilic globulin, Factor V, Factor VII, and the Christmas factor.¹ In addition, contact with a water-wettable surface and the presence of ionized calcium seem to be essential. As its name suggests, one of the plasma components, antihæmophilic globulin (A.H.G.), is the substance which is absent or grossly deficient in true inherited hæmophilia. The exact nature of A.H.G., which is present normally only in very small amounts in the plasma, is unknown; it mostly separates with the fibrinogen fraction (Cohn's fraction I) when plasma is fractionated by chemical methods of precipitation.

The only effective way of treating hæmorrhage in hæmophilia is to administer A.H.G. intravenously. This can be done by whole-blood or plasma transfusions. Large volumes are necessary—several pints of blood or plasma being required for an adult—and as A.H.G. is somewhat labile the blood or plasma should be administered within 24 hours of collection. Lyophilized fresh plasma or plasma frozen as soon as possible after collection may be used provided they are administered immediately they are reconstituted. Alternatively, the fibrinogen fraction of plasma may be administered, if available: it is this preparation that has loosely been referred to as "antihæmophilic globulin." This has the theoretical advantage of containing A.H.G. in a concentrated form. Unfortunately preparations of high and

standard potency are difficult to prepare, and at present it seems best to use freshly obtained plasma, even if this means administering much larger volumes.

NEW FELLOWS OF ROYAL SOCIETY

Though the list of twenty-five Fellows elected to the Royal Society last week did not contain the names of any medical men, some of the distinguished scientists accorded the honour have made far-reaching contributions to the advancement of medicine. Prominent among them is Professor A. Bradford Hill, professor of medical statistics at the London School of Hygiene and Tropical Medicine. In recent years Professor Hill has been foremost among those workers engaged on the evaluation of new therapies. The large number of drugs produced in the last decade or so, often several for a single disease, such as tuberculosis, made some accurate assessment of their worth imperative. In devising the methods for doing this in conjunction with his colleagues of the Medical Research Council, Professor Hill not only put medical men and their patients in his debt but set standards of therapeutic research in Britain that have not yet been adopted on the same scale in any other country. Some years ago Professor Hill collected and analysed data for the Spens reports; more recently his name has been well-known outside medical and scientific circles for his work with Dr. R. Doll showing the link between smoking and cancer of the lung. Professor C. Rimington, who is particularly distinguished for his work on the synthesis of porphyrins, is professor of chemical pathology at U.C.H. Medical School, London. The author of many papers on blood pigments and their chemistry, Professor Rimington served the Medical Research Council as a biochemist from 1937 to 1945. Before that he had worked in the South African veterinary services for several years. Canada is honoured in the person of Professor F. C. MacIntosh, one of its foremost scientists and professor of physiology at McGill University. Professor MacIntosh formerly worked for a time at the National Institute for Medical Research, London. His researches have been concerned with the physiology of the nervous system, including the transmission of the nervous impulse. Dr. Rosalind Pitt-Rivers, who is a biochemist at the National Institute for Medical Research, has worked for some years on products of the thyroid gland, and in the last two years particularly has carried out research into thyronine. Dr. F. Sanger is a biochemist at Cambridge, a colleague there of Professor F. G. Young's. He has played a prominent part in the biochemical researches into insulin that have distinguished that laboratory, and is also an authority on the amino-acid structure of proteins. Dr. M. F. Perutz is a lecturer in biophysics at Cambridge and director of a Medical Research Council unit there for research into the molecular structure of biological systems. He is carrying out research into the structure of proteins by means of x-ray diffraction, and much of his work has been on hæmoglobin, some of it in connexion with sickle-cell anaemia.

CLINICAL PATHOLOGY IN GENERAL PRACTICE THE ASSESSMENT OF ADRENAL CORTICAL ACTIVITY

BY

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In the investigation of patients with altered adrenal cortical function there are certain routine laboratory tests which may show deviations from normal and be of subsidiary value, and other specially designed tests aimed at more precise diagnosis. In this article the former will be discussed first, and then the more specific tests such as the Kepler test, the estimation of the urinary 17-ketosteroids, and the trial of A.C.T.H. Before dealing with these, however, it is convenient to review the important conditions in which changes in adrenal cortical function occur. The following is a brief classification for this purpose.

Decreased Adrenal Cortical Function

Acute.—(1) *Waterhouse-Friderichsen syndrome* (the diagnosis of this condition should be regarded as a clinical problem and it is inserted here only for completeness) and (2) *crisis in Addison's disease*.

Chronic.—(1) *Addison's disease* due to tuberculosis, "adrenal cortical atrophy," and rarely to invasion by tumour, amyloid disease, etc. (2) *Anterior hypopituitarism* may be due to post-partum necrosis (Simmonds's disease), chromophobe adenoma, craniopharyngioma, and other rarer lesions. In these patients partial atrophy of the adrenal cortex occurs owing to lack of adrenocorticotrophin secretion by the pituitary. (3) In rare cases children with *adrenal virilism* may have accompanying Addison's disease owing to lack of secretion of cortisone and hydrocortisone by the glands.

Increased Adrenal Cortical Function

Adrenal Virilism.—Pre- or post-pubertal, due to "hyperplasia" or tumour of the adrenal cortex.

Male Feminization.—Rare cases associated with adrenal cortical tumours.

Cushing's Syndrome.—A small proportion of these cases may be due to primary tumour of the adrenal cortex.

Laboratory Investigations of Subsidiary Value

Blood Counts

In increased adrenal cortical activity of the type seen in Cushing's syndrome a characteristic blood picture is often encountered. Haemoglobin and red-cell counts are usually raised, a haemoglobin level of 110% Haldane, even in women, being expected. The total white-cell count is not demonstrably abnormal, but there is a definite tendency for the polymorphs to rise and the lymphocytes to fall, changes which are best evidenced in the fall in lymphocytes to levels below 25%. The direct eosinophil count may be of value in showing a reduction in the number of these cells to the lower limits of normal or below. (Their usual range is between 25 and 300 cells per c.mm.) For this determination the blood should be collected freshly by the pathologist.

Although all these changes tend to be reversed in Addison's disease and hypopituitarism the values seldom deviate very significantly from normal levels. A few patients with hypopituitarism are found to have a mild macrocytic type of anaemia.

Carbohydrate Metabolism

A proportion of patients with Addison's disease show a tendency to hypoglycaemia on fasting. This may be appar-

ent after the lapse of 24 hours and is gradually progressive with a longer duration of fast. If this tendency is present these patients respond unfavourably to fasts of this duration and may drift into a crisis. Blood-sugar levels below 50 mg. per 100 ml. may occasionally be reached with the development of hypoglycaemic crisis. Patients with hypopituitarism also possess this tendency in a variable degree. Both these groups of patients respond profoundly to the injection of small doses of insulin; for example, a dose of 4 units of soluble insulin may be a large one to the rare patient developing severe diabetes in the presence of Addison's disease. This emphasizes that the standard insulin-tolerance test based upon the injection of 0.1 unit per kg. body weight intravenously is apt to be dangerous, promoting a profound fall of blood sugar which the patient is unable to overcome. Such investigations should never be carried out outside hospital, and substandard doses of insulin must be employed. The administration of oral glucose to these patients results nearly always in a "flat" type of tolerance curve where only low levels of blood sugar are reached after half an hour and one hour. Thus in extreme cases the blood-sugar level may never rise above 100 mg. per 100 ml.

Patients with Cushing's syndrome often show decreased tolerance to carbohydrate; glycosuria, fasting hyperglycaemia (blood sugar greater than 120 mg. per 100 ml.), and a diabetic type of oral glucose curve may all be apparent.

Basal Metabolic Rate

A decrease in the basal metabolism, as would be expected from the secondary hypothyroidism, is nearly always found in patients with hypopituitarism, and values down to minus 40% found in myxoedema are encountered. In Addison's disease there is a tendency to a secondary decrease in the basal metabolism, the average lying within the lower limit of the normal range of minus 15%.

Changes in Blood Chemistry

In Addison's disease characteristic changes in the serum electrolytes are found in the more advanced stages of the disease. The constant renal leak of sodium from decreased tubular reabsorption of this ion results, especially if the intake is insufficiently high, in a decrease of extracellular fluid volume and of its total sodium content. Continued shrinkage of this fluid entails depletion of the volume of blood plasma and the concentration of sodium in both these fluids. This process is accompanied by a rise in the packed cell volume (haematocrit) if the patient is not too anaemic to mask it. This rise in packed cell volume is likely to indicate an impending crisis and can be of value in following the efficacy of intravenous replacement therapy. The low values for serum sodium (below 135 mEq per litre or 310 mg. per 100 ml.) are accompanied by a similar drop in the serum chloride below 95 mEq per litre (560 mg. per 100 ml. expressed as NaCl, or 365 mg. per 100 ml. expressed as Cl). A further finding which may be of corroborative assistance is a rise in the level of serum potassium above 5.5 mEq per litre (or 22 mg. per 100 ml.). In performing estimations for this ion it is essential that the serum be separated from the blood within an hour and that no haemolysis should be present, since the red cells contain very much greater concentrations of potassium than the plasma. In Addisonian crisis these changes tend to be at a maximum and the carbon dioxide combining power of the

¹ Biggs, R., et al., *J. Physiol.*, 1953, 122, 538.

plasma rises slightly. The accompanying dehydration results in a moderate rise in the blood urea and non-protein nitrogen values.

In hypopituitarism there is also a tendency to lowering of the serum sodium and chloride levels, but this is not so marked as in Addison's disease, so that the changes are not easily apparent and the investigation is not worth while. In Cushing's syndrome a curious imbalance is encountered, so-called hypochloreaemic alkalosis. The chloride level falls and the carbon dioxide rises to a small degree. There is an accompanying tendency for the potassium level to fall below 3.5 mEq per litre (14 mg. per 100 ml.). These alterations are of very subsidiary value in the diagnosis of the syndrome.

The Water Test (Kepler Test)

In patients with appreciable decrease of adrenal cortical activity due either to Addison's disease or to hypopituitarism it is found that the excretion of urine follows a more uniform pattern through the day than in normal persons. As a consequence of this the decreased ability to economize in urine volume during the night and to show a diuresis during the day is made use of in the investigation proposed by Robinson, Power, and Kepler at the Mayo Clinic (Kepler test). This test is relatively simple to perform and is one of the most valuable screening tests in the diagnosis of these syndromes. It may be of great value in suggesting the possibility of adrenal cortical insufficiency in the absence of pigmentation. It should never be applied to patients suffering from renal disease or oedema due to any cause.

The test is divided for convenience into two parts. For its performance the patient should be in bed, but admission to hospital is not necessary if adequate facilities can be arranged to make and measure accurately the necessary urine collections over timed periods. The co-operation of the patient in complete emptying of the bladder at the end of each period is also necessary. The first part is carried out by withholding all fluids and food after 6 p.m. After emptying the bladder at 10.30 p.m. urine is collected from 10.30 p.m. until 7.30 a.m. the next morning. The patient is then given 20 ml. of water per kg. body weight (9 ml. per lb.) to drink during 45 minutes. Urine collections are made at 8.30, 9.30, 10.30, and 11.30 a.m. and at 12.30 p.m. If the largest volume of urine excreted during a single hour between 8.30 a.m. and 12.30 p.m. ("day urine") exceeds the volume of the 10.30 p.m. to 7.30 a.m. specimen ("night urine") the result is negative for adrenal cortical insufficiency. If the reverse is true the test is positive. Several shortened and more convenient versions of this test have recently been proposed, but their use is not advised for the data for their interpretation are at present lacking.

The accuracy and specificity of the test are greatly enhanced if the second part is also carried out. This involves obtaining, before the water is administered to the patient, a specimen of oxalated blood for chloride and urea determinations. A specimen of the "night urine" with a note of its volume and the volume of "day urine" should also be sent to the pathologist. The test depends upon the fact that the clearance of chloride is increased in cortical insufficiency and the clearance of urea tends to be decreased. These variables (expressed in mg. per 100 ml.) are multiplied to the urine volume observations thus:

$$\text{Factor} = \frac{\text{Night urine urea}}{\text{Blood urea}} \times \frac{\text{Plasma chloride}}{\text{Night urine chloride}} \times \frac{\text{Volume of day urine}}{\text{Volume of night urine}}$$

Adrenal cortical insufficiency may be regarded as present if the factor is less than 25.

The results of both parts of the test can be interpreted only in an all or none fashion, as they give no information about intermediate degrees of failure. If the second part is applied many less false-positive results are obtained and the number of false negatives diminished. The two parts together, when used for the first time, are positive in about

80% of cases of Addison's disease, but occasional false positives are also obtained in patients with liver disorders, hyperthyroidism, anorexia nervosa, gastric lesions, and sprue, so that the results can be interpreted only in the light of other known factors. The test, however, has the advantage that treatment of the patient with deoxycortone does not alter an abnormal test for adrenal cortical insufficiency into a negative one. Treatment with cortisone can of course effect this change.

Urinary 17-Ketosteroid Determinations

There are excreted in the urine a large number of metabolites of adrenal cortical hormones. The determination of one group of these, the 17-ketosteroids, in which a ketone grouping ($\text{C}=\text{O}$) is present at the seventeenth carbon position in the steroid "nucleus" in ring D, may be considered to be a basically reliable procedure. Substances of the same type and giving the same chemical reaction are excreted as the end-products of the metabolism of testosterone, itself secreted by the interstitial cells of the testes. There is no significant corresponding source of 17-ketosteroid in women, so that this must be taken into account in interpreting the results. A further factor is the variation of technique employed in different laboratories. It is to be hoped that this difficulty may be mitigated by the publication of a recommended technique from the Committee on Clinical Endocrinology of the Medical Research Council.* In my laboratory, which may be taken as a guide, the normal range for adults between the ages of 20 and 40 is taken as 8-23 (average 14.5) mg. a day for men, and 5-18 (average 9.5) mg. a day for women. In older individuals these values fall away by 50% at the age of 70. In children of both sexes up to the age of 8 the excretion is up to approximately 1 mg. a day; up to the age of 12 it rises to 4 mg. a day, and then after puberty is established adult values are reached. Day-to-day variations of up to approximately one-third may be encountered in a given person.

Careful 24-hour collections of urine are required. The patient is instructed to empty his or her bladder at the start of the collection and discard the urine. All the urine excreted during the subsequent 24 hours, including the specimen passed at the conclusion of the period, is collected. The urine is preferably acidified (by adding 10 ml. of dilute hydrochloric acid B.P. to the collection). A note of the total volume and a sample of about 200 ml. should be sent to the pathologist undertaking the estimation.

The determination of 17-ketosteroids may be of ancillary value in the diagnosis of Addison's disease. Values are usually less than 7 mg. a day, with a definite tendency for lower values in women than in men, as would be expected. In the presence of normal values the diagnosis is likely to be wrong. In interpreting reductions of this order it must be remembered that any chronic illness may lead to similar changes. It is advisable not to have the patient on cortisone therapy, but again deoxycortone does not interfere. In hypopituitarism values are often lower and approach zero in both sexes, so that the diagnostic value is greatly increased. This is partly owing to the fact that in the male the testicular component is also reduced in this condition. Patients with anorexia nervosa, the differentiation of which from hypopituitarism may be difficult, sometimes have normal values or they may be decreased to Addisonian levels as a result of the inanition.

Increased adrenal cortical activity due to hyperplasia and producing adreno-genital or virilizing syndromes always results in a rise in 17-ketosteroid excretion. This is most pronounced in adults who have developed virilism before puberty, in whom values up to approximately 100 mg. a day may be reached. The post-pubertal variety of this syndrome in girls has to be differentiated from "idiopathic hirsutism" and may show only quite moderate rises in excretion to about 40 mg. a day. In some of these patients with a similar clinical picture the underlying lesion may be

*Lancet, 1951, 2, 585.

an adrenal cortical tumour, an uncommon lesion. In about half the cases this is accompanied by the excretion of large amounts of 17-ketosteroid, and many biochemists feel that a level in excess of 100 mg. a day is likely to be indicative of tumour. It is possible by applying colour reactions for dehydroepiandrosterone and its relatives to obtain some further assistance. A proportion of tumour cases show an increase in the excretion of this steroid. Unfortunately the cases in which there is most difficulty, those with lower levels of 17-ketosteroid excretion, are the least likely to show a rise in dehydroepiandrosterone.

In Cushing's syndrome the help obtained from 17-ketosteroid excretion is much less. This clinical picture may also be due to increased adrenal cortical activity or to a tumour. In the former case a minority of patients show a small elevation of 17-ketosteroids to about 30 mg. a day. The findings in the tumour cases are similar to those discussed for tumours causing the virilizing syndromes. It is inadvisable to have any of the patients in these groups receiving cortisone when 17-ketosteroids are determined. When interpreting a rise in 17-ketosteroid excretion it should be remembered that the rare interstitial tumour of the testes causes a large increase for the age of the patient and a rise may also result from arrhenoblastoma in women.

Trial of A.C.T.H.

The attempt to stimulate the activity of the adrenal cortex by the use of A.C.T.H. and measure the response obtained may be of the greatest value in the diagnosis of Addison's disease and helpful in cases of anterior hypopituitarism. In advanced Addison's disease it seems that destruction of the adrenal cortex is complete. In less severe cases and cases of hypopituitarism destruction is not complete, so that some degree of stimulation of the cortex is possible. There are two ways of using A.C.T.H. that may be helpful.

Eosinophil Test.—At about 10 a.m. an eosinophil count is made in the peripheral blood and 25 international units of lyophilized A.C.T.H. injected intramuscularly. After four hours the count is repeated. Normal individuals show a pronounced fall in the eosinophils under these conditions. If the test shows a decrease of less than 50% in the count the patient is likely to have Addison's disease or severe hypopituitarism. Repetition of the test makes the diagnosis much more certain. Patients with a small degree of cortical destruction or atrophy may give a normal response. The validity of the test is interfered with in some patients with eosinophilia, and tests in which the initial eosinophil count is very low (below 50 cells per c.mm.) should be disregarded.

Excretion of 17-Ketosteroids.—The most stringent diagnostic test for complete adrenal cortical insufficiency is to measure the change in 17-ketosteroid excretion after adequate adrenal cortical stimulation. Several methods have been proposed for the procedure, but one of the best seems to be as follows. The 17-ketosteroid excretion is measured in two consecutive 24-hour periods and the patient is then given 20 units of A.C.T.H. gel intramuscularly 12-hourly for 48 hours. The 17-ketosteroid excretion is measured again for the last 24 hours of the period. A significant increase (exceeding 50% of the baseline level) indicates that the adrenal cortex is responsive. This test is elaborate and will probably have to be carried out in hospital. Both these tests are at present subject to the restricted supplies of A.C.T.H. available.

Conclusions

It will be appreciated that the use and interpretation of laboratory tests in these conditions require careful judgment. In order to draw the correct inferences all the facts, especially the clinical findings, must be given their due weight. For instance in this article the discussion has been limited to the question of deciding whether adrenal cortical function shows serious deviations from normal. Decreased function results from either a primary lesion of the gland or secondary atrophy due to diminished pituitary function. In the latter event evidence of decreased function of other

endocrine glands, particularly the gonads, should be forthcoming. Rarely the differentiation of the two conditions may be a difficult matter. Some of the procedures described would be better carried out in hospital. They are considered here partly to remind the reader of their interpretation, which may be of value when hospital reports on patients are received.

It will be appreciated that most of the tests considered afford only indirect evidence of the behaviour of the adrenal cortex and that other factors may intervene between the secretion of this gland and the final manifestation measured in the test. For this reason measurements of steroids, perhaps in blood, may be the most valuable test in the future. It is evident that 17-ketosteroid determinations have their limitations. It is hoped that other measurements of adrenal cortical steroids and of other metabolites may be more definitive. Several techniques have been proposed for this—for example, determinations of "11-oxosteroids" and "reducing steroids"—but at present no method has been developed which may be regarded as satisfactory for routine use and which can be recommended in this article.

Next article on Clinical Pathology.—"Serological Tests in Diagnosis," by Professor E. T. C. Spooner.

RECOGNITION OF INTOXICATION

With the publication this week of a report on "The Recognition of Intoxication," the B.M.A.'s Committee on Alcohol and Road Accidents* has completed the first half of its work. Appointed in June, 1951, the Committee was instructed to revise and bring up to date the Association's Reports on Tests for Drunkenness (1927) and The Relation of Alcohol to Road Accidents (1935). The Committee is awaiting results of experimental work now in progress on the physiological effects of alcoholic intoxication before revising the report on road accidents.

"The Recognition of Intoxication" is intended as a guide for those who are called upon to examine persons detained by the police on the suspicion of being under the influence of alcohol. The examiner is often a general practitioner, and the report is written primarily to help general practitioners in the discharge of this difficult and anxious task.

The Medical Examination

First comes a brief explanation of the Law relating to alcoholic intoxication. The Road Traffic Act, 1930, makes it not simply a question of deciding whether a person is drunk in the popular sense, but whether he "is under the influence of drink or a drug to such an extent as to be incapable of having proper control of the vehicle." Then follow two important sections on the medical examination itself. The first deals with points of procedure, such as obtaining consent and the degree of privacy that may reasonably be expected. One of the main purposes of the examination is to exclude other causes of unusual behaviour, and if such are present to decide how far they influence the clinical picture. A fairly comprehensive list of these is given, with some tips to help in differential diagnosis. There is advice on taking specimens for the estimation of alcohol content, and on making a second examination at a later date. Finally there is a word about what information should be given to the detained person and to the police. The second section consists in a "model scheme" of medical examination. Making the examinee walk along a straight line is condemned. The examiner is warned to base his opinion on the results of the whole examination, and not to draw conclusions from isolated features.

*Professor E. J. Wayne (chairman), Dr. Robert Forbes, Dr. E. A. Gregg, Dr. F. E. Camps, Dr. E. A. Carmichael, Dr. Macdonald Critchley, Dr. A. B. Davies, Colonel A. H. Farley, Dr. T. C. N. Gibbens, Dr. J. A. Gorsky, Professor A. St. G. Huggett, Dr. J. C. Matthews, Dr. T. W. Morgan, Mr. F. R. J. Peel, and Professor R. J. V. Pulvertaft.

Evidence in Court

After dealing with the form in which a doctor called by the police should record his opinion, the report goes on to consider the evidence which may have to be given in court. "Whether called for the prosecution or the defence (the doctor) should present, without bias, the medical opinion he has formed . . . and, with his scientific knowledge, help the court to arrive at the facts of the case." He should take care not to act as a partisan witness nor to be drawn into legal arguments. It is for the court alone to decide whether the accused person has committed an offence.

Estimation of Alcohol in Body Fluids

Among the data which may help the doctor to estimate the degree of intoxication is the concentration of alcohol in the body fluids. The report recommends the use of urine for this purpose. Urine samples are easier to collect than blood if the subject is obstreperous, and the results equally useful. An estimate of the urine alcohol level may help the court in one or more of four ways: it may conclusively exonerate the person charged; it can serve as a useful check on his veracity, as the alcohol content of the tissues is generally accepted as an accurate indication of the minimum quantity consumed; it may show that it was the victim of an accident who was intoxicated rather than the driver; and, lastly, it may be used—with circumspection—as indirect evidence of incapacity to control a vehicle. The report discusses some of the evidence linking blood alcohol levels with performance, but it is careful to stress that the responses of different individuals to the same concentration of alcohol vary widely. The Committee is continuing its consideration of this problem and will deal with it more fully in its second report.

TABLE I

Minimum Intake of Ordinary Beer or Stout as Calculated from the Alcohol Content of the Urine
(For a male of body weight of 11 st. (70 kg.) and assuming beer and stout to contain 14.7 g. alcohol per pint.)

Urine Result in mg./100 ml.	Intake in Pints	Urine Result in mg./100 ml.	Intake in Pints
24	$\frac{1}{4}$	367	7 $\frac{1}{2}$
49	$\frac{1}{2}$	391	8
73	$\frac{3}{4}$	416	9 $\frac{1}{4}$
97	1	439	9 $\frac{3}{4}$
123	1 $\frac{1}{4}$	464	10 $\frac{1}{4}$
147	1 $\frac{1}{2}$	488	10 $\frac{3}{4}$
171	1 $\frac{3}{4}$	513	10 $\frac{3}{4}$
196	2	537	11
220	2 $\frac{1}{4}$	561	11 $\frac{1}{4}$
244	2 $\frac{1}{2}$	587	12
268	2 $\frac{3}{4}$	611	12 $\frac{1}{4}$
293	3	635	13
317	3 $\frac{1}{4}$	660	13 $\frac{1}{4}$
343	3 $\frac{1}{2}$	684	14

TABLE II

Minimum Whisky or Gin Intake as Calculated from the Alcohol Content of the Urine
(For a male of body weight of 11 st. (70 kg.) and assuming whisky and gin to contain 8.98 g. per fluid ounce.)

Urine Result in mg./100 ml.	Whisky* in fl. oz.	Urine Result in mg./100 ml.	Whisky* in fl. oz.
30	$\frac{1}{4}$	420	14
60	$\frac{1}{2}$	430	15
90	$\frac{3}{4}$	480	16
120	1	510	17
150	1 $\frac{1}{4}$	540	18
180	1 $\frac{1}{2}$	570	19
210	1 $\frac{3}{4}$	600	20
240	2	630	21
270	2 $\frac{1}{4}$	660	22
300	2 $\frac{1}{2}$	690	23
330	2 $\frac{3}{4}$	720	24
360	3	750	25
390	3 $\frac{1}{4}$	780	26
400	13 $\frac{1}{4}$ (= 1 bottle)	800	26 $\frac{1}{4}$ (= 1 bottle)

* 1 whisky = $\frac{1}{2}$ fl. oz. approx. 1 double whisky = 1 fl. oz. approx.
Note.—1 pint = 0.6 litre : 1 fl. oz. = 28 ml.

The last section of the manual is based on the report of a panel of the Royal Institute of Chemistry, which the Council of the Institute appointed to help the Committee. It deals with the technical aspects of determining the blood and urine alcohol concentrations. Detailed instructions are given on how to collect specimens, and the chemical analyses are described in two appendices. This section also discusses the translation of the results of these laboratory investigations into terms of pints of beer or ounces of spirits consumed. Two conversion tables are given (Tables I and II) relating the urine alcohol level to intake for an 11-stone man. These tables show the minimum amount of alcohol in the body; in the average case the amount would undoubtedly be rather higher—it certainly could not be lower. For this reason the Tables cannot be used to estimate the probable urine or blood alcohol content from a knowledge of the amount of alcohol taken.

Factors for differences in body weight and sex are provided. For women the answer in pints of beer or ounces of spirits must be multiplied by $\frac{3}{5}$. If blood alcohol figures are used instead of urine alcohol figures the result must be multiplied by $\frac{4}{3}$.

The report ends with a list of offences in which "drunkenness" plays a part. These are the offences, in addition to those under the Road Traffic Act, in respect of which a doctor might be asked to express an opinion on the sobriety of the defendant or other persons. They range from being "drunk in any street and guilty of any riotous or indecent behaviour therein" to being a drunken person who refuses or fails to quit licensed premises "upon being requested to do so."

The report may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1. It is free to members of the medical profession; to others it costs 1s. (including postage).

PAUL EHRLICH AND EMIL VON BEHRING

CENTENARY CELEBRATIONS

Over 600 men and women from different parts of the world gathered together in Frankfurt am Main a fortnight ago to do homage to the memory of Ehrlich and von Behring, the subject of commemorative articles in last week's *Journal*. The hosts were the Paul Ehrlich Institute, the Philipps University of Marburg a. d. Lahn, and the Johann Wolfgang Goethe University of Frankfurt. Generous hospitality was provided by the Farbwerke Höchst A.G. The opening ceremony in the Paulskirche (no longer a church) began and ended with music and was presided over by Dr. Theodor Heuss, the President of West Germany, who in his address recalled his meeting many years ago with Einstein, whose birthday fell on the same day as Ehrlich's. Two of Ehrlich's daughters and two grandsons were present, as well as descendants of von Behring. The solemnity of the proceedings was heightened by the magnificent robes of the Rectors of Frankfurt and Marburg Universities—Professor O. Gans and Professor W. Walcher, and somewhat marred by the ubiquitous photographer and the glaring lights of the cinematographer. In fact when Professor Gans bestowed the Ehrlich Prize on Professor E. B. Chain a horde of camera-men prevented the audience from witnessing the principal event of the morning. After a word of greeting from Professor R. Prigge, director of the Paul Ehrlich Institute, speeches were made by the Minister of Education of Hesse and the Minister for Internal Affairs of West Germany.

The Ehrlich Prize Oration

Professor Chain, in acknowledging the prize, made handsome acknowledgment to the numerous workers who had played a part in the discovery of penicillin. After a tribute to Ehrlich's work and to the discovery of prontosil in 1935 by Domagk, the orator said that a new era began when,

†Kent-Jones, D. D., and Taylor, G., *Analyst*, 1954, 79, 121.

in 1940, Florey, himself, and their co-workers isolated penicillin at Oxford as a metabolic product of *Penicillium notatum*. But before the turn of the century Pasteur and others had observed the antibacterial action of substances obtained from bacteria and moulds. Fleming's discovery in 1929 of what he then named penicillin, and of the inhibiting effect of a filtrate on the growth of staphylococci, passed for the time being unnoticed. Fleming suggested that his culture extract could be applied in the local treatment of infected wounds, but the instability of penicillin made its use impracticable. Three years after Fleming's discovery Raistrick tried, without success, to isolate the active principle from filtrates of *Penicillium notatum*. Professor Chain emphasized that Florey and he began their work a year before the outbreak of war from a purely biochemical angle, and did not expect to find a preparation which could be applied clinically. To-day one could state that penicillin was the most active and least toxic of chemotherapeutic remedies. The only side-effect was an allergic reaction in about 5% of treated cases. Staphylococci did not develop resistance against penicillin. Staphylococci not affected by penicillin were those which produced penicillinase. Penicillin killed off bacteria only when they were actively growing, thus differing from most other antibacterial substances. After a review of other antibiotics, Professor Chain suggested that the expression "broad spectrum" was not altogether happy—the wider the spectrum of an antibacterial substance the less was its specificity and the greater its toxicity. In other words a "broad spectrum" implied a general protoplasmic poison. He concluded by saying that the search for new antibiotics must go on, especially for the treatment of tuberculosis and virus infections. Further progress would be achieved only through the aid of chemical microbiology as a department of biochemistry.

Ceremony at Marburg

Marburg, an old university town, provided a charming contrast to bustling, largely rebuilt Frankfurt. The university, dating from 1527, was the first protestant university to be founded. After the procession of university authorities entered the Hall to the music of Handel, the Rector, Professor W. Walcher, gave an address and bestowed the von Behring prizes for 1948, 1952, and 1954 on Professor H. Schmidt, Sir Macfarlane Burnet, and Professor M. Heidelberger respectively.

Allergy and Immunity

In a lecture on the relations of allergy to immunity Professor Schmidt recalled the first fatal case in 1896 resulting from the prophylactic injection of an antitoxic serum. It was logical to assume that infection would be followed by allergy to the infecting micro-organism and its antigens. Two main questions posed themselves: (1) How far were the characteristic symptoms of an infectious disease due to the characteristic symptoms of an infectious disease due to allergy? (2) What was the relation between allergy and immunity? The body became allergic to tubercle bacilli immunity? The body became allergic to tubercle bacilli immunity? A focus of infection containing living bacilli existed in it, if a focus of infection containing living bacilli existed in it, and what was known as Koch's phenomenon prevented and what was known as Koch's phenomenon prevented superinfection from becoming a progressive disease. On this basis von Behring tried to protect cattle against tuberculosis with a vaccine prepared from human tubercle bacilli. In principle, Professor Schmidt claimed, von Behring's method corresponded to that of Calmette in the prophylactic use of B.C.G. in man. Was the protection afforded by B.C.G. vaccination due to the concomitant allergy? Experiments with guinea-pigs made tuberculin-allergy? Experiments with sheep blood cells adsorbed positive when immunized with sheep blood cells adsorbed with tuberculin showed that the course of tuberculous infection in them was the same as in normal guinea-pigs. But this did not prove that immunity and allergy were independent of each other, for tuberculin was but a partial antigen. If it were possible to immunize non-infected man with the complete antigens of the tubercle bacillus, the immunity could not last so long as that provided by B.C.G., but, with repeated injections, could be made more effective. Passive immunization with sera of healthy individuals previously

hyperimmunized might be of therapeutic value. "And here," concluded Professor Schmidt, "I am falling into line with von Behring's aim of preparing an antitoxic serum in the treatment of tuberculosis."

Viruses, Enzymes, and Genetics

Sir Macfarlane Burnet briefly described the work on viruses in progress in the Walter and Eliza Hall Institute in Melbourne. During the recent war work was concentrated on means of immunizing against influenza, "with the ever-present fear that the experience of 1918-19 might be repeated." The methods of handling influenza virus in chick embryos were worked out, largely in his laboratory. Then Hirst in New York discovered the haemagglutinating activity of the virus. The war over, they decided to make a systematic attack on the problems presented by haemagglutination. Until 1941 they had understood that viruses acted only on susceptible cells and that their existence could be recognized only by the lesions or symptoms produced as a result of intracellular multiplication in susceptible tissues. Hirst showed that the haemagglutination was a function of the virus particles themselves, the particles adhering firmly to the cell surface. A single virus particle attached to two cells acted as a bridge holding them in contact and helping to build up the visible clumps seen in an agglutinated suspension. Another basic feature of the reaction shown by Hirst was that after a time the virus elutes off the cells, leaving them inagglutinable by fresh virus, the eluted virus, however, retaining the power to agglutinate fresh cells. Hirst was clear that the virus acted as an enzyme, and the first phase of the work at Melbourne was to seek the nature of the virus enzyme. After seven years' work, Sir Macfarlane continued, he could now say that during the past year his colleague Dr. Gottschalk had shown that the virus acted as an amidase, breaking the CO-NH₂ link between 2-carboxy-pyrrole and hexosamine, both of which are present as part of 200 or more prosthetic groups on each macromolecule of certain mucoproteins. Chemical, physical, and biological techniques enabled them to build up a picture of the cell surface—in the first instance of the erythrocyte in its relation to the viruses that attached to it. Over the surface of the virus particle there were many enzymically active groupings, each of which could unite with and, in appropriate conditions, destroy the substrate receptors scattered over the length of the mucoprotein macromolecules. As soon as a virus particle collided with the cell surface many bonds were formed which together held the particle firmly on the cell. But as each pair of reactants developed an appropriate mutual orientation the corresponding bond was broken by enzymic action and a new bond could be then formed elsewhere. "We can almost picture the virus particle browsing like a sheep over the receptors of the cell surface until the concentration of the substrate group becomes too low to hold the virus and the cell in physical contact."

One of the implications of the enzymic attack pictured by Gottschalk was that with each splitting of a receptor an amino group was exposed and a positive electric charge added to the cell—which in practice meant a diminution of its net negative charge.

The surface reactions described were equally important in relation to cells susceptible to attack by the influenza virus. It could be shown that the influenza virus was adsorbed to the cells lining the allantoic cavity of the chick embryo or the respiratory epithelium of the mouse lung, and that the adsorption was to the same type of receptors as were present on the red cell.

As an accidental result of experiments in 1949 they had, Sir Macfarlane said, since then concentrated on the study of virus genetics. First they were concerned to see what happened when a neurotropic influenza virus was inoculated in the mouse brain with a non-neurotropic virus of different serological type. If the amount of the latter was much larger than that of the former no illness resulted—a typical interference phenomenon. But at the level where delayed illness resulted it was often possible to isolate from

After the scientific sessions the visitors had the alternatives of visiting the works and laboratories of Farbwerke Höchst A.G. or of listening to a chamber concert of string quartets of Schubert, Haydn, and Mozart. A feast of good food and wine brought the day to an end.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Ion-exchange Resins

SIR,—I have read with interest your leading article on the ion-exchange resins (*Journal*, March 13, p. 633), but I am surprised to find the statement that "it is questionable whether resin treatment should be used at all" in Type II nephritis. Nephrotic oedema is notoriously resistant to treatment, and in the ion-exchange resins we have a new weapon which appears to produce very good results. The fact that these resins are potentially dangerous in the presence of renal failure is no argument against their careful use when renal function is normal. In the uncomplicated case of Type II nephritis there is little more risk than in the normal person of producing severe acidosis, hyperkalaemia, or complications due to increased ammonium absorption. Your leading article mentions a further possible danger, that of causing or aggravating structural damage in the kidney, and this is considered a possibility, because granular casts may occur in the urine even in healthy subjects taking cation exchange resins. If renal function is normal, the urine of patients on the resin is highly acid. Granular casts can readily be found in such acid urine and are not evidence of structural damage to the kidneys. Their occurrence was noted in the highly acid urine of patients treated with sodium mandelate and ammonium chloride, and it was shown that they disappeared when the urine was no longer so acid.

The medical profession is divided on the advisability of using mercurial diuretics in Type II nephritis, for these drugs are known to act by impairing tubular function. Such evidence as we possess at the present time suggests that ion-exchange resins are a very promising form of treatment for nephrotic oedema, and it would be unfortunate if your leading article were taken as a serious warning against their use even in patients whose urea clearance is not seriously impaired.—I am, etc.,

London, W.C.1.

M. L. ROSENHEIM.

REFERENCE

- ¹ Rosenheim, M. L. (1936). *Lancet*, 2, 1083.

Pre-operative Anticipation of Thrombo-embolic Episodes

SIR,—In his medical memorandum on a possible method of pre-operative anticipation of thrombo-embolic episodes Mr. John Dutton (*Journal*, March 6, p. 566) makes several interesting points. He states that if it could be foreseen which patients were liable to thrombo-embolic phenomena active measures for their prevention could be taken. The guide for this prophylaxis is to be based on the response of the clotting mechanism to an injection of adrenaline. Unfortunately this test involves the performance of eosinophil counts and clotting times at half-hourly intervals over a four-hour period, which will preclude its universal application to all patients undergoing surgery in a general hospital. If Mr. Dutton has found six cases of post-operative thrombo-embolism in his first 50 cases he has been fortunate, in a statistical sense, for the general incidence of such complications must be very much lower. The rational basis for using an accelerated clotting response as a reason for active anticoagulant prophylaxis in an otherwise healthy patient remains unproved.

Waugh and Ruddick,¹ Silverman,² and Rosenthal,³ using sensitized coagulation time tests, have all noted accelerated clotting in patients who showed no evidence of thrombosis. Accelerated clotting (interpreted as a clotting time less than the minimum of a normal range based on 100 controls) has been noted with the heparin-retarded plasma clotting test also in a variety of states with no clinical manifestation of thrombo-embolism.⁴ These include acute inflammation post-

haemorrhagic states as well as the majority of a series of 40 patients who underwent a group of common operative procedures. On the other hand, of 50 cases of recent thrombo-embolism, 37 demonstrated accelerated clotting.⁵ Thus, although it may be deduced that thrombosis is associated with a shortened clotting time the reverse does not necessarily follow.

It is to be hoped that Mr. Dutton's research will produce valuable results in the prevention of these tragic consequences of surgical trauma. However, the danger of reliance on an *in vitro* laboratory test without reference to the clinical state and the all-important vascular factors in thrombosis cannot be allowed to pass unnoticed.—I am, etc.,

Catterick.

L. POLLER.

REFERENCES

- ¹ *Canad. med. Ass. J.*, 1944, 50, 547.
² *Blood*, 1948, 3, 147.
³ *Circulation*, 1952, 6, 257.
⁴ *Angiology*, 1954, 5, 22.
⁵ *British Medical Journal*, 1953, 1, 1331.

Anaesthesia in Hospital Breech Delivery

SIR,—I have read with great interest the article (*Journal*, March 6, p. 562) "Anaesthesia in Hospital Breech Delivery" by Dr. R. G. Law and Dr. Shila G. Ransom. The point which interests me chiefly is the statement that forceps on the after-coming head is a procedure which the authors "strongly advocate in all cases." I should like to know the reasons for this. During the time I was in the active practice of obstetrics as a G.P. in the country I never found this procedure necessary. Incidentally, I attended a large number of breech cases and only had one foetal death (if my memory serves me aright), and this was not due to any difficulty in delivery of the head but due to rupture of the cord *in utero* during the manipulations necessary in bringing down extended legs and arms behind the head. This case was during the war, with hostile planes overhead and consequent difficulties, lighting, etc.

All my confinements were done in cottages by the light of a paraffin lamp with an open coal fire. Hence chloroform was the anaesthetic of choice, and it often had to be given by myself, though not when I could get assistance, which was not always and not in the case quoted. Perineotomy was not often practised by me. I heartily approve of it, and wish I had used it more frequently. The method I used for the after-coming head in all cases, without difficulty, was when the baby was born as far as the umbilicus, legs were brought down, unless they were, as was often the case, already delivered, and then both arms were brought down. I then inserted the middle finger of my left hand into the mouth, thus flexing the head. I got the midwife or whoever was present to press on the abdomen just above the pubes to help flex the head, then seizing the legs with a circular swing the head was easily delivered. All my cases with one or two exceptions were delivered in the left lateral position. Needless to say, anaesthesia was always used and, of course, aseptic precautions taken.

I shall be most grateful if Dr. Law would let me know what the advantages of forceps on the after-coming head are. That it is used frequently and successfully I know from experience with reference to a relative of mine.—I am, etc.,

Petworth.

DAN C. DRUITT.

Utero-tubal Insufflation

SIR,—Mr. Stanley A. Bond's letter (*Journal*, March 13, p. 646) states that "all the work of Rubin and Sharman is based on the proven fact that the information obtained is definitely attributable to the fallopian tubes alone." I am sure that Rubin and Sharman would not claim that all their work is based on this "fact." That it is not a fact is easily shown. Just as good oscillations can be produced by insufflation of a hysterectomy specimen with no peristalsis or spasm visible. The oscillations are just what one would expect of gas passing through a fine tube filled by a sticky medium.—I am, etc.,

Newcastle-upon-Tyne.

FRANK STABLER.

The Thyroid

SIR,—In response to requests to amplify my letter (*Journal*, March 6, p. 584) perhaps you will permit me, in the interests of scientific accuracy, to deal briefly with the points raised in the review of my book, *The Thyroid* (February 27, p. 503).

(i) "There is no reference to controls done, for instance, on post-mortem material from euthyroid patients."—This is incorrect. A reference to the index would have saved the reviewer from this error. On page 112 I state: "A separate study of the changes in the life history of the normal thyroid gland has led me to add support to the finding that 5 to 10% of apparently normal glands contain collections of lymphoid tissue." The discussion on these controls is then elaborated further. The normal thyroid gland is discussed further on pages 68 and 284, and figures 197 and 198. Even electron microscopy of the normal thyroid in the euthyroid patient is discussed and illustrated (p. 21).

(ii) "We cannot tell from the tables whether the designated state refers to the patient at the time of the operation or many years previously."—On page 110, under the title heading "Age," I state: "Taking account only of the age at which the patient presents herself for operation, I find that the diffuse lymphoid hyperplasia or lymphadenoid goitre patient was at operation, on an average, 43 years old, the fibro-lymphoid hyperplasia of Hashimoto 48 years, and the fibrosis of Riedel 56 years." Any further comment becomes unnecessary.

(iii) "Hypotheses . . . [reading] as statements of fact."—In such a swiftly advancing subject, speculation is sometimes necessary. Throughout the book I have been careful to indicate any departure from the conventional views. It is not fortuitous, therefore, that both the sentences to which the reviewer, in his penultimate paragraph, takes exception are preceded in the book by "My own interpretation is" (p. 39) and "I would suggest that" (p. 31). Even thyrotropin, in the quotation, appeared in inverted commas in the book to emphasize the uncertainty of its nature and action; similarly the word "collagenin" is qualified in the book as an "unidentified factor" (p. 39).

(iv) "With regard to the diagnosis of mild toxicity . . . Mr. Levitt's enthusiasm and belief in his thesis have led him to strain fact to fit theory."—Chapter XIV (p. 186) is almost entirely devoted to the recognition and exclusion of a number of conditions simulating mild thyrotoxicosis; it is emphasized in the book that "instances of mild thyrotoxicosis in this series underwent very strict scrutiny" (p. 198). The clinical data including mild thyrotoxicosis were there also subjected to a critical statistical assessment (pp. 48-59 and 144).

(v) "We have no idea how the proportion of lymphatic to epithelial tissue was assessed, whether by cell counts or measurement of cellular areas."—On page 4, I state that "in evolving a reliable criterion for a basic classification I have felt that the final criterion must be the microscopical appearance of the gland." Emphasis is laid throughout on the assessment of cellular areas (pp. 66-77). Nowhere in this book is there any mention whatsoever of cell counts.

(vi) "We are not told whether the selection of blocks was done on an anatomical basis or on appearance."—On page 2 it is emphasized that it is "always possible to assess the dominant phase either from the clinical, the macroscopical or microscopical aspect," which was done in selecting blocks of characteristic thyroid tissue. On page 4 I state that "the naked eye view gives a useful, if crude, estimate of the relative quantities of epithelial and lymphoid tissues." The multiplicity of profusely illustrated macroscopic pictures of the gland, seen in the natural state at operation as well as in the formalin-fixed specimen, stresses the importance given to general macroscopical appearance in the selection of the blocks. The danger of an anatomical selection of blocks is also emphasized on page 527.

(vii) "The patients are designated as mild, moderate, or severe thyrotoxic, but the criteria used to separate the cases studied are not given."—On page 187 in *The Thyroid* I say: "The assessment of mild, moderate and severe toxicity is often a purely personal problem, necessitating repeated observations of all the stigmata by the same investigator." The paramount importance of a clinical assessment has been stressed throughout the book. Laboratory tests (pp. 188-90), radioiodine tests (pp. 477-93) are shown to help to corroborate the clinical diagnosis especially in a difficult borderline case. So protean have the manifestations of

the different degrees of thyrotoxicity been shown to be that hard-and-fast rules have, as indicated in the book, been eschewed.

(viii) "Nor are we given the average weights of the resected thyroid tissue."—This desideratum of the reviewer cuts right across the principle of surgical treatment as discussed in pages 388-9, and noted and illustrated on pages 536-7. Its use as a scientific criterion is shown in the book to be outmoded, unnecessary, and of no statistical significance.

—I am, etc.,

London, W.1.

T. LEVITT.

Continuous Caudal Analgesia

SIR,—Our experience here of caudal analgesia in disordered uterine function confirms that of Mr. G. Trevor Johnson (*Journal*, March 13, p. 627). May I add a comment in favour of the nylon catheter technique? It is true that nylon tubing has to be obtained by devious means, but it is worth the trouble. In our hands it has reduced the percentage of failures. We sometimes find when the needle seems to have been properly placed that the catheter will not pass beyond its point, or will pass on only half an inch or so. Under these circumstances, continuing with the injection of the anaesthetic solution hardly ever produces satisfactory results. The free passage of the nylon for a few inches beyond the needle-point, on the other hand, is certain confirmation that it is correctly placed. Thanks mainly to this test, we have had only three failures in our last fifty cases.

I agree that polythene is not strong enough and its sterilization unreliable. Nylon tubing can be boiled or autoclaved and used three or four times. It is easier to seal off from the perineum with waterproof plaster than are the hub of the malleable needle and the pressure-tubing. It can be led under a strip of plaster to a more accessible part of the body and end under a sterile dressing, leaving the patient free to move about in bed without displacing it.

The cases in which one fails to place a caudal needle correctly need not be deprived of extradural analgesia; in the three cases mentioned above, one patient had the catheter inserted in the lumbar region through a Tuohy needle, and the other two had between them four lumbar extradural injections of 1/600 cinchocaine with 1/100,000 adrenaline, each injection providing four hours of analgesia.—I am, etc.,

Cambridge.

H. R. YOUNGMAN.

Hibernation Anaesthesia

SIR,—Drs. Frank S. Preston and Hugh Y. Wishart (*Journal*, March 13, p. 645) describe an interesting case as "prolonged hypotension following hibernation anaesthesia." From their detailed description it would appear that it was really a case of shock following inadequate anaesthesia. In our opinion the dosage of drugs used, 12.5 mg. of chlorpromazine, 12.5 mg. of promethazine, and 25 mg. of pethidine, together with an aliquot mixture of nitrous oxide and oxygen by inhalation, is unlikely to protect an aged patient from such a severe surgical procedure. It would seem obvious that, as "a few ml. of a 1/250,000 solution of L-noradrenaline" produced a marked rise in blood pressure, the effect of the small dose of chlorpromazine had disappeared. One of the most striking attributes of this drug is its anti-adrenergic action, and at the stage when the noradrenaline was administered a state of shock had supervened. The fact that atropine and neostigmine had no effect supports this view. We feel that if the drugs had been given in adequate dosage to produce "hibernation" anaesthesia this complication would not have arisen.—We are, etc.,

London, N.W.1.

ANGUS SMITH.
J. G. FAIRER.

Methylpentynol

SIR,—Whilst recent contributions to your correspondence columns have dealt chiefly with the use of methylpentynol for premedication, at Warlingham Park Hospital we have been using it for the past nine months as a hypnotic with alcoholic patients. Alcoholics are not infrequently addicted to other drugs as well as to alcohol, or they may become drug addicts when they stop taking alcohol. According to *Alcohol, Science, and Society*,¹ "there is no wholly satisfactory sedative" for the alcoholic. Barbiturates, probably the most widely used sedatives, have recently been alleged to have harmful effects in certain cases when used concurrently with alcohol.² So far, no evidence has been produced that methylpentynol itself may lead to addiction.

Methylpentynol has, up to the present, been given to more than 50 alcoholics in this hospital, who received no other sedative or hypnotic drug except myanesin during the day for a few days following admission. On the whole, our experiences with methylpentynol have been not unsatisfactory. Apart from difficulties during the first night, our patients had five or more hours of sleep in the great majority of cases, and woke up refreshed with no after-effects. The dosage varied from 1 to 5 capsules (250 to 1,250 mg.). Whilst onset of sleep has been said to follow administration of methylpentynol usually within one hour,³ in our patients sleep commonly did not follow until one to two hours afterwards, so that we now give it two hours before bedtime. The minority of patients who experienced wakeful periods during the night stated that even then they felt calm and relaxed under the influence of the drug and consequently went to bed less fearful of possible sleeplessness.

No harmful side-effects or after-effects were noted. Liver and renal function tests and full blood counts, taken repeatedly with patients who took the capsules for longer than a few weeks, failed to show any pathological changes. Most of the patients, however, easily gave up taking the capsules after a few days or weeks, and slept without sedation. No systematic inquiry regarding its use by discharged patients has so far been carried out, but we have not heard that any of them who remained sober have continued taking methylpentynol or any other hypnotic.—I am, etc.,

Warlingham, Surrey.

M. M. GLATT.

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- ² British Medical Journal, 1953, 1, 1269.
- ³ Hirsch, H. L., and Orsinger, W. H. (1952). Amer. Practit. (Philad.), 3, 23.

Medical Treatment of Peptic Ulcer

SIR,—Your leading article on the medical treatment of peptic ulcer (*Journal*, March 13, p. 632) is important for the stress it lays on the uncertainty both of aetiology and the effects of treatment. As regards the former and the greatly increased incidence of the condition I often think that insufficient regard may be given to changes of fashion in treatment. We all know now that many of the classical symptoms of chronic nephritis were, in fact, due to the treatment given and not to the disease itself. Lord Horder¹ hinted at the effect of the premature outmoding of sodium bicarbonate for indigestion as a possible factor in the increase of digestive disorders. I have long thought that the sudden suppression of bismuth at the beginning of the last world war may similarly have contributed to the incidence of more serious disease.

Professor Alstead² gave reasons for believing that bismuth carbonate was at best a feeble antacid, and Professor Brindle³ has *in vitro* recently extended and largely confirmed his results. But, though raising the pH of the gastric contents will relieve pain, this is far from covering the whole of the complex function of the stomach or the causation of peptic ulcer. Bismuth empirically has been used for digestive troubles for over a century, and it is unlikely that our very acute clinical ancestors were entirely wrong in their observations. Having qualified in 1915 I

was a convinced believer in the use of bismuth in 1939 and continued to use it with satisfaction throughout and since the war. One doctor's experience may be of little value, but I must say that I am constantly surprised to find the small number of peptic ulcers I have to treat compared with that of other general practitioners. I do not think this is altogether due to inability to diagnose the condition, for I take full advantage of consultants and x rays. I rather think that my continued use of bismuth may have much to do with it.

I have not used the massive doses recommended by some advocates of bismuth therapy, and Dr. Kemp,⁴ of Copenhagen, certainly has an impressive list of apparent cures by this method followed up for many years, which you rightly stress is the only useful criterion. I am here more concerned to point out the possible effect of moderate doses in indigestion preventing more serious trouble. It is, in my experience, almost specific in relieving the symptoms of mild appendicitis, but its use is not limited to that.

There are many things we still do not know about bismuth and its effects. It was, for instance, stated by Mr. R. L. Stephens,⁵ in the discussion on Professor Brindle's paper, that bismuth will inhibit the digestive action of pepsin at as low a pH as 2.0 instead of the usually accepted 4.4. If this is so a new outlook may be given to the use and abuse of "antacids." Certainly there is room for much more research—and research which, from its nature, may be quite outside the usual pharmacological and out-patient fields. They should illuminate what is and has been found in general practice, and, though I would not have general practitioners or professors chasing will-o'-the-wisps, I think treatment might improve and peptic ulcers diminish if our academic brethren kept before them the precept constantly dinning into me at Cambridge—the immense difficulty of proving a negative. This is more true of medicine even than the pure science in which I was taught it.

In writing this I do not overlook the fact that a peptic ulcer may seem to develop quite suddenly, though, as with coronary thrombosis, I fancy this suddenness is more apparent than real and means that the patient has neglected to seek advice for clear premonitory symptoms.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

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- ¹ Practitioner, 1953, 170, 8.
- ² Lancet, 1941, 2, 421.
- ³ J. Pharm. Pharmacol., 1953, 5, 692.
- ⁴ Nord. Med., 1948, 40, 1979.
- ⁵ J. Pharm. Pharmacol., 1953, 51, 704.

Danger of Slow Combustion Stoves

SIR,—I think it is important that attention should be drawn to the dangers of installing, without adequate precautions, any of the new forms of slow combustion stove inside a house, whether for cooking food or heating water, if such installation entails the use of an existing chimney.

The danger arises within the chimney, where the gases from the slow combustion eddy and attack the mortar or cement between the bricks, eventually permitting the noxious gases, especially carbon monoxide, to seep into rooms and diffuse throughout the house. The danger to health, as so often pointed out by the late Sir Bernard Spilsbury, comes from the insidious nature of the effects of chronic poisoning from the non-smelling carbon monoxide. He emphasized that there was no distinctive clinical picture associated with chronic monoxide poisoning, but that its effects were to bring out any weakness or idiosyncrasy in the individual, whether respiratory, cardiac, or alimentary.

Recent cases here have redrawn my attention to this genuine danger. The more modern chimneys have to be constructed with an approved lining, but this is not imperious in time to the action of the gases evolved in the process of slow combustion. I am informed by technical experts that the only completely safe protection is a sealed (joint by joint) asbestos stackpipe inside the existing chimney, carried up sufficiently to avoid any risk of equal height chimney pots receiving the gases; in new chimneys the liner

should be a salt-glazed pipe. I have myself not seen any scientific proof of this assertion. It is, however, important that the profession should know of this danger and be warned of the symptoms to which these slow combustion stoves may give rise.—I am, etc.,

Chipping Campden, Glos.

C. B. HEALD.

Gastro-intestinal Fuso-spirochaetosis

SIR,—The presence of *Spirochaeta vincenti* and *B. fusiformis* in large numbers in the faeces of patients suffering from diarrhoea and abdominal pain has been reported by the author in 1945¹ and 1947,² and its aetiological significance discussed. Subsequent observations have shown that these organisms are commonly found associated with three groups of symptoms: (a) Recurrent bouts of diarrhoea at intervals of a few weeks. The patient loses weight and often complains of a peculiar burning sensation in the anal region and rectal mucous membrane. Pain is colicky and severe. The faeces show a pH on the acid side—6.0 to 6.6. Arsenical preparations like carbarsone and acetarsol by mouth give relief, but recurrences are common when arsenic is stopped. Penicillin orally gives more lasting relief. (b) Acute diarrhoea simulating cholera. These cases go on to dehydration and collapse, and, if not energetically treated with intravenous saline, may end in death. Repeated saline infusions failed to improve the condition of one of them who had anuria. Neoarsphenamine, 0.3 g. in the next intravenous saline, resulted in a quick recovery. These two groups have been fully described in the two earlier papers. (c) Pain in the epigastrium. It is often worse after food, not relieved by alkalis, and accompanied by a burning sensation. It is very severe in character and there is tenderness over the area. Vomiting is occasionally present, but does not relieve the pain. Fractional test meal shows total and free acidity within normal limits and the gastric contents show blood and mucus with great regularity. The organisms are present in the gastric contents, though not in the large numbers seen in the faeces of the same cases. There is no diarrhoea, as a rule. Response to arsenicals is immediately good, but the trouble recurs when arsenic is stopped. Penicillin orally is more effective.

Details are given below of a case which has been investigated and followed up over a period of five years. The patient is himself a medical officer. He came under observation in March, 1948, with a history of unbearable pain in the epigastrium for the last two months with occasional vomiting. Previous history included an attack of amoebic dysentery in 1924 treated with a full course of emetine injections, appendicectomy in 1926, and recurrence of diarrhoea with two or three loose motions daily and amoebic cysts in the motion in 1928. Acetarsol tablets orally stopped the diarrhoea and the cysts disappeared. During this attack he noticed acid eructations and "hunger pains" for the first time, both being promptly relieved by alkalis. Subsequently he used to get the hunger pains frequently, lasting for two to three weeks at a stretch. In 1943 he was examined at Madras. Fractional test meal report was "slight increase of acidity, with mucus in all the specimens and blood in the later ones." X-ray report: "No evidence of active lesion. Suggestive of healed ulcer." His condition was becoming gradually worse. The usual dietetic and alkaline treatment did not give even temporary relief; in fact, food, especially when hot, aggravated the pain. Tenderness was marked over the area, and he used to roll about in the bed due to the severity of the pain.

In March, 1948, microscopic examination revealed the presence of *Spirochaeta vincenti* in the smears from the gums, in the resting gastric juice, and in the faeces. The gum smears showed *B. fusiformis* also. The saliva and faeces were both on the acid side, the pH varying from 6 to 6.6. Repeated examinations of the faeces were made but did not show any evidence of the old amoebic infection. No pathogenic organisms were isolated. A fractional test meal on March 15 showed total and free acidity within normal limits, but blood and mucus were present in all the specimens.

He was started on acetarsol tablets on March 21, 1948. Within a week the pain disappeared and he found he could take a normal diet with impunity. The gum smears and faeces did not show any spirochaetes after March 30, 1948. After a fortnight, when he was no longer taking acetarsol, there was a recurrence of pain. He was then put on a course of penicillin tablets of 50,000 units, one daily for 12 days. Then pain completely dis-

appeared and he has been free for a period of five years—that is, till April, 1953. There was a slight recurrence which made him take another course of 12 penicillin tablets, with the satisfactory results expected. Fractional test meals were repeated on him in June, 1948, and March, 1950. Blood was absent in all specimens on both occasions. The total and free acidity values were within normal limits but higher than in March, 1948, with, however, no pain.

—I am, etc.,

Coonoor, S. India.

I. G. K. MENON.

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- ² British Medical Journal, 1947, 1, 948.

Smoking and Mouth Cancer

SIR,—Miss Marion H. Russell, in her interesting article on "Cancer of the Tongue, Mouth, and Pharynx" (*Journal*, February 20, p. 430), puts forward several lines of inquiry to investigate sex differences in prognosis following radiotherapy. While supporting her suggestions, I would add that analysis should be made of the smoking habits of patients with cancer of these organs. "Radium National Form No. 1, Malignant Disease of the Tongue and Mouth," compiled in 1929–30 by the Radium Commission and others,¹ required a note on "Tobacco" for completion of records, showing that an association was recognized or suspected at that time, and much valuable information should be available after 20 years.

Doll and Bradford Hill,² in their work to which you refer (p. 445), have jolted us into keeping careful records of the smoking habits of our lung cancer patients, and it seems no less important that we should continue to investigate and record the same information in relation to patients with malignant disease anatomically in closer relation to the cigarette or other source of possible chronic irritation. Prognostic differences which appear to be linked with sex or age could be due, wholly or in part, to differences in smoking habit and/or to duration of smoking.—I am, etc.,

London, W.C.1.

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- ¹ Spear, F. G., and Griffiths, K. (1951). *The Radium Commission*, p. 42. H.M.S.O., London.
- ² British Medical Journal, 1952, 2, 1271.

"Status Lymphaticus"

SIR,—Risking the charge of levity, may I add to the discussion of this condition the story of a meeting held not long after the first world war, where the anaesthetists were pressing for recognition as such. The plaint was repeated *ad nauseam* that they had no "status." Eventually, a surgeon—was it Sir D'Arcy Power?—rose to say that, while he had the greatest sympathy with the anaesthetists' plea, they had a status not enjoyed by any other members of our profession—that is, the status lymphaticus.—I am, etc.,

Sunderland.

W. GRANT WAUGH.

SIR,—I read with bewilderment Dr. H. B. Dodwell's statement (*Journal*, March 6, p. 582) that I have described a syndrome consisting of "anatomical anomalies, recurrent asthma, lymphocytosis, and evidence of the breaking down of the nuclei of lymphocytes" (*Journal*, February 13, p. 398). Like Dr. Dodwell I do not know of such a syndrome, especially as the two last-mentioned findings exclude each other as evidenced by the fact that adrenocortical deficiency is accompanied by lymphoid hyperplasia and lymphocytosis, whereas injection of cortical hormone leads to depletion of the lymphoid stores, lymphopenia, and increased "urinary excretion of uric acid which is presumably formed by the breakdown of lymphatic nuclei." All I did was to draw attention to the obvious similarity between "status lymphaticus" and the state of adrenocortical deficiency to which neither anatomical anomalies nor recurrent asthma nor lymphatic breakdown bear any relationship. I cannot deny, however, that Dr. Dodwell's misrepresentation and lack of understanding have alarmed me.—I am, etc.,

London, W.1.

H. UCKO.

Medical Auxiliaries

SIR,—May I be permitted to reply to Mr. S. S. Knight's letter (*Journal*, February 27, p. 520) on the subject of medical auxiliaries? His claim that the training afforded by the Physiotherapists Association is comparable to that of the Chartered Society of Physiotherapy calls for comment. Candidates for training in schools recognized by the Chartered Society must first submit evidence of a standard of education which would enable him/her intelligently to grasp the basic sciences which form the background of treatments by physical methods. Instruction in these essential sciences and their practical application is carried out by experienced teachers, both physiotherapists and members of the academic staff of medical schools, where the emphasis throughout is on education, and facilities are adequate for this purpose. Throughout the whole three years of training, not only is the application of the practical skills acquired by the students to the treatment of patients very carefully supervised, but the students are also under constant guidance and instruction from really experienced teachers. The examinations are searching and thorough, and are conducted by members of the medical profession and teachers of the Chartered Society. Post-registration courses and congresses ensure a maintenance of that high standard of work that has come to be expected of the chartered physiotherapist.

The intensive training in principles over a short period, mentioned by Mr. Knight, is educationally unsound, and the standard of work produced by such "crammed" training is generally inferior to that where adequate time is allowed for absorption. The expression of aims of the Physiotherapists Association is most commendable, but until there is evidence that those aims are really achieved it is perhaps misleading to claim equality of standards.—I am, etc.,

London, S.E.1.

S. M. EVANS.

Recruitment of Nurses

SIR,—May we have the advantage of your columns to give a brief account of a scheme for the recruitment of nurses in York, which has been in operation since last September and which shows good promise of success? In conjunction with the education authority a course of evening classes has been organized by the hospital management committee in the nurses' training school of one of our general hospitals for young people of either sex under 18 years who have left school and who are already in full employment in other spheres. The lectures are on a wide variety of subjects which bear on biological problems, medicine, surgery, and nursing care, and are given by consultants, family doctors, the sister tutor, and experts in various ancillary branches of medicine and other social services.

The course is designed to occupy a two-year interval between leaving school and the age of 18, when full training may begin. Lectures, which are loosely integrated in subject matter, are given once a week and are divided up into two winter terms each year, each term of about 13 weeks' duration. The lectures are followed by relaxation with cups of tea and buns, and are interspersed with visits to special departments of the hospital, and with instruction in bandaging, invalid cookery, films, and demonstrations of nursing techniques and discussion periods. By holding the courses in the nurses' training school, the student is brought at once into the atmosphere of the school and into contact with the personnel of the hospital, so that any feeling of diffidence or apprehension on entering may be overcome before the candidate is called upon to make a final decision on whether she wants to enter for a nurse's training or not.

The course was publicized in the local press and by the education authority to school-leavers through the youth employment officers, and to youth clubs, and the response was most enthusiastic—double the number of applicants that could be assimilated being forthcoming. Thirty were accepted, two of whom were boys. The applicants were selected on the following grounds—that they intended to take up a nursing career and that they were physically and mentally fitted to do so. Selection was made

by the sister tutor in conjunction with a representative of the education authority, who was in possession of their school records of ability and character.

Enthusiasm for the course has continued unabated, as shown by the attendances, which have been full except when affected by sickness or bad weather. The four girls nearing 18 have all decided to sign on for training as soon as eligible, and from next autumn, when the course starts on its second year, it seems likely that there will be a steady stream of nursing recruits as and when the older ones reach the age of 18. After one year as a pilot experiment it has been decided to plan a second course on exactly similar lines so that both general hospitals will be running similar courses, one starting at the beginning while the other is half-way through. At the same time each course has been planned so that a new entrant could start at the beginning of any one term without feeling the effects of missing the subjects of the preceding term.

The shortage of nurses in training bids fair to be the biggest stumbling block to any plan for the expansion of the hospital service, and in publishing this scheme for a night school for the young people who might take up nursing as a profession we hope that hospitals elsewhere may find in it something of value towards the solution of this pressing problem. The expenses incidental to the course have been largely defrayed by the Ministry of Education, but a great part of the work has been done voluntarily, especially by the sister tutor and by the members of the medical profession, who have given their lectures without fee.—We are, etc.,

A. E. WILLSON-PEPPER.
J. K. WILLSON-PEPPER.

York.

Child Life and Health

SIR,—I have read with interest the study presented by Professor Charles McNeil on the above subject (*Journal*, March 6, p. 533). I saw the service grow in my own district almost from scratch (when a voluntary body had charge of it) to present unimagined proportions.

According to Freudian teaching on the psychopathology of mental and neurotic illness in the adult, the seeds of such are laid in the frustration of the biological needs of the infant. The physical aspect of child health is undoubtedly extremely important, and my training in and practice of paediatrics stressed the sensible, though broad-minded, routine of feeding, "potting," sleeping, and playing in the life of the infant in order to produce its health and happiness. In latter years, however, I became interested in the psychological aspect of health and disease, and it seemed to me that it was almost axiomatic that a contented mother had a contented child and that a stable mother had less illness in her family than a harried, worried, fidgety mother. It may be a matter of genetic inheritance that stability breeds stability, but there would seem to be something more involved—an ingredient which ensures that the right food is digested properly, and that the sleep is tranquil, and that the other biological needs are not only satisfied but happily satisfied. That ingredient is not visible; it is an atmosphere of tranquil security which surrounds the infant, setting its mind at rest and ensuring harmonious working of its bodily functions. In other words, the body is dependent on the mind, so that the mental state of the infant is of paramount importance to its physical well-being. Even though the infant mind is not consciously working, it is intensely impressionable.

According to this thesis, therefore, I would suggest that in child health of to-morrow there should be psychiatric sessions attached to each child welfare centre with the specific objective of supportive therapy for the emotionally unstable mother, which would cater also for the needs of the antenatal mother, since much physical and mental trouble is laid up for the offspring during the period of gestation. I would also suggest the great value to child health of the establishment of marriage guidance clinics in the setting of the child welfare centre; at these the man or girl to be married could discuss important premarital problems, and also parents in emotional difficulties might be helped, to the immense benefit of the household and the prevention of much neurotic illness among their children.—I am, etc.,

Morpeth.

J. H. THOMPSON.

Emotions and the Nose

SIR,—Personal experience prompts me to offer two observations upon the papers of Mr. P. Reading, Mr. K. Malcomson, and Dr. D. O'Neill (March 6, pp. 552 and 554). Is it really necessary to invoke anything so recondite as physiology and interference with regulation of body temperature to explain aggravation at night? Will not the blanket allergens of wool and bacteria suffice for most people, or even the homely possibility of the horizontal posture affecting mucous membrane blood vessels? Repeated caravan holidays have taught me the value of eating the antihistamine tablet before both the morning and the evening blanket-tossing.

The psychiatric study, although suggestive, suffers inevitably from the absence of controlled observations. Case 10 found that her nose cleared during the excitement of walking out with her boy friend. Mine used to clear regularly under the excitement of visiting my E.N.T. consultant. Could the sneezing of Case 10, while evacuated to the country, have been due to musty hay or any other rustic allergen? This study, as presented, scarcely warrants a more specific conclusion than that "when the investigation of post-war urban Britishers is carried far enough and deep enough, then some frustration or anxiety will usually be uncovered."—I am, etc.,

Doncaster.

CEDRIC C. HARVEY.

Herpes Simplex Virus in Infantile Eczema

SIR,—Dr. G. I. Barrow's article on "The Herpes Simplex Virus in Infantile Eczema" (*Journal*, February 27, p. 482) reminds me of two cases which connect with his series.

On August 25, 1953, a 4-months-old baby was vaccinated. A typical vaccinia resulted and the scab had already cleanly separated when her mother—never vaccinated before—fell suddenly ill, on September 17. She showed three vaccinia-like lesions on the edges of the eyelids and a phlyctenular lesion on the sclera of the right eye, with severe cellulitis of the eyelids and cheek and a considerable painful adenitis in the pre-auricular region and neck. She felt ill, she had much pain, and her temperature was 101.2° F. (38.4° C.). She had been suffering from ulcerative colitis, but had no skin conditions. One week later her other child, 18 months old and also never previously vaccinated, developed a large herpetic eruption in the right groin, again with marked cellulitis and lymphadenitis, fever, etc., followed within a few days by further 5-6 groups of vesicles in the vicinity. Her skin was clear, but she had just recovered from pityriasis rosea. Both cases were treated with systemic penicillin and ung. chloramphenicol; both took over three weeks to recover. There is a slight residual scarring in both cases, and the mother has partial loss of eyelashes.

A third child, 4 years old, had erythema nodosum with strongly positive Mantoux test two years ago.—I am, etc.,

Tutbury, Staffs.

J. I. HOFMAN.

Burns and the Adrenal

SIR,—In your annotation of March 6 (p. 572) you spoke of the "gross inadequacy of all methods of assessing the activity of the adrenal cortex." A reliable chemical method suitable for routine use was described to the Heberden Society in December, 1952, and first published in *Nature*.¹ Using a simplified form of the method,² a technician can assay six to eight specimens a day. The subject of steroid assays is too complex to discuss in a letter. What matters is that the assay of 17-ketogenic steroids in urine, referred to above, does answer our everyday needs.

Dr. Simon Sevvitt's paper (p. 541), with which your annotation is concerned, does little to clarify the indications for cortisone therapy in the treatment of severe burns. There is good evidence that adrenaline will cause a fall in the eosinophil count in the absence of the adrenals, and that intravenous adrenaline does not give rise to an increased output of adrenocortical steroids.³ It should not be difficult to follow the daily output of 17-ketogenic steroids in severely burned patients and to find out whether in fact adrenal failure is responsible for death in some cases. Alternatively

it would be simple to add hydrocortisone or cortisone aldehyde to the transfusion fluids of a controlled series of patients.—I am, etc.,

Sheffield, 3.

H. F. WEST.

REFERENCES

- ¹ Norymberski, J. K. (1952). *Nature, Lond.*, 170, 1074.
- ² Gibson, G., and Norymberski, J. K. (1954). *Ann. rheum. Dis.* In press.
- ³ Sandberg, A. A., et al. (1953). *J. clin. Endocr.*, 13, 629.

SIR,—Dr. Simon Sevvitt (*Journal*, March 6, p. 541) seeks to revive the adrenaline test of adrenocortical function. Your annotation (p. 572) appears to support the suggestion implicit in Dr. Sevvitt's article that 0.3 mg. adrenaline given intramuscularly or subcutaneously is an adequate adrenal cortical stimulant. The annotation, however, carefully refers to intravenous adrenaline acting on the pituitary to stimulate the production of A.C.T.H. It further refers to three of Dr. Sevvitt's patients in whom intravenous adrenaline was ineffective. Dr. Sevvitt, however, gave adrenaline to his patients by the intramuscular or subcutaneous route. On p. 543 he quotes evidence that intravenous adrenaline produces an increase of adrenocortical activity, and on the next page states that his adrenaline test stimulus consisted of 0.3 ml. of 1 in 1,000 adrenaline B.P. injected subcutaneously or intramuscularly. The route of administration is not mentioned thereafter, so presumably all the tests were done as described.

There must be few who regard subcutaneous or intramuscular adrenaline as an adequate adrenocortical stimulus. Dr. Thorn, who was largely responsible for the introduction of both A.C.T.H. and adrenaline as clinical tests of adrenocortical responsiveness, has amplified his earlier views. To quote¹: "The four-hour A.C.T.H.-eosinophil test is a useful screening procedure in eliminating Addison's disease or acute adrenal failure if a 70 per cent fall or over is observed. Failure to observe a satisfactory fall in circulating eosinophils must not be construed as necessarily indicative of adrenal cortical failure since (1) on occasion A.C.T.H. administered subcutaneously or intramuscularly may be inactivated or destroyed locally, and hence never reach the adrenal; (2) the single administration of 25 i.u. of A.C.T.H. intramuscularly does not place the adrenal cortex under maximum stimulation; and (3) a fall in eosinophils is after all an indirect indicator of adrenal cortical activation in contrast to the measurement of changes in adrenal oxysteroid and 17-ketosteroid excretion. It is also essential to recognize the fact that an initial control level of 100 or more eosinophil cells per c.mm. is necessary if a significant fall is to be detected. Despite these limitations the four-hour eosinophil response to A.C.T.H. remains a useful and highly reliable screening test for the rapid evaluation of adrenocortical responsiveness. These observations refer to the use of A.C.T.H. and not epinephrine."

It would be unfortunate if the adrenaline test as now described were to be accepted without further evidence of its validity. In so far as your annotation appears to lend support, it should be withdrawn.—I am, etc.,

Edinburgh.

J. A. STRONG.

REFERENCE

- ¹ Thorn, G. W., et al. (1952). *Trans. Ass. Amer. Phys.*, 65, 282.

Diagnosis of Thyrotoxicosis

SIR,—Dr. E. Montuschi (*Journal*, March 6, p. 584) raises the interesting point that sinus arrhythmia is absent in thyrotoxicosis. For some years past this test has been in common use in Dublin for suspected hyperthyroidism. It is a test which is open to certain fallacies. Sinus arrhythmia is more easily elicited in younger patients, and hence the test is less valuable in patients over 50 years of age. In menopausal tachycardia, when, if reliable, it would be very helpful, the results are less satisfactory, as, while its presence is strong evidence against hyperthyroidism, its absence is not so easily interpreted. The value of this and other signs of thyroid disease will be incorporated in a communication at a later date.—I am, etc.,

Dublin.

D. K. O'DONOVAN.

Obituary

H. W. MARETT TIMS, O.B.E., M.D.

Dr. H. W. Marett Tims died at Lower Bourne, near Farnham, Surrey, on March 4, eight days before his 91st birthday. All through his professional career his interests ranged widely over the whole field of biology, and he was perhaps best known as professor of biology at the Royal Veterinary College.

Henry William Marett Tims was born at Calcutta, the son of Dr. T. Lamb Tims, and was educated at Reading School and at Edinburgh University, where he had an outstanding career as a student. He obtained first-class honours in anatomy, surgery, and clinical surgery and graduated M.B., C.M. in 1887. Three years later he proceeded to the M.D., with commendation. After graduation he held the appointment of assistant demonstrator in anatomy and physiology in Edinburgh University, and then, in 1889, he came to London to continue his postgraduate studies at St. Thomas's Hospital. Then for a number of years in the late 'eighties and early 'nineties he was employed as a medical officer under the London County Council. In 1892 he became lecturer in biology and comparative anatomy at Westminster Hospital Medical School, an appointment he held until 1901, when he took up a similar post at the Charing Cross Hospital Medical School. A few years later he became reader in zoology at the Bedford College for Women in London University, and in 1908 was appointed to the chair of biology at the Royal Veterinary College. To these two appointments he devoted a good deal of his time until the outbreak of the first world war in 1914, when he relinquished his civilian duties to serve in the R.A.M.C., in which he attained the rank of lieutenant-colonel. For his war work he was appointed O.B.E. in 1919, and in the following year he was awarded the Order of St. Sava by the King of Yugoslavia.

For many years Dr. Marett Tims acted as examiner in physiology and biology for the Society of Apothecaries of London and in elementary biology for the London Conjoint Board. After the war he was for a time reader in zoology and comparative anatomy in London University and lecturer in comparative dental anatomy at the Royal Dental Hospital of London. Always keenly interested in odontology, he contributed a number of important papers on the subject to various scientific publications. He also edited the seventh and eighth editions of *Tomes's Dental Anatomy*. He had been recorder and vice-president of section D of the British Association, and while resident in the Channel Islands, where he lived for a time after the first world war, he was chairman of the Jersey Division of the British Medical Association in 1924-5. In 1888 he married Miss Alice M. M. Findlay, who died in 1950. There was one son and one daughter of the marriage.

Dr. AMBROSE EMERSON, who was in general practice at Eastbourne for many years, died suddenly at his home at Vennes-sur-Lausanne, Switzerland, on January 28 at the age of 78. Ambrose Emerson was born on January 15, 1876, and was educated at Cambridge University and at University College Hospital, graduating M.B., B.Chir. in 1901. He proceeded to the M.D. three years later. He held appointments at the Stanley Hospital and the Hospital

for Women, Liverpool, before moving to London, where he worked successively as house-physician at the East London Hospital for Children and as clinical assistant to the ophthalmic out-patients department at the London Hospital. In 1906 he entered a partnership at Eastbourne, where he remained until he retired in 1922, except for the period of his service as a temporary captain in the R.A.M.C. in Italy and France in the first world war. In 1923 he was appointed a cavalier of the Order of the Crown of Italy for distinguished services rendered during the war. In 1922 he took up residence in Switzerland and remained there until his death, except for the major part of the last war, when he was in England. He is survived by a widow, two sons, and three daughters.

Dr. EDGAR STEVENSON, who died at his home at Hoylake, Cheshire, on February 3 at the age of 86, was for many years well known as an ophthalmic surgeon in the Liverpool area. He studied medicine at Aberdeen, graduating M.B., C.M. in 1889, and proceeded to the M.D., with commendation, three years later. After a period of study at Strasbourg he returned to his home at Birkenhead. In 1892 he was appointed house-surgeon to the Liverpool Eye and Ear Infirmary, becoming assistant surgeon two years later, as well as honorary ophthalmic surgeon to Toxteth workhouse. At the beginning of the century he was appointed to the honorary staff of the Eye and Ear Infirmary—to which he later became consulting ophthalmic surgeon—and also demonstrator in ophthalmology in University College, Liverpool, a post he held for a number of years. At Liverpool he was in partnership first with Dr. Edgar A. Browne, a son of Hablot Knight Browne, better known as "Phiz," the illustrator of books by Charles Dickens, and later with Dr. F. B. Chavasse, son of the second Bishop of Liverpool. During the first world war Dr. Stevenson served as an ophthalmic surgeon attached to the 1st Western General Hospital. Later he became ophthalmic surgeon to the Ministry of Pensions Hospital at Liverpool. Among his many contributions to the medical literature was a paper on the treatment of corneal opacities by electrolysis which appeared in this *Journal* in 1896. After his retirement he went to live at Hoylake. For relaxation he enjoyed fishing, and only recently had contributed an article to the *Fishing Gazette*. His wife, formerly Miss Helen D. L. Gunn, had predeceased him by only two weeks.

Dr. G. H. GRILLS, formerly medical superintendent of the County Mental Hospital, Chester, died at his home at Lymm on February 16 at the age of 82. Galbraith Hamilton Grills was born on April 17, 1871, and was educated at the old Queen's College, Belfast, and at Liverpool University, graduating M.B., B.Ch. at the former Royal University of Ireland in 1899. He proceeded to the M.D. in 1902, and was awarded the diploma in mental and nervous disorders of the University and the Gaskell medal and prize of the Royal Medico-Psychological Association. Dr. Grills spent practically the whole of his professional life at the County Mental Hospital, Chester, where he first went in the early 1900's as assistant medical officer. He later became medical superintendent and held the post for many years, retiring in 1945, when he went to live at King's Norton, Birmingham. Last year, however, he returned to the county he had served so well and took up residence at Lymm, where he died.

J. H. M. writes: Having been associated with Dr. Grills for well over 30 years, I find it hard to realize that he has passed on. Somehow I regarded him as one who had discovered the secret of perpetual youth. His unceasing vitality, his boundless enthusiasm, and his boyishness of spirits never suggested that he should grow old, although he lived to the good age of 82. He was a doyen and a pioneer among medical superintendents. All his vigour of mind and body was given wholeheartedly to his life's work, which he loved and in which he spent 45 years of active service. His sympathy, kindness, and knowledge were ever available to his patients as well as to his junior colleagues, who mourn the passing of a great and lovable gentleman.

He was invariably in the van in the use of new treatments. His hospital was among the first to introduce malarial therapy, diathermy, sun-ray lamps, electric shock treatment, etc. His motto was "To stand still is to recede." He genuinely felt for his patients. My own feeling is that he regarded it almost as an injustice that they should be so sorely afflicted. "What better are we," he used to say, "that we should escape?" Material improvements during his tenure of office were many and included a new annexe (12 wards) with operating theatre, a handsome home for nurses, and the complete modernizing of the (then) 100-year-old building. He had no hobbies as such. He was devoted to his family and home. He was a profound thinker, always seeking after truth. Books dealing with matters metaphysical and mystical were his joy, and it was a sheer delight to listen to his discoursing on these and kindred subjects. From him I learnt much. He is survived by his wife and daughter and three grandchildren, to whom we extend our sympathy in their sudden and sad bereavement.

Dr. C. B. COHEN, a well-known general practitioner at Oxted, Surrey, died in St. Thomas's Hospital on February 10 at the age of 59. Charles Benjamin Cohen was born on August 15, 1894, the son of the late Sir Benjamin Cohen, K.C., and was educated at Rugby School and at Trinity College, Cambridge, before entering St. Thomas's Hospital as a medical student in 1916. He qualified M.R.C.S., L.R.C.P. in 1918, and after holding a house appointment at St. Thomas's served as a captain in the R.A.M.C. in the first world war. After demobilization he obtained further experience as a house-surgeon at his own teaching hospital and as a house-physician at the Brompton Hospital. He graduated M.B., B.Chir. in 1920 and proceeded to the M.D. four years later. After a period of practice at Brighton and at New Malden, Surrey, he became, in 1931, a junior partner in a practice at Oxted, where his father had moved in 1914. He soon established himself as a very competent general practitioner and was appointed surgeon to the local cottage hospital, in which, from the time of his appointment until shortly before his death, he was responsible for a large proportion of the emergency surgical work. He was also lecturer to the local branch of the British Red Cross Society and medical officer to most of the schools in the district. He is survived by his widow, a son, who is a doctor, and a daughter, who is a trained nurse.

J. F. S. writes: Dr. C. B. Cohen, known to a large circle of friends as Charles, will be badly missed, as he was a very conscientious doctor, nothing ever being too much trouble: he was always available and good at relieving the anxieties of relations. These were his great characteristics—his competence and his conscientiousness—and he will long be remembered in Oxted and Limpsfield for them.

Dr. U. W. N. MILES died at his home at Bewdley on February 11 at the age of 82, and the borough has lost a well-loved figure and a doctor of the old school. Born at Farnworth, Lancashire, on January 22, 1872, Usher William Newton Miles was the son of a country parson. After leaving Rossall School he became a student at King's College Hospital, London. In 1896 he qualified M.R.C.S., L.R.C.P., having been trained by such men as Burney Yeo, Rosc, Carless, and Frederick Silk. After holding resident appointments at various hospitals he became assistant to his uncle, H. L. Miles, at Kidderminster, where he remained until he bought a Bewdley practice in 1901. From that date until his retirement in 1946 he was in general practice, coupling with it the appointments of medical officer of health of the borough, a post he held for 45 years, and honorary anaesthetist at the Kidderminster and District General Hospital, an appointment which spanned the years 1917 to 1946. Being a man of broad mind and wide interests, Dr. Miles did not let himself get into a rut of professional life. For a time he was interested in the Church Lads' Brigade, and in 1909 he started the Boy Scout movement in Bewdley, remaining an active scout until 1914. At the end of the first world war he was made president of the newly formed local associa-

tion of Boy Scouts, a post which he filled with great pride to himself and to everybody else's great satisfaction until his death. He was also a keen sportsman, being a good shot and fisherman, a life member of the local rowing club, and a founder member of the tennis club. In quieter vein he was fond of gardening, showing special interest in the growing of chrysanthemums. In his heyday Dr. Miles was a tall, well-built man, and his character fully matched his physical stature. Forthright and plain spoken, he had all the courage of his convictions, but nobody suffered hurt thereby. His was a deeply religious nature, and this brought all the gentleness and goodness of religion into his activities and his dealings with his fellow men. Indeed, he was built four-square. And all these attributes, welded with a sound professional skill and wisdom, made him what he was—a family doctor *par excellence*. To his widow, after the joy of a golden wedding anniversary, his children, and his grandchildren must go the sympathy of all who knew him.—C. P. P.

Dr. D. B. KENNY died on February 13, in a motor accident, at the age of 34. Douglas Boal Kenny was born on February 1, 1920, and was educated at Campbell College, Belfast, and at Queen's University, where he graduated M.B., B.Ch., in 1945. After graduation he held appointments as house-surgeon at the Belfast City Hospital and the Dreadnought Seamen's Hospital, London. A period as a ship surgeon followed before he joined Dr. J. G. Johnston in practice at Lisburn, Northern Ireland. A quiet and kindly man, Dr. Kenny was rapidly building up a reputation as a first-class general practitioner, and he will be greatly missed by his friends, colleagues, and patients. He is survived by his widow, to whom we extend our sympathy.

Dame GRACE THYRZA KIMMINS, who devoted her life to the care and training of crippled children, died on March 3 at the age of 83. Many who benefited by her help and encouragement and the training she was able to provide will feel a sense of personal loss by her death. From the time of her own girlhood the sight of the neglected poor, the blind, and the crippled child had inspired in her a feeling of deep compassion and a longing to help. The Heritage Craft Schools and Hospitals at Chailey, in Sussex, although now incorporated in the National Health Service, is a fitting memorial to her and to the work she undertook so willingly, work which was spread over two generations. She was the founder of the schools, and the children received from her all the devoted and loving care that could be desired. Dame Grace Kimmins opened the first hospital school for cripples at Chailey in 1903, but such an establishment must have been in her mind much earlier when, in 1894, she convened a meeting which resulted in the foundation of the Guild of Brave Poor Things. It was from the guild that seven boys were drawn to become the first inmates at Chailey, and they were housed in old buildings already condemned. Forty years later the school was accommodating more than 500 boys and girls in modern buildings. This magnificent result was achieved through the remarkable determination of a remarkable woman. In her work she had the whole-hearted support of her husband, Dr. C. W. Kimmins, whom she married in 1897, and who was chief inspector of the education department of the London County Council from 1904 to 1923 and deputy vice-chancellor of London University in 1933-4; he died in 1948. The work at Chailey received support from people in all walks of life, from royalty downwards. It had the approval and encouragement of the late Queen Mary, and other members of the Royal Family have honoured the school with their patronage. Dame Grace Kimmins was appointed C.B.E. in 1927 and promoted Dame Commander four years ago.

Dr. JAMES BRYAN HERRICK, the distinguished American cardiologist, died in Chicago on March 7 in his ninety-third year. He was born at Oak Park, Illinois, and spent four years as a school teacher before beginning an association

with Rush Medical College which lasted from 1886 until his death. He graduated in medicine at Rush in 1888, and served as instructor in medicine (1890-4), adjunct professor (1894-1900), professor (1900-27), and finally professor emeritus. He was attending physician at the Presbyterian Hospital, Chicago, from 1895 until he died. In 1910 Herrick was the first to describe sickle-cell anaemia, which he had observed in a negro six years before. In 1912 he published what has become a classical account of coronary thrombosis with myocardial infarction, diagnosed during life; he also showed that sudden coronary occlusion need not always terminate fatally. Besides making numerous contributions to the periodical literature, he was the author of a *Handbook of Medical Diagnosis* (1895), *A Short History of Cardiology* (1942), and an autobiography, *Memories of Eighty Years* (1949), which reflects the kindness, sympathy, and leadership which made him such an outstanding teacher. He was founder and first president of the Chicago Society of Medicine, president of the Institute of Medicine of Chicago, and, in 1927, president of the American Heart Association, which presented him with the Gold Heart Award in 1951. He was also awarded the Kober Medal of the Association of American Physicians in 1930 and the Distinguished Service Medal of the American Medical Association in 1939. *Circulation*, the journal of the American Heart Association, published a special number in honour of Herrick in 1950. A tribute he paid to Nathan Smith Davis might equally have been said about himself: "Men succeed because of native ability and in small measure because of chance, but chiefly through hard work, through a knowledge of their special vocational subject, and through their ability to apply this knowledge."

Medico-Legal

INJECTION INTO ARTERY

Fulham and Kensington Hospital Management Committee in the Queen's Bench Division on March 18 accepted liability for negligent treatment of a patient's fractured left forearm at Fulham Hospital in 1948. Mr. Justice Pearce awarded £8,254 damages, with costs, to the patient, Mr. Ernest Sidney Peters, a 50-years-old Thames waterman and lighterman.

Mr. Peters's complaints were that during an operation for resetting the arm the anaesthetist, Dr. M. R. Rifaat, injected thiopentone into an artery instead of a vein; when a remedial injection of heparin caused swelling of his left arm the plaster cast was not removed until too late, causing the onset of Volkmann's ischaemic contracture; the fracture was set in the wrong position; and all these matters were concealed from him, thus depriving him of an opportunity to seek other medical advice.

Mr. Peters also sued Mr. J. L. Temple, surgical registrar at the hospital in 1948, who was in charge of the operation, and R. G. Odell, Ltd., of Walton Bridge, Shepperton, Middlesex, owners of the Thames barge *Magpie*, on which he was working a winch when his arm was fractured. Both these defendants were dismissed from the suit without costs.

Mr. Peters's case was that he suffered a fracture of the left radius on October 12, 1948. The same evening Mr. Temple was in charge of an operation for setting the arm at Fulham Hospital. Mr. Peters was given an injection of thiopentone in his right arm, but during the operation it was discovered that the anaesthetist, Dr. Rifaat, had injected into an artery instead of a vein. As the effect of thiopentone was to coagulate the blood there was a danger of thrombosis developing and a crisis was created. Mr. Temple recollected reading an article describing what should be done in such a situation. He sent for the article, and, following its advice, the patient was injected with heparin. The heparin accentuated the bleeding around the muscles of the left arm caused by the manipulation of the bones in setting. As

soon as it was injected, the plaintiff contended, the plaster ought to have been removed. Although the arm swelled that evening and was extremely painful, the plaster was not removed until another doctor arrived at 11.30 the next morning and advised its removal at once. The damage had then been done.

The bones were said to have been set out of alignment, so that when Mr. Peters saw an orthopaedic surgeon in May, 1949, the arm had to be plated permanently in that position. Everybody agreed that the hand was now completely useless and that Mr. Peters would be better off without it.

Heroic Measures

Giving evidence for R. G. Odell, Ltd., and the plaintiff, Sir Hugh Griffiths, consultant surgeon, said it was imprudent to leave the plaster on the fractured arm after the injection of heparin. In his view, by the time the plaster was removed much of the muscle fibre was already dead. Certain orthopaedic treatment might have prevented some of the deformity, but it was impossible to say that any useful function could have been restored. He did not think the condition of Mr. Peters's arm could have been brought about by arterial spasm following the fracture itself. He agreed that the crisis caused by the injection into an artery called for "heroic measures." The surgery on the right arm was brilliant. In the circumstances, he did not think the failure to remove the plaster was negligence, though it was an error of judgment. He also agreed that the malalignment of the bones occurred some days after the operation and was not the result of faulty work by Mr. Temple.

Dr. O. H. Belam, a consultant anaesthetist, said in evidence that no competent anaesthetist should inject thiopentone into an artery if he was careful.

Mr. St. John Dudley Buxton, consultant in orthopaedic surgery, gave evidence on behalf of the management committee. His opinion was that the condition of Mr. Peters's arm was due partly to arterial spasm following the original blow and partly to manipulation of the bone in setting. No one could say to what degree one factor or the other was responsible for the condition. He considered that everything necessary to produce ischaemic contracture was present in the arm before the anaesthetic injection was given and the arm was placed in plaster.

Parties Come to Terms

At a resumed hearing Mr. Gerald Gardiner, Q.C., for the plaintiff, told his lordship that the parties had come to terms. He said: "When something goes wrong in a hospital it is not easy for the patient to tell what has gone wrong, and naturally he can only place the blame where he sees it. In these circumstances, apart from allegations made against the anaesthetist and others who later treated my client, he also complained that the surgeon, Mr. Temple, who manipulated the limb under an anaesthetic, should, in view of an injection of heparin, have at once removed the plaster. Having had an opportunity of hearing the evidence which has so far been given, I should like to withdraw that allegation." The hospital management committee had accepted liability for everything the plaintiff had suffered, including the original injury by the winch. His lordship would be asked, however, to assess the damages which should be paid to Mr. Peters.

Commenting that this was a very just result, the judge assessed damages at £6,000 in addition to special damages of £2,254.

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Mr. Temple.

RETICENT HOSPITAL

Recently a patient claimed damages from a hospital management committee and house-surgeon for injuries received when a hypodermic needle broke in his back during a lumbar puncture examination. The defendants contended

that the patient had received the correct treatment but had jerked suddenly when the needle was inserted, although he had been fully warned what to expect. The judge accepted the defendants' version, found no negligence or lack of skill on the doctor's part, but made no order as to costs. He added: "I have certainly not overlooked the reticence of the hospital authorities in reporting back to the patient's doctor. They had everything to gain and nothing to lose by frankness at that stage. Instead they remained for a time silent. If I had drawn an adverse conclusion from this they would have had only themselves to blame."

Medical Notes in Parliament

Smoking and Cancer of Lung

Mr. J. R. BEVINS, Parliamentary Secretary to the Ministry of Works, replying on behalf of the Lord President of the Council, whom he represents in the Commons, stated on March 16 to Lieutenant-Colonel M. Lipton that the tobacco companies' offer of £250,000 for investigation into the relationship between smoking and lung cancer was accepted by the Medical Research Council at its meeting on February 19. The donation would be made available to the Council in seven equal annual instalments, the first of which had been received.

Lieutenant-Colonel LIPTON asked how this money would be spent, in view of the Minister's previous assurances that research had never been hampered by lack of funds. Mr. BEVINS said the work of the Medical Research Council was already subsidized to the extent of £15,000 a year by the Department of Scientific and Industrial Research. That was additional to the £35,000 a year from the tobacco companies, and there was a total of about £400,000 spent on cancer as a whole by the Medical Research Council. Dr. STROSS said the original statistical work by the Medical Research Council, conducted by Dr. Doll and Professor Bradford Hill, cost only £7,000, and was a magnificent piece of work which showed where the problem lay. This additional sum should be welcomed, because it should prove ample for all the further work needed to elucidate the problem.

Cancer Registrations

Mr. N. DODDS asked the Minister of Health on March 18 what progress had been made in ensuring the complete registration of all cases of cancer. Mr. IAIN MACLEOD informed him that effective registrations of new cases in hospitals in England and Wales, which were 23,239 in 1945, 40,333 in 1947, and 49,110 in 1948, were expected to be about 58,000 for 1953. This figure was estimated to be about half the total probable number of new cases of cancer in 1953 in England and Wales. He had recently issued a circular encouraging hospitals to make still greater efforts to achieve the registration of all cases, and had asked for progress reports by June 30.

Mr. DODDS asked whether the records were kept on a voluntary basis or a compulsory basis; and, if voluntary, why. Mr. MACLEOD said that it was still being done on a voluntary basis. He had recently been advised by the Standing Advisory Committee that, for a variety of complicated reasons, it was best that it should continue on a voluntary basis.

Air Pollution Report

Mr. ERNEST MARPLES, Parliamentary Secretary, Ministry of Housing and Local Government, answering a number of questions on March 16 about air pollution, said that he understood the Beaver Committee expected to present a further report before the end of the summer. The committee's interim report contained a clear statement of the main facts at present known about air pollution and the preventive measures already in operation, and he asked the M.P.s to await its next report on possible further action.

Prescribing Costs

Mr. A. BLENKINSOP asked on March 18 when the Minister of Health expected to introduce area averages of prescribing costs in England and Wales, in view of the commencement of a similar scheme in Scotland. Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, stated that the matter was under discussion with the chemists and with the Joint Pricing Committees, and the Minister was not yet able to give a date. Mr. BLENKINSOP said that they were sufficiently far forward with pricing to make this a reasonably practical proposal. Did the Minister appreciate the importance of giving the extra responsibility to doctors to check their own prescribing costs as probably one of the best ways of keeping costs down? Miss HORNSBY-SMITH said that she recognized that, but it was essential to clear arrears first before starting on a new and complicated scheme.

Miss PAT HORNSBY-SMITH supplied Mr. SOMERVILLE HASTINGS on March 18 with the following figures of the Health Service prescriptions dispensed by retail pharmacists and chemist contractors supplying appliances in successive years since 1949:

Year	Total Cost	Average Cost per Prescription
1949	£30,331,303	36.04 d.
1950	£34,804,535	38.47 d.
1951	£41,662,354	43.91 d.
1952	£43,768,599	48.63 d.
1953 (first six months) ..	£23,898,821	49.15 d.

Flour Improvers

Dr. BARNET STROSS asked the Minister of Food on March 15 whether he could make a statement on the change-over from agene to some other substance as a flour improver; and what were the substances that had been investigated. Major LLOYD-GEORGE replied that he understood that the Medical Research Council had reported on the tests carried out on certain flour improvers. Its report would be considered by the appropriate subcommittee of the Interdepartmental Standing Committee on Medical and Nutritional Problems, and he must await its recommendations. The following were the methods of improvement which had been investigated: agene, chlorine dioxide, the aeration process, ascorbic acid, and potassium bromate.

Prison Treatment of Sexual Offenders

Sir DAVID MAXWELL FYFE, the Home Secretary, was questioned by Mr. LESLIE HALE about the treatment in prison of persons convicted of sexual offences. He replied on March 16 that prisoners convicted of offences of a sexual nature were specially investigated by prison medical officers, who were instructed to recommend for psychiatric treatment those likely to prove susceptible to it. A prisoner would not benefit by such treatment unless he had a sincere desire for it and a genuine anxiety about his condition. Such adverse factors as low intelligence, advancing years, and a history of persistence in the commission of offences reduced the number of suitable cases. In England and Wales there were three centres—Wakefield, Wormwood

Scrubs, and Holloway—to which selected prisoners were sent to receive special treatment from visiting psychotherapists. The precise nature, extent, and duration of treatment in a particular case were determined by the doctor carrying out the treatment. The forms of treatment used included both individual and group methods, assisted, as occasion required, by special procedures. There was also treatment of a less formal kind, especially in training establishments, in which the medical officer played a valuable part as a member of a team. The numbers of prisoners convicted of offences of a sexual nature who were under regular treatment by a visiting psychotherapist for a period exceeding six months in the years 1951, 1952, and 1953 were 25, 26, and 27 respectively. He would hesitate to speak of cure in homosexual cases, and any attempt to give figures of supposed cures could only be misleading.

Vital Statistics

Week Ending March 13

The notifications of infectious diseases in England and Wales during the week included pneumonia 755, scarlet fever 1,476, whooping-cough 2,093, diphtheria 22, measles 2,213, dysentery 1,001, acute poliomyelitis 22, paratyphoid fever 96, and typhoid fever 2.

Infectious Diseases

The largest variations in the trends of infectious diseases in England and Wales during the week ending March 6 were increases of 350 for measles, from 2,099 to 2,449, and 97 for dysentery, from 910 to 1,007, and decreases of 160 for acute pneumonia, from 869 to 709, 84 for scarlet fever, from 1,463 to 1,379, and 64 for whooping-cough, from 2,098 to 2,034.

The largest rises in the incidence of measles were 239 in Norfolk, from 396 to 635, 101 in Cumberland, from 119 to 220, and 52 in Staffordshire, from 207 to 259; the only large decrease in incidence was 59 in Kent, from 94 to 35. The largest variations in the trends of scarlet fever were a rise of 27 in Yorkshire West Riding, from 163 to 190, and a fall of 31 in Lancashire, from 187 to 156. The chief features of the returns for whooping-cough were a rise of 39 in Derbyshire, from 35 to 74, and a fall of 40 in Kent, from 114 to 74. 34 cases of diphtheria were notified; these were 23 more than in the preceding week and were the largest total for the past 67 weeks. The largest rises were from 4 to 10 in Lancashire (Liverpool C.B. 9), from 0 to 5 in Durham (Stockton-on-Tees M.B. 4), from 0 to 3 in Devonshire (Plymouth C.B. 3), from 0 to 3 in Oxfordshire (Henley R.D. 3), and from 1 to 4 in Staffordshire.

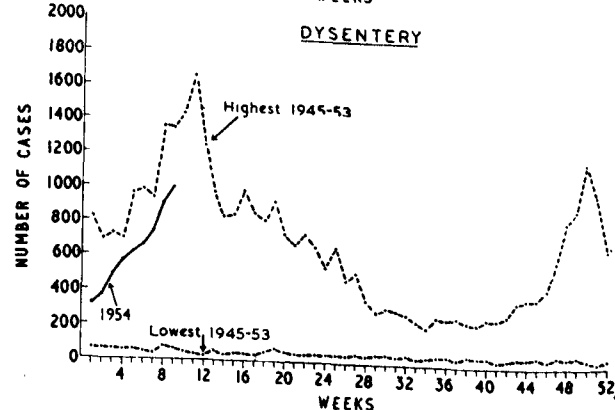
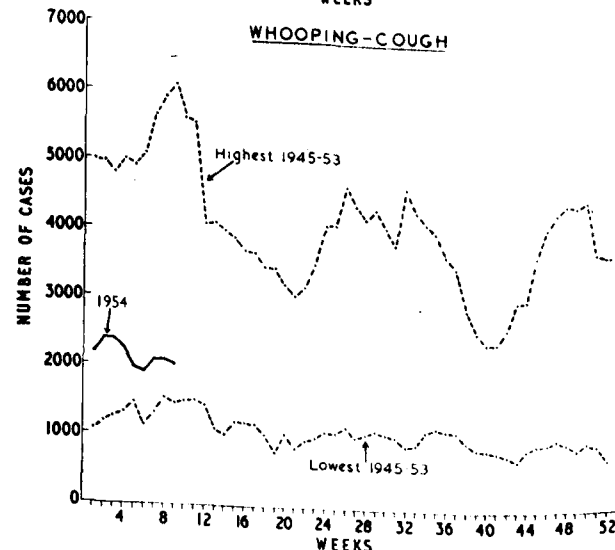
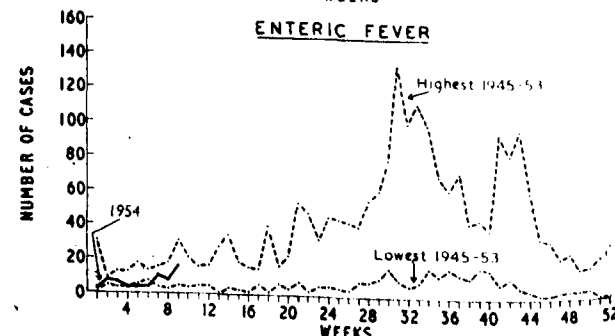
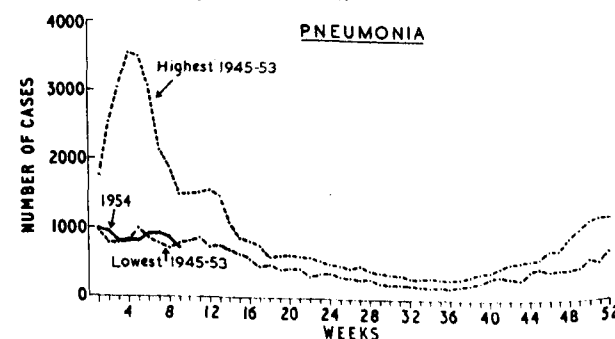
The notifications of paratyphoid fever increased from 5 to 15. This rise was contributed by an outbreak with 11 notifications in Glamorganshire (Cardiff C.B. 7, Penarth U.D. 3, Swansea C.B. 1).

The number of notifications of dysentery reached the highest level for nearly three years. The largest rise during the week was 89 in Lancashire. The largest centres of infection were Lancashire 324 (Eccles M.B. 97, Bolton C.B. 56, Preston C.B. 43, Ormskirk U.D. 33, Liverpool C.B. 23, Salford C.B. 18), Yorkshire West Riding 124 (Leeds C.B. 38, Keighley M.B. 34, Bradford C.B. 15, Royston U.D. 12), London 94 (Islington 23, Finsbury 11, Hackney 10), Middlesex 71 (Enfield U.D. 21, Ealing M.B. 12), Leicestershire 64 (Leicester C.B. 60), Essex 58 (Walthamstow M.B. 17), Staffordshire 58 (Cannock U.D. 46), Kent 37 (Tonbridge R.D. 19), Surrey 25 (Chertsey U.D. 10), Norfolk 24 (Norwich C.B. 24), Gloucestershire 22 (Bristol C.B. 21), and Warwickshire 20 (Birmingham C.B. 19).

The notifications of dysentery in Scotland are the largest for three years. During the week the largest centres of infection were Glasgow 179, Edinburgh 35, Lanark county 29, and Dundee 16.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 6 (No. 9) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrar-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	34	1	7	0	1	22	1	8	0	4
Dysentery ..	1,007	94	276	12	5	289	39	97	0	5
Encephalitis, acute ..	5	0	0	0		8	1	0	0	
Enteric fever: Typhoid ..	1	0	0	0		6	1	1	0	
Paratyphoid ..	15	1	1	0		6	0	0	0	
Food-poisoning ..	194	12		0		183	24		0	
Infective enteritis or diarrhoea under 2 years ..				12	32				9	24
Measles* ..	2,449	33	82	19	395	27,638	1,621	465	135	369
Meningococcal infection ..	27	3	17	0		35	6	17	1	2
Ophthalmia neonatorum ..	24	0	2	1		42	3	7	0	
Pneumonia† ..	709	31	254	9	2	1,301	55	387	21	23
Poliomyelitis, acute: Paralytic ..	14	1				12	1			
Non-paralytic ..	4	0		4	0	5	0		3	0
Puerperal fever‡ ..	241	39	12	0		265	55	11	2	
Scarlet fever ..	1,379	51	181	40	33	1,534	83	202	32	58
Tuberculosis: Respiratory ..	740	109	150	21				157	31	
Non-respiratory ..	128	7	23	3				33	3	
Whooping-cough ..	2,034	94	385	45	44	2,758	187	278	26	87

DEATHS In Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	1	1	0	1	0	0
Dysentery ..	0	0		0		2	0		0	
Encephalitis, acute ..	0	0			0	0				0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	15	1	1	1	3	15	6	4	2	1
Influenza ..	26	1	2	0	0	193	19	10	3	5
Measles ..		0	0	0	0		0	1	0	0
Meningococcal infection ..		0	0				0	0		
Pneumonia ..	323	51	28	10	5	469	72	28	17	9
Poliomyelitis, acute ..	1	0			0	2	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	129	17	18	4	6	134	10	16	2	7
Non-respiratory ..	1	1	1	0	2	4	3	2	0	
Whooping-cough ..	3	0	1	0	0	3	0	2	0	0
Deaths 0-1 year ..	275	28	28	5	15	244	25	24	14	18
Deaths (excluding stillbirths) ..	6,457	868	707	125	201	6,706	915	721	159	207
LIVE BIRTHS ..	8,009	1,181	904	227	399	7,861	1,173	864	197	485
STILLBIRTHS ..	207	23	26			199	23	27		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

‡ Includes puerperal pyrexia.

Medical News

New Chair of Anaesthetics.—Dr. W. W. Mushin has been appointed as the first holder of a new Chair of Anaesthetics in the University of Wales. Dr. Mushin qualified in 1932 from the London Hospital, and was then for a time first assistant in the Nuffield Department of Anaesthetics at Oxford. In 1947 he became director and lecturer in anaesthetics at the Welsh National School of Medicine, Cardiff, his present appointment. He is also adviser in anaesthetics to the Welsh Regional Hospital Board. In 1948 he was elected F.F.A.R.C.S.

Faculty of Anaesthetists' Dinner.—The Faculty of Anaesthetists of the Royal College of Surgeons of England held its sixth anniversary dinner in the library of the College on March 17. The Dean, Dr. Bernard Johnson, presided, and among the guests were the High Commissioner for South Africa, the High Commissioner for Ceylon, the Acting High Commissioner for the Federation of Rhodesia and Nyasaland, Sir Russell Brain, P.R.C.P., Sir Cecil Wakeley, P.R.C.S., Mr. A. A. Gemmell, P.R.C.O.G., Sir John Charles, Chief Medical Officer of the Ministry of Health, Sir Philip Morris, Vice-chancellor of the University of Bristol, Sir Gordon Gordon-Taylor, and Dr. G. Godber. Sir John Charles proposed the toast of the Faculty, and in his acknowledgment Dr. Johnson reviewed the year's work and particularly the educational aspects of it. He referred with gratitude to the gift of £1,000 which the Faculty had received from the Association of Anaesthetists to start a foundation fund for the proposed department of research. The health of the guests was proposed by the Vice-dean, Dr. T. Cecil Gray, and replied to by Sir Philip Morris.

Centenary at Queen's University, Ontario.—In February, 1854, at the home of Sir John A. Macdonald, the father of confederation in Canada, plans were laid for a Faculty of Medicine in the 13-year-old Queen's University at Kingston, Ontario. The centenary is commemorated by a special issue of the *Canadian Medical Association Journal* (the March issue) which has on its cover the armorial ensigns of the university. Inside, all the scientific articles have been contributed by members of the teaching and research staff, and there is a guest editorial by Dr. Austin Smith, editor of the *Journal of the American Medical Association*, who is himself a graduate of Queen's. Queen's University was established by a Royal Charter issued by Queen Victoria in 1841, its foundation being sponsored by the Presbyterian Church of Canada, which remained its legal owner for 71 years. Since 1913 there has been a corporation of trustees, staff, graduates, and benefactors, which receives substantial support from the government of Ontario and, more recently, Ottawa. There are some 4,000 students, of whom about one-tenth are medical.

Professorial Appointments at Sheffield.—Dr. D. H. Collins has been appointed to the Chair of Pathology at Sheffield in succession to Professor H. N. Green. Dr. Collins graduated from Liverpool in 1930, where he was subsequently junior lecturer in pathology. In 1934 he was appointed first Rheumatism Research Fellow in the University of Leeds. During the war Dr. Collins was in the Emergency Pathological Service. In October, 1946, he returned to Leeds as reader in clinical pathology, his present appointment. Dr. Collins is especially interested in diseases of the bone, and he has published a book on spinal disease. He is an assistant editor of the *Journal of Pathology and Bacteriology*. Professor Green has gone to Leeds to take up the Chair of Experimental Pathology.

Another professorial appointment at Sheffield is that of Dr. G. M. Wilson to the Chair of Pharmacology and Therapeutics, which becomes vacant at the end of this month as a result of Professor E. J. Wayne going to Glasgow as Regius Professor of the Practice of Medicine. Dr. Wilson graduated at Edinburgh in 1940, obtaining the M.D. with gold medal in 1950. During the war Dr. Wilson was in the

medical branch of the R.A.F., where he was a medical specialist. In 1947 he became an assistant to the medical unit at St. Mary's Hospital, London, and in 1950 went to Sheffield as lecturer in therapeutics. During 1952-3 he held an Eli Lilly travelling fellowship at Harvard University. Dr. Wilson's main publications have concerned the peripheral circulation and the part played by hormones in metabolic and cardiovascular disorders.

Silliman Lectures.—This year's Silliman Lectures at Yale University mark the fiftieth anniversary of the famous series given by Sir Charles Sherrington in 1904 which culminated in his classic *The Integrative Action of the Nervous System*. The lecturer this year is Professor Ragnar Granit, from Stockholm, whose subject is "Receptors and Sensory Perception." The lectures will be given on April 29 and 30 and May 3 to 7.

Vade-mecum on Transfusion.—Notes on Transfusion, a pamphlet intended primarily for the junior medical staff of hospitals, has been revised and reprinted. It is issued by the Ministry of Health on behalf of the National Blood Transfusion Service, and is distributed free of charge by regional boards and transfusion centres. In 16 pages the pamphlet gives concise and practical advice on the main difficulties that a houseman is likely to encounter. It deals with choice of fluid; storage of blood and plasma and criteria of fitness for use; volume and rate of transfusions; blood grouping and compatibility testing; administration of transfusions; transfusion records; complications and dangers of transfusion; investigation of transfusion reactions; and, lastly, the Rh factor.

Grants for Research at the Tavistock Clinic.—Dr. John Bowlby's work on the effects of separating young children from their mothers is receiving financial support from the following organizations: Trustees of Elmgrove (a private British fund—£1,650), European Office of W.H.O. in conjunction with the International Children's Centre, Paris (£3,900), and the Josiah Macy Jr. Foundation (£3,900 per annum for three years). The Foundations Fund for Research in Psychiatry (U.S.A.) has made a three-year grant of approximately £2,000 a year to Dr. H. Eziel for research on analytic technique. Both Dr. Bowlby and Dr. Eziel are working at the Tavistock Clinic, London.

Royal College of Surgeons in Ireland.—At the annual general meeting of the Association of Graduates, Royal College of Surgeons in Ireland, which was held recently in the College, the following officers were elected for the year 1954-5. *President*: Dr. J. D. H. Widdess; *Vice-President*: Dr. J. Lewis; *Hon. Secretaries*: Dr. P. C. D. MacClancy and Mr. T. O'Grady; *Hon. Treasurer*: Dr. D. Riordan.

Readerships at the Royal Free.—London University has announced the following appointments to University readerships tenable at the Royal Free Hospital School of Medicine: Dr. D. N. Baron to the readership in chemical pathology; and Dr. Eleanor J. Zaimis to the readership in pharmacology.

Family Doctor.—The April *Family Doctor* is now out. The main medical articles are on air travel (Sir Harold Whittingham), tuberculosis (by the secretary-general of the National Association for the Prevention of Tuberculosis, Dr. Harley Williams), hypertension (a continuation of Dr. W. C. Alvarez's series), hysterectomy ("There Need be No Fear about Hysterectomy"), blood transfusion—questions answered by Dr. R. A. Zeitlin, and the sensible use of the clinical thermometer (Dr. W. Edwards). The cover picture of a little girl in her bath is one of the best so far.

Sir Russell Brain, F.R.C.P., is to receive the honorary degree of D.C.L. of Durham University at Newcastle on July 3.

Dr. C. E. Dent, reader in medicine at University College Hospital Medical School, London, has been elected a Fellow of University College.

Mr. Michael Harty, F.R.C.S., has been appointed assistant professor of anatomy in the Graduate School of Medicine, University of Pennsylvania.

COMING EVENTS

Professor D. M. Dunlop will deliver the Lumleian Lectures on April 6 and 8 at 5 p.m. at the Royal College of Physicians. His subject will be "The Complications of Diabetes."

Association of Clinical Pathologists.—The 52nd general meeting will be held in Harrogate from April 8 to 10. Further information may be obtained from the honorary secretary of the association, Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, London, W.9.

Institute of Biology.—A meeting is to be held on April 21 and 22 at the Royal Geographical Society, Kensington Gore, London, S.W.7, to discuss the training of biologists. A programme will be available from the general secretary, Institute of Biology, Tavistock House South, Tavistock Square, London, W.C.1.

Dartford Hospital Group.—A refresher course intended for general practitioners will be held at the Southern Hospital, Dartford, weekly on Fridays from 3.30 p.m. to 6 p.m. from April 23 until July 2. Further information may be obtained from Dr. J. C. Hogarth, Southern Hospital, Dartford.

Wessex Rabere Club.—The spring dinner will take place at the Royal Clarence Hotel, Exeter, on April 24. Mr. H. Jackson Burrows will be the guest of honour. Further details may be obtained from Mr. A. Daunt Bateman, 11, The Circus, Bath.

Seminar on World Health Organization.—The World Federation of United Nations is holding a seminar, for doctors, public health workers, and medical students, on the work of W.H.O., from May 3 to 15 at Geneva. Those attending the seminar will be able to go to the meetings of the seventh World Health Assembly, which is taking place at the same time, as well as to lectures and discussions led by senior W.H.O. officials. Further details may be obtained from W.F.U.N.A., 1, Avenue de la Paix, Geneva.

International Diabetes Federation.—The second congress will be held in Cambridge from July 4 to 8, 1955. Sir Lionel Whitby will be honorary president of the meeting.

NEW ISSUES

Thorax.—The next issue (Vol. 9, No. 1) will be available in a week's time. The contents include:

THE TREATMENT OF PULMONARY TUBERCULOSIS IN ADULTS BY RESECTION. H. T. Thompson, T. Savage, and T. H. L. Rosser.
THE PRODUCTION OF PLEURAL ADHESIONS BY KAOLIN INJECTION. James Maxwell.
EBSTEIN'S DISEASE. W. E. Medd, M. B. Matthews, and W. R. R. Thurnfeldt.
NERVE SUPPLY TO THE CRURA OF THE DIAPHRAGM. J. Leigh Collis, L. M. Seichwell, and L. O. Abrams.
MALIGNANT CELLS IN SEROUS EFFUSIONS COMPLICATING BRONCHIAL CARCINOMA. Arthur J. Spriggs.
ENDOGENOUS LIPOID PNEUMONIA WITH SPECIAL REFERENCE TO CARCINOMA OF THE LUNG. S. De Navasquez and G. A. D. Haslewood.
AIR CONTAINING CYSTS OF LUNG. J. R. Belcher and A. H. M. Siddons.
PULMONARY MANIFESTATIONS IN THE DIFFUSE COLLAGEN DISEASES. Philip Ellman and L. Cudkovic.
LINGULAR BIOPSY IN MITRAL STENOSIS. J. B. Enticknap, B. B. Milstein, and Charles Baker.
A CRITICAL DISCUSSION OF THE RECORDED FORM OF THE FAST VITAL CAPACITY RECORD. L. Bernstein.
UNILATERAL ELEVATION OF THE DIAPHRAGM IN DYSTROPHIA MYOTONICA. J. E. Caughey and W. G. Gray.
A CLINICAL, RADIOGRAPHIC, AND PATHOLOGICAL STUDY OF PULMONARY EMBOLISM. J. C. Macleod and I. W. B. Grant.
INSTRUMENTAL PERFORATION OF THE OESOPHAGUS AND PERFORATED DUODENAL ULCER. James S. Davidson.
THE TREATMENT OF HYPERTROPHIC EMPHYSEMA BY PNEUMOPERITONEUM. Bertram Mann and Edmond A. Murphy.

Published quarterly; annual subscription £2 2s., single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Venereal Diseases.—The next issue (Vol. 30, No. 1) is now available.

Medical and Biological Illustration.—The next issue (Vol. 4, No. 1) will be available in a week's time.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, March 29

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor A. B. Nutt: Significance and Surgical Treatment of Congenital Ocular Palsies.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.15 p.m., Mr. Harold Edwards: Intestinal Diverticula.

Tuesday, March 30

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. R. French: Medico-Legal Problems and the Dermatologist.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. Harvey Jackson: Diagnosis and Treatment of Orbital Tumours; 6.30 p.m., Mr. C. P. Wilson: Malignant Disease of the Superior Maxilla.
● ROYAL SOCIETY OF ARTS.—5.15 p.m., Sir Arthur Porritt: Experiment of a State Medical Service in New Zealand.
ROYAL STATISTICAL SOCIETY: STUDY CIRCLE ON MEDICAL STATISTICS.—At Westminster Medical School, 6 p.m., Mr. N. T. J. Bailey: Queueing for Medical Care.
WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., neuro-radiological demonstration by Dr. D. Gordon.

Wednesday, March 31

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Cytodiagnosis in Dermatology.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. G. F. Rowbotham: Surgical Aspects of Injuries to the Head; 6.30 p.m., Professor A. M. Boyd: Claudication.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Mr. W. E. Tucker: Injuries in Sport.

Thursday, April 1

FACULTY OF HOMOEOPATHY.—5 p.m., Dr. J. C. Mackillop: Some Aspects of Homoeopathic Case-taking.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Mr. G. A. Mason: Diagnosis, Treatment, and Prognosis of Tumours of the Lung.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.30 p.m., Dr. Wilfrid G. Oakley: Diabetes in Surgery.
ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—5 p.m., Symposium: Photosensitivity. Speakers: Dr. W. N. Goldsmith, Professor C. Rimington, and Dr. A. D. Porter.

Friday, April 2

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.—Sir Francis Walsh, F.R.S.: Some Lessons Learned in Consulting Practice.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Professor T. Pomfret Kilner: Reproductive Surgery in the Treatment of Complications following Radiation; 6.30 p.m., Professor J. Trueta: Osteoarthritis of the Hip.
● SOCIETY OF CHEMICAL INDUSTRY: FINE CHEMICALS GROUP.—At King's College, Strand, W.C.2, 7 p.m., annual general meeting; 7.30 p.m., Dr. D. S. Morris: Chorea acrophthalmica.
WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Professor A. Wilson: Peculiar Prescriptions. Members of the South-west Essex Division, B.M.A., are invited.

Saturday, April 3

KENT PAEDIATRIC SOCIETY.—At Royal Star Hotel, Maidstone, 3 p.m., Sir William Hamilton Fyfe: Some Platitudes on Education.
MIDLAND TUBERCULOSIS SOCIETY.—Visit to St. Wulstan's Hospital, Malvern. Clinical meeting.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Happel.—On March 16, 1954, at Alton General Hospital, Alton, Hants, to Margaret, wife of Dr. John S. Happel, D.Obst.R.C.O.G., of Ropley, Alresford, Hants, a daughter—Susan Margaret.

DEATHS

Beane.—On March 5, 1954, at Moretonhampstead, Devon, Robert Leonard Beane, M.R.C.S., L.R.C.P., aged 87.
Cormack.—On February 27, 1954, at Nairobi, Kenya, Robert Fairman Cormack, O.B.E., M.B., Ch.B., D.T.M.&H., D.P.H., Brigadier (retired), R.A.M.C., late Senior Medical Officer, Colonial Medical Service, Kenya.
Cumming.—On March 3, 1954, at Springfield House, Sutton-on-Hull, East Yorks, John Cumming, M.B., C.M.
Farrant.—On March 3, 1954, at his home, Charles Farrant, D.S.O., T.D., M.R.C.S., L.R.C.P., of Boldre, Lymington, Hampshire.
Fraser.—On February 28, 1954, at Craigroyston, Strathpeffer, Ross-shire, John James Fraser, M.B., C.M., aged 87.
Gupta.—On January 31, 1954, Subodh Chandra Gupta, M.B., F.R.C.S.Ed., of Calcutta, India.
Hare.—On March 5, 1954, at Cheltenham, Glos., Edward Christian Hare, M.R.C.S., L.R.C.P., D.P.H., Lieutenant-Colonel, I.M.S., retired, aged 90.
Jackson.—On February 28, 1954, at Feock, Cornwall, Gordon Alexander Jackson, M.B., B.Ch., Surgeon Lieutenant-Commander, R.N., retired, aged 72.
Lyon-Smith.—On February 28, 1954, at his home, Spaxton, Bridgewater, Somerset, George Lyon Lyon-Smith, M.B., M.R.C.P., aged 61.
McGlasgow.—In February, 1954, John Thomas McGlasgow, M.B., Ch.B., of Canonbie, Dumfriesshire.
Thms.—On March 4, 1954, at Eldon House Nursing Home, Lower Bourne, Farnham, Surrey, Henry William Marcet Tims, O.B.E., M.D., aged 90.
Umney.—On March 3, 1954, at 9, The Knoll, Beckenham, Kent, William Francis Umney, M.D., aged 87.
White.—On March 2, 1954, at Merthyr Vale, Glamorgan, Charles Richardson White, D.S.O., T.D., M.D.
Yealland.—On March 2, 1954, at 103, Clarence Gate Gardens, London, N.W., Louis Ralph Yealland, M.D., F.R.C.P.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Bodies for Dissection

Q.—A patient wishes to leave his body for dissection, and has asked my advice on what steps he must take to do this. How should I answer him?

A.—Strictly speaking no one can bequeath his own body, for as soon as he dies the legal right to dispose of it passes to his next-of-kin or the executor of his will. The body can be sent to a medical school for anatomical dissection only if the near relatives agree. Accordingly, if your patient wishes his body to be used for this purpose he should: (a) Ascertain that no objection will be raised by his nearest relatives. (b) Place with his papers a written statement of his wish to benefit medical education in this way. (c) Apply for the necessary forms and instructions to H.M. Inspector of Anatomy, Anatomy Office, Ministry of Health, Savile Row, London, W.1.

All expenses connected with the removal and subsequent burial of the body are borne by the medical school concerned, but if anything more than the very simple funeral provided by the medical school is desired then the executor or next-of-kin is expected to meet the expenditure.

Screening Test for Anaemia

Q.—What are the details of the copper sulphate test which is used by the Blood Transfusion Service as a screening test for anaemia? How reliable is it?

A.—A range of solutions of copper sulphate are prepared as described by R. A. Phillips *et al.*,¹ each being of known specific gravity. These can then be used to estimate the specific gravity of plasma or whole blood in the following way.

A drop of the plasma or blood is dropped into the solution, where it becomes encased in a sac of copper proteinate. Its momentum carries it 1 to 2 cm. below the surface, but in about 5 seconds the momentum of the fall is lost and the drop then begins to rise, becomes stationary, or continues to fall. The gravity of the drop relative to that of the solution remains constant for another 10 to 15 seconds and during this time its behaviour is noted. If it is lighter than the standard it will rise, perhaps only a few millimetres, and may then sink immediately. If the drop remains stationary for a few seconds its gravity is the same as that of the test solution; if the drop is heavier, it continues to fall. From comparison of plasma specific gravities with protein concentration calculated from Kjeldahl analyses an equation can be derived which permits the determination of protein concentration in normal plasma with an error of less than 0.1 g. per 100 ml. plasma (D. D. Van Slyke *et al.*²). The difference between the specific gravities of whole blood and plasma can be used to calculate the blood haemoglobin concentration, and, if one assumes a normal plasma protein concentration, the specific gravity of whole blood can be used to measure the haemoglobin concentration. Van Slyke *et al.*,³ using the latter method on blood from normal individuals and from subjects with anaemia due to iron deficiency or blood loss and comparing the results with those of a precise gasometric method of haemoglobin determination, observed an error of ± 0.5 g. haemoglobin per 100 ml.

A screening test, using a copper sulphate solution of specific gravity 1.053, allows a separation of those with haemoglobin concentrations above 12.5 g. per 100 ml. of blood (that is, about 85% Haldane) from those with lower

concentrations. The accuracy of the method within the limits mentioned depends upon the close observance of certain points. The solution must be properly prepared. The surface film must be clean and free from fragments; occasionally a part of a drop of blood remains attached to the surface film and might interfere with the passage of subsequent drops. The drops must be free of even minute air bubbles, which would make them float. The solution must be allowed to reach room temperature before use; if the solutions are used while warming, convection currents may interfere with the determination. The difference in temperature between the copper sulphate and blood should not exceed 5° C.; however, the error caused by dropping blood immediately after collection from a syringe or capillary tube is very small, because when the drop enters the solution the drop approaches the temperature of the solution so rapidly that the effects of several degrees of initial difference are nearly eliminated. A volume of 100 ml. of the test solution should not be used for more than 50 determinations. The solution must not be allowed to evaporate, for obvious reasons.

The limits of accuracy of this test have also been the subject of a field investigation, the results of which correspond very closely to those of Van Slyke *et al.*, quoted above. It does, however, occasionally happen under field conditions that a few donors are rejected who have in fact concentrations of haemoglobin above the limiting values.

This test is used by transfusion services in many parts of the world and has proved to be a reliable method for rapid examination of large numbers of individuals. Those persons whose haemoglobin concentration is shown by the copper sulphate test to be in the region of, or below, the critical level are usually tested by another method.

REFERENCES

- 1 J. Biol. Chem., 1950, 183, 305.
- 2 Ibid., 1950, 183, 331.
- 3 Ibid., 1950, 183, 349.

Treatment of Still's Disease

Q.—In what way does the treatment of rheumatoid arthritis in children (Still's disease) differ from that of adults? Is hormone therapy particularly indicated in children?

A.—The principles to be observed in treating children with rheumatoid arthritis are no different from those to be followed in adults, but there are many small differences in their application. The major factors in successful treatment of both children and adults are five in number: (1) care of general health, (2) relief of pain by suitable analgesics, (3) maintenance of muscle tone and joint movement by active and passive exercises preceded by heat, with assistance by the masseuse or in a therapeutic pool, (4) prevention of deformity by adequate splinting, and (5) the maintenance of function and morale by adequate employment.

Deformities occur very rapidly in children, and once knee contracture has developed it may take many years of orthopaedic endeavour to regain even limited function. It is most important, therefore, to avoid absolute immobilization, and even in patients who are running considerable fever we endeavour to control this with salicylates and keep the children up and moving about for at least a short time every day. During rest periods, splints are necessary.

There is no specific cure for rheumatoid arthritis either in children or in adults; salicylates in various forms, phenylbutazone, cortisone, hydrocortisone, and corticotrophin (A.C.T.H.) are all useful for diminishing pain and increasing function in conjunction with a regime planned along the lines outlined above. Hormone therapy will sometimes bring a child back to a point where he can lead a normal life and, less frequently, maintain him at that level for a long period of years. It is a little too early yet to know whether these results are better in the long run than those obtained with agents such as salicylates. Hormone therapy is particularly indicated in children who do not respond adequately to the usual regime or whose disease for some

reason or the other has become more active, possibly as the result of an infection or trauma. In view of the slightly better prognosis in children compared with that in adults, it might be maintained that hormones are particularly useful in children.

Multiple Meibomian Cysts in Children

Q.—A girl, aged 4½, since birth has had no less than eight Meibomian cysts removed from all four eyelids at various times. What can be done to prevent their formation?

A.—Children do sometimes suffer from repeated Meibomian cysts. In some instances marginal blepharitis appears to predispose to these cysts. Therefore the lid margins should be kept clear of dried secretion. If no blepharitis can be detected, there is no method of successful prophylaxis, but spontaneous cessation is the rule, and the eyelids hardly ever show any lasting damage from the cysts.

NOTES AND COMMENTS

Pharaoh's Ants.—Mr. H. E. Cox (Infestation Control Division of the Ministry of Agriculture and Fisheries, Hook Rise, Tolworth, Surbiton, Surrey) writes: We were pleased to see the publicity given to the treatment of a hospital infestation of Pharaoh's ant (*Monomorium pharaonis* L.) with chlordane ("Any Questions?" February 20, p. 471). We are in full agreement with the information given in your answer. We hope it would not be out of place for us to suggest that it might be emphasized that not only is treatment with chlordane an efficient control of Pharaoh's ant, and also for cockroaches, which are a common infestation of hospitals, but that the use of chlordane is an easy process. It is only too likely that the attitude of hospitals to infestations of Pharaoh's ant in the past has been rather controlled by the difficulties of the treatments recommended, which, although effective, require poison baiting with a prebaiting technique. No doubt the staff responsible for carry-out treatments in the past found it a tiresome process, with the inevitable result. We are always ready to give advice, particularly in difficult cases.

Phenylbutazone and Pulmonary Tuberculosis.—Dr. W. S. Wilson (Huddersfield) writes: Your answer to this question states that there is no contraindication to therapy ("Any Questions?" February 20, p. 471). About a year ago you published a letter of mine relating to the possible toxic effect of this drug in tuberculosis. The patient was given phenylbutazone for a severe ankylosing spondylitis; on investigation for the latter complaint, an old-standing "quiescent" tuberculosis of the lung was discovered. After about four to six weeks' treatment with phenylbutazone, there was an acute flare-up of the tuberculosis. Although absolute proof is lacking, it is difficult to ignore the clinical impression of phenylbutazone toxicity in this case.

REFERENCE

- 1 British Medical Journal, 1953, 1, 1388.

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THE CONJOINED TWINS OF KANO

BY

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(WITH SPECIAL PLATE)

The term "conjoined (Siamese) twins" is usually applied to twins who are united bodily but possessed of separate personalities. It has therefore been used to include a great variety of twins monstrously joined, and has included partners who have shared various combinations of trunk and limbs. Those of surgical interest include the so-called "symmetrical conjoined twins," though this term is perhaps unfortunate in that conjoined twins are seldom completely symmetrical; they differ from each other usually to some degree in appearance, and their internal organs may partly or wholly each be a mirror image rather than a replica of their partner's.

Formation of Conjoined Twins

It is usually assumed that conjoined twins are monovular and due to fission of an embryo. If fission occurs at the stage of the inner cell mass before the embryonic disk has separated, separate twins result. If the twinning occurs after separation of the embryonic disk, there is only one amniotic sac. If the centres of axial growth are at this stage far enough apart there are separate twins in a single amniotic sac. If the centres of growth were not sufficiently separate the intermediate area between the two centres of axial growth might be shared and conjoined twins result (Potter, 1952).

It has never been completely proved that conjoined twins are in fact monovular. It is conceivable that separate twins might become joined from fusion of the closing edges of the neural grooves, for example, or from fusion of some other epithelial surfaces with their underlying mesodermal masses; but this would require disappearance of intervening amnion, a rare accident, as well as fusion of the twins. It is certainly curious that conjoined twins always differ from each other slightly in size and appearance, and are seldom so precisely identical as separate monovular twins are. Seventy-three per cent. of conjoined twins exhibit mirror imaging, while separate one-egg twins show this abnormality in only 22%, the mirror imaging taking the form of a degree of *sinus inversus viscerum*, which has never been explained satisfactorily. I have a record, obtained directly from a traveller, of Chinese conjoined twins, one of whom was a eunuch. There is also a report of twins joined at the pelvis, one of whom suffered from hypertension (Jones *et al.*, 1948). In one reported pair there was a hare-lip deformity in the case of one only, and, as in the Townsend twins of Alberta (Allin, 1953), the heart is often normal in one twin but the seat of Fallot's tetralogy or some other congenital cardiac defect

in the other. In this connexion it should, however, be remembered that in parabiosis of any kind one partner always becomes dominant. If two identical twins from a normal litter are artificially joined by parabiosis one almost invariably outgrows the other, contributing more to the total organism and taking more from the total organism than its partner. If conjoined twins were ever the result of the fusion of binovular embryos it would be likely that on some occasion a blood-group chimera would occur; this has never been demonstrated, but it apparently has never been sought.

Types of Twins

Conjoined twins may take the form of an *omphalopagus* (joined at the navel); a *xiphopagus* (joined at the lower sternum); a *thoracopagus* (joined in the chest); a *craniopagus* (joined by the heads); or a *pygopagus* (joined at the pelvis). The bridge of fusion may include an important internal organ. An *omphalopagus* may have a fusion of the two small intestines, or of the stomach, or of the liver. A *craniopagus* may have the two brains joined by a bridge of nervous tissue. When union is at the pelvis, urogenital organs may be shared, or if union is at the sacrum the spinal cords may be single at the level of the union. Rarely, one twin is included in the body cavity of the other as an "included foetus" (Farris and Bishop, 1950).

The frequency of occurrence of conjoined twins is difficult to ascertain. Potter reports one specimen of symmetrical joined twins in the Chicago Lying-in Hospital in 60,000 deliveries; during the same period there was no example of such union in embryos or foetuses. The frequency of reports of conjoined twins is increasing, but it would seem that this is due to the increasing accessibility of very large populations in Asia and Africa, to the greater possibility of the successful birth of conjoined twins in improved modern obstetrical circumstances, and to the lessening likelihood now of conjoined twins being sacrificed as monsters at birth. My belief is that we may expect each year, over the world as a whole, the birth of half a dozen or more conjoined twins capable of separation. A number of survivors from the operation of separation of Siamese twins have come to my notice in the past few months, and not all of these have been reported in the medical press.

Only a minority of conjoined twins seem to cause dystocia, though at least one case of obstructed labour from this cause is reported (Roxburgh, 1946).

Some Historical Examples

A number of conjoined twins have become historically famous. The earliest case on record seems to be that of the "Biddenden Maids" born in A.D. 1100 in England, united from hips to shoulders and with only one pair of upper and one pair of lower extremities shared between them. The "Florentine Twins," born in the fourteenth century and the subject of a bas-relief in the Church of La Scala and of a sonnet of Petrarch's, seem to have had three lower extremities between them and three upper, though successive mediaeval authors vary in their descriptions and illustrations (Belloni, 1950). The "Scottish Brothers," joined from the waist down but separate above it, lived for 28 years at the Court of James III of Scotland in the latter part of the fifteenth century. The opposite abnormality—one head and chest and a double abdomen and pelvis, with four inferior extremities—has also been described (Rohrbach, 1950). In the sixteenth century female conjoined twins with three legs, the central one equipped with ten toes, lived at Middleton, in England (Rueff, 1554), and during the same century there was a similar monster, carrying, however, only five toes on each of the three lower extremities, alive at Viaban in France. The "Hungarian Sisters" were born at Szorny in 1701 and survived in a convent for 22 years. The famous "Siamese Twins," Chang and Eng (1811–74), have been fully documented elsewhere (Luckhardt, 1941). Born of Chinese parents in Siam in 1811 as a xiphopagus, they were discovered at the age of 13 by a British merchant. Removed to North America, they were shown in his circus by Barnum, married English sisters, and settled down as farmers in North Carolina under the name of Bunker. As in the case of most other conjoined twins, when one died the other refused separation. Other conjoined twins include the "Sardinian Sisters" (1829–?), the Negro slave sisters Millie-Christine (1851–?), the "Bohemian Sisters" Rosa-Josepha Blazek (1878–1922), and many subsequent examples (Newman, 1942). There are at least three dozen fully documented instances in the literature of conjoined twins born alive. Hindu twins, Guarabai and Guaganbai, were on exhibition at the Paris Exposition of 1931. The Godino twins, born in the Philippines, applied for United States' citizenship. They were perplexed when the official response to their application was a warning that military service would be required of them; their sacral junction would have rendered it impossible for them both to have obeyed marching orders simultaneously (*N.Y. St. J. Med.*, 1937).

Previous Operations

Scammon (1925) recorded and described the operations performed for the separation of conjoined twins, including that performed by Doyen in 1902 for the separation of the Radica-Doodica sisters, one of whom had developed active tuberculosis: the tuberculous sister died, but the healthy survived. The earliest attempt at surgical separation is said to have been made by Dr. Farius, of Basle, in 1689, but I have not traced the record of this operation.

In October, 1912, conjoined twins were successfully separated at the Military Families Hospital, Portsmouth, by a R.A.M.C. officer whose name cannot now be traced. One of the sisters of this pair is alive to-day, age 41, and the scar of her operation can be seen on the lateral aspect of the hip. The other sister died of pneumonia at the age of 4 months, but there are no records to show whether or not she in fact had congenital heart disease. This would appear to be the first successful separation of conjoined twins.

Dr. Holm, of Minnesota, successfully separated conjoined twins joined by the xiphoid cartilage on January 8, 1927, and they were alive and well nine years later (Holm, 1936). Dr. D. W. McLaren (1936) also successfully separated conjoined twins of a Hausa woman in the Sokoto Emirate of Nigeria on June 16, 1935, and the separated twins are alive and well to-day (McLaren, 1953). Here again the junction was of skin, subcutaneous tissue, and cartilage at the level of the xiphoid process. Three further separations were recorded last year in America in the medical and lay press. In one of these (Carolyn Anne and Catherine Anne Mouton) the junction was pelvic and both girls survived, one with an artificial anus. The second example, in Cleveland, Ohio, was a separation of twins joined by cartilage at the xiphisternum, both again surviving (Reitman *et al.*, 1953), and the third (Grossman *et al.*, 1953) was a craniopagus, with a common sagittal sinus which necessitated the sacrifice of one child, the other surviving. In 1953 a craniopagus was born in Bonn, Germany, but operation was, I understand, refused. A xiphopagus born in Molenend in Friesland awaits operation. A thoracopagus born in Greenock, Scotland, on March 20, 1954, survived for rather more than a day, and conjoined twins born in Hamburg, Germany, on the same day, are still alive at the time of writing.

Hazards of Operation

Surgical success is most likely to be obtained when the union between conjoined twins is only of skin, subcutaneous tissue, and perhaps cartilage. I have recently been informed of several cases in which an umbilical junction of minor extent has been successfully separated just after birth and the event not thought worthy of medical record. The chance of success should also be high in twins joined at the xiphisternum by skin and cartilage only. Where a vital organ is shared—the liver or the brain—the division of that organ may render operation hazardous. The Edendale twins shared a common ileum (Tibbit, 1951). Pelvic junctions also offer particular difficulties, for frequently the generative organs, urethra, or rectum may be single (Fox and Barnes, 1950), or may be so closely associated with each other that surgical separation is extremely difficult. Sacral unions can be divided often only with sacrifice of one spinal cord at that level. Cranial unions may involve the division of brain substance (Smellie and Starr, 1950), or the loss to one infant of a blood vessel vital to the survival of its brain. In any event, and however great the risk of the death of one or both children, it would seem that operation should nearly always be undertaken if the children are known each to have a full complement of the organs and tissues necessary for separate life. In very extensive union there may be no prospect at all of separation, as in those historical monsters who lack a full complement of limbs, or who share a single pelvis or an even more extensive length of trunk.

In the case of a stillborn premature thoracopagus which I had an opportunity to dissect in February, 1954, by the courtesy of Dr. T. K. Owen, of Bournemouth, union was exceedingly complex. A bridge extended from just below the chin to the navel and the chest cavities and abdominal cavities were shared. Each foetus had a mouth, pharynx, and larynx, but there were a single oesophagus, stomach, duodenum, and small intestine down to the level of Meckel's diverticulum; here there was a dilatation from which the lower ileum passed to each foetus, and each foetus had a complete colon. There were only one heart and thoracic aorta, and one liver—a misshapen organ lying vertically in the middle of the bridge with only one common bile duct and portal vein, and with one pair of hepatic veins. The urinary tracts were normal and separate. There was a single trachea terminating in an arborization of bronchi which ended blindly, and the lungs were represented by multiple islands of solid tissue which had no communication with the bronchi. Such monsters could in no circumstances have survived to live separately.

The diagnosis of conjunction, usually made during labour, has only twice been made before labour has begun (Graber, 1945; Becker, 1950).

IAN AIRD: THE CONJOINED TWINS OF KANO



FIG. 1.—Photograph of conjoined twins showing hernia of common umbilicus. (Copyright reserved.)



FIG. 2.—Investigating finger invaginating hernia into peritoneal cavity. (Copyright reserved.)



FIG. 3.—Lower part of "bridge" joining twins. (Copyright reserved.)



FIG. 4.—Barium meal filling stomach. (Copyright reserved.)



FIG. 5.—Barium meal showing small intestine. (Copyright reserved.)

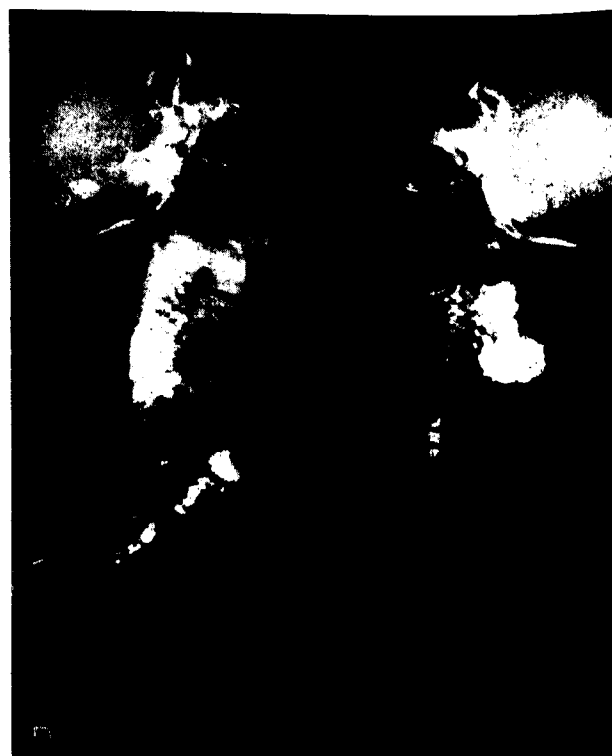


FIG. 6.—Barium meal showing colon and rectum. (Copyright reserved.)



FIG. 7.—Photograph of surviving twin. (Copyright reserved.)



FIG. 8.—X-ray film of surviving twin showing dextro-rotation of the heart. (Copyright reserved.)

On March 22, 1954, a thoracopagus was born at Hastings, Sussex. The mother's previous obstetric history was of a miscarriage at 12 weeks gestation in 1947 and a full-time pregnancy in 1949. There was a history that the paternal grandmother had had three sets of normal twins. There was a pre-natal diagnosis of twins, both presenting by the head. Labour began at term on March 22. One head presented at the vulva next morning, but further progress was arrested and traction was in vain. The presenting baby died during these efforts to deliver it. The obstetrician (Mr. John F. Foulkes) was summoned, and his examination revealed the presence of conjoined twins. In view of their size delivery by the abdominal route was undertaken and accomplished, both babies being now dead. The mother has made a good recovery.

These twins were joined from the sternum at the level of the third costal cartilage to the umbilicus. The lower part of the communicating bridge took the form of a substantial exomphalos through the wall of which four umbilical veins, one pair on each aspect of the bridge, could be seen passing from a single placenta, diverging from each other on each aspect of the bridge and coursing together again, appearing to join at the edge of the exomphalos. Dissection of the specimen showed that each infant had an oesophagus and stomach, but that the two pyloric canals entered a single duodenum which was continued as a single small intestine to a point about half-way along the small intestine, where there was a pouch resembling a Meckel's diverticulum, though placed at a much higher level than usual; and from this pouch two separate enteric channels continued, one to each infant. The large intestines were normal. The liver was joined and no gall-bladders could be found. There appeared to be two sets of bile passages and each infant had a pancreas. A single heart, anatomically abnormal in a complex way, served both infants, and only one of the infants was possessed of an aorta. In the other infant no vessel or vessels suitable to take the place of the aorta could be found. These infants, though externally not substantially dissimilar to the conjoined twins of Kano, could not have been separated with any hope of the survival of both, and it seems unlikely that even one of them would have survived operative intervention. The complexity of their union shows the need for the most extensive possible investigation before the surgical separation of conjoined twins is attempted.

The Kano Twins

The conjoined twins which are the subject of the present paper were born in Kano, Nigeria, to a mother of Ibo race, on July 25, 1953. They were rotated at birth with respect to each other; one presented as a vertex, the other as a breech. A diagnosis of plural birth had not been made. The twins were successfully and safely delivered by a pupil midwife. Their weight at birth was 7 lb. 13 oz. (3.5 kg.) They were nursed at the breast, the mother learning to support them both in a suitable position for feeding together.

X-ray examination after the feeding of barium to one twin showed already while they were in Nigeria that the alimentary tracts were separate.

The twins were admitted to Hammersmith Hospital on Friday, November 13, 1953. Both were then in good health, and their joint weight was 19 lb. 1 oz. (8.7 kg.). One twin, Wariboko, was noticeably larger and more active than the other, Tomunotonye, and the facial appearance of each was quite distinct. They were not in the literal sense identical even though presumably uniovular.

The twins were joined by a bridge which extended from the sixth costal cartilage to the navel. The bridge was 14 cm. in its long vertical diameter and 37 cm. in circumference. There were a single common navel and an umbilical hernia which depended from the lowest part of the bridge (Fig. 1). This hernia could be invaginated, the invaginating finger passing easily into both peritoneal cavities (Fig. 2), which showed that the peritoneal cavities communicated at least in

the lower part of the bridge. There was a firm ring of muscle around the neck of the hernia, which admitted two fingers, and it thus seemed certain that the bridge had a substantial muscle wall in its greater part. In its lower part the bridge could be compressed between finger and thumb (Fig. 3) so that its two walls met. In its uppermost part the bridge contained a hard tissue which was deduced to be cartilage: it seemed to arch over the upper part of the bridge formed by the fusion of the sixth, seventh, and eighth costal cartilages, and the lower part of the sternum. Even below palpable cartilage the bridge could not be fully compressed in its upper half.

A heart beat could be heard over the chest of each child, but it was impossible on auscultation to decide whether the beat was separate. The children breathed in unison and consequently sucked synchronously when fed. This was a matter at first of some apprehension, in case the diaphragms should be extensively intermingled and the pericardial cavities perhaps in communication with each other. It was then recalled, however, that animals artificially joined in parabiosis breathe synchronously, apparently as a matter of convenience, and it was hoped that synchronous breathing was a matter of convenience in these twins rather than a sign of seriously extensive anatomical union of their respiratory organs. It is perhaps of psychological interest that each infant sucked her own and her sister's thumb almost indiscriminately and with equal and mutual satisfaction.

A series of special investigations was undertaken to decide whether operative separation afforded any prospect of success.

X-ray Examination

A straight x-ray film failed to demonstrate visibly the cartilage bridge between sternums and ribs. (This feature can be seen in Figs. 4, 5, and 6.) Both spines were lordotic from the infants constantly straining away from each other, and the sternums both sloped forward towards each other from the upper to the lower ends. The heart shadows were clearly separate from each other. In repeated x-ray examinations the intestines filled the lower part of the bridge, but in none of the very numerous plates were hollow viscera seen to occupy the upper third of the bridge. In the very uppermost parts of the bridge a clear gap was observed between the two livers and the outlines of the opposing faces of the two livers were thought to be distinguishable; yet there remained a rather hazy shadow between these two outlines, and a bridge of liver tissue crossing from one infant to the other could not be excluded.

An opaque-meal examination was undertaken in Nigeria, barium being fed to one infant. This showed clearly that stomach (Fig. 4), small intestine (Fig. 5), and colon and rectum (Fig. 6) were separate for each child. It showed in addition that the pylorus of one child lay at least 3 in. (7.6 cm.) from the pylorus of the other, and therefore it was assumed that the two duodenum were substantially separate from each other, and consequently that at least the lower ends of the common ducts were separate too.

Cholecystography was next performed. The gall-bladders were both visible, well separate from each other. Consequently it was deduced that the common ducts must be separate at their upper ends and, since their lower ends were also considered above to be separate, presumably throughout their whole length. It was assumed that if the bile ducts were separate the portal veins would be separate also.

Intravenous pyelogram was performed at the same time as blood and circulation studies were done in order to preserve at least one great saphenous vein in each baby to be used for transfusion at the time of operation. An intravenous catheter was in each infant passed by way of the saphenous vein into the common iliac vein. A pyelogram showed that each infant had two kidneys placed well back in the paravertebral region. From this it was deduced that the renal arteries, and probably therefore the aortas, were in their

normal situations. Anomalies of the great vessels are frequent in conjoined twins and a common ventral aorta was to be feared. The pyelogram seemed to exclude this particular danger. The bladders were well outlined, separate from each other, and there was no visible junctional canal between them, as might be found by the union of one allantois with the other.

Electrocardiography

Electrocardiographic studies were undertaken by Dr. T. Counihan. They proved to be of special cardiological interest sufficient to require separate description, and Dr. Counihan's description of the electrocardiographic changes and discussion of their implications will be described in a separate paper. The individual electrocardiographs of both children were essentially normal. In the joint electrocardiograph (Fig. A) the Wariboko complex was inverted, and

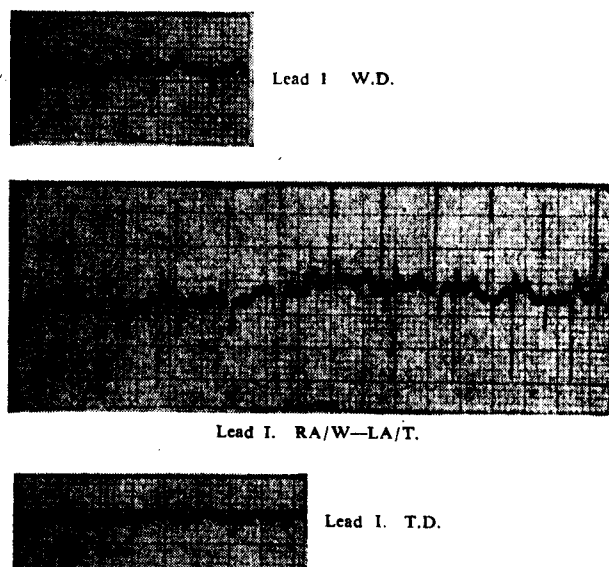


FIG. A.—Joint electrocardiograph. Wariboko complex inverted. Heart rates different.

this infant was shown later to have a dextro-rotation of the heart. This joint tracing showed clearly that the heart rates were different.

Investigation with Radio-isotopes

Mr. N. Veall, formerly of the Radiotherapy Unit, and Dr. P. L. Mollison, of the Transfusion Research Unit, of the Medical Research Council, both situated in Hammersmith Hospital, undertook a study of the circulatory connexion between the two infants: A known dose of radioactive red cells was injected by intravenous catheter into twin I. Gradually the injected cells, circulating across the bridge, mixed with the circulating blood of twin II. The concentration of radioactive blood in twin I consequently gradually fell, and the concentration of radioactive blood in twin II, as measured in successive specimens by Geiger-Müller counter, gradually rose, until equilibrium was reached with complete mixing. From the rate at which the proportion of radioactive cells in twin II increased the rate of blood flow across the bridge could be deduced. Mr. Veall prepared a graph (Fig. B) which showed the rise in radioactivity in the blood of infant II and the fall in that of infant I. The curve is, as was expected, an exponential one, but it will be seen that there is a slight time-lag in the early part of the curve. This would be compatible with the blood in the injected infant having to complete nearly the whole circle of the circulation, passing through not only pulmonary and systemic capillary beds but also the hepatic

sinusoid bed before crossing the bridge. Mr. Veall's curve shows that complete mixing was obtained in 29 minutes, and half-mixing was reached in 5 minutes. The logarithmic curve and formula for determining the rate of crossing is given in Fig. C. It is thought desirable here to publish Mr. Veall's pre-operative report in full.

Consider two tanks A and B each having an equal volume V ml. They are connected together so that there is a flow of

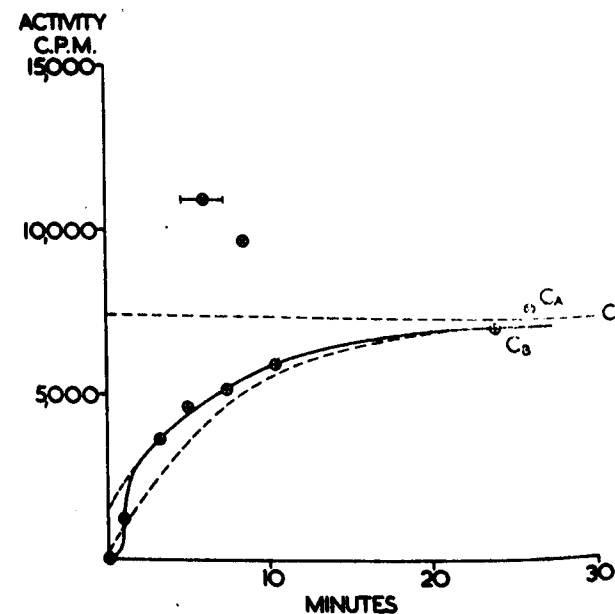


FIG. B.—Graph showing rise in radioactivity in blood of infant II and fall in infant I.

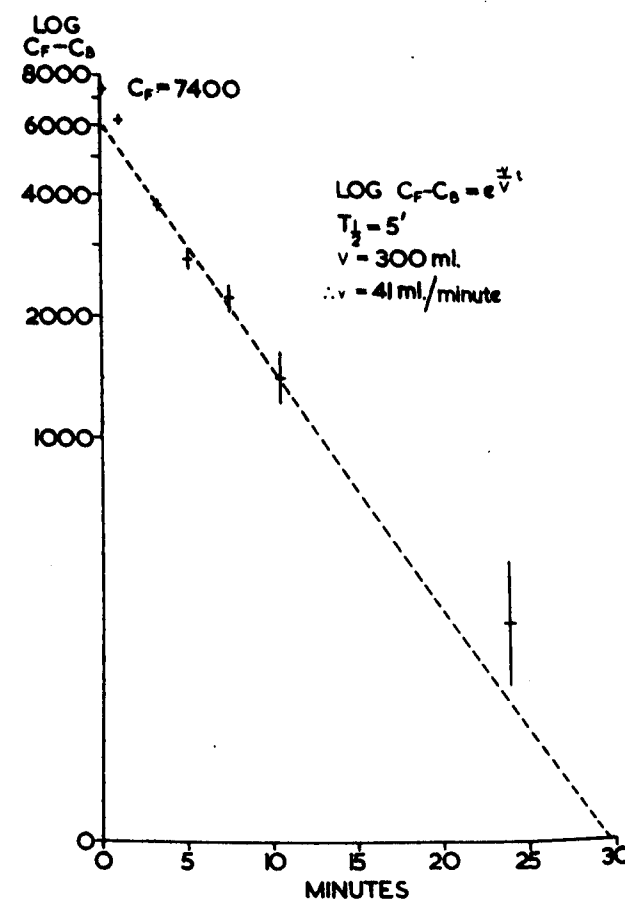


FIG. C.—Logarithmic curve and formula for determining the rate of crossing.

v ml./minute between them. A marker substance is added to tank A and its concentration C is measured in both tanks as a function of time. Assuming perfect mixing, the concentration of the marker in each tank is given by the equations:

$$(1) C_A = C_F (1 + e^{-\frac{v}{V}t}); \text{ and } (2) C_B = C_F (1 - e^{-\frac{v}{V}t})$$

where C_F is the final equilibrium concentration after mixing is complete. The two curves have the form shown in Fig. B, one being the mirror image of the other. By plotting the logarithms of either $(C_A - C_F)$ or $(C_F - C_B)$ against time a straight line is obtained (Fig. C), whose slope gives the value of the ratio v/V . Finally the volume V can be calculated from the value of C_F and a knowledge of the amount of marker added, so that the flow v can be calculated.

Two assumptions were made:

(1) That the blood volumes of the infants were equal: this assumption greatly simplifies the mathematical treatment and within the limits of the experimental data available appears to be reasonable.

(2) That there is perfect mixing: in the first two or three minutes this is certainly not true, so the very early points cannot be relied on for determining the slope of the logarithmic plot.

Injection of labelled red cells was made into infant I. Only two well-timed samples were obtained from that infant, and one sample which was uncertain because of catheter blockage. Six well-timed samples were obtained from infant II, and these gave a value for the ratio of v/V of about 1/7. The one-minute sample was ignored for this purpose (see assumption (2) above). A reliable value of C_F was obtained by means of samples from both infants when mixing was almost complete. This gave a combined blood volume, using the normal procedure and corrections, of 600 ml. for the thoracopagus, whence V (blood volume of each twin) equals 300 ml. Hence the blood flow, v , between the two infants is 40 ml. per minute in each direction. This figure is thought to be accurate to within $\pm 10\%$.

It will be seen that the actual points in figure B, except for the first and the last, do not fit the exponential curve which suits a half period of five minutes; the other points can be fitted by another exponential curve which extrapolates back to a value of 1,400 c.p.m. instead of zero. It is therefore necessary to account for a relatively sudden influx of labelled red cells, sufficient to increase the activity of the blood in infant II by about 1,400 c.p.m. and occurring at about one minute after injection.

A reasonable interpretation of this phenomenon would be as follows:

Assume that one-third of the cardiac output (blood volume) passes to the liver—that is, 100 ml. When the labelled red cells are injected no appreciable mixing will have occurred, and one-third of the labelled red cells will pass into the liver circulation of infant I as a wave. If 30 ml. of the liver flow then passes directly to the liver from infant II, and thence into the circulation, then the effective increase in concentration in infant II will be given by $14,800 \times \frac{1}{3} \times 0.3 = 1,500$ c.p.m.

This effect takes about one minute to manifest itself at the sampling point, a time consistent with the length of the circuit involved.

If the above assumption about liver flow is true a completely common liver circulation, with a common portal vein, would give about 50/50 partition. The implication of the figures obtained is that about 60% of the liver tissue is shared.

It thus emerged from the circulation studies that 41 ml. per minute of blood crossed the bridge in each direction. It was a guess that perhaps 5 to 10 ml. per minute might cross in the skin and muscle of the bridge. There was thus 30 to 35 ml. per minute to account for by a cross-circulation in some tissue other than skin and muscle. Assuming the liver circulation to be one-third of the total circulation it might be taken that 100 ml. per minute passed to each liver, or to each half of a shared liver. For 30 to 35 ml. to cross the bridge in each direction by way of the liver would mean that there was substantial mixing in the central 60% to 70% of a shared liver. The presumption that liver lay in the bridge was thus extremely strong.

Decision to Operate

The investigations seemed to show that both infants were fully equipped with all the organs necessary for separate life. It was not possible to predict whether the separate organs

would necessarily function adequately after separation, but it was unfortunately not anticipated at this point that one of the pair might be contributing more, and one less, than the other to the total endocrine production. The only hazard of operation would seem to be the liver union which was confidently predicted; but this was not felt to be an insoluble barrier, though division of a common liver might well add to the shock of the operation. There was no previous record of the successful separation of twins so extensively conjoined. The investigations seemed to have shown that the portal veins and common bile ducts were separate. It was decided to operate without further loss of time to avoid increasing the spinal lordosis and the forward angling of the sternums.

The Operation

The mother was prepared for operation in case a vein or fascia graft or temporary skin cover by homograft should be required.

INSTRUMENTS

Only two special instruments were included in our armamentarium, a liver tourniquet of fine soft rubber (Penrose) tubing, as used by Dr. Allin, of Edmonton, who lent his film of a previous separation, and Schumacher intestinal clamps for application to the liver bridge if it was narrow enough.

ANAESTHESIA

Since the vascular communication across the bridge gave complete mixing of the twins' blood only after 29 minutes it was obvious that both must be separately anaesthetized, and two anaesthetic teams were arranged. Nitrous oxide and oxygen anaesthesia was chosen, and each infant was to be separately intubated and to be anaesthetized by means of a separate anaesthetic apparatus.

For an operation of such magnitude on babies so young blood transfusion was obviously essential, and Dr. P. L. Mollison, Director of the Medical Research Council Transfusion Research Unit, catheterized the remaining saphenous veins so that transfusion would be entirely dependable.

The twins were placed on an operating table with the headpieces and footpieces dropped, and the double anaesthetic was induced without difficulty. A remarkable phenomenon was observed during the induction of anaesthesia. As has already been stated, the respiration of the twins before operation was synchronous. As the induction of anaesthesia proceeded, and while the children were breathing still voluntarily, each through its own anaesthetic apparatus, the character of the breathing changed, and a kind of saw-saw respiration developed, one baby inspiring as the other exhaled. Gradually the tempo of respiration again changed, until each settled down at its own pace. The explanation of these respiratory changes must be exceedingly complex. Once induction was complete intubation proceeded and was effected without difficulty.

TOWELLING THE TWINS

The special arrangements for towelling were learnt also from the Canadian film. A team of nurses supported the twins horizontally over the operating table and well clear of it, while the skin of the whole trunk of each, and of the bridge between them, was cleaned. A series of four towels were then applied to the babies, one towel wrapping the head and upper chest of each, and the others the lower extremities. The towelled babies were then placed on the operation table. Two surgical teams were in readiness, each consisting of surgeon, assistant, and instrument nurses, the two surgeons to separate the twins and then each to conduct one closure. Other specialists were additionally available to advise in the solution of unexpected problems in particular fields, and an anatomist to help unravel internal anatomi-

cal abnormalities, especially the complicated and varied venous plexuses sometimes present in such twins on the under surface of the liver.

INITIAL PHASES

It was decided first to explore the bridge directly through its presenting obverse surface, the incision being made initially from the cartilage bridge to the navel. The alternative would have been to start at the lower limit of the bridge, dividing the parietes on both obverse and reverse aspects, and closing the two abdomens from below upwards *pari passu* with the division. This might have been less shocking, but would have been clumsy and slow, and control of escaping viscera might have been awkward. The anterior approach to the abdominal cavity and to the liver, leaving the parietes on the far side undivided until the end of the operation, would, it was thought, permit the intestines to be easily packed off throughout the whole period of operation. The number of hands in the operation field was restricted to four, which ought to be sufficient for control of the abdominal contents and for retraction. A multiplicity of hands is a hindrance in the neighbourhood of so small a wound.

The skin having been divided, a reasonably thick sheet of abdominal muscle presented, equal to the whole thickness of the normal infantile abdominal wall, though not separated in layers. When this was divided, peritoneum appeared in the lower part of the wound and the liver bridge could be detected in the upper part. A cushion pad of suitable size inserted under the bridge was now found to enhance the exposure substantially.

Since it was known that there was a common peritoneal cavity, extending at least across the lower part of the bridge, where the hernia could be invaginated, the peritoneal cavity was first opened here. It was now clear that the peritoneal cavities communicated only at the lowest extremity of the bridge in the neighbourhood of the hernia. The peritoneal incision had in fact entered the peritoneal cavity of baby I. It was extended now up as far as the liver, and it was clear that the peritoneal cavities communicated freely below, but above were separated by a slender dividing veil which stretched across the whole thickness of the bridge. The peritoneal cavity of baby II was now opened in the same way.

The intestines were now packed off carefully, the packs being inserted along the surface of the peritoneal partition to reach the abdominal wall on the far side of the bridge. The nature of the peritoneal partition was now clear. Above, it was attached to the liver; and inferiorly it had a crescentic edge concave downwards. Its attachment to the near and far walls of the bridge extended down to the navel, and to its surfaces were attached the falciform ligaments. The upper part of this partition, just below its attachment to the liver, was now divided, together with the falciform ligaments. There was the expected plexus of veins in relation to the under surface of the liver and the falciform ligaments, but this gave less trouble than was expected. Care was nevertheless taken to clamp carefully the peritoneal folds of the liver before their division.

THE LIVER

It was now clear that the central part of the common liver could not be satisfactorily exposed for division until the bridge of cartilage which crossed from one chest wall to the other had been at least partly divided. It proved to take the form literally of a bridge or arch, being concave downwards in the coronal plane and forming a cartilage roof over the upper part of the common liver. It cut easily with the knife, but was really so rigid that it was surprising to recollect that the babies had been twisted through 90 degrees at birth. After the bridge had been divided to a point beyond its summit, the remaining cartilage on the far side yielded sufficiently for a much better view of the liver to be obtained. Care was taken not to distract the two infants

from each other. It was felt that stretching of the liver after the loss of its cartilage protection might exert dangerous traction on the hepatic veins and on the diaphragm. The division of the cartilage did, however, give a much wider view of the presenting surface and of the inferior surface of the common liver, and the two gall-bladders could be demonstrated in the situations where cholecystography had shown them to lie. Obviously the next stage of the operation must be division of the liver through its centre in the bridge. No obstruction was met to a finger passed round the bridge to reach the lower edge of the liver on the far side.

At this stage of the operation it soon became clear to us how valuable was the method of liver control devised in Edmonton at the operation on the Townsend twins. In passing the forceps which would later guide the tourniquets round the liver bridge it was clearly desirable to keep as far as possible, on each side, from the centre of the liver. If the tourniquets lay too close together on the far side of the bridge they might easily slip through the cleft in the divided liver when liver division was completed. Consequently each artery forceps was induced to find its own separate way round the far side of the liver as far as possible from the median plane of the bridge. Each Penrose rubber drainage tube followed easily the path of its guiding forceps, and the tension made by this tubing when finally controlled by clip was very comfortable. It was estimated that the tourniquets lay 5 or 6 cm. from each other on the far side of the liver, and that there would not be much danger of their slipping when liver division was completed. It was found more convenient to divide the liver by knife and scissors than to tear through it with forceps, though the consistency of the liver varied from place to place: in one place it would be easy to tear through soft liver substances, while in another it was necessary to use sharp dissection.

When liver division had proceeded through approximately three-quarters of the bridge a thin band of liver tissue remained on the far side, and it proved easy to apply a Schumacher clamp and to divide the remaining liver between the clamps: though a variety of clamps were in readiness, this particular type was, as had been expected, the most suitable for the purpose. By rotation of the clamps towards the operator the raw surface of the liver of baby I could now be inspected. It was easy to distinguish open blood vessels and bile ducts, and these sustained the application of artery forceps surprisingly strongly without tearing. Indeed the impression was obtained that the divided vessels on the cut surface of the liver of this baby were easier to control than are those of the adult liver.

It had been intended to trim the cut surface of the liver to a concave shape so that its edges could be sutured together by stitches through Glisson's capsule, and the liver surface was inspected while consideration was given to this step. It was felt highly desirable to close the raw surface in this way lest bleeding should occur with the increase in liver flow which follows operation, and to avoid the oozing of bile into the peritoneal cavity, so commonly followed in babies by subphrenic abscess. In fact the question did not arise, for the liver tissue proved to be so flexible and elastic that the cut edge of Glisson's capsule on the far side of the raw surface could be brought quite readily forwards for suture. After division of the liver the abdominal contents had to be packed off again on each side to afford a view of the undivided peritoneum on the far side of the bridge. Division of the remaining cartilage link was now completed, and the soft tissues on the far side of the bridge were divided from within outwards.

CLOSING THE ABDOMINAL WALL

In closure of the abdominal wall a single layer of stitches was employed for muscle and peritoneum. In the upper part of the closed abdominal wound the heart could be seen beating through the opening in the diaphragm, where diaphragmatic muscle had presumably been united across

the bridge under cover of the cartilage roof. That part of the cartilage bridge which now appertained to each child protruded in an unsightly way and had to be trimmed, but care was taken in trimming not to leave too much of the pericardial sac exposed. The procedure was now identical for the two children at the two separate tables except in so far as the liver of baby II had still to be sewn over after the moment of separation. The last stage in closure was to trim the skin over the hernia that had been present in the lower part of the bridge, and to excise on each side what remained of the hernial sac. The quality of the muscle in both babies was rather poor at this level, and the muscle closure at the lower end of the wound, though complete, gave rise to some doubt of its strength.

As separation approached completion the second team came into play. This proved to be really quite a complicated manoeuvre. Its abdominal contents kept in place by packs and manual pressure, the baby, complete with transfusion apparatus, had to be carried to the second table, the anaesthetist moving over with his apparatus too. The manoeuvre was completed without mishap.

It might be said at this point that all pre-operative predictions were, as has been seen, fulfilled as the operation proceeded, and the plan of the operation proved reasonably sound. There was, however, one fault in the planning which should be considered when this operation is repeated—the difficulty of an accurate swab count at the end of the operation which starts as a single operation and finishes as two operations performed by two separate teams. This did not occur either to the surgical or to the nursing planners until the time came to count the swabs at the end of the operation, when for a few minutes it proved extremely difficult to establish that no swab was missing.

The abdomen of the second baby was now closed, and the total operating time from the first incision to the insertion of the last stitch in the second baby was one hour and thirty-five minutes.

Thus at the end of the operation two apparently normal and separate babies were obtained. Their general condition was good, and the circulation of each was entirely satisfactory. The babies were in as good shape as any babies of that age are after an abdominal operation. The babies were returned from theatre to ward in a double oxyginaire specially constructed by the Oxyginaire Company to contain both. On their return to the premature baby unit, still in good shape, they were transferred to separate oxygenaires.

Collapse of Tomo

One hour after their return, while still under close inspection, Tomo suddenly collapsed. The chest was opened and the heart massaged for an hour. A ventricular rhythm returned but no normal beat. Post-mortem examination showed no cause for death. There had been no bleeding and the liver closure was perfect. There was no cardiac or other abnormality. The lungs were airless and oedematous, as is usually observed *post mortem* after artificial respiration with oxygen through tracheal tube and cardiac massage. The only possible cause of death lay in the adrenal gland. This was only about one-third of its normal weight as measured by the adrenal/renal weight ratio. It is possible that the surviving twin had been responsible in life for the greater part of the production of cortisone for the pair, and that the dead twin had insufficient adrenal-cortical tissue to withstand the shock of the operation. When this operation is done again it would be wise to give both twins cortisone, for usually in such a partnership one twin is dominant, providing more for, and taking more from, the joint organism. It is notable that after Holm's successful separation of twins conjoined only by skin, muscle, and cartilage one infant was noticed to be particularly pale and collapsed.

The Surviving Twin

The surviving baby's wound was well healed on the tenth day of her post-operative course (Fig. 7), and it gave rise to no anxiety whatever. There remained a weakness of the lower end of the wound, and this baby has the umbilical hernia which is exceeding common among Nigerian babies. There is a protuberance also where the cartilage bridge was divided, and this is to some extent due to the rather acutely sloping sternum, the children when joined having striven always to pull away from each other, a fact which led to distraction of the xiphisternum on each side forward in front of the upper part of that bone. X-ray examination of the surviving baby (Fig. 8) shows now dextro-rotation of the heart. But the electrocardiogram was not that of a situs inversus; there was therefore no true mirror-imaging of the twins present. The surviving baby and her mother left hospital to return to Nigeria on December 21, eighteen days after operation.

ACKNOWLEDGMENTS

I must express my gratitude to Dr. A. O. Sasegbon, of Kano Hospital, for offering us this rare surgical problem, and for the excellent clinical notes which he furnished of the birth and early life of the twins in Nigeria. I must also pay public tribute to Dr. Eardley S. Allin, of Edmonton, for sending us his film of the operation on the Townsend twins; we learnt much from it.

I am indebted to many colleagues for assistance with the management of these twins. Professor Alan Moncrieff supervised the paediatric problem they presented in his Premature Baby Unit at Hammersmith Hospital. Dr. R. Steiner was responsible for the radiographic detail. The anaesthetic arrangements were supervised by Dr. H. Woodfield-Davies, with the assistance of Dr. A. Ryan. Dr. T. Counihan undertook the electrocardiographic studies. For the precise prediction of the size of the liver bridge we are indebted to the radio-isotope work of Mr. N. Veall, formerly of the Medical Research Council Radiotherapeutic Unit at Hammersmith Hospital. All the intravenous work before and during the operation was undertaken by Dr. P. L. Mollison, of the Medical Research Council Blood Transfusion Research Unit at Hammersmith Hospital; Dr. Mollison's previous experience of infant transfusion made his services invaluable on this occasion. Mr. Selwyn Taylor co-operated with me in the operation on the babies and was responsible for the closure of one of them. Professor W. J. Hamilton, Professor of Anatomy at the Charing Cross Hospital Medical School, advised us on the vascular anatomy to be expected in the bridge, assuming a common liver. I am grateful to Dr. I. Doniach for his report on the post-mortem findings in the case of the twin who died.

The return journey Kano-London-Kano of baby and mother, together with nurse, was defrayed by the United Africa Company. The cost of their treatment as private patients in Hammersmith Hospital was borne by an anonymous donor.

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TREATMENT OF PERNICIOUS ANAEMIA WITH VERY SMALL QUANTITIES OF PYLORIC MUCOSA AND VITAMIN B₁₂

BY

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Recently I described investigations into the localization of the anti-anaemic factor ("intrinsic factor") in the pig's stomach (Meulengracht, 1952a, 1952b). It was shown that even minute amounts of the pyloric mucosa of the pig's stomach can be therapeutically active when combined with one or other source of the "extrinsic factor" under suitable conditions regarding preparation and blending.

In the present work this advance, which arose from a fortuitous discovery, has been pursued further, and it has been proved that an apparently full therapeutic effect can be obtained with doses of the intrinsic factor far smaller than had hitherto been imagined, when these are suitably combined with vitamin B₁₂.

Technique

The source of the intrinsic factor used was the dried mucosa of the pyloric region of the pig's stomach prepared as previously described (Meulengracht, 1952a, 1952b). The vitamin B₁₂ used was an ordinary commercial product, controlled spectrographically.

Patients suffering from untreated pernicious anaemia were used in the investigation. The reticulocytes were counted daily in wet preparations. The reticulocyte maxima for the different forms of dosage were plotted against the number of erythrocytes at the beginning of treatment, for comparison with Bethell and Goldhamer's (1933) standard for the expected reticulocyte maxima after adequate intravenous and oral treatment with liver extract.

The erythrocytes were counted at weekly intervals. The rises during the first three weeks for the different forms of dosage were plotted against the number of erythrocytes at the beginning of treatment, for comparison with Schiødt's (1939) standard for the expected erythrocyte rises after adequate oral treatment with liver extract, "ventriculin," and (in accordance with my own experiences) "pylorin." Schiødt's standard was recalculated for 21 days.

Experiments With Very Small Doses of Pyloric Mucosa Administered Alone

Some orientating experiments were first made with very small amounts of pyloric mucosa given alone in the form of weighed powder. Preliminary tests showed that such doses were not entirely inactive, at any rate when given in close association with meals, which, in fact, on the ordinary mixed diet, must contain requisite amounts of the food factor.

Twelve experiments were made. In nine the dose of pyloric mucosa was 0.1 g. of dried substance thrice daily, and in three it was 0.2 g. thrice daily. In some of the experiments the administration was at meal-times—that is, at 9 a.m., 1 p.m., and 6 p.m.—in other experiments it was between meals, at 8 a.m., 11 a.m., and 9 p.m.

The following results were obtained. In one isolated case there was no demonstrable effect. In the majority there was some response, but it was not complete, since only a weak and protracted reticulocyte reaction occurred without a full rise in the haemoglobin and red cells, and with subsequent secondary reactions after adequate injection treatment with liver extract or vitamin B₁₂. Lastly, in two or three experiments there was a more pronounced effect.

The experiments showed practically no difference between the two dosages. Nor is it possible to decide definitely whether administration at meal-times or between meals played any part, although the effect seemed to be more pronounced when the pyloric mucosa was given at meal-times. It is possible that a rather more suitable planning of the experiments might produce clearer evidence on this point; thus it might be arranged that, in the case of the dosage between meals, the stomach and the upper part of the intestinal canal should be empty at the time of the administration—for example, by resorting to nightly administration. The importance of the times of oral intake of the intrinsic factor in relation to meals has never been

TABLE I.—Reticulocyte Maximum and Erythrocyte Rise in 12 Patients After Oral Administration of Small Amounts of Pyloric Mucosa Alone

No.	Pyloric Mucosa Orally	Reticulocyte Maximum	Three Weeks' Erythrocyte Rise
180	0.1 g. × 3	4.6%	0.65
181	0.1 g. × 3	5.4%	0.10 (14 days)
184	0.2 g. × 3	7.8%	0.60
186	0.1 g. × 3	10.8%	0.80
192	0.1 g. × 3	13.3%	0.40 (14 ..)
194	0.1 g. × 3	7.8%	0.35 (14 ..)
196	0.1 g. × 3	5.2%	0.80
197	0.1 g. × 3	4.6%	0.30
200	0.1 g. × 3	1.8%	0.10* (14 ..)
1	0.2 g. × 3	16.8%	1.15*
3	0.2 g. × 3	21.0%	0.60
5	0.1 g. × 3	10.6%	0.20 (14 ..)

*Blood transfusion.

properly grasped. An attempt was therefore made to elucidate this point, but, as intimated, the technique of the experiment was scarcely satisfactory for this purpose.

The results of these orientating experiments with very small doses of pyloric mucosa given by itself are shown in Table I and Fig. 1. Both the reticulocyte maxima and the three-weeks erythrocyte rises after adequate oral administration are far below the expected increases in each case.

Experiments With Very Small Doses of Pyloric Mucosa and Vitamin B₁₂

In this series of experiments the same very small amounts of pyloric mucosa were combined with vitamin B₁₂ in the proportion of 0.1 g. of dried pyloric mucosa and 5 µg. of vitamin B₁₂ in weighed powder.

There were 10 experiments in all. In the first three the mixture was given three times daily, the daily dose being 0.3 g. of dried pyloric mucosa and 15 µg. of vitamin B₁₂. In the following experiment the combination was given twice daily, the dose then amounting to 0.2 g. and 10 µg. respectively. In the rest of the experiments the compound was given only once a day, so the daily dose was narrowed down to 0.10 g. and 5 µg. respectively. It will be seen from Table II and Fig. 2 that the reticulocyte maxima and the three-weeks erythrocyte rises are now greater and approach the standards for adequate oral treatment in spite of the dosage in most of the cases being restricted to 0.1 g. of dried pyloric mucosa and 5 µg. of vitamin B₁₂.

In two of the experiments the erythrocyte rise is clearly unsatisfactory. Both of these experiments fall into the group in which the dose was reduced most drastically.

Preliminary Experiments with a Commercially Prepared Substance, "Cycloplex Mco"

Our knowledge was now so far advanced that it was decided to adopt the method in the routine treatment of pernicious anaemia.

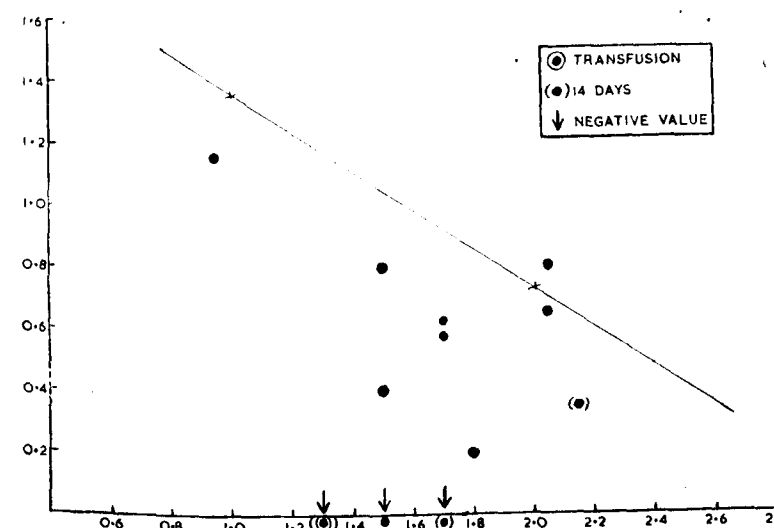


FIG. 1.—Three weeks' erythrocyte rises in 12 patients after oral administration of small amounts of pyloric mucosa alone in comparison with Schiødt's standard.

When it is remembered that at the time the treatment with dried stomach was first introduced large amounts were administered, it must seem surprising, indeed almost sensational, that such small doses as those used in the above experiments can be effective.

For the earlier preparations the following scheme of dosage was usually recommended in the treatment of fresh cases:

Ventriculin	20 g. thrice daily
Pylorin	10 g. " "
Exo-pylorin	5 g. " "

In view of the experiments described above, it would seem that we ought to be able to come right down to centigram doses, provided that the material is taken from a site in the pig's stomach where the intrinsic factor occurs in a concentrated form—that is, the pyloric mucosa (Meulengracht, 1934; Meulengracht and Søbørg-Ohlson, 1934).

As has so often happened on previous occasions, it became apparent that, when one proceeded to the commercial production of a preparation various obstacles of a technical nature had to be overcome if uniformity and stability were to be guaranteed.

In the commercial preparation the mixture of dried pyloric mucosa and vitamin B₁₂ was put into small gelatin capsules. Each capsule contains 0.05 g. of dried pyloric mucosa and 5 µg. of vitamin B₁₂. The vitamin B₁₂ content is thus greater than that in the above-described orientating experiments. The preparation has received the name "cycloplex mco."*

Therapeutic experiments with this commercial preparation have been carried out in my hospital department and, at the manufacturer's request, in the medical departments of a number of other hospitals in this country. The dosage has been three capsules daily, corresponding to a daily dose of 0.10 g. of dried pyloric mucosa and 15 µg. of vitamin B₁₂. The four curves from my department are reproduced in Figs. 3, 4, 5, and 6, in which the reticulocyte reaction and the rises in Hb and red cells are recorded. The total number of experiments—both my own and those from the various other

*Cycloplex (Pharmacopoeia danica)=vitamin B₁₂.

medical departments—are recorded, with the permission of the manufacturers, by graphic presentation of three-weeks erythrocyte rises (Fig. 7).

In my four experiments subjective recovery, rapidly ensuing reticulocyte reaction with a high narrow form of curve, and a big rise in the number of erythrocytes were observed. When one is used to judging the reactions in different kinds of treatment, the rapidity and abruptness with which they set in become striking. The three-weeks erythrocyte rises for all the cases, which are plotted in Fig. 7 in comparison with Schiødt's standard, display an even distribution around the latter.

Commentary

Combined preparations—that is, preparations in which an attempt has been made to combine the intrinsic and extrinsic factors in a suitable manner—are nothing new in the treatment of pernicious anaemia. The most commonly used preparation in Denmark,

exo-pylorin, is just such a combination: each 5-g. carton contains 3.5 g. of dried and pulverized pig's total pylorus and 1.5 g. of "liver remains" as the sources of the intrinsic and extrinsic factors respectively (Meulengracht, 1941).

TABLE II.—Reticulocyte Maximum and Erythrocyte Rise in 10 Patients After Oral Administration of Small Amounts of Pyloric Mucosa + Vitamin B₁₂

No.	Pyloric Mucosa + Vitamin B ₁₂ Orally	Reticulocyte Maximum	Three Weeks' Erythrocyte Rise (Millions)
8	0.1 g. + 5 µg. × 3	15.2%	1.25
10	0.1 g. + 5 µg. × 3	24.6%	1.20
12	0.1 g. + 5 µg. × 3	15.4%	1.15
38†	0.1 g. + 5 µg. × 2	10.0%	1.80* (17 days)
14‡	0.1 g. + 5 µg. × 1	42.4%	1.50
16	0.1 g. + 5 µg. × 1	19.0%	1.35
18	0.1 g. + 5 µg. × 1	12.6%	0.75
19	0.1 g. + 5 µg. × 1	9.2%	0.05 (16 days)
28	0.1 g. + 5 µg. × 1	10.4%	1.25
30‡	0.1 g. + 5 µg. × 1	18.0%	0.50

*Blood transfusion.

†Complicated by fracture of the neck of the femur.

‡Complicated by fever (pyuria, phlebitis).

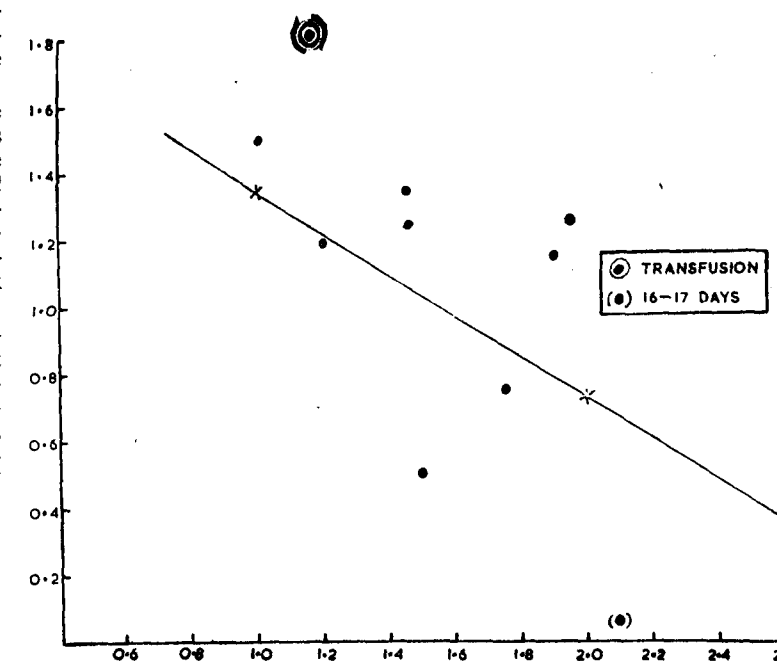


FIG. 2.—Three weeks' erythrocyte rises in 10 patients after oral administration of small amounts of pyloric mucosa and vitamin B₁₂ in comparison with Schiødt's standard calculated for 21 days.

The bringing to light or, indeed, identification of the two factors which has gradually taken place, particularly the generally accepted identification of the extrinsic factor with vitamin B₁₂, has led to the production of combined preparations from concentrated sources of the two factors. In practice this means a concentrate of the intrinsic factor from the pyloric portion of the pig's stomach, where this factor, according to earlier experiments, is principally localized (Meulengracht, 1934; Meulengracht and Søborg-Ohlsen, 1934), and the pure crystalline vitamin B₁₂ which is now easily procurable commercially.

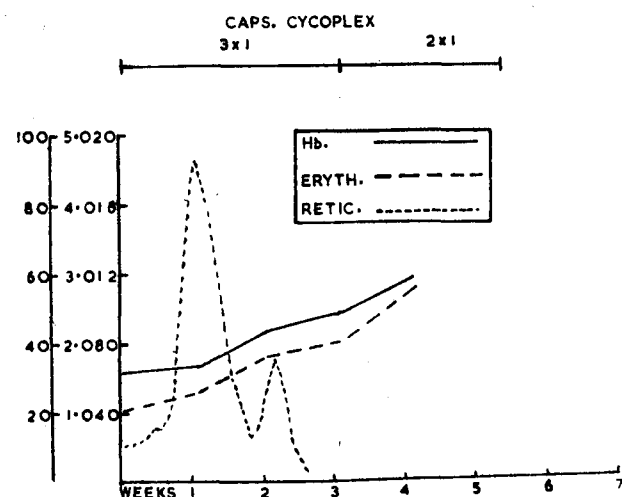


FIG. 3.—E. V. L., a woman aged 64. Treated with cycloplex mco three capsules daily. Bispebjerg Hospital, Dept. B.

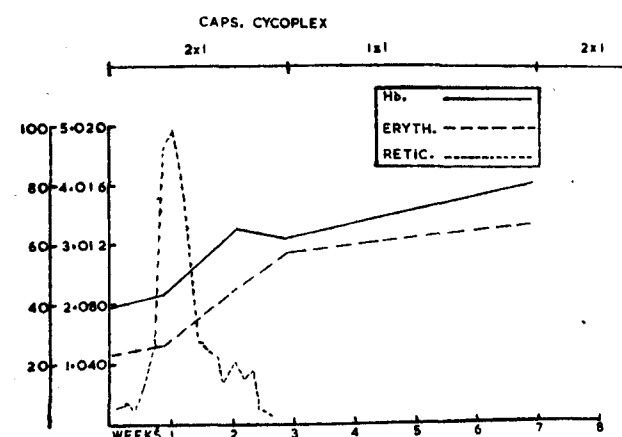


FIG. 4.—M. K. B., a woman aged 74. Treated with cycloplex mco three capsules daily.

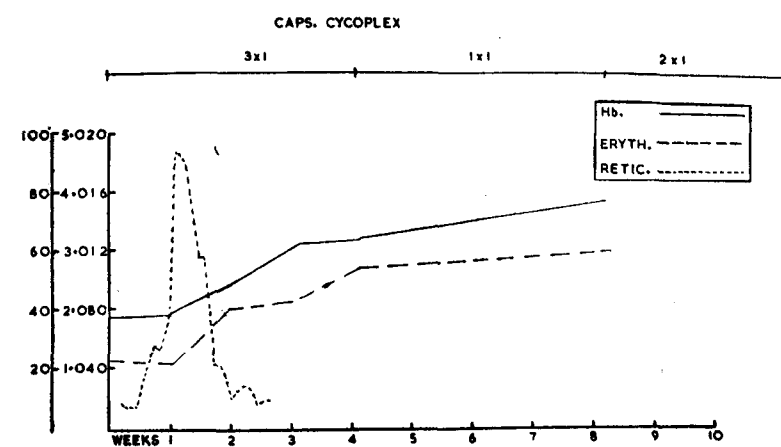


FIG. 5.—M. B., a woman aged 53. Treated with cycloplex mco three capsules daily.

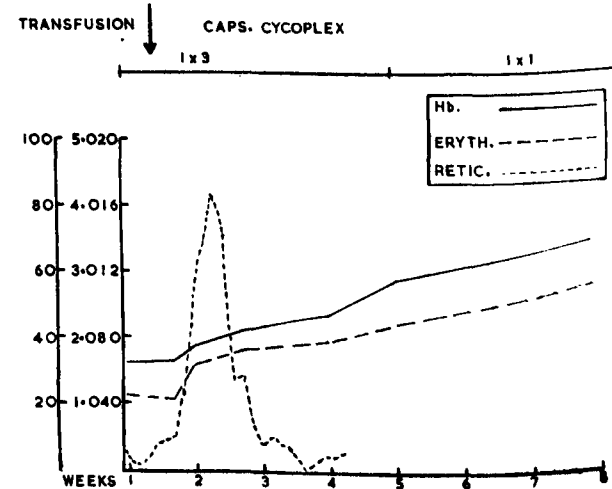


FIG. 6.—H. N. J., a woman aged 53. Treated with cycloplex mco three capsules daily.

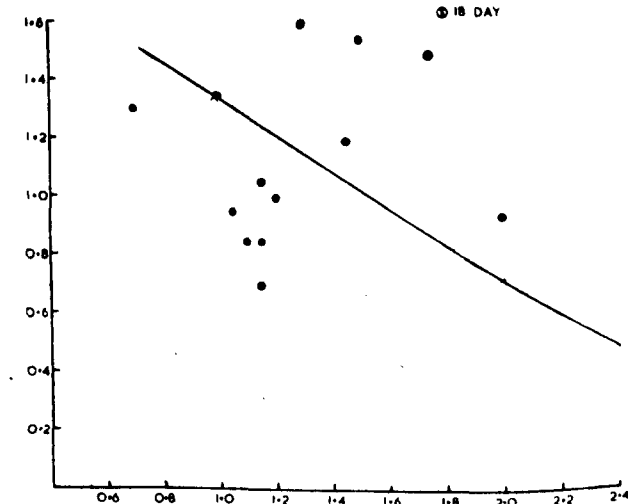


FIG. 7.—Three weeks' erythrocyte rises in 16 patients after oral administration of cycloplex mco three capsules daily in comparison with Schiødt's standard.

Such combined preparations suggest themselves, and indeed they have recently been put on the market in different ways in a series of preparations in some countries, including Denmark (Hoff-Jørgensen *et al.*, 1952). As the source of the intrinsic factor in these preparations extracts of stomach have been used, by which means a reduction in weight can be arrived at, although rather complicated technical procedures and the probability of waste are involved. Much more simply, however, with regard to both preparation technique and accuracy, can one resort to very small—in fact, in relation to previous dosage, minimal—amounts of pyloric mucosa for the source of the intrinsic factor, as demonstrated in the investigations above. One is thereby spared an elaborate and incalculable technical process, and can be content with a statement of the weight of the substance of the organ dried at a low temperature; while, as regards the testing of the activity of the preparation and the determination of the dose, one can keep to the approved methods, using fresh cases of pernicious anaemia.

It seems as if extremely small doses are usually adequate. Profiting by earlier painful experiences (Meulengracht, 1933)—there an attempt was made to cut down the dose and to individualize it—it was felt to be more rational that the dose should be fixed in excess of what is absolutely needed, so that each patient might be covered and protected against unpleasant surprises in the form of incomplete compensation of the anaemia or a myelopathy attack.

Since the economic factor is less important than hitherto, I would recommend, as a result of the experiences here recorded, that the initial dose in fresh cases be fixed at two capsules three times daily, but the maintenance dose has yet to be fixed by further experiments.

With regard to the plan of dosage, I have endeavoured to give these between meals in order not to mix up the small quantities involved with a large meal; but whether this is reasonable and appropriate I honestly do not know, for there is no evidence in favour of this procedure, and I cannot conclude anything definite from my own experiments.

Summary

It has been shown that even very small doses of dried pyloric mucosa from the pig's stomach given alone exert a definite but, in comparison with Bethell and Goldhamer's and Schiødt's standards, slight anti-anaemic effect.

It has also been demonstrated that the same very small amounts of pyloric mucosa, when combined with vitamin B₁₂ in quantities which in themselves are inactive when given orally, exert a strong anti-anaemic effect which is practically the same as the standards referred to.

A commercial preparation, cycloplex mco, in daily dosage of 0.15 g. of dried pyloric mucosa and 15 µg. of vitamin B₁₂, exerts a strong anti-anaemic effect which corresponds to the standards cited. In the routine treatment of pernicious anaemia patients, in order to be well on the safe side, a dosage is recommended which corresponds to 0.3 g. of dried pyloric mucosa and 30 µg. of vitamin B₁₂ for the initial doses. The maintenance dose has yet to be fixed.

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The "Odium Fund," recently set up by the National Association for Mental Health through the generosity of Dr. Doris Odium and others, is to be used as a permanent fund for the production of pamphlets by the association. The fund, which amounts to about £1,000, will enable the association to consider the possibility of publications without reference to its general finances. In its annual report for 1952-3 the association states that its financial position, extremely serious at the beginning of the year, has now greatly improved. The report gives a short account of considerable and varied activities. An inquiry into the necessity for a change in the law for dealing with aggressive psychopaths has reached the stage where discussions with the Home Office are imminent. In the case-work department the number of advisory cases referred during the year was 1,650.

DOMICILIARY OBSTETRICS*

A SURVEY AND COMMENTARY

BY

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Domiciliary midwifery is gradually diminishing in spite of the ample evidence that good results are compatible with a high proportion of domiciliary deliveries. Delivery in hospital is no panacea, and is expensive. It may be that for the same expenditure better results can be obtained by improving the domiciliary services than by expanding maternity hospitals, for the former make greater use of the patient's own resources; but it is difficult to say how improvements could be made, or how cases should be selected for hospital delivery, for the literature relating to domiciliary work is very small.

This survey is a superficial study of 4,441 births, with the primary object of collecting information on which can be based the selection of cases for hospital delivery so that the remainder will consist of those who can be delivered at home in reasonable, if not absolute, safety. It is also intended to indicate the type of obstetrical problem likely to be met in general practice, and to show whether maternity cases may safely be supervised by a practitioner who has consultant support but no post-graduate experience.

Material

The patients of a general practitioner with a list of 2,500 (rather more than average) will produce only about 40 babies a year. Approximately half will be born in hospital, and some of the remainder may be attended entirely by midwives. It is evident that a general practitioner cannot study domiciliary midwifery effectively in his own practice alone, for on an average he would take ten years to accumulate records of 150 cases. Therefore, in addition to a small personal series, two much larger groups have been studied, the survey con-

TABLE I.—Number of Primiparae and Multiparae in Each Group, and Place of Delivery

	Domiciliary			Hospital			Nursing-home		
	Prim.	Mult.	Total	Prim.	Mult.	Total	Prim.	Mult.	Total
Personal	15	85	100	16	28	44	19	5	24
City	365	1,119	1,484	892	897	1,789			
County	176	824	1,000						
Total	556	2,028	2,584	908	925	1,833	19	5	24

sisting of (1) 168 confinements of patients of a general practitioner between 1946 and 1952; (2) 3,273 confinements of residents in a city in 1949, 1950, and 1951, either at home or in hospital; and (3) 1,000 domiciliary deliveries in the surrounding district but outside the city boundary in the early months of 1952.

These three groups are called "personal," "city," and "county" cases respectively. The inclusion of hospital and nursing-home cases (Table I) makes it possible to study domiciliary cases in relation to the group from which they were selected, and to consider all the cases for which a general practitioner could assume responsibility.

*A revised version of the Sir Charles Hastings Clinical Prize essay for 1953.

Obstetrics in a Community

The city series consists of almost all births, at home or in hospital, to residents in the City of Gloucester over a period of three years. As it includes 97.4% of all births to city residents, and also 97.1% of all stillbirths and neonatal deaths, it is believed to give a true account of obstetrics in that area, a community of about 67,000 inhabitants.

Supervision of the majority of the 1,484 domiciliary deliveries was carried out by midwives, for practitioners arranged in advance to attend only 242, representing 29.8% and 11.8% respectively of those primiparae and multiparae who were delivered at home. Medical aid was requested during pregnancy, labour, or the puerperium in 26% of all cases.

TABLE II.—Total Numbers of Certain Types of Case in the City Group, and the Proportions Delivered at Home

Type of Case	Total No. of Such Cases	Delivered at Home	
		Cases	% of Total
All deliveries	3,273	1,484	45.3
Multiple pregnancy	39	16	41.0
Stillbirth	69	30	43.4
Neonatal death	69	29	42.0
Babies under 5½ lb. (2.5 kg.)	219	93	42.4
Mature stillbirth or neonatal death	62	20	32.2
Ante-partum haemorrhage	29	6	20.7
Post-partum	95	32	33.6
Manual removal of placenta	47	8	17.0
Primiparae	1,387	368	26.6
Primiparae breech	102	32	31.3
" episiotomy	43	7	16.2
Multiparae	1,686	28	1.6
Multiparae breech	15	11	73.3
" episiotomy	68	24	35.2
" episiotomy	40	4	10.0

Selection of cases for home delivery, shown in Table II, was, of course, dependent on the force of circumstance and the whims of the patient, as well as on the advice of the attendants. It seems that primiparae and breech presentations were to some extent selected for hospital delivery, but the district took almost its full proportionate share of twins and premature deliveries, and, perhaps in consequence, of stillbirths and neonatal deaths. It is axiomatic that a high foetal risk necessitates delivery under the best possible conditions, and it appears that, although over 50% of deliveries took place in hospital, too many cases in which the baby was in danger were delivered at home. If, however, it had been possible to arrange for all premature babies to be delivered in hospital, the number of babies lost after delivery at home would have been reduced from 59 to 20, a combined stillbirth and neonatal death rate of only 14.2 per thousand.

Table II also shows that only a small proportion of the cases having episiotomies were delivered at home. As the types of case needing forceps delivery and episiotomy are very similar the relatively low proportion of the latter on the district is likely to be due to management rather than to case selection.

The additional 1,000 domiciliary deliveries collected from the county of Gloucestershire include abnormalities in proportions similar to those in the city series, except that the proportions of premature birth, stillbirth, and neonatal death were lower, presumably owing to case selection. Primiparae had apparently been selected for hospital delivery on a rather larger scale, for only 17.6% of the deliveries were primiparous, compared with 24.5% of the city domiciliary cases. Of the county cases, 3% had been induced, either medically or surgically; 30.2% had blood examinations during pregnancy;

and 2.8% were admitted to hospital after delivery, half of them for either prematurity or post-partum haemorrhage. The proportion of domiciliary deliveries attended by a doctor, either by prearrangement or in response to calls for medical aid, was 15.6%.

Obstetrics in a General Practice

The personal series consists of the booked maternity cases from a practice rather larger than average, over a period of six years. During that time there were 168 cases booked for delivery under the practitioner's care, either at home or in nursing-homes or hospital, the last being possible only during a period of clinical assistantship and relating to 29 patients. Fourteen patients developed abnormalities and had to be transferred to a hospital where they could not remain under the practitioner's direct supervision, but they have not been excluded from the series on that account. It follows that some forceps deliveries, surgical inductions, and the like were not performed personally.

The average number of antenatal examinations was 8.3, and the two most common abnormalities during pregnancy were breech presentation and hypertension (over 140/90 mm. Hg), with 18 and 14 cases respectively. There were six cases of retroverted gravid uterus, five being corrected by the insertion of a large rubber ring as recommended by Sinclair (1900), and the sixth bimanually. Other abnormalities were multiple pregnancy 3, thrush vaginitis 4, trichomonas vaginitis 1, pyelitis 2, fibroids 2, pelvic tumour (a retroperitoneal fibrolipoma) 1, mitral stenosis 1, anaemia (Hb below 70%) 4, and ante-partum haemorrhage 4. It is notable that there were only two cases of pelvic contraction and that both patients were born prior to the 1914-18 war.

Consultations.—Consultant opinion is easily obtainable either at local clinics or, when necessary, in the home, and there were 33 consultations, for the following reasons: suspected multiple pregnancy 5, breech presentation 2, high head at term 6, toxæmia 4, post-maturity 5, previous obstetric history 4, and 1 each for pelvic tumour, mitral stenosis, retroverted gravid uterus, recurrent pyelitis, deficient perineum, vulval varices, and uterine inertia.

Transfers to Hospital Before Delivery.—Fourteen of the 114 domiciliary and 1 of the 24 nursing-home bookings were transferred to hospital. The principal reasons were collapse of domestic arrangements, and toxæmia, which accounted for two cases each; with one each for uterine inertia, premature labour, mitral stenosis, ante-partum haemorrhage, contracted pelvis, deficient perineum, pelvic tumour, unstable lie, vulval varices, triplets, and suspected diabetes. The cases of unstable lie and triplets account for three of the six babies lost in the whole series so that before labour began it was possible to arrange hospital delivery for half the babies so destined. Of the other three, one was a premature stillbirth, labour being so rapid that transfer was impossible, and the remaining two had gross deformities.

Difficult Cases Delivered at Home

There were, in addition to the cases transferred to hospital, 24 domiciliary or nursing-home cases which were actually or potentially difficult, some of which were the subject of consultation as above. There were nine in which it was decided that a surgical induction was necessary (Table III), and it was decided with some reluctance to deliver one breech and two sets of twins at home. All these could, of course, have been transferred to hospital, or induced at hospital and returned home for delivery. In fact, all but one had uneventful deliveries, the exception being a twin delivery which produced an intra-partum haemorrhage due to premature separation of the first placenta. It was possible to extract the second baby quickly, and a transfusion was not necessary at the time, but a pint (570 ml.) of blood was given during the puerperium.

Two cases of ante-partum haemorrhage were not transferred to hospital. One was a loss of about 4 oz. (110 ml.) at low membrane rupture for post-maturity, but labour

TABLE III.—A General Practitioner's Booked Maternity Cases Between 1946 and 1952. Details Relating to Labour and Delivery

	Place of Delivery		Total
	Home or Nursing-home	Hospital	
Total deliveries	124	44	168
Primiparae	34	16	50
Multiparae	90	28	118
Deliveries attended	106	17	123
Total babies born	126	46	172
Babies under 5½ lb. (2.5 kg.)	2	0	2
Stillbirths	1	0	1
Neonatal deaths	2	3	5
Analgesia:			
Pethidine			84
Gas and air			60
Chloroform			7
Trichlorethylene			92
Induction of labour:			
Medical	25	8	33
Surgical	9	10	19
Uterine inertia:	0	2	2
Forceps delivery:			
Primiparae	3	2	5
Multiparae	0	0	0
Breech delivery	1	2	3
Face presentation	1	0	1
Spontaneous P.O.P.	3	1	4
Episiotomy	16	9	25
Perineal tear	35	11	46
Intra- or post-partum haemorrhage	5	2	7
Manual removal	1	0	1
Blood transfusion	3	0	3
Pulmonary embolus	1	0	1
General anaesthesia	5	2	7

started at once and delivery was normal. A second patient lost 1 oz. (28 ml.) at 35 weeks, at a time when she had raised blood pressure. This subsided completely with rest, and she went to term without further loss.

There were three persistent occipito-posterior cases, but all were multiparae, and two delivered themselves easily before the diagnosis was made. The third succeeded after an episiotomy.

Three post-partum haemorrhages were relatively slight and were controlled by ergometrine. The fourth followed a manual removal at which a combination of chloroform and amyl nitrite was used, and the uterus became so atonic that there was heavy loss. No fluid was necessary at the time, but a transfusion was given during the puerperium. The patient could have gone to hospital for the manual removal, but was dealt with at home at her own request.

Finally there were three forceps deliveries. In two cases the head was on the perineum, and in the third only a little higher, and the occiput was anterior in all three. All were fairly easy extractions; but one patient, who had a mild pyrexia for most of the first week, had a small pulmonary embolus on the 18th day, after she had been getting up for a week. Apart from a baby with haemolytic disease whose rhesus-negative mother had been labelled positive, this was the only patient admitted to hospital after delivery, and she was not too upset by the experience to have another baby, normally, two years later.

Post-natal Examination

At post-natal examination, which since the introduction of an appointment system has been attended by 98% of patients, it was noted that failure to restore the perineum completely occurred once in four cases after a tear, but only once in eighteen after an episiotomy. The two primiparae with stress incontinence (Table IV) both had episiotomies, for forceps and breech delivery respectively, and both regained continence.

TABLE IV.—Abnormalities Noted at Post-natal Examination Six Weeks After Delivery

	Total Exams	Cervical Erosion	Pro-lapse	Deficient Perineum	Stress Incont.	Retro-version	Hyper-tension
Primiparae	43	2	6	7	2	6	7
Multiparae	99	4	13	17	5	20	3
All cases	142	6	19	24	7	26	10

trol after faradism. During the two and a half years for which records have been kept of the number of babies entirely breast-fed at the time of post-natal examination, the proportion has been 77.2% and 55.5% for primiparae and multiparae respectively.

Forceps Delivery

The forceps rates shown in Table V illustrate the well-recognized difference between primiparae and multiparae, the rates being 1 in 10 and 1 in 128 respectively. The caesarean section rate in the area is 1.06%.

TABLE V.—Forceps Rates, and the Number of Babies Lost After Forceps Delivery

	Primiparae				Multiparae			
	Total Cases	Forceps Cases	Rate %	Babies Lost	Total Cases	Forceps Cases	Rate %	Babies Lost
Personal series	50	5	10.0	2	118	0	0	0
City and county domiciliary cases	541	55	10.1	4	1,943	19	0.9	1
All city cases	1,257	102	8.1	9	2,016	15	0.7	1

It would be useful to be able to predict the probability of a forceps delivery either before the end of the first stage of labour or, better still, during pregnancy. Table VI, which refers only to the primiparae of the county series, shows what would have been the effect on the number of primiparous forceps deliveries at home if certain groups of these patients had been selected, either before the onset of labour or during the first stage, for delivery in hospital.

TABLE VI.—The Probable Effect on the Number of Primiparous Forceps Deliveries at Home if Certain Groups of Those Patients Delivered at Home Had Been Transferred to Hospital for Delivery

If the Types of Patient Below had been Transferred to Hospital for Delivery	The Total Number Transferred Would Have Been	The Number of Primiparous Forceps Deliveries	
		Among Those Transferred	Among Those Remaining at Home
All primiparae	176	23	NH
Primiparae over age 30	12	6	17
Primiparae with delayed 1st stage:	6	3	20
Over 24 hours	20	8	15
36 " "	8	4	19
Primiparae over age 30 or with 1st stage over 24 hours	30	12	11

The admission of all primiparae shows a poor return for the number of beds taken up. Each of the other groups has a forceps delivery rate of more than 1 in 3, and there seems to be a good case for recommending hospital delivery for primiparae over 30 years of age, and for those not fully dilated after 24 hours in labour, if it is desired to avoid forceps delivery at home. But the home rate would not have been reduced below 1 in 15, and the only patient who lost her baby would still have been delivered at home.

Table VII refers to the domiciliary cases in the city series, and compares the forceps delivery rates and the length of

TABLE VII.—Comparison of Forceps Rate and Average Length of Second Stage in Forceps Cases, in Maternity and Midwifery Cases in the City Domiciliary Series

	Primiparae				Multiparae			
	Total Cases	Forceps Cases	Average 2nd Stage		Total Cases	Forceps Cases	Average 2nd Stage	
Maternity cases	109	19	17.9	1 hr. 53 min.	133	5	3.7	1 hr. 35 min.
Midwifery cases	256	13	5.0	3 " 16 "	986	6	0.6	2 " 21 "

the average second stage in "maternity" and midwifery cases, maternity cases being those in which a practitioner had arranged in advance to attend the delivery.

In comparison with that for midwifery cases, the forceps rate for maternity cases is more than three times as high for primiparae and six times for multiparae. Even when allowance is made for the time taken to call a doctor, 3½ hours is long for the average second stage, and the extreme was 5 hours 40 minutes.

In addition to the long second stages ending in forceps delivery, there are many ending in normal birth, and the number of second stages exceeding various lengths has been determined in the primiparae of the county series, being shown in Table VIII.

TABLE VIII.—Showing the Number of Patients, out of the 176 Primiparae of the County Series, Whose Second Stage of Labour was Prolonged, and the Number Eventually Delivered with Forceps

	Length of Second Stage of Labour in Hours				
	2 or More	2½ or More	3 or More	4 or More	5 or More
Total cases	44	32	23	9	3
Forceps deliveries	20	18	14	4	0

Many would think it unwise to tolerate a high proportion of long second stages, and, even without resorting to a high forceps rate, it may be unnecessary to do so. Table IX compares the primiparous forceps and episiotomy rates, and the proportion of primiparae having second stages of over three hours and four hours in the county series, with the corresponding figures for personal cases; it appears that a large proportion of long second stages can be eliminated by episiotomy.

TABLE IX.—Comparison of Forceps and Episiotomy Rates in Primiparae of the Personal and County Series, Showing the Proportion of All Cases Having a Long Second Stage

	Forceps Rate %	Episiotomy Rate %	Length of Second Stage	
			Over 3 Hours	Over 4 Hours
County cases	13.0	7.4	13.0%	5.1%
Personal cases	10.0	36.0	2.0%	Nil

It is possible that some of the forceps deliveries might also have been eliminated by preliminary episiotomy, for Table X shows that an episiotomy was carried out in less than one domiciliary forceps delivery in four.

TABLE X.—Condition of Perineum After Forceps Delivery at Home

	Forceps Deliveries	Condition of Perineum			
		Intact	Episiotomy	Tear	Third-degree Tear
Primiparae	55	16	15	24	4
Multiparae	19	9	2	8	0
All cases	74	25	17	32	4

Suturing was avoided in only 25 cases out of 74, and at a cost of four third-degree tears. This alone seems too high a price to pay; in addition there is the greater difficulty of repairing tears as compared with episiotomies, and there may be concealed vaginal lacerations and stretched levatores ani in those cases in which the perineum is intact. Four primiparae and two multiparae were delivered face to pubes without episiotomy, but as these account for only one of the third-degree tears it is not enough to perform the episiotomy only when the baby is so delivered. It appears that episiotomy is a desirable preliminary to most if not all forceps deliveries, and, performed before an anaesthetic is given in those cases in which the head is on the perineum, it may make forceps delivery unnecessary.

Breech Presentation

Breech delivery can be foreseen and, to a great extent, prevented. The domiciliary obstetrician can, if he chooses, reduce the breech delivery rate to very small proportions, and he can arrange in advance for the inevitable cases to be delivered in hospital. This survey includes 51 breech deliveries at home, with the loss of 23.5% of the babies. Not all were lost as a result of breech delivery itself, but, after excluding all babies weighing less than 5½ lb. (2.5 kg.) and all in whom there was an obvious cause of death other than breech delivery, the percentage loss remains formidable, and is shown in Table XI, where it is compared with results obtained in hospital.

TABLE XI.—Proportion of Babies Lost, Either by Stillbirth or Neonatal Death, Following Breech Delivery, After Eliminating all Babies Weighing Less than 5½ lb. (2.5 kg.) and All in Whom There Was an Obvious Cause of Death Other Than Breech Delivery

	Corrected Loss %		
	Primiparae	Multiparae	All Cases
Domiciliary cases	25.0	10.2	13.7
Hospital "	11.1	9.0	10.0

These figures suggest that there would still be a very considerable mortality after breech delivery if all such cases were delivered in hospital. Cox (1950) has shown that the mortality for mature babies after breech delivery can be much lower than this, but the figure of 5.2%, extracted from his findings, may not be universally attainable, for it related to a centre dealing with a large number of cases, and involved a caesarean section rate of 12.4%. A low mortality in a small centre might be dependent on a high breech delivery rate to provide the staff with enough practice in breech delivery, and this would tend to cancel the gain due to a lower mortality. It does not appear that the problems of breech delivery can be solved merely by the transfer of cases to hospital.

In the personal series, version was performed whenever a breech presentation was diagnosed after the 30th week, and there were only two inevitable breech deliveries—a rate of 1.19%. Abercrombie (1952) performed version as soon after the 30th week as he felt that it was becoming difficult, and had only two breech deliveries in 249 cases. Dalley (1952) quotes a series of 576 booked cases in which early version resulted in a breech delivery rate of 0.86%. If the breech delivery rate in the city had been reduced to 1%, the number of babies lost would probably have been halved, allowing for the mortality of version. Since this would achieve the same saving in babies' lives, without the risks of a caesarean section rate of 12.4%, as would reduction of mortality to Cox's figure, it suggests that the primary aim in a small centre should be not the reduction of mortality but the elimination of breech delivery itself.

The Perineum

It is difficult for the general practitioner to observe a large number of normal primiparous deliveries, because the number delivered at home is small, and before 1948 he could attend normal cases only if the patient could afford to pay private fees. Table XII records the fate of the perineum in all the personally observed normal primiparous deliveries during a period of six years, including a few not qualified for inclusion in the personal series. These cases can be

TABLE XII.—Fate of Perineum in 40 Personally Observed Normal Primiparous Deliveries

No Delay on the Perineum			Delay on the Perineum		
Intact	Tear	Episiotomy	Intact	Tear	Episiotomy
10	16	2	0	2	10

divided into three groups: (1) no undue delay and an intact perineum, 25%; (2) no undue delay but a torn or incised perineum, 45%; and (3) delay on the perineum, 30%.

The delay in most of the cases having an episiotomy for delay was very considerable, for many date back to a time when episiotomy was used reluctantly. In retrospect it is thought that at least one, and possibly two, of the forceps deliveries in the personal series could have been avoided if an incision had been made before the patient and the uterus had become too exhausted to make full use of it. If this is correct, second stages of over three hours could have been eliminated from the personal series, at the same time reducing the primiparous forceps rate to 6%. These results suggest that nearly one-third of primiparae need episiotomy to avoid delay on the perineum, and to avoid the forceps delivery that may result if the perineum resists until the patient and the uterus are exhausted.

Table XIII shows tear, episiotomy, and suture rates in cases having a normal delivery. Episiotomy was rarely used in the absence of a doctor, and in multiparae the absence of a doctor reduced the incidence of recorded tears by nearly a half, although it is likely in all cases, and quite certain in the personal ones, that the actual delivery was almost invariably controlled by the midwife.

TABLE XIII.—Fate of Perineum in Normal Domiciliary Deliveries, Showing Effect of the Presence of a Doctor

	Primiparae			Multiparae		
	Tear Rate %	Episiotomy Rate %	Suture Rate %	Tear Rate %	Episiotomy Rate %	Suture Rate %
County and city cases:						
Doctor present	38.7	14.4	53.1	25.6	2.2	27.9
Doctor not present	34.1	3.0	37.1	13.3	Nil	13.3
Personal cases	36.3	27.2	63.5	25.6	5.1	30.7

Post-partum Haemorrhage

The post-partum haemorrhage rate in domiciliary cases varied with parity, being 2.6% for primiparae and 6.9% for patients with a parity of five or more. A much greater difference, however, is that between normal and forceps deliveries (Table XIV), possibly due to the use of chloroform, which, in the city series, was certainly used in 67% of forceps deliveries, and possibly in 87%.

TABLE XIV.—Post-partum Haemorrhage Rate in Domiciliary Cases, Showing the Difference Between Forceps Deliveries and Normal Deliveries

	Total Cases	Post-partum Haemorrhage	
		Cases	Rate %
All deliveries	2,484	70	2.8
Forceps deliveries	74	10	13.2
All deliveries, excluding forceps	2,410	60	2.4

Lister (1950) suggested that the use of ergometrine at the end of the second stage should be practised only under hospital conditions, where team-work is possible. To explore the possibility of using it routinely in domiciliary work, the intention recently has been to give it to all cases in the personal series. Over a series of 48 consecutive domiciliary deliveries it was found possible to give an intravenous injection between the time of head crowning and of birth of the anterior shoulder in 64%; it is considered that, after elaborating a routine and working with the same midwife, the proportion could be raised to 80%. In domiciliary practice, where blood transfusion is not readily available, it is particularly important to prevent post-partum haemorrhage, and there is no doubt that the use of intravenous ergometrine is a great advance in this direction. If it cannot be given in all domiciliary cases it seems most important to make the attempt in all cases of forceps delivery, and in all those with a parity of five or more.

Hypertension in Pregnancy

Hypertension has been studied only in the personal series in which patients were normally examined monthly from the time of booking up to 32 weeks, at 34 weeks, at 36 weeks, and then weekly until delivered. Where necessary, several readings were taken to eliminate labile pressures. The cases

TABLE XV.—Hypertensive Patients of Personal Series Divided Into Three Groups According to Highest Pressure Reached in Late Pregnancy. Bracketed Figures Show the Number Developing Albuminuria

	Total Cases	Highest Pressure Recorded in Late Pregnancy		
		Between 130/85 and 140/90	Between 140/90 and 150/100	150/100 and Over
Primiparae	50	9 (0)	7 (4)	7 (5)
Multiparae	118	7 (1)	7 (2)	1 (1)

have been divided into three groups according to the highest stable pressure recorded in late pregnancy (Table XV): 14% of primiparae and only 1% of multiparae qualify for the highest group, which is 87% primiparous, confirming the higher incidence of toxæmia in primiparae. In 46% of primiparae a pressure of 130/85 occurred at some time during late pregnancy, and 18% developed albuminuria.

Of the first six primiparae in the personal series, two developed toxæmia severe enough to require admission to hospital and premature induction, both having a considerable amount of albumin. In retrospect it was thought that insufficient attention had been paid to slight early rises of pressure in these cases, and since then the following regime has been instituted.

Stage 1.—Blood pressure over 120/80. No work except light household duties. Rest from 2 to 3 p.m. Bed at 9 p.m.

Stage 2.—Blood pressure over 130/85. As Stage 1, but bed until 10 a.m. Rest from 2 to 4 p.m. Phenobarbitone, ½ gr. (32 mg.) three times a day.

Stage 3.—Blood pressure over 140/90. Complete rest in bed. Phenobarbitone 1 gr. (65 mg.) three times a day.

This regime has been varied a little to suit individual cases, according to parity, age, the lowest pressure recorded in mid-pregnancy, and the presence of albumin or oedema. It has not prevented 45% of primiparae from developing a pressure of 130/85 or more, and 25% have required rest in bed. Four (9%) eventually passed the 150/100 level, but only two needed induction before term. There were no babies under 6 lb. (2.7 kg.) in weight, and none appeared to be in real danger on account of toxæmia. The number of cases is, of course, so small that a similar result might well have been obtained by chance.

Induction of Labour

McKiddie (1949), using figures for Aberdeen, showed that the stillbirth rates for patients delivered in the second, third, and fourth weeks after term were about 1 in 60, 1 in 30, and 1 in 15 respectively. The neonatal death rates were unaffected. McKeown and Gibson (1951) showed that the stillbirth rate in Birmingham in 1947 was 11.5 per thousand for babies born in the 41st and 42nd weeks, and 25.5 for babies more than two weeks post-mature.

In the personal series the policy has been to induce at about two weeks after the expected date, if that seemed reliable. In addition, patients with a raised blood pressure were rarely allowed to go past term. This has led to a very high induction rate, and the proportion of patients successfully induced was 21.4% (Table XVI).

For post-maturity 13% of all patients were induced, and for toxæmia 16% of primiparae and 1.7% of multiparae. There was only one stillbirth in the whole series, this baby being five weeks premature and not induced. Only one baby was lost after induction, this being the neonatal death of a post-mature monster.

The results so far recorded in this small series do not indicate the need for a change in the policy regarding in-

TABLE XVI.—Medical and Surgical Induction in Personal Series

	Total Cases	Medical Induction			Surgical Induction	Induction Rate (Successful Cases Only)
		Total	Failed	Successful		
Primiparae	50	14	4	10	10	40.0%
Multiparae	118	19	12	7	9	13.5%
All cases	168	33	16	17	19	21.4%

duction, but a simple calculation based on McKeown and Gibson's figures shows that, if the average general practitioner eliminates post-maturity of more than two weeks' duration from his domiciliary practice, he will save the lives of only 1.5 babies in his lifetime.

Stillbirths and Neonatal Deaths

McKeown and Gibson (1951), who investigated all births in the City of Birmingham in 1947, suggested that babies born more than four weeks before the expected date should be delivered in hospital whenever possible. They showed that such babies had a collective mortality of 1 in 3, but the mortality for babies born in the 36th and 37th weeks was 150 and 94 per thousand respectively. This suggests that, for babies born prematurely, a dividing line between suitability for hospital and home delivery might be placed at an expected mortality of 100 per thousand. The line would not necessarily be at the same level for other types of case, for the difference in the relative safety of hospital and home delivery may vary. It would, for instance, be very considerable for a primiparous breech delivery, and almost non-existent for a normal patient having her second baby. It has not been possible in this survey to attempt to compare the results of hospital and home delivery of identical cases, but Table XVII shows the total mortality, stillbirths, and neonatal deaths together, for certain types of patient and for certain abnormalities.

TABLE XVII.—Total Mortality, Stillbirths, and Neonatal Deaths Together, for Certain Types of Patient and for Certain Abnormalities

	Babies Lost per 1,000 Births	
	All Domiciliary Cases	All City Cases
All first births	45.7	52.7
Other	29.5	34.7
Babies over 5½ lb. (2.5 kg.)		
First births	17.9	26.7
Other	14.9	16.0
Forceps deliveries		
All cases	67.5	85.4
First births	72.7	88.8
Breech deliveries		
All cases	235.2	207.2
First births	250.0	232.5
Over 5½ lb.	139.5	144.3
Multiple births		
All cases	229.1	191.5
Over 5½ lb.	100.0	111.1
All babies under 5½ lb.	330.8	347.0

Many of these groups are composite, and, if the total numbers had been large enough, might have been broken down into smaller groups with varying mortalities. For instance, twins in a multipara, if both were presenting by the vertex and were expected to be over 5½ lb. (2.5 kg.), might be expected to have a mortality appreciably lower than 100 per thousand. With such reservations, it seems that all breech, multiple, and premature deliveries should take place in hospital. First births, however, if the baby is mature, are relatively so innocuous that it seems ridiculous to suggest that primiparity alone is a reason for hospital delivery, for the rate for those at present selected for home delivery is at the low figure of 17.9 per thousand, and is only 3 per thousand higher than the corresponding figure for multiparae.

The General-Practitioner Obstetrician

When the National Health Service was introduced the conception of the general-practitioner obstetrician appeared

to be one who had postgraduate experience of obstetrics, examined his patients at 12 weeks, 36 weeks, and 6 weeks after delivery, and, apart from that, merely attended abnormal cases at the request of the midwife. By and large, unless his midwives are exceptional, this type of practitioner will not see anaemia of pregnancy in time to cure it without transfusion, hypertension in its earliest stages at a time when it may be possible to prevent serious toxæmia and to avoid premature induction, breech presentation in time for early version, or multiple pregnancy in time to advise on the avoidance of premature labour. Post-maturity will not be eliminated, his primiparae and their foetuses will endure unnecessary hours of the second stage, little will be done to prevent post-partum haemorrhage, and the vulval orifices of his multiparae will enlarge a little at each delivery because minor tears will be left unsutured.

If the results of domiciliary midwifery have been bad in the past, it is important, before attempting to improve matters by introducing a special obstetric list, to inquire why it was so, and whether the same causes would operate in the future. One cause, possibly the major one, was that the family doctor could undertake only the maternity work for which his patients could afford to pay—and that in many practices was very little. Many patients who did engage him wished to pay not for antenatal and post-natal care, but only for analgesia at the delivery. This gave the family doctor very little experience of the normal and little opportunity of practising preventive obstetrics, but, on the other hand, arrangements for consultant help were often inadequate, so that he was obliged to undertake difficult abnormal cases in response to midwives' requests for help. Local authority schemes, when introduced, allowed the practitioner to examine his patients at 12 and 36 weeks, but did not permit him to be paid for any other attendance on normal cases. The result was that, having seen little of the normal, and having had little opportunity of preventing the abnormal, he was obliged to deal with the latter when it occurred.

Since 1948 it has been possible for the family doctor to give adequate attention to all cases, normal and abnormal. Specialist opinion is easy to obtain, and the opportunity exists for the next generation of family doctors to acquire adequate experience of normal midwifery, to learn to recognize the abnormal at an early stage, and often to prevent the occurrence of dangerous conditions. If this is likely to happen, it is not at all certain that the maternity services will be improved by regulations aimed at making the patient forsake her family doctor for a stranger with a little more experience of abnormal obstetrics.

In any discussion of the competence of the newly qualified practitioner it will inevitably be said that he has no experience of forceps or breech delivery. In practice, as the average family doctor has only one imperative forceps delivery in two years, and as most are either able to carry out a forceps delivery or have the help of a competent colleague, it is no more necessary for the inexperienced single-handed practitioner to apply forceps himself than it would be for him to remove an appendix on the kitchen table. The number of such cases is so small that he need not hesitate to call a consultant. As for domiciliary breech delivery, it is too dangerous to be justified, and the inability to conduct a breech delivery, an abnormality which can be foreseen, does not prevent the family doctor from being an adequate domiciliary obstetrician if he aims at the avoidance of breech delivery altogether, handing the inevitable cases over to hospital.

It may be true, as Farquhar Murray (1952) says, that there are insufficient forceps deliveries to permit the student to perform even one before qualification, but the same explanation cannot be offered if he has not sutured a perineum, for there are about a quarter of a million to repair per annum in England and Wales. It is an essential accomplishment for the domiciliary obstetrician, but it can, and should, be taught before qualification.

In dealing with hypertension, the inexperienced practitioner who knows a few simple rules and sees his antenatal

patients regularly will see serious cases of toxæmia so rarely that the postgraduate obstetric experience necessary to decide when to induce before term, or when to carry out a caesarean section, would rarely be of use to him. When the need arose—say once in two or three years—the help of a specialist could be obtained.

It does not need postgraduate obstetric experience to select for hospital women who have had many previous deliveries and those with a history of an abnormal third stage, or to prevent pregnancy anaemia, or to give an intravenous injection when the head crowns. Students are familiar with intravenous infusion, and any enthusiast who has provided himself with ergometrine, suitable fluid, and a "giving" set, can greatly reduce the incidence and danger of post-partum haemorrhage, and, in the occasional difficult case, keep the patient in good condition until the flying squad arrives.

The possibility of disproportion causes much concern, but, because rickets in childhood has been eliminated almost completely, pelvic contraction is rare and likely to become more so. The only two cases in the personal series were aged 37 and 41, an incidence of 6% in patients over 35 and nil in younger patients. If consultant opinion is available the family doctor should not meet serious trouble with disproportion.

These are some of the more common abnormalities with which the domiciliary obstetrician has to deal. There are many others, but in domiciliary practice most of them are rare. The number of years for which the average family doctor would have to practise to see a case among his domiciliary patients is, for prolapsed cord, 10 years; transverse presentation in labour, 10 years; mento-posterior presentation, 40 years; brow presentation, 50 years; hydatidiform mole, 50 years; ruptured uterus, 300 years; inverted uterus, 600 years. Averages cannot be applied to individuals, but they help to keep a sense of proportion. General practice would be impossible if one of the qualifications for it were postgraduate experience of abnormalities unlikely to be encountered in 10 years of practice.

There are good reasons for making adequate experience in obstetrics an essential qualification for practice in remote country districts, but it appears equally clear that any family doctor who is interested in obstetrics, and who, as a student, has had adequate instruction in the aspects of midwifery likely to be met in general practice, can be allowed to supervise maternity cases in any area where consultant support is available, without the risk of serious consequences for his patients. The role of practitioners with postgraduate obstetrical experience should be to practise either in country areas where consultant help is not readily available or as members of a group, where, by helping their colleagues with difficult cases and by providing a liaison between them and recent advances in obstetrics, they can help to maintain a high standard throughout the group, without taking the day-to-day care of maternity cases out of the hands of the family doctor.

Summary and Conclusions

An inquiry has been made into the practice of obstetrics (1) in a general practice over a period of six years; (2) in a community of 67,000 inhabitants over a period of three years; and (3) in a further 1,000 domiciliary deliveries.

In group 1 the case records were those of a medical practitioner, and in groups 2 and 3 those of midwives. The following suggestions are offered.

Premature delivery, breech delivery, and multiple birth carry a stillbirth or neonatal death rate too high to be acceptable for domiciliary delivery. The rates for first births do not suggest that normal primiparae should be delivered in hospital.

Domiciliary forceps delivery is inevitable in a small proportion of cases, but the risks are not great. The proportion can be reduced considerably if hospital

delivery is arranged for primiparae who are over 30 years of age or who are not fully dilated after 24 hours in labour.

More frequent use of episiotomy in domiciliary work would reduce the forceps rate and the incidence of severe tears, and would avoid many long second stages of labour.

Toxaemia can be controlled to a very great extent if blood pressures are observed frequently and if adequate attention is paid to slight rises.

Intravenous ergometrine at the end of the second stage can be used with advantage in domiciliary practice, particularly in forceps deliveries.

Interest in obstetrics and adequate instruction as a student are the only essential qualifications for the family doctor who wishes to practise obstetrics in an area where consultant support is available.

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CONDITIONS ASSOCIATED WITH THE GROWTH OF BOYS, 1950-1

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The changes which have taken place over the years in the growth of children are generally, and we think rightly, attributed to improvements in their food. Whereas during the slump years dietary surveys showed a grossly deficient diet, a study made in 1949 by Beltram and Bransby (1950) of children from the lowest income group (parent earning £4 10s. or less a week) showed average intakes which compared "satisfactorily" with the recommendations of the B.M.A. Committee on Nutrition (1950) in respect of all nutrients with the exception of vitamin D, the requirement of which at school age is still a matter of complete uncertainty. If this was the case for the lowest income group, then it could be argued that an actual margin of safety existed in higher income groups. It is, of course, obvious that about half of the group surveyed by Beltram and Bransby must have had intakes below the B.M.A. recommendations, but nutritional "standards" are set, deliberately, on the safe side of the optimum, and it is at least questionable whether many boys, even in this group, consumed too little of any nutrient.

There is, too, evidence from the past to suggest that schoolboys' diets may now be adequate. The last large milk-feeding experiment, carried out for a year on 2,800 children in 1934-6, showed gains in height and weight

in all groups; but they were small and none was statistically significant; the opinion that they were, in fact, real was formed on the grounds that they were consistently found in all of the groups. Since then, not only has milk been added to the diet of school-children, but their diet has been enormously improved in other respects. Again, a feeding experiment carried out during the war (Bransby, Burn, Magee, and MacKecknie, 1946) tested the effect of a supplement of vitamins A and B₁, riboflavin, nicotinamide, ascorbic acid, and vitamin D on 800 children for a year. No effect was observed on growth, strength, endurance, or absenteeism.

It is of interest, then, to note that well-marked differences in stature still exist in children, not only between the lowest income group and the one above it, but fairly evenly throughout most of the social scale.

Cause of Differences in Stature

In view of the evidence cited above, it is worth while to consider the other possible causes for these differences in stature. The first is that these differences are hereditary. But the considerable changes in stature that have occurred as a result of environmental change should make us very wary of accepting this. The finding of Weir (1952) that "secular changes in growth are similar to the differences in growth associated with differences in social condition" adds point to this.

Another possibility is that the rate of growth is inexorably set as a result of conditions in the early years of life, and if these are adverse no subsequent improvement can lift the child out of his "growth channel." This has been shown to be the case in underfed pigs by McMeekan (1940), and in his study certain changes in skeletal proportion occurred, which, as Leitch (1951) has pointed out, are similar to skeletal differences to be found between children of different social classes. But application of the findings of animal experiment to man needs always to be made with caution. Moreover, Bransby (1953), studying the diets of 461 children over 6 months and under 5 years in 1951, found that in high income groups the nutrient intake was just as often below the optimum in some respect as it was in the low income groups; yet, at any rate by the age of 6, differences in stature can be demonstrated in association with social class. Nevertheless, the work of Yudkin (1952b), in which a liver supplement fed to small children on an otherwise excellent diet enhanced growth, reminds us that all may not yet be known concerning the essentials for growth.

A further possibility is that some factor other than diet may operate to an important degree to-day. This has never been adequately explored because, as Cruickshank (1951) has put it, "heredity and environmental factors—nutrition, poor housing, lack of sleep, infectious disease—are inextricably interrelated in determining the growth and development of children." The only instance, so far as we know, in which a non-dietary factor has been demonstrated to affect the growth of children in the mass was reported by Widdowson (1951). German orphans, she found, grew better when the matron in charge of them was motherly and kind than when she was severe, though their diet remained the same. Other non-dietary factors have never been studied in isolation. For example, no one can be confident that the environment of our great industrial cities is favourable to the growth of children, and it is in these, typically, that growth rates are least.

We may presume that the answers to all these problems will ultimately be writ clear in the stature of future generations. There are, too, long-term research studies afoot which may somewhat anticipate the event. But in the meantime we do not even know whether there may not be conditions affecting the stature of large numbers of children and thus preventing them from benefiting fully from im-

provements in their diet. The public health aspects of this question appeared to us of sufficient importance to warrant a reconnaissance.

The Investigation

The plan of investigation was as follows. In Beltram and Bransby's survey the intakes of Salford schoolboys were analysed separately and found on the whole to be slightly higher in most nutrients than the rest. Salford is an industrial city, with mean crowded houses, and much smoke and rain. Here, therefore, non-dietary conditions might be expected to operate at a maximum, and dietary ones at a minimum. The stature and physique of Salford boys, at three age levels, were therefore compared with those of boys at Kingston-on-Thames, a sunny pleasant town. At each place, each age group was examined at one season and in the same year. At Bristol a study was carried out on a larger group of 14-year-old boys, and the findings were analysed in terms of social class and similar factors. Our aim was to test whether the differences between stature and physique in industrial and other areas were similar to the differences that occur between different social groups—in effect, an extension of Weir's dictum quoted above.

In addition, we obtained at Bristol as much information as we could about dietary and non-dietary factors. Before the war Bristol built a large housing estate for families who had previously lived under slum conditions in the city. Data on these boys were compared with those on boys still living in the heart of the city. Thus the environmental differences between these groups reflected *in parvo* those seen *in magno* in Salford as compared with Kingston. Since we interpreted Widdowson's study as showing the effects of mental stress, we analysed separately the weights, in Bristol, of boys from "broken homes," in which category we include parental death and divorce and illegitimacy. We also compared boys whose mothers went out to work with those whose mothers did not, for it had been retailed to us elsewhere that children often came home to an empty house, or even had to wait outside a locked door, and that they were on occasion sent to school when they should really have been in bed, because the mother could not afford to lose her day's work; we therefore felt that in this group some form of mental stress might operate. One further point was tested: in our surveys in previous years it had been the practice to record the number of boys who had a "tired expression." Inquiry had shown that a high proportion of them shared beds, and, to judge by their looks, did not get enough sleep. We therefore analysed our findings in terms of those who did and those who did not share beds.

Physical Findings

Stature and Physique.—Table I gives the mean heights and weights of boys in the different groups, and the numbers involved. The children at all ages are lighter and

TABLE I.—Weight and Heights of Boys in Different Parts of Britain

	Age	No.	Weight in kg.	Height in cm.
Salford ..	6 years	149	20.83 ± 2.45	114.38 ± 5.08
Kingston ..	6 "	197	22.63 ± 2.72	118.00 ± 5.69
Salford ..	10 "	197	28.78 ± 4.24	133.76 ± 5.40
Kingston ..	10 "	135	32.70 ± 4.79	139.61 ± 6.10
Salford ..	14 "	206	44.39 ± 9.14	154.10 ± 9.09
Kingston ..	14 "	190	48.61 ± 8.3	160.50 ± 8.57
Bristol:				
Modern ..	14 "	210	46.78 ± 7.62	158.39 ± 8.99
Grammar ..	14 "	167	50.52 ± 8.02	164.82 ± 8.71
A public school	14 "	76	51.63 ± 6.71	166.50 ± 7.82

shorter at Salford than at Kingston, and at Bristol the modern-school boys are lighter than the grammar-school boys, who are in turn lighter than public-school boys. We compared the height/weight ratio in the different groups to test whether they showed the tendency, reported by Weir,

towards a slimmer build where mean growth was greater. No consistent or statistically significant differences were found. As a further test, we expressed the biacromial and bitrochanteric diameters, and the chest girth, as percentages of height (Table II). It will be seen that in every set of comparisons the group shown in Table I to be taller and heavier is also slimmer.

TABLE II.—Biacromial, Bitrochanteric, and Chest Measurements Expressed as a Percentage of Height

	Age	Bitrochanteric	Biacromial	Chest Circumference
Salford ..	6 years	18.8	22.7	49.7
Kingston ..	6 "	18.2	22.3	48.2
Salford ..	10 "	18.6	22.0	—
Kingston ..	10 "	18.1	21.3	—
Salford ..	14 "	18.9	21.8	47.0
Kingston ..	14 "	18.6	21.5	45.3
Bristol:				
Modern ..	14 "	18.6	21.0	46.2
Grammar ..	14 "	18.3	21.0	46.1
A public school	14 "	18.0	20.8	45.6

Development.—Following on Greulich's work in America, Ellis (1947) showed that Barnardo boys who became pubertal early grew more rapidly than their fellows. The differences here were presumably genetic in origin, but data collated by Stuart (1946) show that improved socioeconomic circumstances accelerated the onset of puberty. We therefore studied the stage of puberty in our 14-year-old boys. We held that because we knew the plan of our study, and the place of our different groups in it, unconscious bias could creep in, and we therefore concentrated on the physical index of puberty which we considered the least subjective—namely, the condition of the pubic hair. We felt our groups were large enough to offset the errors due to the use of a single criterion. We recorded four degrees; complete absence of hair (PH-), a few downy hairs (PH±), an intermediate stage (PH), and a well-developed escutcheon (PH+). At Bristol we were fortunate in having as a check the findings of Drs. Irving-Bell and Fraser, of the Bristol school medical service, on the same boys. They used a system of classification to which they were accustomed, with three grades only, but the trend of their findings clearly confirms our own (Table III). There is a lag in puberty in Salford compared with Kingston, and in Bristol modern compared with grammar schools.

TABLE III.—Percentage in Each Group at Different Stages of Puberty From Pre-pubesence (PH-) to Adolescence (PH+)

	PH-	PH±	PH	PH+
Our findings (P.J.C.):				
Salford schools ..	33.8	11.7	40.0	14.5
Kingston ..	13.4	22.6	22.6	41.4
Bristol modern schools	10.8	18.5	40.0	30.7
Bristol grammar ..	7.8	15.0	26.1	51.1
Public school ..	7.9	19.7	32.9	39.5
Dr. Frazer:				
Bristol modern (71 boys)	25.4	60.5	14.1	—
" grammar (55 ..)	2.9	45.4	52.7	—
Dr. Bell:				
Bristol modern (138 boys)	13.0	44.9	42.0	—
" grammar (106 ..)	8.5	28.3	63.2	—

Pallor.—Yudkin (1952a) reported that pallor was associated with underdevelopment. Differences in lighting, etc., made it impossible to compare our groups with one another, but a comparison could be made within each group. Only about 20 boys in each group were recorded as pallid, but in each case they were on average lighter than their fellows. The difference was on average about 4%. On the other hand, no consistent difference whatever was recorded in height.

Fat Covering.—Because pallor is an early sign of under-nutrition, data on the skinfold thickness of our groups are of interest. There were no statistical differences between the mean readings of comparable groups, but when

we separated in each group the "thin" boys (with readings below the norm for all boys of their age group) and others, the former showed consistently lower mean weights, and, with the exception of one group, the Kingston 6-year-olds, in which there were only 28 "thin" boys, consistently lower mean heights. It is to be expected that the "thin" boys would be slighter, but it is surprising that they should also be shorter. Details both of these findings and of those relating to pallor are omitted for reasons of space.

Environmental Conditions Associated with Difference in Stature

In relating environment to stature, weight only was taken into account. Height varied similarly, but in less degree, and there was therefore no point in including it. The data given below are from Bristol only. In a few cases in which the information provided was inadequate the boy was excluded from that part of the analysis.

Diet

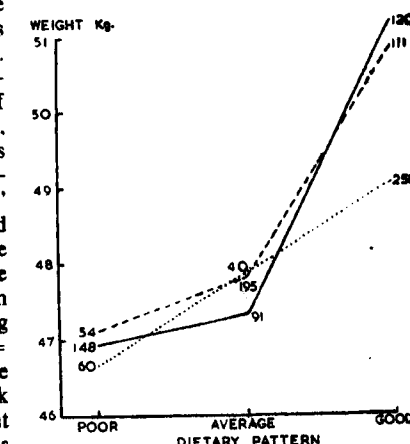
It was not practicable to carry out detailed dietary surveys of such large numbers of boys. Instead, each boy was questioned about the frequency with which meat or fish was provided for him, upon the number of times a week that he ate fresh fruit, and on the amount of milk he consumed, which was checked by determining the amount delivered daily for the family, and making allowances for the other members (their ages were known); the amount drunk at school was known. The whole of this work was done by Miss C. M. Wood, nutritionist on the staff of the M.O.H., Bristol. The diets have been classified as "poor," "average," and "good," in the case of each of the three indices, on the following basis: "Poor" = Meat or fish once or less a day; milk less than half-pint daily; fruit less than every other day. "Good" = Meat or fish for more than two meals daily; milk one pint daily or more; fruit daily. The average diet was intermediate between these. Obviously the biochemical content of the diet cannot be assessed by this means. But an indication is provided of the extent to which variety enters into the diet, and it is axiomatic that the greater the variety the greater the likelihood that the diet is balanced.

As the graph shows, whatever criterion is used the mean weight increases progressively from "poor" to "good." The differences between the extremes are statistically significant in the case of meat and fish, and of milk.

Non-dietary Conditions

Parental Care.—Each boy's home was visited by a health visitor and an assessment made of the standard of parental care. The mean weight of 122 boys with "very good" parental care was 51.63 kg.; of 220 with "normal" parental care it was 47.16; of 17 with "bad" parental care it was 46.26. The first of these differences is statistically significant, and the second is in keeping with the trend of the data.

Parent's Occupation: Type of School.—The Registrar-General's classification was used (here written R.G. I to V in



Graph showing association between dietary pattern as indicated by number of servings of various foodstuffs, and weight. —, Meat and fish. ---, Milk., Fruit.

descending social order). There was a relation between R.G. category and weight, in grammar schools the means (in kg.) being R.G. I and II, 52.95; III, 49.86; IV, 48.87; V, 47.38; and in modern schools 47.64, 46.89, 46.85, and 46.37 respectively. It may be noted that in every case grammar-school boys are heavier than modern-school boys of the corresponding R.G. group. In general, grammar-school boys have passed, and modern boys have failed, an examination at the age of 10-11 years, and the implied difference in "intelligence" is presumably also to be found in their parents. We feel that the R.G. classification, the type of school, and the assessed parental care should be regarded merely as different indices of the care given to the welfare of the child.

Bed-sharing.—A relationship, if any, with bed-sharing needed to be separated from the factors shown above to be associated with stature. Therefore (1) the mean was found for all boys who shared beds, and (2) this was "matched" by a mean made up of boys who did not, but were otherwise identically placed as regards the environmental factors noted above. The mean of 100 boys who shared beds was 45.6 kg.; the figure for the matched mean was 47.8. Formal tests of significance could not be applied to this difference because of the complexity of factors concerned, but the difference is large and showed up with great consistency throughout the process of analysis. We therefore think that it is real.

Open Surroundings.—Sixty-three boys who lived in the heart of Bristol were compared with a "matched sample" who had lived almost all their lives in the open surroundings of a modern housing estate. The difference, 1.41 kg. in favour of the latter group, is too small in view of the size of the sample to enable an inference to be drawn.

"Broken Homes."—Twenty-eight boys from broken homes had a mean weight of 48.7 kg. as compared with a mean of 48.5 kg. for a matched sample from unbroken homes. This sample is small, but we may add that we were also unable to demonstrate any difference in this respect in either Kingston or Salford.

"Mother Goes Out to Work."—The mean weight of 105 children whose mothers went out to work was 49.8 kg. That of a matched sample was 47.0 kg., a difference so great as unlikely to be a "chance" occurrence. In the case of boys from modern schools it was permissible to make a direct comparison without resorting to matching, because there was little difference between the mean weights of R.G. groups in modern schools. In the modern schools, 65 boys whose mothers went out to work had a mean weight of 48.9 $\pm$ 9.33 kg., compared with 145 boys with mean weight 45.8 $\pm$ 8.13. These differences are statistically significant.

Independence of Dietary and Other Factors

The mean weight (kg.) of grammar-school boys on "poor," "average," and "good" diets was 47.6, 50.3, and 52.0 respectively. For modern schools it was 46.1, 46.4, and 48.1. The corresponding figures for good parental care were 48.5, 51.6, and 52.1, compared with 46.6, 46.4, and 48.4 for average parental care. For R.G. I and II they were 49.0, 52.7, and 54.0, compared with 46.9, 47.0, and 50.0 for R.G. III, IV, and V combined. Whatever the social criterion used, those assessed as "good" stand well above their fellows of the corresponding dietary pattern. The data above are for consumption of meat and fish. The other dietary indices gave a similar picture.

Discussion

Physical Findings

This work confirms the report of Weir that where the stature of children has increased the physique is slimmer. The findings on puberty are in harmony with those cited by Stuart upon the effect of good social conditions in accelerating the onset of puberty.

The differences between Salford and Kingston are similar in character to those between the different social groups in Bristol. This, we hold, extends the implication of Weir's work comparing secular change and social differences.

Environmental Factors

Certain negative points are best cleared up first. We adduce no evidence that mental stress affected the stature of our groups; in fact, one of our "stresses" was associated with exactly the opposite result. We cannot say whether residence in open surroundings confers any advantage over residence in the heart of a city, for the fact that the difference found was small does not mean that it may not have been real. Whether the association between weight and bed-sharing was in fact causal could only have been proved by the provision of beds.

The inquiry was not designed to throw light on the effect, in after years, of environmental conditions affecting the growth in early childhood, and some of the contrasts in weight that we have recognized may simply be the result of factors which operated then. For example, there was little difference in the dietary pattern of boys whose mothers worked and of those whose mothers did not work, but it does not follow that differences did not exist in early years, particularly if those having working mothers were left for any part of their pre-school life in the nutritionally excellent environment of a day nursery.

The association between dietary pattern and weight shown in this study does not support the hypothesis put forward at the outset concerning the adequacy of schoolboys' diets. There are, of course, possibilities other than the obvious one. (1) The "poorer" diets may be adequate for growth at 14, but boys on them may also have lived on poorer diets earlier when their rate of growth was relatively greater. (2) Since the provision of a varied diet is a function of a good parent, it may be that we are merely recording degrees of parental care which were not shown up by the social criteria which we used in this study.

The relation, at all dietary levels, between weight and "very good" and "normal" parental care is reminiscent of Widdowson's demonstration of the influence of the motherly matron on the orphans in her care. Here too, however, other possibilities exist, because our dietary criteria are not exact, nor do they provide information about the diet at other seasons or earlier in life.

The problems raised in this study would not have been resolved had the same approach been used but with greater detail and exactitude. For example, even using the conventional (and costly) method of dietary survey, doubt would have arisen whether any association found between growth and diet was in fact causative. This study suggests that non-dietary factors cannot be ignored as a potential cause of checks to growth, and further progress in this direction would seem to depend upon the development and testing of working hypotheses on how such factors may operate. Presumably they either act "centrally"—for example, through the endocrine system (in which case, for lack of knowledge, no guess can be hazarded regarding the way in which they work)—or there is some disturbance in the equilibrium between intake and the needs of energy and of growth. From clinical studies in time of hunger, and from animal experiments, notably by Young (1945) and by Greenbaum and Maclean (1953) it may be concluded that under certain conditions competition between growth and energy requirements does occur. There is, too, some evidence that this may occur in everyday life. For example, Macy and Hunscher (1951) have reported that for some children the voluntary intake level is not sufficient for "satisfactory" weight gain or nitrogen retention, and that these may be secured by increases of total intake of 10 calories per kg. body weight. Similarly, Hubbell and Koehne (1934) report improved nitrogen, calcium, and phosphorus retention in children whose calorie intake was increased 16-18% by the addition of sugar.

The finding of Yudkin (1952a) that pallor was related to poor development (but not to haemoglobin level), which we confirm in respect of weight, is of interest in this connexion, for pallor is an early sign of undernutrition. A possible explanation is that over long periods of life the

equilibrium between growth, activity, and appetite is set at a low level, owing to some factor affecting the last of these. Whether "undernutrition" of this nature could affect growth without effect on the surface fat, or with such small changes only as we have reported, is unknown; it is not the role, and may not even be the prime, function of the surface fat exactly to make good deficits of intake.

There are, as already noted, long-term growth studies in progress, some of them on the general public. The practical value of these will depend in part upon the success with which the factors affecting growth are recognized at a time and their intensity is gauged. This is impossible in the case of non-dietary factors without working hypotheses regarding their *modus operandi*. Hence these considerable speculations. We would suggest, among such hypotheses, at such things as a varied and tempting diet, adequate sleep, and regular bowel habits, and similar attention to the needs of the child, may affect appetite and therefore growth rate.

Summary

Recent published evidence on schoolboys' diets and stature has been reviewed. Possible reasons for the differences in stature which still persist are discussed, and a field study of a reconnaissance character is described.

The findings confirm the report by Weir (1952) that increase in growth rate is associated with slimmer physique.

Differences in physique between boys in an industrial area and others elsewhere are similar to the differences in boys of different socio-economic environment.

Boys with pallor were found on average to be lighter, confirming a part of Yudkin's (1952a) findings on the significance of pallor. Thin boys were found to be lighter and also shorter than others. The possibility that these findings mean that in some individuals growth is checked because appetite is inadequate is discussed in the light of American work.

Varied diets, as indicated by frequency of consumption of meat and fish, milk, and fruit, were found to be associated with higher weights.

There was a relationship, independent of the association between weight and diet, between weight and the standard of parental care, social class, and type of school.

We wish to express our gratitude to the Medical Officers of Health of Salford, Kingston, and Bristol for their help. We are much indebted to Miss C. M. Wood, Dr. R. J. Irving-Bell, and Dr. A. M. Fraser, of the Bristol Public Health Services, and to many health visitors, school nurses, and others in the three areas for their kind collaboration.

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ENTERIC PNEUMATOSIS

BY

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Enteric pneumatosis is characterized by the occurrence of gas-containing cysts, either sessile or pedunculated, arising in the submucous and subserous layers of the small intestine. They attain the size of a grape and tend to appear in local masses, which in turn may be multiple. They are classically more common on the mesenteric aspect of the bowel and are confined to the small intestine and proximal half of the large intestine.

These cysts are similar in appearance to lymphangiomas, having a thin translucent wall, and are composed of delicate connective tissue lined, at least partially, by endothelium and with evidence of giant-cell formation. The entire microscopical appearance supports the view that the longevity of these cysts is not so much the result of their own perpetuity as of continual replacement due to some influence not understood. The contents are gaseous, being composed mostly of nitrogen with smaller proportions of oxygen and occasionally carbon dioxide, hydrogen, and methane.

Theories on the Cause

Various theories of the evolution of this condition have been expounded, and Masson (1925) has examined these in some detail. It has been thought that these collections of gas are caused by gas-producing organisms, but experiments have failed to produce a similar condition. Further work has been done to investigate possible penetration of intestinal mucosa, associated with increase in intestinal pressure such as may occur in vomiting, coughing, or constipation, but this theory in turn has been disproved, as the cystic gas has not shown the same constituents as intestinal gas.

It is now accepted that this condition is in fact one of gaseous dilatation of lymphatic channels. Masson has investigated the causation of this phenomenon, and concludes that the fundamental pathology lies in lymph stagnation in tortuous or obstructed lymph vessels. He further states that absorption of carbon dioxide and lactic acid from the intestinal mucosa occurs into blocked lymphatics, and that this is followed by liberation of the carbon dioxide, and by diffusion of nitrogen, oxygen, and occasionally methane from capillaries; the resultant ratios of the gases being adjusted by the laws of diffusion governing the partial pressures of gases.

Masson and others have suggested that enteric pneumatosis occurs in association with digestive disturbances, and especially those due either to gastric or to duodenal ulceration, although the cause for this is not clear. Various other authors assert that it is associated with such conditions as intestinal tuberculosis, acute and chronic appendicitis, colitis, and many others, but these seem to be purely coincidental.

Koss (1952), in a review of the literature, has noted the clinical course of this disease. He asserts that the disease may develop within a relatively short time, as confirmed by operative findings. There is also considerable evidence to show that these cysts may disappear spontaneously, but certain complications have been noted. Pneumoperitoneum may occur owing to spontaneous rupture of the cysts, but intestinal obstruction seems to be the most likely complication. The obstruction may be precipitated by blockage of the bowel lumen by submucous cysts, by volvulus induced by a cyst mass, or by extrinsic obstruction due to pressure by cysts or adhesions arising as a result of the condition. Koss reported one case of intussusception due to gas cysts.

This disease has been described as occurring in the vagina during pregnancy, and the first, albeit inadequate, descrip-

tion of its occurrence in man is claimed by English authors to be that of John Hunter (1728-93) and by French authors to be that of Duverney (1648-1730).

In 1825 Mayer described a case occurring in the intestine and peritoneum of a pig, but the first full account of the disease in humans is attributed to Bang (1876), who found this condition at necropsy in a female who died of volvulus of the colon. In 1899 came the first report of the condition by Hahn, who found it in the living subject. Since that time, according to Koss, who has reviewed the available literature very fully, 213 cases have been reported, the vast majority from Central Europe.

A further case, reported below, shows the classical features as described, with the exception that the condition was found to be present in the distal colon—a rare site in a rare disease.

Case History

A married woman aged 49 was first seen in January, 1952, complaining of the passage of bright red blood intermittently on defaecation and associated with diarrhoea and lower abdominal pain. The pain was not severe, but the whole syndrome had been present for 18 months. She had no other complaints apart from long-standing constipation before the onset of the present symptoms, and her weight was steady at about 11 st. (70 kg.). Her previous history contained nothing relevant—an appendicectomy at the age of 19 and hysterectomy at 39. She had been a chronic sufferer from asthma.

Showing filling defects in sigmoid colon and splenic flexure due to gas cysts.

She was admitted to hospital, and, apart from some deep tenderness in the left iliac fossa and a minor degree of haemorrhoids, nothing abnormal was found on either abdominal or rectal examination. Her blood picture was normal. Sigmoidoscopy was performed and the bowel was normal to 23 cm. At this level several polypoid masses were seen filling the lumen of the colon; these were sessile, and measured from 0.5 to 1.5 cm. in diameter. The surface was translucent and of a bluish hue, the appearance being more like that of lymphangiomatosis than polyposis. There was some evidence of recent haemorrhage from the surface of the cysts.

Examination by a barium enema showed rounded translucent filling defects in the sigmoid colon and the splenic flexure (see Fig.). It was decided to perform laparotomy to elucidate further the diagnosis and the extent of the involvement of the bowel.

On opening the lower abdomen the diagnosis was at once evident. Masses of gas cysts were found, involving 6 in. (15 cm.) of a redundant sigmoid colon and 4 in. (10 cm.) of the splenic flexure and distal transverse colon with a normal descending colon between. These cysts presented a similar appearance to that seen at sigmoidoscopy and were aggregated around the entire circumference of the bowel but stopping short of the mesentery. No other abnormality was demonstrated in the abdominal cavity. In view of the symptoms, it was decided to excise the distal colon, and this was performed with end-to-end suture of the transverse colon stump to the pelvi-rectal junction.

Convalescence was uneventful and the patient was discharged from hospital 12 days later free from symptoms. When seen at the out-patient department two months later she had fully recovered from her operation, and her bowel action was normal and her pain and bleeding had gone.

Pathological Report.—"The specimen consists of distal transverse colon, splenic flexure, and descending and sigmoid colon, and shows the typical submucous and subserous gas-filled cysts. The phenomenon of 'skipping' is well illustrated. Microscopically the cysts bear evidence of an endothelial lining with commencing giant-cell formation. No portal of entry for the 'air' has been demonstrated in the colon."

Conclusions

Enteric pneumatosis is a condition in which the intestinal lymphatic channels become blocked and distended by gas, producing multiple gas cysts both subserous and submucous in position.

The condition occurs mainly in men between the ages of 30 and 50, is accompanied by vague digestive and abdominal symptoms, and would appear to be subject to spontaneous resolution. Intestinal obstruction has been pointed out as the most likely complication.

The case reported above is of interest apart from the rarity of the condition in that barium enema and sigmoidoscopic evidence of the disease was found and had not previously been reported in the literature.

The distribution of the cysts in this case seems to differ from that of cases previously noted, and the all-important symptom of haemorrhage on defaecation led the patient to seek medical advice.

I wish to thank Dr. W. MacCullagh Wilson, of the Coventry and Warwickshire Hospital, for his help with the pathological investigation of the specimen.

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ULCERATIVE COLITIS AND CARCINOMA OF THE LARGE INTESTINE

BY

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That ulcerative colitis apparently predisposes to cancer of the colon or rectum seems now to be widely accepted. Upon the correct assessment of this risk the whole therapeutic policy towards the disease might well depend. I have been unable to find any report in which such cancer risk has been estimated, although there are many papers which record the occurrence of this complication of colitis.

The purpose of this communication is to report a further five cases of malignant disease of the intestine arising in the course of colitis, and to consider these cases, in conjunction with reports by other authors, in an attempt to estimate the cancer risk.

Clinical Material

Between January 1, 1947, and December 31, 1951, 154 patients with the diagnosis of idiopathic ulcerative colitis were admitted to St. Bartholomew's Hospital under the care of the physicians and surgeons and to the Gordon Hospital under Dr. E. R. Cullinan's care.

Three of these have gone abroad; their fate is unknown, and they have not been included in the discussion which follows. A further 25 have been excluded from the series on the grounds of incomplete investigation and uncertainty of diagnosis. No case of proctitis without evidence of colonic involvement has been included.

Table I gives the age and sex distribution of the remaining 126. Table II shows the result of a combined postal and personal-attendance follow-up by January 1, 1953. Table III sets out the period for which each patient has been under surveillance since January 1, 1947, with additional information concerning the recognition of cancer of the bowel. In this Table the follow-up is recorded as finishing if colectomy is performed, as, of course, cancer of the large intestine can no longer occur. Table IV classifies the patients according to duration of the disease.

In addition to the five cancer cases recorded here, it should be stated that a further four cases have occurred in the period under review. These have been excluded from the current study because, the diagnosis of cancer having been made elsewhere, the patients were referred to us for treatment of the growth.

TABLE I.—Age (in 1952 or at death) and Sex Distribution. The Ages at Which Cancer of the Large Intestine Appeared are Shown

Age Group	Male	Female	Total	Cancer Diagnosed
0-14	0	0	0	
15-19	4	2	6	
20-24	2	2	4	
25-29	13	11	24	1
30-34	4	17	21	
35-39	7	11	18	
40-44	11	9	20	1
45-49	3	5	8	
50-54	5	7	12	2
Over 55	4	9	13	1
Total	53	73	126	5

TABLE II.—Results of Follow-up

Alive		Dead		Not Traced	Total
No. Known Cancer	Has Cancer	No. Known Cancer	With Cancer		
98	1	19	4	4	126

TABLE III.—Cases Grouped According to Length of Follow-up. The Last Column is Obtained by the Assumption that the Patients on the First Line have Been Followed-up for an Average of Six Months. Those on the Second Line for One and a Half Years, and So On

No. of Years of Follow-up Completed	No. of Patients	Follow-up Ended by Colectomy	Follow-up Ended by Death	Large-gut Cancer Found	Approx. No. of "Patient-Years"
0	25	8	11	2	12½
1	12	7	5	0	18
2	28	4	2	0	70
3	28	3	3	2	98
4	14	2	2	1	63
5	19	0	0	0	104½
Total patient-years					366

TABLE IV.—Distribution of Cases According to Duration of Symptoms

Duration of Symptoms to Date, till Death, or till Colectomy	Total No. of Cases	History Ended		Carcinoma Found
		By Colectomy	By Death	
0-4	30	9	6	1
5-9	50	9	7	1
10-14	21	4	2	1
15-19	12	1	3	1
20-24	8	1	3	1
25-29	4	0	2	1
30 and over	1	0	1	1

Case Reports

Case 1.—A 51-year-old housewife was referred to St. Bartholomew's Hospital in October, 1949, because she had had bloody diarrhoea for 20 years, with slight remissions. Medical in-patient treatment in other hospitals had helped her little. Physical examination revealed a mobile tender swelling in the left hypochondrium, and this was shown radiologically to be a colonic neoplasm, the rest of the colon showing the changes of ulcerative colitis. Total colectomy and ileostomy were performed. The operation specimen showed a carcinoma in the left half of the transverse colon, with the characteristic changes of chronic ulcerative colitis affecting the whole of the remainder of the colon. Histologically, the growth was described as "moderately anaplastic" and one out of 27 lymph nodes was infiltrated with carcinoma cells. In 1953 she was free from recurrence of growth, and plans for ileo-rectal anastomosis were being considered.

Case 2.—A 26-year-old unmarried carpenter was first seen at St. Bartholomew's Hospital in 1935, with a two-year history of bloody diarrhoea. Sigmoidoscopy showed the changes of ulcerative colitis, but the colon was not x-rayed. Appendicostomy was performed, with temporary improvement. This closed spontaneously two years later. Remissions and relapses continued until 1945, after which he became well for two and a half years. In August, 1949, he reported the appearance of alternating constipation and diarrhoea, with small stools. Barium enema revealed a carcinoma at the junction of the descending and pelvic colon, with chronic colitic changes above the growth. Exploration confirmed the presence of the growth, but numerous peritoneal metastases were seen, and no curative treatment was possible. No biopsy was taken. Palliative caecostomy was performed, and death occurred five months later. Necropsy was not permitted.

Case 3.—A married clerk aged 50 was referred to St. Bartholomew's Hospital by his doctor in February, 1949. He had had bloody diarrhoea from 1918 intermittently until 1922, when a caecostomy was performed. Thereafter there were a number of minor relapses of the colitis symptoms, and a very severe one. For several years a prolapsed caecum had been troublesome, and because of this he was sent to this hospital. Examination showed the rectum to be greatly stenosed; right hemicolectomy and ileostomy were carried out; the left colon was to have been removed later. The operation specimen showed the appearances of ulcerative colitis throughout its length, but not spreading to the ileum. He remained well until May, 1950, when left iliac pain and abdominal distension appeared. A mass could be felt in the abdomen, and laparotomy revealed a large carcinoma of the descending colon, with many peritoneal metastases. Biopsy showed a mucoid adenocarcinoma. He returned home and died in January, 1951. No necropsy was performed.

Case 4.—A married woman, aged 63, was referred to the Gordon Hospital by her doctor in April, 1951, with a history of bloody diarrhoea intermittently since 1925, more continuous since a severe relapse in 1935. In 1935 ulcerative colitis was diagnosed, and after eight months' hospital in-patient treatment she had to some extent improved. Symptoms remained troublesome, but six months before we saw her she became much worse, with 20 to 30 bowel actions a day and much blood and mucus. On examination she was found to have a carcinoma of the rectum, and laparotomy revealed peritoneal metastases. She died on the eighth post-operative day. **Necropsy report:** Carcinoma of rectum of mucoid type, peritoneal secondary deposits, severe generalized ulcerative colitis: confirmed histologically.

Case 5.—A married woman aged 25 first attended at the Gordon Hospital in August, 1949, with a six-year history of bloody diarrhoea for which she had had three previous periods of in-patient treatment at other hospitals. Barium enema and sigmoidoscopy showed the typical appearances of ulcerative colitis throughout the colon. After six weeks' in-patient medical treatment she was much improved. For two years she was fairly well, but in September,

1951, she reported a lump in the breast, an abdominal mass, and pain in the chest. Laparotomy revealed carcinomatous peritonei, and she died two weeks later. *Necropsy report*: primary colloid cancer of the transverse colon, with generalized metastases; the whole colon was affected by extensive and severe ulcerative colitis, without spread to the ileum. The diagnosis was confirmed histologically.

Discussion

During the period of observation of 126 patients with ulcerative colitis, five cases of carcinoma of the rectum or colon have been found. That this is not an unusually high proportion is suggested by other reports. Rice-Oxley and Truelove (1950) found 4 cases out of 129; Counsell and Dukes (1952) discovered 7 cases with this complication in a group of 63; Lyons and Garlock (1951) reported that 9 in their series of 226 showed malignant change; Dennis (1945) noted 2 certain cases and 1 probable case of bowel cancer in his series of 82 cases of colitis; Kirsner *et al.* (1948) reported 2 in a selected group of 100; Lahey (1949) found 17 in a series of 600; Brown *et al.* (1951) found 7 in 147; and Sloan *et al.* (1950) reported 109 cases of intestinal malignancy in a group of 2,000 cases of ulcerative colitis.

Earlier papers (Feder, 1938; Willard *et al.*, 1938; Hurst, 1935) do not record this complication. Up to 1945 Lynn, in his review of the literature on this subject, found that 98 cases had been reported, and he stated that by collecting the reported series together he found that 28 cases had arisen in 1,467 patients with colitis. In a more recent paper Felsen and Wolarsky (1949) reported that they had found no cases of intestinal malignant disease in a study of 855 patients with ulcerative colitis. It is difficult to reconcile the negative findings of the last-named with the recent reports from so many other centres. Nevertheless, even including this series, the average ratio of cancer to total cases in the post-war reports is about 3.7%.

Most clinicians would feel that this figure is so small as to have little weight in the decision whether a particular patient should have his colon removed. It is important to recognize, however, that this figure does not represent the chance of a patient eventually developing cancer of the diseased intestine, but only the cancer incidence over a particular time—in the majority of reports an unspecified time. If, for example, all the patients in the accumulated series had been observed for an average of 10 years each, 3.7% incidence represents 3.7 cases for every 100 of the population at risk, during a period of 10 years, or 3.7 per 1,000 living per year.

In England and Wales in 1950 (Registrar-General, 1952), 16,389 deaths were registered as being due to neoplasm of the colon and rectum. A guess that this represents an annual incidence of 20,000 new cases cannot be very wide of the mark. A negligible number of these occur below the age of 25, and the population over that age in 1950 was 28½ million. This gives an annual incidence in the population of England and Wales over the age of 25 of 0.7 per 1,000 living. The estimated annual incidence in the U.S.A. is 0.88 per 1,000 (Bargen, 1949).

So that, by our quite generous guess that every patient in all these reports has been followed up for an average period of 10 years, we derive the result that cancer of the rectum and colon in these cases is five times more common than among the population as a whole.

If we apply the same principle to the much smaller group formed by my own cases we obtain the figure of 366 patient-years (Table III) in which five carcinomas have occurred—an annual incidence of 14 per 1,000, or twenty times the national figure. This calculation is unsatisfactory because of the extremely small number of cases. It is worthy of note, however, that the small group here reported closely follows the pattern of other accounts. Thus the proportion of cancer cases to colitis cases is very close to the average figure of the other reports: the relatively youthful incidence of cancer in this site as compared with the com-

monest ages in the whole population is commented on by others (for example, Sauer and Bargen, 1949); that the growths appear especially in those who had had colitis for many years (Lahey, 1949; Counsell and Dukes, 1952) is borne out in our series, in which four out of the five cancer patients had had colitis for 15 years or longer.

This method of assessing the cancer morbidity in the present series as compared with the general population is, for lack of data, crude and involves a good deal of guess-work. It is not possible, with the information at my disposal from other publications, or with the small numbers in my series, to analyse these figures with greater refinement. It seems reasonable to deduce that in the reports I have quoted carcinoma of the rectum and colon has occurred at least five times as often as one would have expected if they had been a sample of the normal adult population.

Conclusions

The fallacy of reporting an "incidence" in the neighbourhood of 4% without reference to time has been illustrated. It would appear that such an incidence represents a cancer risk to these patients which is many times that for the "average" person. Cancer of the rectum and colon in the general population is by no means a rare disease (being responsible for 1 in 30 of all deaths), and a possible fivefold increase in our patients is therefore no mere academic observation. One feels that until long-term study has produced more cases and an opportunity for more exact examination of survival times and cancer incidence, the increased risk of malignant disease in the rectums and colons of these patients should be held to be an important factor when the question of surgical intervention is being considered.

Summary

Five cases of carcinoma of the large intestine occurred in 126 cases of ulcerative colitis. Case reports of the carcinoma cases are presented.

An attempt is made to assess the cancer risk for this site in ulcerative colitis, with reference to this and other reported series.

It is suggested that the cancer risk for this site in patients with ulcerative colitis is not less than five times that for the population as a whole.

ADDENDUM.—Since this paper was written, the workers at the Mayo Clinic have published an analysis of cancer mortality in a series of 1,500 cases of ulcerative colitis. They conclude that carcinoma of the rectum and colon is 20 to 30 times commoner as a cause of death in this disease than in the population as a whole (Bargen, J. A., Sauer, W. G., Sloan, W. P., and Gage, R. P., *Gastroenterology*, 1954, 26, 32).

I am greatly indebted to Mr. Basil Hume for permission to report Case 1; to Sir James Paterson Ross for Case 2; to Mr. J. P. Hosford for Case 3; and to Dr. E. R. Cullinan for Cases 4 and 5. The staff of the follow-up departments at St. Bartholomew's Hospital and the Gordon Hospital have been of tremendous help in tracing the patients. Dr. Cullinan has given me much valuable advice and encouragement, and Mr. M. P. Curwen, medical statistician at St. Bartholomew's Hospital, has been most helpful with his kindly criticism.

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ASSOCIATION OF DIABETES MELLITUS WITH CEREBRAL TUMOUR

BY

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Ashby and Tweedy (1953) stated that "no neurogenic lesion causing permanent diabetes has been described," and they added that numerous cerebral lesions are known to cause transient hyperglycaemia, but not permanent diabetes. In view of this we are prompted to record the following case.

Case Report

A 51-year-old lorry driver was sent to the out-patients department on April 6, 1951, with symptoms of polydipsia and polyuria which he had had for three months; he had lost a good deal of weight in spite of an excellent appetite. There was no family history of diabetes.

Examination showed a well-built man, not obese, who was thought to be rather slow mentally, though co-operative. He had a thickly furred, dry tongue, and was moderately arteriosclerotic, but all peripheral pulses were palpable. The blood pressure was normal. Fundi and media were clear and all reflexes were brisk and equal, with normal power and sensation in the limbs. The urine was acid, specific gravity 1028, and orange to Benedict's reagent; there was no acetone or albumin. A glucose-tolerance test showed a diabetic curve (see Chart), and the patient was admitted a week later for stabilization. The above findings were confirmed, but in addition the ankle-jerks were now absent and the right knee-jerk was weak. There was some subjective difficulty in using the left leg, and both calves were tender.

He was placed on a 200-g. carbohydrate diet and was finally allowed out of hospital on April 30 on two injections of 48 and 24 units of soluble insulin daily. During his stay in hospital his diabetes was difficult to stabilize and the urine contained acetone on occasion. His weight remained steady and he felt better, though he was still rather slow in cerebration. He was seen in the clinic two weeks later, before going to a diabetics' convalescent home, when he seemed well, though complaining of some weakness in the right leg. On return from convalescence at the beginning of June, however, he was not at all well, appeared increasingly slow mentally, and had difficulty in getting about.

He was readmitted the next day, when he was found to have weakness of both quadriceps and foot extensors, with absent tendon reflexes. The plantar responses were flexor. His feet felt numb, but there was no objective sensory loss, except to light touch in the left palm, where the grip was poor. The fundi were normal. There were crepitations at the bases of the lungs, but no evidence of congestive failure. A diagnosis of peripheral neuritis was made, and he was treated with injections of vitamin B₁ and physiotherapy. A chest radiograph was normal. The Wasser-

mann reaction and Kahn test were negative. A lumbar puncture revealed normal fluid under a pressure of 220 mm., with a protein content of 20 mg. per 100 ml. His condition deteriorated rapidly and he became increasingly comatose. Eleven days after admission he was found to have regained his tendon reflexes in the legs and the left plantar response had become extensor. There was no papilloedema. A left hemiparesis developed, and he died in coma with hyperpyrexia 10 weeks after first attending hospital. His urine during the last period of admission still contained moderate amounts of sugar and acetone, but the blood sugar the day before death was normal.

At necropsy (Dr. T. Goodier) a large glioblastoma multiforme, containing mainly spongioblast-like cells, was found in the left temporal region, spreading down into the hypothalamus, but not involving the pituitary. The pancreas showed degenerative changes compatible with diabetes mellitus. There were no other gross findings.

Discussion

Since Claud Bernard (1849) produced glycosuria by puncture (piqûre) of the floor of the fourth ventricle in animals, repeated attempts to define a cerebral centre concerned with carbohydrate metabolism have yielded conflicting results. The centres for piqure glycosuria are now thought to lie in the hypothalamic nuclei in the walls and floor of the third ventricle, but most authors agree that experimental damage to this region causes transient hyperglycaemia and glycosuria only, and that thereafter the blood sugar returns to normal or low normal figures (Long, 1940). Ranson *et al.* (1938) recorded the production of diabetes in only one of 50 monkeys and in none of 300 cats with hypothalamic lesions, and thought that the disturbance in carbohydrate metabolism in their one animal was related to obesity and overeating. No other worker has reported the production of permanent diabetes in the experimental animal.

Clinically, it is well known that cerebrovascular accidents, cerebral trauma, meningitis, and tumours may cause transient hyperglycaemia and glycosuria. Cushing (1930), however, stated that he had never seen even transient glycosuria after operations in the hypothalamic region. Joslin *et al.* (1952) also quite clearly subscribed to the view that there is no justification for assuming a cerebral role in the aetiology of diabetes mellitus, and that where the two are associated there is a coincident hereditary weakness of the pancreas. Nevertheless, van Bogaert (1928) mentioned two patients with tumours of the third ventricle, with hyperglycaemia and diabetic sugar-tolerance curves. The pancreas was normal in one case at necropsy. Byrom and Russell (1932) gave a detailed account of a woman with an insulin-resistant diabetes, who was found to have an ependymal cyst of the third ventricle. There was, however, a strong family history of diabetes, but they suggest that hypothalamic irritatory of diabetes, but they suggest that hypothalamic irritatory may lead to hyperglycaemia through overactivity of the sympathetic nervous system, and eventually to diabetes. Penfield (1934) also mentioned a patient with insulin-resistant diabetes of five years' duration in whom a cyst of the mid-brain was found at necropsy.

In the present case the association of diabetes mellitus with the cerebral tumour seems inescapable. The short history, the absence of any hereditary predisposition, and the insulin resistance are points in favour of this. The retarded mental state was a striking feature, though there were no other hypothalamic symptoms. The mechanism of production of the diabetes, however, is difficult to explain.

There seems little doubt that the hypothalamus is concerned in the emergency regulation of the blood sugar through its control of sympathetic-parasympathetic pathways. If this control is upset hyperglycaemia might result from sympathetic overactivity; the hyperglycaemia would act as a stimulus to increased insulin production and might lead to eventual exhaustion of the β -cells of the pancreas. Permanent diabetes has been produced in animals by long-continued hyperglycaemia (Dohan and Lukens, 1947). Alternatively, parasympathetic overactivity might increase insulin production through vagal stimulation of the pan-

creas, which again might lead to islet atrophy and permanent diabetes. The evidence for vagal control of insulin secretion, however, is not very clear-cut (Long, 1940). With either hypothesis, the finding of changes in the pancreas at necropsy does not necessarily implicate that organ as being primarily responsible for the diabetes.

In conclusion, experimental and clinical evidence suggests that the production of diabetes mellitus by hypothalamic damage is exceptional. Nevertheless, the hypothalamus seems to play some part in the regulation of carbohydrate metabolism, and its role is worthy of further study.

Summary

A case is described in which diabetes mellitus of recent onset was associated at necropsy with a neoplasm in the region of the hypothalamus.

It is suggested that the cerebral lesion was responsible for the onset of diabetes.

Experimental and clinical evidence gives some support to the view that the hypothalamus is concerned in the regulation of carbohydrate metabolism.

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SYSTEMIC ANTIBIOTICS IN CERTAIN DERMATOSES

TRIAL CONDUCTED UNDER THE AUSPICES OF THE MEDICAL RESEARCH COUNCIL

Under the auspices of the Medical Research Council clinical trials were undertaken at St. John's Hospital for Diseases of the Skin* in order to evaluate the effect of the newer antibiotics when given systemically for certain chronic, recurrent, and resistant skin conditions. This trial was under the direction of Dr. J. O. Oliver (director of pathology) and was regarded as a "pilot" survey to indicate whether subsequent large-scale trials would be of value.

The trials were designed for use with out-patients, the antibiotics under scrutiny being aureomycin, chloramphenicol, and oxytetracycline ("terramycin"). For control purposes dummy capsules were prescribed to a second group of patients, and it was arranged that neither the doctor nor the patient knew which medication was being given. Dosage used for the antibiotic was 2 g. a day, taken in four divided doses, and the treatment was continued for three weeks unless the patient was forced to stop because of side-effects. A compound vitamin-B tablet was taken with each capsule. All cases which did not complete three weeks' treatment were regarded as failures. The observed results (see Table) were as follows.

1. *Herpes simplex recurrens* (31 cases, including 8 controls). No effect in preventing recurrence was observed as the result of the administration of aureomycin, chloramphenicol, or oxytetracycline. One case relapsed under active treatment.

2. *Plantar warts* (30 cases, including 9 controls). No indication of superiority of any of these antibiotics over the dummy capsules. In fact, in the control series six patients

*The medical registrars responsible for this trial were Drs. R. H. Seville, C. D. Calnan, R. H. Meara, and J. H. S. Pettit. Dr. P. D. Samman undertook the lichen planus series.

Disease and Drug Used in Trial	Total	Cured	Improved	Unchanged	Failed to Complete Course	Observed Effect
<i>Herpes simplex recurrens</i>	31					
Chloramphenicol	12	0	0	12	4	Nil
Aureomycin	6	0	0	4	2	
Oxytetracycline	5	0	0	1	2	
Controls	8	0	0	8	0	
<i>Plantar warts</i>	30					
Chloramphenicol	8	3	1	1	2	Nil
Aureomycin	9	1	1	1	2	
Oxytetracycline	4	2	0	0	2	
Controls	9	6	1	3	0	
<i>Lichen planus</i>	19					
Chloramphenicol	7	0	1	4	2	Nil
Aureomycin	5	0	1	2	2	
Oxytetracycline	3	0	1	0	0	
Controls	4	0	3	1	0	
<i>Pityriasis rosea</i>	25					
Chloramphenicol	8	0	0	8	1	Nil
Aureomycin	8	0	0	8	1	
Oxytetracycline	3	0	0	3	1	
Controls	6	0	0	6	1	
<i>Dermatitis herpetiformis</i>	12					
Chloramphenicol	3	0	1	1	1	Nil
Aureomycin	4	0	0	2	2	
Oxytetracycline	3	0	0	0	3	
Controls	2	0	0	2	0	
<i>Discoid eczema</i>	16					
Chloramphenicol	6	0	0	4	2	Nil
Aureomycin	5	0	1	2	2	
Oxytetracycline	2	0	0	1	1	
Controls	3	0	1	2	0	
<i>Seborrhoeic infective eczema</i>						
Short duration	7					
Chloramphenicol	4	4	—	—	—	Marked benefit
Aureomycin	2	2	—	—	—	
Oxytetracycline	1	1	—	—	—	
Controls	0	0	—	—	—	
Long-standing	7					
Chloramphenicol	3	0	—	3	—	Possible benefit
Aureomycin	3	1	—	2	—	
Oxytetracycline	1	1	—	0	—	
Controls	0	0	—	0	—	

recovered out of the nine, substantiating the well-known observation that warts are unpredictable in their behaviour.

3. *Lichen planus* (19 cases, including 4 controls). No apparent effect was noticed.

4. *Pityriasis rosea* (25 cases, including 6 controls). There was no apparent reduction in the duration of the condition as a result of administration of any of the antibiotics.

5. *Dermatitis herpetiformis* (12 cases, including 2 controls). Although this series was small no indication was given that any of the antibiotics exerted a favourable effect.

6. *Discoid eczema* (16 cases, including 3 controls). No apparent effect was detected.

7. *Seborrhoeic infective eczema* (patients with red oozing scalp and faces with crusting, scaling, and fissuring of the ears). These were divided into two groups: (a) *Of short duration* (7 cases, with no controls). All seven patients made a rapid and uninterrupted recovery. (b) *Long-standing cases lasting for months or years* (7 cases, with no controls). Two apparently recovered but five were unaffected.

Summary

From the small number of patients treated it would appear that the use of aureomycin, chloramphenicol, and oxytetracycline, when given systemically, is not indicated for herpes simplex recurrens, plantar warts, lichen planus, pityriasis rosea, dermatitis herpetiformis, or discoid eczema. It would seem, however, that in infective seborrhoeic eczemas of recent origin, in which one must regard an infective process as being superimposed on a readily infectable soil, rapid results are often obtained by the use of these antibiotics. It also became apparent that the use of large doses of these antibiotics on ambulant patients may cause such unpleasant side-effects (nausea, vomiting, and gastro-intestinal upsets)—particularly so when aureomycin is being used—as to make such treatment impracticable.

Our thanks are due to Miss H. M. Tedham, pharmacist, for her assistance.

Medical Memorandum

Carcinoma of the Pancreas in a Girl of 16, Presenting as Carcinomatosis of Lungs

The following case is of interest owing to its unusual presenting symptoms and to the rarity of the disease at this age.

CASE REPORT

The patient was a girl aged 16 whose father and mother were in a mental hospital. Apart from pertussis at the age of 7 she had kept well, and recently had been working in a toy factory and at a laundry. For the past year she had complained of a dry cough. In July, 1951 (four months before her death), she had measles and had been off work since. Since August there had been increasing tiredness and loss of weight. She became more breathless on exertion and had occasional substernal pain. About November 10 her condition began to deteriorate rapidly. She had a slight evening temperature of 99° F. (37.2° C.) and began to cough up thick white sputum which was never blood-stained.

When examined at home on November 21 she was a pale, wasted, toxic girl obviously breathless, even in bed. The throat was injected, but the tonsils were small. There were no palpable lymph nodes. Tachycardia was pronounced, but the heart sounds were clear. In the chest there was impairment at the right base anteriorly and posteriorly, with harsh breath sounds at the right apex. No added sounds were heard at that time, although her doctor had previously noted scattered crepitations and rhonchi at both bases, particularly the right. The abdomen was soft and no enlarged viscus was felt. An x-ray film of the chest showed widespread scattered shadowing throughout both lungs, confluent at the right lower zone—an appearance suggestive of secondary carcinomatosis. The sputum was consistently negative for *M. tuberculosis*.

On admission to the Copthorne Branch of the Royal Salop Infirmary on November 30 it was obvious that she had deteriorated further. She remained pyrexial, with a temperature rising to 102° F. (38.9° C.), and was even more breathless, the respiration rate being 54. She was cyanosed, her cough and sputum had now increased somewhat, and she complained of frontal headaches. The chest expansion was fair, but coarse and fine crepitations were heard all over the chest except at the apices. In the abdomen the liver edge was soft and just palpable. The spleen was also just palpable. A further x-ray film of the chest showed the lung fields to be almost completely replaced by multiple opacities, many of which had coalesced. X-ray films of the hands, dorsal and lumbar spine, and pelvis were normal.

She became weaker, her cough prevented sleep, and even in an oxygen tent she was breathless and cyanosed. Finally, on December 6 she died from progressive asphyxia.

Clinically, although the case resembled an acute tuberculous bronchopneumonia, the persistently negative sputum and the typical radiological appearances made the diagnosis of secondary carcinomatosis very likely. The site of the primary growth, however, was undetermined.

Post-mortem Examination.—The lungs were found to be consolidated to the shape of the thoracic cage by white and cream-coloured nodules of growth varying in size up to 4 cm. in diameter, so numerous as almost entirely to replace the lung tissue, and so dense as to make the lungs about five times their usual weight. On opening the abdomen the tail and part of the body of the pancreas were found to be replaced by a mass of scirrhous growth about 5 cm. in diameter. Numerous lymph nodes enlarged by metastatic growth were found around the pancreas and aorta, in the mesentery, and in the mediastinum. Secondary growths were also found in the liver and on the lower surface of the diaphragm. The remaining organs showed no significant abnormality. Serial sections taken from near the edge of the growth in the pancreas showed microscopically every gradation from normal tissue with varying degrees of fibrosis to

well-differentiated adenocarcinoma and then to anaplastic growth. The lung tumours were found to consist of solid masses of spheroidal cells separated into groups by fibrous trabeculae, and also occasionally more differentiated areas of columnar-cell adenocarcinoma.

COMMENT

Although carcinoma of the pancreas is very rare under the age of 20, we have found in the literature reports of eight cases, which were confirmed at necropsy. Mielcarek (1935) reviewed five previous cases and added one of his own. Since then Smith (1935) reported a case of a boy aged 14½, and Corner (1943) described a case of a baby girl aged 7 months. A possible ninth case (Kaletchiff, 1939) in a girl of 14 is quoted by Schnedorf and Orr (1941).

Only three of these cases were found at necropsy to have pulmonary metastases. In Kühn's patient (1887), a girl aged 2, the primary growth was in the head of the pancreas; there was a single secondary nodule in the lungs, and the only respiratory symptoms were due to a terminal pneumonia in the left lower lobe around this nodule. Kaufmann (1927) described the post-mortem findings in a girl aged 19: the primary growth was situated in the tail of the pancreas, and there were secondary growths in the liver and lungs; unfortunately no clinical details are given. In Smith's case the whole pancreas was involved; multiple metastases were found in the lungs as well as in the liver, lymph nodes, stomach, and adrenals; and respiratory symptoms were recorded throughout the illness accompanied by weakness and signs of an abdominal tumour.

The formation of extensive secondary tumours, which can cause presenting clinical features, probably depends largely on the exact site of the primary growth in the pancreas. If in the tail, the tumour is more likely to remain clinically latent, until metastases develop elsewhere. Of the reported cases all arose from the head of the pancreas, with the exception of Kaufmann's and Smith's cases. In our case the primary growth was in the tail, and the symptoms and signs during life were exclusively respiratory in origin. The organs invaded by secondary growth—liver, lymph nodes and lungs—are those most commonly involved in all age groups (Arkin and Weisberg, 1949), but the extent of lung involvement was here so great as to dominate the clinical picture.

We should like to thank Dr. W. D. Wallace for his help and interest in this case.

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The International Conference of Social Work, of which Dr. René Sand was the founder, for many years president, and since 1948 honorary president, has initiated a memorial in his name, and for this purpose has opened a memorial fund inviting all those organizations and individuals who wish to pay tribute to the personality and work of René Sand to make a contribution. The fund is to be used to provide a René Sand Prize, to be awarded every two years to some individual who has rendered outstanding service in social welfare or social medicine, and presented at the biennial meetings of the International Conference of Social Work. The amount contributed will determine the length of time during which the prize can be awarded, but it is hoped to raise a sum of 10,000 dollars (£3,570), to be expended over the next 10 years. Contributions may be sent to Captain J. E. Stone, honorary secretary and treasurer of the International Hospital Federation, King Edward's Hospital Fund, 10, Old Jewry, London, E.C.2.

Reviews

INTERNATIONAL DERMATOLOGY

The Tenth International Congress of Dermatology: Proceedings, London, 1952. Foreword by Sir Archibald Gray, C.B.E., T.D., M.D., F.R.C.P., F.R.C.S., President of the Congress. (Pp. 556; illustrated. £3 3s.) London: British Medical Association. 1953.

Following an account of the organization of the congress and the list of patrons, officers, and members, the meeting of national delegates, the social arrangements, and the opening and closing ceremonies, come the main discussions. The first is on the pathogenesis of eczema, the second on the effects on the skin and its diseases of cortisone and corticotropin (A.C.T.H.), and the third on the treatment of tuberculosis of the skin and allied conditions. Readers of the discussions will obtain up-to-date views on these important subjects. Then come abstracts of interesting short papers (pp. 289-415) and clinical case reports (pp. 419-542). Some of the latter (clinical cases actually demonstrated at the congress) are listed below. They have been selected because the reviewer believes that, taken together, they illustrate "the fighting line of dermatological diagnostic progress."

Porphyria cutanea tarda in siblings (W. R. Goldsmith). Congenital porphyria in a man aged 37 (S. Gold). Naevus comedonicus with partial Sturge-Weber syndrome and extensive vascular naevi with haemangiectatic hypertrophy of leg (A. J. Rook). Keratoma palmo-plantaris in a man aged 38 (F. Ray Bettley and C. D. Calnan). Lichen amyloidosis in a Chinaman aged 68 of six years' duration (G. B. Dowling and D. R. Tipping). Localized amyloidosis in a man aged 59 of 26 years' duration (A. D. Porter and L. A. Musso). Circumscribed myxoedema of the lower extremities in a man aged 57 with bilateral exophthalmos and right-sided ophthalmoplegia (E. Prosser Thomas and E. Waddington). Sarcoidosis in a man aged 35 in whom neurosyphilis had at first been suspected (R. M. B. MacKenna and I. S. Hodgson-Jones). Epidermolysis bullosa dystrophica in a boy aged 17 (I. B. Sneddon).

Rosacea acuminata in a man aged 39 in whom a diagnosis of rosacea tuberculoides, rosacea acuminata, or sarcoidosis was suggested in 1948 (the reviewer would suggest what he calls the rosaceous type of sarcoidosis) (W. J. O'Donovan and S. P. Hall-Smith). "Benign" chronic polyarteritis nodosa in a man aged 30 with recurrent, slightly painful subcutaneous nodules in the forearms and legs (F. Ray Bettley). Polyarteritis nodosa treated with A.C.T.H. and cortisone in a man aged 53 with apparent success (G. B. Mitchell-Heggs and J. G. Holmes). Gastric and jejunal polyposis associated with melanin spots of the oral region and digits in a girl aged 17 whose younger sister had pigment spots around the mouth (references to the literature of this rare but important syndrome) (M. Feiwel). Incontinentia pigmenti in a girl aged 4 years (a sister had the same condition) (R. T. Brain and C. D. Calnan). Epidermolysis bullosa dystrophica vegetans in a boy aged 12 years whose twin brother was similarly affected and died at the age of 6 months (R. T. Brain). Miliary lymphocytoma in a woman aged 59 (F. Ray Bettley). Acanthosis nigricans in a woman aged 63 with suggested gastric neoplasm (O. L. S. Scott).

Hyperkeratosis follicularis et parafollicularis in cutem penetrans (Kyrle) in a woman aged 62 (R. M. B. MacKenna and R. H. Seville). Atrophie blanche in a woman aged 36 (A. Monroe and R. H. Meara), and another case in a girl aged 18 (F. Ray Bettley and C. D. Calnan). Local panatropy in a boy aged 15 apparently beginning eight years ago, also in a girl aged 16 apparently beginning 12 years ago (F. Ray Bettley). Erosive gingivitis-lichen planus of mouth mucosa and vulval skin—in a woman aged 50 (L. Forman). Acanthosis nigricans with Cushing's syndrome in a man aged 28; parents were first cousins, and a paternal cousin was grossly obese (F. Ray Bettley).

Poikiloderma vasculare atrophicum of Jacobi in a man aged 30: Gougerot and Eliaschew papules seen in some of the more marked erythematous areas (J. L. Franklin and J. B. Lyon). Poikiloderma atrophicum vasculare (Lane type) with mycosis fungoides in a man aged 43 (G. B. Dowling and E. Waddington). Poikiloderma: a benign variant confined to the extremities in a man aged 63; the condition has also been described as "lichen planus erythematosus" (R. M. B. MacKenna and P. D. Samman). Calcinosis universalis beginning at 7 years in a man aged 23 whose paternal grandmother suffered from "chalk gout":

no evidence of scleroderma, dermatomyositis or other "collagen disease" (Stephen Gold).

Hand-Schüller-Christian disease (with eosinophilic granuloma of right femur, "honeycomb" lungs, diabetes insipidus, and Simmonds's disease) in a man aged 61 (Brian Russell). Congenital telangiectasia of face and legs in a girl aged 6 years with dysostosis of clavicles and minor abnormalities of bony development and coloboma of right eye (H. T. H. Wilson). "Disseminated nodules of skin and bone": this title is suggested for two cases described by C. D. Evans and R. P. Warin respectively, who refer to a remarkable case discussed by F. Parkes Weber and Freudenthal (for a summary of that case see Parkes Weber's article in *Modern Trends in Dermatology*, 1948, p. 309). Dermatomyositis in a woman aged 69 with neoplasm of the cervix uteri (L. Forman). Pemphigus erythematousus in a woman aged 46 (F. Ray Bettley). Lichen sclerosus et atrophicus with alopecia in a woman aged 40: early lesions resembled morphoeic scleroderma (J. Morgan). Lichen sclerosus et atrophicus in a woman aged 64 who had been formerly under treatment for colitis, pelvic abscess, and diverticulitis (H. T. Calvert). Bullous eruption (? acquired epidermolysis bullosa) in a woman aged 52 (Brian Russell). Bullous eruption, starting as lichen sclerosus et atrophicus, later resembling pemphigus vulgaris, in a woman aged 52 (Brian Russell). Chronic familial benign pemphigus (Hailey-Hailey) in a woman aged 45 (L. Forman and C. D. Calnan), and her brother aged 42 (L. Forman and J. Pettit): the father who died at the age of 75 had the same condition all his life. Ocular pemphigus in a woman aged 70 (L. Forman).

Poikiloderma congenitale (Thomson) in a girl aged 4 years (R. T. Brain). Another case in a woman aged 38 (G. B. Dowling and D. L. Rees). Another case in a girl aged 13 (P. D. Samman). Porokeratosis (Mibelli) in a boy aged 14 (G. Savage). Another case in a girl aged 14 whose elder sister had a similar lesion (A. D. Porter and R. H. Seville). Another case in a girl aged 14 (W. Tillman).

In the limited space at my disposal I find it impossible to give more detailed accounts. Suffice it to say that the volume, which must have taken very much time and trouble in its production, contains excellent illustrations, and constitutes a valuable memorial.

F. PARKES WEBER.

SURGERY OF AUTONOMIC NERVOUS SYSTEM

Sympathikus Chirurgie. By Professor Paul Sunder-Plassmann. (Pp. 162; 146 figures. M. 54.) Stuttgart: Georg Thieme Verlag. 1953.

The title of this volume conveys no idea of its scope and its importance. It is in fact a brilliant study based on years of research, and it deserves the most serious consideration of all who are interested in the autonomic nervous system—which is after all the background of our lives. For most of us the sympathetic nervous system is a remote and difficult field, and it is only in recent years that our attention has been drawn to its surgical importance and possibilities, largely by the work of Leriche.

The book opens with a detailed study of the anatomy of the autonomic system, both general and microscopic, superbly illustrated by drawings of special dissections and photomicrographs. This is followed by a description of the relation of the autonomic nerves to the blood vessels and lymphatics. The "neurohormonal system" is discussed in great detail, with particular reference to the thyroid and adrenal glands, and this section of the book concludes with a description of the great sympathetic ganglia. The surgical section follows, with full descriptions of sympathetic block, excision of ganglia, and other procedures. The illustrations are here again of a high order and of real practical value. To those who are working in this field we can only say that they cannot afford to dispense with the experience which is here placed at their disposal.

Both in its material content and in its production the volume is a great achievement, but the author has in his introduction expressed the spirit which has inspired his work in an allegory so perfect and so simple in its grandeur that I cannot refrain from quoting this one passage. In the little town of Mittenwald in the Bavarian Alps stands a bronze statue of Mathias Klotz, master-maker of violins in 1700. "With his knife in his hand he carves the precious violin from the wood which he himself has brought from the heights of the Karwendel. Quietly and easily he carves it from simple wood. But from

this his violin the hands of the master will draw forth immortal symphonies, which may bring even to the tired men of the twentieth century some glimpse of those things real and eternal with which their destiny still remains inseparably bound."

HENRY SOUTTAR.

TEXTBOOK OF OPHTHALMOLOGY

Ophthalmologie. By Louis Guillaumat, assisted by Suzanne Schiff-Wertheimer, Guy Offret, and André Dubois-Poulsen. (Pp. 1,263; 265 figures. 10,500 fr. or £11 11s. approx.) Paris: Editions Médicales Flammarion. London: H. K. Lewis. 1953.

This is a large and important book, part of a larger and more important project, for it forms one of thirty-four projected volumes designed for the general practitioner as well as the specialist, dealing with the whole gamut of the medical specialties, therapeutics, and allied sciences such as bacteriology. If the remainder of the volumes are on the scale of that devoted to ophthalmology, the project is indeed formidable, and if they are of the same degree of excellence it will be greatly to the credit of French medicine.

The ophthalmological volume is written by the staff of the Clinique Nationale des Quinze-Vingts, Paris, and bears the authority one would expect from that school. It is divided into seven parts. The first is on methods of examination, but is so short and inadequate that it is difficult to see what is its value: ordinary techniques such as the exploration of the visual fields and more recent methods such as gonioscopy and slit-lamp ophthalmoscopy are equally dismissed in a few lines. The second part deals adequately with refraction and its correction, and the third, which forms the main mass of the book, discusses fully and informatively the diseases of the eye and its adnexa on a regional basis, after preliminary paragraphs on the embryology, anatomy, physiology, and clinical investigation of the part concerned. Operative techniques are less fully described than are most other matters, and the accounts are inadequate to form a sole guide to the surgeon. The fourth part, on neuro-ophthalmology (which includes ocular motility), is full and excellent, while the remaining three sections—on injuries, therapeutics, and medico-legal matters—are short.

The book itself is based on a scheme rarely seen in Britain. It is in loose-leaf form—but very substantially bound, so that it should resist much rough use—and the intention of the publishers is that additional pages will be supplied annually supplementing the original text and adding new knowledge as it appears. If this can be adequately carried out, it is an excellent and economic suggestion.

STEWART DUKE-ELDER.

VECTOR CARDIOGRAPHY

Spatial Vectorcardiography. By George E. Burch, M.D., F.A.C.P., J. A. Abildskov, M.D., and James A. Cronin, M.S. (Pp. 173; 121 illustrations. 37s. 6d.) London: Henry Kimpton. 1953.

This is a book we can certainly recommend to anyone who wishes to learn something of the subject. The reader must not be dismayed by the formidable definition on p. 10: "The vectorcardiogram may be defined as a record of the time course of the mean instantaneous electric spatial vector forces from the heart." Most of the book is much simpler than this. The expression throughout is clear and free from jargon. The information is neatly summed up. The fairly varied type gives clarity and emphasis. The advantages and disadvantages are set out in a judicial way, so that the reader gets a fair discussion of the various topics without bias of view.

As the heart is a three-dimensional structure enclosed in a volume conductor, the electrical events occur in space. In order to obtain a spatial vectorcardiogram a three-dimensional reference frame is needed. The authors favour the equilateral tetrahedron, the triangle of Einthoven forming the base, or frontal plane, and the apex being a point on the back, just to the left of the seventh dorsal vertebra. In order to get a stereoscopic effect two projections are used, frontal and sagittal; the true stereoscopic record is

obtained by specially selected resistances. This part is difficult to follow. The authors claim that stereovector cardiography simplifies the subject, avoids the making of wire models, and may eliminate some of the electrocardiography. They think that vector cardiography may perhaps be helpful in detecting the presence of infarction in the left ventricle when the activation of that chamber is delayed, but admit that much more study, with post-mortem confirmation, is needed. They find that hypertrophy of the left ventricle, which may produce electrocardiographic patterns resembling those of bundle branch block, can perhaps be distinguished by vectorcardiograms, which appear to be different when bundle branch block is present without hypertrophy. The presence of right ventricular hypertrophy could also be detected when bundle branch block on that side was present.

The authors point out that this subject is still in its early stages and that standardization of methods and nomenclature is most important. They would not claim that it replaced the electrocardiogram: it is obvious that the important early alterations in the T-waves are difficult to pick up in the vectorcardiogram. Altogether, this is an interesting and stimulating little book, clearly written, with a balanced and judicious view of the subject so far as it has developed at the present day.

TERENCE EAST.

SLIPPED EPIPHYSIS

Slipped Capital Femoral Epiphysis. By Armin Klein, M.D., Robert J. Joplin, M.D., John A. Reidy, M.D., and Joseph Havelin, M.D. American Lecture Series. (Pp. 130; 77 figures. 49s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

This monograph composed by four surgeons from the Massachusetts General Hospital incorporates the knowledge gained from the study in diagnosis and treatment of 81 cases of slipped capital femoral epiphysis. Early radiological diagnosis is described in detail and thrown into relief by an excellent survey of the appearances of hips in both sexes from infancy until the closure of the upper femoral epiphyseal line. The authors have divided their cases into three clinically distinct groups: (1) sudden traumatic displacement of the epiphysis, (2) a gradual and minor degree of displacement, and (3) a gradual and major degree of displacement. In each group surgical treatment is recommended, though differing from one to the other.

It is perhaps regrettable that the authors have not given a more detailed description of the operation for subcapital osteotomy, a procedure that others have not so often found to give good results as these leaders in this particular field. It was disappointing that a survey of results of previous conservative treatment was not included to serve as a comparison to the excellent follow-up results of this review.

This work is a valuable guide in the modern management of adolescent coxa vara, and the reader can be left with little doubt that the results of surgical treatment are superior to the older method of traction and immobilization.

PHILIP NEWMAN.

The Medical Directory for 1954 (J. and A. Churchill Ltd., London, 72s.) is the 110th annual issue of a work which is indispensable in an editorial office, in libraries, and in clubs which maintain reference books for their members. Medical men who replace their old copies from time to time would be advised to make the change now, for the present two volumes are an improvement over the former in that there is no longer that invidious distinction between London, the provinces, and other parts of the British Isles. The 80,983 names in the 1954 edition are listed alphabetically without any topographical distinction. This makes for much easier reference. The "local lists" are grouped together in the second volume, which also includes the usual information about health departments, learned bodies, postgraduate institutions, and the hospitals of the various regions. The first volume gives helpful details about medical periodicals, medical trades, the General Medical Council, and so forth. Messrs. J. and A. Churchill are to be congratulated on maintaining a remarkably high standard of accuracy and on improving the usefulness of this work.

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REMUNERATION OF CONSULTANTS AND
HOSPITAL MEDICAL STAFF

The report of the Spens Committee on the Remuneration of Consultants and Specialists was published in May, 1948, and in the House of Commons on June 3 of that year Mr. Aneurin Bevan, then Minister of Health, said, "I should like to add that the Government accept the recommendations in principle. The task of evolving from it the best scheme of remuneration, to suit all cases—and especially the bearing of the recommendations on remuneration for teaching duties—will be difficult and will require the help of the profession in discussion. I propose to begin this quickly. . . ." In this week's *Supplement* we publish details of the agreement between the Staff and Management Sides of Whitley Committee "B" on the increases in the rates of pay of consultants and hospital medical staff along with a statement on the situation by Sir Russell Brain, P.R.C.P., chairman of the Staff Side. The increases can be briefly summarized. House officers are to receive an annual increase of £50 (£75 minus £25 for residence); senior house officers, junior hospital medical officers, and registrars of £75; senior registrars of £100; senior hospital medical officers of £200. The basic scale for consultants is to be increased by £400 at the minimum, tapering to £350 at the maximum, giving a scale of £2,100 to £3,100; consultants with "C" awards will have the same increase, with resultant scale of £2,600 to £3,600; those with "B" awards will receive an increase of £150, with a resultant scale of £3,400 to £4,400; the consultants with "A" awards will receive an increase of £50, the scale becoming £4,300 to £5,300. All these represent the increases over the rates of pay of 1948, and will not be retrospective. There is protection against anyone's present remuneration being diminished (no-detriment protection), and the maximum weighting allowed to part-time consultants and S.H.M.O.s is to be reduced from one and three-quarter sessions to three-quarter sessions; otherwise weighting will be the same.

It is difficult to see on what basis these increases have been determined; and it appears that the negotiators were not armed with the facts and advice that an expert economist and statistician might have given them. Sir Russell Brain points out that in the draft terms accepted in 1948 by the hospital staffs the betterment factor was then the same as that given to general practitioners—namely, 20%—but that this betterment factor was not accepted by the profession as being a

realistic adjustment of the 1939 figures to post-war conditions. In January, 1949, a deputation from the Joint Consultants Committee and the General Medical Services Committee made representations to the Ministry on this, the Ministry then declining to make any upward adjustment. In July of that year the Ministry of Health assured the Joint Committee that changes would not be made in the terms and conditions of service without discussions through the Whitley machinery, that remuneration was looked upon as a subject suitable for arbitration, and that save in exceptional circumstances remuneration would become the subject for arbitration or inquiry. Accordingly the Joint Committee advised hospital staffs to accept permanent contracts on the basis of the terms and conditions of service then offered. Sir Russell then briefly reviews the general practitioners' negotiations, culminating in the Danckwerts award, and quotes the statement made by the Chancellor of the Exchequer in the House of Commons in July, 1952, to the effect that the Government did not adopt the view that similar adjustments in other fields would follow. Legal advice since then is to the effect that the Staff Side had no claim which was enforceable at law, and Mr. F. Grant, Q.C., "did not think that it could be argued that an undertaking by the Ministry to implement the terms of the Consultant Spens Report was a part of the contract on which consultants entered the Service." Sir Russell goes on to argue that there was little likelihood of the Government's applying the Danckwerts decision to the remuneration of consultants and hospital medical staffs. He concludes that "the Staff Side is satisfied that the settlement it has achieved does in fact restore the balance between consultant and general-practitioner remuneration which was upset by the Danckwerts award"; and that "the Staff Side is . . . satisfied that the agreement it has made with the Management Side in no way weakens the Spens Report as a basis of consultant remuneration."

As was pointed out in a recent leading article,¹ the Staff Side negotiators on behalf of consultants and hospital medical staff are chosen by the Joint Consultants Committee, which has on it representatives from the Royal Colleges and Corporations of England and Scotland, and from the Central Consultants and Specialists Committee of the B.M.A., the distinguished President of the Royal College of Physicians acting as chairman. The British Medical Association has not in fact conducted the negotiations (as it did for the general practitioners). The B.M.A. has a clear-cut policy on the remuneration of consultants and that is that they should be based upon the Spens recommendations, a policy, after all, which was the policy of the Government six years ago as stated by Mr. Bevan and which has not yet

¹ *British Medical Journal*, March 13, 1954, p. 634.

been repudiated. It is therefore necessary to look at the present proposals in the terms of the Spens Report and to see how far they may or may not fall short of them. The actual sum of new money—some three million pounds—is perhaps less important than any departure from the principles of the Spens Committee. The levels of remuneration in the Report were in the 1939 terms of money, and the Committee made it clear that these should be adjusted in relation both to the present value of money and to the increases "which have in fact taken place since 1939 in incomes both in the medical and other professions." The Spens Report went on to add this: "In our judgment it is only if corresponding changes are made in the incomes of consultants and specialists that the recruitment and status of various branches of specialist practice will be maintained." Further on the following point was also made: "We would emphasize that if the best possible recruits are to be attracted to specialist practice there must remain for a significant minority the opportunity to earn incomes comparable with the highest that can be earned in other professions. . . . We concluded that specialists of the highest eminence should be able, in the public Service, to aspire to a remuneration of the order of £5,000 for clinical work." This attitude afforded the strongest argument for the merit awards, about which some doubts were expressed at the time. There could, however, be little disagreement with the view that to attract men of the highest calibre into medicine there should be for the few at the top rewards which would enable medicine to compete effectively with other professions for those who would add lustre to it. It is rather difficult to relate the Spens maximum of £5,000, in terms of 1939 values of money, to the present agreement that consultants with "A" awards will go up to a maximum of £5,300. This represents a betterment factor of 6% on 1939 values (excluding the Government's contribution to superannuation). This is not to ignore the position of those in the other ranks of consultants or hospital medical staff, and they will not take it amiss if it is suggested that it is the example and excellence of the eminent in a profession which set a standard for their colleagues not only in professional worth but also in prestige. A further departure from the Spens recommendations is in the alterations of weighting for part-time specialists, and whole-time consultants and specialists may doubt whether this slight relative improvement of their position is so satisfactory as would have been agreement on the allowances for their expenses which the Spens Committee recommended; the Staff Side will continue to press for these.

Consultants and hospital medical staff, either individually or through their various representative bodies, will express their own views on the present

agreement, and in doing so will no doubt take into account the extremely difficult position with which their hard-working negotiators have been faced, made still more difficult by the fact that the profession still has no right to insist upon arbitration. The present is perhaps less important than the future, and consultants would want to feel assured that their representatives of three, five, or ten years hence will be able to negotiate on the basis of the Spens recommendations, for it was these more than anything else which persuaded consultants to go into the N.H.S. in 1948. Sir Russell Brain says that in the view of the Staff Side "Spens remains the yardstick of consultant remuneration, and either side of Committee 'B' is free to seek future adjustments in any grade if experience shows that the present settlement is working unfairly." But it is not easy to escape the conclusion that the Spens recommendations have been so far departed from as to weaken still more their influence on subsequent Ministers and Ministries. Unless the present Minister of Health makes in the House of Commons a similar statement to Sir Russell's and to that of Mr. Bevan in 1948, consultants and hospital medical staff and the profession as a whole will remain uneasy about the future.

DOMICILIARY OBSTETRICS

The designation of general-practitioner obstetricians under the National Health Service Acts aimed at encouraging interested practitioners to acquire post-graduate experience in obstetrics, but only an extremely low standard of supervision before, during, and after labour is required to qualify for payment. In a review of domiciliary midwifery on page 841 of the *Journal* this week Dr. Ivor Cookson, as others have done previously, points out that if the doctor does no more than fulfil these minimum requirements he cannot practise good obstetrics, for he will not recognize anaemia or toxæmia nor diagnose twins or breech presentation at a desirably early time in pregnancy, nor will he prevent unnecessary delay in the second stage of labour, nor bleeding in the third stage. But, if matters are to be remedied, the general practitioner needs something more than a good training and a conscientious attitude; he needs, as Claye has pointed out in a challenging paper,¹ a large enough practice in midwifery to enable him to maintain his skill and knowledge. The increasing popularity of hospital confinement therefore presents a serious problem. For, despite ministerial fiat and financial inducements, the extent of domiciliary obstetrics is gradually diminishing, chiefly because more and more women are preferring to be confined

¹ Claye, A. M., *Midwives Chronicle*, 1954, 67, 40.

² Sheehan, H. L., *British Medical Journal*, 1949, 1, 849.

³ Jameson, J. E., and Handfield-Jones, R. P. C., *Lancet*, 1954, 1, 665.

⁴ Jeffcoate, T. N. A., *British Medical Journal*, 1953, 2, 951.

in hospital. Nevertheless a sufficiency still remains to make it desirable for the scope of domiciliary midwifery in terms of pure obstetrics to be delineated. It is in this regard that Dr. Cookson's paper, which gained for him the Sir Charles Hastings Clinical Prize for 1953, is particularly pertinent.

One of the objects of his survey was to find out how to select cases for hospital delivery so that the remainder could be delivered at home in reasonable, if not absolute, safety. It is noteworthy that in addition to the well-recognized indications for hospital confinement such as high parity, bad obstetric history, antepartum haemorrhage, toxæmia other than of mild degree, and concomitant general disease, Dr. Cookson has found from experience that premature delivery, breech delivery, and multiple births involve too high a rate of foetal loss to be acceptable for delivery at home. On the other hand, he believes that normal primigravidae need not be booked for hospital confinement unless over 30 years of age, nor transferred there unless labour is prolonged beyond 24 hours. With such a careful selection of cases, abnormalities will be rarely encountered in women labouring at home; nevertheless they must then be recognized early and treated adequately, if only pending the arrival of an obstetric flying squad. In particular, complications of the third stage and postpartum haemorrhage require skilled handling. Dr. Cookson believes that the prophylactic intravenous injection of ergometrine towards the close of the second stage should be more widely administered in domiciliary practice, especially after forceps delivery and in women of high parity. This procedure is generally regarded as best reserved for hospital practice, but there is much to commend its use to prevent postpartum haemorrhage in the home where blood transfusion is not readily available. The objection, not universally admitted, that manual removal of the placenta is then more often required is not valid, for in any environment postpartum haemorrhage is more dangerous to the patient than the operation of manual removal. Even in the absence of bleeding it is wiser not to leave the placenta in the genital tract for more than one hour.² If it has separated it is easily expressed; otherwise 0.5 mg. of ergometrine may be given intravenously or intramuscularly, and if the placenta is not then delivered it should be removed manually. The modern view is to recommend that this operation should be carried out either by the general practitioner or by the flying squad in the home rather than transfer the woman to hospital with the placenta still retained, for severe shock or haemorrhage or both may occur on the journey.

Dr. Cookson is rightly concerned at the high proportion of women delivered at home in whom the second stage was prolonged beyond two hours, notably one in every four primigravidae. He argues with conviction that many of these long second stages can be eliminated by the midwife calling the doctor earlier and more often and by the doctor having more frequent recourse to episiotomy, a procedure which will also reduce the forceps rate. He found that episiotomy was performed in only 17 of 74 domiciliary forceps deliveries in his area. Yet in 32 of the remaining 57 women the perineum was torn, in 4 of them through to the rectum. This, he remarks, is too high a price to pay for trying to avoid suturing. Perhaps undergraduate teaching on the indications for episiotomy, and practical instruction in the ease with which these and lacerations can be repaired under adequate local analgesia, are not emphatic enough.

Dr. Cookson concludes from his survey that any family doctor who is interested in domiciliary obstetrics and has had adequate and pertinent instruction can, in any area in which consultant support is available, supervise maternity cases with reasonable freedom from risk to mother and baby. There is no doubt that this conclusion is valid in regard to antenatal supervision. But it is doubtful whether it holds good equally for intranatal care, especially at a time when less than one woman in four of those delivered at home sees a doctor during labour and then often only when he is summoned by the midwife. However carefully the potentially abnormal cases are sifted antenatally, unforeseen complications may arise suddenly in labour to prejudice the life of mother or baby, and all facilities are not readily available at home to deal with these. One possible solution to this problem, which might also satisfy the demand by patients to be delivered in hospital, is the provision of hospital beds for general-practitioner obstetricians on the lines reported last month by Jameson and Handfield-Jones³ in a paper which, in terms of obstetric practice for the family doctor, is in striking accord with that of Dr. Cookson. However, while such provision reduces the risk, especially for the baby, it cannot produce the best possible results unless arrangements are made whereby the general practitioner who engages in obstetrics has a large enough midwifery practice to develop and maintain a high degree of special knowledge and technical skill. Means must also be found by some rota system whereby one doctor is always immediately available in emergency. The factor chiefly responsible for the dramatic fall in maternal and foetal mortality and

morbidity in the large maternity hospitals was the introduction of highly qualified resident, as distinct from non-resident, obstetricians,⁴ for the hospital consultant, like the general practitioner, is not always immediately available for assistance or even advice. Indeed, a maternity hospital without skilled residents in obstetrics, paediatrics, and anaesthesia is not fully equipped to reduce risk to mother and baby to the minimum. But no matter how desirable this may be from the standpoint of statistics it is clearly an ideal not universally obtainable, and in any case it sometimes results in an impersonal type of efficiency. There will always be women who are happier having their babies in the familiar surroundings of their homes or in the friendly atmosphere of the small hospital staffed by attendants they know. These two reports from the same county by Dr. Cookson and by Drs. Jameson and Handfield-Jones indicate that the general-practitioner obstetrician can cater for these patients with a high degree of freedom from risk to mother and baby.

CONJOINED TWINS

In the opening pages of this issue we publish a paper by Professor Ian Aird entitled "The Conjoined Twins of Kano." These were the "Siamese" twins from Nigeria who hit the headlines with rather an alarming impact five months ago. Much of the information that appeared in the newspapers at the time was accurate, though of course incomplete, and much was wild surmise, and those whose appetite for further details was sharpened by the newspaper reports can now turn to Professor Aird's clear and dispassionate account of the investigations carried out on these twins and of the operation which separated them.

The great rarity of conjoined twins probably accounts for the fact that there is still doubt about the exact aetiology. It is thought that the origin of the malformation occurs very early in foetal development, either before the embryonic disk is differentiated, or by the initiation of two centres of axial growth instead of one in the embryonic plate. The position of the extra centre of axial development in relationship to the primitive streak may account for the type of conjoined twin produced.¹ It used to be held by some that many of the teratomatous malformations seen in the newborn were examples of twinning. This theory is not now generally accepted, and it is believed that such cases, and duplications of organs and parts of viscera, are due to other causes.

The classification of the varieties of conjoined twins is complicated. The position of the joined area is easily described in the symmetrical types—for example, xiphopagus (joined at the lower sternum), or craniopagus (joined by the heads). But the classification of the more bizarre forms becomes extremely complicated. Potter² has described and illustrated very well the almost surrealist range of monstrosities—mostly incompatible with life—which may occur. It has been generally accepted that conjoined twins are always uniovular in type. Professor Aird, however, casts some doubt on this theory. His reasons are that in the majority of the cases described the twins have not appeared identical, and he quotes several anatomical and pathological differences between them. While the proof that some conjoined twins are in fact polyovular is difficult, his views gain support from the fact that there is a family history of twinning in some of the cases described. Monoovular twinning is unrelated to a family history of twins and occurs in the same ratio in all pregnant women. Polyovular pregnancies are more frequent when there is a history of twins in either parent.

The separation of conjoined twins ranges in difficulty from the division of a small bridge of skin joining the umbilical region to what is often an impossible surgical problem. The number of cases in which both twins have survived operation is small: Professor Aird mentions that the first recorded successful separation was carried out at the Military Families Hospital at Portsmouth in 1912. It seems probable that when there is a large interchange of blood between the circulations of conjoined twins one twin becomes dominant to some degree. Stockard's³ notable work on this subject was carried out more than thirty years ago. Professor Aird stresses the importance of finding out how much one twin relies on the dominant partner not only for anatomical structures but for the production of hormones such as cortisone. His detailed description of the Kano twins is an important contribution to the sparse scientific literature on the subject, and the well-documented record of the complicated pre-operative tests carried out to determine the chances of a successful separation, and of the operation itself, will be of the greatest value to any surgeon faced with the same problem. Those who saw the film of the operation at the Royal Society of Medicine on Wednesday this week will, by reading Professor Aird's paper, be able to complete the picture of this brilliant example of teamwork at the Hammersmith Hospital.

¹ Keith, Arthur, *Human Embryology and Morphology*, 6th ed., 1948, London.

² *Pathology of the Foetus and the Newborn*. 1952. Chicago.

³ *Amer. J. Anat.*, 1921, 28, 115.

THE ESTIMATES

The most noteworthy feature of the Health Service estimates for the financial year that has just opened is the apparent standstill in the cost of prescriptions. Ever since a tight hold was imposed on hospitals' spending, the pharmaceutical service has been the most uncontrollable part of Health Service financing. The charges for dentures and, in particular, for dental treatment and the charge for spectacles led to a sharp fall in the amount the taxpayer had to find for these two branches of the Health Service. But the shilling charge for prescriptions appeared to be an inefficient brake. The latest figures available for the number of prescriptions dispensed—for the calendar year 1953—show a higher total than ever.

The year 1952-3, the first year in which the charge was in existence, was an abnormal year in the amount of illness that occurred in the winter months. Nearly £5m. was added to the drugs bill for this reason alone. The year just ended has been more fortunate in this respect, and there may well have been some falling off in the number of prescriptions dispensed in the winter months of 1953-4 compared with the previous winter. But the Ministry of Health is perhaps counting on a greater saving in the cost of each prescription than in a fall in the total number. The detailed estimates show that payment to chemists in respect of dispensing fees are expected to be slightly higher in 1954-5 than in 1953-4. A small fall, on the other hand, is shown in the cost of ingredients. Perhaps Mr. Macleod is relying on achieving some savings by his appeal to doctors to prescribe from the *National Formulary* wherever possible. Figures given in Parliament a few weeks ago show that in the first half of last year the average cost of each prescription was 49.15d. This is over a shilling more than in 1949. Even when allowance has been made for the development of expensive antibiotics since then, there would appear to be room for economies without interfering with the doctor's freedom to prescribe what he thinks best for his patient.

The total net cost of the Health Service to the taxpayer is expected to rise by some £16m. in the new financial year. Most of this rise can be attributed to higher advances to hospital boards; the estimate for these advances allows for increases in wages and salaries. An extra £4m. is also to be allowed to these boards for capital expenditure. This increase is welcome in itself. Even so, much larger sums will have to be spent on improving the hospitals' accommodation—particularly that of the mental hospitals—before anyone can accuse them of extravagance in this respect.

In the other branches of the Health Service, it is worth noting that the initial check to dental treatment caused by the charges is evidently wearing away to some extent, and there is a rise of nearly £2m. in the estimate. A somewhat similar trend can be observed in the supplementary ophthalmic service. But the whole cost of the Health Service is so dominated by the hospitals, whose advances on capital and revenue account combined now exceed £300m. a year for the first time, that increases elsewhere seem small beer indeed.

To sum up, and apart from long-term factors such as the ageing of the population, the Health Service's finances appear to have achieved some sort of stability. But this has been secured only at the cost of deferring many worth-while schemes and in particular of postponing much hospital building which will have to be undertaken some time. The fixed limit of £400m. a year as the amount the taxpayer would have to find for the Health Service has been abandoned. Instead a sharp brake has been imposed, which is released only when the pressure on it is too heavy to be withstood. Unfortunately, the result precludes any form of planning—of expanding here and contracting there—which is essential for a wise administration of the hospitals. It is probable that, without any increase in the amount voted, the money could be spent to better advantage if there were less control at the centre and more independence elsewhere.

LOCAL HYDROCORTISONE

The recognition that cortisone, or hydrocortisone, which is the adrenal steroid occurring in the body, produces many of its effects through an anti-inflammatory mechanism^{1,2} rather than by any fundamental influence on underlying disease processes has led to some change of approach to the use of these drugs. Much attention has been directed to their value in chronic inflammatory joint disorders of the rheumatic type, partly no doubt as a result of the original discovery of their effects in rheumatoid arthritis. Further experience of their use in the management of this disease has shown that the prolonged systemic administration of cortisone is not always entirely satisfactory in controlling symptoms,^{3,4} and, although hydrocortisone may be more active^{5,6} when given systemically, there is little doubt that it is apt to be similarly unsatisfactory. There is evidence that the source of the pain of arthritis is in the joint capsule, and perhaps to a lesser extent in the synovium,⁷ and, since systemic administration of these hormones diminishes joint temperature and blood flow,^{8,9} it was logical to study the effect of local injection into the joint space. As expected, it was found that both reduced the amount of joint fluid, lowered the cell count, especially of polymorphonuclears, and increased the viscosity.^{10,11} These changes are accompanied by temporary clinical improvement which cannot be attributed to any general systemic effect, even though the rate of absorption from the joint is at much the same rate as from intramuscular injection. Most

- ¹ Lovell, R. R. H., et al., *Clin. Sci.*, 1953, 12, 41.
- ² Duke-Elder, Sir S., and Ashton, N., *Brit. J. Ophthalmol.*, 1951, 36, 695.
- ³ West, H. F., and News, G. R., *Lancet*, 1953, 2, 1123.
- ⁴ Kellgren, J. H., and Hill, A. B., *Ann. rheum. Dis.*, 1953, 12, 239.
- ⁵ Boland, E. W., *British Medical Journal*, 1952, 1, 559.
- ⁶ *Ann. rheum. Dis.*, 1953, 12, 125.
- ⁷ Kellgren, J. H., and Samuel, E. P., *J. Bone Jt Surg.*, 1950, 32-B, 84.
- ⁸ Janus, O., *British Medical Journal*, 1950, 2, 1244.
- ⁹ Hollander, J. L., et al., *J. Amer. med. Ass.*, 1951, 147, 1629.
- ¹⁰ Stevenson, C. R., et al., *Ann. rheum. Dis.*, 1952, 11, 112.
- ¹¹ Dixon, A. St. J., and Bywaters, E. G. L., *Clin. Sci.*, 1953, 12, 15.
- ¹² Kersley, G. D., and Desmarais, M. H. L., *Lancet*, 1952, 2, 269.
- ¹³ *Annual Report of West London Hospital Department of Rheumatic Diseases*, 1953.
- ¹⁴ *Ann. Intern. Med.*, 1953, 39, 735.
- ¹⁵ Brown, E. M., et al., *Amer. J. Med.*, 1953, 15, 656.
- ¹⁶ Harrison, M. H. M., et al., *J. Bone Jt Surg.*, 1953, 35-B, 598.
- ¹⁷ *Ibid.*, 1953, 35-B, 627.
- ¹⁸ *British Medical Journal*, 1953, 2, 966.

workers are agreed that cortisone has a less reliable and constant effect than hydrocortisone when given intra-articularly,^{11,12} although Fearnley¹³ believes that this is simply a reflection of different effective therapeutic doses, twice as much cortisone being required to produce a comparable effect.

Hollander and his colleagues¹⁴ have found that intra-articular injection is a relatively simple procedure and suitable as an ordinary out-patient manoeuvre; not only the knee but most other joints except those of the spine are accessible, the hip being the most difficult. They have now been able to report their clinical results after nearly 4,000 such injections in over 500 patients suffering from various types of rheumatic condition, using a dosage of 25 mg. of hydrocortisone for the larger joints (occasionally increased to 50 mg.) and of 5 mg. for the small joints.¹⁵ In rheumatoid arthritis they found that such treatment gave continued local palliation with repeated injections as often as symptoms returned—every one to four weeks—in 90% of the cases selected. The use of hydrocortisone in this way is, as they emphasize, only an adjunct to the general management of the patient. Selection of patients was restricted to those in whom one, or very few, joints were affected, or predominantly affected and resistant to other treatment. Although the effect of systemic cortisone has been almost uniformly disappointing in osteoarthritis, local injection may be more helpful, for 20% of their cases had no return of symptoms after a series of injections, some 6% having been followed for more than one year. This response is not necessarily so inexplicable as it may seem at first, for Trueta and his colleagues¹⁶ and Lloyd-Roberts¹⁷ have recently thrown light on the pathology of osteoarthritis. Both have shown that hyperaemia either in the juxta-chondral bone or in the synovium and capsule is an important feature of this type of arthritis, and the suggestion of Trueta that compression of cartilage by use is necessary for its healthy nutrition might give such therapy a theoretical basis and open the way to a new and more active therapeutic approach to the problem of degenerative joint disease.

As might be expected, the more transient, self-limiting articular and non-articular inflammatory conditions showed a good response. Thus acute gouty and traumatic arthritis often responded well to a single injection. The results of Hollander and his colleagues in non-articular conditions were similar to those which Cyriax reported recently in this *Journal*.¹⁸ Acute sub-deltoid or pre-patellar bursitis responded well; the results in tennis elbow and stenosing tenosynovitis were encouraging also, but in chronic sub-deltoid bursitis they were disappointing. Untoward effects were rare and were usually mild, occurring at the rate of 2.3% of injections. Most of them were temporary local flares, but acute staphylococcal joint infection occurred in one case. They also record that one case of tuberculous arthritis was injected as a result of faulty diagnosis. It is clear that the presence of infection is an absolute contraindication to this form of therapy. In view of these very encouraging reports it is unfortunate that supplies of hydrocortisone are so scarce in Britain, but it is to be hoped that sufficient will

be made available to allow for controlled therapeutic trials to investigate further its place in the local therapy of these various rheumatic conditions.

SYNTHETIC ATROPINE

In spite of the enormous output of synthetic drugs in recent years there are still many indispensable drugs of plant origin which cannot be produced synthetically at an economic price and for which no entirely satisfactory synthetic substitute has been found. Until recently atropine belonged to this group. No doubt in Britain we could cultivate *Atropa belladonna*, or other plants containing atropine, on a sufficient scale to supply our needs, but we have normally relied upon other countries, in which atropine-containing plants grow wild, for this essential alkaloid. During the last war a serious effort was made to find a synthetic substitute for atropine, because at the time it was thought, and probably quite rightly, that the synthesis of atropine itself was not a practical proposition. Atropine was first synthesized in 1896 by Willstätter, but his synthesis involved fourteen stages and was obviously not one which could be adapted to manufacturing processes. In 1917 Sir Robert Robinson¹ devised a new synthesis which reduced the number of chemical processes to three, but one of his starting materials (namely, succindialdehyde) was at the time economically inaccessible. It is therefore of great interest that T. and H. Smith, Ltd., of Edinburgh, have taken advantage of new methods of obtaining succindialdehyde from furan and have developed a process for manufacturing atropine based on the Robinson synthesis.

Whether synthetic atropine will be able to compete economically with the natural alkaloid is not for the scientist to say. Synthetic ephedrine has not entirely replaced the natural drug, probably because the plants containing this alkaloid grow wild and in great abundance in many parts of Asia and can be collected and extracted cheaply; but this situation will not last indefinitely. The probability is that synthetic drugs will ultimately replace drugs of plant origin.

Atropine is an ester of tropic acid and a bicyclic basic alcohol, tropine. Pyman and his colleagues^{2,3} investigated the mydriatic effects of numerous esters of tropine, applied locally to the eyes of cats, but no systematic pharmacological study of the esters of tropine has ever been made, probably because the only source of tropine was the expensive natural alkaloid, atropine. A commercial source of tropine will make possible a thorough reinvestigation of many new esters and other derivatives of this substance, which appears to have a peculiar affinity for many types of tissues in animals. Consequently the achievement of a manufacturing process for tropine and its derivatives is an important advance: it may make this country independent of foreign sources of an essential drug, and it may also lead to the development of new drugs of value in medicine.

¹ *J. chem. Soc.*, 1917, 111, 762.

² Jowett, H. A. D., and Pyman, F. L., *7th International Congress of Applied Chemistry*, 1909, 4A, 1, 355.

³ Pyman, F. L., *J. chem. Soc.*, 1917, 111, 1108.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

THE ASSESSMENT OF GONADAL FUNCTION

BY

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In both sexes the gonads serve two functions: the secretion of the sex hormones and the production of germ cells. These two functions are not entirely independent. Assessment of endocrine function can be made by purely clinical means and by special investigation. The gametogenic function can be studied by special tests alone.

Normal Development

The endocrine activities of the gonads can be considered in four phases: pre-pubertal, at puberty, in the adult, and after the close of the reproductive period.

Before puberty the gonads are physiologically functionless, not apparently through any intrinsic incompetence but because they receive no gonadotrophic stimulation. It is obvious, therefore, that before puberty a diagnosis of hypogonadism is meaningless. At a variable age, usually falling within the range 10-16 years, and for reasons which are quite unknown, the anterior lobe of the pituitary gland begins to secrete effective amounts of gonadotrophic hormone, which stimulates the gonads. Under this influence they secrete their respective sex hormones, which, acting upon their various target organs, bring about the changes of puberty. In the male the interstitial cells of Leydig secrete testosterone; and at the same time the hitherto inert germinal epithelium of the seminiferous tubules begins to proliferate and to differentiate into spermatozoa. Thus, in the male, endocrine and gametogenic functions begin at the same time.

In the female events are rather different. It appears that oogenesis—the production of potential ova—is a wholly foetal phenomenon, so that the newborn female infant possesses preformed all her potential germ cells—perhaps some 400,000. A large proportion of these disappear through atresia before puberty is reached. Thereafter, again the majority are destined to undergo atresia and no more than some 400 are ever likely to become mature ova. At puberty in the female gonadotrophic stimulation leads to the development of Graafian follicles which secrete oestrogen. It is probable that during the first year or two of post-menarchal life no ovulation usually occurs. During this phase menstrual periods are the result simply of cyclically waning oestrogen levels. Eventually, however, one of the maturing follicles becomes predominant, outstrips the rest, and from it the ovum is extruded. Immediately following this event the corpus luteum is formed and secretes progesterone as well as oestrogen. If the ovum is not fertilized and does not become embedded within the endometrium, the corpus luteum begins to degenerate and the levels of ovarian hormones fall. Following this, menstruation takes place and the cyclic changes recommence.

In the male the reproductive phase usually has no clear ending. The testis may continue to produce its hormones and spermatozoa, though on a gradually waning scale, right into old age. For this reason the "male climacteric" does not usually exist or have any outward manifestation. Occasionally, however, testicular function may decrease more abruptly, with the production of climacteric symptoms—such as loss of energy, fatigability, impaired memory and powers of concentration, reduced libido and potency, hot flushes, and so on. These symptoms can be relieved by the administration of testosterone.

In the female the Graafian follicles are used up as described above. When no more remain the ovary ceases to

produce effective amounts of oestrogen. For some time before this final stage is reached the endocrine function of the ovary becomes inadequate to maintain regular menstruation. At the menopause all menstruation ceases. Because the pituitary is no longer subjected to the inhibiting influence of oestrogen, it produces excessive amounts of gonadotrophin, which may be detected in the urine. Other endocrine glands—thyroid and adrenal cortex—tend to become hyperfunctional and so to cause the climacteric symptoms, until a new balance is eventually re-established.

Hypogonadism

Hypogonadism in both sexes may be either *primary* or *secondary*. In the former the gonad itself is the defective organ, failing to respond to gonadotrophic stimulation. In the latter there is failure of gonadotrophin production by the pituitary. It may be possible to differentiate these two types clinically. A clear-cut syndrome—Turner's syndrome—of primary hypogonadism was first recognized in the case of the female, but male examples of the condition are now known to occur. In this there is an absence for all practical purposes of the gonad, and the individual remains stunted in growth, often with a typical squat appearance, and a number of congenital anomalies usually coexist. Outstanding among these are webbing of the neck and cubitus valgus; others include coarctation of the aorta of varying degrees, supernumerary digits, squints, etc. Some elevation of blood pressure is almost invariable. Complete failure of the secondary sex characters occurs.

The key laboratory finding is an increased excretion of gonadotrophic hormone in the urine. This is due to the fact that the sex hormones normally produced by the gonads exert an inhibiting action on the pituitary production of gonadotrophin so that in their absence the pituitary becomes hyperactive. In secondary hypogonadism the characteristic appearance noted above is not found. The individual remains more or less infantilistic and may be either tall or short. Examination of the urine fails to reveal the presence of pituitary gonadotrophin. In these individuals, therefore, the fault lies in the production of gonadotrophin by the pituitary, the gonads themselves being essentially normal, though remaining unstimulated.

Androgen Production

In the male the determination of androgen production by the testis would theoretically be the logical method of obtaining an objective assessment of gonadal function. Androgen assay, however, is not a practical procedure for clinical purposes. It can be done by preparing suitable urinary extracts and testing them for their ability to induce growth of the capon's comb when applied direct to it. A more practical method is to estimate the 17-ketosteroid excretion, which can be done by purely chemical means. The 17-ketosteroids—so-called because they possess a ketone group on the 17 carbon atom of the steroid nucleus—are among the metabolites of testosterone. The position is complicated, however, by the fact that the adrenal cortex also produces androgens, some of which are metabolized to form 17-ketosteroids. It is therefore clear that, even in the absence of testicular testosterone, 17-ketosteroids will be present in the urine. Indeed, they may be produced by normal women in amounts not very different from those produced by normal men.

The mean figures for children of both sexes rise from the order of 1 mg. per 24 hours to 5 mg. before puberty. From then on the mean increases more rapidly for males than for females, reaching 14 mg. for adult males and about 9.5 mg. for adult females. The ranges for adults show considerable overlap in the two sexes, being 8-32 mg. for males and 5-20 mg. for females. In old age the mean figure again falls off with increasing years. It is thus quite obvious that the interpretation of the significance of the 17-ketosteroid excretion is none too easy, and the test has only a limited value in the assessment of male gonadal function. Of distinct value in some instances is the study of testicular biopsies. These are not difficult to carry out as a purely out-patient procedure under local analgesia, cause no undue discomfort and no loss of time from work, and enable one to assess the status of the Leydig cells, which are the source of the male hormone.

Oestrogen Production

In the female the simplest and one of the most useful objective tests of gonadal endocrine function is the study of the vaginal smear. This is obtained by inserting a cotton-wool applicator into the vagina, twirling it round a few times, and then rubbing it on a clean microscope slide. To obtain the best results this should be fixed immediately by immersion in equal parts of absolute alcohol and ether, and then stained with haematoxylin and a suitable differentiating stain such as Shorr's. In the absence of oestrogenic stimulation, the vaginal smear consists almost exclusively of small rounded basal cells with relatively large vesicular nuclei, and frequently contains many leucocytes. The fully oestrogenized smear consists of large squames which may have curled-over edges and contain either small densely staining pyknotic nuclei or larger vesicular nuclei (late intermediate cells). Intermediate grades may contain varying proportions of these different types of cell (Fig. 1). One

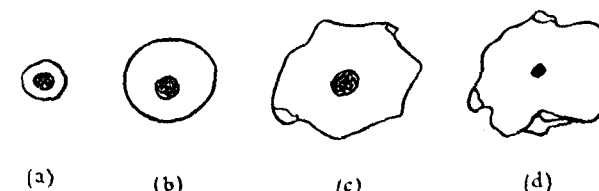


FIG. 1.—The principal types of epithelial cell found in vaginal smears: (a) basal; (b) primitive; (c) late intermediate; (d) fully cornified, with pyknotic nucleus.

drawback to this method of oestrogen assessment is that the vaginal epithelium is very sensitive to oestrogens, so that a very significantly reduced level must exist before it becomes apparent from the vaginal smear.

Another wholly practical method of oestrogen assessment is by the histological study of the endometrial biopsy specimen. This is easily obtained without an anaesthetic in the adult woman, though in girls and young unmarried women the position is, of course, less simple. An atrophic endometrium denotes either deficient oestrogen production or failure of endometrial response. Which of these alternatives is correct can be decided by studying the response to oestrogenic treatment; if, after an adequate course, the endometrium is still atrophic, a failure of target organ response may be concluded. A hyperplastic proliferative endometrium suggests a high oestrogen level but does not prove it, since the same conditions can result from prolonged though moderate oestrogenic stimulation. Under the influence of progesterone the proliferative oestrogenic endometrium becomes converted into a secretory type. Inadequacy of secretory development in the endometrium obtained during the latter part of the menstrual cycle suggests deficient production of progesterone. Once again, however, this result can arise through failure of endometrial response and can be tested for in the same manner as described above.

The assessment of oestrogen production by the determination of oestrogen excretion or levels in the blood is not yet a procedure of clinical value. In the case of progesterone, however, the estimation of urinary pregnanediol excretion is a not too difficult laboratory procedure and sometimes has practical value. Nevertheless, in normal menstrual cycles the variability of pregnanediol excretion is considerable, so that it is necessary to make several determinations on 24-hour urine collections during the supposed luteal phase in order that useful information may be obtained. It should further be pointed out that accurate methods capable of dealing with small quantities of pregnanediol must be used, since the output may be very small. Less accurate methods, which may have their value during pregnancy, are useless in the non-pregnant state. It is generally believed that the level of pregnanediol excretion reflects the level of production of progesterone by the corpus luteum, but there is no certainty that the parallelism is at all exact.

Gonadotrophin Assay

Mention has already been made of gonadotrophin estimation in both sexes and its value in differentiating primary from secondary hypogonadism. A few words about this estimation may therefore be appropriate. The test is usually referred to as the assay of follicle-stimulating hormone (F.S.H.), since F.S.H. probably is the main gonadotrophin found in non-pregnant urine. There is no doubt, however, that in some circumstances the urinary gonadotrophins include luteinizing hormone (L.H.), so that the test is perhaps better referred to simply as "gonadotrophin assay." The test requires a 24-hour specimen of urine, which should be kept chilled (preferably on ice) during the collection and should be delivered to the laboratory as soon as collection is complete. The urine is subjected to one of a variety of extraction procedures which aims at recovering the total protein content.

The methods which are in use include alcohol precipitation, ultrafiltration, and kaolin adsorption; of these the last is perhaps the most satisfactory technique. The extract is made up into a small volume with saline or distilled water, and groups of immature female mice are injected with fractions at various dilutions. At the end of the injection period (usually four days) the mice are killed, the uteri are removed, dissected free from other tissues, blotted dry, and weighed. Different laboratories have their different "mouse units"; the most commonly used definition is that quantity of gonadotrophin which will cause an increase of 100% in the mean weight of the uterus as compared with that of the controls. It must be emphasized that this assay is a relatively crude affair and that only large differences in gonadotrophin content can be detected. Generally speaking, it is impossible to say that the gonadotrophin excretion is definitely less than normal; at most one can say that the excretion is within the normal range or definitely increased, but this information is usually all that is required.

Semen Analysis and Testicular Biopsy

In the assessment of gametogenic function in the male the key test is the seminal analysis. To be of value the seminal specimen for this purpose should be collected by masturbation after a period of abstinence of three to five days (which should be stated). The specimen jar should be clean, dry, and warmed to something approaching body temperature. The time of production of the seminal specimen should be known. For religious or moral reasons, some men may find themselves unable to comply with these instructions; for them there is no really satisfactory alternative. It cannot be too strongly emphasized that condom specimens are utterly valueless; the presence of various chemicals in the sheath leads to the rapid immobilization of spermatozoa and often to their clumping, so that when examined the spermatozoa are invariably all dead and sperm counts are usually grossly misleading. The production of

seminal fluid by coitus interruptus again usually leads to gross errors, since the ejaculate as produced is not homogeneous and variable losses always occur when this method is attempted. If masturbation cannot be found acceptable, the only reasonable alternative is examination of the wife's cervical mucus some time after intercourse—the test being arranged during the ovular phase of the cycle. Such a test will at least determine whether active spermatozoa are being produced in reasonable numbers or not, though more precise information cannot of course be obtained.

The report on the seminal fluid should note its volume and appearance, the sperm density in millions per millilitre, the proportion of morphologically abnormal spermatozoa, and should give an estimate of the activity and viability of the spermatozoa.

The mean volume of semen is about 3.5 ml.; a volume of less than 1.5 ml. may be of serious consequence, since the interface between semen and cervical mucus after ejaculation within the vagina may be so small as to permit few spermatozoa to penetrate the mucus. On the other hand, if the volume is very large, a normal total number of spermatozoa may be so diluted that again relatively few are able to reach the cervical mucus.

Opinions vary on the lower level of sperm density compatible with normal fertility. Recent accurate studies have tended to lower this figure as compared with former views. It is probable that, provided other features of the seminal fluid are adequate, a density of more than 20,000,000 per ml. is quite satisfactory.

Density aside, it seems that the activity and viability of the spermatozoa are the most important criteria for evaluating fertility. Unfortunately, methods for the accurate determination of these criteria still leave a good deal to be desired. They also vary in different laboratories, so that it is difficult to compare the reports from the various centres. It is fair to conclude that highly fertile seminal fluid contains more than 40% of actively motile spermatozoa which retain their motility for periods in excess of 12 hours *in vitro*.

Although a great deal of attention has been paid to morphological abnormalities, it is doubtful whether most of these studies are really justified. In general, provided the proportion of total abnormal forms does not exceed 40%, the morphology of the spermatozoa is of much less importance than their activity.

Testicular biopsy has already been mentioned. Its value in the assessment of gametogenic function is twofold. In the first place, in cases of azoospermia testicular biopsy enables one to decide whether this is the result of failure of sperm production or failure of sperm delivery through obstruction of the efferent ducts. In the former circumstance the biopsy would reveal absence of spermatogenesis and in the latter a normal testicular structure. In the second place, the biopsy is of prognostic value where the seminal fluid is grossly inadequate, since a study of the histology of the testis may enable one to decide whether treatment has a chance of effecting improvement or could not possibly be of value. It is a fact that in most cases of oligospermia the biopsy reveals severe disorganization of the germinal epithelium in most tubules, while the other tubules are unaffected; clearly in these cases the stimulus to the testis must be normal and its modification by treatment cannot hope to produce any tangible results.

Tests for Ovulation

The direct study of ova is unfortunately not a practical procedure; we are, for example, quite unable to say whether the ova are morphologically normal or not, even though ovulation appears to be taking place. Our assessment of the occurrence of ovulation or its failure has to be made on deductive grounds. The principal methods in use for the determination of the occurrence of ovulation are: basal body temperature records, endometrial biopsy studies, and vaginal smear examinations.

Basal Body Temperatures.—If the temperature is carefully taken every morning as soon as the patient wakes up, and before any activities are undertaken, characteristic changes are found in ovular cycles. It is of little consequence whether the temperature is taken orally or rectally; provided the thermometer is left in place for three to five minutes and the mouth is kept closed, oral temperatures are normally quite satisfactory. Generally speaking, the temperature runs at a mean value of about 97.4° F. (36.3° C.) during the first half of the cycle, then it rises and thereafter runs at a level of approximately 98.2° F. (36.8° C.) until shortly before the period begins. It then falls to its previous level and the changes are repeated in the following cycle. In this way a biphasic pattern is produced, and this pattern is characteristic of ovulation (Fig. 2). The temperature rise during the latter half of the cycle has been shown to be due to the action of progesterone. It follows therefore that such a pattern could occur even in the absence of ovulation, provided a corpus luteum were formed. Indeed, this happens occasionally.

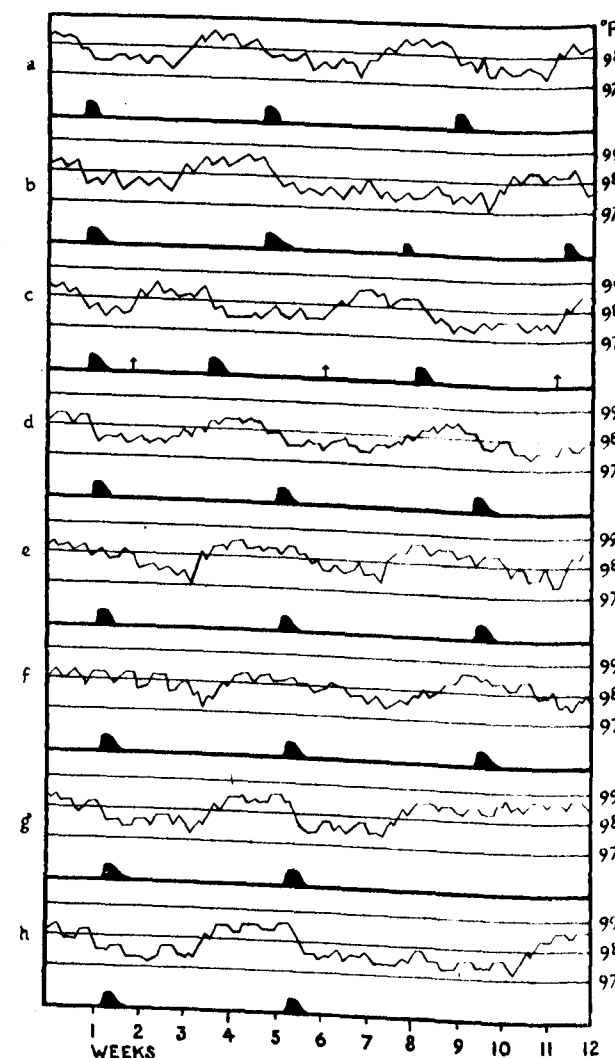


FIG. 2.—Basal temperature records. The black shapes represent menstrual bleeding. (a) The biphasic record of regular ovular cycles. (b) An anovular cycle, with no rise of temperature (monophasic) and relatively scanty period, between two ovular cycles. (c) Irregular ovular cycles; the intervals from the start of the periods to the arrows marking the occurrences of ovulation are inconsistent, but the post-ovular intervals are of more uniform duration. (d) The temperature rises slowly in the post-ovular phase in this record. (e) The temperature falls slowly from the post-ovular plateau. (f) A combination of (d) and (e), so that little more than a mid-cycle depression remains to represent the biphasic pattern. (g) Here conception has occurred and the post-ovular plateau persists. (h) In this case delayed ovulation, not conception, accounts for the non-appearance of the period.

the ovum being trapped within the follicle instead of being extruded. Nevertheless, trapped ovum is probably so rare a phenomenon that it is safe to say that regular biphasic basal temperatures reflect regular ovulation. It cannot be too strongly emphasized that the temperature record merely indicates that ovulation has occurred. It does not indicate with any certainty when ovulation occurs and it certainly cannot predict when ovulation is going to occur. Consequently, the advice sometimes given to women wishing to conceive—to time intercourse in accordance with their temperature record—is likely merely to perpetuate their infertility, since, once ovulation has occurred, intercourse can no longer lead to the fertilization of that particular ovum. If ovulation is not taking place the biphasic pattern described above does not appear, the temperature running a more or less uniform course. When the cycles are irregular but nevertheless ovular, the temperature pattern reveals that it is the pre-ovular rather than the post-ovular phase of the cycle which is variable. If the period is overdue the basal temperature record may indicate whether the delay is due to conception or to delay in ovulation. In the former circumstance a normal pre-ovular phase followed by a prolonged post-ovular plateau will be found; if the plateau exceeds three weeks the existence of pregnancy is almost certain. In the latter case either the post-ovular rise will be missing or it will have followed a prolonged pre-ovular interval.

Endometrial Biopsy.—An endometrial biopsy taken shortly before a period is expected will reveal a secretory pattern in an ovular cycle. Such a result indicates the existence of a functional corpus luteum, from which the conclusion that ovulation has occurred is usually justifiable. If the periods are irregular it is best to take the biopsy on the first day of bleeding; if the bleeding is taking place from a proliferative type of endometrium an anovular cycle may be inferred.

Vaginal Smear.—If daily vaginal smears are followed characteristic changes occur at and after the time of ovulation, from which it is possible to infer that this event has occurred. It must be emphasized, however, that daily smears are necessary for such a study. The method is thus of limited value and can be applied only to patients in hospital, or to those who can be instructed to take and prepare their own vaginal smears.

The detection of pregnanediol in the urine during the latter half of the cycle has sometimes been advocated as a test for the occurrence of ovulation. Clearly, it is in general of less practical value than temperature records or endometrial biopsies.

Observations on changes in the cervical mucus have also been advocated for the detection of the occurrence of ovulation. Their limited usefulness does not warrant further elaboration.

Next article on Clinical Pathology.—"Liver-function Tests," by Professor N. F. MacLagan.

The Wellcome Foundation, Limited, has increased its authorized capital from £1m. to £3m. The issued capital has been increased to the same amount. At the time of his death in 1936 Sir Henry Wellcome owned all the shares in the Wellcome Foundation, Limited. By the terms of his will he established the Wellcome Trust, a public charity administered by five trustees to whom all the shares were bequeathed. The objects of the Trust are the furtherance of research work bearing upon medicine, surgery, and allied sciences, and the entire declared dividends of the company are at the disposal of the trustees. The Wellcome Foundation, Limited, trades under the name of Burroughs Wellcome and Co., and the capital increase will bring the issued capital more into line with the capital actually employed in the business. It foreshadows a large programme of expansion starting with a new £350,000 pharmaceutical manufacturing unit at the Wellcome Chemical Works, Dartford, on which work has already started.

Reports of Societies

THE CLINICAL ASPECTS OF IMMUNITY

A symposium on the "Clinical Aspects of Immunity" was held on March 23 at the Royal Society of Medicine, under the chairmanship of the president of the Section of Medicine, Sir HENRY COHEN. The opening speaker, Professor A. A. MILES (Lister Institute), emphasized that specific immunity usually meant antibody immunity. The two factors to be considered were the capacity of the host to produce protective antibody, and the ability of the bacterial antigens to induce antibody formation. Bacteria contained many antigens, only a few of which were capable of inducing protective antibodies. The body did not discriminate, and was as likely to make an irrelevant response to the antigens of an invading organism as it was to produce a protective antibody.

It was difficult to separate relevant from irrelevant antigens for the production of vaccines, and to assess the results of immunization. The ideal test of a vaccine was a controlled clinical trial in a susceptible community, but this had rarely been made. Vaccine had therefore to be devised largely on the basis of laboratory evidence, which was valuable but required careful interpretation.

In diseases like diphtheria, immunity was very largely antitoxic; but in invasive diseases such as cholera, enteric fever, and whooping-cough the role of toxins was less certain. Resistance to endotoxins did not always confer protection against infection by the living organism. Endotoxins were often also surface antigens; in cases where antitoxic antibodies had been shown to be protective the reason was probably that they were acting as opsonins, not as antitoxins.

The search for relevant immunizing antigens had been outstandingly successful in the pneumococci. When virulent pneumococci lost their capsule they lost virulence, became useless as vaccines and susceptible to phagocytosis. Anti-capsular antibody was protective against infection and was clearly an opsonin. Another example of a non-toxic surface antigen largely determining protective immunity was the M-protein of *S. pyogenes*. Although *H. pertussis* possessed several surface antigens, none had been conclusively proved by laboratory methods to be protective. The effective antigen had not yet been demonstrated by *in vitro* reactions.

In addition to toxins and surface antigens determining resistance to the host's defences, bacteria might possess antigenic substances that appear to be auxiliary pathogenic factors. These should not be accepted as important for artificial immunization unless there was evidence, not only that they were associated with the virulent form of the organism and had an observable effect on the host in conditions resembling those of natural infection, but that they were capable of inducing protective antibodies. For example, streptococcal hyaluronidase and fibrinolysin could not be implicated, because they did not immunize against streptococcal infection.

Antibody Formation in Virus Diseases

Professor A. W. DOWNIE (Liverpool University) spoke on the relation of antibody formation to the course of virus diseases. Not all viruses were good immunizing agents. Acute generalized diseases with viraemia such as measles and smallpox often gave lifelong immunity with high titres of circulating antibody. Localized surface infections such as influenza and the common cold gave poorly maintained immunity. Lymphogranuloma and psittacosis viruses were poor immunizing agents. Relapse was common, and the complement-fixing antibodies produced had little relation to protection.

The relation of antibody formation to the course of the virus infection could best be considered in the acute

generalized diseases. In smallpox infection in the unvaccinated, neutralizing antibodies appeared after the fifth day of illness, but most deaths occurred in the second week. This apparent paradox could be resolved by considering the course of the disease. Generalized spread of the virus occurred in the first few days. The virus quickly became intracellular and was then protected from the antibody which developed subsequently. The role of the antibody could only be to limit further spread. Necrosis of cells already parasitized could still go on. The patient's chance of recovery depended very largely on the original severity of the infection, which would not be influenced by antibody, if this appeared late. The duration and degree of viraemia were less in patients who subsequently recovered than in those who died.

After vaccination, antibody might be found for many years though individual variation was great. Exposure to infection was more likely to cause clinical disease in those whose antibody titre waned soonest, but even in these cases there remained an enhanced capacity to respond to the antigenic stimulus. Antibody was produced early and to higher titres than in the unvaccinated, and generalization of the disease was more rapidly checked. To prevent smallpox, antibody should be present in adequate amounts before the incubation period was over.

In poliomyelitis the virus was found in faeces and in the throat, and, in monkeys infected by feeding, could often be isolated from the central nervous system before paralysis appeared. Antibody, however, did not begin to appear until just before the paralytic phase. As in smallpox, efficient immunity required the presence of antibody in the serum before the end of the incubation period. This could be achieved by active immunization before exposure, or on occasion by passive immunization with immune sera in the first few days of the infection—that is, early in the incubation period.

Immunity to Protozoal Diseases

Professor B. G. MAEGRAITH (Liverpool School of Tropical Medicine) discussed immunity to protozoal disease with special reference to so-called "natural" resistance to infection. Protection in the absence of previous infection was not always as "natural" as it might appear, but often depended largely on a chance relationship of host and parasite. For example, infants in the first few months of life in endemic malarial districts often showed few signs of the clinical disease. This apparent resistance to the parasite was said to be associated with transferred maternal antibodies, but it had recently been demonstrated that it might be in fact related to their breast-milk diet.

Adventitious circumstances could also affect the acceptance or otherwise of *E. histolytica* by the host. For instance, the parasite readily established itself in the large intestine of the host, where the physico-chemical environment was suitable, but invasion could easily be restricted by changing this environment by varying the diet of the host. Invasion of the intestinal wall by *E. histolytica* depended on many things besides the establishment of the parasite in the gut lumen. The chance of contact with the epithelium and the length of that contact were important, for example. The presence of an inhibitor of the proteolytic enzymes of the parasite was sometimes decisive. Moreover, the host possessed a kind of negative resistance in that the conditions in its tissues were unfavourable for the parasite's development and the latter could apparently not easily adjust conditions to suit itself. Changes in the host tissues might lead to establishment and multiplication of the parasite. Induced hypersensitivity might be important in this respect, as shown in the development of amoebic liver abscesses after intraperitoneal injection of parasites in guinea-pigs with "chronic" gut infections or "sensitized" to amoebic antigen.

It was probable that when an animal was sensitized to amoebic products the presence of metastatic amoebae in the liver caused a reaction which led to profound local

circulatory changes resulting in the creation of conditions suitable for growth and multiplication of the parasite.

Acquired resistance was demonstrable in many parasitic infections, including vivax malaria. In this infection the resistance was specific for the species, and there was little overlap, even with other strains of the same parasite. It was reasonable clinical practice to separate patients with vivax malaria into those likely to have resistance and those unlikely to have any. Patients with previous exposure to infection, especially after repeated reinfection, developed a strong resistance to the clinical manifestations of the disease. A single dose of a good schizonticidal drug would in these patients usually abort an attack. In the case of a resident in an endemic malarial area this was all that was required. Eradication of the disease in such individuals might eventually lead to loss of valuable acquired resistance. In the case of an infected person taking up permanent residence in this country, however, eradication of the disease was desirable. Treatment comprised the use of a powerful schizonticide and of an 8-amino quinoline.

Antibiotic Therapy and Resistance

The discussion was opened by Professor R. CRICKSHANK, who stressed the effect of chemotherapy on immune responses. In scarlet fever administration of antibiotics limited the production of streptococcal antibodies, and while this increased the risk of recurrences it was also paradoxically associated with a decreased incidence of rheumatic fever following streptococcal infection. In long-continued fevers such as typhoid fever immunity developed relatively slowly. Interference with the natural course of the disease by antibiotics greatly reduced the degree of immunity attained, as was shown by the sharp rise in relapse rates in enteric fever following the introduction of antibiotic therapy. A solution to this problem might be to combine antibiotic therapy with immunization with an efficient vaccine. In enteric fever, however, vaccines gave relatively incomplete protection, and there was a need to define the antigenic fractions required for immunization.

Dr. D. McCLEAN emphasized the importance of early passive immunization in virus diseases after exposure to infection. He advocated the collection of blood after vaccination or from convalescents in order to prepare the appropriate immune globulins for use in those infections in which they were shown to be effective. These preparations should not be unduly expensive if fractionation was on a large scale, since the blood would be given free; immune globulin did not, apparently, transmit hepatitis. The most useful vaccines in infections caused by intracellular parasites, such as contagious abortion of cattle, tuberculosis, smallpox, and yellow fever, were living vaccines.

Dr. A. FELIX, F.R.S., confirmed the rising incidence of relapse and reinfection in enteric fever since the introduction of chloramphenicol. The rapid curtailment of the acute disease was achieved only at the expense of protection against future risk. The secondary infection was often due to a strain of a phage type different from that which caused the primary infection, and this had led workers in this country and abroad to draw the erroneous conclusion that these strains differed in their antigenic composition. However, there was no evidence of antigenic differences in the infecting strains when recurrences occurred.

Other points raised in the discussion were the complexity of immunological responses in helminth infections; the possibility that not all antibody may be equally efficient in neutralizing the effect of antigens, and that antibody produced years after immunization may be less potent than antibody produced earlier in protecting against disease. The age at which the antibody-forming mechanism became mature and capable of responding to antigenic stimuli in infants was also discussed.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

The Sickle-cell Trait and Sickle-cell Anaemia

SIR,—Much of the literature on the sickle-cell trait and sickle-cell anaemia is contradictory and confusing. With reference to the recent letters published in your columns and the interesting paper by Dr. A. C. Allison (*Journal*, February 6, p. 290) suggesting that the possession of the trait endows the fortunate bearer with a positive survival value in a hyperendemic malarial area, may I be permitted to add to the literary confusion?

The theory of the positive survival value of the trait was evolved to explain the varying and often high incidence of the dominant sickling gene which in the heterozygous state is considered to be innocuous and in the homozygous state lethal. Allison has assumed that the homozygous theory of the inheritance of sickle-cell anaemia is correct in East Africa. I do not know if this assumption is justified. The majority of the literature from East Africa, apart from a rather neglected paper by Trowell¹ and a not entirely convincing paper by Foy *et al.*,² emphasizes the rarity of sickle-cell anaemia. Indeed it was stated in *Colonial Research*³ that the condition which has been described as sickle-cell anaemia could be recognized in Uganda as being malarial anaemia in persons with the sickle-cell trait. I have also been led to believe that cases of sickle-cell anaemia are rarely seen in necropsy material in this part of Africa. However, if it is accepted that the homozygous theory of the inheritance of sickle-cell anaemia is correct throughout Africa, the high incidence of the trait in certain parts of Africa is difficult to explain and Allison's conclusions may possibly have provided the answer. It is interesting to speculate that the expected malarial mortality in a population in a hyperendemic malarial area (in itself a controversial subject) might be calculated from the incidence of the sickle-cell trait in the population.

Malaria is considered to be hyperendemic in the Gold Coast; the incidence of the trait in the population of the Accra district is in the region of 18% and the homozygous theory of the inheritance of sickle-cell anaemia may well be correct.⁴ In 1949-50 in the Gold Coast I examined 527 children for the presence of the trait, and the blood was also examined for the presence of malarial parasites. Eighty-four exhibited the trait and malarial parasites were present in 30 (35.7%). Malarial parasites were present in 134 of the remaining 443 children (30.2%). Parasite densities were unfortunately not performed and only 200 children were of a strictly comparable group. In conjunction with Dr. M. J. Colbourne a further investigation was recently instituted and the results to date are shown in the following Table:

The Incidence of the Sickle-cell Trait and Malaria, Including Parasite Densities in 161 Children of Comparable Age Group and Social Class in Accra

	No.	Malarial Parasites	Average Parasite Density
Sickling positive	32	16 (50%)	500 c.mm.
" negative	129	77 (60%)	1,000 "

These results are as yet inconclusive and further work will require to be done. However, the general trend of the figures is in agreement with those of Allison, although it cannot be said as yet that the sickle-cell trait partially protects against malaria in the Gold Coast. There may of course be other explanations for the varying incidence of the trait and its persistence in various parts of the world. It must be remembered that sickle-cell anaemia may be a mild disease and improve with advancing years. One of my patients was a male African aged 40 years who had five children, all bearers of the trait, who were alive and well and showed no symptoms of sickle-cell anaemia. In addition, it is recognized that women suffering from sickle-cell

anaemia may still bear children although the mortality and morbidity in pregnancy may be high.⁵ The suggestion of Wells and Itano⁶ that there may be a quantitative as well as a qualitative inheritance of the trait is perhaps worthy of more consideration and further investigation.

One of the sickling children in the investigation discussed above, whose blood film was originally negative and was recorded as such, became ill while under observation and a peripheral blood film showed a density of 29,000 parasites per c.mm. This figure was not naturally recorded in those shown in the table and was the highest parasite density noted in the 161 children investigated. In addition, I have seen malarial pigment in the reticulo-endothelial system of children who have died from sickle-cell anaemia. Thus, although the bearer of the trait may possibly be partially protected against malaria, undoubtedly reasonably severe infestations occur. In addition it has been postulated that a malarial infection might precipitate a crisis in sickle-cell anaemia.⁴ This seems a reasonable hypothesis if the malarial parasite depends on oxygen for its survival, and is borne out by the history given by those suffering from sickle-cell anaemia. There is thus the possibility that malaria may be responsible for an increased death rate in sickle-cell anaemia. Lastly, to further complicate the picture, the "sickle-cell crisis" described by Reid⁷ and Edington⁸ is a common finding in our necropsy material, and may I say, albeit hesitantly, that I am not entirely convinced that this type of catastrophe may not occur in the heterozygous individual and that, in making this statement, I am not entirely unsupported in the literature?—I am, etc.,

Accra.

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- ⁴ Edington, G. M. (1953). *British Medical Journal*, 2, 957.
- ⁵ Beacham, W. D., *et al.* (1950). *St. med. J. (Bgham, Ala.)*, 43, 442.
- ⁶ *J. Biol. Chem.*, 1951, 188, 65.
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G. M. EDINGTON.

Neomycin in Pyogenic Skin Diseases

SIR,—The findings of Dr. R. E. Church (*Journal*, February 6, p. 314) have been further confirmed here in a recent series of 80 similar cases who have been investigated bacteriologically and treated by paired comparison—40 (series A) with 1% aureomycin in a P.M.F. base, and 40 (series N) with "nebacetin"—a preparation containing 5 mg. of neomycin and 250 units of bacitracin per g. of anhydrous ointment base. The numbers were limited by the amount of "nebacetin" available.

In the treatment of the superficial pyodermas, no significant difference was noted between the two groups. All of 30 cases of impetigo were cured within 18 days, the great majority in the first week. Twenty-six cases of infective eczematoid dermatitis were treated with only two unsatisfactory results in each series. One of these in series N showed sensitization, but whether to neomycin, bacitracin, or base could not be determined. In 14 cases of folliculitis barbae, only one failure was recorded in each group. In the treatment of sycosis barbae, however, a considerable difference in results was seen. Of 10 cases treated, the five in series N resulted in one cured, two temporarily improved, and two showing no response. Four of the five in series A were cured and remained so to a three-month follow-up—the other improved, relapsed, and later cleared with 3% terramycin ointment which recently has given comparable results in sycosis barbae to the aureomycin preparation.

The bacteriological results corresponded to Dr. Church's figures for the Sheffield area. *Staphylococci pyogenes* were isolated in all cases investigated and found to be resistant to penicillin in 49 cases (60%), to aureomycin and terramycin each in 8 (10%)—mainly the same patients—to chloramphenicol in 4 (5%), and to neomycin partially in one case only. This percentage of penicillin-resistant organisms has surprised colleagues not practising dermatology, but appears to be a general finding in other places.

The other figures correspond roughly to the proportionate use of these antibiotics to date, and it seems therefore not unreasonable to assume that penicillin resistance will slowly but surely be matched by resistance to the other antibiotics over the next decade and that patient-sensitization—so prevalent now with penicillin—may well follow a similar course.

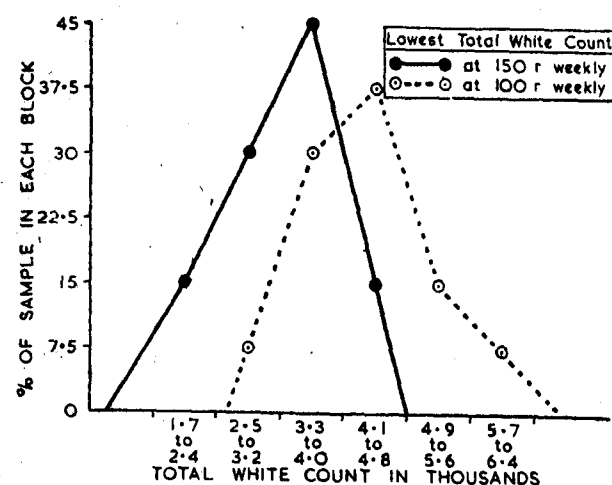
If then the undoubted time-saving factor justifies the local use of these antibiotics at all, neomycin, which has no systemic use, should be the drug of first choice in the superficial pyoderms for as long as these other factors of low bacterial resistance and patient-sensitization remain. Preparations of aureomycin and terramycin which have wide systemic indications at present should now be discriminately restricted to stubborn cases and deeper seated lesions of the sycosis type. But impetigo and related conditions were not regarded with grave therapeutic alarm and despondency before antibiotics were added to our repertoire, and preparations such as lotio or pasta cupra-zincica and "lin. cal. with 2% ichthammol" still cure these conditions in reasonable time and will be both acceptable to the patients and to those concerned in pruning the nation's drug bill. The nebacetin was kindly supplied by Messrs. W. R. Warner and Co. Ltd., through Dr. D. D. H. Craig.—I am, etc.,

Aberdeen.

IAN W. CALDWELL.

Deep X-ray Therapy in Spondylitis

SIR,—The deep x-ray treatment for spondylitis, advocated by Drs. J. Sharp and E. C. Easson (*Journal*, March 13, p. 619), is very nicely shown by them to be effective and moderately safe, and the dosage of 150 r weekly for 10 weeks is, of course, less than that used in some other centres. I think, however, that no one should embark on such therapy without realizing the profound fall in the white cell count that results.



The diagram shows the lowest counts reached in a small sample of cases treated at 150 r weekly, and shows that a striking effect is still seen with a dose of 100 r weekly for 10 weeks. In a small uncontrolled series I have not found this fall in total white count, or the nausea and vomiting which also occurs, to be ameliorated by the injection intravenously of 200 mg. of mercaptamine immediately after treatment, but it is interesting that all of my subjects who were smokers were unable to smoke cigarettes for several days. If this suggestion is confirmed by further work it may be of use to would-be abstainers.—I am, etc.,

Manchester.

M. B. McVEDY.

SIR,—Drs. J. Sharp and E. C. Easson (*Journal*, March 13, p. 619) are to be congratulated upon their excellent results obtained with x-ray therapy in ankylosing spondylitis. We have learned to expect such good results well presented from the Christie Hospital and Holt Radium Institute.

Two points of practical importance referred to in their methods draw comment. The first is the praiseworthy use of dosage below that used in many clinics. I have used a dosage of 1,000 r (tissue) in one week to all the affected zones in sections from the sacro-iliac joints to the top of the cervical spine. The sacro-iliac regions are treated first in one week, next the lumbo-dorsal, 20 cm. in length, then the dorsal, again 20 cm., and lastly the cervical. The results are comparable with those of Dr. Easson. By thus dividing the tissue treated constitutional upset is avoided. The second is the treatment of sacro-iliac disease in the female. I believe I was one of the first to use glancing fields for this region and would like to give particulars of a case treated in 1945 with its effects on menstruation. The right and left sacro-iliac joints were treated with 1,000 r in one week. Ionization in the rectum showed that the patient had a maximum of 100 r from both treatments. Following this she had one excessive period followed by one month's amenorrhoea and then the periods were normal until 1950, when she complained of more pain in the midline of the back. She was given the same dosage again and, in addition, 500 r to a painful area in the midline through a field 6×4 cm. directed towards the head. Following this treatment she has had irregular periods, sometimes twice a month, sometimes five months' amenorrhoea.

The object of reporting this case is to show that x rays in small doses can affect menstruation and also that treatment can be repeated without producing permanent amenorrhoea. This patient's periods were perfectly normal and regular before radiotherapy, and commenced at the age of 16. I realize that this is only an isolated case and any conclusions are arguable, but it is very interesting.—I am, etc.,

London, W.1.

ANTHONY GREEN.

The Thyroid

SIR,—I have read your review (*Journal*, February 27, p. 503) of Mr. T. Levitt's *The Thyroid*; I have also made a careful study of the book itself. It seems to me that the reviewer did not fulfil his primary duty, which is to give a fair account of the general scope of the book. Though a reviewer's own interest may be limited, I think that he should always bear in mind the needs of the audience to which a book is addressed. Thus a surgeon would probably like to know that Mr. Levitt gives a detailed description of recommended operative procedures based on his own extensive experience. I found Mr. Levitt's account of the eye changes in exophthalmic goitre to be one of the fullest and most enlightening, and certainly the best illustrated, that I have ever come across and one which I am sure would interest many types of workers.

It seems to me regrettable that when a really important British monograph appears representing the fruit of much labour and reflection its scope should not be made abundantly clear and that the reviewer should instead take up your valuable space in discussing certain details on which his views are at variance with those of the author.—I am, etc.,

London, W.1.

SAMSON WRIGHT.

Rh Antibodies and Domiciliary Midwifery

SIR,—It is dangerous to draw conclusions from small numbers of cases of haemolytic disease of the newborn, for this disease can vary in severity from an infant so mildly affected as to require no treatment to one so severely affected as to be stillborn. We estimate that the infants of 100 Rh-negative women with antibodies fall into the following categories: Rh-negative and therefore not affected, 20; Rh-positive and therefore affected, 80 (stillborn 10, requiring treatment 42, not requiring treatment 28).

If simple transfusion is the treatment used, then as many as 13 deaths might be expected, whereas practically all could be avoided by the use of exchange transfusion. In our experience in the last two years, out of 52 affected babies born at home, 11 died; 8 were seen early enough

to be treated by exchange transfusion, but 3 of these died. We believe that 2 of these 3 infants would have survived had they been born in a hospital affording special facilities. During the same two years, out of 217 affected infants born in special hospitals, only 7 died, but in only 2 of these cases was death attributable solely to haemolytic disease of the newborn. Two were liveborn hydrops foetalis and therefore not viable, while the other 3 died from causes other than haemolytic disease.

The severity of this disease cannot be predicted accurately antenatally, and even a primipara may have a severely affected infant. It is probably true that only once in a lifetime will a family doctor be faced with a baby born *in extremis* and where exchange transfusion is urgently required. But to the family concerned that infant is supremely important, as witness this extract from a father's letter received by us in response to a postal follow-up of cases not delivered in special hospitals: "... I think the baby could have been saved and it was a great loss to my wife and I, after those months of planning and preparing. We would still like to have one, but we would rather wait until we have some guarantee that every effort would be made to keep the baby alive." It remains our conviction that hospital delivery should be offered to all immunized Rh-negative women.—We are, etc.,

SHEILAGH MURRAY.

WILLIAM WALKER.

Newcastle-upon-Tyne.

Primary B. coli Peritonitis

SIR,—I came across the following unusual case recently. It would be interesting to hear of any similar cases met with by your readers.

A girl aged 4½ years was admitted as an emergency at 11.15 p.m. with a history of abdominal pain since 4 p.m. The mother stated that she was perfectly well up to that time. There had been some nausea but no vomiting. On examination the child was toxic with circumoral pallor, cold extremities, axillary temperature 103° F. (39.4° C.), and pulse 120. The throat, ears, and chest were normal. The abdomen was distended with generalized tenderness. Rigidity was most marked below the umbilicus and maximum in the right iliac fossa. A provisional diagnosis of pneumococcal peritonitis was made, but laparotomy to exclude appendicitis was decided upon. An injection of 250,000 units of penicillin was given, and the child premedicated with "nepenthe"/atropine.

A right lower paramedian incision was made. There was a film of odourless, slimy yellow pus covering the viscera below the umbilicus. The peritoneum was congested, being most marked in the pelvis. The appendix was normal except for the congestion of the outer coat; so was the pelvic colon and ileum. No primary cause was found and a specimen of pus was taken for culture. The appendix was then removed and the incision closed. The penicillin was continued post-operatively for five days. Recovery was uneventful, the temperature falling to normal on the third day by lysis. The bacteriological report was as follows: pus cells +++, Gram-negative bacilli ++, culture: *B. coli* +++, sensitive to aureo-, chloro-, strepto-, and terramycin. The child was discharged perfectly fit on the 16th day.

As the swab was taken before removing the appendix the possibility of contamination could be excluded. I have seen many similar cases where culture of pus proved sterile, probably due to delay in plating and pneumococci being very short-lived on an ordinary swab, but the profuse growth of *B. coli* obtained here seems to justify regarding the case as one of genuine primary peritonitis due to that organism.—I am, etc.,

Bath.

C. P. DE FONSEKA.

Elastic Stump Socks

SIR,—It is well known that amputation stumps require careful early post-operative treatment so that a conical, well-healed, and durable stump can be measured and fitted with an artificial limb as quickly as possible.

I am finding elastic stump socks made from two-way stretch material, specially woven to give maximum pressure at the distal end of the stump, most useful in post-operative cases. The advantages of these elastic socks are: (1) they

exert an even pressure (reduces the oedema); (2) they do not produce folds and invaginate the skin, thus leaving furrows; (3) they shape the stump in a conical manner and produce an even contour, leaving a linear scar; (4) the patient can apply and adjust the socks himself; (5) they are not cumbersome, require no bandaging, and save the time of the physiotherapist; (6) the employment of these socks prevents any injury to the stump which may occur as a result of inexpert bandaging of a stump with vascular disease.

These stump socks are made in two types, one set for above and another set for below knee amputations in three graded sizes—small, medium, and large. The small below-knee socks are also suitable for arms. They are easily washable, are economical, and can be used by the patient at night as well as by day. They are said to last for at least 18 months.—I am, etc.,

London, S.W.15.

LEON GILLIS.

A.C.T.H. and Cortisone

SIR,—Regarding the future possibilities of A.C.T.H. and cortisone, Dr. Sulzberger writes: "It is not at all venturesome to predict that, in the future, these hormones may well prove even more useful in dermatologic research than in dermatological therapy." And Dr. J. T. Ingram, writing on "Stress as a Factor in Dermatology," says: "It may be that the results of treatment of skin disease by A.C.T.H. and cortisone will throw some light on the mechanism involved in skin reaction."

In 1950 an article entitled "Deficiency Patterns in Metallic Poisoning" appeared in the *B.M.J.* In this Dr. W. Hughes recorded his observations on a series of cases of poisoning with heavy metals and also a number of cases of avitaminosis in which the skin lesions were very similar in type and in distribution. He drew attention to the biochemical changes resulting in the case of metal poisoning, in which the enzyme system concerned in cellular oxidation was blocked by the metallic ion having attached itself to the protein moiety. Following the discoveries of Sir Rudolph Peters these cases were successfully treated by dimercaprol, which acted by competing for the metallic ion and freeing the enzyme system.

In the cases of avitaminosis, however produced, the same enzyme system was inactivated, this time by lack of the necessary factor in the form of the vitamin, the addition of which allowed the enzyme action to proceed normally and cured the condition. Following the appropriate treatment in the two types of case, the skin lesions were seen to heal.

It is suggested that there may possibly be other patterns of skin disorders having a dual or even a multiple type of causal origin, particularly those manifestations of rather an obscure origin and mechanism which have been cured by drugs having an equally obscure action on the physiological processes of the body. There are cases of dermatitis herpetiformis which respond to sulphapyridine, others to suramin, others to neither, or to calciferol. Lupus erythematosus of the acute type will respond to A.C.T.H. and the chronic variety be unaffected by it. A rash produced by a sensitivity to penicillin with a similar distribution and appearance to an acute L.E. may also respond dramatically to A.C.T.H. Other examples will probably occur to the reader.—I am, etc.,

Leeds.

DOROTHY C. MACLENNAN.

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Anaesthetics in Out-patient Departments

SIR,—Despite the enormous number of articles and letters about anaesthesia which have appeared recently in the *Journal*, including the report of the meeting of the Section of Anaesthetics at the Royal Society of Medicine on February 5 (*Journal*, February 20, p. 452) in regard to dental anaesthetics, I am prompted to add my own experiences in

this connexion, as I feel they may be of interest. I have given, in the last six years, over 12,000 of these from all age groups; all of which have been given in school clinics, hospital out-patient departments, or in private practice. In no cases, except in private practice, have I ever used any premedication. It would seem to me that in the clinics and hospital out-patient departments doing 20 to 30 patients in a session, and with lack of staff or suitable accommodation for recovery, this is quite impossible.

All cases have been given nitrous oxide-oxygen mixtures with supplementary trichlorethylene or ethyl chloride as available, or if necessary. No ill effects that I know of have occurred in any case. I agree with Dr. J. G. Bourne's views on premedication, but they would seem to be impracticable, and surely the use of cyclopropane as he suggests would be prohibitive from the point of view of expense. I have used all the standard machines and feel that the McKesson-Nagraf machine with trichlorethylene attachment is the most satisfactory of all. I cannot see how the use of cyclopropane, with its risks of explosion, sickness, and salivation, can be considered safer in the hands of a novice than nitrous oxide.—I am, etc.,

London, N.W.6.

KENNETH W. LEON.

SIR,—Following the appearance of your leading article on this subject (*Journal*, February 27, p. 505), there has been some discussion centred mainly on the disadvantages of cyclopropane. All correspondents have failed to recognize the two main points of Dr. J. G. Bourne's thesis (*Journal*, March 13, p. 641): (1) the danger of anoxia in nitrous oxide and oxygen anaesthesia, and (2) the simplicity of Bourne's method.

My only comment on (1) is that it is well known that even a short period of anoxia during a major surgical operation contributes to shock, and yet anoxia (or hypoxia) is gaily used by all and sundry in out-patient departments, doctors' surgeries, and dental surgeries all over the country as an adjuvant to a known weak anaesthetic. Other anaesthetics have their disadvantages also. (2) The apparatus used by Bourne is simple and costs less than half the price of the standard nitrous oxide and oxygen apparatus. The method is simply learnt, and because cyclopropane is a powerful anaesthetic its dose can be regulated by the duration of the inhalation. The mask is removed, leaving the surgeon a quiet subject who is not cyanosed, and still giving him ample time to perform a short operation. I had the privilege of seeing Dr. Bourne's film at the Royal Society of Medicine in which he demonstrated (to me at any rate) the impossibility of maintaining anaesthesia with nitrous oxide and oxygen in the correct physiological admixture in a high proportion of cases.

With regard to Dr. H. Newton-Andrews's comment (*Journal*, March 13, p. 641) on the possibility of explosion by a spark from a difficult extraction, I would point out that a throat pack should always be used, which would minimize the risk of explosion. The time has now come for a reassessment of anaesthesia in all forms of minor surgery. In conclusion, I would recommend correspondents to re-read Dr. Bourne's original paper.—I am, etc.,

London, E.17.

FRANCIS J. GODDARD.

REFERENCE

¹ *Lancet*, 1952, 2, 705.

Ion-exchange Resins

SIR,—I would like to support Professor M. L. Rosenheim's contention (*Journal*, March 27, p. 758) that ion-exchange resins are a very promising form of treatment for nephrotic oedema. We have under observation a lady aged 35 suffering from nephrosis, who was completely resistant to all types of treatment, including cortisone. The use of ion-exchange resin ("kationium") produced most satisfactory results. She has been on continuous resin therapy for close on two years, and is able to lead what is virtually a normal life. I feel, like Professor Rosenheim, that there is a definite place for these compounds in the therapy of nephrosis.—I am, etc.,

Inverness.

JAMES RONALD.

Children's Nursing Unit

SIR,—I read with the greatest interest Dr. J. A. Gillet's account of the Rotherham experiment (*Journal*, March 20, p. 684). I am wondering if he has ever considered extending the benefits of such a scheme to the aged and chronic sick. Their care is becoming an increasingly grave problem and their needs bear many resemblances to those of sick children. Like them, they have a strong attachment to familiar surroundings and dependence on others for the ordinary necessities of life. If adequate care and some skilled nursing were available in the home, many patients now admitted to hospital could be discharged sooner and others would not require admission at all, thus relieving the present famine in hospital beds and the financial burden to the community which hospitalization entails. The disturbance caused by the cerebro-arteriosclerotic in a general ward need arise much less often.

The personnel of such a service would consist of homely women whose work would be supervised by the health visitor or district nurse. Such work might be made to attract old age pensioners if the present pension regulations were modified to allow women so employed to earn up to £3 per week without deduction of pension instead of the £2 at present permitted. I am aware that various schemes already exist for the help of the aged sick, but the success of the Rotherham experiment makes it an excellent model.—I am, etc.,

Tiverton.

G. NICHOLSON.

SIR,—The children's nursing unit described by Dr. Jos. A. Gillet (*Journal*, March 20, p. 684) shows what can be achieved by providing an adequate domiciliary nursing service for children. Such a service could help to reduce the infant mortality rate in a way not mentioned by Dr. Gillet or in your annotation.

It is apparent that an increasing proportion of the hospital deaths in infants are occurring in babies who are admitted in a moribund or practically moribund condition. In very many of these cases the baby has been under treatment by the family practitioner. The mother has often failed to recognize a deterioration in the baby's condition or has been unable to contact the doctor, who may be out on his rounds. In other instances she has hesitated to call him because he had already arranged to visit later or the next day. Dr. Gillet's scheme, by which such babies are visited two or three times daily by a trained children's nurse, who would also be readily available for urgent visits, would do much to prevent such tragedies. Furthermore, experienced practitioners realize that many young mothers may not appreciate a deterioration in their child's condition and naturally tend to send such cases into hospital early. The knowledge that they have at their disposal a children's nursing unit would encourage them to treat such children at home, thus saving hospital beds. It is hoped that more local authorities will follow Rotherham's enlightened example.—I am, etc.,

Huddersfield.

W. P. SWEETNAM.

Synopsis of Children's Diseases

SIR,—Professor Wilfrid Gaisford (*Journal*, March 27, p. 744) is undoubtedly able to distinguish a mongol from a cretin, but how many of his students are able to do so? Confusion between the two conditions is still quite common and is not confined to undergraduates. I recently saw a child of 4 years with very marked cretinism. The child had been diagnosed as a mongol in infancy by the family doctor, and this had been "confirmed" by a consultant paediatrician. No treatment had therefore been given. I think that Dr. John Rendle-Short was well justified in including a table of differential diagnosis of the two conditions in his book.—I am, etc.,

Liverpool, 12.

S. E. KEIDAN.

Injection into Artery

SIR,—I wish to correct what may be a wrong impression left in the minds of some of your readers after seeing the medico-legal report in the *Journal* of March 27 (p. 766) concerning intra-arterial injections. Reading this report may make me appear to be too dogmatic.

In my evidence I divided the act of intra-arterial injection into (a) intra-arterial puncture—which I said was a mishap which can befall anyone—and (b) injection of thiopentone after arterial puncture—which I said was not a careful or skilful act. I gave four means of ascertaining whether a needle was in an artery, and said that to continue further with an injection, having perceived one or more of these signs, was not the act of an experienced person. I also used the expression "person skilled in intravenous work," avoiding the word anaesthetist. I hasten to make myself clear, for it may happen that my turn for intra-arterial puncture instead of intravenous is just around the corner.—I am, etc.,

London, N.19.

O. H. BELAM.

Erythromycin

SIR,—It was with pleasure that I read your leading article (*Journal*, January 30, p. 261) saying that erythromycin had been released for use by general practitioners. It was therefore with surprise and concern that I read the letter from Dr. H. A. Evans (*Journal*, March 20, p. 702), in which he urges that erythromycin should be kept for hospital use only. An actual case history will illustrate my reason. I was called to see an active 75-year-old man, who had bilateral lobar pneumonia. He had been under observation at the local chest clinic as a tuberculosis contact. Specimens of sputum were sent for routine examination, but, as he was very ill, treatment with penicillin was started with "estopen" 500,000 units 12-hourly. Instead of the expected response, his condition deteriorated. The pathologist's reports were negative for tubercle bacilli; culture grew *N. catarrhalis* and *Streptococcus viridans*; Gram-positive cocci and Gram-negative bacilli were also present. On the fourth day I stopped the "estopen" and prescribed erythromycin—300 mg. 6-hourly. Within 24 hours there was an improvement, and by the time the chest physician saw him with me and confirmed the diagnosis he was steadily responding to treatment. After three days the dose was reduced to 300 mg. 8-hourly, and after two more days it was stopped. In all 60 tablets of erythromycin (6 g.) were given, and no side-effects were experienced by the patient. Two weeks later he attended the chest clinic, and it was reported: "This man seems to have made a remarkably good recovery. . . ."

I do not understand why Dr. Evans is prepared to give penicillin empirically, yet not other antibiotics. I agree entirely that laboratory tests for sensitivity are desirable before using any antibiotic, including penicillin, but in a case such as the one described here it is surely imperative to treat the patient by all available means. Otherwise the delay while awaiting sensitivity tests may lead to a very scientific report but a dead patient.

I firmly believe that a patient should be treated in his own home whenever possible, unless he requires a special treatment or technique that is available only in hospital. Apart from the near impossibility of getting a 75-year-old man into hospital, it is better for the patient and more economical to treat him in his own home. Sixty tablets of erythromycin are not so costly as three weeks' maintenance in a hospital bed. Finally—and it cannot be said often enough—the more we general practitioners treat our patients ourselves, the better will be our relationship with the public.—I am, etc.,

London, N.W.3.

PHILIP HOPKINS.

SIR,—It has been well established that erythromycin may be usefully employed in the treatment of certain infections where normally susceptible organisms have become resistant to penicillin. I must disagree strongly with Dr. H. A. Evans

(*Journal*, March 20, p. 702) when he says that this fact will never concern a general practitioner.

As Dr. Evans's experience would indicate, it is probable that penicillin is the best antibiotic for staphylococcal, streptococcal, and pneumococcal infections. Moreover, I agree with him that if a patient suffering from one of these infections does not respond to penicillin, then this is an indication for laboratory testing of sensitivities. If such tests reveal the presence of penicillin-resistant organisms, does Dr. Evans consider that it is outside his province to prescribe erythromycin? It is not my experience that these tests can only be done by a hospital laboratory. In this area I have always found the Public Health Laboratory Service to be most helpful. I welcome the introduction of erythromycin for the limited purpose of dealing with the troublesome problem of penicillin-resistant infections.—I am, etc.,

Sutton Coldfield.

T. A. W. PARKES.

The Nephrotic Syndrome

SIR,—We agree with Dr. F. C. Reubi (*Journal*, March 20, p. 705) that the method we adopt (*Journal*, December 26, 1953, p. 1389) for calculating tubular reabsorption of protein from the results of albumin infusions is complex, and that the graph he shows is simpler. Unfortunately the latter is fallacious, since "the different proteins [albumin and globulins] compete with each other for reabsorption." The evidence for this statement was not given fully (it will be published in detail elsewhere), but to illustrate the point the result of infusing albumin into one patient is shown on the accompanying graph. No significant changes in serum globulin concentrations followed infusion, yet the globulin clearances rose and fell in parallel with the rise and fall in albumin clearance and in serum albumin level.

The simple relationship shown in Dr. Reubi's letter is only valid where one substance of uniform molecular size and "permeability" is being reabsorbed by one tubular mechanism. When several substances of differing molecular size and permeability are being reabsorbed by the same mechanism in proportion to their concentration, and the tubular "load" of only one of them (albumin) is varied, then the increased tubular "load" of albumin will compete with the globulin for the available reabsorptive capacity and the globulin excretion will rise; hence the "clearance" (UV/P) of the globulin fractions will increase in constant proportion to the increase in albumin "clearance," as is seen in the graph. For example, the α_2 -globulin clearance in this case remained about 97% of the albumin clearance, while the latter ranged from 0.4 to 1.7 ml./minute. The method of calculation described thus estimates the total reabsorption, which the simpler method mentioned by Dr. Reubi must therefore underestimate, and, moreover, this simpler relationship between U_{VAIB} and $(P_{AIB} \times g.f.r.)$ will be non-linear. This proportional increase in globulin clearances has now been a constant finding after seven infusions on four patients, and we feel that the theory advanced constitutes the most rational explanation of the observed facts.—We are, etc.,

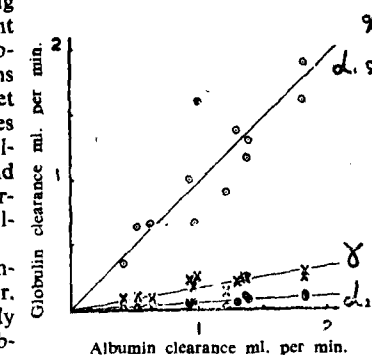
J. R. SQUIRE.

J. HARDWICKE.

Birmingham.

Fear of Litigation

SIR,—One statement in the medico-legal report (*Journal*, March 20, p. 709) where it is reported that Christine Bayliss was awarded £5,000 needs denial. It is the one made by Mr. R. C. Vaughan, appearing for the defendants, that: "Nurses and doctors will shut up like clams, and



you'll never get any information out of the hospital as to what is wrong with yourself, far less your child." The judge then stated: "If it were a child of mine, I would change my doctor," and Mr. Vaughan made a further statement that "one can't get facts from hospitals. They are grossly impertinent when you ask."

I am sure I am voicing the opinion of those who see after children when I say that those in charge of them in hospital try to give parents information about their children. Parents are given appointments for this purpose, told the truth, savoured albeit sometimes with hope which is scarcely justified, and encouraged to come again. This practice, which is rewarding in many ways, was in vogue before the National Health Service Act came into operation. Even then it was our duty to give "a dying pauper" as much attention as we give now to those who pay.—I am, etc.,

Rugby.

R. E. SMITH.

SIR,—When an employer of labour is held responsible for an injury to his workman he alone faces criticism, and employers in general are not forced to share in the disparagement. Why, then, is it possible, on the evidence advanced in a single case, for counsel to assert that "nurses and doctors will shut up like clams and you'll never get any information out of the hospital as to what is wrong with yourself, far less your child," or, again, "One can't get facts from hospitals, they are grossly impertinent when you ask." Remarks of this kind are pounced upon by the popular press, public dissatisfaction is intensified, and we are forced to focus our interest not on the patient but upon self-protection. Surely distinguished lawyers are sufficiently in touch with our problems and difficulties to avoid such expressions of personal opinion which can only serve to damage a sister-profession and to destroy, without cause, the confidence of twenty million people.—I am, etc.,

Swansea.

C. J. CELLAN-JONES.

Change of Sex

SIR,—Your annotation on "Change of Sex" (*Journal*, March 20, p. 694), coupled with the remarks of your medico-legal correspondent (p. 710), raises a serious problem. Intersexes are imperfect males or females, this imperfection being due to the disturbance of the sex-forming—or sex-differentiating—mechanism which occurs in the course of embryological development. In rarer cases the sex differentiation breaks down in the course of post-natal life following, for example, certain endocrine diseases. Although imperfect men and women, intersexes possess what has been called since the Roman jurist Ulpianus, of the third century of our era, the predominant sex.

The problem is, What is the predominant sex in an intersexual? As I pointed out in my Thomas Vicary lecture many years ago,¹ with our contemporary ideas the predominant sex is that manifested by the total personality and not that indicated by special features of nuclear genes, gonads, endocrines, or even by the balance of sexual characters. Total personality is shown by the behaviour and will of the individual. Thus, in principle, an intersexual individual has the right to demand of us to perfectate his sex according to his choice.

The application of this principle is accepted for that class of intersexes designated as hermaphrodites ("true" or "false" according to our ridiculous terminology)—that is, in individuals who show in their genital organs and sometimes in their gonads a mixture of male and female features. Since the work of Ambroise Paré in the sixteenth century we accept to use medical and surgical procedures to perfectate these unfortunate individuals towards the sex they will and to allow them to register accordingly. Legal complications such as marriage can be settled by the procedure of annulment. Sexual behaviour complications are not important, because, with the exception of certain cases of exhibitionism, hermaphrodites have a very weak libido. Fertility is non-existent.

The application of this principle of free choice for the other class of intersexes, the transvestites, is much more difficult. These are individuals whose genital organs and gonads are distinctly male or female but who feel they belong to the opposite

sex and want to live, dress, and work like members of the opposite sex. I have noted the curious fact, however, that this does not apply to their sexual behaviour, and genuine transvestites do not generally wish to act as individuals of the opposite sex. With this group, as with the hermaphrodites, it appears that the intersexualizing process inhibits the development of the libido. In my opinion, these transvestites are as much hermaphrodites as those designated with this term, and, in fact, we find definite endocrine, genital, and other physical stigmata pointing to a definite intersexuality. They are the most unfortunate beings, leading lives of misery often terminating in suicide. We have to help them—but how? In this country psychotherapy, guidance, and help towards registration are sufficient. In Denmark Dr. Hamburger and his co-workers² have had the courage to apply more drastic endocrinotherapeutic and surgical measures. Can we go as far as that?

One important point: We must distinguish between the real transvestites, who are in fact hermaphrodites, and certain homosexuals, as well as patients with special obsessional neuroses, but the life history, the physical stigmata of intersexuality and the maldevelopment of the gonads and genital organs, and the unimportance of the heterosexual libido will help us. Although there are intermediary forms such differentiation is necessary and usually possible.—I am, etc.,

London, W.1.

A. P. CAWADIAS.

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Elderly Psychiatric Patients

SIR,—I was impressed by the diagnostic accuracy recorded by Drs. Vera Norris and Felix Post (*Journal*, March 20, p. 675) in elderly psychiatric patients. I would have wished that the distinction between affective and arteriosclerotic illnesses had been more clearly defined. Of four patients over 65 recently discharged from this hospital suffering from mania and depression which had responded to E.C.T., all had been given a hopeless prognosis of which the patient had unfortunately become aware.

Depression in the elderly is often complicated by confusion, and mania always is, but this does not prejudice the response to E.C.T. The statement that "affective disturbance is commonly the leading symptom in cerebral arteriosclerotic dementia" may perpetuate errors. Again, the authors state: "Special inquiry was usually needed to elicit a history of fainting turns, transitory pareses, or speech disturbances; and this, even in the absence of neurological signs or patchy intellectual defects, was regarded as indicative of cerebral arteriosclerosis." This statement surely needs clarification. Fainting attacks are very common in the aged. Sheldon¹ records that 64.7% of women between 70 and 74 suffer from vertigo and 47.5% are liable to falls. Even patients who suffer from cardiovascular disease or have had strokes may also suffer from depression which can remit completely with E.C.T.

I feel the concept of arteriosclerotic dementia is based on shaky pathological and clinical criteria and the majority of cases so diagnosed are suffering from post-apoplectic dementia and mixtures of psychosis and dementia, but many recoverable illnesses are doomed by this diagnosis. Depression and mania can be fatal diseases, and early death does not necessarily mean a senile process. The points raised in this letter have been discussed at greater length by Gallinek,² so I will not trespass further on your space.—I am, etc.,

Sheffield.

G. I. TEWFIK.

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"Antidotarie Chyrurgical"

SIR,—As Mr. L. Jolley truly remarks (*Journal*, February 20, p. 456), the Tweed appears to be an insuperable barrier to the bibliographer. In your note on "Some More Rare Books" (*Journal*, March 20, p. 699) you say that *Childbirth, or the Happy Delivery of Women*, London, 1635, is

very rare, and only one copy, that in the British Museum, is listed in the *Short Title Catalogue*. There are three copies in the West of Scotland, one in the Royal Faculty Library, one in the Hunterian Library of Glasgow University, and one in William Smellie's Library at Lanark. The latter is historic, as it is the copy which Professor Miles Phillips had restored to Lanark after many years' sojourn in the library of the Royal College of Surgeons in Ireland. It may also interest you to know that we in the Royal Faculty and the Hunterian Museum also have the 1612 edition. The other books mentioned are easily available in one or other of the medical libraries of Scotland.—I am, etc.,

ARCHD. L. GOODALL,

Hon. Librarian,

Royal Faculty of Physicians and Surgeons.

Glasgow, C.2.

Strangulated Hernia

SIR,—Dr. J. Rendle-Short and Mr. Cyril Havard (*Journal*, March 20, p. 680) have done a service in reminding us that, although nearly all herniae in infants can be reduced by conservative means, occasional cases of true strangulation and incarceration do occur. It would be interesting to know how many of their 45 cases required emergency operation, and whether they advocate early elective operation after successful reduction by conservative means. They remark that the age-incidence is remarkably constant, and that the greatest number of cases are found in the first year of life. Textbooks of surgery seldom mention the age-incidence of strangulation, and it may not be appreciated that this condition is virtually confined to infants and the middle-aged and elderly.

A year or so ago, after reflecting that I had never seen a case of strangulated inguino-femoral hernia in a young adult, I examined the case records of 100 patients admitted to Barnet General Hospital with strangulated hernia, and 100 similar cases admitted to Edgware General Hospital. The records of the latter group were obtained by the courtesy of the Medical Director, Mr. J. N. Deacon, whose remarkable records department produced the relevant data by return of post. The average age of the Barnet group was 65.8 years, and of the Edgware group 64.4 years. Even more striking is the fact that, although both hospitals serve large areas, only two patients under 40 years of age (excluding infants) were admitted to Barnet with strangulated hernia in six years, and only five such patients to Edgware in three years. No patient under 30 years of age was admitted to either hospital. Some rather obvious assumptions were confirmed by the study, among which may be mentioned the much greater risk of gangrene in a femoral hernia, and the predisposition to strangulation imposed by the wearing of a truss for inguinal hernia.

These figures are mainly of academic interest, but they may help to resolve an individual clinical problem. For example, if an inguinal hernia is first noticed during pregnancy in a young woman, the risk of disturbing the pregnancy by elective operation is probably more than the risk of strangulation during labour. In this connexion it may be of interest that no case of strangulation has complicated pregnancy or labour in the last 7,000 cases admitted to the maternity department of Barnet General Hospital.—I am, etc.,

Barnet, Herts.

V. J. DOWNIE.

Aetiology of Non-specific Urethritis

SIR,—Dr. R. R. Willcox in his article (*Journal*, January 2, p. 13) dealing with the aetiology of non-specific urethritis, sees the cause of this not uncommon disease in a presence of some "virus" which has not been isolated, and remains to be discovered. In my opinion the bacteria, and even some undefined virus, are just the secondary feature, the main basing on changes of tissue. Non-specific urethritis is a common disease even in my country in recent years, and, besides that, I am observing in practice quite a considerable number of polyurias, pollakisurias, nycturias and enureses in children as well as in adults, without any aetiological

grounds. In all these cases we find one constant symptom, and that is the pronounced alkalinity of urine, detectable with litmus paper, and reaching often points from pH 7.5–8. The alkalinity is not always present in all portions of urine, usually the morning urine being acid and the afternoon alkaline.

What may be the cause of this alkalinity, which years ago was not so often pronounced? I think there is a relative alkalinity of food due, first, to shortage of proteins owing to the second world war, and, secondly, to the over-emphasizing of vegetable foodstuffs by official medicine in both our countries, in respect to a vitamin fashion. However, if we consider the alkalinity of urine as the aetiological cause of non-specific urethritis, the illness should disappear when the kidney excretion is acidified. That is really the fact. After giving 1 g. of ammonium chloride daily the disease disappears within a week. Ammonium chloride forms urea in the body, and free chlorine ions remain acidifying urine finally. Aetiological treatment would be, of course, to enlarge the level of proteins in the food.

For illustration here is one case: a 52-year-old Army colonel, who for six years suffered from a purulent discharge from his urethra, bacteriologically non-specific flora, gonococci never present. During these six years he went through all kinds of treatment: antiseptics, antibiotics, sulfadiazole, abstinence from coitus, and kurort treatment with alkaline mineral water. Finally he shifted from cavalry to artillery, without effect either. After taking the above-quoted medicine he was within a week without any discharge, and remains in good state until now—that is, after a year. He takes ammonium chloride occasionally, when he feels itching in the urethra. The puzzle remains why his wife, vegetarian as him, and many other vegetarians remain without any ill symptoms from the urinary tract.

Please excuse, dear Sir, my bad English—it is now over 15 years since I was a short while in your country, and a year in the U.S.A. I am very indebted to the extraordinary high level of your *B.M.J.*, which is the best one from all Western papers dealing with general medicine.—I am, etc.,

Brno, Czechoslovakia.

JIRI STEFL.

Polio-myelitis

SIR,—In your annotation on immunization against polio-myelitis (*Journal*, March 13, p. 635) you speak of polio-myelitis as "a disease with so low an attack rate . . . and one of which the dissemination is so mysterious that we cannot know whether or when any given individual has been exposed to infection." Can you really say that the attack rate is low or the whether and when of infection mysterious when we have repeated examples of exactly the reverse? As many as 4 out of 13 babies infected in a maternity home,¹ 16 out of 120 inhabitants on a housing estate,² 3 cases in the infant class of a school of 22 pupils,³ 4 cases in a children's hospital ward,⁴ 12 cases in a school of 73 pupils,⁵ 6 cases (1 fatal) in a school of 65 boarders,⁶ numerous examples of multiple infection in a family;⁷ etc.

A great problem is often made of the odd sporadic cases although these form only a small minority of the annual notifications; the majority of cases occur in local outbreaks⁸ and so, far from being distributed over the total population of the affected area, are confined to those associated with an infected school, nursery, hospital, family, or other group, in which the individual's chance of developing the disease and/or transmitting the infection may be a hundred or more times that of the rest of the local population. Thus in the epidemic in Rye in 1952⁹ 17 of the 23 cases were either pupils or home contacts of pupils of the Rye Elementary School, and five of the remaining six cases were indirect contacts.

The tragedy is that the mumbo-jumbo of "mysterious dissemination" of the virus—more worthy of the pre-Pasteur days of "spontaneous generation" than of the present day—is preventing our using the only effective weapon we have against the disease; namely, prevention of transmission of the virus by the enforcement of quarantine restrictions. "Prevention," one is tempted to urge, "is better than cure." But in poliomyelitis we have no cure. Wrong treatment can certainly add to the disaster, but we must recognize that the results of even the best treatment are pathetically insignificant compared on the one hand with what we might do by prevention, and on the other with the

"hard core" of disablement and death which persists in spite of all our efforts. The final score of the 23 cases at Rye was three deaths (two deaths were extremely rapid and one occurred before treatment could even be summoned), two very severely paralysed, three severely paralysed, and four moderately paralysed, giving a combined death and disablement rate of 50%. In addition, two families (four young children) lost their mothers. This score is typical and we cannot afford to continue to ignore it.

It is my firm belief, based on careful study of the records of epidemics and the histories of individual patients, that routine isolation of contacts of poliomyelitis cases might very well prevent at least 50% of the cases notified annually in this country.¹¹ In addition, it would rid us of the danger of experiencing the severe epidemics which we have seen occurring in other countries. It is time that we recognized poliomyelitis as a dangerous infectious disease which can disrupt family and national life and that we took the necessary measures to prevent it.

In closing might I refer you back to your own leading article on the same subject.¹² In it you say "we must regard the family as an 'infected unit,' and 'it is clear that people inside the family infect people outside.'" Replace your "family" by "family and/or institution," and you have stated the problem and indicated its solution.—I am, etc.,

Oxford.

MARGARET AGERHOLM.

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- ¹⁰ Silveston, M. I. (1953). *Ibid.*, 90, 245.
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- ¹² *British Medical Journal*, 1953, 2, 1258.

Accurate Equivalents

SIR,—May I make a plea for a greater sense of proportion, and less blind acceptance of arithmetic, both in assessing results of treatment and in conversion of figures from one system of units to another? This was prompted by the recent statement in your *Journal* that "Two pints (1.1 l.) were transfused..." and that out of 34 mothers in a certain group, 27 (79%) gave birth, etc.

Now I question whether the translation of pints into (I presume) litres, while desirable, would not gain in clarity more than it lost in accuracy by rendering as "Two pints (1 litre)"; and has the figure of 79% any significance? In fact 27 out of 34 is as near 80% as it is to 79%, and a result differing by one case (76.5% or 82.5%) would be surely not unlikely? Nor would it affect the author's argument. This is not in any way intended as a criticism of the letters quoted, for they are but representative of a host of authors who have less understanding than they have fear of inaccuracy—I once met a doctor who proposed quoting a figure of 50% in a paper, out of two cases.

Where lies the logic of stating, as is often written, that a baby's birth weight is "7½ lb. (3.4 kg.)"? To call it 3.5 or even 3½ kg. would still be right to the nearest quarter-pound. I am on thinner ice when I criticize equivalents in dosage, but I pick at random: "Galla B.P.C., dose 10 to 20 gr.—0.6 to 1.2 grammes" and "Acidum hydrochloricum dilutum B.P., dose 2 to 5 min.—0.12 to 0.3 ml." What harm (or measurable loss of effect) would come from a dose range for galls of 0.5 to 1.0 gramme, or for hydrocyanic acid of 0.1 to 0.3 ml.? And who ever measured 0.12 ml. anyway?—I am, etc.,

Acle, Norfolk.

J. F. FILBEE.

* The authors of papers are responsible for inserting percentages of the kind criticized by Dr. Filbee; we are responsible for the metric equivalents. These are not intended to guide the practice of the foreign reader but to serve as a close, though not a pedantic, translation for him of British weights and measures.—Ed., *B.M.J.*

Abbreviations

SIR,—I would like to express agreement with Dr. C. H. Morhouse of the U.S.A.F. Hospital, Arrington, Herts (*Journal*, March 20, p. 703). Abbreviations have become a necessity, but are sometimes difficult to interpret—e.g., A.P.T. can mean alum precipitated toxoid, artificial pneumothorax or, to the M.O.H. (medical officer of health or Ministry of Health), administrative, professional, and technical staff. Specialist reports often contain abbreviations with which their colleagues may not be familiar—e.g., O.A., osteoarthritis; A.F.B., acid-fast bacillus; C.S.O.M., chronic suppurative otitis media; and few would guess that O.B.E. may refer to oil, bath, and enema. Again, students from one hospital use P.R. to denote an examination by the rectum, whereas R.E. is used in another.

May I suggest that a list of recognized abbreviations be compiled by the B.M.A. (British Medical Association)—not the less well known Bald Men's Association), the M.O.H. (Ministry of Health), or even by the W.H.O. (World Health Organization).—I am, etc.,

Plymouth.

O. L. L. LANDER.

POINTS FROM LETTERS

Teach Bacteriology in Schools

DR. ARTHUR TURNBULL (Glasgow) writes: Is it not high time that bacteriology should be taught in British schools? A few microscopes in every school, with culture slides of various germs, would enable our boys and girls to see these interesting organisms for themselves, and once seen by them never forgotten. Our youth would become bacteriologically minded, and a great move forwards in the intelligent prevention, early recognition, and national cure of disease would accrue. For seeing is believing to cinema-minded children. In addition, the practical application of television to schoolchildren's education might well include direct teleray study of the different races of micro-organisms, those real enemies of mankind.

Prostatic Obstruction Due to Ephedrine

DR. H. J. WRIGHT (Nuneaton) writes: In the course of the past six years in general practice I have found the ephedrine given to elderly male asthmatics in therapeutic doses caused symptoms of prostatic obstruction in at least four cases. No previous history of dysuria was elicited, but rectal examination in each case showed moderate prostatic enlargement. Within a day or two of withdrawing the ephedrine the difficulty in micturition disappeared; in no case was catheterization or admission to hospital required. I find no reference in a standard textbook of pharmacology to any effect of ephedrine upon bladder function, and should be interested to know with what degree of frequency this phenomenon may have been observed by others.

Presternal Oedema in Mumps

DR. JOHANNA SPINNER (Mitcham, Surrey) writes: Referring to your recent reports on presteral oedema (*Journal*, January 30, p. 258, and February 27, p. 518), the mother of a little girl who was ill with mumps asked me to see her as "the swelling seemed to be on the top part of her chest as well." This child had a marked presteral oedema, which was slightly painful on palpation. I suppose this symptom is often overlooked and not as rare as one would think.

Second Attack of Chicken-pox

DR. J. I. LYONS (Heston, Middlesex) writes: During the present winter I have been called to a number of cases of a second attack of varicella, a substantial proportion occurring in adults. The illness is accompanied with pyrexia of up to 102° F. (38.9° C.) and subsides within 48 hours. Hitherto, one has regarded a recurrence of the condition as being very rare, sufficient to regard as questionable the diagnosis of the first attack. It would be of interest to know whether other practitioners are encountering similar cases, and any explanation of this phenomenon.

Smoking and Lung Cancer

MR. ANTHONY C. PEARSON (Great Baddow, Essex) writes: The quality of cigarette tobacco and cigarette paper in France differs from that in England, and it would be of interest to know if the increased incidence of lung cancer in France compares with that in this country.

Obituary

Sir FRANK COLYER, LL.D., F.R.C.S.

Sir Frank Colyer, who died on March 30 at the age of 87, was not only a dental surgeon of the highest reputation and an authority on human and comparative odontology, but a leading historian on the subject. For something like 50 years he was curator of the odontological museum of the Royal Dental Hospital, formerly housed in Hanover Square, but later at the Royal College of Surgeons in Lincoln's Inn Fields. His discourses on the specimens in this collection were always fascinating, and nothing delighted him more than to demonstrate them to appreciative visitors.

Born in 1866, James Frank Colyer was trained at Charing Cross Hospital and the Royal Dental Hospital, with both of which he remained associated for the rest of his life, in later years in a consultative capacity. He took the L.D.S. diploma of the Royal College of Surgeons in 1887, and after holding various house appointments at the Royal Dental Hospital he was appointed surgeon there and held for five years the office of Dean. In 1893 he was elected dental surgeon to Charing Cross Hospital. Other hospitals to which he gave his services included the Croydon War Hospital and Queen's Hospital, Sidcup. He served the Ministry of Pensions as honorary consulting dental surgeon. Colyer was the author of several authoritative books on his specialty. His textbook *Dental Surgery and Pathology*, which he wrote with Mr. Evelyn Sprawson, ran through eight editions. He also published in 1936 a work entitled *Variations and Diseases of Teeth in Animals*. A well-known historical book of his was on John Hunter's work in odontology. To him, as to all connected with the Royal College of Surgeons, the damage done to the museum by the air raid in 1941 came as a great blow. But, although he was already 75 years of age, he set himself to the task of salvage and repair and also continued his work on a catalogue of old instruments for dental extraction, on which he published a book as recently as 1952.

Among both the dental and the medical professions Sir Frank Colyer was a greatly liked figure. He was made F.R.C.S. in 1916 and F.D.S. in 1947; Bristol University made him Hon. LL.D. in 1933. He was knighted in 1920. He had been secretary and editor for the old Odontological Society of Great Britain, which in 1907 became the Odontological Section of the Royal Society of Medicine, and of that Section he was President in 1919. In 1932 he became the first President of the British Society of Dental Surgeons, and in the same year at the Centenary Meeting of the British Medical Association he was Vice-President of the Section of Comparative Medicine. He was elected an Honorary Member of the British Dental Association and he was a corresponding member of dental societies in Belgium and Italy.

He is survived by a son and a daughter. Lady Colyer died in 1950 after 55 years of marriage.

S. C. GUPTA, M.B., F.R.C.S.Ed.

Professor S. C. Gupta, professor of general surgery in the Medical College of Bengal, died on January 31 after a short illness. He was 50 years of age.

Subodh Chandra Gupta was born of poor parents on June 10, 1903. As a medical student he had a brilliant career at Calcutta University, and in 1927 was placed

first in order of merit among the successful candidates for the degree of M.B. Soon after graduation he entered the Bengal Medical Service and subsequently worked at a number of hospitals in the province. In 1945 he was appointed civil surgeon and came to the United Kingdom on study leave, obtaining the F.R.C.S.Ed. in the following year. After his return to India he was appointed professor of surgery at the Lake Medical College, Calcutta. He also became presidency surgeon and a member of the standing Medical Board of the West Bengal Government. It was only last year that he took up the appointment of professor of general surgery in the Medical College of Bengal, and by his death the University has lost a good teacher and Calcutta one of its finest surgeons.

Professor Gupta was greatly respected by all who knew him. Very generous to the poor, his hospitable nature had a touch of the Victorian age about it. He is survived by a widow, two sons, and three daughters.

E. H. M. MILLIGAN, M.D., D.P.H.

Dr. E. H. M. Milligan, formerly medical officer of health for the borough of Glossop, died on March 21 at the age of 75.

Ernest Henry Marcus Milligan was born at Belfast on October 13, 1878, the son of S. F. Milligan, M.R.I.A. He was educated at the Methodist and Campbell Colleges, Belfast, and pursued his medical studies at the old Queen's College, Belfast, and at Trinity College, Dublin. He obtained the Irish conjoint diplomas in 1906, graduating M.B., B.Ch. from the former Royal University of Ireland in the same year. Four years later he was granted the M.D. by the recently established Queen's University of Belfast; in 1911 he obtained the Dublin D.P.H. Dr. Milligan was resident medical officer at the Northern Ireland Fever Hospital, Purdysburn, Belfast, from 1906 to 1908. Three years after relinquishing that post he became medical officer of health for Long Eaton, in Derbyshire. In 1917 he moved to Bath as school medical officer, and after three years there he became the first whole-time medical officer and school medical officer for Glossop. On retiring from these offices in 1946 he became a medical officer under the Ministry of Health.

The people of Glossop have good reason to remember the name of Dr. Milligan. For 26 years he worked unceasingly to better the living conditions in the town and so to improve the health of the community. In 1920 the occupants of 2,864 houses were obliged to deposit their refuse in ashpits; 20 years later only 30 were without the more sanitary ash-bin; and over the same period he saw to it that 2,512 pail-closets were replaced by water-closets. From the one small child-welfare clinic of 1920 he developed a series of well-equipped and well-staffed clinics; the health of children became his chief concern. He also bent his energies to improving the water supply. At the request of the county medical officer of health he undertook a campaign against tuberculosis, the death rate from the disease in Glossop making the town a black spot in the county. A pioneer of immunization against diphtheria, he brought about a sharp fall in the number of deaths from this disease: in his last annual report (1945) as medical officer he was able to state that no child in Glossop had died from diphtheria in the previous eight years.

Dr. Milligan was more widely known for his work on nutrition, especially during the last war. During 1941-2 he assisted the Ministry of Health in a vitamin-

feeding test carried out in Ipswich, Glossop, and London. Between July, 1940, and July, 1942, with Dr. Lewis Fanning he investigated the rate of growth of children under one year, attributing the reasonably satisfactory result to the provision by the Government of milk and vitamins for expectant mothers and infants. Comparing the heights and weights of schoolchildren in 1934 and 1944, Dr. Milligan found an improvement in the latter year in the average mean weights of boys of 12 to 14 years of age. One of his last investigations was into the haemoglobin levels of pregnant women, and with Dr. H. E. Magee he published a paper on this in the *British Medical Journal* of December 1, 1951.

Dr. Milligan took an active part in B.M.A. affairs, being honorary secretary to the Glossop Division from 1929 to 1939 and president of the Derbyshire Branch from 1938 to 1939. After his retirement he was in 1946 elected as a Labour member to the Glossop Town Council, resigning from it on account of ill-health in 1949. Apart from his contributions to professional journals, he collaborated with his son-in-law in writing plays, a number of which were broadcast by the B.B.C. He leaves a wife and three daughters, to whom the sympathy of his colleagues is extended in their loss.

Dr. J. ARTHUR REES, who was one of the best-known medical practitioners in North Cardiganshire and the last of the older generation there, died at Aberystwyth on January 12 in his 84th year. John Arthur Rees was born on August 1, 1870, the son of a farmer, David Rees, J.P., and was educated at one of the local academies, the University College of Wales, Aberystwyth, and at Edinburgh University, where he graduated M.B., C.M. in 1896. After graduation, he worked as an assistant in London, and then at Pontycymmer, Glamorganshire, where he distinguished himself in the Llest colliery disaster; he bought a practice in his native village of Llanilar in 1900. Although he moved to the nearby town of Aberystwyth in 1916, he had substantially the same practice until he retired in 1952. He had thus practised in his native district for an unbroken period of 52 years, which fact and the changes he had seen in his working life were widely commented upon at the time of his retirement. Dr. Rees was a Welsh country practitioner of the old school, who knew and was known by everybody throughout a wide and scattered area. In all his 52 years of practice his entire holidays amounted to a month, of which one week was spent at a postgraduate school at Cardiff, and for 43 years he did not have a day's illness. His work was his hobby, and the practice of medicine, often in trying conditions, was truly his whole life. He was of the best type of family physician, not without his little eccentricities, and was to be seen for over half a century on either his bicycle or his Welsh cob, then on motor-cycles, and later in a series of cars which bore evidence of the difficulties of reaching his more inaccessible patients. In his younger days Dr. Rees was a great sportsman. He enjoyed walking, shooting, rowing, and swimming, and he had played football for the Aberystwyth college's first eleven and first fifteen, and for the first fifteen at Edinburgh. Up to the age of 70 his normal habit was to plunge into the sea about 8 a.m. daily from Easter to October each year. Increasing blindness made him retire in December, 1952, and he was totally blind for the last year of his life, which affliction emptied life of much of its savour for him. Dr. Rees had held many appointments in the district, including those of medical officer of health, medical officer to the old board of guardians, and medical officer to the Bronglais Hospital for 43 years. Members of the medical profession, officials of local bodies, clergy and ministers, and hundreds of patients attended the funeral service at Llanilar church. He leaves a widow, a daughter, and two sons.

Dr. JAMES T. MCGLOSSON, who died at Edinburgh on January 24, will be remembered as a conscientious and kindly general practitioner in the Canonbie area of Dumfriesshire. Dr. McGlasson was born at Eastriggs, Dumfriesshire, on June 14, 1901. He graduated M.B., Ch.B. at Edinburgh University in 1925, and, after six months at Stockton Infirmary and a year of assistantship at Pontefract, he spent two years as assistant to the late Dr. R. H. Watt, Langholm. He took up practice in Canonbie in 1929, where his warm-hearted humanity endeared him to his many friends and patients. In addition to running an extremely wide and busy practice Dr. McGlasson found time to take an interest in many of the social activities of the district. He was an ardent horticulturist and apiarist, and in these capacities he was chairman for many years of the Canonbie Horticultural and Crafts Society. He was actively associated with the Canonbie Drama Club and with the local branch of the British Red Cross Society. He also took a keen interest in the Langholm Rugby Club, and both of his sons are playing members. Dr. McGlasson was an extremely active member of the Dumfries and Galloway Division of the B.M.A. In the 1949-50 season he was Deputy Representative to the Annual Representative Meeting, and in the following year he was appointed Representative of the Dumfries and Galloway Division in 1952-3, and was secretary to the Border Counties Branch from 1949 until his death. He was also secretary of the Dumfries and Galloway Division of the British Medical Guild. Dr. McGlasson filled all these appointments with enthusiasm and efficiency. These many interests made him an extremely busy man, and yet he always found time for a cheerful word to a friend or patient and was untiring in his efforts on their behalf. The sympathy of us all goes to his widow, sons, and daughters. He will be greatly missed.—T. M. S. C.

Professor KLOTHILDE GOLLWITZER-MEIER, one of the leading medical research workers in Germany, died at Hamburg on March 2 at the age of 59. She was born at Wolnzach, Upper Bavaria, on October 29, 1894, and studied medicine at Munich, where she graduated in 1919. After holding assistant posts at Halle, Greifswald, and Frankfurt, she was senior physician, under Volhard, at the university clinic in Frankfurt. During 1929-32 she was chief physician of the in-patient department of Hildegarde Hospital, Berlin, and then became extra professor of pharmacology and pathological physiology at the Balneological Institute, University of Hamburg. From 1945 until her death she was director of the Institute for Experimental Pharmacology and Balneology at Hamburg. Professor Gollwitzer-Meier published important papers on the control of the circulation, acid-base balance, and mineral metabolism, and for her experimental work on veins she achieved an international reputation. She married Professor Dr. Christian Kroetz, director of the General Hospital, Hamburg-Bergedorf, and he survives her.

Dr. R. N. DEANE, who died suddenly on February 20, at the early age of 56, had been in practice in Croydon for 27 years. He was one of the best-known doctors in the borough, and his loss leaves a gap which it will be hard indeed to fill. Reginald Neville Deane was born on April 11, 1897, and received his medical education at Queen's University, Belfast, where he graduated M.B., B.Ch. in 1919, taking first place in surgery in his final examination. Electing to enter general practice, he was conspicuously successful, building up a large practice, so that at the time of his death he had two partners. In addition he was one of the first who availed himself of the trainee assistant scheme, with the happiest results. But his success was very much more than material. He stood in the direct line of the best general practitioners of the past, and so became dearly loved by his patients, to whom he was always as much a friend as a doctor. He was an extremely busy man, but though, apart from his practice, he found time for various hobbies,

he always had some to spare to give help to any who were in need of it. To his fellow practitioners he was best known for his interest in medical politics. During the war he was an assiduous member of the local medical war committee, where, as in all committees, his immediate grasp of the essential of any problem was of immense service. He was never afraid to take an unpopular line and was a staunch advocate of the National Health Service. He became an original member of the Croydon Executive Council, and was chairman of the Croydon Local Medical Committee at the time of his death, a position he had filled with conspicuous ability since 1949. But apart from these things he will be remembered with affection by his colleagues as a genial and kindly host, always friendly and optimistic and always full of plans and of energy to carry them into effect. He was widely read, an able mathematician, a country-lover, and no mean inventor. We shall not easily see his like again. We can only guess at the gap which will be left in the lives of his widow and stepson, and offer them our sympathy.—J. N. H.

Dr. JOHN CUMMING died at his home at Sutton-on-Hull, East Yorkshire, on March 3 at the age of 81. He had been in practice at Hull for just over fifty years and he had continued to visit his patients until eight months ago, when a painful illness compelled him to give up. John Cumming was born on October 25, 1872, and was educated at Glasgow High School and at Glasgow University, where he graduated M.B., C.M. in 1895. Before settling at Hull early in the present century, he served for a period as a ship surgeon. In 1911 he decided to remain outside panel practice, and throughout his medical life built up and retained an extensive and busy private practice. For many years he was chief surgeon to the Hull city police until he retired from the post in 1938. During the last war, however, he was recalled to serve again in that capacity and even after the war he retained his interest in medico-legal work. He was the medical examiner for superannuation for the Hull education authority, as well as medical referee for assurance companies.

R. R. S. writes: John Cumming was a well-known figure in the medical life of Hull. His sturdy, native independent spirit kept him outside both the panel and the National Health Service. He was the family doctor in the old tradition, and in that tradition he retained the trust and affection of his patients through almost four generations. Because of his many Glasgow associations, he was especially proud of his presidency of the Hull and District Glasgow University Graduates' Association.

Dr. W. F. UMNEY, consulting physician to the old South-Eastern Hospital for Children, died at his home at Beckenham on March 3 at the age of 87. William Francis Umney was born in London on August 17, 1866, and from the Merchant Taylors School entered St. Thomas's Hospital with a scholarship in 1885. He qualified M.R.C.S., L.R.C.P. in 1890, taking the London M.B. in the following year with honours in medicine and obstetric medicine, and proceeding to the M.D. in 1892. He held a number of house posts at St. Thomas's and then became resident clinical assistant at the Bethlem Royal Hospital; while there he obtained the certificate of the Royal Medico-Psychological Association in 1892. An enthusiastic cricketer in his younger days, he was a member of the Merchant Taylors cricket team from 1883 to 1885, being captain in his final year. He also played for St. Thomas's for four years and was captain in his last two years, in one of which, 1889, St. Thomas's won the inter-hospitals cup. The United Hospitals cricket team also called on his services and he frequently captained the side. In 1893 he settled in practice at Sydenham, and almost at once he was appointed physician to the South-Eastern Hospital for Children (now the Children's Hospital) and medical officer to one of the districts of the London County Council. He held these appointments until 1928, when he was obliged to retire through failing eyesight. He was then

made honorary consulting physician to the hospital. For a few years after starting practice he played a good deal of cricket for a local club and was top of the bowling averages in several seasons. When war broke out in 1914 he formed and trained a voluntary aid detachment of Sydenham ladies, which became V.A.D. 142, Kent, and of which he was medical officer for four years.

Mr. CHARLES MONTAGU POWER, who died on March 6 at the age of 64, became secretary of the Westminster Hospital in 1921, and from then on he was closely concerned with the planning of the new hospital, medical school, and nurses' home. The building committee, at which plans for the new buildings were discussed, soon discovered that in Mr. Power they had a secretary possessing not only a wide knowledge of hospital requirements but also one with the tact and ability to sort out the demands for space which were made by the various sections of the hospital. Years later he supervised the arrangements for the opening of, first, the new nurses' home by the late Queen Mary in March, 1938, then the new medical school by the Earl of Athlone in May, 1938, and, finally, the new hospital in April, 1939, when King George VI performed the ceremony. Mr. Power served in the first world war, was mentioned in dispatches, and in 1917 was awarded the Military Cross. In the last war he was inspector of hospitals and convalescent homes in the home counties, and his work for the Emergency Medical Service, the British Red Cross Society, and Lady Churchill's Aid-to-Russia Fund received official recognition in 1945, when he was appointed O.B.E. Earlier, his election to the presidency of the Institute of Hospital Administrators in 1937-8 was an indication of the admiration in which he was held by his colleagues in the same field of activities. He is survived by a widow and two daughters.

Mr. J. E. KILVERT, who died at his home at Derby on March 10 at the age of 78, was in practice there from the beginning of the century. John Ellis Kilvert was born on May 30, 1875, in India, where his father was a district commissioner. He received his medical education at St. Thomas's Hospital, qualifying M.R.C.S., L.R.C.P. in 1898. Among the hospital appointments he held were those of house-surgeon and ophthalmic house-surgeon at St. Thomas's, clinical assistant at the Evelina Hospital for Sick Children, and house-surgeon at the Derbyshire Royal Infirmary, where his abilities were soon appreciated. In 1903 he joined one of the honorary physicians as partner in general practice, thus following a tradition which was not without merit; at that time the visiting staffs of such hospitals were all in general practice. In 1906 he was appointed honorary assistant surgeon, and he continued as one of the visiting surgeons until 1940. In the first world war, when two of the honorary surgeons were abroad on active service, he dealt with an immense amount of work, including the surgical care of wounded soldiers, work which was accepted as part of the honorary duties of the staff. For his wartime services he was appointed O.B.E. in 1920. In his later years he gave much time to the administrative side of the Infirmary, to which his professional life was devoted, and he made many friends in all departments. In general practice throughout the whole of his active years, which continued until a year or two ago, he was renowned for his clinical acumen, and for the trouble he took in caring for his patients. To many of them he showed a generosity which was private and kindly, and a very wide circle remember him with gratitude. For many years he was the local secretary of Epsom College. Mr. Kilvert had few hobbies, but he had read widely and had a considerable knowledge, among other things, of criminal trials. When he started in practice the partnership relied on horse transport, but in 1906 he bought his first motor-car—of seven horse-power, with one cylinder. Mr. Kilvert is survived by his widow, who before their marriage nearly fifty years ago was a sister at the Derbyshire Royal Infirmary.—H. B.

DR. CHARLES VISGER, who was in practice at Clevedon, Somerset, for very many years, died at his daughter's home at Chippenham, Wiltshire, on March 21 after a short illness. Charles Visger was born on February 28, 1875, and qualified M.R.C.S., L.R.C.P. from University College Hospital, London, in 1901. After qualification he held house appointments at University College Hospital, the Beckett Hospital, Barnsley, and the Victoria Hospital for Children, Chelsea. He then joined the late Dr. Theodore Davis in partnership at Clevedon, where he succeeded to a large general practice, in which he continued until a few weeks of his death at the age of 79. During the first world war Dr. Visger played a prominent part in the organization of a military hospital at Clevedon, work for which he was appointed O.B.E. in 1920. In the last war he was actively associated with a local maternity hospital to which expectant mothers from the more thickly populated areas were admitted under the evacuation scheme. He was a trustee of the Stoke Park Colony and the Burden Neurological Institute, and medical officer to the local cottage hospital and certifying factory surgeon for the district. A member of the British Medical Association for nearly 50 years, he was chairman of the Bristol Division in 1926-7. From his early days at Clevedon Dr. Visger identified himself with many local interests, especially cricket, tennis, and golf. He was also a devout churchman and was a sidesman and a member of the council of the parish church of St. Andrew's at Clevedon, to which he was deeply attached. The large congregation at the funeral service at the parish church bore ample testimony to the esteem and affection in which he was held. His wife died in 1914, and he lost his son a year earlier. He is survived by his daughter, to whom the sympathy of his many friends and patients is extended.—G. M.

DR. MYLES PATRICK MORIARTY died at Blackburn, Lancashire, on March 25 at the age of 53. Born at Dublin on November 9, 1900, he was educated at Belvedere College and University College, Dublin, where he graduated M.B., Ch.B. in 1925, after a brilliant career as a student. In 1929 he took the D.P.H. and then came to England and practised first at Leeds and then at Luddenden Foot, Yorkshire, before settling at Blackburn in 1939.

F. C. R. and J. D. C. write: Myles Moriarty was a rare combination of high intelligence and natural charm, together with kindness and consideration. A true Irishman, he had a wit matched by few, and his touch of humour lightened many a heavy heart. He was as popular with his colleagues as he was with his patients. He took a keen interest in professional affairs and was a member of the British Medical Association and the Blackburn Local Medical Committee. He was a great reader and had an encyclopaedic knowledge of many subjects. Above all else, he was a true Christian and an example to all. Although he must have known the import of his symptoms for some time, he was careful to conceal them to avoid giving anxiety to those around him. It was not until he collapsed in harness in August of last year that the seriousness of his condition was realized. In spite of his long illness his spirit never flagged, and he retained his cheerfulness to the end. Myles Moriarty was a good doctor, a good man, and a good friend, and his loss will be felt by all who knew him. Our sympathy goes out to his widow and his seven children.

DR. ELIZABETH CASSON writes: May I be allowed to add a few words of appreciation to your obituary (*Journal*, March 27, p. 764) of Dr. G. H. GRILLS? His enthusiasm for modern treatment led him to visit mental hospitals in Germany and Holland, and he spent a few days at the Dorset House School of Occupational Therapy in its early days at Bristol. No detail of treatment went unnoticed, to the extent of his joining a Margaret Morris Movement class of patients and students going on at the time. On his return to Chester he incorporated three large and airy

occupational therapy rooms in his hospital improvements, which he named "Sandepoort," "Dorset House," etc. He gave many students opportunities for study of occupational therapy at Chester, and his work led to a rapid spread in other hospitals.

DR. R. E. S. GIBSON died suddenly at his home at Cleethorpes, Lincolnshire on February 18, the day after his 58th birthday. Robert Ernest Stewart Gibson was the son of the late Mr. Robert Gibson, of Hamilton, Lanarkshire. During the first world war he served in the Royal Flying Corps. On demobilization he entered Glasgow University as a medical student and graduated M.B., Ch.B. in 1923. He was in practice at Newcastle-upon-Tyne, Kidderminster, Cambridge, Bideford, and Westward Ho, before he finally settled at Cleethorpes early in 1935.

E. A. R. writes: Dr. R. E. S. Gibson will be remembered by many Glasgow graduates as president of the Students' Union in the vintage era of the Birkenhead Rectorial, and by others as one of the originals of the Royal Flying Corps. His was a ripe intelligence, fortified by wide reading and a detached, critical, and humorous survey of life. Although he had been in indifferent health for several years, his opinion was one which exercised a balancing view in local medical politics, and much of the harmony and co-operation of practitioners in the Grimsby and Cleethorpes area was due to his privately expressed views. His widow and son, who is also a graduate of Glasgow University, survive him.

We are indebted to Dr. W. PAGEL for the following appreciation of Dr. DOROTHY STOPFORD PRICE, whose obituary was printed in the *Journal* of March 6 (p. 589): Dr. Dorothy Stopford Price was outstanding as a personality and as a physician. She combined in her charming and dynamic personality vision, zeal, and the quest for a profound scientific foundation for her medical activities. Her vision led her at an early date to the recommendation and introduction, at a great financial and personal sacrifice, of B.C.G.; and her zeal made her organize and see through extensive tuberculin surveys for Ireland. Her quest for a scientific basis drove her on long and strenuous journeys in order to study the pathology of tuberculosis. She spent many hours in the post-mortem room selecting specimens for investigation. These specimens bespoke her rare gift for the detection of the essential behind the phenomena, and proved to be corner stones in our knowledge of, for example, epituberculosis, congenital tuberculosis, and the early histological changes in primary infection of the human lung (probably the earliest changes so far known). Her deep interest in her subject, associated with a rare sense of humour, made her visits to London special occasions. It was particularly inspiring, however, to see her at Dublin as the centre of a circle of distinguished medical men, young and old, highly enthusiastic for the promotion of medical knowledge and enlightenment. She will long be remembered in the organizations which she created, in her literary monuments, and above all in the memory of her grateful compatriots and her friends in all countries of the globe.

DR. SIMEON BURT WOLBACH, emeritus professor of pathology at Harvard University, died at Sudbury, Mass., on March 18, aged 73. He was born at Grand Island, Nebraska, on July 3, 1880, and graduated M.D. at Harvard in 1903. From 1905 he held various teaching posts at Harvard, becoming Shattuck Professor of Pathology in 1922. He retired in 1947. He was noted particularly for his investigation of rickettsial infections. In 1919 he described the causal agent of Rocky Mountain spotted fever, naming it *Dermacentor rickettsi*, and he was first to demonstrate its intranuclear multiplication in tick tissue. In 1920 Wolbach led an expedition to Poland to investigate epidemic typhus. His monograph on *The Etiology and Pathology of Typhus*, written with J. L. Todd and F. W. Palfrey in 1922, has become a standard work on the subject. Among other appointments held by Wolbach was that of pathologist-in-chief at the Peter Bent Brigham Hospital from 1917 to 1947.

In more recent years he was engaged in studies on vitamin deficiencies and on the effects of taking vitamin A in excess. After his retirement from his chair at Harvard he was officially connected in a consultative capacity with the U.S. Atomic Energy Commission and the Armed Forces Institute of Pathology.

Medico-Legal

E.C.T. INJURY CLAIM FAILS

A claim for damages for personal injuries, alleged to have been caused by the application of electric convulsion therapy, against the Horton Road and Coney Hill Hospitals Management Committee and the medical superintendent, Dr. F. C. Logan, made by Charles Davies, an insurance agent and cycle repairer, of Gorsley, Gloucestershire, was dismissed by Mr. Justice Hallett at Gloucester Assizes on February 17. Davies alleged that he had not been warned that the treatment might result in injury, and that the defendants had assaulted him by giving him the treatment without his consent.

Giving evidence, Davies said that in June, 1951, he suffered from insomnia and throat trouble. His doctor, Dr. K. M. Tomlinson, of Newent, sent him to see Dr. Logan at Gloucester Royal Hospital (Royal Infirmary). He saw him on August 24. He told Dr. Logan to what he attributed his throat trouble, and Dr. Logan said he thought he should have five lots of electrical treatment. Dr. Logan did not explain what the electrical treatment was. He (Davies) had no idea what sort of treatment he was going to have, but thought it was some sort of heat treatment. He had never then heard of the shock treatment. Had he been told that the treatment might result in a fracture and dislocation of bones or limbs, he would not have agreed without consulting his wife.

After describing a treatment, Davies said that one evening he saw Dr. Tomlinson, who sent him to see Dr. J. F. Bourdillon, consulting orthopaedic surgeon, Gloucester Royal Hospital. He was put into plaster on September 12. This was removed on November 9. He had been unable to work since the injury and claimed special damages of £541.

Dr. Bourdillon said that Davies had received a crush fracture of the eighth dorsal vertebra. In his opinion the injury occurred during E.C.T. When he saw Davies at a later date he thought he was making complaints which were more excessive than was justified by the nature of the injury.

Dr. Logan, in evidence, said he had been carrying out electric convulsion therapy for nearly 12 years. During that time he had carried out some 14,000 such treatments and had only experienced three cases of vertebral fractures, including this case, and six cases of jaw dislocation. He had advised five treatments of E.C.T. for Davies. He distinctly remembered telling Davies that under the treatment his muscles would go into spasms and produce violent contractions, and that there was a possible risk of fractures or of dislocation of the jaw. "At that time," said Dr. Logan, "I had had no previous cases of back injury, and there had been no case of jaw dislocation for several years." He distinctly remembered telling Davies that there was a risk, but it was a risk worth taking. He remembered saying to him that there was risk in everything, even crossing the road. Davies said he was quite prepared to undergo the treatment. In answer to the judge, Dr. Logan said relaxants had not then been introduced. He now used relaxants, but considered some small degree of muscular contraction was necessary, otherwise the treatment might as well not be given.

Fair Targets

Giving judgment, Mr. Justice Hallett said he was satisfied that Dr. Logan warned Davies of the risks of the treatment and that Davies accepted those risks. He also found that the treatment was administered carefully and efficiently in

the usual and proper way. He did not think Davies was a reliable witness. He thought that any disability he had suffered since November 9, 1951, had been psychological. Davies's claim would be dismissed with costs.

With regard to costs, Mr. R. C. Hutton, representing Davies, stated that Davies was a legally aided person and that his capacity to pay any part of the legal costs was nil. Mr. J. F. Bourke said that counsel for the defendants could do nothing but complain of the circumstances. The Judge said he made no criticism of the legal aid committee, but it was obvious that this was a case of "Heads I win, tails you lose." He supposed that doctors and hospitals must regard themselves as fair targets under the legal aid system.

The Medical Protection Society instructed Messrs. Le Brasseur and Oakley to act for Dr. Logan.

Medical Notes in Parliament

Tuberculosis Precautions in Navy

A personal case of a young seaman who contracted tuberculosis while serving abroad in a frigate, referred to by Mr. Albert Roberts (Lab.) on March 30, led Commander ALLAN NOBLE, Parliamentary Secretary to the Admiralty, to describe the precautions taken generally in the Royal Navy to avoid, detect, and control the disease.

He said that they attached the greatest importance to mass radiography, which was compulsory. It had been used since 1940, and the fact that the incidence had steadily fallen probably meant that they were reaping the results of what they had been doing over the past 15 years. Compulsory radiography was carried out on all new entries. The examination was repeated annually, and it was carried out on all men before they were sent abroad. When men were in the Far East the x-ray examinations were conducted at six-monthly intervals instead of yearly as at home. In the event of there being a tuberculous contact, all those concerned were x-rayed, and there was a routine follow-up within six months. The value of certain immunity measures such as B.C.G. was being investigated. Every opportunity was taken of giving the men lectures about medicine and health, and a point was made of encouraging men with coughs and colds to seek medical advice.

Appointments for Patients

DR. BARNET STROSS (Lab.) asked the Minister of Health on March 30 how many general practitioners saw their patients, using an appointment system; and, in view of the advantage to doctors and patients, whether he would consider circularizing all local executive committees, stating the advantages that would follow in the time that would be saved and the reduction of cross-infection. Mr. IAIN MACLEOD, Minister of Health, replied that the information was not available. It was in his view for doctors themselves, in the light of the particular circumstances of their practices, to decide how far they could use a system which seemed, when successfully organized, to have many advantages.

Disease Carriers

MR. GEORGE THOMAS (Lab.) asked the Minister of Health on April 1 what steps he took when a person was found to be a carrier of disease, and in how many cases he had taken such action during the past 12 months. Mr. IAIN MACLEOD stated that action was a matter for the local authorities, who could require carriers of certain diseases to cease work in any occupation connected with food and drink if there was a risk of spreading infection. There was no central record of the action taken.

Scottish Hospital Staffs

MRS. JEAN MANN (Lab.) asked the Secretary of State for Scotland on March 30 what representations he had received from hospital staffs, or from hospital boards, concerning the status and remuneration of registrars, junior and senior, and

senior hospital medical officers; and what action he proposed to prevent these staffs from leaving hospitals for general practice. Mr. JAMES STUART, Secretary of State for Scotland, said that he had received no recent representations about the status of these grades. He did not propose any action to prevent doctors from leaving hospitals for general practice or vice versa.

Colonial Service

Mr. JAMES JOHNSON (Lab.) asked the Secretary of State for the Colonies what steps he was contemplating regarding interchangeability of superannuation schemes for teachers, doctors, nurses, and similar public servants who took up service in the colonial territories. Mr. OLIVER LYTTLETON, replying on March 30, said that complete interchangeability of superannuation schemes was not possible, since nearly all colonial schemes were non-contributory and transfer values could not therefore be exchanged. Arrangements existed, however, for the preservation of the superannuation rights of Civil Servants, teachers, doctors, nurses, and local government officers who took up service in the colonial territories. Secondment from several of these home services was also possible.

Prescribed Diseases

Mr. O. PEAKE, Minister of Pensions and National Insurance, informed Dr. BARNET STROSS (Lab.) on March 29 that in 1950 about 36,000 men and 6,000 women were awarded benefit for a prescribed disease under the National Insurance (Industrial Injuries) Acts. The corresponding figures for 1951 were about 35,000 and 7,500. Dr. STROSS suggested that the figures seemed strangely small in relation to all scheduled diseases and the whole industrial population. Did it not mean that some cases, such as dermatitis, could not easily be accepted for full pensionable payments? Mr. PEAKE said that the whole question of the prescription of industrial diseases was before the Beney Committee. On the whole it was a matter for congratulation that the claims for industrial diseases were not of a large order.

£6m. for Salary Increases

Mr. IAIN MACLEOD stated in answer to Mr. A. BLENKINSOP (Lab.) on April 1 that nearly £6m. had been provided in the 1954-5 Health Service estimates for higher expenditure on wages and salaries due to advances already awarded or likely to be awarded.

School Dentists.—The Minister of Education informed Squadron Leader A. E. Cooper on March 31 that in December, 1953, there were the equivalent of 945 full-time dentists in the school dental service. The comparable number in 1952 was 850.

Vital Statistics

Scottish Returns

The preliminary return¹ for the year 1953 shows that the birth rate was 17.8 per 1,000 and was 0.4 below the average of the five preceding years. The infant mortality rate was 31 per 1,000 live births; this was the lowest ever recorded in Scotland, being 4 below the rate for 1952. The death rate was 11.5 per 1,000 and was 0.8 below the average of the five preceding years. 598 deaths were due to road transport accidents compared with 483 in 1952. Deaths from all forms of tuberculosis numbered 1,338, and 1,159 from respiratory tuberculosis. These deaths were, respectively, 274 and 250 fewer than in 1952. The number of deaths from the principal epidemic diseases was 386. These included 271 from influenza, 41 from whooping-cough, and 29 from measles. Only 2 deaths were attributed to diphtheria, the smallest number ever registered in Scotland. In 1940 and 1941 the deaths from diphtheria numbered 676 and 517 respectively. 13 deaths were attributed to acute poliomyelitis, an increase of 1 compared with 1952.

The birth rate for the December quarter of 1953 is shown in the *Quarterly Return* to have been 17.1 per 1,000 population; this was 0.1 above the rate for the preceding fourth quarter. The infant mortality rate was 32 per 1,000 registered live births and was the lowest rate recorded for any fourth quarter, being 7 below the rate for the December quarter of 1952. The general death rate, 11.3 per 1,000 population, was also the lowest recorded for any fourth quarter. 171 deaths were due to road transport accidents, an increase of 52 compared with the fourth quarter of 1952.

England and Wales in 1953

In England and Wales in 1953 the death rate from respiratory tuberculosis was 179 per million population as compared with 212 in 1952. The rate for males was 257 and for females 108 as compared with 304 and 128 in 1952. The death rate from cancer of the lung and bronchus was 343 per million population as compared with 323 in 1952. The death rate for males was 607 and for females 99 as compared with 568 and 98 in 1952. The death rate from other forms of cancer was 1,651 per million population in 1953 as compared with 1,711 in 1952. There were 522 maternal deaths, giving a death rate of 0.76 per 1,000 live and still births.

Infectious Diseases

The largest variations in the trends of infectious diseases in England and Wales during the week ending March 20 were increases in the number of notifications of 450 for whooping-cough, from 2,093 to 2,543, 123 for dysentery, from 1,001 to 1,124, and 112 for measles, from 2,325, and decreases of 194 for scarlet fever, from 1,476 to 1,282, and 51 for paratyphoid fever, from 96 to 45.

The number of notifications of paratyphoid fever in Wales declined from 89 to 44. The chief centres of infection were Glamorganshire 37 (Cardiff C.B. 21, the other 16 cases being returned from 8 areas), and Monmouthshire 7 (Newport C.B. 7). Durham with 1 case was the only other area with paratyphoid fever during the week.

19 cases of acute poliomyelitis were notified during the week. These were 2 fewer for paralytic and 1 fewer for non-paralytic than in the preceding week. The largest returns were 3 cases in Yorkshire West Riding and 2 cases in Devonshire, Surrey, Worcestershire, and Glamorganshire. No administrative area had more than one case.

For the third consecutive week the number of notifications of dysentery exceeded 1,000. The largest rise during the week was 67 in Leicester C.B., from 66 to 133. The chief centres of infection were Lancashire 213 (Bolton C.B. 42, Salford C.B. 33, Eccles M.B. 32, Liverpool C.B. 19, Preston C.B. 17, Manchester C.B. 16, Ormskirk U.D. 15), Leicestershire 141 (Leicester C.B. 133), London 125 (Islington 26, Lewisham 20, Shoreditch 14, Hackney 13, the remaining 52 cases were scattered through 18 boroughs), Yorkshire West Riding 111 (Dewsbury C.B. 40, Leeds C.B. 22, Bradford C.B. 17), Middlesex 92 (Southall M.B. 30, Edmonton M.B. 14, Hornsey M.B. 13, Willesden M.B. 11), Essex 86 (West Ham C.B. 28, the other 58 cases were spread over 13 administrative areas), Staffordshire 46 (Cannock U.D. 35), Norfolk 45 (Norwich C.B. 44), Warwickshire 37 (Birmingham C.B. 33), Kent 30 (Tonbridge R.D. 11), Devonshire 29 (Exeter C.B. 26), Gloucestershire 23 (Bristol C.B. 23), Nottinghamshire 23 (Nottingham C.B. 16), and Surrey 20.

The largest returns in Scotland were Glasgow 137, Edinburgh 35, and Lanark County 34.

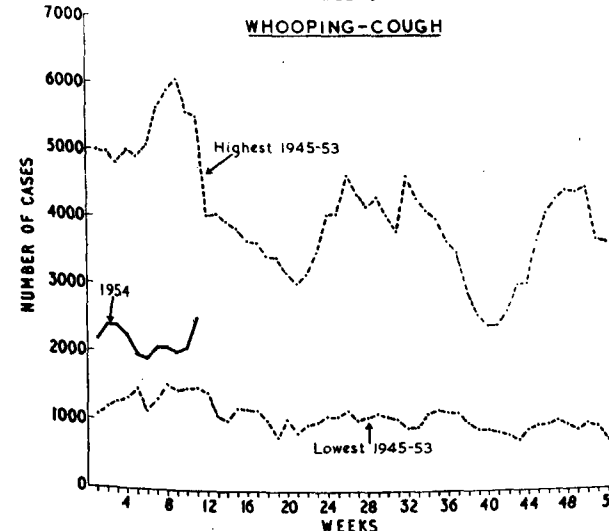
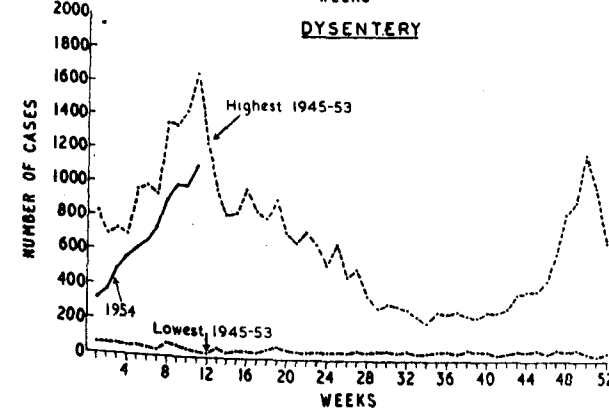
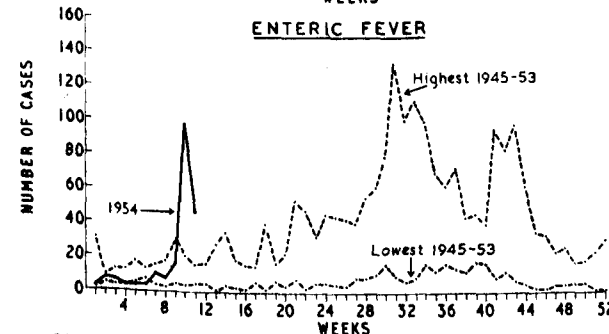
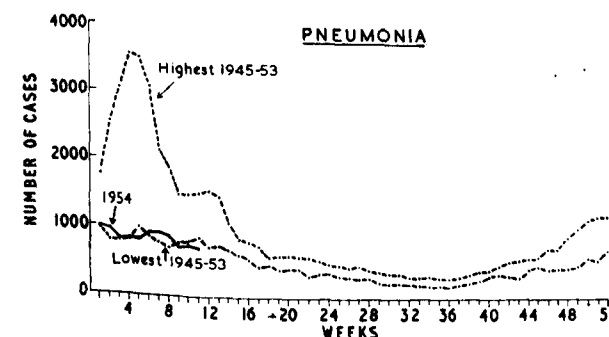
Week Ending March 27

The notifications of infectious diseases in England and Wales during the week included pneumonia 661, scarlet fever 1,492, whooping-cough 2,553, diphtheria 14, measles 2,067, dysentery 1,315, acute poliomyelitis 24, paratyphoid fever 20, and typhoid fever 2.

¹Report of the Department of Health for Scotland for the Year 1953. H.M.S.O., 4s. 6d.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 20 (No. 11) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	18	2	5	0	2	20	3	10	0	1
Dysentery ..	1,124	125	276	11	10	433	41	102	9	1
Encephalitis, acute ..	4	1				6	1	0	0	
Enteric fever: Typhoid ..	2	2	0	0		3	0	1		1
Paratyphoid ..	45		0	0		2	0	0		
Food-poisoning ..	159	18		3		47	11		0	
Infective enteritis or diarrhoea under 2 years ..				13	26				12	15
Measles*	2,325	57	107	49	428	27,226	1439	434	202	200
Meningococcal infection ..	36	3	11	2	1	49	6	15	1	3
Ophthalmia neonatorum ..	41	3	4	0	1	39	2	4	0	
Pneumonia†	704	39	220	1	7	1,044	61	347	10	4
Poliomyelitis, acute: Paralytic ..	13	0		2	0	20	0		2	1
Non-paralytic ..	6	1				6	1			
Puerperal fever‡	262	34	7	2		256	40	8	2	
Scarlet fever ..	1,282	41	144	36	32	1,625	94	178	41	47
Tuberculosis: Respiratory ..	790	97	192	16				188	28	
Non-respiratory ..	120	10	24	4				39	3	
Whooping-cough ..	2,543	104	426	37	43	3,104	202	320	23	88

DEATHS In Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	1	0	1	0	0
Dysentery ..	1	0		0		0	0	0	0	
Encephalitis, acute ..		0	0		0		1			0
Enteric fever ..	0	0	0	0		0	0			
Infective enteritis or diarrhoea under 2 years ..	15	0	1	2	2	13	0	2	1	1
Influenza ..	25	2	3	0	0	133	16	14	0	4
Measles ..		0	0	0	0		1	0	0	1
Meningococcal infection ..		0	2				0	0		
Pneumonia ..	311	40	32	14	7	365	56	25	26	17
Poliomyelitis, acute ..	3	0			0	0				0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	111	18	17	3	5	120	14	15	6	9
Non-respiratory ..			1	1	2		0	2	0	1
Whooping-cough ..	1	0	1	0	0	1	0	0	0	0
Deaths 0-1 year ..	241	24	39	10	18	253	28	20	12	14
Deaths (excluding stillbirths) ..	5,943	771	664	149	158	6,207	879	644	148	204
LIVE BIRTHS ..	7,953	1180	1059	245	362	8,182	1215	913	216	318
STILLBIRTHS ..	201	15	29			220	27	18		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Royal College of Obstetricians and Gynaecologists.—As part of the College's silver jubilee celebrations in July four honorary fellowships will be awarded. Their recipients will be: Lord Simonds, the Lord Chancellor, who as Mr. Gavin Simonds, K.C., gave invaluable help and advice during the foundation of the College; Sir Arthur Sims, who with his family endowed the Sims-Black Travelling Professorship (named after his wife and daughter) to enable a professor to visit the Commonwealth every second year; Dr. Doris Clifton Gordon, of New Zealand, who has rendered distinguished services to obstetrics and gynaecology in her own country, in particular being instrumental in obtaining funds for the endowment of a Chair at Dunedin; and Dr. Joe V. Meigs, clinical professor of gynaecology at Harvard University, and chief gynaecologist at the Massachusetts General Hospital.

Kingsbury Maternity Hospital.—On March 30 Princess Margaret opened a new antenatal clinic and an extension to the nurses' home at the Kingsbury Maternity Hospital, Middlesex, which is one of the Charing Cross Hospital group. The Princess was received by the Lord Lieutenant of the county and Lord Inman, chairman of the board of governors of the Charing Cross Hospital. After a service of dedication conducted by the Bishop of Willesden, Princess Margaret inspected the new buildings. In his speech Lord Inman referred to the new developments as the advance guard of the new Charing Cross Hospital which is to be situated at Northwick Park. The extensions are the first completed major capital project undertaken by the board of governors since the start of the Health Service.

3-D in a Medical Journal.—Not to be outdone by lay periodicals, the current issue of *Anaesthesia* provides its readers with two three-dimensional pictures and a pair of spectacles to view them with. The claim is made that, so far as the editor is aware, this is "the first time that this type of stereogram (Royer-Vala method) has been used in a medical journal." The pictures illustrate an article by Professor E. A. Pask on intravenous injection and the risk of injury to the median nerve. Seen through the glasses, the details of the pictures stand out sharply enough, but one is left wondering whether the slight gain in clarity is really worth the extra cost and trouble.

Middle East Medical Assembly.—The British Council has arranged for Sir Lionel Whitby (Regius Professor of Physics at Cambridge), Professor John McMichael, and Dr. P. M. F. Bishop (both of the Postgraduate Medical School of London) to lecture at the Fourth Middle East Medical Assembly at Beirut, Lebanon, from April 9 to 11. Sir Lionel Whitby will afterwards visit Turkey. Professor McMichael has recently been lecturing in Syria.

Central Midwives Board.—At the meeting of the Board on April 1, Mr. Arnold Walker was re-elected chairman and Professor A. A. Moncrieff vice-chairman for the ensuing year.

Sir Charles Dodds, F.R.S., Courtauld Professor of Biochemistry at the Middlesex Hospital Medical School, London, is to receive from Cambridge University the honorary degree of D.Sc.

COMING EVENTS

Edinburgh Course in Paediatrics.—A one-day course for general practitioners will be held on April 24 at the Royal Hospital for Sick Children, Edinburgh. Further information may be obtained from the Edinburgh Postgraduate Board for Medicine, Surgeons' Hall, Edinburgh, 8.

French Medical Week.—"Les Journées Médicales de France," organized by the Société Médicale des Praticiens, will be held in Paris from April 21 to 25 under the chairmanship of Professor Camille Lian. The "Journées" are open to doctors and medical students of all countries. Further information may be obtained from the Secrétariat des Journées Médicales de France et de l'Union Française, 12, rue Pierre Geoffroy, Colombes (Seine).

The Nutrition Society.—The Scottish group of the society will hold a symposium on "Nutrition and the Liver" in the Lecture Theatre, Departments of Biochemistry and Physiology, University of Glasgow, on May 8. Inquiries should be addressed to Dr. H. N. Munro, Biochemistry Department, The University, Glasgow, W.2.

First European Congress on Clinical Chemistry.—The congress will be held in Amsterdam from September 23 to 28. The main subjects for discussion will be "Isotopes in the Clinico-chemical Laboratory" and "The Physical Methods of Measurement in Connexion with Clinico-chemical Problems." Those wishing to attend should communicate with the secretary general, Ir O. Meulemans, Racineaan 17, Utrecht, Netherlands.

NEW ISSUES

British Journal of Ophthalmology.—The next issue (Vol. 38, No. 4) is now available. The contents include:

ARGEMONE OIL, SANGUINARINE, AND EPIDEMIC-DROPSY GLAUCOMA. *Sohrab A. E. Hakim.*
LATENT NYSTAGMUS AND ALTERNATING HYPERPHORIA. *J. Ringland Anderson.*
THE CORNEO-SCLERAL SUTURE: A TECHNICAL MODIFICATION. *H. B. Stallard.*
THE CORNEO-SCLERAL TRACK SUTURE: A NEW TECHNIQUE. *Mahmud Ali Shah.*

THE DARK-ROOM TEST. *A. C. Higgin.*
RETINAL IRRADIATION AND ANISEKONIA. *R. A. Weale.*

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.

Abstracts of World Medicine.—The April issue (Vol. 15, No. 4), which is now available, contains abstracts of important papers drawn from medical and other scientific journals published in some 20 different countries and in all five continents. The subjects covered range over the whole field of clinical medicine and include pathology, bacteriology, pharmacology, and chemotherapy; there are also sections dealing with medical genetics, public health, industrial medicine, forensic medicine and toxicology, anaesthetics, radiology, and the history of medicine.

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.; a specimen will be sent free on request.

These journals are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged on a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, April 12

MEDICAL SOCIETY OF LONDON.—8.30 p.m., meeting of Fellows. Discussion to be introduced by Air Commodore T. C. MacDonald and Dr. I. J. Corbett: Medical Aspects of Air and Sea Travel.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. H. Osmond-Clarke: Fractures of the Upper End of the Femur; 6.30 p.m., Mr. R. C. Brock: Some Aspects of Surgery of the Heart.

Tuesday, April 13

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. Charles Donald: Surgery of the Neck in Infancy and Childhood; 6.30 p.m., Mr. N. R. Barrett: Empyema.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., neurological demonstration by Dr. B. G. Parsons-Smith.

Wednesday, April 14

HARVEIAN SOCIETY OF LONDON.—8.15 p.m., discussion to be introduced by Dr. George Warren and Dr. Michael Ward: Health at High Altitudes.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Aintree Hospital, Liverpool, 5.30 p.m., Mr. Dillwyn M. E. Thomas: Treatment of Tuberculous Mediastinal Lymph Glands and their Complications.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Sir Reginald Watson-Jones: Injuries of Joints; 6.30 p.m., Mr. J. Cosbie Ross: Renal Tuberculosis.

ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Neurology (2).

SOUTHERN GENERAL HOSPITAL.—At Recreation Hall, General Hospital, Rochford, 8 p.m., First Sydney Body Lecture by Sir Francis Walshe, F.R.S.: The Changing and the Unchanging Face of Medicine.

APPOINTMENTS

GUNN, WILLIAM, M.B., Ch.B., D.I.H., Chief Medical Officer, North Thames Gas Board.
HART, DAVID MCKAY, M.B., Ch.B., F.R.F.P.S., F.R.C.O.G., Consultant Obstetrician and Gynaecologist, Stobhill Hospital, Glasgow.
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BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bihari.—On March 27, 1954, at University College Hospital, London, W.C., to Mac (formerly McMullan), wife of Julian Bihari, F.R.C.S., a brother for Katherine Anne—David Julian.
Cantor.—On March 27, 1954, at the Kent and Canterbury Hospital, to Kathleen, wife of Dr. Jack Cantor, D.Obst.R.C.O.G., of Kent Lodge, Faversham, Kent, a brother for Timothy.
Evans.—On March 19, 1954, at the Norfolk and Norwich Hospital, to Evelyn (formerly Smith), wife of Dr. Trevor Evans, a son—Andrew Leighton.
Gresham.—On March 28, 1954, at Mill Road Hospital, Cambridge, to Gweneth Margery (formerly Leigh), M.B., B.S., wife of Geoffrey Austin Gresham, M.B., B.Ch., a daughter—Diana.
Shrimman.—On March 28, 1954, at the Royal Buckinghamshire Hospital, Aylesbury, to Hazel (formerly Isaacs), wife of Irving Shrimman, M.B., B.Ch., D.P.M., of the Old Vicarage, Stone, Aylesbury, Bucks, a son.
White.—On March 20, 1954, at the Birmingham Maternity Hospital, to Frances Mary (formerly Cottam), M.B., Ch.B., wife of Dr. H. M. White, a son.

DEATHS

Cole.—On March 18, 1954, at 110, Cooden Drive, Bexhill-on-Sea, Sussex, Sydney John Cole, D.M., aged 83.
Colles.—On March 21, 1954, at The Limes Nursing Home, Jacob Post, Burgess Hill, Sussex, George Denbigh Collen, M.D., aged 86.
Freedlander.—On March 19, 1954, at Manchester Royal Infirmary, Isaac Harry Freedlander, M.B., Ch.B., of 618, Oldham Road, Failsworth, Manchester.
Gurney.—On March 18, 1954, at The White House, Grainger Park Road, Newcastle-upon-Tyne, Helen Mary Gurney, M.D., aged 79.
Halley.—On March 23, 1954, at Forester Hill, Aberdeen, Thomas Curr Halley, M.B., Ch.B., late of Bath, Somerset, aged 67.
Jacques.—On March 18, 1954, in a nursing home, Carlisle, Cumberland, Frederick Viel Jacques, V.R.D., M.B., Ch.B., D.P.H., D.T.M.&H., F.R.C.S., D.P.H.
Jones.—On March 23, 1954, at Aberdeen, Glam, Martin Llewellyn Jones, M.B., Ch.B., D.P.H.
Melville.—On March 25, 1954, Charles Melville, M.B., Ch.B., D.P.H., late of Grangemouth, Stirlingshire.
Milligan.—On March 21, 1954, in hospital, Ernest Henry Marcus Milligan, M.D., D.P.H., of Daisy Bank, Hadfield Road, Hadfield, Derbyshire, formerly of Glossop, Derbyshire.
Schwarzwald.—On March 18, 1954, Raimund Theodor Schwarzwald, M.D., of London, W.
Visger.—On March 21, 1954, at "The Paddocks," Chippenham, Wilts, Charles Visger, O.B.E., M.R.C.S., L.R.C.P., of Clevedon, Somerset, aged 79.
Walker.—On March 23, 1954, at the Old Manse, Tyndrum, Perthshire, Robert Alexander Walker, M.B., F.R.C.S., late of Peterborough, aged 79.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Drugs in Breast Milk

Q.—What drugs in common usage are excreted in the breast milk in amounts likely to have a harmful effect on the infant? In particular, I am interested in antihistamine drugs, sulphonamides, antibiotics, barbiturates, aspirin, and purgatives.

A.—Definite clinical evidence exists that breast-fed infants may suffer ill-effects if the mother is receiving bromide and iodide, ergot alkaloids, or thiouracil compounds. Excessive maternal consumption of alcohol or nicotine (cigarette smoking) has also been followed by symptoms in the suckling. Active constituents of purgatives of the anthracene group (cascara, senna, etc.) may be excreted in sufficient quantity to affect the baby, and it is wise to avoid their use in the nursing mother. Liquid paraffin is a suitable preparation to use. There is some evidence that sufficient amounts of the barbiturates and phenytoin may be excreted in breast milk to cause drowsiness in the baby. Caffeine, hyoscine, morphine, codeine, and atropine are either not excreted at all or only in insignificant quantities.

Other drugs which are excreted in breast milk, but in insufficient concentration to have a deleterious effect on the infant, include sulphonamides, antihistamines, salicylates, penicillin, streptomycin, chloramphenicol, terramycin (oxy-tetracycline), and aureomycin.

Ammoniacal Dermatitis in Infants

Q.—In view of the possible dangers of mercury absorption, particularly pink disease, is it unwise to continue prescribing conspersus hydrarg. subchlor. co. for ammoniacal dermatitis in infants? If so, what alternative treatment is recommended?

A.—The use of local applications containing mercury is contraindicated. Likewise rinsing of previously washed napkins in a saturated (or weaker) solution of boracic acid crystals is undesirable. Effective local treatment consists in the use of destructible napkins; bathing the affected parts in warm normal saline after each toileting; and applying pure lanoline if there is severe excoriation, the lanoline being replaced by dusting with a high-grade infant powder as the condition improves. If, as is frequently the case, the stools are abnormal in character, necessary feeding adjustments should be made.

Lipuria and Chyluria

Q.—A woman of 22 has visible lipuria. Diabetes, pregnancy, fracture, and phosphorus poisoning have been excluded as the cause. How should she be investigated now, and what possibilities must be considered?

A.—It is essential to determine whether the urine contains fat globules only (lipuria) or fat globules together with protein, fibrinogen, and a few red cells. In lipuria the fat globules can be recognized with a microscope, using the low power objective and ordinary lighting; in chyluria the fat globules are much smaller, but they can be seen with a high power objective, if dark ground illumination is used.¹

The only other condition, besides those mentioned, which may cause lipuria is said to be a severe chronic nephritis, which can easily be excluded. It is therefore unlikely that the patient has lipuria. Chyluria is due to blocking of a main branch of the receptaculum chyli. If the patient has been abroad the lymphatics may have been blocked by filarial parasites. A more likely cause in this country is

obstruction of the duct due to the after-effects of a tuberculous peritonitis, or pressure of a gland which is infiltrated with tuberculosis, lymphadenoma, or malignant disease. If the abdomen is opened for any cause the appearance is striking, as the lacteals are greatly distended and glistening white. The condition can be improved if the patient will tolerate a low fat diet.

REFERENCE

¹ Harrison, G. A. (1947). *Chemical Methods in Clinical Medicine*, 3rd ed. Churchill, London.

Immunity after Tetanus Toxoid

Q.—How soon after inoculation with tetanus toxoid does reasonable protection develop?

A.—It is usually accepted that protection is significant ten days after the second of two injections of 1 ml. of tetanus toxoid at an interval of 6 weeks. A third dose should be given 9 to 12 months later to complete the primary course.

Tetanus Toxoid and Combined Prophylactics

Q.—If three doses of tetanus toxoid are given at appropriate intervals in childhood, will a useful amount of active immunity against tetanus persist into adult life? If so, can a combined vaccine against diphtheria, whooping-cough, and tetanus be recommended?

A.—In the Services the usual primary course of three well-spaced injections of tetanus toxoid gives a useful degree of active immunity, but it is reinforced in peacetime by boosting doses at intervals of five years. It is unlikely that a more durable immunity will develop in young children than in adults. As there is no maternally transferred passive immunity to tetanus in young babies, the first dose (0.5 ml.) of tetanus toxoid may be given in the early weeks of life without risk of any interference with the responses of the antibody-producing mechanism. After the full primary course in the first year we do not yet know how many five-yearly boosting doses may be necessary, but it seems likely that after two or three such doses further boosting need be very infrequent.

A combined prophylactic against diphtheria, tetanus, and whooping-cough is strongly recommended for primary immunization at the age of 3 to 4 months at the earliest. Three doses are given at intervals of four to six weeks for the primary course, followed by one reinforcing dose at the age of 12 to 15 months. Above the age of 5 years the pertussis constituent is no longer required, but further boosting is essential with either a combined diphtheria and tetanus preparation or the single prophylactics.

Episcope, Diascope, and Epidiascope

Q.—What is the difference between an episcope, a diascope, and an epidiascope? How do they work, and for what type of material is each best suited?

A.—An episcope is an apparatus for projecting images of opaque objects, such as illustrations, graphs, and diagrams, by reflection. A diascope projects transparent images and is made to use with either standard British lantern slides (3½ in. square—8.2 cm. square) or miniature slides (2 in. square—5.1 cm. square) and 35-mm. film strips.

To-day episcope are rarely constructed as a separate instrument, but are more usually combined with the diascope to make the composite instrument known as the epidiascope, which can be rapidly adapted to work with either an opaque image or a transparency.

In the case of a diascope or lantern-slide projector the light is concentrated on the transparency by means of a condenser lens, and a brilliant image is obtained. However, this cannot be done with an episcope, and the image of an opaque object is never very bright. Thus to obtain good quality results all illustrations should be photographed and transparencies prepared. Episcopic projection should be reserved for colour pictures which cannot readily be photographed and for other material required urgently.

Oestrogens in Mumps

Q.—The treatment of mumps orchitis by oestrogens seems to work in my very small experience of this condition. Can you tell me if androgens or oestrogens are of any use for mumps oophoritis?

A.—I am not aware of any reports on the treatment of mumps oophoritis with oestrogens or androgens. The incidence of the complication is extremely small as compared with orchitis, and such few cases as I have encountered resolved naturally so rapidly that it would be difficult to evaluate attempts at treatment or prophylaxis by these preparations. Incidentally, more recent reports on the use of diethylstilboestrol for the prevention of mumps orchitis have been discouraging, but a somewhat cautious acceptance of its use in treatment is allowed, with which I agree.

NOTES AND COMMENTS

Craving for Salt.—Dr. M. N. Ghosh (London, N.W.5) writes: In view of the recent revival of the fairly old concept that the dietary sodium might be a primary cause of arterial hypertension, I wonder whether one is justified in summarily dismissing the topic by concluding that craving for salt is a harmless oddity ("Any Questions?" February 27, p. 532). During recent years salt restriction (sodium ion) in diets has become too well-known a regime in management of cases of oedema and hypertension, and probably the question was put forward by the inquirer with this background in mind. If a salt restriction in diet produces a fall in raised blood pressure, it is quite logical to think of its corollary that hypertension might well be produced by an excessive intake of salt (sodium ion). It is true that one should not be led only by logic, and definite experimental evidence must be put forward either to support or to reject the theory. A glimpse into the available literature throws some light on this direction. By chronically feeding with diets rich in sodium chloride, a group of workers¹ has been able to produce a sustained arterial hypertension in albino rats. Moreover, a positive linear correlation was found between systolic blood pressure and concentration of sodium chloride in diets. They have also been able to produce a syndrome of oedema and renal failure associated with significant histological changes in kidneys and other organs in a certain percentage of their rats. These observations, although they do not bear any direct relationship to human hypertension, definitely point towards some possibilities that can be proved or disproved only by long-term experiments on humans.

OUR EXPERT writes: It is not logical to assume that because a low sodium diet lowers the blood pressure a high sodium diet will cause essential hypertension. It is known, of course, that a high sodium diet, particularly in conjunction with deoxycorticosterone, increases the blood volume and that this tends to raise the blood pressure a little if there is no compensatory vasodilatation. It is also known that the blood volume in essential hypertension is normal. I do not know of any careful research work proving that a high sodium intake over the years does not in fact produce essential hypertension, but the possibility is purely speculative, and has nothing to support it.

REFERENCES

- ¹ Allen, F. M., and Sherrill, J. W. (1922). *J. Metab. Res.*, 2, 429.
² Menckly, G. R., et al. (1953). *J. exp. Med.*, 98, 71.

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PSYCHIATRY AND GENERAL MEDICINE*

BY

Sir DAVID HENDERSON, M.D., F.R.C.P.

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I regard it as a great honour to have been invited to deliver a lecture in the Birmingham Medical School, where so much is being done to effect a liaison between psychiatry and general medicine. This closer integration is greatly to be desired because of the further contribution which may be made to the science and art of medicine. We have worked far too long in considerable isolation, and in consequence we have been too localized, too one-sided, too much in the nature of special pleaders, when a more comprehensive outlook would have led to greater benefit both to our patients and to ourselves. The gap which exists between psychiatry and general medicine (which is inclusive of surgery, obstetrics, gynaecology, etc.) is still far too wide; it requires to be rebridged, and it is my purpose here to consider how that may be effected. The task is a formidable one, because prejudices and faults which are difficult to overcome have been developed on both sides. However, I shall try to examine the position as dispassionately and fairly as possible.

Aim of the Medical Profession

Our profession is vitally concerned not only with the treatment of persons who are ill and in need of help but also with the even greater responsibility of understanding the fundamental facts of human nature and of biology, which concerns itself equally with the health of the individual and the welfare of society. That wider concept of our aim is in process of being more generally recognized, so that it is customary in some universities to inform medical students at the very beginning of their career that medicine is not purely an objective mechanistic science but rather a sphere of work which embraces all the interactions of mind and body. Such a changed outlook constitutes a distinct advance, and prepares the mind of the student to think much more comprehensively of what is ahead of him. It indicates that we have departed a long way from the conception of illness as an organic disease, and it suggests that the multiple causative factors which may exist should be investigated at both a psychological and a physiological level. The result should lead to greater clinical acumen, more accuracy in prognosis and diagnosis, and more successful treatment. The fact that attention is being centred on the whole man will inspire greater confidence both in patient and in doctor, and healing will become more easily managed owing to the neutralization of fear, anxiety, and apprehension, which are so often at the root of all illness.

*A lecture given in the Faculty of Medicine of the University of Birmingham on January 8, 1954.

All who successfully practise the healing art recognize the above principle. The particular agent employed might have been a priest of experience at one or other of the Aesculapian temples; Mesmer or one of his disciples; a royal or other distinguished person who used the prerogative of "touch"; the Christian Science Church; or Lourdes; or Gheel; or any other person or place which inspired confidence. That that is not an antiquated theory is amply confirmed by a book recently published, *Stress and Disease*, by H. G. Wolff, whose work on psychosomatic disorders is so well known. A review of that book (*Lancet*, 1953, 2, 763) points out that "man's reaction to man may be at least as important as his reaction to a microbe." It is therefore not so surprising as it might seem that Wolff, as a result of his interesting and intensive study of 739 subjects, concluded that the main therapeutic aim to effect recovery was to produce tranquillity and freedom from sustained hostility and resentment. It was only then that satisfactory cures could be attained—surely a powerful argument in favour of the psychosomatic approach.

Attitude Towards Mental Illness

In earlier times, to which reference has already been made, it is probable that the main differentiation of illness was effected in terms of death, recovery, or apparent incurability. And it is a fair guess to suggest that the vast majority of psychotic and nervous patients belonged to the incurable class. No doubt it was their recalcitrancy, their inability to respond—either to kindness or to a beating—which led eventually to their exclusion from society. They were not understood; they were stigmatized as wicked and perverse rather than as suffering from an illness which, under proper conditions, might respond to treatment. I regret to say that I believe we may have helped to manufacture many of them by the harsh and arbitrary methods of treatment which were in vogue; padded rooms, excessive sedation, the too hasty employment of powerful physical remedies. In passing it is of some interest to comment on the fact that such conditions as multiple personalities and florid conversion hysterical states, often the results of ill-advised examinations, rarely occur to-day.

It seems to me that it is justifiable to state that our practice in relation to mental illness then was very similar to our attitude towards the delinquent classes to-day. Constructive rehabilitation measures—legal, medical, and social—for those who for one reason or another fail to make a satisfactory social adjustment because of mental illness or delinquency, are still sadly lacking.

Great advances have undoubtedly taken place; our therapeutic equipment is much more efficient and varied, but in the face of failure we are much too slow and unwilling to admit our incompetence and lack of knowledge. We behave much as our forebears did; we over-rationalize, we project our disappointments on the lack of co-operation of our patient, or question the genuineness of his complaints, or call him a wicked, immature person with a decided negative transference. This, of course, is the identical attitude adopted by those who criticize art, or poetry, or music, or anything else they neither understand nor like.

A Dangerous Trend

In the development of our special medical skills we have watched the progress of general medicine by way of biochemistry, biophysics, physiology, and therapeutics, while psychiatry has gained its particular stimulus through the study of biology, personality structure, psychogenesis, and psychotherapy. Such a parallel but divided course has constituted a dual misfortune, because general medicine became too organically minded, too mechanistic, almost too pathological, while psychiatry lost its objectivity and became dominated by the subjective, emotional, and hypothetical. The somewhat absurd stage has now been reached where, so far as the latter is concerned, a basic medical training is no longer regarded as a necessary prerequisite for the work of the clinical psychiatrist. Truly that is a most serious and disastrous state of affairs. It cuts across all medical tradition and practice. We must not be content with the thought that lay therapists are not accorded official recognition; that is not enough, because, irrespective of the lack of official recognition, certain institutes and clinics have drawn up comprehensive programmes of instruction (of which personal analysis is usually an integral part) to which many lay persons are attracted.

I regard such a development as dangerous and reprehensible; it tends to undermine the whole structure of medical education; it requires the critical attention of every faculty of medicine and of the General Medical Council. How has all this come about? Largely, I believe, because orthodox medicine has so often failed to give due consideration to the psychological factor which is so much part and parcel of all illness. There is truth, indeed, in the statement that the *malades imaginaires* are the reward of the quack and the despair of the honest physician. In consequence the advocates of the policy of training lay psychotherapists justify themselves by pointing to the large number of nervous invalids in need of help, and the scarcity of trained personnel to deal with them. For my part, I do not accept that statement as a valid argument. The management of the greater number of psychoneurotic states is not an essentially specialist problem, but one which should be brought within the scope of a well-trained general practitioner.

Some, at least, of the mistakes and difficulties I have mentioned would be avoided if we were more historically minded, and had more ability to correlate our clinical observations. It is so disappointing to find that so many of our colleagues seem to believe that psychiatry began to function only from the Freudian era, while others, even more modern, base their practice on the wonders of present-day physical therapy. This is evidenced by those candidates for senior appointments who, in support of their claims, proudly state that they have had a personal analysis, have introduced electric convulsion therapy into their out-patient departments or consulting-rooms, regard insulin coma as a specific for "early" schizophrenia, or have performed a transorbital leucotomy. It would be infinitely more encouraging if they expressed an interest in the broader aspects of psychiatry, in its history and its literature. It is more through good clinical observation and individual work with patients that we are likely to be successful in our search for so much which is still unknown. I do not want to flog that

issue too much, but, in order to keep a reasonable perspective before us, allow me to give you a glimpse of the thought and work of 100 years ago.

A View Held 100 Years Ago

In 1854 Forbes Winslow's first Lettsomian Lecture was entitled "The Psychological Vocation of the Physician," and what he said then is so apropos of my thought to-day that I venture to give a brief quotation. He wrote:

"I have undertaken in my first lecture to illustrate the special psychological attributes of the physician—to claim for the cultivators of medical science higher and more exalted functions than those usually assigned to them—to consider the physician in his spiritual character, as having at his command, and under his control, a *medicina mentis* as well as a *medicina corporis*—agents of great power and magnitude which have not been sufficiently recognized or appreciated. It will be my object to establish the close connexion between the Science of Mind and the Science and Practice of Medicine, and to illustrate the true philosophic character of the professors of the healing art.

"The physician is daily called upon, in the exercise of his profession, to witness the painful effect of mental emotion upon the material fabric. He recognizes the fact although he may be unable to explain its rationale. He perceives that moral causes induce disease, destroy life, retard recovery, and often interfere with the successful operation of the most potent remedial means exhibited for the alleviation and cure of bodily disease and suffering. Although such influences are admitted to play a part, either for good or evil, I do not conceive that, as physicians, we have sufficient appreciation of their great importance. . . . Many a disease is the *contre-coup*, so to speak, of a strong moral emotion; the mischief may not be apparent at the time, but its germ will be nevertheless inevitably laid."

That short extract indicates that many of the great physicians and psychiatrists of the past had an admirable knowledge of psychosomatic disorders, and it is surprising that the significance of the principles which they laid down is only now being fully recognized. Forbes Winslow and others like him, and some far greater than he, were broad-minded philosophical clinicians imbued with a wide outlook who, although they worked under great difficulties and against much prejudice, helped and cured their patients because of their interest and understanding of them, and because of the love of the work they were doing. To-day we are in a much stronger position than our forebears. Our technical resources have been greatly increased. We can readily enlist the help of chemists and physicists, psychologists, physiologists, brain surgeons, neurologists, all of whom can contribute their particular quota. But in our search for the new let us hold on to the experience, the wisdom, and the humanitarianism of the past.

Important Landmarks

We may now consider in more detail the biological concept which I have mentioned, and refer briefly to some of the more important landmarks which have contributed so much to an intensification of psychiatric thought and practice.

The descriptive and, may I add, the philosophical period of Kraepelin, Maudsley, Clouston, and their contemporaries was an era of brilliant achievement which has proved to be the foundation of many of the great advances which have occurred since. That is a categorical statement, no doubt, but yet I believe it will be substantiated by any fair-minded person who cares to examine the position for himself. It was the foundations and classifications of those men which inspired Adolf Meyer, in the first decade of this century, to describe his conception of psycho-biological principles, with particular emphasis on reaction types, and the study of the individual in his social setting. It is no exaggeration to say that his views and his teaching transformed the standard of psychiatric work not only in the United States but throughout most of the civilized world. His impact here in Britain was enormous. He was one of the great psychiatrists (clinical and neuro-pathological) whose penetrating, investigative mind made it imperative for him, in sizing up every case, to be in possession of all the facts derived from

whatsoever source, personal or environmental—a lesson and a discipline which it is essential for us to remember to-day.

During the same period Freud started from a much more specialized angle than Meyer, but it was not long before the ingenious technique of psycho-analysis for the treatment of certain psychoneurotic states broadened out into a system of philosophy and psychology which has received universal recognition. Whether Freud has done more for the advancement of an understanding of human nature than any other man since Aristotle might raise considerable argument, but he certainly infused an interest and a stimulus into psychiatry and philosophy which still persists. Our dreams, our words, our acts mean something, and even the weird and bizarre symptomatology of nervous and mental disorders which baffled our understanding for so long can be interpreted and understood. Freud brought us nearer the core of things.

Again, from a totally different and even wider angle, Clifford Beers, the young Yale undergraduate, promulgated the doctrine of mental hygiene as an educative force towards better, and healthier, and more understanding living. The small Connecticut Society for Mental Hygiene, which he founded in 1908, has grown into a mighty World Federation movement.

Each approach which I have mentioned has taken us a stage or two further. The work done has been complementary, and has been directed to the particular purpose of coming to a fuller understanding of nervous and mental illness so that it may be prevented and remedied.

Problem of the Nervous Invalid

We need help from all quarters in dealing with the tremendous problem presented by the nervous invalid—a problem which, whether in peace or whether in war, creates serious and numerous casualties, and one which, without wishing to be sensational, may be said to be eating into the life-blood and efficiency of every nation. At no time has it been more necessary to direct attention to the imperative need for a better appraisal of the interactions of mind on body, and body on mind—a study which can be successfully accomplished only by the friendly co-operation of psychiatry and general medicine.

A study of the epidemiology of psychoneurotic and psychosomatic disorders leaves us in no doubt of the upward trend which is occurring. Our out-patient departments are inundated with new cases, our in-patient accommodation is inadequate, and, furthermore, we have neither the quality nor the quantity of skilled medical personnel to deal adequately with those often so desperately in need of help. It may be that this present position merely reflects the disturbed social and economic conditions under which we are living, but it is more probable that the real cause lies a good deal deeper and is centred, to a certain extent, in the increase of the selfish, individualistic, irresponsible types in whom a sense of loyalty to family, friends, or organization is so greatly lacking. Wherever the fault lies it needs tackling, and one of the ways in which this may be done is to see to it that the doctors of the future are trained to investigate the psychological and social factors which may operate in any form of illness. It is partly a problem of medical education which will be referred to later.

But before I pass to another topic may I be allowed to comment on a group of psychosomatic disturbances which have always been of great interest to me. I refer to cases of pregnancy and child-bearing in which the interplay between the psychological and the physiological components must be very intense. In most cases, fortunately, the personality remains intact. Clouston was probably quite correct when he stated that nature seems to have a remarkable ability to look after the pregnant woman. But that is not always the case; many failures occur, and many difficult situations arise which lead to disturbances of thought and conduct that may be disastrous and tragic. Helene Deutsch

has explained all this very well in her book *Psychology of Women*, in which she points out "that there is hardly a woman in whom the normal psychic conflicts do not result in a pathological distortion, at some point, of the biologic process of Motherhood." I think, for instance, of those cases in which there is (1) a fear of transmitting nervous or mental disease; (2) an unwanted child; (3) marital disharmony; (4) infertility; or (5) repeated abortion. When such conflicts are present there may be a rich display of symptoms which operate like a conditioned reflex—for example, nausea, vomiting, miscarriage. This is indeed a field in which the closest possible co-operation should prevail between the obstetrical and psychiatric departments.

It is not a very far cry from the mother to the nervous child—to an understanding of its psychological as well as its physical needs. Kanner has always insisted that the problems presented by such children lie in the patients themselves rather than in their organs—for example, poor school progress, enuresis, food capriciousness, temper-tantrums, nail-biting, fear reactions, epileptic phenomena; others may exhibit tics, headache, sleep disturbance, sex problems, stealing. A fascinating and rewarding field for study if we believe, as we should do, that the sense of security and confidence attained in childhood passes on into adult life. It is both disappointing and surprising that, under these circumstances, there is still so little co-operative effort between psychiatrists and paediatricians.

Personality Disturbances

The above discussion has demonstrated many conditions involving body and mind which are not susceptible of care until we have understood and treated the psychological traumata which have created them. In contrast attention can now be directed to those personality disturbances involving emotional, ideational, or intellectual impairment which are due to or dependent on objective organic lesions. It is fairly certain that, here, no real betterment will occur until the organic cause has been successfully dealt with. We can think, for instance, of the anoxaemias which can produce quite devastating effects, as evidenced by the sensitive, suspicious, irritable, aggressive, and even murderous reactions of explorers, mountaineers, and others who may find themselves in dangerous straits due to exposure, hunger, or other circumstances leading to deoxygenation. In toxic exhaustive conditions such as alcoholism, malarial infection, and so on, intense fear reactions are in the ascendant, and often are accompanied by delirium with its dangerous sequelae. And then there are the great variety of inflammatory and/or destructive lesions of the brain structure due to primary tissue change or dependent on vascular disturbance. Nor should one forget to mention the personality changes which not infrequently may be the aftermath of leucotomy operations.

Some day, perhaps, we will gain a little more knowledge of the epileptic mechanisms, what determines their particular form, whether there is a particular epileptic temperament or character, to what extent the psychic epilepsies, the post-epileptic and fugue states, are linked up with emotional factors—for example, the aggressive behaviour of the psychopath. The pre-senile groups are still inadequately understood, and often not recognized, and we know practically nothing of how they arise or can be prevented. Brain tumours masquerade far too frequently as dyspepsias or neurasthenic states, when a careful neurological examination would often allow a correct diagnosis to be made at a remedial level. Great and quite unnecessary difficulty seems to circle round the correlation of the mental and physical symptoms in cerebral vascular disease, especially in relation to the vessels supplying the basal nuclei. The labile emotional state, the personality change, the lack of concentration, and puzzlement with insight all form a characteristic picture that should never be confused with hysterical or melancholic phenomena, which, unfortunately, is often the case. I have not mentioned the above matters from any critical angle, but merely to emphasize again the

importance of clinical observation and the ability to correlate one's findings. Furthermore, a warning may be incorporated to the effect that the use of electric convulsion therapy to remove what is called a depressive or emotional overlay is very questionable practice.

Finally, from the clinical standpoint attention may be directed to the large group of constitutionally predisposed persons who form the bulk of our mental hospital population. The origin and development of schizophrenic, affective, paranoid, and psychopathic states is as much a mystery to-day as it ever was, and little progress has been made in the prevention and control of the various forms of amentia. We may take a certain amount of encouragement from the genetic understanding of the transmission of Huntington's chorea, and from the interesting work of Penrose and Munro in this country and of Jarvis in the United States on the body-mind relationship which occurs in phenylketonuria. But a tremendous lot more requires to be done. The numbers of all such patients are increasing, hospital accommodation is inadequate, and our medical and nursing establishments are so curtailed that many of our patients are failing to get anything like the individual attention they need and deserve.

The above clinical situations which I have little more than mentioned show in no uncertain manner the vast territories which must be explored much more thoroughly. It is not a purely psychiatric matter, but one which calls for co-operative effort so as "to advance that knowledge which secures the development of the race, and establishes man's dominion over nature" (Laycock). My experience has taught me that the best psychiatrists are those who have acquired a sound, thorough training in general psychiatry and neurology before specializing in psychotherapy, psychoanalysis, child psychiatry, or forensic psychiatry. The great Charcot (his joints seem to have almost reached vanishing point) was an accomplished neurologist before he studied the manifestations of hysteria, and it has always impressed me that men like Freud, Meyer, White, Jelliffe, Ernest Jones, Putnam, Bleuler, and many others had had wide experience and training before embarking on their more specialized studies.

In any case, in this rich storehouse of the organic psychoses the diligent student, drawn from whatsoever sphere, will find infinite scope for his investigative spirit.

Medical Education

This takes me at once into the field of general medical education, which recently formed the subject of a World Conference. More specifically the relationship of psychiatry to medical education was discussed very fully at a conference organized in 1951 by the American Psychiatric Association and the Association of American Medical Colleges. The results of that conference are now available in book form under the able editorship of Whitehorn. The general formulation laid down is that the aim of all medical education—and especially of psychiatry—is "to prepare the medical student to deal intelligently and skilfully with patients as persons, and to provide him with the basic knowledge of psychological and social problems and resources in relation to health and disease."

In Edinburgh we have been able to put such a course into being. In the preclinical years an integrated course of instruction in psychology and psychiatry is given, dealing with such topics as the psychology of development and the life history of the individual; heredity and environment; temperament and character; personality structure; emotion and its role in symptom production. In the clinical years systematic and clinical lectures are given, and throughout the course emphasis is placed on out-patient work in the Royal Infirmary, Edinburgh. Psychiatry is one of the professional subjects which are obligatory in the final examination for the degree of M.B., Ch.B. During my teaching experience, both in Glasgow and in Edinburgh, large classes varying from 160 to 200 students annually have been the rule. While the students have not, therefore, had the close personal supervision which would be desirable, yet they have

developed a keenness and an interest which have not made the professional examination an additional unwieldy burden. For my part I am convinced that the system in being has been of immense benefit both to the student and to his teachers. Furthermore, the establishment of professional or degree examinations in psychiatry puts the subject on an equality with other major subjects and ensures that the professor has his rightful place in the faculty of medicine.

While I am on this topic I might mention that universities as well as big industrial concerns are vitally concerned with wastage turnover, which in this instance centres in the unsatisfactory student. It is too often forgotten that when students come to their universities they are at a most vulnerable period of their development, so that the promise of their earlier years may, tragically often, not be fulfilled. We have a duty surely in our universities to promote mental hygiene, and to have the facility through our various departments to make the thorough personal and environmental inquiries which may preserve health and promote efficiency. This could be facilitated if it were more generally accepted that psychiatric units should be established as an integral part of every large general hospital. A fair suggestion is that from 5 to 10% of general hospital beds should be provided for psychiatric cases. It is lamentable to reflect how in this Welfare State we lag so far behind what has been accomplished so successfully in the United States, Scandinavia, and Germany.

The same suggestion or argument applies even more cogently to the affiliation of departments of child psychiatry to paediatric hospitals. Here again one can take a lesson from our American and Scandinavian colleagues, and can do more than pay lip-service to the slogan that childhood is the golden period for mental hygiene. We can and should provide accommodation for such children—not in mental hospitals, but in specially appointed clinics where they can have the benefit of all that present-day medicine can provide.

Much of what I have said in regard to undergraduate training and the affiliation of psychiatric clinics with paediatric and general hospitals holds good in relation to post-graduate and general-practitioner training. My experience is that both groups desire much more instruction and training in the principles of psychological medicine. Their success in practice depends on it. There are, of course, some doctors who state, blatantly enough, that they have no use for psychiatry, that psychiatrists should be avoided like the plague, that the subject is too mystical, theoretical, and dangerous, that it puts far more wrong ideas into the patient's mind than it removes. But in contrast to those cynics and sceptics there are an increasing number who are genuinely interested and who appreciate its significance in the medical hierarchy both as a specialty and as part of the working equipment of the general practitioner. Elaborate courses of instruction are by no means necessary, but familiarity with the ordinary methods of psychiatric examination are necessary, and an elasticity of mind which will allow him to switch to the possibility of a psychological explanation instead of seeking, long and vainly, for that pathological focus which is going to solve all the mystery.

The Art of Case-taking

What are those ordinary methods of psychiatric examination which have been referred to? The answer is quite simple—the art of case-taking. It may sound very unspectacular, but it is really fundamental for the whole of medicine, and I believe that it is in this field that psychiatry has made one of its greatest contributions. To do justice to any case it is essential to have a comprehensive life-study embracing hereditary structure plus environmental circumstances of a personal, social, or economic nature which may have influenced bodily or psychological development. It is dangerous practice to base our diagnosis and treatment on the symptoms alone, because the really important thing is the way the patient feels about them, and the setting or background in which they occur. It is diathesis and constitution we need more knowledge about, and how the

particular individual reacts to and compensates for the various bodily and psychological disabilities from which he may suffer. Selye applies the same concept to organic bodily states. That is why personality studies are so important, as in the differentiation of types as described in the first place by Hoch and Amsden, and, later, notably by Bleuler, Kretschmer, and Sheldon.

Such chronological studies, in terms of life history, are infinitely more illuminating than the cross-section method of the general physician. The latter uses the presenting symptom as his starting-point, and, while skilfully tracing out its ramifications, far too often fails to pay attention to the background, personal or environmental, in which the symptom is occurring. Cabot has given many examples of the fallacy of that method. It is a fault of training, a relic of a too concentrated, mechanistic objective approach, a vain seeking for a specific cause. How seldom we find it, and how much better it is to deal with all the multiple causative factors which may be playing a part. Then we will become much more accurate in our diagnosis, prognosis, and treatment. Very modestly it is suggested that our psychiatric case-taking methods may be of considerable value to our general medical colleagues. They will help them to remember that physical symptoms are often purely a face-saving device to maintain the *amour propre* of the patient. If this is forgotten, then examinations and treatment are introduced which often obscure the clinical picture. This, as I have said already, can be obviated by good history-taking and careful clinical evaluation. If the procedure I advocate was adopted we would hear much less of the failure of orthodox medicine and of the success of the medically untrained.

Our understanding of illness would be greatly increased if the relationship between the doctor and the social worker was drawn a bit closer. The social worker is not used intelligently enough. Social work is not a matter of almsgiving, of arranging loans, of giving financial or other material assistance. But it is the social worker's ability to size up a situation, to sense the atmosphere of the case, and to establish a good liaison between patient and employer, which is one of the most potent factors in successful rehabilitation and preventive medicine. We medical people do not appreciate how much we could gain, and how much more our patients would benefit, if we worked directly with the social workers rather than through the intermediation of the ward sister.

While, therefore, I have been striving to indicate the fields in which all medically trained people may learn to work more co-operatively, yet my main theme has been to show how psychiatry can be more greatly developed in relation to general practice. It is the psychologically oriented general practitioner who can become a much more important force in dealing with the great majority of nervous and mental ailments. The College of General Practitioners, which has just been founded, may be willing to consider how such a development can be most successfully pursued.

Conclusion

To conclude, I might make the following general suggestions:

1. A wider concept of medical education, so that all universities and medical schools recognize that the understanding and treatment of nervous and mental disorders is a matter of paramount national importance and should constitute a major subject in the medical curriculum.
2. Psychiatric clinics for in-patients and out-patients should form an integral part of all large general and paediatric hospitals.
3. Far greater reciprocity and co-ordination should be effected between all groups of medical men and social workers, in the hope that psychiatry will become less of a specialty and more part and parcel of general medicine.

TREATMENT OF RENAL OEDEMA WITH DEXTRAN

BY

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The obstinate oedema characteristic of type II nephritis (nephrosis, nephrotic syndrome, or chronic parenchymatous nephritis) is often difficult to treat. Limitation of salt and fluids seldom does more than mitigate the condition, and often not even that; the attempt to raise the level of albumin in the plasma with a diet rich in protein is equally unsatisfactory. Among the diuretics, only mersalyl is likely to be outstandingly successful. Even when circumstances appear favourable for administration of mercury—that is, absence of haematuria, normal renal-function tests, and normal blood pressure—many physicians are reluctant to use it in the presence of Bright's disease. More recently, ion exchange resins, A.C.T.H., and cortisone have been used. From the literature the response to these substances appears to be inconstant and the resins are difficult to stomach. The last resort is the removal of oedema by acupuncture or by the insertion of Southey's tubes at the ankles. With the introduction of antibiotics this procedure carries less risk of infection than formerly, but remains an unpleasant one.

Attempts to increase the colloid osmotic pressure of the plasma other than by high protein diet are not new. One of the earliest was by the intravenous injection of 6% gum acacia in normal saline, which was successfully used in the treatment of wound shock in the first world war. As a diuretic, this substance administered in 5% glucose achieved a measure of success, but became unpopular when experiments on animals showed that it remained in the tissues for years, deposited particularly in the liver, where it was said to depress the formation of plasma albumin. Later, blood and plasma were used, usually with little or no diuretic effect. With concentrated plasma, preferably with concentrated human plasma albumin, some diuresis is obtained. These latter blood products are expensive (concentrated plasma albumin is not obtainable in this country), and there is some risk of hepatitis in their use.

More recently the search for a substitute for plasma capable of restoring blood volume in patients suffering from shock has led to the use of gelatin, polyvinylpyrrolidone, and dextran. The last-named has been used as a diuretic in the treatment of renal oedema, and it is this aspect of its use with which this paper deals.

Dextran is a polysaccharide formed by the condensation of the glucose moiety of sucrose by the action of the organism *Leuconostoc mesenteroides*. Commercial dextran is prepared by the controlled hydrolysis and fractional precipitation of this crude dextran. It is thus theoretically possible to produce a dextran of any desired molecular weight, but, in practice, a fairly wide scatter in molecular size results, and it is so far practicable only to make preparations in which a large proportion of the molecules are within the chosen range of molecular size. Not only does the dextran made by

different drug firms vary in molecular distribution, but it is probable that different batches made by the same firm are not identical.

Dextran was introduced in Sweden by Grönwall and Ingelman (1944), who tested its properties in animals, and later in man (1945). They pointed out that an ideal substitute for plasma should be non-toxic, non-antigenic, and either completely excreted or completely metabolized—that is, it should not be stored in the tissues. They considered dextran to have these properties. Bohmanson, Rosenkvist, Thorsén, and Wilander (1946) confirmed the work with large-scale trials in which each batch of dextran was tried first on patients in the last stages of carcinoma. For some years dextran has been used extensively in Sweden for the treatment of shock, and Thorsén (1950) estimated the incidence of reactions to be as low as 0.1%. Bloom (1951) did not find any reactions in 51 patients suffering from shock, or in 50 others who were not suffering from shock.

On the other hand, Turner, Butler, Smith, and Scudder (1949), in America, observed reactions in 10 out of 30 patients. These reactions took the form of fever, headache, and tachycardia, with urticaria in six instances, cyanosis three times, and dyspnoea once. None of their patients was suffering from shock, but 500 ml. of 6% dextran was given in the short time of 30 minutes. More recently, in this country, Maycock (1952) noted reactions in only 1.51% of 1,647 patients who had received dextran at various medical centres, mostly to combat shock. There was one death, in a moribund patient, and the relationship to dextran was uncertain. Pyrexia, headache, urticaria, and pain in the loins and other abnormalities were noted. A severe reaction developed in one patient but none at all in 46 others who received infusions of the same batch of dextran. Accordingly, Maycock thought reactions possibly occurred as a result of sensitization to *L. mesenteroides* or antigenically related organisms such as pneumococcus type 2 or 20. As Maycock states, it should never be forgotten that large numbers of infusions have been given in the treatment of shock without any reaction whatever.

The fate of injected dextran is still being intensively studied. Thorsén (1949), after infusion into animals of an amount equivalent to one-third of the body weight, found by examination of watery extracts no dextran in the liver, spleen, bone marrow, brain, lungs, heart muscle, or kidney, and observed no morphological changes. On the other hand, Turner and his co-workers (1949) found minimal but in their view irreversible changes in the liver, spleen, kidney, and reticulo-endothelial system. These took the form of giant-cell formation and proliferation. Goldenberg, Crane, and Popper (1947) and Hartman (1951) also noted histological changes in the kidney, the liver, and the reticulo-endothelial system, but considered them to be probably reversible. Using rabbits, to which the equivalent of 1.5 litres of 6% dextran was given daily for seven days, Bull and his colleagues (1949) detected dextran by chemical methods in spleen and lymph nodes up to 21 days later. With a serological method, dextran was found to be still present up to 56 days afterwards.

The amount of dextran excreted in the urine varies considerably with the molecular distribution of the product used. Recent experimental work has shown that up to 40%, presumably of small molecular size, is excreted in the urine—mostly in the first 24 hours and the rest in four to six days. Dextran has also been

found in the faeces. Some of the remainder is metabolized, as shown by Gray, Siiteri, and Pulaski (1951), who found the D:N ratio arose when dextran was given to phloridzinized dogs. Work with dextran containing radioactive carbon indicates that some dextran is taken up by the reticulo-endothelial system. It therefore seems highly probable that this fraction also is eventually broken down and metabolized. Some tagged carbon is lost in expired air (Pulaski, 1952).

It is noteworthy that dextran has been approved by the Federal Food and Drug Administration, and that doctors of the American Forces have been authorized to use it wherever they believe it may be suitably employed in place of plasma (Government Services, 1953).

The objects of our investigation were (1) to confirm that dextran is a safe and efficient diuretic for relief of renal oedema; (2) to attempt to determine the influence of the size of the dextran molecule upon diuresis; and (3) to study some of the biochemical changes.

Clinical Material and Plan of Treatment

Dextran was given on 81 occasions to eight patients, all of whom showed oedema of long duration, heavy albuminuria, and marked hypo-albuminaemia. Full clinical data are given in the case histories. Throughout the period of treatment the patients were kept in bed and received a constant diet containing less than 2 g. NaCl and a fluid intake of 1,200 or 1,800 ml. in 24 hours. The protein intake in one patient was 60 g. daily, in the others either 100 or 120 g. No other treatment was given. Collections of urine were made over periods of 24 hours, and the patients were weighed daily as a further check on fluctuation in oedema. Dextran was not given until it was reasonably certain that diuresis from the effects of diet or rest in bed was not taking place.

During the period before administration of dextran, observations were made on the protein and cholesterol of the serum, on the blood urea and urea clearance, and on the haemoglobin and packed cell volume. Where possible these observations were repeated at regular intervals.

Salt-free dextran was used, much of which was presented to us by Benger Laboratories Ltd. 540 ml. was given by

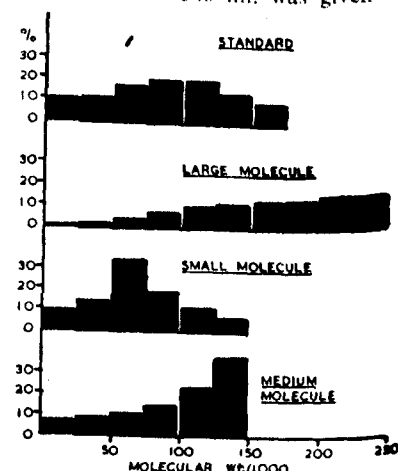


FIG. 1.—Molecular weight distributions of the preparations of dextran used.

Four categories of dextran were used; the standard commercial salt-free preparation in 6% strength and three preparations of differing molecular distribution (Fig. 1). These

were designated for convenience large, medium, and small molecule, according to the predominant molecular size in each. All were salt-free and were of 10% strength.

Results

Diuresis.—Increase of urinary output was produced by every course of dextran. Outstandingly good results were obtained in Cases 1–3, which became at least temporarily free of oedema, losing 12.3, 13.6, and 18.2 kg. body weight respectively within 7–14 days. On recurrence of oedema, a further course of dextran was again followed by diuresis. In Case 4 a moderate diuresis was produced on five occasions although the patient was never free of pitting oedema. Results in Cases 5 and 6 were less striking, but it is fair to say that in neither was the degree of oedema at all comparable with that present in the other four (Table I). In

TABLE I.—Effect of Dextran on Oedema

Case No.	Preparation of Dextran	Weight Loss (kg.)	Weight before Start of Treatment (kg.)	Duration of Diuresis (Days)
1	Standard 6%	12.3	64.5	9
2	" "	3.2	60.9	8
3	" "	13.6	92.3	7
4	Large molecule 10%	6.4	83.6	6
5	Medium " "	18.2	65.9	14
6	Small " "	10.9	65.9	5
7	Standard 6%	6.4	70.5	9
8	Large molecule 10%	7.7	64.5	19
9	Medium " "	8.2	69.1	11
10	Large " "	6.4	69.5	22
11	Small " "	5.9	70.9	6*
12	Large " "	2.7	59.5	13
13	Medium " "	4.1	65.6	6
14	Medium " "	2.7		5

* Four infusions only.

Case 7 the administration of a course of small-molecule dextran was begun the day after an apparently spontaneous increase in the output of urine, and the data are therefore excluded from the assessment of dextran as a diuretic.

Effect of Molecular Size of Dextran on Diuresis.—Diuresis occurred with every preparation of dextran irrespective of whether the concentration was 6 or 10%, or whether large or small molecules predominated in the preparation used. With the method of administration employed and the number of observations made, it was not possible to say that one preparation produced a greater loss of oedema

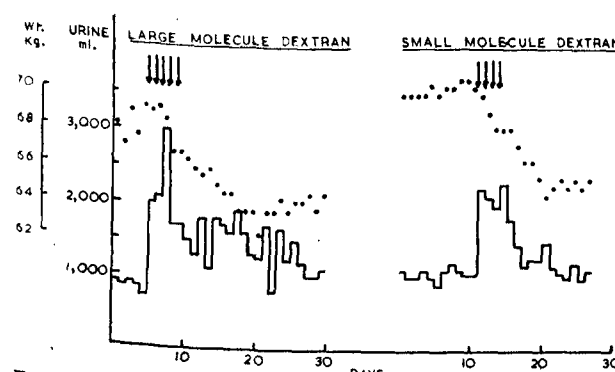


FIG. 2.—The diuretic effect of two preparations of dextran on Case 4.

than another (Table I). It is clear, however, that the diuretic effect of large-molecule dextran is of longer duration than any of the others (Table I). The duration of diuresis with large- and small-molecule dextran in the same patient is shown in Fig. 2. The biochemical findings are in harmony with these clinical observations, which suggest that the larger molecules remain longer in the blood stream.

Effect of Dextran on the Course of Nephritis.—Dextran is an effective agent for dispelling oedema, but its effect is

temporary, and there is no evidence that it favourably affects the course of the disease in any other way. On the other hand, three patients (Cases 1, 3, and 6) have died of uraemia 54, 24, and 24 weeks respectively after the last infusion of dextran. In two of these patients the urea clearance was subnormal before the start of treatment. Two were suffering from amyloidosis of the kidneys, a progressive fatal lesion. Periodic observations on renal function for some months after dextran showed nothing to suggest that deterioration was due to its administration, and in our view death occurred in the natural course of the disease and was not accelerated by dextran.

Toxic Effects

Some form of side-effect was shown after most of the infusions, but seldom were there symptoms which gave rise to concern. In Case 4, on the conclusion of the fourth infusion of small-molecule dextran, shivering, marked dyspnoea, and cough developed. The patient complained of nausea and had a temperature of 100.4° F. (38° C.). On examination there were only scanty rales at the lung bases and no wheezing was heard. He was not cyanosed. The blood pressure remained unchanged. The pulse was poor in quality and the rate was 124 per minute. Within four hours these manifestations passed off. This patient had received four courses of dextran (Table I) over 11 months, but there had been an interval of four months since the last course. Accordingly, a skin test was carried out with dextran before the infusion. It was negative. A similar but less severe side-effect occurred in Case 7 during the infusion of small-molecule dextran, which was stopped after 340 ml. had been given.

After the earlier infusions, severe headache lasting for six or more hours was noted. Nausea and vomiting were less common. In one patient a subconjunctival haemorrhage developed and in another bleeding from the gums and nose occurred. Rashes were not seen. These side-effects were less frequent and less severe when the infusion was given more slowly—that is, not faster than four hours for 540 ml. It was not possible to correlate their occurrence with the molecular size of the product used; but it is worth mentioning that the sharpest fall in packed cell volume and in haemoglobin, indicating the greatest increase in blood volume (61%), was seen in association with the severe reaction in Case 4 after administration of small-molecule dextran. Blood-pressure readings before, during, and after infusion showed no change in our cases, but we have not given dextran to anyone with appreciable hypertension.

In two patients hepatic enlargement of two to three fingerbreadths below the costal margin was detected immediately after a course of dextran. This disappeared in two to three weeks, and at necropsy in Case 3 (dying of uraemia six months after administration of dextran) histological observations showed no evidence of damage and, with the method used, no evidence of dextran. We were at this time unaware of the special method required for the detection of dextran advocated by Mowry, Longley, and Millican (1952). This observation would seem to be in agreement with reports of the temporary deposition of dextran in various organs. The absence of other signs of cardiac failure make it unlikely to have been due to engorgement.

Biochemistry

Changes in Blood Volume as Reflected by Changes in Haemoglobin and Haematocrit

Since it was impracticable to make frequent estimations of the blood volume, observations on haemoglobin and haematocrit were made before and at intervals after the administration of dextran. It was thought unlikely that alterations in the total circulating haemoglobin as a result of marrow influence would occur over short periods, and consequently that changes in the haematocrit and haemoglobin level would provide an index of change in the blood volume.

TABLE II.—Behaviour of Haematocrit and Haemoglobin Levels after Infusion of Dextran

Preparation of Dextran	No. and Volume of Infusions	Case No.	Haematocrit %				Haemoglobin, g. per 100 ml.			
			Before Dextran	1 Hour After First Infusion	20 Hours After First Infusion	20 Hours After Last Infusion	Before Dextran	1 Hour After First Infusion	20 Hours After First Infusion	20 Hours After Last Infusion
Large molecule	5 x 540 ml.	3	36.0	26.0	—	27.0	12.2	8.9	—	9.1
	5 x 540 "	3	32.0	—	25.5	21.0	10.2	—	—	6.7
	5 x 540 "	4	28.5	22.0	25.5	—	10.8	8.4	8.3	—
	5 x 540 "	4	26.5	21.5	—	19.0	9.6	9.6	—	—
	5 x 540 "	5	38.0	33.5	—	29.5	12.0	7.9	—	6.8
Medium molecule	1 x 540 "	7	34.0	25.0	29.0	—	9.8	11.1	10.4	9.7
	5 x 540 "	4	37.0	28.0	29.0	25.0	11.8	10.4	11.0	9.0
	5 x 540 "	5	35.0	—	32.0	30.0	11.1	—	10.7	9.5
Small molecule	5 x 540 "	6	44.5	39.0	42.0	40.0	13.9	12.2	12.6	12.8
	4 x 540 "	4	38.0	26.0	28.5	23.5	12.8	9.0	10.2	8.0
	1 x 540 "	7	43.0	32.0	36.0	—	15.4	11.6	13.0	—
Small molecule	1 x 540 "	7	41.0	33.0	38.0	—	15.0	11.8	13.4	—
	1 x 540 "	8	37.0	28.0	31.0	—	11.2	8.4	9.6	—
	1 x 540 "	8	32.5	26.5	31.0	—	9.8	7.4	9.6	—

A considerable increase in blood volume was apparent immediately after the first infusion of 540 ml. of dextran, the degree of this increase varying from 13 to 46%. By the following morning a considerable reduction had taken place (Table II). With repeated daily infusions further increases tended to occur and the maximum fall in haemoglobin and haematocrit was usually noted after the final infusion. In general, the rise in plasma dextran was proportional to the fall in haemoglobin and haematocrit. No exact correlation could be determined between them and the preparation of dextran used. However, to Case 4, courses of all four were given and the fall produced by the small-molecule preparation was much the greatest (Table II). It was calculated that the blood volume increased by 61% in this instance, the highest value in the series. The first three cases received 6% commercial dextran. Observations were not made on the haemoglobin and haematocrit; but it is clear that a sharp increase in blood volume also took place as shown by the fall in serum protein. On two occasions restoration of the haemoglobin and haematocrit to the pre-dextran levels lagged behind the rise in serum protein. This was particularly noticeable in Case 4.

Serum Protein.—The serum protein levels showed a sharp drop within half an hour after an infusion of dextran, with gradual return to normal over seven or more days.

Serum Cholesterol.—A striking fall in serum cholesterol was observed within half an hour after the injection of dextran. When considered in relation to the fall in serum protein (Table III) it would seem reasonable to accept this

TABLE III.—Behaviour of Serum Cholesterol After Infusion of Dextran

Case No.	Serum Cholesterol mg./100 ml.	Serum Protein g./100 ml.	Serum Cholesterol mg./100 ml.	Serum Protein g./100 ml.	Serum Cholesterol mg./100 ml.	Serum Protein g./100 ml.
	Before Dextran		20 hours after 5th infusion		Proteins near pre-infusion level	
3	926	—	204	—	—	—
3	675	3.5	245	1.25	—	—
4	310	4.0	100	1.5	155	4.0
4	235	4.0	114	1.25	159	3.5
4*	316	5.5	92	2.2	177	4.5
5	260	5.5	108	2.0	220	4.5
5	—	5.5	122	2.5	176	5.5
			20 hours after 1st infusion			
7	640	4.25	400	2.8	450	4.0
7	412	4.5	268	3.1	176	4.5
7†	400	5.0	285	3.0	380	4.5
8	175	6.0	110	4.0	134	5.5
8	188	5.75	118	4.0	—	—

* Only 4 infusions. † Only 340 ml.

as further evidence of dilution due to increase of plasma volume. However, even a week or more after the infusion of dextran, when the serum protein had returned to pre-infusion level, the serum cholesterol was usually still well below its original value.

Plasma Dextran.—Values noted 20 hours after the infusion of 540 ml. of 10% dextran ranged from 0.7 to 1.2 g./100 ml. Too few observations were made, however, to determine whether differences could be correlated with the preparations of dextran employed. On subsequent days the values fell more rapidly in those patients who had received small-molecule dextran. When a course of five daily infusions of large-molecule dextran was administered the plasma levels after the final infusion ranged from 2.4 to 3.7 g./100 ml. Fourteen days afterwards plasma levels of 1.2 and 1.3 g./100 ml. were found in Case 3 on two occasions. Only one patient received a course of small-molecule dextran and this was stopped after four infusions of 540 ml. because of a severe reaction. The level of dextran in the plasma was then 1.7 g./100 ml.

Urinary Dextran.—Table IV shows the difference in the amount of dextran excreted in the urine when single infusions of large- and small-molecule dextran were given.

TABLE IV.—Excretion of Large- and Small-molecule Dextran in the Urine (g. per day)

Days after Infusion of 540 ml.	Large Molecule		Small Molecule	
	Case 7	Case 8	Case 7	Case 8
1	4.6	1.3	14.8	9.6
2	—	0.8	8.1	1.9
3	2.2	0.7	1.6	1.8
4	1.5	0.5	0.9	0.7
5	1.1	0.5	0.9	0.8
Cumulative	—	3.8	26.3	14.8

While there is no point in comparing these results with the theoretical loss in patients with intact kidneys, it is clear that excretion of dextran is much greater when a preparation containing a high proportion of small molecules is used. The fact that Case 7 excreted 26.3 g. in five days and Case 8 only 14.8 g. in the same period, although both had received small-molecule dextran, may possibly be explained by a difference in the nature of the lesion, the former being an example of type II nephritis and the latter of amyloid nephrosis. The greater excretion of small-molecule dextran was also demonstrated in Case 4, who, in the week following four daily infusions of the small-molecule preparation, excreted 112 g. (52%), whereas only 33 g. (12%) was excreted in a similar period after five pints (2.8 litres) of the large-molecule product.

Case Histories

Case 1.—A woman aged 21 developed oedema of her legs two years before admission to Stobhill Hospital on November 6, 1951. There was no history of preceding infection. On examination oedema was found to be general and the urine contained much albumin; but only scanty casts and red blood corpuscles were found. Serum protein was 4 g./100 ml., serum albumin 1.8 g./100 ml., and serum chole-

sterol 552 mg./100 ml. Blood urea was normal (22 mg./100 ml.), but urea clearance was 35% of average normal. Blood pressure was 120/80 mm. Hg. Fundi were normal. The heart, lungs, and nervous system showed no abnormality. Some ascites was present. On a diet rich in protein and poor in salt there was no improvement; but after a course of dextran massive diuresis took place. Oedema gradually reaccumulated and a second course of dextran was again successful. She was discharged improved on December 21. Her urea clearance three months later was 36%. About six months after dismissal renal function began to fail sharply, and she died in her own home on November 29, 1952, of uraemia.

Case 2.—A man aged 34 developed a sore throat in October, 1950, followed a week later by swelling of his feet. When admitted to Stobhill Hospital on January 10, 1951, there was marked general oedema. Blood pressure was 160/112 mm. Hg. The fundi were normal. The urine contained much albumin and numerous hyaline and granular casts. Red blood corpuscles were present, but in numbers too few to give a positive guaiac reaction. The heart, lungs, abdomen, and central nervous system showed no abnormality. Ascites was present. Serum protein was 4.5 g./100 ml., serum albumin 1.6 g./100 ml., and serum cholesterol 384 mg./100 ml. The blood urea was 42 mg./100 ml. and the urea clearance 57%. His condition remained substantially unchanged for 14 months in spite of diet, mercury, urea in large doses, A.C.T.H., cortisone, ion-exchange resin, and insertion of Southey's tubes in the legs. Profuse diuresis followed each of two courses of dextran, and he was discharged from hospital much improved in February, 1952; his blood urea being then 35 mg./100 ml. and the urea clearance 72%. Renal function since then has remained good (urea clearance 70% on January 10, 1954) and the blood pressure unchanged.

Case 3.—A woman aged 43 developed oedema insidiously 11 months before admission to Stobhill Hospital on May 2, 1952. For six months ascites had been present. Six years previously she had had pre-eclamptic toxæmia and labour had to be induced at seven and a half months. Eighteen months later there was a normal delivery, and during this pregnancy the urine remained free of albumin and the blood pressure did not rise above 160/110 mm. Hg. On examination in May, 1952, she showed generalized oedema and ascites. In the urine there was much albumin; casts were numerous; but there were no erythrocytes. Serum protein was 4 g./100 ml., serum albumin 1.2 g./100 ml., serum cholesterol 860 mg./100 ml., blood urea 32 mg./100 ml., urea clearance 45%. Blood pressure was 105/85 mm. Hg. The fundi were normal. The heart, lungs, and nervous system showed no abnormality. No improvement followed a protein-rich salt-poor diet. After a course of dextran 18.2 kg. of body weight was lost in 14 days and she was discharged on May 21. On July 5 she was readmitted because of massive oedema. Her serum protein level was 3.5 g./100 ml., albumin 0.8 g./100 ml., blood urea 47 mg./100 ml., and urea clearance 47%. Diuresis again followed a course of dextran. On the day after the fifth injection the liver was noted to be three fingerbreadths below the costal margin and very firm. The serum bilirubin and prothrombin time were within the normal range: the thymol turbidity was two units and the thymol flocculation test negative. When discharged, at her own request, 14 days later the liver was then only just palpable. Renal function was unchanged. She died of uraemia on January 27, 1953. The findings at necropsy were unexpected. There was marked amyloid disease of the kidneys and a large area of necrosis in the cortex of one. No gross or histological evidence of damage due to dextran was made out in the liver, spleen, or kidneys, nor could any focus of sepsis be found except a degree of sinusitis.

Case 4.—A man aged 44 noticed oedema of the legs a month before admission to hospital in December, 1951. There was no history of preceding infection. On examination there was widespread oedema. The urine contained much albumin but only a few red blood corpuscles and

casts. Blood pressure was 120/90 mm. Hg. The fundi were normal. Serum protein was 4.8 g./100 ml., serum albumin 1.5 g./100 ml., serum cholesterol 235 mg./100 ml., serum urea 45 mg./100 ml., and urea clearance 33%. The heart, lungs, abdomen, and nervous system showed no abnormality. This patient received no relief from diet. Five courses of dextran were given, each of which produced considerable diuresis, but never enough to make him free of oedema. Renal function was unchanged during the six months he was receiving the first four courses, but is gradually deteriorating: blood pressure 170/110 mm. Hg and blood urea 134 mg./100 ml. on September 15, 1953.

Case 5.—A man aged 49 had suffered from pulmonary tuberculosis for at least five years. In January, 1952, he was admitted to hospital with erysipelas, and a month later swelling of the legs was noted. When admitted to Stobhill Hospital in April there was oedema of the legs only. The urine contained much albumin and many granular casts, but no red blood corpuscles. The blood pressure was 110/60 mm. Hg. The fundi were normal. Serum protein was 5.5 g./100 ml., serum albumin 1.6 g./100 ml., serum cholesterol 350 mg./100 ml., blood urea 47 mg./100 ml., and urea clearance 54%. The heart, abdomen, and nervous system showed no abnormality. There was dullness over the left lung, with deficient respiratory murmur. No adventitious sounds were heard. The trachea was deviated to the left. A skiagram showed collapse of the left lung and a small effusion. At this time no tubercle bacilli were found in the sputum. The fingers showed marked clubbing. A diagnosis of amyloid nephrosis complicating pulmonary tuberculosis was made. With dextran a moderate diuresis which caused reduction in oedema was induced on two occasions. On September 15, 1953, the serum protein was 5.5 g./100 ml., serum urea 37 mg./100 ml., and urea clearance 71%. His condition remains stationary.

Case 6.—A man aged 50 was proved to have pulmonary tuberculosis in 1944. For three months before admission in April, 1952, swelling of the legs had been noted. On examination oedema was found to be moderate only, and confined to the legs. Albuminuria was profuse and casts and erythrocytes were scanty. The blood pressure was 140/85 mm. Hg. The fundi were normal. The heart, abdomen, and nervous system showed no abnormality. There was marked clubbing of the fingers. Over the right upper chest there was extensive dullness, with areas of bronchial respiratory murmur and rales. A skiagram showed cavitation and fibrosis. No tubercle bacilli were found in the sputum at this time. Serum protein was 6 g./100 ml., serum albumin 2 g./100 ml., serum cholesterol 335 mg./100 ml., blood urea 30 mg./100 ml., and urea clearance 90%. A diagnosis of amyloid nephrosis complicating pulmonary tuberculosis was made. Dextran produced slight diuresis. Five months after his discharge from hospital on May 16, 1952, renal function rather suddenly deteriorated and death occurred from uraemia. The clinical diagnosis was confirmed at necropsy.

Case 7.—A boy aged 14 developed generalized oedema in January, 1953, without preceding infection other than boils on the face. When seen on February 20, 1953, he had moderate oedema of the legs and sacrum. The fundi were normal; blood pressure was 130/75 mm. Hg. The heart, lungs, and nervous system showed no abnormality. In the urine there was much albumin; a few granular casts and erythrocytes were found. Serum protein was 3.5 g./100 ml., serum albumin 2 g./100 ml., serum cholesterol 462 mg./100 ml., blood urea 34 mg./100 ml., and urea clearance 56%. When he was last seen his condition was unchanged.

Case 8.—A man aged 62 was admitted to hospital on April 14, 1953, complaining of swelling of the legs and abdomen for two weeks. For many years previously he had had a productive cough which had become worse in the past year and was associated with loss of weight. On examination he was emaciated, but showed gross generalized oedema and also ascites. There was very marked clubbing of the fingers.

In the sputum tubercle bacilli were numerous. The upper zone of the right lung was dull and the breathing bronchial. Rales were numerous and a skiagram confirmed the presence of cavitation. The heart and nervous system showed no abnormality. Blood pressure was 140/80 mm. Hg; the fundi were normal. After withdrawal of 2,700 ml. of fluid from the peritoneal cavity, the liver and spleen were not felt. In the urine there was a large amount of albumin but no casts and no erythrocytes. Serum protein was 5.5 g./100 ml., albumin 1.2 g./100 ml., serum cholesterol 168 mg./100 ml., serum urea 37 mg./100 ml., and urea clearance 37%. A diagnosis of pulmonary tuberculosis complicated by amyloidosis was made. There has been little change in his condition.

Discussion

An earlier publication by Wallenius (1950) indicated that dextran was a diuretic for nephrotic oedema. While Olive, Mills, and Lundy (1953) achieved good results in 7 out of 12 children, Bedford and Broughton (1951) had no success in three attempts on one patient. Both Wallenius (1950) and Olive and co-workers (1953) suggested that single injections are of little or no value.

When we gave five infusions of 540 ml. of 10% dextran on consecutive days, three out of six patients were rendered free of oedema and three were improved. In one instance dextran was successful after a wide variety of measures, including ion-exchange resin, A.C.T.H., cortisone, and even Southey's tubes, had made little impression. The good result was temporary in every instance, but a further course of dextran was again satisfactory on all of 11 occasions. We have found dextran to be consistently effective, and consider it to be a powerful diuretic which is valuable when other measures fail. It is perhaps particularly useful when it is decided not to use mersalyl.

Concerning the mechanism of this diuresis we have little to say. In the treatment of shock the object of administering dextran is to restore the blood volume by infusion of a substance which will remain in the vascular system for a long period. In patients suffering from type II nephritis with hypoproteinaemic oedema, the increase of osmotic pressure of the plasma due to the circulating dextran draws oedema fluid from the tissues into the blood stream. Similar changes followed the intravenous injection of acacia, a plasma volume expander of the first world war, which had a short vogue as a diuretic in nephrotic oedema (Lepore, 1937). Peters (1935) linked increase in blood volume after acacia with the production of diuresis, and, while the mechanism of this is still not understood, more recently MacArthur (1946) found that increase of blood volume was associated with the onset of spontaneous diuresis in nephrotic children. Marked haemodilution without diuresis was observed in the case reported by Bedford and Broughton (1951), who attributed this to the poor state of renal function. None of our cases is comparable with their case in that respect.

When the dextran is excreted or leaves the blood stream the blood volume returns to normal, as shown by the return of the haematocrit, haemoglobin, and total plasma protein to pre-infusion levels. The diuretic effect is therefore of limited duration.

Boyd, Fletcher, and Ratcliffe (1953) showed that dextran containing a high percentage of small molecules left the blood stream more rapidly than a product with a high percentage of larger molecules. The loss occurred into the urine and also, it was stated, into the interstitial fluids. There is not yet general agreement concerning the optimum molecular size to promote diuresis. Wallenius postulated that a preparation of small molecules might prove to be more effective, as they are osmotically more active, and, since they pass freely into the urine, they might also promote diuresis by hindering tubular reabsorption of water. Yet he held that they might pass more freely into the tissue spaces and there exert osmotic pressure against the plasma protein and circulating dextran. This we have not confirmed, in so far as no dextran was detected on examination

of oedema fluid. Bedford and Broughton (1951) also failed to find dextran in oedema fluid, and made the point that it may be present in too great dilution to be detected.

A preparation of larger and consequently less osmotically active molecules would, on the other hand, remain longer in the blood stream and so might produce a greater total diuresis. With the preparations used we were, however, unable to detect any material difference in the amount of oedema lost even when the three preparations were given to the same patient with a comparable degree of oedema as judged by body weight.

The findings of this paper cannot easily be compared with those of Wallenius (1950) or of Olive and his co-workers (1953), since both used dextran prepared by Pharmacia, of Sweden, differing in molecular distribution from the dextrans used by us. There is no support from our results for the suggestion made by Wallenius that diuresis might be due to diminished reabsorption of water from the tubules in the presence of a large number of small molecules of dextran, since the diuretic effect was just as good with large-molecule dextran as with the small-molecule preparation.

Hazards of Dextran

The hazards may be considered under two heads. In the first place, those that develop during the period of infusion or very shortly afterwards. Reactions of this type, usually of mild degree, were seen in most of our patients. They included headache and nausea; vomiting and dyspnoea were less common. These, along with rashes and backache, have usually been attributed to sensitivity or to the large molecules of dextran. We are inclined to think, however, that most if not all of these side-effects occurring in patients with oedema are due to overloading of the circulation. We have also seen subconjunctival haemorrhage and bleeding from the gums and nose. Headache, at least, is certainly minimized if the dextran is given slowly. Severe reactions, causing concern, occurred twice, on both occasions when small-molecule dextran was given. The high incidence of reactions in our patients may be explained on the basis that a normal blood volume is suddenly much increased by the attraction of oedema fluid into the blood stream when the plasma osmotic pressure is raised by dextran. Consequently very slow administration is clearly advisable to minimize reactions, and the use of small-molecule dextran is best avoided.

The second potential hazard of dextran administration is the possibility of its retention in the tissues. For a time at least it appears to lodge in the reticulo-endothelial system, particularly of the liver and spleen, and we have twice observed that the haematocrit and haemoglobin values have not returned to the pre-infusion level along with the serum protein. In one patient there was a drop in haemoglobin of over 2 g./100 ml. which was not made good until two months after the dextran was stopped. We can only tentatively interpret this as an indication that marrow function may be temporarily impaired by dextran in some individuals. The evidence gradually accumulating is strongly in favour of the view that all dextran injected is eventually excreted or metabolized. In our work there was no evidence that renal function was adversely affected by its use.

Appendix: Analytical Methods

Haemoglobin, haematocrit, and plasma dextran levels were determined on heparinized blood.

Haemoglobin was estimated as oxyhaemoglobin by photoelectric colorimetry.

Plasma dextran was estimated in the first cases by the method of Hint and Thorsén (1947), but later samples were estimated by a method using anthrone and based on the work of Morris (1948). This method, which was found to give comparable results, was preferred because of its greater rapidity and simplicity. Urinary dextran was also estimated by this procedure.

Serum total protein was estimated by the biuret method. It has been widely reported that the biuret reaction gives falsely high results in the presence of dextran, since dextran combines

with copper in alkaline solution (Jacobsson and Hansen, 1953), but these same authors have pointed out that this occurs only when a method such as that of Lehmann (1944) is used in which there is no initial precipitation of the proteins.

As they have shown, and we have confirmed, the disturbing influence of dextran is, for practical purposes, eliminated by precipitating the protein with trichloroacetic acid.

Serum cholesterol was estimated by the modification (King, 1951) of the method of Sackett (1925).

Summary

The diuretic action of dextran in renal oedema has been investigated and confirmed.

Attention is drawn to the large increases in blood volume produced in these patients by intravenous infusions of dextran.

Headache and nausea, usually of slight degree, occurred in most of our patients, and it is postulated that these symptoms were due to overloading of the circulation. Vomiting and dyspnoea were less frequent.

In an attempt to find the optimal molecular size of dextran to promote diuresis four preparations with differing molecular distribution were used. There was little difference in the amount of diuresis produced, but the most severe side-effects, accompanied by the greatest increases in blood volume, occurred after infusion of the preparation containing the greatest proportion of small molecules. The most prolonged diuresis was effected by the large-molecule dextran.

Attention is drawn to the fact that the presence of dextran does not interfere with the estimation of plasma proteins by the biuret reaction provided the proteins are first precipitated by trichloroacetic acid.

We wish to express our thanks to Dr. Frank Fletcher, medical director of Benger Laboratories Ltd., who obtained for us three preparations of dextran and gave us the data in Fig. 1, and to Benger Laboratories Ltd., who provided the dextran gratis. We also thank Dr. J. W. Chambers, clinical biochemist to Stobhill General Hospital, in whose department much of the work was done, for his valuable help and encouragement.

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THROMBOCYTOPENIC PURPURA AFTER ADMINISTRATION OF GOLD COMPARISON OF TREATMENT WITH DIMERCAPROL, A.C.T.H., AND CORTISONE

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Various authors, reporting on the incidence of toxic reactions to gold salts, record percentages varying from 20 to 77. Severe reactions occur in approximately 6%. Amongst the most serious are thrombocytopenic purpura, agranulocytosis, and aplastic anaemia. Hartfall *et al.* (1937), in a series of 750 cases of rheumatoid arthritis given gold, noted toxic reactions of greater or lesser severity in 40% of patients, which included nine cases of thrombocytopenic purpura. Three of these patients died. Wintrobe *et al.* (1939), in a review of the literature, reported seven cases of purpura, four of which were fatal. Cecil *et al.* (1942) recorded three cases of purpura, one fatal, in a series of 245 cases given gold. Price and Leichtentritt (1943), in a series of 101 patients, noted three with purpura, one of whom died. Short *et al.* (1946) reported one fatal case of purpura in a series of 47 patients. Nyström (1950) encountered one fatal case of purpura among 572 patients given gold. Mettler *et al.* (1948), on the other hand, recorded four cases of purpura among 160 patients, none of which were fatal. Various other workers have reported isolated cases, but the incidence of this complication of gold therapy has declined in recent years, presumably owing to a better appreciation of the dangers of gold administration.

The introduction of 2,3-dimercaptopropanol (dimer-caprol, "B.A.L.") by Peters *et al.* (1947) as a therapeutic agent in the treatment of poisoning by arsenic and other heavy metals quickly led to its use in the treatment of toxic reactions due to gold. Many of the less serious reactions, such as dermatitis, rapidly improved following the use of dimercaprol (Ragan and Boots, 1947; Cohen *et al.*, 1947; Macleod, 1948; Montgomery, 1950; Edström, 1950; Kirsch, 1951). Good results have been recorded in cases of thrombocytopenic purpura, but only a few have been reported in detail. Lockie *et al.* (1947) describe a case of thrombocytopenic purpura due to gold which had shown no response to various methods of treatment over a period of three months and ultimately developed a subarachnoid haemorrhage. Dimercaprol was administered in doses of 180 mg. four-hourly for two days, then twice daily for ten days (total 5.7 g.), and the patient made a good recovery. The platelet level rose from 36,000 to 120,000 in three weeks, and was at approximately the same level three months later. Kroese (1949) described two cases of purpura following gold administration. In one case the response to dimercaprol was excellent. The drug was given immediately the symptoms appeared. The

second case was of five months' duration and showed no response to dimercaprol. Brodthagen (1950) reported one case in which 2 ml. of 5% dimercaprol was given daily for three days, but the patient died on the third day.

Initially dimercaprol was used mainly by intramuscular injection in the doses recommended by Peters *et al.* (1947). A course consisted of four injections, each of 2 ml. of 5% dimercaprol, at four-hourly intervals on the first day (400 mg.), followed on the second, third, and fourth days by 2 ml. twice daily. On the fifth and sixth days a single injection of 2 ml. was given (total dose 1.2 g.). In severely ill patients nearly double these doses were given, but "with considerable trepidation" (Lóngcope and Luetscher, 1946).

Only a small number of cases of thrombocytopenic purpura due to gold administration and subsequently treated with dimercaprol have been described in detail. In view of this it was considered important to report in full two further cases, in one of which the total amount of dimercaprol far exceeded the recommended dose, without ill effect.

Case 1

This patient, a man aged 49, was first seen as an out-patient in October, 1948. He had suffered from rheumatoid arthritis since 1946. He was treated conservatively until 1949, when a course of gold was recommended. Three days after the fifteenth injection (total 0.22 g.) a purpuric eruption appeared. He was admitted to hospital two days later.

On admission there was evidence of a recent epistaxis with haemorrhagic bullae present on the tongue and mucous membrane of the mouth, and a widespread purpuric eruption on the hands, feet, shoulders, neck, and face. He complained of a feeling of weakness, but was not distressed. His blood pressure was 170/110. Nothing abnormal was found in the cardiovascular, respiratory, nervous, and renal systems. The spleen was palpable, and enlarged lymph nodes were present in both axillae. There was typical spindling of the proximal interphalangeal joints of the fingers. Pain, swelling, and limitation of movement were also present in the wrists, elbows, ankles, and feet. At this time his haemoglobin was 90%, white blood cells 10,000 per c.mm. E.S.R. 46 mm. per hour, and platelets 163,000 per c.mm. Examination of a sternal marrow smear showed some hyaline degeneration of the megakaryocytes.

A transfusion of 2 pints (1,140 ml.) of whole blood was given and the bleeding stopped for three days. Epistaxis then recurred, and the patient complained of abdominal pain, nausea, headache, and diplopia. Haematuria developed and a subconjunctival haemorrhage appeared in the right eye. Ptosis became apparent and the power of accommodation was lost. Some weakness of the left leg was noted and the knee-jerk could not be elicited. There was no evidence of sensory loss. Paralysis of the third cranial nerve on the right side became complete. A further 2 pints of whole blood was transfused, but this did not control the bleeding. At this stage the platelet count had fallen to 20,000 per c.mm. The white-cell count was within the range of 5,600 to 8,200 per c.mm. The haemoglobin was 102%.

In view of the failure of transfusions to control bleeding, and the presence of a persistently low platelet count, dimercaprol was given in doses of 150 mg. six-hourly. After the second injection the patient complained of a feeling of constriction in the chest, with flushing. The individual dose was reduced to 100 mg. and no further reactions occurred. A total of 1.3 g. was given over six days. The bleeding diminished, and ceased during the course of treatment with dimercaprol. After withdrawal of the drug no further haemorrhage occurred. The platelet count remained low during dimercaprol treatment, values between 30,000 and

50,000 per c.mm. being recorded. A further transfusion of 1½ pints (850 ml.) of fresh whole blood was given without appreciable effect on the platelet count. Power in the left leg gradually improved, but the knee-jerk did not return for about eighteen months. Paralysis of the right third cranial nerve slowly improved and recovery was complete in seven months.

Comment.—Although the administration of dimercaprol coincided with the cessation of haemorrhage there was no appreciable rise in the platelet count for a further 25 days, and it is doubtful if dimercaprol, in the doses given, materially influenced the course of the disease. The most remarkable feature in this case was the localized lesions of the nervous system. Damage to the central nervous system can undoubtedly complicate the administration of gold. Mollard (1935) reported a case which developed bulbar palsy and paralysis of the right facial nerve. Hinault and Mollard (1934) described a patient in whom facial neuralgia, impairment of accommodation, and transitory blindness arose during the administration of gold. Sundelin (1941) collected 107 cases in which some evidence of neurological damage had occurred as a result of gold therapy. Hartfall *et al.* (1937), Cohen *et al.* (1947), and Doyle and Cannon (1950) reported cases of severe peripheral neuritis, in all of which recovery was eventually complete. In the present case it is difficult to be certain whether the neurological symptoms were due to the direct effect of the gold on the central nervous system or to small haemorrhages into the brain stem and cord. In view of the widespread purpura, the latter is considered to be the more likely explanation.

Case 2

This patient, a woman aged 44, was admitted to hospital with a history of profuse vaginal bleeding and widespread purpura for 12 days. She had suffered from rheumatoid arthritis of a very mild type for three years. Six months before admission her symptoms became much more acute and a course of gold was recommended. Injections were given at weekly intervals. A substantial clinical improvement was noted when a total of 0.85 g. had been given. After an interval of three weeks she received three further injections, each of 0.05 g. She noticed a metallic taste in her mouth and complained of general malaise. Menstruation began at the normal time, but bleeding became profuse and continuous. A generalized purpuric eruption appeared. She was admitted to another hospital and found to be severely anaemic. She received 4 pints (2,280 ml.) of blood before transfer to the rheumatic unit.

On admission her haemoglobin was 35%, red blood cells, 2,000,000 per c.mm.; white blood cells, 2,050 per c.mm.; and platelets, 20,100 per c.mm. The bleeding-time was raised to 20 minutes. Purpura and ecchymoses were present on the hands, thighs, and buttocks. Physical examination revealed only minimal evidence of rheumatoid arthritis in the small peripheral joints. The spleen was not palpable and no other abnormality was discovered. Vaginal haemorrhage continued. Her condition improved somewhat with repeated transfusions, 5 pints (2,840 ml.) of packed cells being given initially. The haemoglobin rose to 53% and the red cells to 3,270,000. In view of the value of A.C.T.H. and cortisone in idiopathic thrombocytopenic purpura (Bethell *et al.*, 1951; Wilson and Eisemann, 1952; Faloona *et al.*, 1952) and in other varieties of toxic reaction to drugs (Steinberg and Roodenburg, 1951), it was decided to explore their value in this condition. A total of 100 mg. of A.C.T.H. was given by the intravenous route, in the course of three days, combined with 40 mg. of "acthar gel" twice daily. Little evidence of haematological response appeared. The platelet count remained less than 40,000 per c.mm. and the bleeding-time remained over 10 minutes. The red-cell count and haemoglobin level fell from their post-transfusion levels to 2,780,000 per c.mm. and 47% respectively.

The dose of acthar gel was therefore increased to 60 mg. twice daily from the fourth day of treatment and, in addition, 100 mg. of cortisone was given daily by mouth. Apart

from a transitory fall in the bleeding-time, there was no evidence of any improvement. The dose of cortisone was increased to 125 mg. and subsequently to 150 mg. daily, while the dose of A.C.T.H. was reduced to 40 mg. daily. Signs of fluid retention appeared, in the form of ankle and sacral oedema, basal pulmonary crepitations, and a rise in systolic blood pressure. The bleeding-time remained over 10 minutes. Vaginal bleeding continued. The haemoglobin had fallen to 42%, red-cell count to 2,410,000, and platelets to 18,000 by the fourteenth day of treatment. The white-cell count was reduced to 2,500 per c.mm. A further 3 pints (1,700 ml.) of blood was given.

In view of the complete absence of any signs of improvement in the haematological condition, it was not considered justifiable to continue with cortisone or A.C.T.H. When the hormones were finally withdrawn, a total of 1.41 g. of A.C.T.H. and 1.75 g. of cortisone had been given. It would appear, therefore, that these hormones may be of little value in the treatment of severe cases of thrombocytopenic purpura following the administration of gold. It is of interest to note that the E.S.R. fell from initially high levels of 120 and 130 mm. in one hour to within normal limits during the period of hormone therapy and rose rapidly after withdrawal. The capillary resistance, measured by the method described by Robson and Duthie (1950), also rose during the period of hormonal treatment and fell after withdrawal. A similar effect on the blood pressure was noted. Eosinophils were absent from the peripheral blood during the period of hormonal therapy.

Dimercaprol was then given in doses of 150 mg. eight-hourly for 10 days. There was an immediate and dramatic response (see Chart). Haemorrhage ceased, the bleeding-

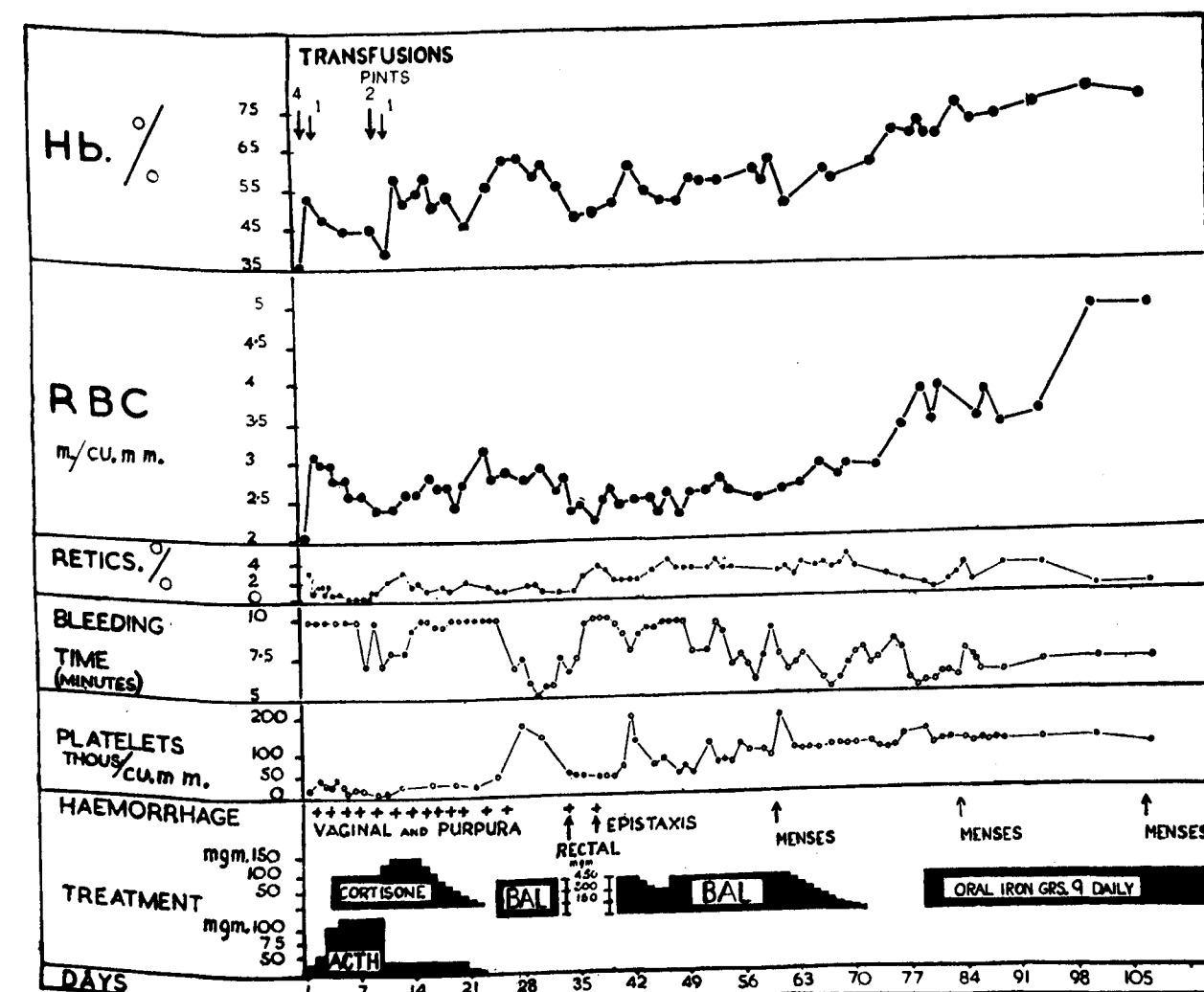
time fell rapidly, while the platelet count rose from 20,000 to 200,000 per c.mm. and the haemoglobin level rose from 52% to 60%. On the abrupt withdrawal of dimercaprol this improvement was quickly reversed. The platelet count and haemoglobin level fell, the bleeding-time rose again, and there were further episodes of haemorrhage, this time from the rectum and nose.

After an interval of six days dimercaprol was again given in doses of 450 mg. daily and the haematological response was unequivocal (see Chart). Five days later the dose was reduced to 300 mg., but some deterioration again took place. The dose was restored to the former level of 450 mg. daily and continued for a further 12 days. During this time normal menstruation occurred, and it was thought to be safe to begin withdrawal of the drug. This was done during the course of 10 days, without any sign of relapse. The patient's condition improved rapidly and there has been no relapse for one year. A feature of interest that occurred during administration of the second course of dimercaprol was a marked eosinophilia. The eosinophil count rose abruptly to 1,200 per c.mm. from its previous level of 50. This marked eosinophilia persisted during the second course of dimercaprol and subsided slowly as the drug was withdrawn.

No flare-up in the joints occurred after the withdrawal of cortisone, A.C.T.H., or dimercaprol.

Discussion

Several points of interest emerge from a study of the response to treatment of these two patients. In Case 1 purpura and thrombocytopenia appeared after the administration of a relatively small amount of gold (0.22 g.).



Dimercaprol given in the recommended doses (total 1.2 g.) appeared to have little immediate effect on the course of the condition. The platelet count remained at a very low level for 25 days after its administration was stopped. The fact that the cessation of haemorrhage coincided fairly closely with the administration of dimercaprol may be of little significance, as bleeding was not a prominent feature and anaemia did not develop. The neurological complications in this patient have already been discussed.

In Case 2 1 g. of gold had been given before purpura appeared. Haemorrhage was severe and continuous. A marked degree of anaemia rapidly developed. Repeated transfusions were necessary as a life-saving measure, but were of very temporary benefit. Large doses of A.C.T.H. and cortisone had no significant effect on the platelet count or the anaemia. The bleeding-time did show some improvement, and the capillary resistance, as measured by the negative-pressure method (Robson and Duthie, 1950), rose sharply from an initially subnormal level. This is an observation of some interest, as it would suggest that the reduction in the strength of the capillary wall found in thrombocytopenia of both the idiopathic and the toxic type may be of little importance as a cause of haemorrhage. The findings in this patient would suggest that there is a closer inter-relationship with the platelet count, but other as yet unknown factors must be concerned, as low counts are not infrequently found in the absence of bleeding (see Case 1). The failure of these hormones is in marked contrast to their effects in the idiopathic variety of thrombocytopenic purpura, in which a response occurs in most cases, although it may be incomplete and temporary.

Davidson *et al.* (1952) have also reported the failure of A.C.T.H. to influence the haematological condition in one case of thrombocytopenic purpura following the administration of gold. Virkkunen (1952), however, describes the effect of A.C.T.H. and cortisone in two cases with severe thrombocytopenic purpura after gold therapy. In one case a short course of cortisone produced a substantial rise in the platelet level, with an immediate fall on withdrawal. A subsequent more prolonged course produced a permanent return of the platelet level to normal. In the other case a total of 2 g. of A.C.T.H. was administered over one month, without any improvement in the extremely low platelet count. Clinically the patient improved without further haemorrhagic phenomena, but the thrombocytopenia persisted until four months after treatment, when a spontaneous remission occurred.

In Case 2 the response to dimercaprol was prompt and unequivocal. Cessation of treatment was followed by deterioration. Resumption of dimercaprol restored the position, but reduction of the daily dose to 300 mg. was again followed by relapse. The critical dose at this time lay between 300 and 450 mg. daily. The occurrence of normal menstruation was thought to indicate that dimercaprol might safely be withdrawn, and this proved to be the case. This patient received a total of 15.575 g. of the drug without any evidence of toxic effects. An interesting finding was the marked eosinophilia during the second course of dimercaprol. This is difficult to explain, as the patient had no clinical signs of hypersensitivity such as rash or fever. The presence of a persistent leucopenia would suggest a depression of all the cellular elements of the bone marrow. It may be that the adequate removal of the gold in the tissues by dimercaprol prevented further damage of the marrow and thereby avoided the possible onset of agranulocytosis or aplastic anaemia.

The pharmacological properties and therapeutic uses of dimercaprol have been reviewed by Weatherall (1948). Its action depends on its ability to form stable complexes with the heavy metals. By so doing it transfers the toxic element from the cells to the tissue fluids, from which it is excreted in the urine. In doses above 5 mg. per kg. body weight it may cause lacrimation, salivation, vomiting, and a rise in blood pressure, but permanent damage to organs has not been reported. It is not known why certain individuals develop toxic reactions to gold, but in such individuals it

would appear necessary to protect any susceptible tissues from the damaging action of gold until it is no longer being absorbed from tissue depots in significant quantities. This point is well illustrated in Case 2. It would seem that in the past some of the poor results reported in the treatment of thrombocytopenic purpura with dimercaprol may have been due to failure to give the drug in large enough doses for long enough periods. Results are likely to be more satisfactory if dimercaprol is given immediately toxic effects appear, as in these circumstances it may be possible to clear gold both from the damaged tissues and from the tissue depots, thus protecting susceptible cells from further injury. In recent years the successful use of much higher doses has been reported. Montgomery (1950), in two cases of gold dermatitis, gave a total of 9.6 g. in one case and 11.9 g. to the other over periods of 12 and 8 weeks respectively. One patient developed skin sensitivity to dimercaprol, but suffered no other ill effects.

Summary

Two cases of thrombocytopenic purpura following gold administration are described.

Unusual neurological signs occurred in one case, probably due to small haemorrhages into the cord and brain stem.

One case appeared to show no response to dimercaprol, but it is now considered that the total dosage given was inadequate.

One case showed no response to large doses of A.C.T.H. and cortisone, but responded promptly to dimercaprol.

The need for a higher daily dose and more prolonged courses of dimercaprol are discussed.

During the period when these cases were studied, the Rheumatic Unit, Northern General Hospital, was in receipt of grants from the Medical Research Council and the Nuffield Foundation. The cortisone and A.C.T.H. were supplied by the Medical Research Council, to whom we are indebted.

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HYPOPARATHYROIDISM AND PSEUDO-HYPOPARATHYROIDISM

BY

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Hypoparathyroidism is well recognized as a complication of thyroidectomy. In most series of cases reported in the literature the incidence has been less than 1% after operations for hyperthyroidism, the figures ranging from 0.2% (Cattel, 1934) to 3.5% (Lachmann, 1941); in about half the cases the tetany is only transient. Idiopathic hypoparathyroidism is generally regarded as a rarity. Only 60 to 70 proved cases have been recorded in the literature, and only three of these have been reported from this country (Humphreys, 1939; Hims-worth and Maizels, 1940; Jordan and Kelsall, 1951). Still rarer, perhaps, is the condition of pseudo-hypoparathyroidism, described by Albright *et al.* (1942), which results from abnormal resistance to parathyroid hormone rather than from deficient secretion. Only 18 cases have so far been reported.

We have been impressed by the variety of ways in which this group of disorders may present, and by the ease with which they may escape recognition. We believe that they may not be as rare as is commonly supposed. We therefore record three cases of idiopathic hypoparathyroidism, together with three illustrative cases of the post-operative condition and one case of pseudo-hypoparathyroidism. This last case has already been reported elsewhere (Bishop and de Mowbray, 1951), and is, so far as we are aware, the first to be recorded in this country.

Case 1. Idiopathic Hypoparathyroidism

This patient, a man aged 44, first noticed stiffness of his leg muscles after mild exercise when aged about 12. At 22 he began to develop progressive failure of vision, at 40 a cataract was removed from his left eye. At the age of 32 he began to have carpal spasm, and between the attacks he had difficulty in moving his joints, owing to a feeling of "hardness" in the muscles. A few years later he developed sudden involuntary "flinging" movements of his limbs, occasionally causing him to fall to the ground. For four years he had difficulty in initiating sudden leg movements, on account of spasm of the

muscles. For about 20 years his wife had noticed a gradual loss of his critical and introspective faculties, and, more recently, he himself had been aware of an impairment of his powers of concentration and emotional control. He had never had an operation on the thyroid gland. He had been treated for some years as a hysteric and later as an epileptic (one of his sisters had suffered from epilepsy in the past).

On examination he was facile and emotionally unstable, and liable to attacks of uncontrolled and sometimes inappropriate laughter. His powers of concentration were limited and variable, and intelligence tests showed deterioration (Wechsler Bellevue, 61; progressive matrix, Grade V). Chvostek's and Trousseau's signs were positive. A mature cataract was present in his right eye, and one had already been removed from his left eye. His skin and nails were normal, but his teeth were poor in quality.

Investigations.—The serum calcium was 6.5 mg., the phosphate 4.3 mg., and the alkaline phosphatase 18 units per 100 ml. The Sulkowitch test showed no calcium in the urine. The Ellsworth-Howard test gave a normal response to parathyroid hormone (Fig. 1). The faeces contained no excess of fat. X-ray films (Figs. 2 and 3) showed radiating striae of calcification in the caudate nucleus areas of the brain and possibly calcification in the cerebellum. Two of the last molar teeth were unerupted (Fig. 2). The pelvic bones showed increased density, with some calcification of the tendon insertions. The electroencephalogram

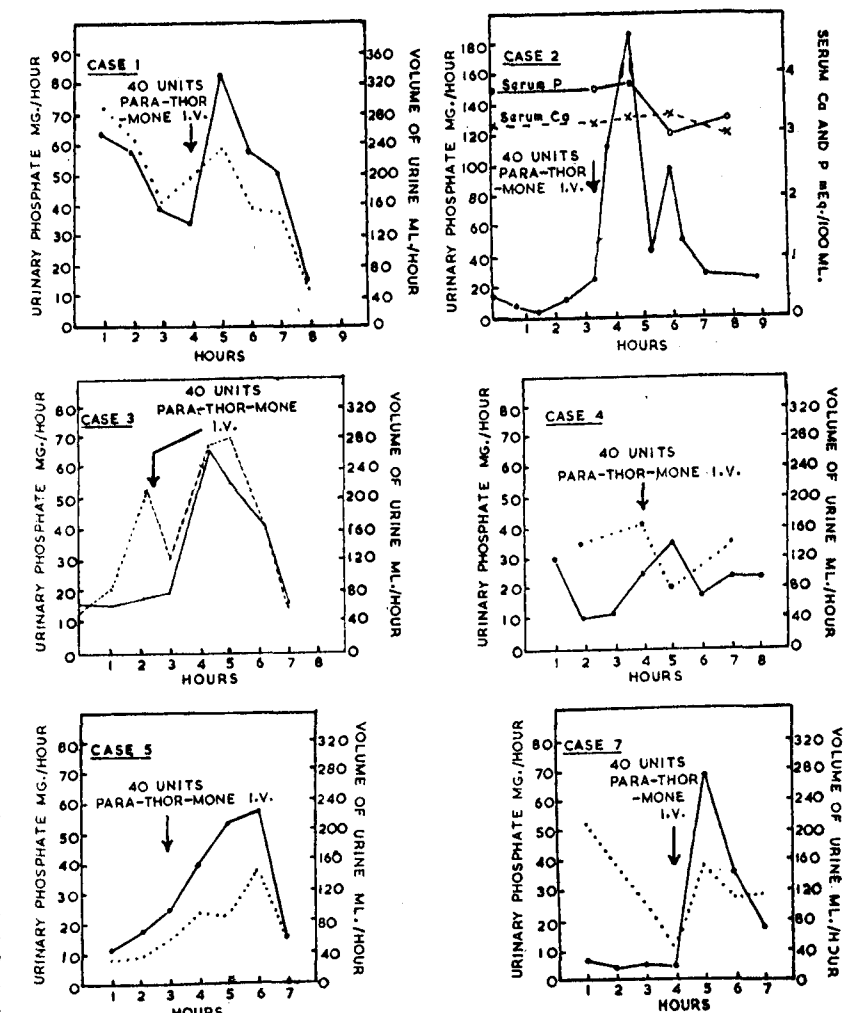


Fig. 1.—Ellsworth-Howard test. Administration of parathyroid hormone to subjects with true hypoparathyroidism (and to normal subjects) leads to a marked increase in urinary phosphate excretion and a water diuresis. There is no significant response in the case of pseudo-hypoparathyroidism. The patients were under basal conditions, except in Case 2. — Urinary phosphate level. Urinary volume.

showed abnormally slow dominant frequency at 6 to 7 cycles a second in the post-central areas. These waves were bilaterally symmetrical, and were inhibited by visual attention; hyperventilation led to a slight increase in dominant



FIG. 2.—Case 1. Idiopathic hypoparathyroidism. Bilateral calcification in the basal ganglia, arranged in radiating striations. One of the unerupted molars is also shown.

frequency. The electrocardiogram showed low voltage in all leads, especially in the T waves, and the Q-T interval was prolonged.

Treatment.—Dihydratichysterol, 1 ml. (1.25 mg.), was given three times daily, and the dose was gradually reduced



FIG. 3.—Outline drawing of radiating striae of calcification shown in Fig. 2. The electroencephalogram improved, now showing a dominant alpha rhythm at 8 cycles a second, and the electrocardiogram returned to normal.

Case 2. Idiopathic Hypoparathyroidism

A man aged 41 was seen by an ophthalmic surgeon in February, 1951, on account of failing vision of three years' duration. He was found to have extensive bilateral posterior lamellar cataracts, and a reducing substance was present in the urine. He was therefore referred for a physician's opinion. On further questioning it was revealed that 12 years previously the hair of his head had fallen out rapidly in a patchy manner, and that it had never completely grown again. The eyebrows had also fallen out, and several of his nails had been shed and had only partially regrown. He had never had any symptoms of tetany, except for some paraesthesiae in the hands and a tendency to paraesthesiae and cramps in the legs. His wife said that for two or three years he had been becoming more morose, irritable, and forgetful, and had been losing interest in his appearance and cleanliness. He had never had an operation on the thyroid gland, and there was no relevant family history.

On examination the vertex of the scalp was almost completely bald, and at the sides of the head were patches of thinning, where the hairs were small, white, and brittle. Several of his nails had only partially grown again and

were ridged, broken, and brittle (Fig. 4); scrapings from them failed to show any fungus. Chvostek's sign was positive, but Trousseau's sign was negative. The blood pressure was 130/70 and the urine normal.

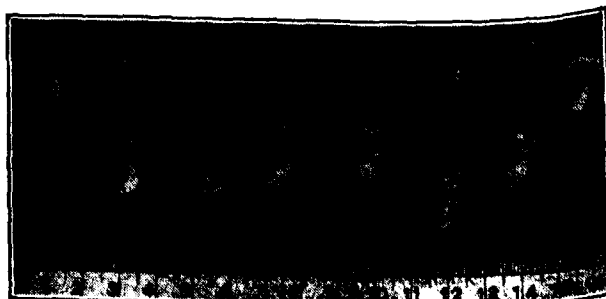


FIG. 4.—Case 2. Trophic changes in the finger-nails.

Investigations.—The serum calcium was 5.8 mg. and the phosphate 6.2 mg. per 100 ml. The Ellsworth-Howard test showed a normal response to parathyroid hormone (Fig. 1). X-ray films showed no calcification in the brain and the bone density was normal.

Treatment.—Dihydratichysterol and calcium lactate were given, as shown in Fig. 5, the maintenance dose being 1 ml. and 75 gr. (5 g.) daily, respectively. The mental symptoms resolved soon after treatment was begun and the paraesthesiae disappeared. The nails have completely regrown (Fig. 6) and there is some evidence of regrowth of hair. There is no apparent change in his cataracts, and it has not so far been necessary to operate on them.

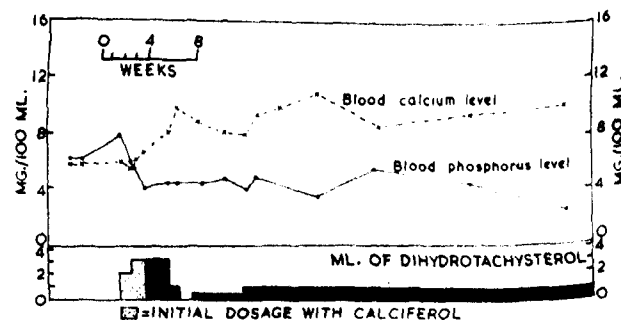


FIG. 5.—Case 2. Response of blood calcium and phosphate levels dihydratichysterol dosage. (50,000 units of calciferol = 1 ml. of dihydratichysterol.)



FIG. 6.—Finger-nails of Case 2 after six months' treatment with dihydratichysterol.

Case 3. Idiopathic Hypoparathyroidism

This patient, a man aged 50, had been seized with severe cramps in the hands after an attack of "influenza" when aged 31. The cramps continued intermittently, being brought on particularly by his work as a boot-repairer. In March, 1933, two months after the onset of symptoms, he had an exceptionally severe attack, which involved the muscles of the face and throat, causing dyspnoea, and he was admitted to hospital. On admission Chvostek's and Trousseau's signs were strongly positive, and the serum calcium level was 5.4 mg. and the serum phosphate level 8 mg. per 100 ml. Within six hours after injections of calcium chloride and "para-thor-mone" the symptoms

disappeared. He was discharged from hospital, free of symptoms, with a serum calcium level of 8.1 mg. per 100 ml. and taking calcium gluconate, 2 dr. (8 g.) thrice daily, and "ostelin," 3 minims (0.18 ml.) thrice daily, and 2 pints (1.1 litres) of milk daily. On return to work, however, he continued to have cramps. These became more severe again and he was readmitted to hospital in December, 1933. At that time x-ray films showed normal bone density and there was no excess of fats in the faeces. He was treated with para-thor-mone 10 units weekly. Eight years after the onset of the tetany his vision began to fail. A cataract was removed from the left eye seven years later (in 1949), and another was removed from the right eye in December, 1951.

When first seen by us, on February 14, 1952, he was still having intermittent attacks of tetany, mainly after any infection or anxiety, or during the winter and spring. The spasms were painful and were accompanied by sweating. He had never had any epileptiform convulsions. He was not receiving any regular treatment, but was given injections of para-thor-mone during attacks of tetany, with complete relief. He had never had an operation on the thyroid gland.

On examination Chvostek's and Trousseau's signs were positive. There were no trophic changes in the skin, hair, or nails. The blood pressure was 130/80 and the urine normal.

Investigations.—The serum calcium was 6 mg. and the serum phosphate 4 mg. per 100 ml. He had, however, received an injection of para-thor-mone a fortnight previously, and after a further 10 days without treatment the calcium fell to 5.5 mg. and the phosphate rose to 5.4 mg. per 100 ml. The serum alkaline phosphatase was 7.5 units per 100 ml. The Ellsworth-Howard test gave a normal response to parathyroid hormone (Fig. 1). X-ray films showed normal bone density and no evidence of calcification in the brain.

Treatment.—The serum calcium level has been raised to 8.8 mg. per 100 ml. by treatment with dihydratichysterol, and the serum phosphate figure is now 3.6 mg. per 100 ml.

Case 4. Pseudohypoparathyroidism

This patient, a girl aged 18, developed tetany after operation for an acute mastoid infection at the age of 6. The symptoms were alleviated by "ostocalcium," but she continued to have mild tetany from time to time and the serum calcium level remained below normal. She had always been undersized and mentally retarded. The menarche was at the age of 13, since when she had menstruated normally. There was no relevant family history.

On examination she was dwarfed, thick-set, and somewhat obese. Her height was 55 in. (140 cm.), span 53½ in. (136 cm.), floor to pubis measurement 26½ in. (67 cm.), and pubis to vertex 28½ in. (72 cm.). Thus the limbs were a little short in comparison with the trunk. The hands and fingers were short and there was a characteristic roundness of the face (Fig. 7). X-ray films showed disproportionate shortening of the fourth and fifth metacarpals. The tibiae were slightly bowed, especially the left one. Secondary sexual development was normal, except for a slight degree of hirsutism. There were no defects in the skin, hair, and nails, and no lens opacities, but the teeth were poorly formed. Chvostek's and Trousseau's signs were positive. The blood pressure was 110/65 and the urine normal.

Investigations.—The serum calcium was 6 mg., phosphate 6.8 mg., and alkaline phosphatase 2.7 units per 100 ml. The Sulkowitch test showed no calcium in the urine and quantitative estimation showed only 12 mg. per 24 hours. The Ellsworth-Howard test showed almost complete resistance to parathyroid hormone (Fig. 1). X-ray films showed patches of calcification in the basal ganglia of the brain. The bone density was normal. Epiphyseal closure was well advanced for her age. Small patches of calcification were seen in the soft tissues of the limbs, some of them being deposited along the course of the blood vessels. The first

premolars of the lower jaw and the first molars of both jaws were unerupted and none of the second molars showed proper root formation. Renal function was impaired; the urine could be diluted to 1002 and concentrated to 1020, but the maximal urea concentration was only 1.08%. Intravenous pyelography was normal.

Treatment.—Dihydratichysterol, 1 ml. (1.25 mg.), was given three times daily. Calcium was detectable in the urine after one week, and within three weeks the serum calcium level had risen to 11.6 mg. per 100 ml. The symptoms and signs of tetany disappeared, and the patient has remained well, with normal serum calcium and phosphate levels, on a maintenance dose of 0.5 ml. of dihydratichysterol daily.



FIG. 7.—Case 4. Pseudo-hypoparathyroidism. Rounding of the face.

Case 5. Post-operative Hypoparathyroidism

A woman aged 37 had had two operations for hyperthyroidism at the ages of 31 and 35. On the second occasion a total thyroidectomy was performed, as the surgeon was suspicious that the goitre might be malignant. After operation she lost her voice, and in the course of five months became myxoedematous. She responded to treatment with thyroid, but then began to have epileptiform convulsions with asphyxial symptoms. She developed a marked laryngeal stridor, due to abductor paralysis of both vocal cords, presumably from injury to the recurrent laryngeal nerves. A tracheotomy was performed, but this failed to relieve the asphyxial attacks. The epileptiform convulsions were not relieved by phenytoin sodium, 1½ gr. (0.1 g.) twice daily, and one year after the second operation she also began to have paraesthesiae in the neck and in the right arm and leg. At this time, while her blood pressure was being recorded, it was noticed that she showed a positive Trousseau's sign, and the serum calcium level was found to be 7.2 mg. (phosphate 4.2 mg.) per 100 ml.

Calcium lactate, 75 gr. (5 g.) and calciferol, 6,000 units daily, failed to alter the serum calcium level, and after a week she was given 9 ml. (11.25 mg.) of dihydratichysterol daily. The serum calcium level rose to 10 mg. per 100 ml. after nine days and the fits ceased to occur. For the past four years she has been maintained on a dose of 6,000 units of calciferol daily, together with 75 gr. (5 g.) of calcium lactate. It has not been possible to dispense with the tracheotomy, and it is therefore clear that the laryngeal palsy was not a result of the hypocalcaemia. It is of interest that both she and her siblings had convulsions in infancy, which suggests that her threshold for convulsions is low.

Case 6. Post-operative Hypoparathyroidism

A married woman aged 46 underwent three operations for a non-toxic goitre between the ages of 15 and 17. She apparently had no symptoms until five years later, when she began to have generalized convulsions. These were thought to be epileptic and were treated as such for a number of years. Some 14 years later it was recognized that she was suffering from chronic tetany. At that time she showed bilateral cataracts, and the serum calcium level was 6.5 mg. per 100 ml.; the serum phosphate level was

not estimated. She was treated with a high calcium intake, hydrochloric acid, and ammonium chloride, with only partial relief. Two years later she was given calciferol, 100,000 units daily, with remarkable improvement. The cataract in the right eye was removed at the age of 44. A year later she began to develop menopausal symptoms, accompanied by emotional instability and a tendency to overbreathe, thus precipitating further symptoms of tetany.

When first seen by us she had been taking vitamin D, 100,000 units daily, for eight years, but was still having tetany. Chvostek's sign was weakly positive, and Trousseau's sign was strongly positive, being accompanied by emotional disturbance and overbreathing. The hair of her head was generally sparse. The blood pressure was 170/110 and the urine normal. The serum calcium was 7.1 mg., phosphate 4.5 mg., and alkaline phosphatase 9.5 units per 100 ml. The electrocardiogram showed left axis deviation with low voltage T_1 , inverted T_2 and T_3 , and depression of the ST segment. The Q-T interval was prolonged. X-ray films showed marked calcification in the basal ganglia and in the region of the cerebellum. The bone density was normal. The Ellsworth-Howard test showed a poor response to the injection of 40 units of para-thor-mone (Fig. 1).

Dihydrotachysterol was substituted for calciferol, and the symptoms and the serum calcium level were controlled by a maintenance dose of 0.66 to 1 ml. daily. Three months later the cataract in the left eye was successfully removed, but a month later still, after a respiratory infection, the symptoms of tetany and epilepsy relapsed to their original state. Neither the symptoms nor the serum calcium level could be controlled by as much as 4 ml. of dihydrotachysterol daily, and treatment with calciferol was resumed instead. The symptoms were well controlled by a dose of 200,000 units daily, and four successive normal serum calcium figures were obtained within a fortnight under inpatient conditions. Five days after discharge from the ward she developed anorexia, followed by thirst, polyuria, an unpleasant taste in the mouth, weakness of the limbs, dyspnoea, and vomiting, and she was readmitted five days later in a confused state, with muscular atony and a serum calcium level of 15.9 mg. per 100 ml. The calciferol was discontinued, but she became maniacal and deluded, and had to be transferred to a mental ward. She subsequently developed a hemiparesis, and the blood urea rose to 72 mg. per 100 ml. Both the mental symptoms and the hemiparesis cleared up within 10 days, and the serum calcium level fell to normal after a further four weeks.

Case 7. Post-operative Hypoparathyroidism

A married woman aged 23 underwent thyroidectomy for hyperthyroidism at the age of 21. Four days after operation she developed tetany, which was relieved by injections of calcium gluconate and dihydrotachysterol. Treatment with dihydrotachysterol was continued only intermittently, in view of difficulty in obtaining supplies. Fifteen months later she became pregnant, and continued to term in spite of the fact that she received no calcium or dihydrotachysterol during pregnancy. There was, however, a return of the attacks of tetany during labour. Lactation was terminated after two months on account of a breast abscess. When inadequately treated she was inclined to emotional instability and hyperventilation, with exacerbation of her tetany. She was investigated when not under the influence of treatment, and showed positive Chvostek's and Trousseau's signs, a serum calcium level of 6.1 mg. and a phosphate level of 4.9 mg. per 100 ml., and only a trace of calcium in the urine. The Ellsworth-Howard test showed a normal response to parathyroid hormone (Fig. 1). There were no defects in the skin, hair, or nails, and no opacities in the lenses on examination with a slit-lamp.

Her symptoms were controlled, and a normal serum calcium level was maintained, on a dose of 1 ml. of dihydrotachysterol daily.

Mode of Presentation

Tetany.—Three of our cases presented with this symptom (Cases 3, 4, and 7). Carpopedal spasms also occurred in Cases 1, 5, and 6, but they were overshadowed by other manifestations. In Case 2 the only symptoms of tetany which could be elicited were mild paraesthesiae and cramps. The symptoms may indeed vary from trivial paraesthesiae to severe generalized spasms. Sometimes these involve the respiratory muscles, and, rarely, the diaphragm is affected, with fatal results. Shelling (1935) describes other occasional manifestations of tetany, such as strabismus, nystagmus, abnormalities of the pupils, dysphagia, dysarthria, symptoms of pyloric or intestinal obstruction, bronchial spasm, retention or incontinence of urine, peripheral oedema, Raynaud's phenomenon, tachycardia, cardiac irregularities, or even sudden cardiac arrest. Boothby *et al.* (1931) describe weakness and fatigability of the muscles, and Lachmann (1941) describes intermittent pareses in the limbs in one case. Infantile convulsions may occasionally be due to hypoparathyroidism, which may be physiological in the neonatal period or may represent the onset of idiopathic hypoparathyroidism (Bakwin, 1939).

Epilepsy.—Cases 5 and 6 presented with typical major seizures, and were treated for some time as cases of idiopathic epilepsy. In Case 6 the fits did not begin until five years after thyroidectomy, which made the diagnosis more elusive. Approximately 40% of the cases of idiopathic hypoparathyroidism recorded in the literature have presented with epilepsy, and many cases have escaped recognition as a result of this. Either major or minor seizures may occur. They are not necessarily associated with frank symptoms of tetany, and, when they are, their onset is often independent, but they usually cease when the serum calcium level is restored to normal. The electroencephalogram may show typical epileptic changes, and the abnormal waves tend to disappear with correction of the serum calcium level, but the record does not necessarily become normal, suggesting either that these patients are latent epileptics or that irreversible cerebral changes have occurred (Kowallis, 1941; Taubenhau and Engle, 1945; Mortell, 1946; Gotta and Odoriz, 1948). In Case 1 there were no true epileptic manifestations, but there was a history of seizures of a myoclonic pattern.

Ectodermal Lesions.—Case 2 showed patchy loss of hair, loss of the eyebrows and eyelashes, and deformity of the nails. More commonly, the hair of the head is generally sparse, and rarely there is complete alopecia. There may also be loss of pubic and axillary hair. In some cases the skin becomes dry, rough, and scaly. The nails and the mouth may become infected with moniliasis in idiopathic hypoparathyroidism (Thorpe and Handley, 1929; Sevringhaus, 1942; Sutphin *et al.*, 1943; Talbot *et al.*, 1943). Impetigo herpetiformis has also been described as an association with chronic tetany (Lachmann, 1941).

Cataracts.—Case 2 attended an eye hospital with cataracts in the first instance and was referred to a physician only because of the finding of a trace of reducing substance in the urine. Cataracts were also present in Cases 1, 3, and 6, and had to be extracted. They may occur in chronic hypocalcaemia from any cause (Albright and Reifenstein, 1948). Although some authors have claimed that those occurring in hypoparathyroidism have a distinct pattern and that they tend to develop in the subcapsular layer, O'Brien (1932) came to the conclusion that there was no characteristic morphology. Cataracts may develop in the absence of frank symptoms of tetany or when the symptoms have become much milder, either with or without treatment. They may develop rapidly, leading to blindness within a few months (Emerson *et al.*, 1941).

It is clear that cases of hypoparathyroidism may present in various ways and that they may be referred in the first instance to various special departments. Thus Case 1 first came to a neurological clinic, and Case 2 to an eye hospital, and it is likely that other cases might be found in skin clinics. Though classical carpopedal spasms may easily be

recognized, mild tetany may be mistaken for acroparaesthesiae, "neuritis," "fibrositis," "cramps," or "hysteria." More cases of hypoparathyroidism might come to light if the diagnosis were borne in mind in such cases, and in cases of epilepsy, in cases of cataract occurring in young persons, and in patients with trophic lesions in the skin, hair, and nails.

Other Manifestations

Changes in Teeth.—When parathyroid deficiency arises in childhood the enamel is often deficient and shows transverse ridges, and changes occur in the dentine. Sometimes there may be delay or failure of eruption. These changes do not occur when the disease arises in adult life, and decalcification never occurs (Albright and Strock, 1933).

Mental Changes.—Anxiety symptoms were prominent in Cases 6 and 7, and there was a resulting tendency to hyperventilation, precipitating further attacks of tetany. Case 1 showed intellectual deterioration and emotional instability and incongruity, and Case 2 showed moroseness, irritability, impairment of memory, and loss of interest in his appearance. Frank psychoses of manic-depressive and delusional types have been described (Barr *et al.*, 1938; Eaton and Haines, 1939; Greene and Swanson, 1941; Scarlett and Houghtling, 1944). These mental changes usually resolve within a few weeks after the serum calcium is restored to normal, which suggests that they are the direct result of hypocalcaemia. Mental retardation has also been recorded in a number of cases of idiopathic hypoparathyroidism arising in childhood.

Papilloedema occurs occasionally. It subsides when the serum calcium level is restored to normal (Albrecht, 1923; Shelling and Goodman, 1934; Barr *et al.*, 1938; Hurxthal, 1942; Sutphin *et al.*, 1943; Mortell, 1946; Berezin and Stein, 1948). The combination of papilloedema and epilepsy may suggest a cerebral tumour.

Physical Development.—In a number of cases arising in childhood the patients have been undersized. The height has been recorded in the literature in 10 cases in which the patient has reached the age of 18. The heights ranged from 57 to 67 in. (145 to 170 cm.), average 61½ in. (156 cm.). In some cases puberty has been delayed and secondary sexual characters have been underdeveloped.

Other Endocrine Disorders.—These are seldom found. Hypothyroidism occasionally occurs in post-operative cases (as in Case 4); it has also been described in two idiopathic cases (Himsworth and Maizels, 1940; Lachmann, 1941). Addison's disease has been associated with idiopathic hypoparathyroidism in three cases (Sutphin *et al.*, 1943; Talbot *et al.*, 1943; Leonard, 1946). In Leonard's case necropsy showed atrophy of the adrenal glands as well as absence of the parathyroids; in the case of Sutphin *et al.* there was tuberculous infection.

Hypoparathyroidism has not been recorded in panhypopituitarism, and there is no good evidence that a pituitary parathyrotrophic factor exists. This subject is reviewed by Collip (1940), Törnblom (1949), and Engfeldt (1950).

Diagnosis

Blood Chemistry.—The serum calcium figure is reduced and the serum inorganic phosphorus level is raised. The normal range for the serum phosphate level is given by Albright and Reifenstein (1948) as 3.2 mg. per 100 ml. $\pm$ 0.5 but in our laboratories it is from 2.5 to 5 mg. per 100 ml. Drake, Albright, *et al.* (1939) regard a raised serum phosphate level as an essential diagnostic criterion. This distinguishes hypoparathyroidism from other low-calcium disorders, such as rickets, osteomalacia, and steatorrhoea, in which the blood is unsaturated with calcium and phosphorus and both levels tend to be low. The only other condition in which a low serum calcium level and a high serum phosphorus level are found is chronic renal disease; this should therefore be excluded. In Case 1 the serum phosphorus level was never higher than 4.5 mg. per 100 ml.;

this figure is raised by Albright and Reifenstein's standards, though it falls within our normal range.

Radiological Findings.—Calcification was present in the basal ganglia in three of our cases (Cases 1, 4, and 6). In Cases 4 and 6 it was punctate, but in Case 1 it was arranged in radiating striations (see Fig. 2). The radiological aspects of Cases 1 and 3 have already been reported (Medill, 1951), and the subject is reviewed by Camp (1947), Siglin, Eaton, Camp, and Haines (1947), and Foley (1951). The bone density is normal or increased. It was increased in Case 1, but was normal in the others. Rarefaction does not occur as a primary feature of hypoparathyroidism; it was reported in one of Emerson, Walsh, and Howard's cases (1941) and in one of Lachmann's cases (1941), but in both of these it was probably due to post-menopausal osteoporosis. The metabolic and radiological changes can best be explained on the basis of the theory of Albright and his colleagues that the primary action of parathyroid hormone is to increase the excretion of phosphorus in the urine, leading to a fall in the serum phosphate level and a compensatory rise in the serum calcium level. It follows that in hypoparathyroidism the initial change will be a rise in the serum phosphate level, followed by a compensatory fall in the serum calcium level. Since the blood is fully saturated with calcium phosphate, a rise in the phosphate concentration, together with continued absorption from the intestine, will lead to a tendency to supersaturation of the blood, with an increase in deposition of bone salt and an increase in bone density (Albright and Reifenstein, 1948). The cerebral calcification may be due to the same mechanism, but it is not clear why the brain is affected and other soft tissues are not.

Electrocardiographic Changes.—The characteristic change of hypocalcaemia is seen—namely, prolongation of the Q-T interval.

Electroencephalographic Changes.—There may be: (a) slow waves of 2 to 5 cycles a second (as in Case 1), usually in series of three or four waves, but sometimes in stretches of up to 10 seconds; (b) typical epileptic changes, with groups of slow waves and spikes; (c) a continuous generalized disturbance of rhythm; or (d) a normal record (Gotta and Odoriz, 1948).

Pseudo-hypoparathyroidism

This consists of three independent genetic defects. (1) There is a disturbance of the peripheral action of parathyroid hormone, producing effects exactly similar to those of true hypoparathyroidism, except that the injection of parathyroid hormone usually fails to increase the excretion of phosphate in the urine (see Fig. 1). The parathyroid glands are shown to be normal or hyperplastic on biopsy. (2) There is a dyschondroplasia, resulting in a short stature and in shortening of various bones, particularly the metacarpals and metatarsals. (3) There is a tendency for the subcutaneous tissues to become calcified and to form bone. The appearance of these patients is characteristic. They are short and thick-set; the face is rounded (see Fig. 6) and they are often mentally retarded. All these features are well shown by Case 4. The suggestion that the condition is due to a genetic disturbance is confirmed by its occurrence on two occasions in a pair of twins, and in another case in a mother and child (Elrick *et al.*, 1950).

The distinction from true hypoparathyroidism is to a large extent academic, as the treatment is the same, but it is of considerable general interest, since it shows that an endocrine disorder may result not only from failure of secretion of a hormone but also from an abnormal peripheral response to it.

Treatment

Para-thor-mone is of very limited value, since acute cases following operation are more rapidly controlled by administration of calcium salts, and in chronic cases the hormone has four disadvantages: (1) it is expensive, (2) it has to be given by injection, (3) it is apt to give rise to local

reactions, and (4) it leads to antibody-formation and therefore begins to lose its effect after a few weeks (Albright and Ellsworth, 1929).

Either calciferol (vitamin D₂) or dihydrotachysterol should be used. These substances differ in chemical structure only in the saturation of a double bond. Whereas parathyroid hormone increases the excretion of phosphate in the urine but has no effect upon calcium absorption, calciferol acts principally upon calcium absorption, and only to a less extent upon phosphate excretion. Dihydrotachysterol, on the other hand, more closely resembles parathyroid hormone in its action, in that it acts primarily upon excretion of phosphate and only to a less extent upon absorption of calcium (Albright *et al.*, 1938). There is also evidence that both calciferol and dihydrotachysterol have a direct action upon bone, leading to resorption and mobilization of calcium (Selye, 1932).

Dihydrotachysterol is usually given in doses of 3 ml. (3.75 mg.) daily initially, the dose being reduced to 0.5 or 1 ml. (0.625 to 1.25 mg.) daily for maintenance treatment. Calciferol usually has to be given in doses of 100,000 to 400,000 units daily (Sevringhaus and St. John, 1943) or occasionally 500,000 units (Himsworth and Maizels, 1940).

McLean (1941) states that the toxic effects of vitamin D have been overemphasized, and that many of the effects reported by earlier workers were due to the high toxicol content of the original preparations. The dangers are by no means negligible, however, as Anning *et al.* (1948) and Howard and Meyer (1948) have pointed out. Anning *et al.* found toxic symptoms in 19% of 200 patients who were receiving 100,000 to 150,000 units of calciferol daily for treatment of various skin diseases. Howard and Meyer describe toxic effects in 11 cases but only one of these was suffering from hypoparathyroidism. The symptoms of intoxication consist of thirst, anorexia, vomiting, tiredness, malaise, nausea, headache, constipation, abdominal pain, polyuria, intolerance of noise, loss of weight, excitability, photophobia, rhinorrhoea, generalized pruritus, and, occasionally, drowsiness and coma, psychic disturbances, impaired memory, paraesthesiae, muscular pains and atony, and amblyopia. Howard and Meyer report calcium deposits beneath the conjunctival basement membranes, as seen with the slit-lamp, in 9 of 11 cases, and albuminuria in seven cases. All their cases showed impairment of renal function, with blood non-protein-nitrogen levels of 46 to 106 mg. per 100 ml. Psychotic changes as severe as those occurring in Case 6 do not appear to have been reported previously. It seems that the risk of toxic effects is smaller in cases of hypoparathyroidism, and in fact few such cases have been reported. But Howard and Meyer's case and our Case 6 show that the risk exists and that the consequences may be serious.

It is probable that toxic symptoms are due to an individual idiosyncrasy or to impaired renal function. In Case 6 they resulted from a dose of 200,000 units daily, and in Howard and Meyer's case of hypoparathyroidism on a dose of 300,000 units daily, whereas many other patients have received much higher doses without untoward effects. Both in Case 6 and in Howard and Meyer's case the symptoms occurred within three weeks of starting calciferol treatment, though our Case 6 had previously received a prolonged course of 100,000 units daily, and had been thought to have developed mild intoxication some years previously.

If toxic symptoms appear the drug must be discontinued immediately, fluids must be given copiously, and the calcium intake must be reduced to a minimum. Howard and Meyer found that the serum calcium level remained raised for two to four months, and in one case for as long as 20 months, during which time the blood urea level remained slightly raised and renal function remained impaired. Under such conditions there is, of course, a risk of widespread soft-tissue calcification. In our Case 5 the serum calcium level returned to normal within four weeks.

Similar toxic effects have been observed by some workers with dihydrotachysterol, but these have not been of serious

import; no fatal case has been reported so far as we are aware, and no evidence has been obtained of chronic damage, even when the serum calcium level has been raised temporarily as high as 15 mg. per 100 ml. (McLean, 1941). Dihydrotachysterol is probably less likely to give rise to hypercalcaemia than is calciferol, since it does not predominantly influence calcium absorption.

Summarizing, dihydrotachysterol is preferable to calciferol on theoretical grounds, in that it more closely resembles parathyroid hormone in its action. In practice there seems to be little difference between them so far as their effect upon the clinical and biochemical picture is concerned. But, assuming that an average maintenance dose of dihydrotachysterol is 0.5 ml. daily, and that this is equivalent to 100,000 units of calciferol daily, the expense of treatment amounts to approximately £1 a month in the case of dihydrotachysterol, as against approximately 1s. a month in the case of calciferol. On the other hand, calciferol is probably more likely to produce hypercalcaemia, since it acts primarily upon calcium absorption. Occasional cases show resistance to dihydrotachysterol (Holtz, 1933), and cases of pseudo-hypoparathyroidism may be relatively resistant to dihydrotachysterol as well as to parathyroid hormone (Albright *et al.*, 1942).

We have not found it necessary to give calcium salts as well, and, as dosage has to be readjusted repeatedly, it would appear to be easier to deal with only one variable than with two. Nor have we paid any attention to the diet, as no patient is likely to maintain a strict intake of calcium and phosphorus, and it does not seem to be necessary to control it. Milk should, however, not be taken in excess, for its phosphorus content is high (Albright and Reifenstein, 1948).

Albright and Reifenstein state that treatment can be controlled adequately by testing the urine for calcium, with Sulkowitch reagent. We have not found the Sulkowitch test to be reliable in practice. In Case 6 only a moderate reaction was obtained, even though the patient was in a state of acute hypercalcaemia, and on other occasions we have found subnormal calcium levels when the Sulkowitch reaction was optimal. Sevringhaus and St. John (1943) and Jordan and Kelsall (1951) have also found the test to be not completely reliable. In our experience, it is necessary to control treatment by means of repeated estimations of the serum calcium level. The chief value of the Sulkowitch test is that it can be performed regularly by the patient himself, and that a strongly positive or negative reaction should warn him that his treatment requires immediate readjustment. It is important that the test-tubes should be cleaned with distilled water, as tap-water usually contains considerable amounts of calcium.

Dosage may have to be increased during pregnancy, but a few cases improve at this time, as in Case 7 and in Scarlett and Houghtling's case (1944), and some cases quoted by Lachmann (1941). The dose may also have to be increased during periods of physical and mental strain, during infections, and after operations.

In practice we have found that stabilization is not nearly as easy as might appear at first sight, and that the dosage repeatedly needs to be adjusted. The principles of treatment are in fact very similar to those involved in the treatment of diabetes mellitus.

The aim should be not only to control symptoms but to maintain a persistently normal level of serum calcium, in the attempt to avoid such serious complications as cataracts, mental changes, and calcification in the brain.

Summary

Three cases of idiopathic hypoparathyroidism, three post-operative cases, and one case of pseudo-hypoparathyroidism are described.

The cases usually present with tetany, the symptoms of which are very variable. Epilepsy is also a common presenting symptom. Some cases may present with

cataracts or with ectodermal defects. Other manifestations include defects in the teeth, psychoneurotic or psychotic disturbances, papilloedema, and physical and mental retardation.

The serum calcium level is reduced and the serum phosphate level is raised.

X-ray films often show calcification in the brain, especially in the basal ganglia, and normal or increased density of the bones.

The electrocardiogram shows a prolonged Q-T interval and the electroencephalogram shows abnormal slow waves or epileptic changes.

Pseudo-hypoparathyroidism is due to abnormal resistance to parathyroid hormone and presents exactly similar features, together with a dyschondroplasia, resulting in a short stature and shortening of the metacarpal and metatarsal bones, and a tendency to metaplastic bone formation in the soft tissues.

Treatment is by means of dihydrotachysterol or calciferol. Theoretically, the former is preferable, in so far as it more closely resembles parathyroid hormone in its action; but in practice there is little to choose between them. Dihydrotachysterol has the disadvantage that it is considerably more expensive, while calciferol is probably more apt to give rise to hypercalcaemia.

Though idiopathic hypoparathyroidism and pseudo-hypoparathyroidism are generally regarded as rare disorders, it is likely that more cases would come to light if the diagnosis were borne in mind in cases with obscure paraesthesiae and pains and cramps in the limbs, and in cases of epilepsy, of cataract in young persons, and of defects in the ectodermal tissues.

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Addendum. Since this article was submitted for publication we have found it necessary to increase the doses of dihydrotachysterol (A.T.10) considerably above the amounts indicated in the text. Thus Case 4 now requires 6 ml. daily, and Case 7 4 ml. daily, of the material at present available in this country, in order to maintain a normal serum calcium level. Case 3 has required 3 ml. throughout. We are in close consultation with the manufacturers, who are investigating this discrepancy.

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THE RECENT TRENDS OF INFECTIOUS DISEASES IN CHILDHOOD

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Since the inception of the National Health Service Act in 1948 the level of the notifications of three common infectious diseases of childhood—scarlet fever, whooping-cough, and measles—has been above that of the immediately preceding years. During the first quarter of 1951 the weekly notifications of both measles and whooping-cough reached the highest point since these diseases were made notifiable, and an even larger incidence of measles has been recorded in the first quarter of 1953. Diphtheria, on the other hand, has declined consistently and rapidly, and the average weekly notifications during the first quarter of 1953 were only 20, compared with 900 for the first quarters of 1940 and 1941. The number of notifications and the deaths per 1,000 notifications for these four diseases, for the years 1940 to 1952, are shown in Table I. The incidence of measles, scarlet fever, and whooping-cough rose in 1948, and it may well be thought that the recent high level of these diseases is due only to the operation of the National Health Service, because medical advice is more often sought regarding mild cases. It is to be noted, however, that the incidence of all three was unusually large for the first six months of 1949—that is, preceding the operation of the Service—as can be seen from Figs. 1, 2, and 3.

Table I shows that the fall in the fatality rates, which had been apparent since 1942, was accentuated in 1948 for measles and whooping-cough. The fatality rates for these diseases were about half of those in the preceding year. The obvious explanation for the large drop in fatality is that more mild cases were being notified. Scarlet fever did not show a large fall in the fatality rate, and the decrease was no larger than would have

TABLE I.—*Infectious Diseases: Notifications and Death Rates. England and Wales*

Year	No. of Notifications				Deaths per 1,000 Notifications			
	Measles	Whooping-cough	Scarlet Fever	Diphtheria	Measles	Whooping-cough	Scarlet Fever	Diphtheria
1940	407,468	53,545	63,778	45,445	2.1	12.7	2.4	54
1941	407,949	173,249	58,051	49,432	2.8	13.8	2.3	53
1942	285,446	65,986	83,830	40,042	1.6	12.1	1.2	45
1943	373,788	96,105	113,917	33,277	2.1	11.6	1.1	41
1944	157,125	93,944	90,581	22,085	1.5	11.2	1.2	40
1945	445,412	62,663	72,174	17,580	1.6	11.0	1.1	39
1946	159,553	92,892	56,099	11,601	1.3	8.7	0.7	39
1947	393,116	92,657	57,246	5,492	1.6	9.8	0.7	44
1948	399,185	146,372	73,940	3,531	0.8	5.1	0.5	44
1949	385,753	102,801	70,186	1,874	0.8	5.1	0.4	45
1950	367,598	157,752	65,878	959	0.6	2.5	0.5	51
1951	616,093	169,347	48,735	658	0.5	2.7	0.8	50
1952	389,505	114,868	67,251	375	0.4	1.6	0.3	85

been expected from a continuation of the existing trend. It would appear that clinically recognizable attacks of scarlet fever were fairly completely notified prior to 1948. The trend of diphtheria appears to be unaffected by the events of 1948, although the fall in the number of notifications was not proportionately so large as in the preceding year. The percentage rates of decline for 1945 to 1948 were 21, 33, 53, and 36 respectively. The case fatality of diphtheria in 1948 was the same as in 1947. There is no evidence, therefore, from the notifications or deaths that the trend of diphtheria was disturbed in 1948.

It seems of interest to examine the trends of whooping-cough, scarlet fever, and measles in an attempt to decide whether more complete reporting can wholly or partially explain their increase in incidence or whether there has been a real increase in prevalence.

Scarlet Fever

The number of notifications of scarlet fever has been generally accepted as a good index of the actual incidence for the 20 years prior to 1948. On the basis of notifications it has been estimated that about 10% of the child population suffered from a notifiable attack of scarlet fever before the age of 15. This value was in close agreement with the

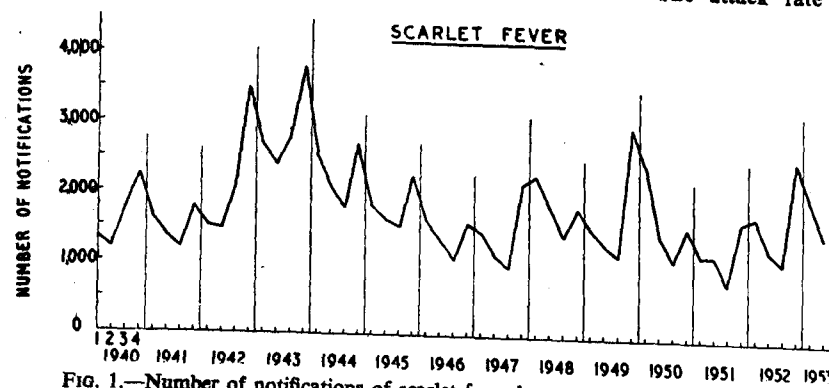


FIG. 1.—Number of notifications of scarlet fever by quarters, England and Wales.

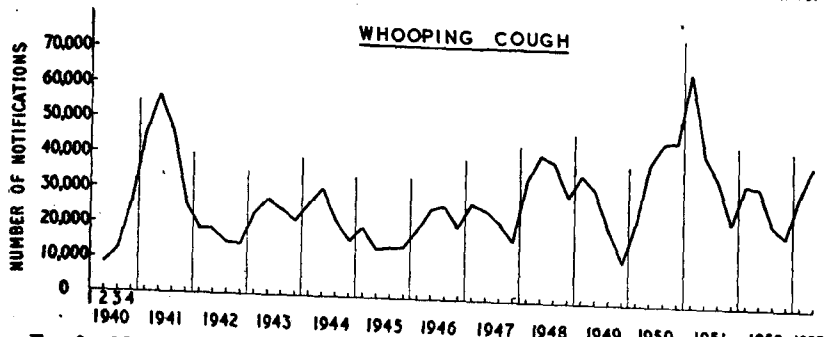


FIG. 2.—Number of notifications of whooping-cough by quarters, England and Wales.

proportion found in field surveys—for example, Stocks's (1930) investigation in St. Pancras. The records of over 10,000 children in 26 English public boarding schools examined during 1930–4 (Epidemics in Schools, 1938) showed that a history of an attack of scarlet fever before entry into school was given by 8.3% of the boys and 7.2% of the girls.

It follows that it was not to be expected that the operation of the National Health Act would materially affect the reported incidence of scarlet fever, since there was no evidence that any appreciable number of cases escaped notification. The rhythm of the seasonal trend was altered just before the operation of the Health Service, when instead of the expected fall in incidence in the first quarter of 1948 the number of notifications slightly exceeded those in the preceding fourth quarter (Fig. 1). This phenomenon of the postponement of the seasonal peak to the first quarter occurred again in 1951–2. The difference between the expected and the actual number of notifications is so large that it seems extremely unlikely that the exceptional trend in the first quarter of 1948 can be explained by the inclusion of mild cases which in preceding years would have escaped notification. The deaths per 1,000 notifications given in Table I also show that no large abrupt change occurred in 1948. It would appear, therefore, that there was a real increase in the prevalence of scarlet fever just before the introduction of the Health Service.

The age of attack of scarlet fever differs from that of measles or whooping-cough. The school-child has a greater

TABLE II.—*Notifications of Scarlet Fever per 100,000 Living. England and Wales*

Year	Ages 0–4	Ages 5–14	Ratio (5–14/0–4)
1944	652	1,056	1.62
1945	531	836	1.57
1946	410	647	1.58
1947	362	658	1.82
1948	338	839	1.56
1949	380	770	1.33
1950	565	679	1.20
1951	403	504	1.25
1952	522	724	1.38

rate of attack from scarlet fever than the pre-school child, while the reverse is the case for the other two diseases. The attack rate for recent years is shown in Table II.

There is a suggestion that the attack rate for the pre-school child compared with that of the school-child has become relatively larger in the last four years of the period. This may have been due to young children receiving medical attention who prior to 1948 would not have been seen and notified by a medical practitioner. Just as likely an explanation is that there has been a real shift in the age of attack.

Whooping-cough

The numbers of notifications of whooping-cough prior to 1948 were known to be defective, and from them the estimated proportion of children who had an attack of whooping-cough before the age of 15 was 15%. This value was much below that of about 70% found in field surveys or in the inquiry into the 26 English public schools (Epidemics in Schools, 1938), when 70% of the boys and 67% of the girls had a history of whooping-cough before entry. The available evidence leads to the conclusion that only about one-quarter of the children with whooping-cough were notified in the years immediately preceding 1948. Probably in many

cases medical attention was not sought. In discussing this deficit, Stocks (1949) stated: "Whether or not the National Health Service, coupled with the increased notification fee for whooping-cough, will result in an increase in the proportion of children and adults notified remains to be seen, but there is room for a large increase."

A large rise in incidence began before the start of the Health Service in 1948, and the number of notifications in that year was larger than in any of the six preceding years—though less than in 1941 (Fig. 2). A further large rise occurred in 1950–1, when the outbreak lasted two years. Table I shows that the recorded fatality rate, which had been falling slowly since 1941, fell abruptly in 1948 to almost half the level of 1947. The large outbreak in 1950–1 was accompanied by a further halving of the recorded fatality rate. The trend of this rate suggests that since 1948 the increase in the numbers of notifications of whooping-cough is due to more cases coming to the notice of the medical practitioners than formerly.

If the evidence of the field inquiries is accepted that 60 to 70% of the child population suffer an attack of whooping-cough before the age of 15, then even the higher incidence of whooping-cough since 1948 would imply that less than half of the cases of whooping-cough were notified during 1948–52. It seems, therefore, that most of the increase in the number of notifications in the past five years could be accounted for by increased case-finding, but the rather erratic decline in the recorded fatality rate makes an estimation of the amount of real increase in prevalence rather uncertain. This uncertainty is increased by immunization against whooping-cough, which has been practised during this period. If immunity has been conferred on any appreciable proportion of the child population then a part of the increase in the number of notifications was due to an increased prevalence of the disease.

Whooping-cough is a disease of the pre-school child, and the attack rate for children aged 0 to 4 is slightly more than three times that of children aged 5 to 14. The ratio of the attack rate of the pre-school children to that of the schoolchildren has been practically constant during recent years.

Measles

The estimated proportion of children notified as suffering from measles between 1940, when measles was first made notifiable, and 1947 was slightly less than 50%. This compares with 72.5% for boys and 63.1% for girls with a history of measles before entry into English public schools in 1930–4 (Epidemics in Schools, 1938). Many children suffering from a mild attack of measles were not seen by a medical practitioner, and Stocks (1949) estimated that the notification rate represented only about two-thirds of the true incidence. He stated: "The National Health Services and raising of the notification fee in 1948 may result in some increase in the proportion who are notified." Prior to 1948 measles had a well-marked biennial distribution with alternating years of high and low incidence (Fig. 3). In years of low incidence the maximum occurred in the second quarter, while in years of high incidence the peak was in the first quarter, except for 1945, when the number of notifications in the second quarter slightly exceeded the number in the first.

According to this pattern 1948 should have been a year of low incidence, but in fact the number of notifications slightly exceeded those in 1947. The outbreak in 1948, with a large rise in the second quarter, differed from preceding major outbreaks in seasonal distribution. The distinctive peak in the alternate first quarters reappeared in 1949, 1951, and 1953, but the incidence in the inter-epidemic years did not fall to the low level recorded prior to 1948.

and the notifications in 1950 and 1952 were twice the number recorded in 1944 and 1946. A large fall in the fatality rate supports the hypothesis that many more mild cases than usual were notified. The fatality rate had been falling since 1941, with a large fall in the years of low incidence and a small rise in the years of high incidence. From the trend of the fatality rates a value of 1.1 instead of 0.8 would have been expected in 1948.

If we assume that the difference between the observed and the expected fatality rate was due to an increase in case-finding then the number of notifications necessary for 326 deaths to give a rate of 1.1 per 1,000 would be 296,000, and the difference between this value and the actual notifications gives 100,000 as the estimated increase due to better case-finding and reporting. Reducing the number of notifications in 1948 by 100,000 still leaves a total which is almost twice that of 1946 or 1944, the preceding non-epidemic years. On this basis it appears that the increase in incidence in 1948 was contributed in equal parts by a real increase in prevalence and by more complete notification, and the disease was almost twice as prevalent in 1948 as in 1946 or 1944.

It was expected that the operation of the National Health Service would appreciably raise the number of persons seeking medical attention and the number of consultations, especially among the previously non-insured section of the population, mainly women and children, in the lower-income groups. How far this group contributed to the increase in the number of notifications of infectious diseases is a matter of speculation. A comparison between the experience of different types of areas selected according to their degree of industrialization presents some difficulties.

TABLE III.—*Number of Notifications of Measles*

Year	Group 1	Group 2	Ratio
1947	4,081	2,588	1.6
1948	7,264	4,893	1.5
1949	7,101	4,134	1.7
1950	5,551	2,473	2.2
1951	11,671	7,966	1.5
1952	7,203	4,543	1.6

The two chief are: (a) the dispersal of the child population during the war years, which invalidates any comparison before 1946, and (b) the only information at present available regarding occupations and industries is that of the 1931 census. Despite these difficulties, it was thought it would be of interest to compare two contrasting groups of London boroughs. These groups were chosen on the basis of the social classes of the occupied males.

Group 1 consisted of six boroughs—Hampstead, Holborn, Kensington, Lewisham, Wandsworth, Westminster—with the largest proportion of occupied males in social classes I and II and a low proportion in classes IV and V. Group 2 comprised six boroughs—Bermondsey, Bethnal Green, Finsbury, Poplar, Shoreditch, Southwark—which had the largest proportions of the male population in social classes IV and V. Although the classification of these boroughs depends

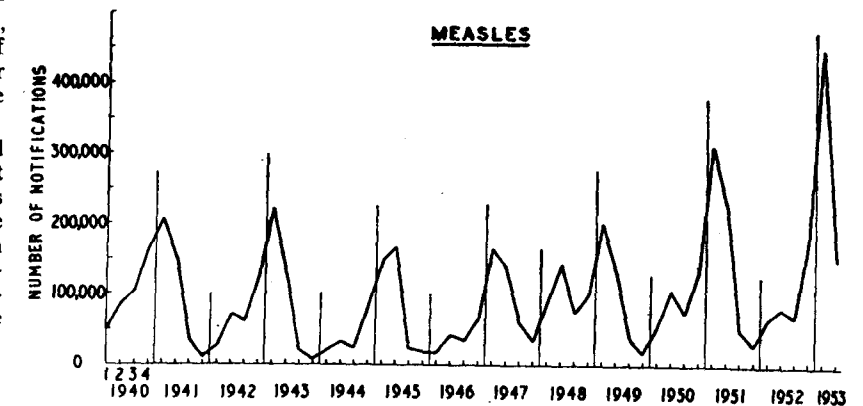


FIG. 3.—Number of notifications of measles by quarters, England and Wales.

on outdated material it is not likely that any borough has moved from one extreme to the other in social grading. The trend of the incidence of measles in both these groups of boroughs was very similar, and there was no difference of any importance between them. A summary of their positions is given in Table III. It appears from these values that the relative incidence of measles was constant during the period, although Group 1 had relatively a larger outbreak than Group 2 in 1950 owing to a summer rise in incidence. The introduction of the National Health Service in 1948 did not have any differential effect on the incidence.

In recent years the measles attack rate has been twice as large among pre-school children as among school-children, and the ratio of these attack rates has been practically constant during the past nine years.

Summary

The number of notifications of scarlet fever, whooping-cough, and measles rose in the six months preceding the operation of the National Health Service in 1948 and has remained above the level prevailing in 1946-7.

Scarlet Fever.—Although the incidence in the first quarter of 1948 was unusually high the subsequent level of the notifications does not suggest that the prevalence of scarlet fever has undergone much change in recent years. There is, however, a suggestion that since 1948 the disease has tended to be more concentrated on the pre-school child.

Whooping-cough.—A large increase in the numbers of notifications has occurred since 1948. If the pre-war estimate that 70% of the child population have an attack of whooping-cough before age 15 is still valid, then only about one-half of the cases are being notified. But if immunization against whooping-cough has been carried out on large enough numbers it is possible that the higher level of notifications since 1948 is due to a real increase in prevalence.

Measles.—The level of notifications of measles has increased in recent years. The whole of the rise in 1948 cannot be explained by increased case-finding and reporting, and it seems that there was a real rise in prevalence just before the operation of the National Health Service. The proportion of children under 15 who suffer a notifiable attack of measles has risen from about one-half in the early 1940's to about two-thirds in the last five years. It seems probable that there has been a real increase in prevalence during these years.

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The Pakistan Minister for Health, Dr. A. M. Malik, in his country's parliament last month, gave details of steps taken in co-operation with the World Health Organization to improve public health and provide facilities for medical treatment. He said that the United Nations International Children's Emergency Fund had offered a 700 tons annual capacity plant for making Pakistan self-sufficient in her requirements of D.D.T. Work on the construction of the buildings and installations of the plant at Naushera in the Frontier Province had progressed considerably, and the plant should go into production in July. A B.C.G. vaccination campaign had been started in 1949, and so far more than 2,200,000 persons had been vaccinated. In East Pakistan a three-year programme for improving teaching and practice facilities at a nursing school in Dacca had been launched.

CLINICAL AND CHEMICAL STUDIES IN HUMAN LACTATION*

VI. THE FUNCTIONAL CAPACITY OF THE BREAST

BY

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There is little published evidence about the relationship of the size of the breast to its functional efficiency, but it is generally held by clinicians that no strong relationship exists. On the other hand, there is a well-recognized relationship between the size and function of the cow's udder: Gowen and Tobey (1927) computed that 1 lb. (450 g.) of udder would produce 1 lb. (450 ml.) of milk in three hours. It is reasonable to expect that, if there were any clear relationship in women, then this knowledge would have been incorporated into the general folklore of lactation; but the only idea occurring sporadically in the old literature, and still commonly held to-day, is that the very large breast is likely to have a poor performance. Nevertheless, Lussky (1951), in a hospital study, found that successful lactation occurred in 50.2%, 36.6%, and 19.0% of women with "large," "medium," and "small" breasts respectively.

The capacity of the breast to secrete milk probably depends on the amount of functional tissue it contains, and this is not necessarily related to the size of the breast: not only is there a layer of subcutaneous fat of variable thickness, but the gland itself, as has been demonstrated in post-mortem material by Engel (1941), shows an enormous variation in the ratio of parenchyma to fibrous tissue, ranging from almost 100% secretory tissue to almost none.

It would nevertheless be surprising if there were no relationship whatever between the size of the breast and its functional ability, and it is of some clinical interest to determine accurately what that relationship is.

For comparative studies, an estimate of the amount of functional tissue might be made in the living subject by measuring changes in breast size occurring in response to the menstrual cycle or to pregnancy. Engel (1947) believes that subjective impressions of breast enlargement during the premenstruum are a good index of the breast's functional equipment, presumably on the basis that the enlargement is due to proliferation of glandular tissue. This may be so, but breast changes during the cycle are due only partly to such proliferation, and, in any case, mostly to non-secretory tissue; much of the enlargement may be caused by oedema in the stroma (Geschickter, 1945), perhaps as part of a more general mechanism of water retention, and not directly related to the amount of gland present. The enlargement which occurs in pregnancy is likely to be a more reliable index of the amount of functional tissue, since it is due mostly to the proliferation of the gland. No study of these changes has been reported.

Previous Technique of Breast Measurement

Ingleby (1949) measured wax impressions taken from serial plaster casts of the breasts of 17 women during the menstrual cycle, and appeared able to measure differences of the order of 30 ml. Geschickter (1945) estimated the menstrual enlargements of the breasts in two women by measuring the

differences in the amount of water required to fill a glass vessel, applied to the chest and enclosing the breast. He describes a difference in one subject of only 15 ml., but this difference is likely to be less than the experimental error of such a method. Reimann and Seabold (1933), incidental to a study of breast lesions during the menstrual cycle, calculated areas of the x-ray shadows of breasts in profile, but this method is clearly subject to a good deal of inaccuracy and is, in any case, not comparable with three-dimensional estimations.

The fundamental difficulty in the determination of breast volume by any method *in vivo* is to define the posterior surface; that is, the chest wall underlying the breast. If a plaster cast of the breast is taken, then it is not difficult to curve the posterior wall to an arbitrary approximation of the chest contour, but, if a series from the same subject are to be made, then an artificial "chest wall" must be made first and all subsequent models fitted to it, so that the posterior surface, if not true to life, is at least constant for all the models. The method of making plaster casts takes time and requires a considerable degree of co-operation from the subject. It is also unsatisfactory for the large pendulous breast.

Several indirect methods which might be used to assess the functional tissue of the breast have been suggested. Pickles (1953) has described two rather complex techniques which will indicate the amount of blood flow through the breast, but there is no evidence of a fixed relationship between blood flow and breast function, and there are many circumstances which will confuse such estimations. An even less direct method of estimating blood flow is by infra-red photography (Bowes, 1950), but the amount of incident light is difficult to control and quantitative interpretation of the photographs would not be simple.

Method

In this investigation a method of water displacement has been used to study breast size.

The apparatus is illustrated in Fig. 1. It consists of a "perspex" container,* shaped to fit closely to the average



FIG. 1.—The method of estimating breast size. 1, Tube for filling apparatus. 2, Tube for emptying apparatus. 3, Tube for inflating the sealing ring.

chest wall round the breast, the seal being ensured by an inflatable rubber ring at the periphery. This ring is inflated by mouth and forms a cushion with a section of about $\frac{1}{4}$ in. (6 mm.) diameter. This arrangement proved to be leak-proof in all but two cases examined, the exceptions being small women with thin narrow chests.

With the subject seated upright, the apparatus is held firmly against the chest and filled with water at body tem-

*The apparatus may be obtained from Arnoplast Ltd., South Hillingdon Farm, Kelhead Avenue, Glasgow, S.W.2.

perature through an opening at the highest point, air escaping from a small hole alongside. When it is completely filled the water is drained off through another tube into a measuring cylinder. This volume of water is subtracted from the volume of the container, which has been previously determined using a perspex sheet curved to represent an approximately average chest wall. All measurements were made by one observer to ensure, so far as possible, that the rubber ring was inflated to a similar pressure for each observation, and that the apparatus was held against the chest wall with similar force. Results were reproducible to within 20-30 ml., an error of about 5%. Only the left breast was measured in all subjects except one, in whom the breasts were obviously asymmetrical, and in this woman both breasts were measured and the mean was taken.

Measurements were made on the seventh post-partum day, immediately following complete emptying by the "humalactor," in 86 primiparae and 23 multiparae. In nine of the primiparae and two of the multiparae measurements were also made during the course of pregnancy, beginning at the third month.

A detailed history of breast reactions during the menstrual cycle was obtained from 50 of the subjects whose breasts were measured.

The method of collection of milk samples has been previously described (Hyttén, 1954a); the volume and composition of the seventh-day milk for all these subjects is included in Table II of an earlier paper of this series (Hyttén, 1954c).

Results

For the 86 primiparae, the mean size of the empty breast on the seventh day of lactation was 787.0 ± 219.6 ml., and for the 23 multiparae 756.9 ± 314.0 . The difference is not statistically significant.

Fig. 2 shows the relationship between breast size and the milk output on the seventh day of lactation. The calculated

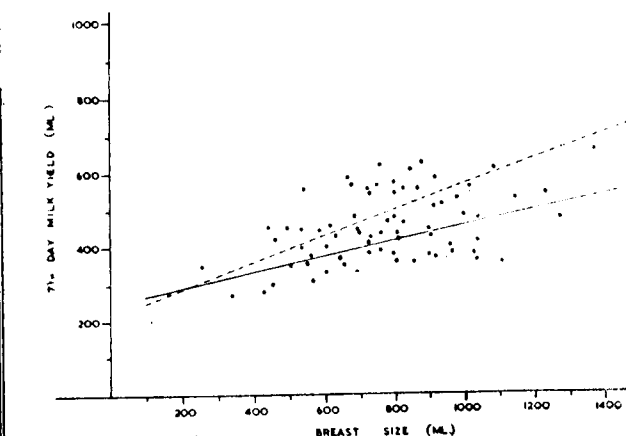


FIG. 2.—The relationship of milk yield on the seventh post-partum day to the size of the left breast. The regression lines calculated from these data are superimposed, the continuous line representing primiparae, the broken line multiparae.

regression lines for the primiparae and multiparae are superimposed. There was a correlation in the primiparous series ($r = +0.31$) significant at the 1% level, and a correlation of about the same magnitude for the multiparae ($r = +0.35$), although this was not statistically significant, probably because of the small numbers. The precision with which the seventh-day milk output could be predicted from breast size was not significantly different in the two groups, although this again may be due to the small sample.*

There was no correlation between the size of the breast and the fat, protein, or lactose content of the seventh-day milk.

*The regression equation combining both sets of data is: Seventh-day milk output = 0.23 (breast size in ml.) + 260 ml. ± 0.07 .

In an attempt to reduce the effect of "fatness" on the size of the breast, an index was calculated by dividing the measured breast size by the weight-to-height ratio of the subject. In this way a breast of the same actual size would have a higher index in a thin woman than in a fat woman. The correlation between this index and the seventh-day milk output was no better than the correlation of the measured breast size and the seventh-day milk output.

Of the 50 women questioned about breast symptoms in the premenstrual period, only 10 (20%) had noticed any reaction at all. The mean seventh-day milk output of these 10 women was 573 ml., and for the remaining 40, 430 ml., the difference being statistically significant ($P < 0.01$). The difference between the mean breast sizes of these two groups (838 ml. and 746 ml.) was also statistically significant ($P < 0.01$).

The serial breast measurements taken throughout pregnancy on 11 subjects do not permit an accurate interpretation of the pattern of breast enlargement, since in this pilot experiment measurements were made during routine antenatal visits and were too widely spaced. Moreover, the estimation of small increases with an apparatus liable to an error of 20-30 ml. is not close enough. Nevertheless, in five cases there was almost no further increase after about the twenty-fourth week of pregnancy, the remainder continuing to enlarge, but at a slower rate than during the first half of pregnancy.

The Table shows the breast sizes at the third month of pregnancy, together with the post-partum breast sizes, milk output on the seventh post-partum day, and the ages of the 11 subjects.

Serial Breast Measurements in 11 Subjects

Case No.	Age	Left Breast [Volume (ml.)]			Seventh-day Milk Volume (ml.)
		3rd Month	Post-partum	Enlargement	
113	19	295	775	480	800
129	25	295	490	195	455
184	28	860	960	100	390
210	24	620	740	120	565
237	20	700	1,030	330	480
239*	31	510	720	210	385
246	25	410	760	350	805
248	21	990	1,050	60	250
263†	41	785	1,050	265	565
265	22	1,800	1,920	120	600
		600	580	-20	180

* Second pregnancy. † Fifth pregnancy.

Results from the nine primiparae only were subjected to statistical analysis. There was a high correlation between the pregnancy enlargement of the breast and its milk output on the seventh post-partum day ($r = +0.87$), significant at 1%, and this can be clearly seen in the scatter diagram (Fig. 3). The regression line for primiparae has been drawn, and data for the two multiparae are also shown. There was no relationship between the initial size of the breast and its subsequent enlargement.

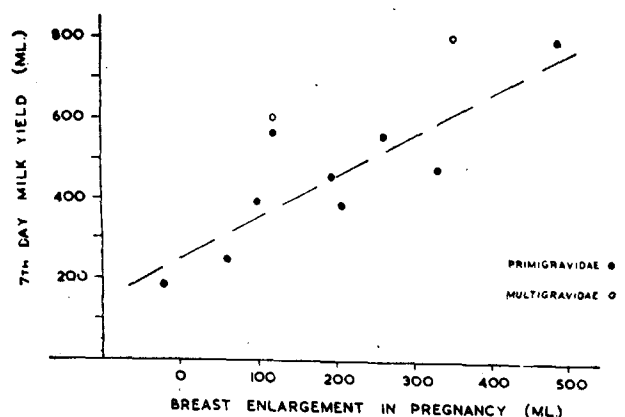


FIG. 3.—The relationship of milk yield on the seventh post-partum day to the enlargement of the breast which occurred during pregnancy.

There are clearly not enough results to test statistically the effect of age, but it can be seen from the Table that, apart from subject No. 265, who showed no enlargement at all, the four subjects aged 22 or under all had an enlargement of more than 200 ml., and the four older than this all enlarged by less than 200 ml. This confirms the clinical impression that while the very young primiparae are usually first seen at the antenatal clinic with tender swollen breasts and uncomfortably tight clothes, the older primiparae tend to show little reaction at the same stage of pregnancy.

Multiparae present an entirely different picture, since the glandular enlargement occurs into the loose stroma which has been left by involution from the previous lactation. There is therefore no tension, and the enlargement which occurs is not readily appreciated by either patient or examiner.

Discussion

Although there is an undoubted correlation between the size of the lactating breast and its milk production in hospital, the scatter is wide and the predictive value for an individual breast is obviously low. Fig. 2 does suggest, however, that the smallest breasts have a ceiling of performance on the seventh day.

In view of the differences in the actual shape of the chest wall which must occur between subjects, the results of measurement of breast size are not strictly comparable, but the error involved is probably slight in relation to the large range of values for breast size. Again, the milk output on any given day is not necessarily equivalent to the breast's potential yield, since it may have a considerable reserve which it does not exhibit in the absence of an appropriate demand. An artificial demand, such as the stripping of breasts by manual expression, may or may not provide this, although Waller (1950) claimed that the breast could be brought to maximum productivity during the first week of lactation by this means. However, Sydow (1952) has shown a close correlation between the milk output on the sixth day and the subsequent success of lactation, so that milk output in hospital can be accepted as of at least some value in indicating the true capacity of the breast.

It is difficult to interpret the striking relationship between breast size and breast-feeding in Lusk's series, since only half of the best group, those with "large" breasts, left hospital breast-feeding, in contrast to the overall hospital breast-feeding rate in this country of between 80 and 90% (Ministry of Health, 1951). It is unlikely that breast size was the only or even the major factor involved.

Two aspects of breast size must be kept in mind: one is the ability to produce milk, and the other the ability to store it. The small breast will suffer a double disability, and below a certain size this lack of storage capacity may become critical. Such an effect has been demonstrated in a previous paper (Hyttén, 1954b). Subject No. 74, with a breast size of only 530 ml., produced about 120 ml. of milk at each feeding; that is, the amount of milk in the breast at, say, 2 p.m., after four hours' secretion, was 120 ml., and at 6 a.m., after eight hours' secretion, the amount was no more, clearly indicating an upper limit to storage capacity.

The range of breast capacity may, in part, explain the gradual falling off in breast-feeding which occurs during the course of the first two months, since lactation will become unsatisfactory when an infant has outgrown the supply which the breast can secrete or store.

The degree of breast enlargement occurring during pregnancy, which is probably due to changes in the functional tissues alone, would be expected to show a high correlation with lactation performance, although it must be stressed again that the results from so few subjects can only be tentative. Data for increase in size are of comparative value only, and in no sense absolute measurements of the gland itself; much of the increase must be due to other changes, such as increased vascularity, but these are likely to parallel closely the growth of the glandular tissue.

The measurement of the enlargement of the breast during the whole course of pregnancy is in practice extremely difficult, since women are not usually seen until the third month, by which time some enlargement of the breast has already occurred; in fact, it is usually claimed that the most rapid enlargement occurs during the first three or four months. The amount of enlargement which is missed, however, should be proportional to the total breast enlargement, provided that the measurements are made at approximately the same stage of pregnancy, so that for a comparative study it is probably no serious disadvantage to have missed the first two months. A large-scale investigation of measurements during the entire pregnancy will be required to establish the precise pattern of enlargement. The suggestion that the most rapid enlargement occurs at the beginning of pregnancy is probably fallacious, since it is based on subjective impressions of discomfort which are greatest at this stage, probably because of vascular engorgement. The unreliability of such subjective impressions as an index of enlargement is supported by the finding that there is seldom any difference in size between the breast on the seventh post-partum day and the same breast at the end of pregnancy, although it is also claimed that the first few days of the puerperium are a period of rapid enlargement.

For the same reason a history of change of size of clothes required during the pregnancy can be misleading. Subject No. 113, for example, whose left breast increased in volume by 480 ml. (160%) said she noticed almost no change in the size of the breasts and had worn the same brassière throughout pregnancy.

It has been suggested that a simpler investigation could be undertaken by serial circumferential chest measurements, but these are unlikely to provide anything but the crudest information, because the breast may change in shape without becoming any more protuberant. In fact, Engel's (1941) finding that breasts with little glandular tissue have it disposed round the periphery suggests that a "spreading out" rather than a forward enlargement may be commonly found.

The few cases so far investigated suggest that breast enlargement during pregnancy in primigravidae is greatly influenced by age, and additional evidence, to be given in a later paper, shows that failure to establish lactation owing to an inadequate milk supply increases rapidly with age in primiparae. It is possible that the long delay, sometimes of over twenty years, from the time of puberty may lead to disuse atrophy, or it may be that small breasts are among a number of physical characteristics which make early marriage and child-bearing less likely.

Although the reason for breast symptoms during the menstrual cycle is not altogether clear, their occurrence seems to be a rough indication that the breast is well equipped, although the converse is by no means necessarily true. The small proportion of women who report the phenomenon (20%) is perhaps surprising, but it agrees well with Engel's (1947) findings that only in 20-30% of breasts is the structure predominantly glandular.

The different reaction to pregnancy shown by multiparae may be due to their having already laid down much of their glandular tissue during a previous pregnancy. The primipara reacts by encroaching on and replacing the fatty stroma of the breast with growing gland, but when the lactation is over only a small part of this stroma is reformed (Geschickter, 1945), and the characteristic flabby breast, which again becomes firm only during another lactation, results. Although only two multiparae had their breasts measured during pregnancy in this series, it can be seen from Fig. 3 that they have a higher milk production for the same degree of enlargement in pregnancy than primigravidae. Similarly, although the difference between the correlations of breast size with milk output in primiparae and multiparae is not statistically significant, nevertheless the regression lines (Fig. 2) confirm this parity difference, the multiparae having a better milk yield for the same size of breast. This is in accord with the histological findings of

Langer (1851), who found an increased amount of active breast tissue in women who had had repeated pregnancies.

Much of the variation in breast size and quantity of glandular tissue between individual women can probably be explained on the same basis as the difference in milk composition (Hyttén, 1954d)—that is, the absence of selective breeding for lactational ability in human society. In other mammals the lactating gland is "characterized by the absolute predominance of glandular tissue" (Engel, 1947), but this is true of only 20-30% of human lactating breasts.

No relationship has been found between the size of a breast and the composition of the milk it secretes. It is probable, then, that women who are unable to provide milk of adequate composition are not necessarily the same persons who are unable to provide sufficient milk because of inadequate mammary glands. There are therefore two groups whose lactation will be unsatisfactory, and it is not surprising that so many mothers resort to artificial feeding because of a dissatisfied baby.

Summary

The size of the lactating breast was measured, after emptying in 86 primiparae and 23 multiparae, by a method of water displacement.

There was a significant correlation between breast size and the output of milk on the seventh day of lactation, but not with any of the major constituents of milk.

In nine of the primiparae and two of the multiparae the amount of breast enlargement during pregnancy was also measured; the first measurement was made during the third month of pregnancy. Wide variations in the amount of enlargement occurred, and this was closely related to milk output.

I am grateful to Professor Dugald Baird and to the staffs of the Midwifery Department and the Aberdeen Maternity Hospital for invaluable help; to Dr. I. Leitch, of the Commonwealth Bureau of Animal Nutrition, Bucksburn, for criticism and advice; to Dr. F. H. C. Marriott and Mr. I. MacDonald for statistical assistance; and to Mr. T. C. G. McKay, of the Aberdeen Royal Infirmary, for technical assistance with the apparatus.

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Because full particulars are not always given on prescriptions, the dispensing and pricing of prescriptions ordering certain Schedule IV poisons are proving unnecessarily difficult. This is stated in a recent notice from executive councils to practitioners (ECN/140). The difficulty particularly arises with drugs which are put up in several strengths, as unless the strength is stated prompt dispensing becomes impossible. Common examples of such drugs are "amylal" tablets (amyllobarbitone), "amylal sodium" capsules (amyllobarbitone sodium), "anthisan" tablets (mepyrmine maleate), "benadryl" capsules (diphenylhydramine hydrochloride), "butazolidin" tablets (phenylbutazone), "nembutal" capsules (pentobarbitone sodium), "phenegan" tablets (promethazine hydrochloride), phenobarbitone tablets, "seconal sodium" capsules (quinabarbitone sodium), quinalbarbitone tablets, and various sulphonamide preparations. In addition to the name, quantity, and dose of these drugs, the strength must also be given.

SPONTANEOUS REGRESSION OF THE GLANDS IN HODGKIN'S DISEASE

BY

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In view of the recent emphasis on the treatment of Hodgkin's disease, it is timely to remember that the enlarged glands may regress spontaneously. The purpose of this paper is to report three cases (Cases 1-3) in which this occurred and to refer to others collected from a survey of the hospital records.

In the first patient the regression was so striking and the restoration to apparently normal health so remarkable that the diagnosis was doubted even though supported by a gland biopsy. Only after a recurrence was it accepted. Shortly afterwards the second patient was admitted with a similar story. Meanwhile the diagnosis in the third patient had passed through a similar cycle to that of the first.

A review of the records of the Royal Victoria Infirmary from 1948 to 1952, inclusive, revealed 29 acceptable cases in which to study the occurrence of this phenomenon. All underwent biopsy or necropsy. Five showed it clearly and six less definitely.

Case Reports

Case 1.—A farmer aged 46 attended first on October 2, 1952. One month previously he had developed glands in his neck associated with sweating bouts and persistent itching. Apart from the enlarged glands there and in his groins and axillae, nothing abnormal was found on clinical or laboratory examination. On October 18 he was pyrexial, with further involvement. On gland biopsy the case was reported as being more like Hodgkin's disease than anything else. One month later he said that he was better and that the glands had disappeared. They were, however, just palpable. The diagnosis was doubted and the question of the histology raised, but the pathologist maintained his position. A fortnight later the patient was readmitted with stridor, the glands having enlarged again. All the superficial groups were affected, but particularly the cervical. A final diagnosis of Hodgkin's disease was made and radiotherapy given. On February 17, 1953, he was readmitted with symptoms and signs of bone involvement and marrow replacement. He died three days later. **Necropsy:**—Lymph glands: abdominal mainly involved, pink or mottled red. The liver and spleen were large, the latter being soft, with an early infarct but no Malpighian bodies. **Histology:**—The spleen showed a pleomorphic mixture of lymphocytes, plasma cells, large mononuclears, occasional polymorphs and eosinophils, scanty Dorothy Reed cells, and primitive reticular cells. The lymph nodes were similar, with some haemorrhages. The marrow showed no haemopoietic tissue but small collections of cells resembling those in the spleen. The liver showed a non-specific picture. **Comment:**—The appearances are like those of Hodgkin's disease, but are not absolutely classical.

Case 2.—A schoolboy aged 14 was admitted as an emergency case on January 2, 1952, complaining of swellings in his right groin for two weeks. His temperature was 103.8° F. (39.9° C.). He was ill and drowsy. He had marked tender enlargement of all the right inguinal glands. There was a small uninfected scratch on the right calf and no lymphangitis. Blood cultures were sterile and his white-cell count was 4,600 per c.mm. He was treated with antibiotics, but his temperature seemed to settle fortuitously. The glands decreased to about half their original size, but

in August others appeared elsewhere. Section showed Hodgkin's disease. He was readmitted on November 26 with visceral as well as glandular involvement. He responded to nitrogen mustard therapy, but subsequently died at home.

Case 3.—A farm labourer aged 36 was admitted on June 7, 1952, as a case of Hodgkin's disease for a gland biopsy. His story was of malaise, night sweats, and a cough of recent onset. His temperature was 99.4° F. (37.4° C.). Most groups of glands were enlarged, and his spleen was palpable two fingerbreadths down. He had signs of collapse at the right base. Chest x-ray examination showed enlargement of the right hilar and paratracheal glands. After pyrexia for five days the swelling of the spleen and glands subsided along with the temperature. He was discharged with a tentative diagnosis of glandular fever in spite of a negative Paul-Bunnell test and differential white count. His general condition improved. He was readmitted with a recurrence and a remittent temperature up to 102° F. (38.9° C.). The glands had enlarged, as were the spleen and liver to four fingerbreadths. The chest x-ray report stated that there was "marked decrease in the glandular shadows but not complete resolution." Biopsy showed Hodgkin's disease.

Case 4.—A miner aged 50 was admitted on March 5, 1952. Eighteen months previously he had noticed lumps first on the right and then on the left side of his neck. They subsided without treatment. Four months before admission they enlarged again. With the glandular enlargement went general symptoms. He was pyrexial, with discrete enlargement of all groups of glands except the posterior cervical and the axillary. Section of a gland showed appearances more like Hodgkin's disease than anything else.

Case 5.—A housewife aged 29 was admitted on February 4, 1952. Her main complaint was of pain subternally after meals and night sweats. She was pyrexial, with epigastric tenderness but no significant glandular enlargement. Chest x-ray examination showed hilar lymphadenopathy. A Mantoux test was positive at 1:1,000, but her sputum was negative for *Mycobacterium tuberculosis*. Tuberculosis or reticulosis was the provisional diagnosis. Following readmission for haemoptysis on February 26, she had a large tender gland above the left clavicle. Biopsy was postponed because she developed a cold and then because the gland disappeared. Subsequent biopsy of a recurrence showed appearances more like Hodgkin's disease than anything else.

In the remaining six cases the decrease in size was not so dramatic, and in two there was a possible focus of infection.

Discussion

There is no reference to this phenomenon in most recent textbooks. Horder and McNee (1950) describe Hodgkin's disease as "characterized by painless, progressive enlargement of the lymph nodes." Cecil and Loeb (1951) make a similar statement, and say that the onset may be associated with oropharyngeal infections, but there is no proof of their connexion. Longcope (1927) states that "the correct conclusion may not be arrived at until the subsidence of the swellings (glands) with complete recovery excludes Hodgkin's disease." It was such statements as these which made our original diagnoses suspect.

Again there are few papers in which it is mentioned. Wallhauser (1933), in a review mainly concerned with pathology, merely says that he has known regression to occur. Symmers (1948), in a paper of similar nature, does not hint at it; nor does Gilbert (1939), although many varied presentations are discussed. Slaughter and Craver (1942) mention a case in which it probably occurred.

Among clinical reports, Baker and Mann (1939) and Goldman (1940) also ignore it. Middleton (1937) briefly mentions it, but without histories. This emphasis upon the progressive enlargement of the glands in Hodgkin's disease seems to be derived from Dorothy Reed's classical paper

in 1902. She, however, was faced with the problem of definition of the disease and therefore had to choose strict criteria for the cases for her studies.

As early as 1911 MacNalty recognized that there was a definite form of Hodgkin's disease associated with a relapsing fever. He noted that sometimes when the temperature became normal the spleen and glands decreased in size. This seems to have been widely forgotten in recent years, although Rolleston (1925) quotes MacNalty.

Hodgkin (1832) himself recorded a case in which the spleen and right glandulae concatenatae (cervical glands) were considerably enlarged, but "under the treatment employed these tumours, as well as that in the situation of the spleen, were at times very considerably reduced in size." This patient, Ellenborough King, was accepted by Fox (1936) as being a true example of the disease on histological grounds. The variations were probably spontaneous. Murchison (1870), who recorded the recurrent febrile episodes now erroneously accorded the eponym of Pel-Ebstein, comments on it clearly. Gowers (1879) stated that "a remarkable diminution in size of the glands may occur," and he refers to the "alternating pyrexia," thus avoiding inaccurate eponymy. Barron (1926) records a case in which the glands subsided, followed by a relapsing fever without a local recurrence.

Variation in the size of the spleen with the temperature is perhaps better appreciated. Whittington (1915) and Baldrige and Awe (1930) each recorded such a case. Jackson and Parker (1947) note that "it is not so well known that an enlarged spleen may diminish in size without any treatment whatsoever." However, they attribute diminution in size of the lymph nodes to the elimination of secondary infection, and add that their virtual disappearance should not be taken as proof that they merely represent chronic inflammation. In support, they give a history, and comment on whether the glands which decreased in size were actually involved with Hodgkin's disease at the time or not. Elsewhere they quote histories, and four more of these contain definite statements of variation in size without treatment, although the diagnosis had not yet been confirmed. Horder and Dratman (1948) in a comprehensive review, do not refer to it in the clinical section, although elsewhere they quote it in favour of the inflammatory nature of the disease.

Whenever regression of the glands or spleen is recorded and explained, either secondary infection is invoked to account for it or it is implied that the disease may not have been present in these glands. I submit that regression of the glands may occur as part of the natural history of one form of the disease. In Case 1 the diagnosis was thought to be Hodgkin's disease from the biopsy before the decrease in size occurred. Nor was there evidence of infection. It is unlikely that several groups of glands should regress as in Cases 1 and 3 if a local septic focus is the cause. Indeed, where only one group of glands has been involved there is not always a convincing source (Case 2).

The commonest group of glands affected appears to be the posterior cervical and not the tonsillar and superior cervical. It would be reasonable to expect the latter if secondary infection played an important part (Baker and Mann, 1939). Jackson and Parker (1947, p. 67) contrast the rarity of involvement of the tonsils by Hodgkin's disease with its frequent infections. They therefore deny a direct relationship, and suggest that they serve only to light up dormant disease or to draw attention to already enlarged glands. Case 5 shows how this may occur. There was no suggestion of an infection in Cases 1, 3, or 4, while in Case 2 both groups of inguinal glands were enlarged, which would be unusual for such a local lesion.

The reason for the decrease in size is unlikely to be necrosis, as it coincides with restoration to apparently normal health, whereas patients with necrotic neoplasms are usually ill. The enlargement of the glands in Case 1 prevented a proposed further biopsy. So far as our knowledge extends, such behaviour is seen only in some of the leukaemias apart from infections.

The reason for the high incidence of this phenomenon in the series under survey is uncertain. There is nothing to suggest sex, abnormal selection, geography, or inadequate records as a reason. Whatever it is, this phenomenon, which clearly has received insufficient attention in the past, is an important feature of one form of the disease. Such an occurrence is no reason for doubting the diagnosis.

Summary

The glands in a patient with Hodgkin's disease were observed to undergo almost complete regression without treatment.

Out of 29 cases, 5 showed the phenomenon clearly and a further 6 less well.

The cursory attention that this occurrence receives in the literature is noted; there is no evidence that elimination of secondary infection, adduced as a possible explanation, is responsible.

It is submitted that regression of the glands in Hodgkin's disease; often associated with an alternating fever, is an occasional but important variant of its natural history.

I am grateful to the various consultants under whom these patients were admitted for permission to publish, especially to Dr. T. H. Boon, and to Drs. L. W. Carstairs and J. N. Walton for their advice and criticism.

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The fifth annual report of the medical officer in charge of the student health service at the Queen's University of Belfast contains an account of some student health services in the United States. The University of Minnesota, for instance, has one of the most advanced student health services in the world. It has been in existence for 32 years and is responsible for the medical care of 17,000 students. The staff consists of a director, an assistant director, 13 whole-time physicians (three of whom are psychiatrists), and 50 part-time physicians and consultants. The staff also includes a sanitary engineer and four sanitary inspectors responsible for the public health of the university campus. The service maintains its own laboratory, x-ray and ophthalmic departments, dental clinic, and a separate 50-bed hospital. The present hospital building was built four years ago and is magnificently equipped. The student health service is self-supporting and receives no funds from the general university budget. Each student pays a fee of five dollars a quarter, which entitles him or her to the initial medical and x-ray examination and four days in hospital. Fees are charged for special examinations, drugs, dental treatment, and any stay in hospital above the allotted four days. The main aim of the service is the care and treatment of the individual student during illness, and the service is used by about 80% of the student population. It is less expensive to the student than private or other hospital services.

SYMPTOMS AS A GUIDE TO ANAEMIA

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It is well known that persons with anaemia vary greatly in the degree to which they complain of symptoms. The study described below approaches the problem from the opposite angle—namely, the extent to which symptoms capable of being interpreted as due to anaemia, such as lassitude or feeling "below par," are in fact an indication of the prevalence of anaemia.

Method and Material

A total of 360 housewives, attending for miniature x-ray examination and found free from tuberculosis, accepted the offer of a haemoglobin test. They were asked to answer the following questions:

- Do you feel fit?
Average?
Below par?
Do you suffer from:
Breathlessness?
Poor appetite?
Always feel tired; lack of energy?
Swelling of ankles?
Do you need to take a laxative once a week or more?

It was realized that the questions were of a leading nature, but they were asked before the subject knew the result of the test, and were applied to all subjects without bias. The questions were not intended to include all the symptoms of which anaemic subjects are said to complain. The question on laxatives was posed so as to provide an objective index of the constipation which may accompany anaemia.

Haemoglobins were tested by the doctors, to whom acknowledgment is made above, using oxyhaemoglobin in Grey-Wedge photometers. Finger-prick blood was used. Each operator calibrated herself on an average once per ten

Haemoglobin Levels in Housewives who Complained, or Did Not Complain, of Certain Symptoms

	No.	Mean Hb (% Haldane: 100% = 14.8 g./ 100 ml.)	% Below	
			83%	73%
Below par	49	91.10	12.2	10.0
Average	172	89.70	16.3	5.8
Fit	127	89.95	12.6	4.7
Swelling ankles ..	73	89.80	20.5	4.1
Not	277	90.08	13.0	6.1
Breathless	134	90.24	16.4	9.0
Not	225	89.82	13.3	4.0
Always tired	153	90.04	15.7	7.8
Not	202	90.00	13.9	4.5
Poor appetite	43	90.21	9.3	7.0
Not	313	90.00	15.0	5.4
Constipated	104	89.31	19.2	5.8
Not	248	90.42	12.5	5.6
Fit, not always tired, not breathless ..	94	90.20	13.8	4.3
Below par, always tired, breathless ..	31	90.58	12.9	12.9

Where a reply was equivocal no entry has been made. Hence the difference in total numbers in each division. The level 83% was selected because at this level prospective blood donors are refused by the Ministry of Health Transfusion Service.

determinations by means of the invaluable samples provided by the M.R.C. haemoglobin standards scheme (Dr. I. D. P. Wootton).

Results

The Table shows that there was no difference in mean haemoglobin level between those that did and those that did not complain of these symptoms. Those whose haemoglobin level was below 73% were present in rather larger proportion in the group which complained of symptoms; but the differences were not greater than could occur by chance.

Discussion

The symptoms that we are dealing with are common to-day, as indeed the number of positive replies to our questionnaire suggests. Whether this has always been the case it is impossible to say; and, in any event, this is less important than to know the cause. Anaemia, to us, seemed to be one of the possible causes in practice, but it is clear from the analysis of our data that this is in fact not so.

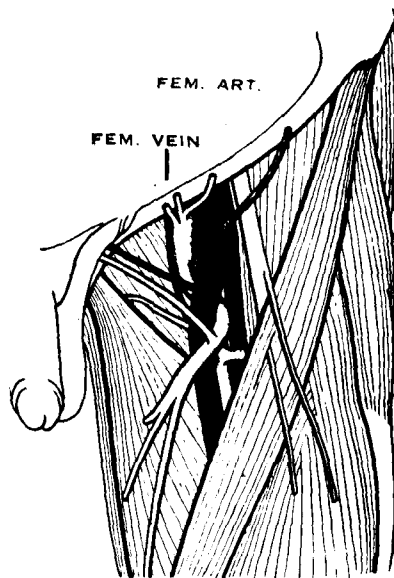
Medical Memoranda

An Important Anomaly of the Long Saphenous Vein

Ligation of the superficial or deep veins of the lower limb is so commonly practised that the following anomaly of the long saphenous vein discovered in the course of routine laboratory dissection merits description.

Ascending through the femoral triangle the long saphenous vein crossed in front of the femoral artery to reach its lateral side 4 in. (10 cm.) below the mid-inguinal point. It then passed backwards and medially behind the artery to end in the femoral vein 2½ in. (7 cm.) below the mid-inguinal point—that is, about 1 in. (2.5 cm.) lower than usual. Where the long saphenous vein crossed in front of the artery the two vessels were firmly bound together by fibrous tissue. Thereafter the vein was intimately related to the artery below the origin of the profunda femoris branch, and thus it described a spiral course round the lateral side of the femoral artery (see Fig.). The level at which the vein pierced the deep fascia could not be determined, as the dissectors had removed the fascia in an attempt to elucidate the abnormal relationship. However, since the femoral artery is always beneath the deep fascia, it is likely that the long saphenous vein perforated that fascia at or before the point where it crossed in front of the artery. The femoral vein lay on a more posterior plane than the femoral artery immediately below the inguinal ligament, and the superficial circumflex iliac and the superficial epigastric veins ended in it.

The practical importance of this anomaly is clear. A point 1½ in. (3.8 cm.) below and lateral to the pubic tubercle, the standard guide to the middle of the saphenous opening (fossa ovalis), was found in this case to be opposite the



The long saphenous vein passing spirally round the lateral side of the femoral artery.

femoral vein just as it appeared on the medial side of the femoral artery. Using this surface marking, the surgeon intending to resect the terminal part of the long saphenous vein would not come upon that structure in this case. Instead, on tracing the superficial circumflex iliac and superficial epigastric veins to their termination, he would pass imperceptibly beneath the deep fascia, cribriform in this region, into the plane of the femoral vessels. If the vessel which then presented itself was the femoral vein, this might be ligated in error. On the other hand, if the dissection were carried low enough to encounter the long saphenous vein, the close relationship of this vessel to the femoral artery might result in the inclusion of both artery and vein in the ligature. That the femoral artery has been injured in the course of Trendelenburg's operation, occasionally with subsequent loss of the limb or death, is beyond doubt.

Luke and Miller (1948) cited three certain cases and one probable case of ligation of the femoral artery. McPheeters (1945) described two cases of ligation of the femoral artery, and in one of these the femoral vein was also tied. At least three cases have come to my notice in this country in which either injury or ligation of the femoral artery occurred during this operation. For obvious reasons it is difficult to get details of the operative findings, but it is possible that the anomaly described above may have been present in some of these cases.

A somewhat similar course of the long saphenous vein was described and illustrated by von Lanz and Wachsmuth (1938). It was also depicted in Fig. 5 of an article by Anson and McVay (1938), so that it cannot be exceptionally rare. No mention was made of its significance in either of these texts.

Whatever the explanation of the surgical errors associated with Trendelenburg's operation it is obvious that the surgeon should be aware of the deceptive variation described in this report. The technical difficulties which it presents are slight. The real danger lies in not knowing that such a condition may exist.

My thanks are due to Professor D. R. Dow for assistance in writing this report.

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Two Cases of "Novalgin" Agranulocytosis

Numerous reports of the occurrence of agranulocytosis following the administration of "novalgin" and other drugs containing amidopyrine have been published (Kracke, 1931; Plum, 1934; Stenbeck, 1935; Benjamin and Biederman, 1936; Moloney and Vidoli, 1943; Kneeder, 1946). Now that these drugs have been put on the Fourth Schedule of the Poisons List, and the danger of their use is more widely appreciated, cases such as those recorded below should become rare.

CASE 1

A female domestic worker aged 70 was admitted as a suspected case of diphtheria in July, 1950. For three weeks previously she had been taking novalgin tablets (which she obtained direct from the chemist) for rheumatic pains, the exact dose being unknown. Two days before admission she had chilly sensations with malaise, and the next day a sore throat and difficulty in swallowing.

On admission she was found to be well nourished but not fat, and was obviously very ill, with stertorous breathing and a hoarse nasal-sounding voice. Both tonsils, uvula, and soft palate were covered with patchy exudate, greenish yellow in colour, and on the left tonsil it was becoming black, indicating early gangrene; fetor was pronounced and an icteric tinge was visible on the conjunctivae. The tonsillar lymph nodes were moderately enlarged. The blood pressure was 135/70. Blood count: Hb. 80%; red cells, 3,800,000;

white cells, 750 (lymphocytes 100%, no granulocytes). From the throat swab *Streptococcus viridans* only was grown. Penicillin, 500,000 units, and penicillinate, 10 ml., were given intramuscularly immediately on admission, but the patient died three hours afterwards, before arrangements for a transfusion of fresh compatible blood could be made. Necropsy revealed a superficial pharyngeal necrosis extending from tonsils to epiglottis and haemorrhagic congestion and oedema of the lungs with subpleural and subpericardial haemorrhages.

CASE 2

A female domestic worker aged 68 was admitted to hospital with tonsillitis and pneumonia in May, 1952. In the previous month she saw her doctor on account of painful stiff joints, when novalgin was prescribed in doses of 2 tablets, each containing 5 gr. (0.32 g.), three times a day; over a period of three weeks she had taken a total of 90 tablets, when she became febrile and weak with sore throat, dysphagia, and hoarseness. Novalgin was discontinued at once, and two days later she was given sulphamerazine, a total of 30 g. in five days, without apparent response, and was admitted to hospital.

She was obese, pale, and obviously ill, with hurried noisy breathing; her temperature was 101° F. (38.3° C.), pulse 120, and respirations 30. Exudate covered most of the tonsillar surfaces and spread to the uvula and soft palate without underlying ulceration. The associated lymph nodes were enlarged and tender, and moist sounds were heard at both lung bases without evidence of heart failure. Blood count: Hb. 78%; white cells, 2,000 (neutrophils 3%, lymphocytes 90%, monocytes 7%). Some of the lymphocytes were atypical early forms. A heavy growth of *Str. viridans* was obtained from the throat swabs, but haemolytic forms were not present. Crystalline penicillin, 1,000,000 units daily, was given for seven days, with amelioration of the symptoms and rapid disappearance of the exudate. Immediately thereafter she received 9.5 g. of chloramphenicol over four days on account of persisting bronchitis, to which she was known to be prone. Two days after penicillin was started the white cells numbered 3,100 (neutrophils 10%, lymphocytes 78%, monocytes 12%), and two days later the count was almost normal, subsequent recovery being uneventful.

COMMENT

Despite the similarity of the two patients in respect of age, occupation, and physical state, and probably also of the amount and duration of ingestion of novalgin, the clinical differences in the character of the disease—in the one brief and rapidly fatal, and in the other, over a week and mild with prompt resolution—are impressive, suggesting that idiosyncrasy may be the most important aetiological factor. There was no history of previous ingestion of the drug, although this could not be eliminated completely, especially in Case 1.

The absence of recognized respiratory pathogens, such as haemolytic streptococci, suggests that the faucial angina is a degenerative or allergic rather than an inflammatory condition, and therefore unlikely to respond to penicillin. Alternatively, *Str. viridans* may, under particular conditions, become pathogenic to the respiratory mucosa, as has been long suspected in association with virus infections. Aureomycin therefore seems to be the antibiotic of choice, as chloramphenicol has been shown capable of causing both agranulocytosis and aplastic anaemia. Sensitivity tests are probably essential in severe cases to find the correct antibiotic.

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Reviews

SIGMUND FREUD

Sigmund Freud—Life and Work. Volume 1—The Young Freud, 1856–1900. By Ernest Jones. (Pp. 454, illustrated. 27s. 6d.) London: The Hogarth Press. 1953.

The author is the oldest colleague of Freud still alive. It was due to him that Freud spent his last months peacefully in this country following his rescue from Nazi-invaded Vienna. In this first volume of three Freud's life to the age of 44 is described. By 1900 Freud had established his basic concepts—the importance of unconscious mental life, the beginnings of sexuality in infancy, the value of "free association" and dream life, both for the therapy of neuroses and as a method of investigating psychic development.

Not only psychiatrists but all those who enjoy the story of the trials and triumphs of physicians will be fascinated by this book and the promise of the two further volumes to come. Dr. Jones has added to his laurels as a clear expositor. Rarely has a physician been so lucky in his biographer or a medical biographer in his subject. It is difficult to make comparisons, but one thinks of Cushing's much-read life of Osler and Pearson's unfortunately little-read life of Galton. Galton, Osler, and Freud were all clear and voluminous writers. Unfortunately, at one time Freud destroyed much of his previous writings, but Ernest Jones has had access to many family letters, perhaps the most significant being the 1,500 love letters sent by Freud to his future wife during their four years' engagement previous to marriage when he was 30. Freud's letters to his friend Fliess during the 'nineties, when he was gradually leaving neurology for psychology, have been preserved (they will soon be published in an English translation) and give a vivid picture of the doubts and mental anguish of a pioneer. Gradually his independence emerged, and he sought collaborators as critics rather than the opinions of those who did not seek confirmatory access to the facts he had discovered.

The author's stated aim is the hope of elucidating something of the processes in Freud's mind and the experiences in his life which led to his discoveries. The scanty details about Freud's childhood and adolescence which are available are partly compensated for by the greater knowledge of his medical studies until graduation at 25 and his career as a neurologist. Apart from his interest in cocaine as a treatment for depression—which nearly led to his discovering its use as an analgesic—his early years as a physician were typically those of one who wished to become a consultant neurologist. This period ended with his most important neurological publication "Aphasia" in 1891, which did not attract the attention in this country it deserved. In it he strongly supported Hughlings Jackson's genetic views. His numerous neurological publications established his reputation in this field as a hard worker and a close thinker, but only in his work "Aphasia" was there a hint of the genius which was to appear.

During the 'nineties the work that established psychoanalysis was done almost alone. His early contact with Breuer was, of course, important. But he soon had to test his developing hypotheses without the help of others. In 1889, replying to Meynert's criticism of his interest in hypnosis, he wrote: "Respect for greatness, especially intellectual greatness, belongs to the best qualities of human nature. But it should take second place to respect for facts. One need not be ashamed to admit when one sets aside reliance on authority in favour of one's judgment gained by a study of the facts."

The publication in 1893 of his and Breuer's experiences of transference phenomena in hysteria led to the first note of his work in this country, F. W. H. Myers giving a good account of it in the *Proceedings of the Society for Psychical Research* in June, 1893. His 1895 "Studies in Hysteria" were favourably reviewed by Mitchell Clark in *Brain* in

1896. During the period 1892–6 the method of free association gradually developed, and was freed from hypnosis, suggestion, urging, and questioning. In 1898 he began to realize the importance of the connexion between infantile and pubertal sexuality. From 1897 his own self-analysis continued.

In the 'nineties the beginning of the resistance and reaction to his views began—not so much to his view of unconscious mental life, which was generally accepted, but to the content he discovered. To Freud the unconscious gradually became an inner reality deep to consciousness just as real as the outer reality beyond that which our senses give access to. From the beginning of his interest in psychology he manifested his wish to understand normality. In 1882 he had written of his uncanny feeling when he could not understand someone in terms of his own experience. The passage from physiology to psychology meant much more to Freud than a change in intellectual outlook. It betokened a need to reach towards the depths of his own being, which for many years had been covered over. His long self-analysis was the first of many that have followed in physicians who are unsatisfied unless they can attempt to understand the sufferings and delights of others in terms of their own.

Freud emerges from this book as the complex man he was: with his scientific industry, his love of family, his love of travel and pursuits outside medicine, and his neurosis. The reader will be left baffled but thrilled. This is the lot of those who try to comprehend genius.

W. CLIFFORD M. SCOTT.

ARTERIOSCLEROSIS

Arteriosclerosis. By Dr. José Froimovich. (Pp. 218; illustrated. No price given.) Valparaíso, Chile.

This book, which is described as a clinical and experimental study of arteriosclerosis, comes in Spanish from Valparaíso. The term "hardening of the arteries," which is the exact translation, is in many ways unsatisfactory. It may refer to one or more of several distinctly different diseases. In this book the discussion of the pathogenesis refers to atherosclerosis or atheroma. It ranges over a wide field, rather too wide perhaps. At times other forms of arterial disease come into the discussion, so that the text becomes rather confusing. Many authors are quoted, but there is no summary or synthesis of views. In the account of morbid anatomy the reader is again confronted with a great many references from various authors. The experimental work is shown in a number of photomicrographs, but these are far from clear and do not show much detail. There are descriptions of the results of keeping rabbits on diets containing much cholesterol; the author claims that this leads to the development of atheroma; but he thinks that iodide of potassium checked the formation of the deposits. Then comes a chapter on the symptomatology of common disease. He gives some description of cardiograms, but no tracings are shown; his approach to this important subject is hardly up to date. He advocates propyl thiouracil in treating angina pectoris.

Although this book contains a large amount of work cited from many writers, the author does not discuss it well; there is a lack of correlation, sifting, and criticism. He leaves the reader without any clear idea of what he really thinks, and in some confusion about the whole subject.

TERENCE EAST.

MANUAL OF PSYCHIATRY

A Manual of Psychiatry. By K. R. Stallworthy, M.B., Ch.B. Second edition. (Pp. 314. £1 10s.) Christchurch, New Zealand: N. M. Peryer. 1953.

The writer of the foreword to this volume commends it to all who seek a soundly based, common-sense knowledge of modern psychiatry. The author achieves this objective only in part. The book will not interest the experienced psychiatrist, and the psychiatrist in training may find it rather fragmentary. But the psychiatric nurse will profit by reading the chapters on physical methods of treatment and special

nursing procedures. The chapter on the neuroses contains some recommendations which could scarcely be described as soundly based. We read that it is relatively uncommon for an anxiety state to require expert psychiatric treatment. Where it does, an effort should be made "to unmask the underlying complexes," and, should this fail, leucotomy may be advised. Psychotherapy is not much in favour. The doctor who has neither time nor patience to listen to the involved story of his patient should "refer the person to some colleague who has." The superficial references to the work of Freud and Jung suggest that the analysis of the unconscious occupies a lowly place in the treatment of psychiatric illness. Physical methods of treatment, on the other hand, receive considerable attention and, by implication, are the main concern of the psychiatrist. Psychiatry is a complicated subject, and it is probably impossible, without oversimplification, to summarize its essentials in a manual designed as "a practical guide for practitioners and students of psychiatry."

E. A. BENNET.

SCIENTIFIC LANGUAGE

The Language of Science: Its Growth, Character, and Usage. By Theodore H. Savory. (Pp. 184. 10s. 6d.) London: André Deutsch. 1953.

The object of scientific prose is to convey information as clearly as possible; for this reason, ordinary words used for scientific purposes have to be specially defined, and many words have to be coined to denote things and relationships outside ordinary experience. To this extent one can say that there is such a thing as scientific language, though it is possible to exaggerate its importance; and scientific authors probably think of themselves as writers of English or other languages also used by non-scientists. It would perhaps be better to speak of a scientific vocabulary, since grammar is the same for all users of a language. This book is a collection of essays on various aspects of scientific language. The author writes on such topics as technical terms and their derivation and date of appearance, the object of scientific writing, the translation of scientific literature; and the value of foreign languages to the scientific worker. He has been a schoolmaster for over 30 years, which no doubt explains his heavily expository style and tendency to labour the obvious; much of what he has to say is in fact common knowledge, in universities at any rate. The different problems of translators of poetry and scientific prose are well discussed, but scientific translation is more difficult than the author allows; the scientific translator needs as strong a grasp of idiom as the translator of verse. The author thinks that the university student of science has no time for interests outside his work, and we can only hope his sample was not representative.

The book is addressed to philologists and scientists, but its strongest appeal will probably be to schoolmasters and general readers with an interest in science.

RAYMOND WHITEHEAD.

DICTIONARY OF MIDWIFERY

A Dictionary of Midwifery and Public Health. By G. B. Carter, B.Sc., S.R.N., S.C.M., and G. H. Dodds, M.D., F.R.C.S., F.R.C.O.G. (Pp. 686; illustrated. 25s.) London: Faber and Faber Ltd. 1953.

This is more than a dictionary—it is an encyclopaedia. The greater part of the book is devoted to the definition of obstetric and other medical terms and concise and accurate descriptions of a wide variety of well-chosen topics. The other part is on public health and administration.

The book is intended for midwives both for reference and for study, but the dictionary part will be welcomed also by medical students and hospital administrators, and even a reviewer may be forgiven, I hope, for forgetting the task in hand and losing himself in the neat and instructive articles in this comprehensive dictionary. The many excellent line drawings have been executed by Miss P. Forman with artistic skill and baptismal patience. I recommend unreservedly the dictionary part to all associated with obstetrics.

The smaller part on public health and administration is constructed on somewhat similar lines. Here, too, are many interesting and informative articles, but unfortunately this part is marred by a number of errors and misleading statements. For example, the Ministry of Housing and Local Government receives its correct title under that heading, but elsewhere it becomes the Ministry of Local Government and Housing, and, again, the Ministry of Local Government and Planning. And the statement that "It is usually agreed in Great Britain that the trained hospital almoner is the medico-social worker in clinic and hospital and the health visitor in the home" will not commend itself as either fact or opinion to the thousands of health visitors working in hundreds of local authority clinics in addition to their work in the home.

The whole volume would be improved by eliminating the section on public health and administration altogether, or, better still, by careful revision raising it to the standard of the main part consisting of the excellent dictionary of midwifery.

C. METCALFE BROWN.

THE DERMATOPHYTES

Dermatophytes. By Dr. Jean Obtel. (Pp. 44; 196 coloured plates and 59 photographs. No price.) Prague: Editions Médicales.

This book presents a wide selection of beautifully executed coloured plates of dermatophyte cultures grown on standard Sabouraud media at room temperatures and an equally wide selection of good clinical photographs of the lesions caused by dermatophytes. But its practical value to the clinician and medical mycologist is vitiated by the author's adherence to the outdated classification instituted by Sabouraud. This classification is based chiefly on host-parasite relationships and on gross cultural features and does not represent the natural affinities between the various members of the dermatophyte group. The lesions caused by dermatophytes are well known to vary considerably, and similarly their gross cultural features, as is indeed so well demonstrated in this book. A classification based on such variable criteria is of doubtful value for purposes of identification and therefore defeats its own object. The classifications of dermatophytes most widely used in France, Belgium, Great Britain, and America are all based on microscopic morphological criteria presented by these organisms in culture, thus bringing them into line with the taxonomic treatment of other groups of fungi.

Some surprising mycological statements appear in the text—for example, "Le groupe Microdon comprend les dermatophytes du type ectothrix caractérisés par de grandes spores" (italics mine); and further on the same page, in reference to Sabouraud, "Il différencie dans le cinquième groupe les mucorinées dites Mégasporon en deux autres groupes indépendants" (italics mine). These are probably due to insufficient proof-reading and are such obvious errors that they are not likely to mislead at any rate the medical mycologist.

Some notes on distribution, epidemiology, clinical features, and therapy are included. While this information is in some cases based on insufficient data, it provides for workers west of the Iron Curtain an interesting documentary of local conditions as regards the dermatomycoses. The book is elegantly and sumptuously produced, but it is to be regretted that its artistic merit outweighs its scientific value. There are numerous typographical errors in the references to articles in the English language.

C. J. P. LA TOUCHE.

From the fact that the 7th edition (1953) of R. W. Fairbrother's *Textbook of Bacteriology* (Pp. 492; 20s. London: William Heinemann Medical Books) is, including reprints, its 18th issue in 16 years, it may be gathered that this work has found favour. The principal changes in this edition are in the chapters on chemotherapy and virus diseases.

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KIDNEY TRANSPLANTATION

The transplantation of kidneys is perhaps the most ambitious enterprise that has yet been undertaken in the surgery of tissue and organ replacement. Although the kidney is a firm and compact organ, with a single chief arterial input and venous outflow, and is an organ which seems not to need a nerve supply for its continued working, the obstacles to its successful transplantation are by no means merely technical. With rare exceptions—one of them described by Michon and his colleagues¹—grafts of kidney that are to be clinically useful must be homografts—that is, they must be grafts transplanted from one human being to another or between animals of the same species. In addition, therefore, to all the technical and physiological difficulties of transplantation are all the immunological impediments arising from the fact that the tissues of one individual provoke a highly efficient, if teleologically uncalled-for, defence mechanism after transplantation to the body of another.

The experimental work of Dempster^{2,3} and of Simonsen⁴ and their respective colleagues on dogs has given ground for believing that these immunological difficulties are of two kinds. First, there is the reaction of the host upon the graft, which both writers believe to be similar in all essentials to that provoked by homografts of skin—that is, a kind of immunological reaction. If that were the whole story the outlook would be grave but not desperate, for the problem of abolishing reactions of this kind has already been solved for laboratory animals,⁵ although by methods which, in their existing form, have no clinical application. But both Dempster and Simonsen have described certain histological appearances (confirmed, in Dempster's work, by irradiation experiments) which suggest, unfortunately, that a second factor is at work—the reaction of the kidney homograft against its host. This possibility, although it

still requires a formal experimental proof, is entirely plausible, and its recognition is one of the most important contributions to the theory of tissue transplantation immunity that has been made in recent years. There is no reason at all why a graft, if it contains antibody-forming cells, should not respond to the antigenic matter entering it from its host. When two animals are in parabiotic union, each is graft and each host, and Simonsen believes that the kidney homograft is best thought of as a parabiosis of unequal partnership. With homografts of many types—for example, of skin or cancerous tissue—a reaction of graft against host is either absent or of little importance; skin homografts, for instance, will survive indefinitely after transplantation from members of an inbred line of mice to the progeny of a cross between that inbred line and another. As every geneticist knows, such a situation is one in which the host does not react against the graft, for the graft contains no antigens not also present in the host; but there is nothing to stop the graft reacting against the host if it is immunologically qualified to do so. Neither Dempster nor Simonsen have had the good fortune to work with highly inbred dogs, perhaps because no dogs of sufficient genetic uniformity exist. It is not therefore possible to weigh up the relative importance of host-against-graft and graft-against-host reactions in homografts of kidneys. The former type are indeed entirely competent to account for the failure of kidney homografts as such, but the question is: if the reactions of the host can be subdued or abolished—it can surely be only a matter of time before they are—will the converse reaction, of graft against host, be in itself sufficiently severe to cause kidney homografts to fail?

So much for the immunological hazards of kidney transplantation. Superimposed on them are the technical and physiological disabilities of the transplantation itself. Autografts of whole kidneys are, in general, of two kinds: these are the isotopic (or orthotopic), in which the graft is transplanted into the position formerly occupied by a kidney, and the heterotopic, in which it is caused to derive its external blood supply from, perhaps, the iliac or carotid arteries. The orthotopic graft enjoys certain neighbourly relationships that are denied it elsewhere. For instance, it has long been known that removal of one of the adrenals increases the outflow of urine from the kidney of the same side. Dempster and Graber⁶ are satisfied that this alteration of function is not to be attributed to splanchnic denervation, and they think it possible (as Cow did some forty years ago) that the adrenal exerts a direct hormonal influence via the lymphatics upon the kidney of the same side. How-

ever that may be, a dog's kidney transplanted to the neck works, and may work permanently, but it does not work quite normally. Dempster and his colleagues^{7,8} have consistently recorded, among other shortcomings, a rapid and permanent deterioration of the graft's power to concentrate urine, the specific gravity of which falls to a fairly constant level of about 1012 (the normal range in dogs is 1035–1050). This deterioration was not corrected by the removal of the dog's remaining normal kidney. But removal of the normal kidney did restore to its original value a total urinary output which had fallen to a half or less in the period beginning from about a month after transplantation. A toxic syndrome which sometimes develops after a period of useful working in kidney autografts⁹ is probably due to infection consequent upon a vascular accident, since it usually yields to the administration of terramycin; but Dempster finds no ground for believing that the administration of any antibiotic can prolong the life of a kidney homograft as such.

Dempster gave an account of his interpretation of the behaviour of kidney homografts at a symposium on immunological problems of tissue grafting held at the Royal Society of Medicine on April 6, paying special attention to the histopathological evidence of the reaction of graft against host. It is against the background of these systematic physiological and immunological researches that we must appraise the occasional attempt to make use of kidney homografts in clinical practice.^{10,11} For reasons that are not yet clear the human being is, in a purely quantitative sense, more tolerant of homografts of all kinds than are most domesticated animals, and kidney homografts in human beings may therefore sometimes last long enough to raise hopes which later suffer a tragic disappointment. Kidney homotransplantation cannot at present be carried out in human beings with any theoretical expectation of success. The problems of tissue-transplantation immunity are not likely to yield to anything but prolonged, systematic, and fundamental research, and it should be a cause for some satisfaction that the homografting of kidneys has in recent years been made the subject of research of the concentration and skill required.

THE PROMOTION OF WORLD HEALTH

World Health Day, April 7, was celebrated in London at a meeting, addressed by Dr. M. G. Candau, Director-General of the World Health Organization, and by Mr. Walter Elliot, M.P., a former Minister of Health. The theme of the meeting was the vital part played by the nursing services, and a letter was

read from the present Minister of Health expressing appreciation of the importance of nurses in all branches of the National Health Service. On the following day Dr. Candau spoke at the Royal Society of Medicine and showed a film illustrating the work of W.H.O. His visit to London coincided with the publication of his annual report¹ to the World Health Assembly, which meets in Geneva in May. The report mentions that there were about 350 W.H.O. projects in 74 countries last year. The greatest number of these were proceeding in south-east Asia, and the next largest groups were in Europe, the Americas, and the Eastern Mediterranean, with 60 or 70 enterprises in each region. W.H.O.'s activities in Africa were relatively few in 1953, but they extended from public health education in Liberia to the supply of medical school equipment in Kenya and malaria control on the Congo. India received help in nearly 30 separate undertakings, from assistance for a school of nursing in Calcutta to a paediatric unit in Madras General Hospital, and from a campaign for B.C.G. vaccination in Delhi State to the establishment of a school of physiotherapy in Bombay. In the Eastern Mediterranean the projects ranged from a public health laboratory in Jerusalem to an eye diseases seminar in Cairo; and in Europe, from the setting up of a child guidance clinic in Dublin to venereal diseases control in Istanbul. Another feature of the European work of the Organization last year was inter-country programmes—for example, France and the United Kingdom continued a three-year pilot study to determine the kind of health visitor best suited to meet health and welfare needs, and they collaborated also in a study of the effects of separating the child from its mother in the early years of life. Many European countries also joined together in conferences and training courses.

As these projects are developed they seem to have a sharper definition than in earlier years. W.H.O. is not a rich uncle distributing largesse among impoverished nephews. Its purpose is to stimulate regional and local effort so that eventually there may be in every country and territory a band of trained and competent workers to man the health services. In the distant future when that is accomplished W.H.O. will have a different role to play. Meanwhile, as Dr. Candau rather sadly remarked at the World Health Day meeting in London, the funds available from technical assistance sources are liable to fluctuate. In order that the work of the Organization will not suffer, the World Health Assembly at its gathering in Geneva next month is to be asked to increase the effective working budget from the

¹ *The Work of W.H.O. in 1953, 1954.* Geneva.

¹ Michon, L., *et al.*, *Presse méd.*, 1953, 61, 1419.
² Dempster, W. J., *British Medical Journal*, 1951, 2, 1041.
³ ———, *Brit. J. Surg.*, 1953, 40, 447.
⁴ Simonsen, M., *et al.*, *Acta path. microbiol. scand.*, 1953, 32, 1.
⁵ Billingham, R. E., *et al.*, *Nature (Lond.)*, 1953, 172, 603.
⁶ Dempster, W. J., and Graber, I. G., *Acta med. scand.*, 1953, 146, 411.
⁷ ———, and Joekes, A. M., *Quart. J. exp. Physiol.*, 1953, 38, 11.
⁸ *Acta med. scand.*, 1953, 147, 99.
⁹ *Ibid.*, 1953, 144, 360.
¹⁰ Lawler, R. H., *et al.*, *J. Amer. med. Ass.*, 1950, 144, 844.
¹¹ ———, *Ibid.*, 1951, 147, 45.

previous year's figure of 8,500,000 dollars to 10,300,000 dollars. This amount, Dr. Candau said, was needed to enable them to carry out, without interruption, their planned health activities in 117 countries and territories in 1955. He added that the United Kingdom was the second largest contributor, after the United States, to the funds of W.H.O.: at the present moment the United Kingdom contribution to W.H.O. amounted to 1½d. per head of the population per year. If the budget was increased by the desired amount the cost to every person in the United Kingdom would be one halfpenny a year more. It is unfortunate that a number of countries are in arrear with their contributions, and that there is a phalanx of inactive members behind the Iron Curtain, but even with these disabilities W.H.O. achieved much to be proud of in 1953 and will undoubtedly continue to play a central part in the work of improving environmental conditions throughout the world.

THE PROPHYLACTIC EGG

With the coming of Easter and springtime we welcome both the chocolate eggs in the shops and the renewed determination of hens to start laying real ones. Unlike the chocolate variety or the somewhat rarer cardboard type enclosing a string of pearls, real eggs contain choline, and, if Wallis's theory about egg lack in rheumatic fever turns out to be correct, the sudden decrease of rheumatic fever after the peak maximum incidence of April¹ and its low incidence during summer might be due to Easter and its effect on the domestic fowl. Though this particular fancy is not included in the chain of possibilities elaborated by Wallis, he postulates that a deficiency of eggs during childhood (among other factors) leads to rheumatic fever. His argument is that low egg intake means low choline intake, and, since choline is necessary for serum phospholipid synthesis and cannot itself be synthesized, this may in turn lead to low phospholipid serum levels. Since serum phospholipid is one of the normal serum factors which inhibits the streptococcal exotoxin streptolysin S,² and since rheumatic fever is associated with streptococcal infection, the possibility exists that rheumatic fever might be conditioned partly by egg intake. This is a long and tenuous chain of reasoning, but it can be tested at various points, and Wallis provides some information at two. First, by retrospective inquiry among a group of 184 adult or adolescent patients with rheumatic heart disease and a group of normal subjects of similar economic status, he establishes³ that 41% of the former believe they ate few eggs in childhood as against 16% of the latter. Ten per cent. of the cardiac group dis-

liked eggs as against 5% of the controls. How significant this is we do not know. Such retrospective inquiries are difficult to conduct free from bias (although attempts were made to eliminate this) and even more difficult to interpret. His second contribution is a study of serum phospholipid levels at various ages in 146 normal subjects and in 178 patients with inactive rheumatic heart disease.⁴ This substance rises from a normal mean level of 8.2 mg. per 100 ml. in children aged 3-12 to 9.7 mg. per 100 ml. in adults aged 20-39, but with a great deal of scatter in the readings. In the cardiac group no mean values are given, but it is stated that the serum level was below normal average in two-thirds, tending to be lower in those with multiple attacks or of a severity great enough to need digitalis. Although Wallis found that 10.2% of 184 rheumatic heart disease patients and 4.6% of 1,380 normals disliked eggs, no information is given of the serum phospholipid level of the egg lovers and the egg haters.

Previously Coburn and Moore⁵ had reported a poverty of eggs and other materials in the diet of rheumatic children and had supplemented the diet of thirty convalescent rheumatic children with the equivalent of four egg-yolks a day. Recurrences occurred in 7% of this group, compared with 38% of thirty children whose diet was not supplemented. No further studies have been described in detail, though Coburn has reported⁶ briefly that 8-10 yolks daily prevented rheumatic relapses after group-A streptococcal infection in children who had previously had rheumatic fever.

The best hypotheses are the simplest. All current theories about the aetiology of rheumatic fever are complicated, and none more so than that recently suggested by Long⁷ on a basis of cabbage, thyroid, ascorbic acid, and tuberculin allergy in the guinea-pig. So long as a clear distinction is made between observation and speculation we should welcome theories if they are founded on fact and lead to the discovery of more facts. The egg theory might be described as "good in parts." Although support for it is meagre, we cannot afford to neglect any clue to the nature of the streptococcal role in initiating rheumatic fever. But the enthusiastic clinician might pause before loading his patients with eggs to prevent rheumatic fever lest he speed them on the way to atherosclerosis and coronary disease.

DEXTRAN AND NEPHROTIC OEDEMA

Recently two new therapeutic agents have been used in the treatment of nephrotic oedema. They are cation-exchange resins and dextran. So far, more of the clinical trials have been with cation-exchangers, but now the first studies on the effect of dextran have been published,^{1 2} and it is beginning to be possible to assess its usefulness in this syndrome. The essential principles by which resins and dextran work are quite different. Cation-exchangers increase the loss of sodium from the body, while dextran increases the osmotic pressure of the plasma and so attracts idle water from the oedematous parts, and possibly hinders tubular reabsorption of water in the kidneys.¹

Elsewhere in this issue of the *Journal* Drs. A. W. Mollison and J. B. Rennie report their experience of treating nephrotic oedema with intravenous infusions of dextran. Dextran was given on 81 occasions to eight patients. All were at rest in bed, on restricted salt intake, and a moderately restricted fluid intake. Seven patients received a high and one a normal protein intake. The dextran was used in a standard commercial 6% salt-free preparation, and three 10% salt-free preparations of large, medium, and small molecular size. Diuresis and delivery of the oedema occurred with all these preparations, regardless of molecular size or concentration, but the effect lasted longest with the large molecular preparation. In all cases the oedema re-accumulated. Dextran had no adverse influence on renal function. Toxic reactions to infusion were noted in all cases, and consisted of severe headaches, occasional nausea and vomiting, and fever; two patients developed transient hepatic enlargement; one patient developed fever, dyspnoea, cough, and scanty rales at the lung bases after the fourth infusion of small-molecule dextran, and another developed the same symptoms though less severely with a similar preparation. The more severe reactor of these two also showed signs of the greatest increase in blood volume of any of the patients in response to the infusion, and this occurred at the time of his reaction; skin tests for sensitivity to dextran were negative. The authors thought that the reactions they encountered were not allergic so much as due to overloading of the circulation, and they found that slowing the rate of infusion reduced the severity of the reaction.

It is interesting that subsequent courses of dextran after the first were effective in producing diuresis in this series of cases. Olive *et al.*² found that in two of the twelve children with nephrotic oedema whom they treated the second course of dextran failed to cause diuresis even though the first had been quite effective. On the other hand they noted toxic reactions in only three of their cases, the reactions being correlated with the use of a preparation of high molecular weight and with frequent molecular branching. Kabat and Berg³ noted that dextran given to healthy humans was antigenic, and Kabat, Turino, and Tarrow⁴ have shown that cutaneous sensitivity to dextran was statistically correlated with the occurrence of systemic reactions to subsequent intravenous infusions. Apart from the reactions of an antigenic or haemodynamic type Mollison and Rennie draw attention to a hitherto unremarked complication to its therapeutic use. Two of their patients suffered impairment of haemopoiesis, which in the more severely affected case persisted for two months after the last infusion of dextran. The authors thought this was due to the fact that the dextran is taken up by the reticuloendothelial system and therefore of the bone marrow and only slowly released and excreted or

metabolized. The hepatic enlargement which occurred in two of their cases was presumably from this cause, although histochemical examination of the liver from one case at necropsy failed to reveal the presence of any dextran. Dextran is also deposited in the renal tubules.⁵ Michie and Ragni⁶ noted that the repeated intravenous administration of it significantly decreased the maximal tubular excretory capacity for para-aminohippurate in two out of five subjects with normal kidneys and in three out of four patients with pre-existing renal disease. The significance of this finding in such a small series of patients is doubtful, particularly in view of other evidence of the innocuousness of dextran where the kidneys are concerned.^{1 7 8}

Most reports indicate that single infusions of dextran are not very effective in delivering nephrotic oedema,^{1 2} and Mollison and Rennie's experience is no exception to this. There is little doubt that dextran is a powerful diuretic and may succeed when all other measures fail, but by the very nature of its route of administration and the transience of its effects it is unsuitable for use in domiciliary practice.

PHOTIC CONVULSIONS

Cases have been reported from time to time of epileptic seizures apparently induced by flashing lights, such as sunlight through rows of trees. But it was Grey-Walter and his associates¹ who first showed systematically that rhythmic visual stimulation produced widespread physiological effects, leading in some cases to clinical epileptic attacks. Since then several modifications of the original technique have been made, such as triggering the stimulus frequency by a "feed-back" circuit from frequencies present in the stimulated brain.² Gastaut^{3 4} introduced the combination of injected metrazol with photic stimulation. Many studies of the effects of these methods of examination in various neurological and psychiatric conditions have now appeared. Recently Bickford, Daly, and Keith⁵ have reported on 27 epileptic children who all showed, on photic stimulation, epileptic discharges in their electroencephalogram, often with clinical attacks as well. As found by other workers, the effective flash frequencies were usually between ten and twenty flashes per second, and myoclonic jerks were the commonest clinical manifestation. Arrest of speech and clinical petit mal sometimes occurred. In several cases there was a clinical history of minor attacks precipitated by light stimuli. One child sometimes induced attacks at will by waving his fingers in front of his eyes, apparently getting a pleasurable sensation thereby. The authors do not specifically discuss the aetiology of their patients' epilepsy, but several obviously have diffuse degenerative cerebral disorders, and others have so-called idiopathic epilepsy.

¹ Walter, W. G., *et al.*, *Nature, Lond.*, 1946, 158, 540.

² Shipton, H. W., *J. Brit. I.R.E.*, 1949, 4, 374.

³ Gastaut, H., *Electroenceph. clin. Neurophysiol.*, 1950, 2, 249.

⁴ — and Hunter, J., *ibid.*, 1950, 2, 263.

⁵ Bickford, R. G., *et al.*, *Amer. J. Dis. Child.*, 1953, 88, 170.

⁶ Ulett, G. A., *Arch. Ophthalm. (Chicago)*, 1953, 50, 685.

⁷ Williams, D., *Brain*, 1953, 76, 50.

⁸ Wall, P. D., *et al.*, *Electroenceph. clin. Neurophysiol.*, 1953, 5, 385.

¹ Wilson, May G., *Rheumatic Fever*. Oxford University Press, London, 1940.

² Humphrey, J. H., *Brit. J. exp. Path.*, 1949, 30, 345.

³ *Amer. J. med. Sci.*, 1954, 227, 167.

⁴ *Ibid.*, 1954, 227, 171.

⁵ *Amer. J. Dis. Child.*, 1943, 65, 744.

⁶ *Ibid.*, 1945, 70, 348.

⁷ *J. Amer. diet. Ass.*, 1950, 28, 345.

⁸ *Lancet*, 1954, 1, 529.

¹ Wallenius, G., *Scand. J. clin. Lab. Invest.*, 1950, 2, 228.

² *Proc. Mayo Clin.*, 1953, 28, 199.

³ *J. Immunol.*, 1953, 70, 514.

⁴ Reports to the National Research Council Subcommittee on Shock, Jan.-April, 1952.

⁵ Froeb, H. F., *et al.*, *Fed. Proc.*, 1952, 11, 51.

⁶ *J. appl. Physiol.*, 1953, 5, 625.

⁷ Raisz, L., *J. Lab. clin. Med.*, 1952, 40, 880.

⁸ Harrison, J. H., *Ann. Surg.*, 1954, 139, 137.

A rational treatment of this abnormal light sensitivity would seem to be to cut down the intensity of visual stimulation by dark glasses. Bickford and his colleagues noted that this was an effective adjuvant to drug therapy in some cases. Ulett⁶ has used dark glasses to prevent laboratory staff exposed to experimental stimulation from suffering ill effects. Trimethadione and amylo-barbital are the most effective drugs in diminishing photosensitivity, especially when given intravenously. No one seems to have followed up the odd fact that the former drug, the most effective of all, has the unpleasant side-effect of producing glare and other visual disturbances, contrary to what might have been expected.

Abnormal photosensitivity, leading to the production of epileptic discharges in the E.E.G. and even myoclonic jerks, occasionally occurs in subjects who have never had any spontaneous epileptic attacks of any sort. Some hysterics, schizophrenics, and children with behaviour problems, for example, will give myoclonic jerks with photic stimulation (and no metrazol). Anticonvulsants are usually beneficial only to patients with spontaneous epileptic attacks: rarely, for example, will a pure behaviour disorder occurring in a photosensitive child respond to anticonvulsants. As these authors remark, neither their clinical studies nor current neurophysiological research gave unequivocal evidence of the pathways responsible for the abnormal spread of impulses from the visual to the motor systems. Gastaut and Hunter's experiments³ pointed to a sub-cortical, possibly thalamic "leak" (a view supported by Williams's observations⁷ on thalamic activity in spontaneous petit mal), but recent studies⁸ have indicated the pre-tectal region. The mechanism certainly appears different in pathway and function from the normal non-specific arousal responses obtainable from the reticular substance of the central grey matter. The solution of this problem may shed light on many neuropsychiatric disorders apparently far beyond the borderlands of epilepsy.

DANGERS OF EFOCAINE

Last year Iason and Shaftel¹ described the use of a solution known as "efocaine" for producing long-lasting local analgesia in the neighbourhood of operation wounds. They obtained favourable results in 100 cases. Efocaine contains procaine as base 1%, procaine hydrochloride 0.25%, butyl-*p*-aminobenzoate 5%, in a solvent composed of 2% polyethylene glycol, 78% propylene glycol, and water. When injected near the incision they found that efocaine produced analgesia for a period which varied from six to eighteen days as determined by the response to pricking the skin. Iason and Shaftel state that "when efocaine is injected into the tissue, the contact with the body fluid causes a deposition of the active ingredients producing anaesthetic depot." To obtain by this means more or less complete absence of pain around the incision is a notable achievement, and there have been several papers from surgeons giving favourable accounts of the use of efocaine. It has been used to relieve the

pain of fissure- and fistula-in-ano, to control the pain after removal of haemorrhoids, and to relieve pruritus ani; for caesarean section, episiotomy, and hysterectomy; for hernia, cholecystectomy, and gastrectomy. When it has been used it is stated that much less morphine, codeine, and pethidine have been required, but in many places these drugs are given as a post-operative routine, sometimes perhaps when not required. In this country Roualle² obtained a good result in eight and a fair result in three out of fourteen patients. He pointed out that to be effective the efocaine should be deposited close to the nerves supplying the area, and therefore he recommended a nerve block in preference to local infiltration.

More recently there have been accounts^{3, 4, 5} of some disadvantages of efocaine. After its use there have been perirectal sloughs, unilateral anhidrosis, severe neuralgia persisting for weeks, neuritis, prolonged motor paralysis of the legs, and atonic bladders. Finally, Angerer, Su, and Head⁶ have described a death which was clearly due to efocaine, when it was used to produce an intercostal nerve block. During the injection, when 1.5 ml. of efocaine had been given, the patient complained of severe pain in his back and radiating down both legs. He collapsed and died forty-four hours later. At necropsy there was acute thrombophlebitis of the 8th intercostal vein, and focal necrosis and acute inflammation of the spinal cord. The spinal fluid gave a positive test for procaine. The authors conclude that efocaine, "since it may produce myelitis and even death, should not be used for local anaesthesia, especially in a region near a vital organ such as the spinal cord."

The substances present in efocaine taken separately are not toxic, though butyl-*p*-aminobenzoate is a substance with a structure not wholly unlike that of butyn, which is a toxic anaesthetic. However, when present together in efocaine they may clearly damage both vascular and nervous tissue, with serious consequences in some patients, the changes being probably due to one or other of the solvents. Mannheimer and his colleagues⁷ have recently reported that perineural injections of efocaine in animals caused coagulation necrosis of the nerve fibres, and that the propyleneglycol and polyethylene glycol mixture (solvent for efocaine) alone and mixed with 5% butyl-*p*-aminobenzoate caused muscle and nerve changes identical to the changes caused by efocaine. This evidence also prompts the inquiry how far it is good physiological practice to seek to produce prolonged local analgesia in the neighbourhood of a healing wound. Are there grounds for supposing that the impulses arising in the sensory nerves carry out no useful or important function? Certainly the deposition of a large amount of foreign matter cannot evoke the normal tissue reaction in an anaesthetized area, and it is not surprising to learn of untoward results following this practice.

¹ Iason, A. H., and Shaftel, H. E., *Amer. J. Surg.*, 1952, 83, 549.

² Roualle, H. L. M., *British Medical Journal*, 1952, 2, 1293.

³ Bonica, J. J., *J. Amer. med. Ass.*, 1952, 150, 1581.

⁴ Shapiro, S. K., and Norman, D. D., *ibid.*, 1953, 152, 608.

⁵ Sullivan, M. B., and Gerber, M. L., *U.S. Armed Forces med. J.*, 1954, 8, 100.

⁶ Angerer, A. L., Su, H. H., and Head, J. R., *ibid.*, 1953, 153, 550.

⁷ *J. Amer. med. Ass.*, 1954, 154, 70.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

LIVER-FUNCTION TESTS

BY

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In view of the very large number of liver-function tests which have been elaborated, the present discussion is limited to a few tests of established value. These tests can be divided into two groups according to the nature of the material required. Tests in the first group can be performed on material collected by the practitioner, whereas those in the second group require the attendance of the patient at a laboratory or hospital centre or, alternatively, a personal visit by the pathologist. Tests performed on material submitted by the practitioner include serum bilirubin, serum alkaline phosphatase, flocculation tests, serum albumin and globulin estimations, and qualitative urine tests for bile pigments. More elaborate tests are the quantitative estimation of urine bile pigments, bromsulphthalein retention, and prothrombin response to vitamin K.

The blood tests in the first group require the collection of approximately 10 ml. of clotted blood reasonably free from haemolysis. To achieve this it is necessary to use a dry sterilized syringe and to remove the needle before squirting the blood gently into the dry collection tube. Urine can be naturally voided and should preferably be an afternoon specimen, since the amount of urobilinogen, for example, is small in morning specimens. It is, in general, inadvisable to rely upon any one test of liver function, and a "battery" of tests is usually employed. This need not necessarily include all the tests mentioned, and some guidance on the choice of tests is given below.

The various tests are considered individually in relation to their usefulness in the diagnosis of liver diseases.

Serum Bilirubin

It is difficult to avoid discussion of technique in this test, as so many different methods have been used since the pioneer work of van den Bergh. I prefer a separate estimation of "direct" and "indirect" serum bilirubin by a photoelectric method based on that of Malloy and Evelyn. With this technique direct pigment refers to colour developed in aqueous solution after 15 minutes, while the total pigment is read in alcoholic solution at 30 minutes. The indirect pigment represents the difference between the two values. Terms such as direct, indirect, and biphasic reaction are also used, but they are difficult to define quantitatively.

The normal total serum bilirubin is from 0 to 1 mg. per 100 ml. of serum, and a zone of latent jaundice not clinically detectable exists between 1 to 3 mg. per 100 ml., patients with values over 3 mg. being usually clinically jaundiced. The demonstration of latent jaundice is an important aid to diagnosis in conditions such as infective hepatitis, hepatic cirrhosis, and the haemolytic anaemias. In jaundiced patients both the direct and the indirect bilirubin will increase, but if more than half the total is indirect the jaundice is probably haemolytic in nature. Jaundice due mainly to increase in direct pigment is usually either obstructive or toxic and infective.

The serum bilirubin estimation is an important basic procedure as it provides an accurate record of the intensity

of any jaundice which may be present. It may nevertheless give normal results in certain cases of chronic liver disease such as cirrhosis, carcinomatosis, etc.

Serum Alkaline Phosphatase

The serum alkaline phosphatase is an enzyme produced mainly in the bones by the osteoblasts but also by the liver cells. It can therefore only be used as a liver-function test in cases in which the bones can be assumed to be normal. Its level in the blood (normal 3 to 13 King-Armstrong units) is elevated in a variety of liver conditions such as obstructive jaundice, hepatitis, carcinomatosis, abscess, amyloidosis, and cirrhosis. It is, however, on the whole much higher in obstructive jaundice than in the other conditions named, and values over 35 units, for example, are particularly suggestive of obstruction as opposed to hepatitis in a jaundiced patient. In the differential diagnosis of jaundice it is particularly valuable to combine this test with one or more of the flocculation tests.

Flocculation Tests

Under this heading are included a rather large number of empirical procedures which have been used to demonstrate hepatic dysfunction, ranging from the earlier formol-gel and Takata-Ara reactions to more recent tests such as the serum colloidal gold reaction and the thymol turbidity and flocculation tests. There are, however, considerable individual differences in these various tests, and the following remarks apply mainly to the thymol and gold tests.

These tests are positive, particularly in acute infective hepatitis (about 90%) and in cirrhosis (about 50%), and have a special tendency to be negative in obstructive jaundice. They are therefore of value in the detection of hepatitis and in the differential diagnosis of jaundice. It should always be remembered that they are not specific tests of liver damage, as they depend upon a particular type of serum protein disturbance which may also occur in various acute and chronic infections such as glandular fever, malaria, infective endocarditis, etc. The necessity of interpreting all laboratory procedures with due regard to the whole clinical picture applies particularly to these tests.

Serum Albumin and Globulin Estimations

These tests are of most value in the more chronic types of liver disease such as cirrhosis. In cirrhosis the albumin (normal 4 to 5.5 g. per 100 ml.) tends to fall and the globulin (normal 1.5 to 3 g. per 100 ml.) to rise. Alternatively, one may say that the albumin/globulin ratio (A/G ratio) (normally about 2:1) tends to fall in liver disease, but as changes in the two fractions are largely independent of one another it is preferable to consider the values individually. Neither change is an entirely specific indication of liver damage, but if both alterations are present hepatic disease is the most likely explanation.

These tests are of value in confirming a diagnosis of cirrhosis. From the prognostic point of view the albumin is the more important estimation, values below 2 g. per 100 ml. indicating a poor prognosis, and usually being associated with an obstinate oedema. High globulin values, on the other hand, are compatible with good health and do not usually produce symptoms. These estimations, based on

salting-out procedures, are to some extent becoming replaced by electrophoretic analysis of the serum proteins. However, this procedure is not available in all laboratory centres and rules for the interpretation of results are not yet so firmly established.

Qualitative Urine Tests for Bile

The ordinary clinical tests for bile such as the foam and iodine tests are, of course, very insensitive. The following remarks refer to tests such as the Harrison-Fouchet test for bilirubin and the Ehrlich-Watson test for urobilinogen. These tests reach their maximum usefulness in patients who are not clinically jaundiced. In such cases the occurrence of bilirubinuria suggests a latent jaundice usually due to hepatitis or to biliary obstruction, and this test may be positive some days before a rise in the serum bilirubin can be demonstrated. The test is therefore particularly valuable in the pre-icteric phase of infective hepatitis and in hepatic cirrhosis.

An increase in urine urobilinogen may accompany bilirubinuria but may also occur without any latent jaundice in chronic liver damage such as hepatic cirrhosis. It is a less specific indication of liver pathology than bilirubinuria and may occur as a temporary event in febrile states. Urobilinuria may also occur in jaundiced patients but is of limited diagnostic value in this group; on the whole, increased values are suggestive of toxic and infective jaundice, but there are many exceptions to this rule.

Quantitative Estimation of Urine Bile Pigments

As noted above, the urinary excretion of urobilinogen is increased as a result of liver damage, and this increase is best demonstrated by a quantitative estimation. Urobilinogen is formed mainly by the bacterial decomposition of bilirubin in the intestinal tract. It is partially reabsorbed from there into the blood stream and is partly re-excreted by the liver in the bile. It follows from this that urine for this test should not be collected in the morning, when the effects of bile flow will be minimal, and also that the investigation is of greatest value in patients not clinically jaundiced. In the absence of jaundice it can be assumed that bile is reaching the intestine, whereas in the presence of jaundice this may not be the case.

Although this examination can be carried out on 24-hour urine specimens it is more convenient to collect a timed specimen of urine in the afternoon and to estimate the amount of pigment in a one- or two-hour specimen by the methods of Watson. Normal values for urobilinogen are from 0 to 1 Ehrlich unit per 2 hours or up to 3 mg. per 24 hours.

The interpretation of this estimation is very similar to that given for the qualitative urobilinogen test above, but the procedure is more accurate and reliable. The test is of particular value in non-jaundiced cases of hepatitis and cirrhosis.

Bromsulphthalein Retention

Bromsulphthalein (phenoltetrabromphthalein disodium sulphonate) is a harmless dye which is injected intravenously and is excreted mainly in the bile. The recommended dosage is 5 mg. per kg. body weight and blood is collected exactly 45 minutes after injection. The amount of bromsulphthalein remaining in the serum is estimated. Normal subjects will show no significant bromsulphthalein retention at 45 minutes, and in pathological states the amount remaining in the circulation at this time is expressed as a percentage of the injected dose to give a figure of percentage bromsulphthalein retention.

Like the preceding test this is of little value in jaundiced subjects and is mainly used in non-jaundiced subjects and in cases of hepatitis and cirrhosis. It is a sensitive and convenient test in cases of this type, although even this test is not invariably positive in cirrhosis. It will also indicate the existence of liver dysfunction in other conditions, such as malaria, diabetes mellitus, glandular fever, etc.

Prothrombin Response to Vitamin K

This test has been used mainly in cases of obstructive jaundice but is also of value in the differentiation between surgical and non-surgical jaundice. It is, of course, applicable only to those patients who have low prothrombin values when first seen. This may happen either because the exclusion of the bile from the intestine interferes with the absorption of vitamin K (obstructive jaundice) or because the liver is too severely damaged to manufacture vitamin K from its plasma precursors (hepatitis or cirrhosis). About a quarter of all jaundiced subjects may be expected to exhibit an initial deficiency in prothrombin and therefore become eligible for this test.

After the initial estimation vitamin K is administered, usually as 50-100 mg. of a water-soluble preparation, and the prothrombin is again estimated after 24 to 48 hours. A rapid return towards normal indicates good liver function and confirms the diagnosis of biliary obstruction. An absence of response indicates gross liver damage and suggests a hepatogenous origin for the jaundice. In practice the first part of this test is often omitted; a low prothrombin value after adequate vitamin-K therapy is, of course, significant even in the absence of the preliminary observation.

Quite apart from its value in diagnosis the test is of great importance if operation is contemplated, as a low plasma prothrombin value indicates a greatly increased risk of haemorrhage.

Combination of Tests

Certain tests are particularly suitable for use in combination, and this applies especially to the serum alkaline phosphatase estimation and the thymol flocculation test in relation to the differential diagnosis of jaundice. The individual variations in these two tests have already been discussed, but the accuracy of diagnosis is improved when they are undertaken simultaneously. Thus cases of jaundice with negative thymol tests and serum alkaline phosphatase values above 35 units are almost invariably obstructive in nature, whereas those with strongly positive flocculation tests and/or with normal serum alkaline phosphatase levels are usually non-obstructive. In some 20% of cases the findings fall between these two extremes and are of no diagnostic value.

Indications for Liver-function Tests

Laboratory procedures in general can only be used to answer certain restricted types of question, and it is important to have a clear idea of exactly what the provisional diagnosis is before any help can be expected from tests of this type. Most of the indications for the tests will fall under one or more of the following heads:

In suspected primary liver disease the condition may be either acute or chronic in nature—for example, infective hepatitis or hepatic cirrhosis. Any of the tests described may assist in making the diagnosis, their relative importance varying, however, with the type of case. In pre-icteric hepatitis the first tests to become positive are those for urine bile pigments, particularly bilirubin. At a later stage all the pigmentary tests will be positive and usually the flocculation tests in addition. In hepatic cirrhosis, on the other hand, the pigmentary tests and many of the others may be at times completely negative and more reliance is placed upon the serum protein estimations and the bromsulphthalein retention.

The liver may be secondarily involved in a variety of diseases. In heart failure, for example, the turbidity and flocculation tests are often positive and urobilinuria may occur. In malaria and glandular fever the positive flocculation tests constitute the most frequent abnormality, while in thyrotoxicosis the disturbance is of a different type and may require the use of tests such as a galactose-tolerance test and a hippuric-acid test, which are not especially valuable for general diagnostic purposes.

The differential diagnosis of hepatic enlargement tends to be concerned mainly with the problem of distinguishing hepatic cirrhosis from carcinomatosis. The biochemical changes are usually distinctly different in the two groups, the serum protein and flocculation tests being mainly altered in cirrhosis while the raised serum alkaline phosphatase is the main change in carcinomatosis.

In the differential diagnosis of jaundice we are usually trying to distinguish jaundice due to a mechanical obstruction of the bile passages from that due to hepatitis or cirrhosis. As noted above, the thymol flocculation test and serum alkaline phosphatase used in combination give the best results in cases of this type, making the distinction satisfactorily in about 80% of such cases, the results being equivocal in the remaining 20%. Some assistance can also be given in the detection of haemolytic jaundice in which the indirect serum bilirubin is more raised than the direct pigment, and the serum alkaline phosphatase tends to be normal.

The tests principally used in the prognosis of liver diseases are the serum albumin estimation and the prothrombin response to vitamin K. In cirrhosis values for the serum albumin below 2 g. per 100 ml. indicate an irrecoverable liver damage with a poor prognosis. In obstructive jaundice failure of a low prothrombin level to respond to vitamin-K therapy suggests grave liver damage and a poor operative risk.

The investigation of anaemias is, of course, the province of the haematologist, but the differential serum bilirubin estimation may assist in the detection of haemolysis, in which the indirect pigment is mainly increased. This finding has been found valuable in the diagnosis not only of the various haemolytic anaemias but also in cases of pernicious anaemia.

Choice of Test

As mentioned above, it is usually desirable to combine several different tests, and the following scheme may be taken as a guide.

Tests for Routine Application.—Serum bilirubin, serum alkaline phosphatase, flocculation tests, qualitative urine tests for bilirubin and urobilinogen: this small battery of tests will often give all the information required, at all events from a diagnostic standpoint. They will establish the absence or presence of jaundice, and if jaundice is present they will provide a record of its intensity and will also give a good indication of its probable cause. In the non-jaundiced patient, on the other hand, one or more of the tests may be positive and provide enough evidence to confirm a suggested diagnosis of hepatic disease.

Further Tests.—If the above tests are negative or if their indications are in any way equivocal the remaining tests mentioned may be undertaken in the following order of preference: serum albumin and globulin estimations, quantitative estimation of urine bile pigments, bromsulphthalein retention, prothrombin response to vitamin K. It will usually be unnecessary to do more than one or two of these additional tests in order to support, for example, a diagnosis of liver cirrhosis, but the vitamin-K test is specifically indicated in surgical jaundice.

Conclusion

In conclusion it may be emphasized that modern liver-function tests reach a high degree of sensitivity and will rarely fail to demonstrate any significant liver damage which may be present. This implies that the disturbances of function occurring in various non-hepatic diseases may complicate interpretation, which should always be undertaken with due regard to the whole clinical picture.

Next article on Clinical Pathology.—"Laboratory Investigations in Suspected Industrial Poisoning," by Professor R. E. Lane.

Reports of Societies

CONVULSIONS IN CHILDHOOD

The Section of Paediatrics of the Royal Society of Medicine met under the chairmanship of Dr. C. T. Potter on March 26 to discuss "The Significance of Convulsions in Infancy and Childhood."

Dr. PETER TIZARD (Paediatric Unit, St. Mary's Hospital, Paddington) opened with a general review of the aetiology of convulsions. Most textbooks divided fits into the symptomatic—those caused by fever, cerebral tumour, brain injury, etc.—and the idiopathic, which included infantile convulsions, pyknolepsy, and true epilepsy. Was this sort of division justifiable? With regard to symptomatic convulsions, we did not know the effective cause, in the Aristotelian sense, of any fit. Clearly fever, for example, in itself could not be regarded as a cause. Were it so any individual would have a fit whenever his temperature reached a certain critical height, whereas in fact that happened only with an extremely small minority of children. Similarly, a focal lesion, such as a cerebral tumour or brain injury, could not in itself be the cause of a fit; if it were, the patient would convulse continuously and not intermittently.

Probably, in the production of any one fit there were several causative factors. This view led to the concept of a "convulsive threshold," to the idea that there was no fundamental difference between the epileptic and the non-epileptic, and that any person given an adequate stimulus would have a fit. The nature and degree of stimulus would vary widely, of course; at one end of the scale were those who would convulse only in response to a severe electric shock or an injection of insulin, while at the other end the threshold was so low that fits seemed to occur spontaneously. Between these two extremes were those who developed fits in response to such precipitating factors as fever or brain injury.

This view, that we are all potential epileptics but have varying degrees of natural resistance, provided a useful method of approach to the parent of a child who had fits. It took away much of the sting that goes with a diagnosis of epilepsy. Useful though it was, however, it represented an over-simplification of the problem. There was no evidence of hereditary predisposition in some forms of symptomatic epilepsy. In conclusion, Dr. Tizard discussed the possibility that included in what we now call idiopathic epilepsy there were several different diseases of unknown aetiology and pathology, of which the main symptom was the occurrence of fits.

The First Fit

Dr. CHRISTOPHER OUNSTED (Research Assistant to the Oxford Regional Hospital Board) spoke about the "First Fit." Its significance in a young child depended on the setting in which it occurred. In severe infections multiple fits were common and were of grave prognostic significance. Prolonged fits and status epilepticus were fatal *per se*. Dr. Ounsted gave figures showing that a sharp reduction in the mortality of purulent meningitis, and a parallel reduction in the incidence of fits, could be achieved by giving prophylactic anticonvulsants to affected children. Established convulsions should be aborted as rapidly as possible; phenobarbitone and chloral were valueless once a fit had begun, but sodium amyllobarbitone given intramuscularly in doses from 0.125 to 0.25 g. controlled convulsions rapidly and safely.

After a single fit the regular use of anticonvulsants was not necessary, but the child should be given prophylactic phenobarbitone during any future febrile illness up to the age of 4 years. This measure seemed to be effective in preventing fits, and the mothers were comforted by having some practical steps offered to them.

The relationship between infantile convulsions and adult epilepsy was not known, and studies made by different workers had given conflicting results. The paediatrician's problem was to give a prognosis at the time of the first fit. Various prognostic criteria had been proposed; in particular much weight had been given to electro-encephalographic abnormalities and to a family history of epilepsy. Neither of these criteria was a reliable guide. Study of 800 family trees of children with convulsive disorders had shown that benign convulsions and intractable epilepsies were often found in the same family. The E.E.G. was not a prognostic instrument in childhood. Records made on young children were often inscrutable.

E.E.G. Studies

Dr. W. A. COBB (Department of Applied Electrophysiology, National Hospital, Queen Square) gave an account of the contribution of electro-encephalography to the study of fits. The characteristic 3-cycle per second spike-and-wave tracing of petit mal remained a problem. Though it was always present, he thought, in petit mal, it might also occur in subjects with other types of fit, or rarely in subjects who were not suffering from any form of fit. Several tracings were shown in which, in addition to the usual spike-and-wave episodes, there was an occipital delta rhythm with bilateral foci in the occipito-temporal regions. Evidence was accumulating to suggest that this combination might provide a means of recognizing a certain type of epilepsy in children, a type hard to treat successfully but with nevertheless an excellent ultimate prognosis. The existence of such a group of cases with electro-encephalographic diagnostic criteria might perhaps justify a revival of the old term of pyknopsia.

Post-mortem Appearances

Dr. L. CROME (Fountain Hospital) gave an account (illustrated by slides) of the morbid anatomical findings in a series of 61 epileptics from an institution devoted to low-grade defectives. Gross structural abnormalities, affecting chiefly the cerebral cortex, were found in all these cases, and his material afforded no support for the existence of idiopathic epilepsy.

It was difficult to be sure to what extent comparison was justifiable with normally intelligent patients with fits, but it seemed possible that processes in the group with severely deranged brains were often greatly magnified reproductions of similar events occurring in more normal individuals.

Discussion

Dr. T. STAPLETON wondered whether there might not be some danger of adding to anoxia if phenobarbitone were given as a routine in cases of bronchopneumonia in small children. Dr. OUNSTED replied that he felt sure that there was no danger of this in the small dosage used.

Dr. R. M. MAYON-WHITE asked to what extent intrathecal therapy was related to the incidence of fits in purulent meningitis, and Dr. OUNSTED said that no correlation had been observed at Oxford.

Dr. E. S. STERN mentioned that Dr. Gillman had shown that barbiturate poisoning could be successfully treated with picrotoxin even in advanced cases, and that 1 g. of sodium hexobarbitone intramuscularly was an effective treatment for status epilepticus in adults.

Dr. HUGH ELLIS and others, including the CHAIRMAN and Dr. OUNSTED, commented on a pamphlet* recently issued by the Ministry of Health in which it was suggested that cases of fits should be notified to the school medical officer as soon as possible after the age of 2 years. It was generally agreed that this would be most inadvisable, as one or more convulsions at this age might have no prognostic significance whatever.

*Ministry of Health Circular No. 26/53, December, 1953—Welfare of Handicapped Persons. The Special Welfare Needs of Epileptics and Spastics.

There was little time for discussion after the four opening papers, which, as is usually the case, considerably exceeded their allotted time. This was a pity, especially as the subject of the meeting was of general medical interest. There might be something to be said for a compromise between this sort of meeting, which, valuable as it may be, is certainly not a discussion, and the sort of channelled and controlled—and sometimes artificial—discussion with which the B.B.C. has made us familiar.

LOCAL MEDICAL SOCIETIES

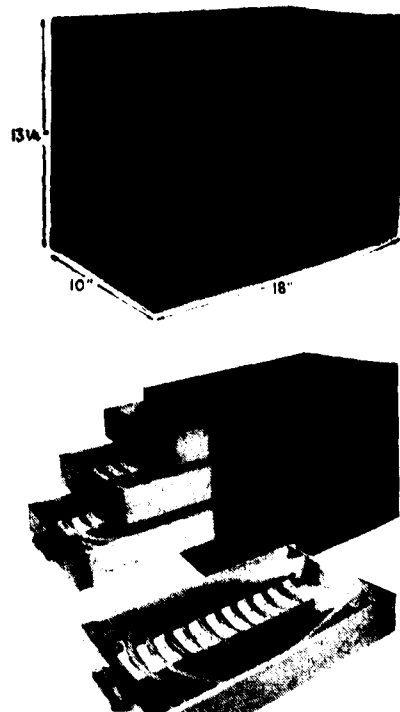
Liverpool Medical Institution

Speaking at a meeting on March 18, Sir Reginald Watson-Jones stressed the need for a clearer conception of what constituted a minor injury. Many finger injuries, hitherto regarded as minor, were in fact major and responsible for men being off work for long periods at a time. A simple strained ankle might turn out to have a recurrent subluxation associated with a displaced astragalus, and a badly handled shoulder dislocation might be the start of a recurrent dislocation. On the other hand, fracture-dislocation of the pelvis, commonly regarded as a major injury, usually gave rise to little trouble if properly managed. At the beginning of the meeting Dr. Henry G. Carlisle and Dr. G. F. Rawdon Smith were admitted, with acclamation, to life membership of the institution.

Preparations and Appliances

STORAGE CABINET FOR ENDOTRACHEAL TUBES

Dr. M. J. HARKER, consultant anaesthetist, Shrewsbury Group Hospital Management Committee, writes: I find the cabinet illustrated a very useful and time-saving adjunct to the anaesthetic department. It was devised by the theatre sister (Sister K. Wilks) and made by the carpenter (Mr. W. H. Edwards) at Copthorne Hospital, Shrewsbury. It is simple in construction, it facilitates the instant selection of any size or type of tube, and the tubes are kept at their correct curve by the kidney-shaped blocks. The cabinet fits conveniently under the ordinary dressing trolley, such as is used for the intravenous tray in the anaesthetic room. The top drawer, 8½ by 2½ in. (22.5 by 6.4 cm.), has a division in the centre and is used for airways and connexions. The second, third, and fourth drawers, of the same dimensions, have central kidney-shaped blocks ½ by 1½ by 2½ in. (1.9 by 3.8 by 6.4 cm.). There are two side pieces 8½ in. (21.6 cm.) long, to narrow the width of the drawer for the smaller tubes. The second drawer houses cuffed tubes, the third drawer nasal tubes, and the bottom drawer oral tubes.



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Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Action of Chlorpromazine and Promethazine

SIR.—On April 2 a discussion took place at the Royal Society of Medicine on the action of chlorpromazine and promethazine. In practical anaesthesia these two substances are used together with pethidine. In the discussion it became clear that anaesthetists are not much interested in the fall of temperature which chlorpromazine produces, and that these substances are used together for their peculiar anaesthetic action.

Since from the pharmacological evidence there is not very much to choose between these substances so far as their central action is concerned, would it not be possible for observations to be made in patients using only one substance at a time? It would be of great value to know whether a dose of 200 mg. chlorpromazine given alone would have different effects from 200 mg. promethazine given alone, or from 200 mg. pethidine given alone. It would be important that the observations on the effect of these substances should be made by somebody who did not know which of the compounds had been administered, in order to exclude preconceptions in making the comparison.—I am, etc.,

Oxford.

J. H. BURN.

Hibernation Anaesthesia

SIR.—Drs. Angus Smith and J. G. Fairer (*Journal*, March 27, p. 759) suggest that the case of "prolonged hypotension following hibernation anaesthesia" described by us (*Journal*, March 13, p. 645) was in fact due to surgical shock, the result of inadequate anaesthesia. In reply we would like to make the following points.

(1) The patient was a small—120 lb. (54.4 kg.)—frail, elderly woman. In accordance with usual pharmacological practice we considered that a reduction in dosage, in relation to age and body weight, was indicated. (2) The dosage of the "potentiating mixture" given (chlorpromazine 12½ mg., promethazine 12½ mg., pethidine 25 mg.) produced the usual picture obtained after its exhibition in the doses recommended by Smith and Fairer—loss of consciousness, slight hypotension, initial rise in pulse rate, lack of response to painful stimuli, ease of intubation without muscle relaxants. (3) At no time during the operation were there any signs of inadequate anaesthesia. The blood pressure levelled off at 80/45 mm. Hg; the pulse rate remained steady at 120/minute (pre-operative level 100/minute); there were no voluntary movements, no sweating, and no lacrimation. The "aliquot mixture of nitrous oxide and oxygen" would appear to have been sufficient for adequate anaesthesia, its effect presumably being potentiated by the "lytic cocktail." The indications for supplementary doses of "lytic cocktail" are a rise in pulse rate and/or blood pressure, neither of which occurred during the operation on our case. (4) Our "hibernation anaesthetic" cases hitherto had awakened some 4–5 hours after the start of the hibernation, by which time the blood pressure was nearly at pre-operative levels. After the elapse of nearly four hours the case reported was still deeply unconscious and not reacting to deep painful stimulation. The usual picture of post-operative shock was absent (hypotension, hypothermia, clammy skin, cyanotic lips and nail-beds, rise in pulse rate, intense peripheral vasoconstriction). Although there was profound hypotension (50/20 mm. Hg) and hypothermia, the skin was quite dry, the lips and nail-beds were pink, the pulse rate was still 120/minute. We also feel that inadequate anaesthesia would have been accompanied by evidence of returning consciousness. (5) Chlorpromazine, according to Courvoisier *et al.*, diminishes, abolishes, or reverses the hypertensive effects of

an intravenous injection of adrenaline, but in the same doses and conditions only diminishes the hypertensive effects of noradrenaline and even in high doses does not reverse the hypertensive effects of noradrenaline. (In view of our experience with this case under discussion, one of us has given 0.05 mg. noradrenaline intravenously to a patient whose blood pressure was 70/40 mm. Hg (170/90 mm. Hg pre-operatively) 40 minutes after the exhibition of a mixture containing chlorpromazine 50 mg., promethazine 50 mg., pethidine 100 mg. The blood pressure was raised immediately to 130/70 mm. Hg.)

We feel satisfied that the case under discussion was not suffering from traumatic shock, but appeared to be suffering from a continuing effect of the modified dose of the "lytic cocktail." Although similar results have not occurred in our other cases and have not been reported elsewhere, we felt justified in describing our experience and the method used to produce a favourable outcome.—We are, etc.,

HUGH Y. WISHART.

FRANK S. PRESTON.

Glasgow, W.I.

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- ¹ *British Medical Journal*, 1953, 2, 1247.
- ² *Arch. Int. Pharmacodyn.*, 1953, 92, 305.

Carbon Dioxide Retention Simulating Curarization

SIR.—In your issue of March 6 (p. 565) Dr. C. V. Scurr recorded a case of "Carbon Dioxide Retention Simulating Curarization." In the *Journal* of April 3 (p. 820) Drs. T. C. Gray and E. S. N. Fenton report on a similar condition in one of their patients. To my mind, however, there is very little similarity between the two, and I do not think that the latter can be considered as offering confirmatory evidence of CO₂ retention as such.

In the case cited by Dr. Scurr, no periods of anoxia were recorded, and post-operatively "it was noted that such respiratory effort as was present was not marked by any urgency, neither was it accompanied by any tracheal tug, both of which features are usually present in cases of residual curarization." In Drs. Gray and Fenton's case, on the other hand, several periods of anoxia were admittedly experienced by the patient on each occasion, particularly on the second. Due to the pre-operative cardiac condition, it is more than likely that this anoxia was tolerated very poorly. At the conclusion of the second operation, "in view of the increasing cyanosis and distress, and loss of consciousness, an endotracheal tube was introduced." Surely this was gross anoxia. They then go on to state that the striking features of the patient on this occasion were "(1) inadequacy of the tidal exchange compared with the forceful chest movements and tracheal tug . . . , and (2) the bounding forceful pulse." Dr. Scurr attributes the features in (1) above to residual curarization, and not to CO₂ retention.

In view of the evidence, I venture to suggest that on both occasions Drs. Gray and Fenton's patient was suffering from the combined effects of O₂ lack and CO₂ excess—in other words, asphyxia. It is also very probable that there was some degree of residual curarization.—I am, etc.,

Beckenham.

P. M. F. MCGARRY.

Failed Forceps

SIR.—I was very interested to read Dr. R. Lisle Gadd's article on failed forceps (*Journal*, March 27, p. 735), which is a valuable contribution to the literature on one of the most serious complications that can befall a woman in labour. His article concludes that incomplete dilatation of the cervix (39%) is the main cause for failure, whereas in the Birmingham series occipito-posterior positions and deep transverse arrest of the head accounted for 56% of cases and incomplete dilatation of the cervix 20%.¹ Malposition of the foetal head was also 2½ times more common than undilated cervix in the Norwich series,² which has not been referred to by Dr. Gadd.

In the Manchester series only six out of 39 cases classified as incomplete cervical dilatation subsequently had a normal delivery, and only a further six had a low forceps delivery. This suggests that malposition of the foetal head, or some mechanical factor other than the failure of the cervix to dilate, was the main reason why the forceps failed. In Dr. Gadd's series incomplete cervical dilatation with occipito-posterior positions has been classified under the former category, whereas in my series and Mr. Law's we would have classified some of these cases under occipito-posterior positions or deep transverse arrest.

I have observed that in some cases of occipito-posterior position the anterior lip of the cervix becomes trapped between the head and the symphysis pubis, with the result that this cervical rim becomes oedematous and will never fully disappear unless the head is disimpacted and the cervix pushed up. This cervical lip, however, is no bar to a forceps delivery, provided manual rotation to occipito-anterior has been accomplished, and it is the malposition of the foetal head rather than the cervix that has led to the failed forceps.—I am, etc.,

Crewe.

DEREK FREETH.

REFERENCES

- ¹ Freeth, H. D. (1950). *British Medical Journal*, 2, 18.
² Law, R. G. (1953). *Ibid.*, 2, 955.

Anaesthesia in Hospital Breech Delivery

SIR,—In his letter on the above subject (*Journal*, March 27, p. 758) Dr. D. C. Drutt asks for the reasons for advocating the use of the forceps on the aftercoming head. These reasons were very well stated by Baxter¹ a few years ago. In brief, his conclusions were that the maximum safe limit of traction on the shoulders is considerably less than the expulsive force of the uterus, so that, "when the patient is unable to expel the head by a spontaneous effort of normal magnitude, shoulder traction is unlikely to deliver a live infant." On the other hand, when forceps are used a very much greater traction is possible without any risk to the baby, provided that they are accurately applied to the sides of the aftercoming head. These views are based on good clinical and experimental evidence. There is also the less well-founded view that the blades of the forceps act as splints to the foetal head, and prevent dangerous fluctuations in shape and pressure at the moment of delivery.

The use of forceps on the aftercoming head is one of Smellie's greatest contributions to the art of obstetrics. His name is often erroneously associated with Mauriceau's technique of jaw flexion and shoulder traction, which was also the method used in this country by Giffard as early as 1725.² It is interesting to see how Smellie's teaching is receiving due recognition now after the lapse of two centuries, during which it was generally neglected.—I am, etc.,

Wivenhoe, Essex.

WALTER RADCLIFFE.

REFERENCES

- ¹ J. Obstet. Gynaec. Brit. Emp., 1949, 56, 95.
² Wendell-Smith, C. P. (1950). *St. Bart's Hospital J.*, 54, 59.

Considered Contraception

SIR,—May I be allowed to support Professor H. C. McLaren's letter on this subject (*Journal*, April 3, p. 817)? I would say that it is almost never justifiable to tell a patient that she must not have another pregnancy, and it should be done only when the adverse factor is permanent. In these circumstances it is my practice to offer bilateral partial salpingectomy as an alternative to contraceptive advice. The risk of abdominal operation is not unduly great.

As Professor McLaren says, the banning of further pregnancy to a young woman is a most serious matter, and advice on the subject should never be lightly given. Not only must her physical state be considered, but also her psyche. A woman who longs for children is often better undertaking a pregnancy at some extra risk rather than being condemned to perpetual sterility.—I am, etc.,

Leeds, 2.

ANDREW M. CLAYE.

Appointment with Fear

SIR,—Half the patients I have ever treated smoke like chimneys. Whatever else happens to them, they don't die of cancer of the mouth. What are we coming to? We mustn't smoke for fear of getting respiratory cancer of some sort. The stuff we inhale makes breathing a dangerous procedure. The poisons we consume in our food are sure to kill us soon, and of course we may even die in our sleep. In addition, the mental state induced by these hazards is sure to hasten the inevitable attack of coronary thrombosis or peptic ulcer. It seems that the way of living to a reasonable old age is to become a High Court judge, diet rigidly, give up smoking, and move to a rural area (there would also be less chance of getting run over on a farm).

Isn't it about time that we gave both our patients and ourselves a proper sense of proportion before we develop into a nation of anxious hypochondriacs? We haven't yet caught up on our American friends (if their magazine advertisements are anything to go by), but we'd better do something about it soon. Let us help our patients to live—and die—without the dread picture of disease for ever in their thoughts; and let us refrain from giving the lay press so much ammunition to use in their quasi-medical fear-stimulating extracts. Finally, the only cause of cancer of the mouth I have treated in 16 years of medical practice was in an old lady with no bad habits. She didn't even smoke.—I am, etc.,

London, E.9.

PAUL R. SAVILLE.

Abdominal Testicles and Fertility

SIR,—The gonadotrophic hormone in small boys causes precocious secondary sexual changes. Since the day 25 years ago when I was first shocked by the sight of a group of youngsters receiving this (as I think) unfortunate form of treatment, I have taught that it is unjustifiable except in the case of gross hypopituitarism—a subject for the endocrinologist.

This is only the expression of an opinion, but I agree with Dr. Nicholas S. Craig (*Journal*, March 20, p. 706), Denis Browne, Great Ormond Street, and the Boston Children's Hospital, or, if Dr. G. I. M. Swyer (*Journal*, April 3, p. 815) prefers it so, they agree with me. My reason for writing is to draw attention to the serious physical and psychological side effects apart from which the suggested and too often practised therapeutic test might be attractive.—I am, etc.,

Liverpool, 7.

CHARLES WELLS.

Fructose in Diabetes Mellitus

SIR,—In the *Journal* of February 27 (p. 510) you have published an annotation on "Fructose in Diabetes Mellitus." Since some of its implications might be misunderstood and lead to unnecessary and indeed dangerous experimentation, I would beg your permission to comment.

The annotation, as well as some of the original publications cited, clearly imply that most tissues of normal and diabetic animals can and do utilize significant amounts of fructose. By "utilize" I mean "metabolize in such a way as to derive some useful energy from it." It is, however, quite likely that in the mammalian organism, and in the presence of even small amounts of glucose, fructose is utilized almost exclusively by the liver and, to a lesser degree, by intestinal mucosa. Thus Bollman and Mann¹ have shown in 1931 that in the hepatectomized, eviscerated dog the intravenous administration of fructose results in little fructose disappearance, no slowing in the rate at which blood glucose decreases after hepatectomy, no slowing in the rate at which muscle glycogen decreases after hepatectomy, and no relief of hypoglycaemic convulsions. Gemmill² showed in 1941 that rat diaphragm cannot deposit glycogen when incubated with fructose, with or without the addition of insulin. This earlier evidence for lack of peripheral

fructose utilization has been recently confirmed conclusively by Wick and collaborators³ using fructose labelled with C¹⁴ in eviscerated rabbits.

The concept of fructose utilization by skeletal muscle has been fostered by the demonstration of muscle enzymes capable of phosphorylating and further metabolizing fructose.⁴ However, the primary product of fructose phosphorylation in both liver and muscle has been shown to be fructose-1-phosphate^{5,6,7}—that is, a metabolite which is not a regular by-product or intermediate of glycolysis. The further metabolism of fructose-1-phosphate has been shown to differ in liver and in muscle,^{8,9,10} and it might well be that in the intact muscle cell fructose-1-phosphate represents a metabolic dead end.

The presence of a normal fructose tolerance in the diabetic organism simply means that diabetic tissues utilize fructose as well (or as poorly) as normal tissues. Since in the normal neither brain cells nor muscle cells utilize a physiologically significant amount of fructose, there is no reason to believe that fructose utilization will be better in brain or muscle of the diabetic organism.

The statement that "fructose may prove to be a more useful sugar in conditions where glucose has a time-honoured place—for example, in the treatment of hypoglycaemia"—should be retracted. Hypoglycaemic convulsions occurred in the animals of Bullman and Mann as soon as blood glucose sank below the critical level, even though high blood fructose concentrations were maintained. It should be particularly kept in mind that most laboratory determinations of blood glucose also measure fructose, and that the danger of severe hypoglycaemia in the presence of what appears to be a normal or elevated "blood glucose"—that is, reducing sugar—determination is indeed a real one. The treatment of hypoglycaemia remains the time-honoured one: glucose.

In the treatment of diabetic acidosis it should be clearly understood that fructose administration in no way decreases the requirement for insulin. Fructose administration might, however, prove useful in diabetic acidosis for at least two reasons: (a) fructose represents a ready source of carbohydrate for the liver, and therefore one might expect a more rapid decrease in the excessive hepatic production of ketone bodies, (b) a larger proportion of fructose is almost immediately transformed into liver glycogen and other non-reducing metabolites (although a considerable portion, of course, is transformed into glucose); fructose might therefore be used to bring the tonicity of hypotonic salt solutions to normal, and thus facilitate their early administration without interfering quite as much as glucose with our ability to evaluate the adequacy of the blood sugar response to insulin. It remains to be seen, however, whether this will really prove of any practical value.—I am, etc.,

Boston, Mass.

ALBERT E. RENOLD.

REFERENCES

- ¹ Amer. J. Physiol., 1931, 96, 683.
² Bull. Johns Hopk. Hosp., 1941, 68, 50.
³ Diabetes, 1953, 2, 465.
⁴ Stein, M. W., et al. (1950). *J. Biol. Chem.*, 186, 763.
⁵ Leuthardt, F., and Testa, E. (1950). *Helv. chim. Acta*, 33, 1919.
⁶ Cori, G. T., et al. (1951). *Ibid.*, 34, 931.
⁷ Blochim. Biophys. Acta, 1951, 7, 304.
⁸ Hers, H. G. (1952). *Ibid.*, 8, 416.
⁹ — and Kusaka, T. (1953). *Ibid.*, 11, 427.
¹⁰ Leuthardt, F., et al. (1953). *Helv. chim. Acta*, 36, 227.

Acholuric Jaundice

SIR,—I was most interested in the article by Drs. J. L. Emery and D. W. Lemmon (*Journal*, March 27, p. 737) on "Crises in Congenital Spherocytic Anaemia (Acholuric Jaundice)." I have been following the case of acholuric jaundice in a medical man, in which, when he was a student, the condition used to remain quiescent until a spell of hard physical or mental activity. The condition would invariably appear a week or so before he sat for an examination, when he would develop a pale yellow, earthy colour. Cessation of work used to lead to regression of these symptoms, which would recur at the next period of mental stress. Haematological examination revealed the typical findings of acholuric jaundice.

He has since had splenectomy, since when there has been a clinical cure, and no amount of mental or physical work produces any jaundice whatever.—I am, etc.,

London, S.W.3.

DAVID THOMAS.

Advice on Weight-lifting

SIR,—Dr. M. E. M. Herford (*Journal*, March 20, p. 703) is right to stress the importance of showing men how to lift without damaging the back. The prophylaxis of lumbar disk lesions begins, however, not after the injury, but before.

All men doing heavy work should have the mechanics of the lumbar joints explained to them and be taught how to avoid the initial damage, no less than a recurrence. He states that hospitals do not, in his experience, give this tuition. At the Department of Physical Medicine at St. Thomas's Hospital, a demonstration of the various ways of maintaining the lordosis during different types of work has been given by our physiotherapists in every relevant case for the past ten years. The first industrial body to illustrate the modern view on the prophylaxis of lumbar disk lesions¹ appears to have been the Workmen's Compensation Board of British Columbia, whose original poster is reproduced herewith.—I am, etc.,

London, W.1.

JAMES CYRIAX.

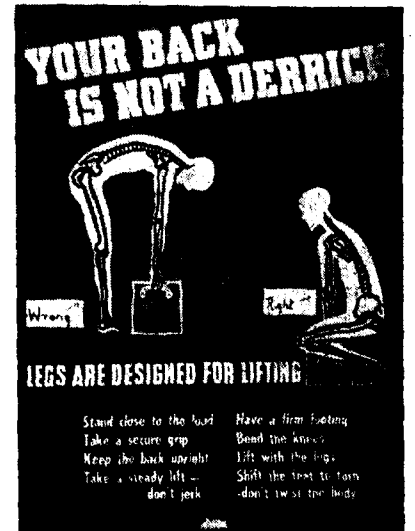
REFERENCE

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Chronic Pyelonephritis in Children

SIR,—In the past urinary infections in childhood have been treated much too lightly, and, as Drs. J. M. Stansfeld and J. K. G. Webb have shown (*Journal*, March 13, p. 616), for much too short a period. I am not convinced, however, that prolonged therapy, even using the broad-spectrum antibiotics, will prove successful, nor do I accept the arguments they use to explain why short courses of treatment so often fail.

Shortly after the war I studied a series of children of all ages who had had a proved urinary infection. The records are no longer readily available, but I recall that they comprised about 80 cases, of which over 70 were girls and almost every one had had at least two attacks. All the boys had demonstrable deformities in the renal tract. About eight of the girls, all with normal pyelograms, were liable to frequent recurrent attacks of urinary infection, and, at Dr. Charles F. Harris's suggestion, they were treated with prolonged courses of sulphonamides. The results were most disappointing and the treatment was eventually abandoned because so many of them developed staphylococcal infections whilst under treatment, whereas all the previous attacks had been due to *B. coli*. The new organism caused greater pain, dysuria, and fever, and was more difficult to eradicate than the old. Now that newer broad-spectrum antibiotics are available it is possible that prolonged therapy would be more efficacious, but clearly chloramphenicol would be too dangerous to use in this way; aureomycin might give rise to *B. pyocyaneus* infection in due course, and



hence terramycin would be the antibiotic of choice. No doubt Dr. Stanafeld is now using this drug, and his further experience will be awaited with interest.

The fact that the organism may change so readily with prolonged chemotherapy indicates a low resistance to infection in the renal tract and refutes the suggestion, made in the paper, that isolated foci of organisms, surviving in the kidney after the initial course of treatment, are responsible for the subsequent relapse.—I am, etc.,

Stock, Essex.

IAN G. WICKES.

Adolescence and the Family Doctor

SIR.—Everyone who is interested in the health of the adolescent will welcome your leading article (*Journal*, March 27, p. 748) broadening and summarizing what has been constructive in the recent discussions in the medical journals. The problems of youth are indeed "many-sided and compelling," yet it is only one side which is really stressed by you as well as by most other contemporary writers on the subject. The eventual adjustment and mental health of the adolescent is obviously now one of our principal concerns, and it seems generally agreed that at least some of these young people need help in tackling the emotional disturbances associated with growing up.

There are two considerations which arise from your wholly reasonable suggestion that "this is surely above all the sphere of the family doctor." One is concerned with the ascertainment of the mental health problems of adolescence, the other with the treatment of psychiatric problems by the family doctor. First, I would like to be convinced that even a good family doctor will encounter anything like all the mental health problems of his adolescent patients unless he seeks actively for them. I fancy that the problems of adjustment of the type which you mention are not, in fact, regarded as medical problems by these young people in the same way as a boil or a sprained ankle for which advice is sought in the doctor's surgery. Some support for this comes from a rough analysis of the medical problems discovered among the adolescents in a recent study of the health of a small random sample of families in a London practice. Only one in five of the few "mental health" problems of these adolescents reached medical care. Secondly, even if he does encounter this mental ill-health which exists in his practice, and in spite of the admirable work of Dr. Michael Balint (*Journal*, January 16, p. 115) and the recommendations of several learned medical bodies,¹⁻⁴ the modern doctor still knows little or nothing of the psychotherapy which we are told is so badly needed. He knows something perhaps of what has been called the "technique" of support and reassurance (most of which he has picked up by trial and error), but I doubt that this is enough to give more than very superficial help to the adolescent or anyone else who is in trouble.

If the evidence of need is good and the psychotherapists know what they are talking about, then there is an increasingly strong case for an expansion of teaching about the medical care of the minor psychiatric disorders of all ages, and particularly about the adjustment problems of adolescence.—I am, etc.,

Belfast.

E. MAURICE BACKETT.

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- ² Report of Interdepartmental Committee on Medical Schools, 1944. H.M.S.O. (The Goodenough Report). London.
- ³ General Medical Council (1947). *Recommendations as to the Medical Curriculum*. London.
- ⁴ British Medical Association (1948). *The Training of a Doctor*. London.

Single Incision for Bilateral Orchidectomy

SIR.—With reference to the letter by Mr. W. Skyrme Rees (*Journal*, April 3, p. 815), many years ago I learned, I think from Charles Donald, that the right approach to the testis is through the scrotum, and many years' experience of operation for hydrocele has confirmed the wisdom of that advice. Nature pushed the testicles into the scrotum; why pull them out, trim or enucleate them, and then push them back again?

Oozing may follow operations on the testis. It is harmless if there is a scrotal incision, but leads to a troublesome haematoma if there is not. Both testicles can be approached through an incision in the median raphe, and the final result after healing is the only known example of scarless surgery, the only perfect cosmetic result where cosmesis is unimportant.—I am, etc.,

London, N.W.8.

HENEAGE OGILVIE.

Estimating Alcoholic Content of Body Fluids

SIR.—In the annotation on alcohol and road accidents (*Journal*, March 27, p. 749), I am surprised to read: "The more novel feature of the report is its discussion of estimating the alcoholic content of body fluids." This has been done for years in Sweden, and as long ago as 1936 I wrote an article on the subject which was published in your *Journal*.—I am, etc.,

Bristol.

H. K. V. SOLTAU.

REFERENCE

- ¹ *British Medical Journal*, 1936, 1, 1048.

Medical Treatment of Peptic Ulcer

SIR.—In a leading article (*Journal*, March 13, p. 632) the results of medical treatment of chronic ulcer of the stomach are estimated as follows: "On the evidence, therefore, it would seem that the value of any form of dieting or of any drugs other than alkalis (and these only for the relief of pain) must be considered unproved." For about 40 years I have been engaged in the diagnosis and treatment of chronic gastric ulcers, and on the basis of my experiences I can at almost all points accept the editorial point of view. All the medicinal experiments that have been made with a "rational and even causal" treatment of peptic ulcer, for instance—with "novoprotein," L-histidine hydrochloride ("larostidin"), or different hormones, or the Sippy or Roentgen treatment—have proved disappointing with regard to the lasting effects, and the latest ulcer drugs, hexamethonium ("vegolyse") and methantheline ("banthine"), seem to get the same fate. Only the treatment with large doses of bismuth forms an exception.

This treatment was originally indicated, though in a somewhat primitive form, by Kussmaul and Steiner (about 1890), and subsequently taken up by Hayem and other French clinicians; they used the drug either in the pure state or in the less expensive, but also doubtless less effective, mixture composed of equal parts of bismuth, kaolin, and talc (*pansement bismutique*). Partly owing to the unmethodical use of this drug, partly because of the absence of an actual scientific basis (especially of efficient follow-up), the bismuth treatment was gradually brought into discredit. In Germany it seems to have been abandoned about 1930, and in France there has been a rapid decline of bismuth therapy, the interest being chiefly centred on "pathogenic ulcer therapy." The treatment with large doses of bismuth appears to sink more and more into oblivion; it is not even mentioned in Bochar's impressive standard work *Gastroenterology*.¹

About 30 years ago I took up the treatment of chronic gastric ulcer with large doses of bismuth carbonate, and during the last 20 years I have used this form of treatment in all my ulcer patients on the following principles: 10 g. of bismuth subcarbonate three times daily for the first two months, twice daily for the next two months, and for the last two months once daily before the principal meal. As the action probably depends upon a protective treatment of the gastric ulcer, it is of the utmost importance that the bismuth should be given on an empty stomach, 10 to 15 minutes before the meals. The simultaneous dietetic treatment commenced with a light puréed diet, gradually progressing to a normal light diet in the course of four to six months.

In 1948² and 1950³ I published the results of an extensive research on this subject, based upon control examinations and follow-up of 400 patients with severe chronic ulcers, all with very pronounced roentgenologic changes, and in 60% with a duration of the disease of over five years. Apparently fresh ulcers with manifest bleeding were not included in this series of cases selected from a material of approximately 1,000 ulcer patients. In my 400 patients with gastric ulcer the immediate results were excellent, with rapid freedom from symptoms in the great majority (90%) of the cases, almost the same results ob-

tained in hospitalized patients (88%) and out-patients (83%) in six months. This observation is against the great importance which especially the psychosomatics attach to confinement to bed as an important sedative treatment in chronic peptic ulcer.

The permanent results—by far the most important point in estimating the efficiency of an ulcer treatment—are much better than could be expected: 41% of 400 patients were free from symptoms; these were cases of severe chronic ulcer, and the percentage is considerably higher than in the usual ulcer statistics. The freedom from symptoms applies to a great extent to the patients with the longest period of observation (10–16 years in 79 patients), where 31.6% were found to be free from symptoms, a lasting result which is far better than the usual one in medical treatment of gastric ulcer.

Practically similar results have been obtained by English authors, H. Avery⁴ and F. Croxon Deller⁵; the latter concluded from his investigations that "bismuth subcarbonate takes pride of place in the modern treatment of ulcerative conditions of the stomach and duodenum—it is a most valued therapeutic weapon."—I am, etc.,

Hellerup, Denmark.

SK. KEMP.

REFERENCES

- ¹ *Congrès des Sociétés Nationales de Gastro-entérologie*, 1948. Lausanne.
- ² *Gastroenterology*, 1947. Philadelphia.
- ³ *Nord. Med.*, 1948, 40, 1979.
- ⁴ *Ugeskr. Læge.*, 1950, 112, 1655.
- ⁵ *Med. Press*, 1953, 229, 579.
- ⁶ *Med. ill. (Lond.)*, 1952, 6, 51.

Dyspareunia

SIR.—The cause of this condition, a frequent source of frustration and despair in the newly married, is as a rule anatomic or psychogenic. The textbooks recommend ointments, stretching, dilators, operation, etc., but within the orb of every practitioner is a treatment which I have on many occasions found easy and immediately successful.

With the buttock raised upon a sandbag the small area to be dealt with is cleansed with ether and then painted with iodine. Shaving is not necessary. Using a very fine needle a weal is raised 3 cm. from the vaginal margin by the injection of 0.5 ml. procaine at 4, 6, and 8 o'clock to the fourchette. Through each of the 3 weals 5 ml. of warm "proctocaine" is deeply injected. After waiting a few minutes the vagina can be ironed out quite painlessly with three fingers. Success is 100%. Occasionally in the nervous, anxious type of patient it is advisable to induce anaesthesia with thiopentone, 0.5 g.—I am, etc.,

London, W.1.

V. B. GREEN-ARMYTAGUE.

Infectious Mononucleosis

SIR.—Dr. S. Shubert, Captain J. G. Collee, and Dr. B. J. Smith (*Journal*, March 20, p. 671) make a stimulating contribution to the study of infectious mononucleosis (glandular fever).

It would seem necessary, however, to emphasize that the term "sporadic" applied to cases of glandular fever may give a misleading conception of the disease. The term serves a useful purpose in distinguishing a group of cases, collected from different sources, in which the antibody is, by selection, of unquestionable degree and quality. This type of case has, as a rule, been selected from hospital records and is nothing more than a caricature of the cases seen in an epidemic, in many of which antibodies are of borderline diagnostic significance and in others entirely absent. As Tidy¹ points out, the disease is of low infectivity, but "if two or three cases develop in a school or closed community, a high proportion of the occupants tend to become infected"; and again, "It is probable that the disease is infectious only in the early stages." By the time a single case is admitted to hospital cross-infection in a ward is rare. The following case, studied in an epidemic in 1952–3, illustrates these points.

An 18-year-old veterinary student, having spent a holiday at home where an epidemic of glandular fever was in progress, returned in good health to his studies at a university some 50 miles away. A week later he was off colour, and after a few days he reported sick with sore throat, frontal headache, and a stiff neck. He was admitted to hospital, where the diagnosis of angin-

ose glandular fever was confirmed, the heterophil antibodies reaching a dilution of 1/896 with positive absorption, and W.B.C. of 10,000 with 86% mononuclear cells. The staff, being unaware of the distant epidemic, took blood samples from the student's colleagues in a hostel, with entirely negative results. Thus an apparently "sporadic" case (and incidentally the most severe case in the epidemic) occurred in a town 50 miles away from the centre of the epidemic.

I maintain that so-called "sporadic" cases are merely the more severe forms which occur in any epidemic and indeed may be the only cases to be recognized in a mild epidemic. The difference lies in the degrees of infectivity, of symptomatology, of lymphocytosis, and of antibody formation. Glandular fever is primarily a disease of low infectivity, but widespread dissemination of infection is possible when other factors induce a hypersensitivity of a community to the cause. I hope to illustrate these points more fully at a later date.—I am, etc.,

Cupar, Fife.

DAVID W. W. HENDRY.

REFERENCES

- ¹ *British Medical Journal*, 1952, 2, 436.
- ² *Lancet*, 1934, 2, 180.

SIR.—As one engaged in long-term investigation of infectious mononucleosis in a university population, may I make some comments related to the article by Dr. S. Shubert, Captain J. G. Collee, and Dr. B. J. Smith (*Journal*, March 20, p. 671)? The answer to their query "A Syndrome or a Disease?" is, I think, that the sporadic infectious mononucleosis is a syndrome and the epidemic glandular fever a disease. The suggested mechanism for the syndrome of lymphadenopathy, mononucleosis, and heterophil antibodies is that sensitization by a previous infection is required, whereon the "trigger action" is provided by reinfection at a suitable interval by the same or a closely allied organism. This agent may in many cases be that responsible for epidemic glandular fever, but it is likely that a heterogeneous group, viral, bacterial, and even protozoan, can produce similar results in a sensitized individual.

From experience of some 80 cases of infectious mononucleosis, I have seen several which could fit such a hypothesis, but in two instances there was a record of a recently previous blood examination. In both examples the first counts were done because of pharyngitis with enlargement of cervical lymph nodes suggesting mild infectious mononucleosis. In one patient the acute illness, with clear-cut mononucleosis and characteristic differential, occurred five months later, and in the other this took place after an interval of six weeks.

The serological tests seem an obstacle to the syndrome theory and have undoubtedly encouraged investigators to think in terms of a specific infective aetiology, but there is another viewpoint. At a conference of the British Student Health Officers' Association (Glasgow, July 6, 1953) I presented a progress report in which I claimed to have found a high correlation between the abnormal mononuclear count and the sheep cell agglutination titre of the serum from the same sample taken at or about maximum mononucleosis. This correlation was sufficiently high for the prediction of the agglutination titre, in the absence of Forsman antibody, with a reasonable degree of accuracy, the reciprocal of the titre being about one-tenth of the number of abnormal cells per cubic millimetre.

It seems that the antibody is simply a response to the presence of a special type of abnormal cell (of which a detailed account is in course of preparation). This possibility occurred to Paul and Bunnell¹ when they made their original contribution to the serology of infectious mononucleosis, and, if it can be established as a firm conclusion, the balance tips in favour of the syndrome concept, although the possibility that these cells produce or carry antibody specific for an unknown infective agent still remains. I am indebted to Collee, Shubert, and Smith for mention of Warren's paper, which I regret to say had escaped my notice. Warren² states that a positive Paul-Bunnell reaction only occurs when the curious lymphocytes of infectious mononucleosis form a large proportion of the differential count, an observation with which my own findings are in full accord.

Finally, I wish to underline the views of your contributors on the unsatisfactory nature of the simple agglutination reaction usually named the Paul-Bunnell test. There are at least 16 published articles representing over 100

cases where this test has been positive, even in titre as high as 1 in 2,560, in conditions other than infectious mononucleosis or serum disease. One wonders how many other strange cases, in which the former diagnosis has been made, properly belong to the same group.—I am, etc.,

Birmingham.

J. C. BOWIE.

REFERENCES

- ¹ *Amer. J. med. Sci.*, 1932, 183, 90.
² *Ibid.*, 1941, 201, 483.

Metabolic Stimulating Effect of Salicylate

SIR.—Dr. J. B. Cochran's paper "Further Observations on the Metabolic Stimulating Effect of Salicylate" (*Journal*, March 27, p. 733) is of interest in relation to a series of experiments on the "Effect of Certain Hydroxybenzoic Acids on the Oxygen Consumption of Wistar Rats" which I have recently reported.¹ To summarize the relevant data I found that salicylate had a stimulating effect, meta-hydroxybenzoic acid a depressant effect, and amongst the compounds which were inactive were para-hydroxybenzoic acid and 2:6 dihydroxybenzoic acid (γ resorcylic acid).

The results with the latter compound are of particular interest, since it has been reported² that γ resorcylic acid was beneficial in doses lower than those of salicylate necessary to achieve comparable clinical results. It would seem, therefore, important to know whether further experience with this drug has supported the original claims and, if so, has Dr. Cochran observed any metabolic stimulating effect in the human? If the original clinical claims are supported and the compound has no effect on the oxygen consumption of patients, then this metabolic effect would appear irrelevant to the treatment of rheumatic fever. If, on the other hand, the drug has not proved successful, then the rationale for introducing the drug, the ability of the anion to chelate, would seem to be fallacious.

It seems possible that the metabolic stimulating effect of salicylate has its origin in an uncoupling of oxidative phosphorylation similar to that which has been demonstrated in the case of dinitrophenols and related compounds.³ Whether this is of any significance in elucidating the mode of action of salicylate in rheumatic fever must remain problematical. However, it is intended that the effect of salicylate on oxidative phosphorylation shall be studied elsewhere.—I am, etc.,

London, S.W.1.

B. W. MEADE.

REFERENCES

- ¹ *Ann. rheum. Dis.*, 1954, in press.
² Reid, J., et al. (1951). *British Medical Journal*, 2, 321.
³ Judah, J. D. (1951). *Biochem. J.*, 36, 706.

Long-acting Penicillin on Haemolytic Streptococci

SIR.—It may be of interest to note the effect of a long-acting penicillin on the course of an epidemic of haemolytic streptococci, Type "A," in a residential school of 137 boys of 8 to 13 years of age. A nose and throat infection started at the end of January, and by February 9 28 boys were in the sick rooms with pyrexia and "positive" nose and/or throat swabs, and 12 others were either away from school or isolated but not diagnosed. On February 10 all the remaining boys and all of the staff had nose and throat swabs taken; 31 of these were "positive"—all boys—giving a carrier rate of nearly one in three of the remaining boys. It seemed likely that the school would shortly have to close down.

During the following three days, February 11 to 13, all of these boys and 16 adult staff were given a single intramuscular injection of 2 ml. of benzathine penicillin ("penidural") L.A. Throat and nose swabs taken five days and ten days or more later were "negative" in all except one boy, which was returned as "small numbers." There have been no further cases up to date. Reactions occurred in 17 boys within 24 to 48 hours of injection, 7 having pyrexia of 99° to 102° F. (37.2° to 38.9° C.), 8 nausea or vomiting, and 7 local induration or stiffness. Most of the 16 adults were very stiff, 5 felt "sick and miserable," and 3 had

pyrexia. It seems probable that reactions are more likely to occur in those who are up and about. The cessation of the epidemic was more sudden and complete than had been hoped for. Whether this wholesale injection of infected and non-infected members of a community is more or less likely to produce insensitive strains of streptococci, I should like to hear argued.—I am, etc.,

Colwyn Bay.

HERBERT LORD.

Bovine Tuberculosis

SIR.—We wish to clarify a point arising out of our report on bovine tuberculosis (*Journal*, February 13, p. 372), which is the subject of a letter to you by Drs. T. R. Maurice and Hugh Ellis (*Journal*, March 13, p. 646). In our report we employed the words "accredited tuberculin-tested herds" to convey the sense of officially recognized herds containing no reactors. Our choice of words was unfortunate, in that it permitted confusion to arise with the special designation accredited.

We do not believe the milk from such accredited herds to be safe, as in fact the herd responsible for our investigation carried this designation. We do, however, consider milk from herds of non-reactors—that is, carrying special designation tuberculin-tested—or pasteurized milk to represent a reasonable universal level of safety, and certainly to be more reliable than assuming consumers will always boil milk prior to use.—We are, etc.,

Leicester.

R. W. KIND.
M. C. BROUGH.

Appendicitis in the Course of Measles

SIR.—Dr. W. H. Galloway's series (*Journal*, December 26, 1953, p. 1412) may appear apparently impressive, but only two of the seven operations seem justifiable to me on closer scrutiny of the case reports as submitted in the paper. The conclusion that the author derives from the series—namely, that symptoms of appendicitis during the course of measles warrant immediate operation—should not, I think, go unchallenged. I, with my limited experience in India, consider it my duty, in the cause of prevention of unnecessary appendicectomies, to raise my pen against it. Appendicular syndrome is fairly common in measles, and conservatism has proved successful in every case (about 15 in number) I have encountered so far. I do not deny the possibility of a fortuitous association of acute appendicitis with an attack of measles, and under these circumstances the case should be treated surgically on its merits. But such a coincidence is very rare and does not warrant the sweeping rule that a patient with measles showing appendicular syndrome should be operated on. On the other hand, my rule in practice has been that before diagnosing "surgical" appendicitis in a child, look in the mouth for Koplik's spots, and at the throat for congestion. If they are there, it is probably the "medical" appendicular syndrome not requiring a surgical intervention.

It does not mean thereby that the case should not be observed for acute surgical developments. As soon as there appears unequivocal evidence for the latter, surgical help should be called in. I may mention here some of the distinguishing features of the "medical" appendicular syndrome in measles: (1) associated flushed face, suffused eyes, and catarrh of the upper respiratory tract; (2) Koplik's spots on the buccal mucous membrane; (3) there is often leucopenia—occasionally there may be leucocytosis if the lungs show some inflammatory condition; (4) vomiting is often absent; (5) bowels tend to be normal or loose, but not constipated; (6) abdominal reflex on the right lower quadrant is often present; (7) the pain is more colicky in nature; and (8) comparatively little rigidity is present.

I have noticed a similar syndrome appearing in generalized urticaria when mucous membrane is probably involved as in measles. There also it is seen to respond to expectant line of treatment.—I am, etc.,

Poona City, India.

P. L. DESHMUKH.

Dental Anaesthetics

SIR.—Dr. H. Newton-Andrews made a valuable contribution when he reported in the *Journal* (March 13, p. 641) the astonishing fact that he had seen sparks when the dentist's forceps slipped during the extraction of a tooth. I was therefore grateful to Dr. H. J. V. Morton when he suggested to me that he would, if I wished, investigate experimentally this unforeseen danger. Mr. Morton's experiments have already shown that sparks, visible in the dark, may quite easily be struck with certain dental forceps from extracted teeth, whether dry or wet and whether filled or unfilled. This observation has been confirmed by Mr. J. D. Robson, the dental surgeon at Salisbury with whom for some years I have been investigating the use of cyclopropane anaesthesia for extraction work. Dr. Morton has also shown in three patients that when anaesthesia was induced with a 50% mixture of cyclopropane and oxygen in the manner I have advocated¹ a sample of expired gases, even up to the sixth exhalation after withdrawing the anaesthetic, could be ignited by an electric spark.

Perhaps it is luck that in more than 2,000 administrations of cyclopropane for the extraction of more than 5,000 teeth I have had no mishap; or perhaps it is because the energy of these incandescent particles is not quite sufficient to detonate the explosive mixture. However that may be, it is now abundantly clear that this form of anaesthesia for extraction of teeth must at present be considered dangerous and abandoned until the matter has been more fully investigated.—I am, etc.,

London, S.E.1.

J. G. BOURNE.

REFERENCES

- ¹ *Lancet*, 1952, 2, 705.
² Meeting of the Section of Anaesthetics, Royal Society of Medicine, February 5, 1954. See *British Medical Journal*, February 20, p. 452.

POINTS FROM LETTERS

Ulcerative Colitis

Mr. C. HORVITZ (London, S.W.1) writes: I was interested to read what Sir Robert Hutchison had to say about the operation of colectomy as performed by the late Sir Arbuthnot Lane (*Journal*, February 20, p. 454). I recall a certain occasion in my student days at Guy's Hospital on ward round with Lane. When confronted with a man who had a painful swollen wrist, he examined it for a few seconds, and then remarked to the class: "A clear case of auto-intoxication. We will remove his colon."

Smoking and Lung Cancer

Dr. G. G. SHERRIFF (London, W.8) writes: Is there necessarily any discrepancy between the fact that cancer of the lung increases with smoking or with life in towns, and the fact that it may occur in non-smokers? After all, smoking is an intensified and localized form of atmospheric pollution. One basic factor, then, would appear to be atmospheric pollution of various degrees and kinds.

Broken Milk-bottles

Dr. T. D. S. HOLLIDAY (Chester) writes: The danger of the dropped milk-bottle and its maiming effect on the hands, abdomen, and other parts of small children must be familiar to most doctors. The annual incidence of milk-bottle injuries in this country is probably considerable. Daily I view the quota of bottles huddled on the stone step with dread and my children with suspicion. Is it not possible for a better material to be used than glass? Would not waxed paper cartons be lighter and easier to transport, as well as safer than these slippery, dangerous bottles?

Telephone Manners

Dr. H. A. CONDON (Bromley, Kent) writes: I write to draw attention to a form of discourteous behaviour widely prevalent among hospital staff, both medical and administrative. I refer to the practice when making a telephone call of asking a secretary or the switchboard to find the desired person. The unfortunate recipient, on answering, is then kept waiting either while a search is made for the caller or until the caller is free to come to the telephone. This is no new problem—for example, it has been condemned by Hardy-Roberts (*Lancet*, 1951, 1, 1119) in an admirable lecture. However, the exercise of a little thought would soon abolish what is a most irritating practice.

Obituary

THOMAS CARNWATH, D.S.O., D.Sc., M.B., D.P.H.

Dr. Thomas Carnwath, who retired from the post of deputy chief medical officer to the Ministry of Health in 1940, died at his home at Whitehead, Northern Ireland, on April 2, after a long illness. He was 75 years of age.

Thomas Carnwath was born on April 7, 1878, the son of Mr. J. Carnwath, of Tyrone. From Foyle College, Londonderry, he went on to study medicine at Queen's University, Belfast, where he won a number of exhibitions and scholarships, and graduated M.B., B.Ch. with honours in 1903.

After holding an appointment as demonstrator of anatomy at his own university he continued his postgraduate studies at Berlin University and at Hamburg, where he was an assistant in the Institute of Hygiene. He also held a post in Berlin as an assistant in the Imperial Board of Health. On his return to Britain he took the Cambridge D.P.H. in 1906, and

was then appointed assistant medical officer of health of Manchester, and later deputy medical officer of health. He then joined the staff of the Local Government Board as a medical inspector, and about this time he was appointed lecturer in public health at St. Thomas's Hospital. On the outbreak of the first world war he joined the R.A.M.C., and was for a time attached to the Honourable Artillery Company. He was mentioned in dispatches, and in 1918 was awarded the D.S.O. By the time he returned to civilian life the Ministry of Health had taken the place of the Local Government Board, and Carnwath immediately became busily engaged in the many medical activities of the Ministry. In 1929 he was promoted to senior medical officer, and in 1935 he became deputy chief medical officer. At the Annual Meeting of the B.M.A. in 1934 he was president of the Public Health Section, and three years later president of the Section of Medical Sociology. In 1935 he was awarded the honorary degree of D.Sc. by Queen's University. After his retirement in 1940 he went to live in Northern Ireland, where, among other activities, he helped to carry out an investigation of the public health services of Belfast.

Apart from the numerous official reports of which he was the author, Dr. Carnwath, during the early stage of his career, had written a number of papers on public health subjects, some of which were published in German medical journals. He was an examiner at the Universities of London, Manchester, Birmingham, and Belfast, and a member of the Board of Studies in Hygiene and Public Health of the University of London and of the Senate of Queen's University, Belfast. In addition, he served on the Army Hygiene Advisory Committee and the National Radium Commission.



[Elliott & Fry, Ltd., London]

Dr. Carnwath married Margaret Ethel, only child of the late Andrew M'Kee, of Belfast, who survives him together with two sons.

We are indebted to Sir ARTHUR MACNALT for the following appreciation: May I be allowed to pay a tribute to my friend and former colleague, Thomas Carnwath? After a distinguished career at the Queen's University, Belfast, postgraduate study in Germany, and as deputy medical officer of health at Manchester, he became a medical inspector at the Local Government Board. It was a most interesting time, for the health services—tuberculosis, maternity and child welfare, and venereal diseases—were being planned and organized under the direction of Sir Arthur Newsholme. Then the first world war broke out, and Carnwath immediately joined the R.A.M.C.(T.F.). He came back to us in 1918 with a D.S.O. and resumed work in public health under his immediate chief, Sir George Buchanan. International health work, the Radium Commission, with many other activities, fully occupied him at the Ministry of Health. In each and all of them he did excellent though often inconspicuous work, and I was both honoured and pleased that he became Deputy Chief Medical Officer when I was appointed Chief Medical Officer of the Ministry in 1935. Those were strenuous days, for war threatened, and we had much to do in preparing for it. We were often working at the office until midnight. Carnwath had a serious illness just before the outbreak of war, and, though for a time he struggled gallantly on, the Ministry lost his valuable services early in 1940. In retirement his health improved, and he rendered services to Northern Ireland as an elder statesman of public health.

At the Ministry we liked Carnwath not only for his great abilities, but for his invariable kindness, goodness of heart, wit, and humour. The sympathy of his many friends goes out to Mrs. Carnwath and their two sons.

Medical Notes in Parliament

HOSPITAL DOCTORS' PAY

Mr. JACK BROWNE (Govan, Con.) asked the Minister of Health on April 8 whether the Medical Whitley Council had yet reached agreement on the pay of hospital medical staff. Mr. IAIN MACLEOD replied that an agreement had just been reached. He then gave the details issued by Committee "B" of the Medical Whitley Council and published in the *Supplement* of April 10 (p. 145). After saying that details of the new arrangements were being worked out by the two sides of Committee "B," the Minister added that he and the Secretary of State for Scotland had told the committee that they were prepared to approve the agreement. Its cost would be about £3,250,000 in a full year.

Consultants' Expenses

Mr. A. A. H. MARLOWE (Hove, Con.) asked the Chancellor of the Exchequer what consultations had taken place between the Treasury and the Ministry of Health with regard to the expenses of hospital consultants employed in the Health Service which were not deductible for income-tax purposes; whether he was aware that consultants incurred many expenses for which they could make no income tax rebate claim on Schedule E assessments; and whether he would introduce legislation to remedy this hardship.

Mr. J. A. BOYD-CARPENTER, the Financial Secretary, replied on April 8 that hospital consultants were, like other employees, assessable under Schedule E, and the same rules with respect to expenses applied to them as to other taxpayers so assessed. He saw no reason to propose legislation giving them preferential treatment. The general question of what expenses were admissible to such taxpayers was within the terms of reference of the royal commission.

Mr. MARLOWE said there was a conflict between the appointing authorities, who would not appoint a consultant

unless he had a motor-car, telephone, and secretary, and the Revenue authorities, who would not allow these expenses. A consultant therefore had necessarily to incur expenses which he could not deduct for tax purposes. Mr. BOYD-CARPENTER said the broad question was within the reference to the royal commission. He could not see any justification for treating these persons for tax purposes differently from other taxpayers.

Mr. H. M. KING (Southampton, Lab.) urged that consultants were not treated the same as general practitioners for this purpose. Would the Financial Secretary try to make an adjustment as between them? Mr. BOYD-CARPENTER said that sort of question was for the Minister of Health. He was only concerned with administration of the tax law. Mr. MARLOWE gave notice of his intention to raise the matter again.

Transfers to Part-time Service

Mr. KENNETH ROBINSON (St. Pancras, North, Lab.) was informed by Miss PAT HORNSBY-SMITH, Parliamentary Secretary to the Ministry of Health; that in 1951 the number of consultants employed by regional boards who transferred from whole-time to part-time service was 42, in 1952 it was 61, and in 1953 it was 46.

Defects of Welfare Services

The subject of debate in the House of Lords on April 7 was a resolution laying the blame for many of the failures in the welfare and health services on imperfect co-ordination between the various authorities concerned, and declaring that greater local discretion, financial and administrative, would result in better service at less cost.

Lord SALTOUN, introducing it, emphasized that he was not seeking to attack individuals but to correct the system. In the past three years there had been a trend towards crystallization in the various services, and the marking of boundaries between the various branches of what should be a common service. The motto should not be "Trespassers will be prosecuted" or "Over to you." But so many different authorities were concerned that some sort of co-ordination was difficult, and complete harmony at all times little short of a miracle. He suggested that a small committee should examine the services to find out how better co-ordination could be achieved, and to make a quick report.

Lord MATHERS suggested the possibility of a closer integration of the specialist and general-practitioner services by a closer linking of the functions of executive councils with the regional hospital boards. He was critical of the way in which many senior members of hospital staffs, he said, concentrated their work into the early part of the day; this might even involve duplication of staff to meet peak demands, while later in the day theatres might be empty and unused.

Lord Beveridge's Criticisms

Lord BEVERIDGE deplored the failure to establish health centres—there were three mentioned in the Ministry of Health report for 1952, and one or two others had come along since. The institution of health centres was proposed long before 1946, in an interim report of the B.M.A. Planning Commission, which set out a detailed scheme. Health, and the proper provision for it, would become soon even more important than houses. He pressed the Government to get "this dream, and main intention of the 1946 Act, put into reality. He criticized as inappropriate to a Health Service the Treasury rule of annual budgets, which meant hasty spending towards the end of a year, or the return of unexpended resources; and, going further, questioned whether a Minister and a Civil Service department was the right organ for running this national industry to secure for the people the means to health.

The EARL OF CRANBROOK, a regional hospital board chairman, said the machine could be made to work, by co-operation at every level. The members of various bodies were all drawn from people with an interest in local administration; many people sat on more than one body, and so secured a good deal of integration of policy.

Lord AMULREE said there were probably enough hospital beds for the sick if proper use was made of them. In 1948 a committee called together by the B.M.A. issued a very good report,¹ propounding practical and economical means, but nothing had been heard of it since. What was needed was free exchange between welfare institutions and the hospitals. The encouragement of domiciliary services for the benefit of the infirm and the frail was very important. According to the census figures, in 1901 the total number of people in the medical and auxiliary services was about 3,000 per million of the population. In 1951 it had risen to nearly 10,000 per million. That was rather alarming, because it showed that the supply was going to dry up.

Lord CALVERLEY said that the kingpin of the Health Service was the general practitioner. He was only heard of when he had made a mistake.

Desire for Improvements

Lord MANCROFT, a Lord-in-Waiting, was prepared to accept the spirit of the motion, but not the letter. There was no official façade and satisfaction about the services, he said, but a constant desire on the part of the Government for improvements. Co-ordination of the different parts of these services was one of the greatest single problems of the Health Service, but it was only emphasized and not created by the Service itself. Co-operation eventually rested on human relationships and personalities rather than on drastic reorganizations. Health centres were expensive to build, and had not been as popular either with patients or with doctors as had been expected. An alternative that presented itself was the establishment by doctors of group practices. This development was supported by the Minister, and was being encouraged by the offer of interest-free loans to doctors to acquire or convert buildings to establish a group practice. His general answer to the debate, however, rested on the fact that most of the subjects it covered were within the terms of reference of the Guillebaud and Phillips committees investigating the Health Service, and half-way conjectures from him would not be helpful. The motion was withdrawn.

College of Physiotherapy

Miss PAT HORNSBY-SMITH, Parliamentary Secretary, Ministry of Health, stated on April 8 in answer to Mr. F. J. ERROLL (Altrincham and Sale, Con.) that the Minister of Health would not give recognition to the British College of Physiotherapy under the terms of the N.H.S. (Medical Auxiliaries) Regulations, 1954.

Welfare Foods

Mr. JOHN RODGERS (Sevenoaks, Con.) asked the Minister of Food on April 6 what arrangements would be made for the local distribution of welfare foods, other than liquid milk, when the local offices of his department were closed later in the year. Major G. LLOYD GEORGE stated that the local health authorities had been invited to take over responsibility for these arrangements as part of their duty under the National Health Service Acts to provide for the care of expectant and nursing mothers and young children. The associations of authorities covering England and Wales had already agreed to do so.

Power Station Flue Gases

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked the Minister of Fuel and Power on April 5 whether, in view of the limited possibilities of existing processes for ridding the flue gases of power stations of harmful sulphur oxides, he would arrange for investigation and research into the matter. Mr. GEOFFREY LLOYD answered that it was already the subject of continuous research. Mr. HASTINGS pressed for special attention to the matter, saying that the present methods required large quantities of water, and the River

Thames would be saturated with the effluent of calcium sulphate when only two of the power stations on its banks were in use. Mr. LLOYD agreed that the limit had been reached with this effluent, and said that work was in progress on a new process involving the use of gas works liquor, but it was in an experimental stage.

Mr. HASTINGS also questioned the Minister about the additional amount of sulphur oxides that would be discharged from the proposed extension to the Bankside power station, and what methods were proposed for eliminating them from the flue gases. Mr. LLOYD told him that a steady decrease in fuel consumption was expected from now onwards, and the discharge of sulphur oxides would therefore be reduced. The new part of the station would disperse its oxides at high temperature and great velocity through chimneys 375 ft. high.

Gas Workers' Risks

Mr. GEOFFREY LLOYD, Minister of Fuel and Power, informed Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) that the West Midland Gas Board employed three full-time and a number of part-time medical officers. The question of x-ray examinations of the employees, and at what intervals, was part of the board's day-to-day administration on which he was asking the chairman to write to Dr. Stross.

Dr. STROSS asked the Minister to bear in mind the work of the Medical Research Council on the specific risks which gas workers had to undergo, especially in cancer of the lung. Would he see that as far as possible all gas boards provided ample medical services for their workers? Mr. LLOYD replied that he had brought the matter to the attention of the gas boards, and impressed on them the importance of medical services.

Average Cost of Prescriptions

In reply to Mr. VAUGHAN-MORGAN (Reigate, Con.), on April 8 Miss PAT HORNSBY-SMITH gave the following Table showing the average cost per prescription in England and Wales for each month since June, 1952, and for the comparable period before June, 1953.

June, 1950, to February, 1952				June, 1952, to February, 1954			
1950		d.		1952		d.	
June	..	39.47	..	June	..	49.92	..
July	..	39.81	..	July	..	50.33	..
August	..	40.14	..	August	..	50.42	..
September	..	39.65	..	September	..	49.21	..
October	..	38.71	..	October	..	49.00	..
November	..	39.02	..	November	..	49.79	..
December	..	39.55	..	December	..	49.68	..
1951		d.		1953		d.	
January	..	37.09	..	January	..	48.12	..
February	..	40.49	..	February	..	47.30	..
March	..	42.50	..	March	..	48.79	..
April	..	43.81	..	April	..	50.50	..
May	..	44.88	..	May	..	50.66	..
June	..	45.55	..	June	..	50.61	..
July	..	46.55	..	July	..	50.88	..
August	..	47.33	..	August	..	48.92	..
September	..	46.31	..	September	..	47.82	..
October	..	45.31	..	October	..	47.09	..
November	..	46.02	..	November	..	47.49	..
December	..	46.58	..	December	..	49.22	..
1952		d.		1954		d.	
January	..	46.51	..	January	..	48.48	..
February	..	47.27	..	February	..	48.80	..

Estimates obtained from sample

£5,000 Then and Now

Mr. C. OSBORNE (Louth, Con.) asked the Chancellor of the Exchequer on April 6 the net income of a married man with two children in 1935 who received a gross income of £5,000 a year; what it would be to-day; and what it would amount to to-day allowing for the depreciation in the value of the £ between 1935 and to-day. Mr. J. A. BOYD-CARPENTER, Financial Secretary to the Treasury, replied that a gross earned income of £5,000, in the case of a married man with two children, produced a net income, after deduction of tax, of £3,687 in 1935-6 and £2,689 in 1953-4. The latter amount was equivalent in purchasing power to about £1,090 in 1935-6.

¹Supplement, August 7, 1948, p. 71.

Medico-Legal

SPINAL ANAESTHETICS APPEALS FAIL

The Court of Appeal on April 8 dismissed the appeals of two men who became paralysed below the waist after they had been given spinal anaesthetics (nupercaine) contaminated with phenol antiseptic in 1947. Mr. C. H. Roe, aged 51, and Mr. Albert Woolley, aged 62, had claimed damages from the Ministry of Health and Dr. J. Malcolm Graham, the anaesthetist. Mr. Justice McNair, who had dismissed the actions, holding that the hospital theatre staff and the doctor were not negligent, found that the nupercaine had been contaminated by phenol getting into ampoules.¹ General damages had been provisionally assessed at £15,000 for Mr. Roe and £10,000 for Mr. Woolley.

Lord Justice Somervell said that the question was whether the percolation of phenol solution into ampoules was caused by the negligence of the defendants or either of them. Dr. Graham, who appreciated the possibility of cracks in ampoules, said that he examined each one carefully and he did not believe that he could have missed a crack. The judge accepted his evidence. The finding that the hospital authorities and Dr. Graham were not negligent was justified. The fact that something went wrong was not proof of negligence. There were obvious risks in surgical operations.

Lord Justice Denning said that no one could be unmoved by the disaster of these two men. The facts called for an explanation by the hospital authorities and Dr. Graham, and they had given one. They had spared no trouble or expense to seek out the cause of the disaster. There was a danger that ampoules might become cracked, and the cracks might be so fine that they could not be detected by ordinary inspection. The carbolic disinfectant in which the ampoules were kept would then seep through the cracks into the nupercaine, and no one would realize that it had taken place. That was the explanation of the disaster, and the question was whether any of the staff were negligent. Medical science had conferred great benefits on mankind, but those benefits were attended by considerable risks. Every surgical operation was attended by risks. Dr. Graham sought to escape the danger of infection by disinfecting the ampoule. In escaping that known danger he unfortunately ran into another danger. He did not know that there could be undetectable cracks, but it was not negligent for him not to know it at that time. "We must not look at this 1947 accident with 1954 spectacles," said his lordship. "The judge acquitted Dr. Graham of negligence, and we should uphold his decision." Never again, it was to be hoped, would such a thing happen. It was the extraordinary accident to these two men which first disclosed the danger. Nowadays it would be negligence not to realize the danger, but it was not then. These two men had suffered such terrible consequences that there was a natural feeling that they should be compensated, but we should be doing a disservice to the community if we were to impose liability on hospitals and doctors for everything that happened to go wrong. "Doctors would be led to think more of their own safety," he continued, "than of the good of their patients. Initiative would be stifled and confidence shaken. A proper sense of proportion requires us to have regard to the conditions in which hospitals and doctors have to work. We must insist on due care for the patient at every point, but we must not condemn as negligence that which is only a misadventure."

Lord Justice Morris also agreed that the appeals failed. No order was made as to costs. Leave to appeal to the House of Lords was refused.

The Medical Defence Union instructed Messrs. Hempsons to act for Dr. Graham.

¹British Medical Journal, November 21, 1953, p. 1165.

LACK OF HOSPITAL-G.P. LIAISON

A report has been published of an inquiry into the unsuccessful attempts of a general practitioner to gain admission to hospital for a patient dying of haemorrhage. Failure to secure admission was due to a number of circumstances, reports the investigating committee, which had been appointed by the Birmingham Regional Hospital Board. Its findings were as follows.

First, the general practitioner should have used the bed bureau. If he had, admission would have been obtained. Secondly, Wolverhampton Hospital Management Committee failed to communicate the proper arrangements to the medical staff, and the house-physicians did not know that refusal to admit could be decided only by the senior resident officer or the consultant on call. Thirdly, no real effort was made to impress upon two hospitals the seriousness of the case. The committee states that liaison between the hospital group and the general-practitioner service needs to be improved. Among the administrative recommendations to ensure that such a case shall not recur the committee recommends that refusal to admit to hospital shall not be based on lack of beds: extra beds must be put up.

Vital Statistics

Infectious Diseases

The largest increases in the notifications of infectious diseases in England and Wales during the week ending March 27 were 210 for scarlet fever, from 1,282 to 1,492, and 191 for dysentery, from 1,124 to 1,315, and the only large decrease was 258 for measles, from 2,325 to 2,067.

A small rise in the incidence of scarlet fever occurred in every region. The largest rise was 53 in London, from 41 to 94. 2,553 cases of whooping-cough, 10 more than in the previous week, were notified, and the largest fluctuations in the local returns were increases of 37 in Norfolk, from 39 to 76, 37 in Warwickshire, from 116 to 153, and 30 in Kent, from 120 to 150, and decreases of 39 in Cornwall, from 68 to 29, and 36 in Yorkshire West Riding, from 179 to 143. The chief variations in the trends of measles were an increase of 95 in Staffordshire, from 169 to 264, and decreases of 70 in Cheshire, from 160 to 90, and 42 in Norfolk, from 467 to 425. 14 cases of diphtheria, 4 fewer than in the preceding week, were notified.

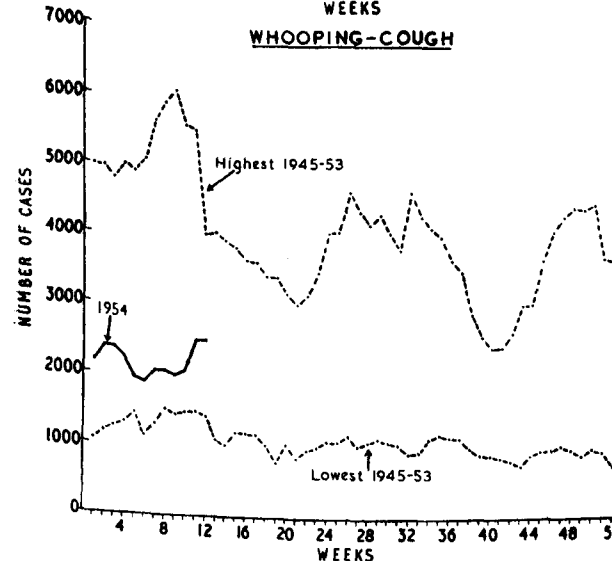
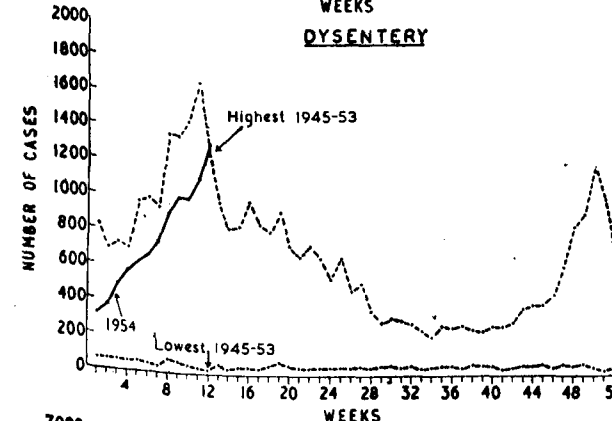
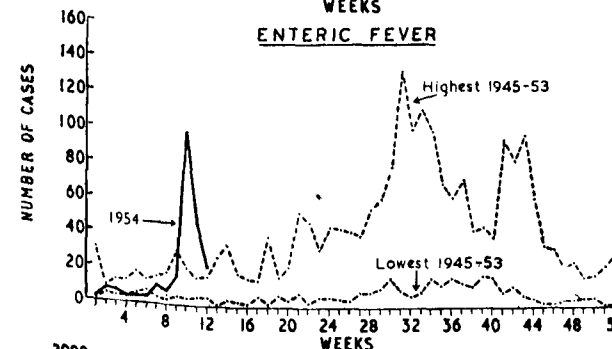
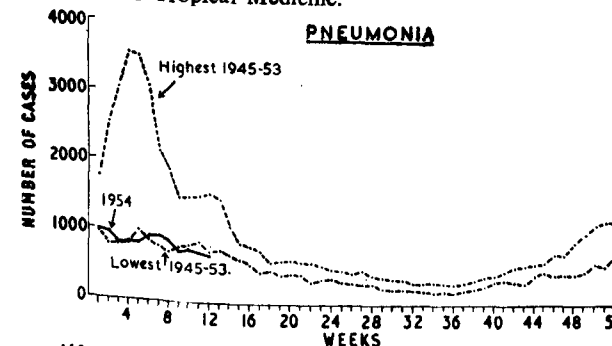
The number of notifications of paratyphoid fever decreased by 25, from 45 to 20. This fall was contributed by Wales, where the notifications declined from 44 to 17. 24 cases of acute poliomyelitis were notified during the week. These were 2 more for paralytic and 3 more for non-paralytic cases than in the preceding week. The only administrative areas with 2 cases were Gloucestershire, Bristol C.B., and Staffordshire, Cannock U.D.

For the fourth consecutive week the number of notifications of dysentery has exceeded 1,000. The largest returns during the week were Lancashire 229 (Salford C.B. 50, Bolton C.B. 45, Eccles M.B. 18, Preston C.B. 15, Manchester C.B. 14, Southport C.B. 14, Ormskirk U.D. 14, Liverpool C.B. 11), London 194 (Islington 65, Lewisham 31, Shore-ditch 19, Stepney 11, Finsbury 10), Yorkshire West Riding 159 (Bradford C.B. 48, Keighley M.B. 29, Leeds C.B. 28, Dewsbury C.B. 24), Middlesex 101 (Southall M.B. 21, Hornsey M.B. 19, Enfield U.D. 16, Willesden M.B. 11), Leicestershire 100 (Leicester C.B. 100), Essex 58 (Romford U.D. 16, West Ham C.B. 10), Kent 54 (Sevenoaks R.D. 24), Devonshire 53 (Exeter C.B. 28, Great Torrington M.B. 17), Norfolk 45 (Norwich C.B. 45), Surrey 43 (Epsom and Ewell M.B. 21, Carshalton U.D. 15), Nottinghamshire 42 (Nottingham C.B. 23, Beeston and Stapleford U.D. 18), Warwickshire 39 (Birmingham C.B. 34), Staffordshire 35 (Cannock U.D. 21), and Berkshire 24 (Maidenhead M.B. 20).

In Scotland the number of notifications of dysentery increased from 276 to 366.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 27 (No. 12) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	14	0	9	1	0	20	1	13	3	
Dysentery ..	1,315	194	366	2	23	463	79	120	5	
Encephalitis, acute ..	6	3			0	6	0	0	0	
Enteric fever: Typhoid ..	2	0	0	1		2	0	0	0	2
Paratyphoid ..	20	0	0	1		5	0	0	0	0
Food-poisoning ..	130	17		0		60	7		0	
Infective enteritis or diarrhoea under 2 years ..				14	11				13	11
Measles* ..	2,067	32	176	32	452	25,791	1133	479	176	254
Meningococcal infection ..	35	4	17	4		44	5	25	4	1
Ophthalmia neonatorum ..	34	3	11	0		39	5	6	0	
Pneumonia† ..	661	41	222	12	9	1,067	64	365	27	5
Poliomyelitis, acute: Paralytic ..	15	1		4	0	42	9		1	2
Non-paralytic ..	9	0				4	0			
Puerperal fever‡ ..	233	43	3	1		241	15	16	0	
Scarlet fever ..	1,492	94	166	38	35	1,739	111	207	42	50
Tuberculosis: Respiratory ..	785	92	147	29				201	25	
Non-respiratory ..	95	5	21	5				28	2	
Whooping-cough ..	2,553	93	466	30	58	3,202	260	372	59	158

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	1	0	0	0	0	0
Dysentery ..	0	0		0		0	0	1	0	
Encephalitis, acute ..			0		0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	8	0	3	0	4	19	2	3	4	1
Influenza ..	22	3	1	0	0	100	6	7	3	2
Measles ..			0	0	2		0	0	0	0
Meningococcal infection ..		0	0				0	1		
Pneumonia ..	257	35	27	7	7	369	59	28	23	15
Poliomyelitis, acute ..	1	0			0	7	2			0
Scarlet fever ..			0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	96	14	16	4	12	137	20	16	5	9
Non-respiratory ..		3	0	0	2		3	2	0	2
Whooping-cough ..	2	0	0	0	0	7	1	0	0	0
Deaths 0-1 year ..	270	30	30	9	14	301	35	30	13	22
Deaths (excluding stillbirths) ..	5,906	836	706	128	188	6,489	943	651	146	213
LIVE BIRTHS ..	8,346	1,233	931	257	378	8,163	1,223	990	249	484
STILLBIRTHS ..	210	22	21			218	26	26		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

British Pharmaceutical Industry.—The annual dinner of the Association of British Pharmaceutical Industry was held on April 7, the president, Mr. C. L. Saul, being in the chair. In proposing the toast, "The Pharmaceutical Industry," Miss Pat Hornsby-Smith, M.P., Parliamentary Secretary, Ministry of Health, said that in the field of British enterprise it was a great industry. "You command a high standard for your products and show the world—particularly in those of your companies that have vast research enterprises besides their manufacturing processes—that you have a standard in which we in the Ministry of Health share your pride." Their keenest competitor in the world markets, Miss Hornsby-Smith continued, was a rehabilitated Germany "working like a beaver." The Ministry was grateful to the industry for the unflinching co-operation it had given in dealing with inquiries as to cost and calls for economy. The prescription side of the N.H.S. bill was about £35m. out of a total of £400m., the biggest single item being £280m. for the hospital service. The general practitioner had the last word in saying what should go on the prescription, and could make the biggest single contribution to economy, "because you in your industry merely provide the goods which he is responsible for ordering." Miss Hornsby-Smith said she thought that "such abuse and extravagance as there is lies not in the highly expensive drugs which are vital in particular and limited cases, but in the overprescribing of the small common articles—the cotton-wool, the lint, and the like." Referring to inquiries into costings and price, Miss Hornsby-Smith said that if the State was to fulfil its obligation to the public and the taxpayer they had to be able to assure the Public Accounts Committee "that we as a Ministry were satisfied that the prices charged in whatever sphere of your industry were right, proper, and justified." Mr. Saul proposed the health of the guests, to which Mr. A. E. W. Thomas, the editor of *The Listener*, made a most happy and witty response.

Food Production in East Africa.—A most successful three-day conference on the "Medical, Agricultural, and Veterinary Aspects of Food Production in East Africa" was recently held at Makerere College Medical School, Uganda, under the presidency of Sir Bernard Keen, F.R.S. The conference was organized by the East African Advisory Committee on Medical Research, and attended by doctors and experts on agriculture and local custom. Speaking in his opening address on the future of the Colonial Territories, the Governor of Uganda, Sir Andrew Cohen, stated his belief that their standard of living would be determined by no one more than those engaged in research. "We can no longer rely," he said, "on hit-and-miss methods and *ad hoc* solutions." During the discussions the medical workers pointed to the widespread existence of calorie and protein deficiency, particularly in the weanling child. A great increase in food production was needed—quantity not quality. In their answer the agriculturists emphasized the great inefficiency in the use of existing resources and the vast scope for improved production by relatively simple methods. One of the crucial questions was the shortage of man-power. There was evidence that East Africa was underpopulated, and only the best land was being used. Industrialization was in danger of preceding the agrarian revolution which alone could sustain it. Among the visitors from Britain to the conference were Professor A. C. Frazer (Birmingham), Professor P. C. C. Garnham (London School of Tropical Medicine), and Dr. R. Lewthwaite (Colonial Office).

Hostel for the Borderline Case.—On March 30 Sir Henry Cohen and the Bishop of Liverpool, Dr. Clifford Martin, opened an experimental hostel at Sefton Drive, Liverpool. The hostel, which is directly administered by the Liverpool

Personal Service Society, provides accommodation for 38 patients. The Liverpool Regional Hospital Board has entered into contractual arrangements for the use of 18 of the beds for patients who are transferred from hospital while still requiring medical and nursing care but who are as yet not fit for discharge to their own homes. The remaining 20 beds are available to the local health authority for patients who are aged and frail but who do not require medical and nursing care. The hostel is experimental in nature, and it is hoped that experience of its use will do much to answer many of the questions about those borderline cases which are neither fully the responsibility of the hospital service nor yet fit enough to be cared for in the type of hostel provided by the local health authority under Part III of the National Assistance Act.

Henry Simpson Newland Prize in Surgery.—The first award of this triennial prize to commemorate the services of Sir Henry Newland to the medical profession, particularly in Australia, will be made in 1955. The prize, offered by the Federal Council of the B.M.A. in Australia, will consist of £100 and a medal. It will be given for the best essay on "The Influence upon Surgical Practice of Irradiation and Endocrine Therapy." Essays, typewritten or printed in English, must be based on personal observation and experience, and not exceed 50,000 words in length. The prize essay will be submitted to the editor of the *Medical Journal of Australia*. The competition is open to any graduate of a medical school within the British Commonwealth. The closing date for the receipt of essays is May 20, 1955. Further information may be obtained from the general secretary of the Federal Council, 135 Macquarie Street, Sydney, Australia.

Hunterian Society Essays.—Dr. J. Lipsey, of Littlehampton, Sussex, has been awarded the Hunterian Society's Gold Medal for his essay in last year's competition. The subject was "The Management of Peptic Ulceration in General Practice." A *proxime accessit* award was made to Dr. B. C. Zoob, of Battersea. The subject for this year's essay is "Management of the Climacteric in General Practice." The competition is open to all general practitioners, and the closing date for entries is December 31. Further details may be obtained from the honorary secretary, Mr. Alec W. Badenoch, 110, Harley Street, London, W.1.

Nuffield Grant to Walter and Eliza Hall Institute.—The Nuffield Foundation has given £12,000 to the Walter and Eliza Hall Institute in Melbourne, Australia, for research into inherited elements in the more common human diseases. The gift is an outcome of discussions between the director of the Institute, Sir MacFarlane Burnet, F.R.S., and representatives of the Foundation.

Overseas Plastic Surgeons in Britain.—Twenty plastic surgeons coming from Austria, Belgium, Denmark, Egypt, Finland, France, Germany, Italy, and Portugal have just completed a two weeks' course at the Plastic Surgery and Jaw Injuries Centre of the Queen Victoria Hospital, East Grinstead. The course was directed by Sir Archibald McIndoe and arranged by the British Council.

William Hyde Award.—Miss P. C. Colson has recently received the William Hyde Award for 1952. Miss Colson is general secretary of the Central Council of Physical Recreation. The award is made by the Research Board for the Correlation of Medical Science and Physical Education, and is valued at £300.

Dr. F. E. Camps has been appointed to the part-time university readership in forensic medicine tenable at the London Hospital Medical School.

Dr. G. E. Francis has been appointed to the university readership in biochemistry tenable at St. Bartholomew's Hospital Medical School, London.

COMING EVENTS

Professor Henry K. Beecher, of Harvard, will deliver the MacArthur Postgraduate Lecture in the Surgery Lecture Theatre, University New Buildings, Teviot Place, Edinburgh, on May 5 at 5 p.m. His subject will be "Resuscitation and Other Early Care of the Severely Wounded Man."

Professor Gerhard Domagk will deliver the Cameron Prize Lecture in the Anatomy Lecture Theatre, University New Buildings, Teviot Place, Edinburgh, on May 6 at 5 p.m. His subject will be "The Development of Chemotherapy in Tuberculosis."

St. John Ambulance Brigade: Surgeons' Weekend Conference.—A conference and dinner for surgeons of all ranks, nursing officers, and non-medical officers nominated by their surgeons will be held at the Cairn Hotel, Harrogate, from April 23 to 25. Further information from the Department of the Surgeon-in-Chief of the Brigade, 8, Grosvenor Crescent, London, S.W.1.

Renal Association.—The annual general meeting will be held at the Ciba Foundation, 41, Portland Place, London, W.1, on May 28 at 4.30 p.m. Mr. I. H. Griffiths will speak on "Renal Arteriography," and Dr. Robert Gaunt on "Studies on the Experimental 'Eclampsia-like' Syndrome."

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Tuesday, April 20

SOCIETY FOR THE STUDY OF ADDICTION.—At 11, Chandos Street, W., 8 p.m., 70th annual meeting. Mr. Derek Curtis-Bennett, Q.C.: Alcoholism and the Law.

Wednesday, April 21

OXFORD UNIVERSITY.—At Department of Human Anatomy, 2.15 p.m., demonstration by Professor P. Stohr (University of Bonn): Morphology and Pathology of the Vegetative Nervous System.

ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Neurology (3).

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. C. Worster-Drought: Speech Disorders in Children of School Age.

Thursday, April 22

CHADWICK TRUST.—At 26, Portland Place, W., 5.30 p.m., Dr. C. Banning (Netherlands): Ante-Natal, Natal, and Post-Natal Care in the Netherlands.

MIDDLESEX COUNTY MEDICAL SOCIETY.—At Chase Farm Hospital, Enfield, 3.15 p.m., clinical meeting. Members of Enfield and Potters Bar and North Middlesex Divisions, B.M.A., are invited.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor D. J. Browne: Principle of Controlled Movement in Orthopaedics.

ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: Myopia, and the Care and Treatment of the Myopic Patient.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Mr. J. Bruce: Surgery of the Small Intestine.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. D. J. Williams.

Friday, April 23

OSTER CLUB OF LONDON.—At 11, Chandos Street, W., 7.45 p.m., Marie Stopes, Ph.D.: History of Contraception.

Saturday, April 24

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Middlesex Hospital, 2.30 p.m., clinical meeting in Radiotherapy Department.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Harper.—On April 3, 1954, to Dr. Marita Harper (formerly Shattock), wife of Dr. Eric Harper, of Swindon, Wilts, a son.

DEATHS

Duncan.—On March 25, 1954, at the Chelsea Nursing Home, Gisborne, New Zealand, Robert Reid Duncan, M.B., Ch.B., D.P.H., formerly of Altrincham, Cheshire, aged 71.

Ham.—On March 28, 1954, Bertie Burnett Ham, M.D., D.P.H., formerly of Australia, aged 86.

Jameson.—On March 31, 1954, at his home, Romeland Cottage, St. Albans, Hertis, Harold Parnell Jameson, M.D., M.R.C.P.

Levy.—On March 31, 1954, at his home, The Heights, Marlow, Bucks, Alfred Goodman Levy, M.D., M.R.C.P., aged 87.

McMinn.—On March 31, 1954, at 47, Eaton Place, Brighton, Sussex, Robert Martin McMinn, M.B., Ch.B.

Mitchell.—On March 27, 1954, at Stowmarket, James Robertson Mitchell, M.C., M.B., Ch.B., D.P.H., of Dunallan, Combs Lanc, Stowmarket, Suffolk.

Moreton.—On March 31, 1954, at 24, Edensor Road, Eastbourne, Sussex, Reginald Moreton, M.R.C.S., L.R.C.P., aged 81.

Morrin.—On March 22, 1954, at 14, Fitzwilliam Place, Dublin, Eileen Morrin (formerly Dowling), M.B., Ch.B., wife of Francis J. Morrin, M.Ch.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Encephalitis after Immunization

Q.—How great is the risk of encephalitis following immunization procedures against whooping-cough and diphtheria? Does the risk increase with age, and is it increased if a combined vaccine is given?

A.—There is no evidence of the occurrence of encephalitis following immunization with diphtheria prophylactic. American workers have reported cases of encephalopathy following injections of pertussis vaccine, but it is very difficult from a collection of case records to estimate what are the chances of developing such a syndrome after pertussis vaccination. It is noteworthy that in Byers and Moll's series¹ twice as many of the cases followed attacks of whooping-cough as followed the prophylactic vaccination. The risk in this country must be extremely small, as, despite the many thousands of young children who have received inoculations of pertussis vaccine in the past few years, recorded cases of post-inoculation encephalopathy have been very rare.²

Since most inoculations against pertussis are given in the early years of life it is impossible to say if the risk is greater with older children, although it may be that injections of vaccine in older children will activate a latent infection with a virus that has an affinity for the central nervous system—for example, mumps or herpes virus. There is no evidence that the risk would be greater with a combined prophylactic like pertussis vaccine and diphtheria toxoid, although the apparently greater risk of post-inoculation poliomyelitis following alum-containing combined prophylactics should be kept in mind. It is inadvisable to give pertussis vaccine alone or combined to a child with a history of recent convulsions or within three weeks of vaccination against small-pox.

REFERENCES

- ¹ Byers, R. K., and Moll, F. C. (1948). *Pediatrics*, 1, 437.
- ² Anderson, I. M., and Morris, D. (1950). *Lancet*, 1, 537.

Spots Before the Eyes

Q.—What are the causes of "spots before the eyes"? What are their significance and treatment?

A.—"Spots before the eyes" without any detectable particles moving about inside the eye can occasionally occur in patients suffering from derangement of the vessels which supply the occipital cortex. Such derangement is usually associated with cardiovascular disease elsewhere in the body, and it is unlikely that spasm can account for it in the absence of obliterative changes. A disordered liver, which is commonly blamed by the lay public, may also account for a few cases; but these "spots" are nearly always due to the presence of mobile opacities in the vitreous, and are essentially harmless. Indeed, many patients learn to ignore them when once they are assured that the spots are not of sinister import. Sometimes they are particularly obtrusive when a patient gets up after a long rest, as we can readily appreciate by a simple analogy. If a tumbler of lemon squash stands for a few hours, most of the flakes will settle to the bottom, but rotation or agitation of the vessel will spread these opaque particles, making the contents turbid.

Vitreous opacities are particularly common in myopes, and in all old people, but they are often found on routine examination of patients who had not noticed them. One important cause is choroido-retinitis, in which a shower of inflammatory particles will be launched into the vitreous.

Retinal detachment is another possibility to be borne in mind, but in this condition the patient will probably also complain of a shimmering film seen by the affected eye. Vitreous particles may also be derived from large retinal haemorrhages and intraocular foreign bodies.

There is no ocular treatment for "spots before the eyes" as such. When they are due to constitutional disturbance, treatment on general lines must be given. When the "spots" are due to intraocular disease—for example, retinal detachment—the causative lesion should be attacked. When they are harmless no treatment can disperse them, and the custom of piously prescribing potassium iodide as a remedy is quite useless. "Spots before the eyes," in the absence of general illness, demand a careful eye examination. If no abnormal signs are present, other than mobile vitreous opacities, the patient should be reassured.

Diseases Spread by Breast Milk

Q.—What diseases of the mother are likely to be communicated to the infant via her milk?

A.—The answer to this question is quite simple: no diseases are known to be transmitted to the infant via breast milk.

Certain possibilities may be considered, but these are more academic than practical. Staphylococci from a breast abscess might enter the milk, and could infect the child, and for this reason it is wiser to discard or boil milk expressed from an inflamed breast. It is not thought possible for bacteria in the systemic circulation to pass the cell barriers and enter the milk, but it is possible that viruses of small molecular size could do so. There is no evidence that this happens in man. It has been shown that, in specially bred strains of mice, cancer of the breast is transmitted in the breast milk, but nothing of this sort is known in man or other animals. Syphilis might be acquired from the nipple by an infant not infected before birth.

Thrush is frequently acquired from the mother's nipple, not from the milk.

Circumcision in Infancy

Q.—What are the indications for and against circumcision in the normal healthy baby?

A.—There are no contraindications to circumcision in earliest infancy. Later, haemophilia is an obvious contraindication.

The indications may be considered under three headings: religious, parental insistence, and paediatric. The first two do not call for any discussion. The third is rare. A preputial orifice so small that micturition is difficult, a long redundant prepuce with repeated ulceration at the tip, or one which is associated with recurring balanitis, and paraphimosis may be regarded as the chief indications. The subject has been well discussed by Gairdner.¹

REFERENCE

- ¹ *British Medical Journal*, 1949, 2, 1433.

Repeated X-ray Treatment for Cheilopompholyx

Q.—Is there any danger in repeating x-ray treatment of cheilopompholyx in a case which has already relapsed twice?

A.—Superficial x-ray therapy should be prescribed only by a dermatologist who knows what treatment the patient has previously received. Using unfiltered, fractional dosage—as should be employed—safety depends upon the actual dosage and the spacing of treatments. There is strong evidence to support the view that a total dosage exceeding 1,500 to 2,000 r units should not be given to any one area of skin. In some sites—for example, vulva and perineum—a total dosage of 1,000 to 1,500 r units should probably not be exceeded and such dosage is usually spaced over many years.

Arachnodactyly and Wedge-shaped Vertebrae

Q.—Is anything known of the inheritance of congenital wedge-shaped vertebrae? I know a father and daughter who both suffer from this condition, associated with mild arachnodactyly. It would be helpful to me to know whether the daughter's children are likely to develop the same condition.

A.—Arachnodactyly is due to a dominant gene, though there may sometimes be skipping of generations. Sporadic cases also occur; they may be due to dominant mutations. In about half the cases abnormalities of the vertebral column are also present. Very little is known about the genetics of wedge-shaped vertebrae, except that several instances in a family have been reported. As both the father and daughter are affected it is likely that a dominant gene is involved; if so, there is one chance in two that any child will receive it. It may be, however, that owing to possible skipping of generations the chance that any child will actually be affected is somewhat less.

NOTES AND COMMENTS

Male and Female Symbols.—Dr. E. J. THOMSON (Grimsby) writes: Your paragraph on the origin of ♂ and ♀ ("Any Questions?" March 6, p. 596) is obviously no more than a précis of your meditations on the matter, but it does include statements that read like facts, and some of them are fallacious. A less educated—and I refrain from "sophisticated"—eye would see at once that the symbols are simply primitive drawings of male and female genital parts. They were probably stereotyped, and their significance established, long before they were applied to Mars and Venus, and, on this basis, their use in alchemy becomes logical: the hard metal—the spear—is male, and the soft one—the pot—female.

The use of a distinctive part to represent the whole is common in all early art forms, and the gross exaggeration of sexual parts in Palaeolithic statues suggests that inscriptions of that period might yet be found to show just such hieroglyphs as these. This would put the date of origin nearer 10,000 than 2,000 B.C.

OUR EXPERT writes: I do not quite understand Dr. Thomson's difficulties. I am ready to take his word that the symbols ♂ and ♀ were used to indicate the genitals before they were used to designate the planets Mars and Venus, though I know of no evidence for this. As regards his second paragraph there must be a misunderstanding. An inscription must be "something written." Not only is there no evidence of writing among men of Palaeolithic culture, but the evidence that we have of their achievements suggests that the conception of writing had not dawned upon them. The earliest efforts that can be reasonably regarded as approaching writing are of the second half of the fourth millennium B.C. and are the work of men of Neolithic culture. This is long after 10,000 B.C. But, leaving the meaning of "inscription" aside, I know of no Palaeolithic painting or carvings of these signs, nor do I see any clear resemblance to ♀ in the exaggeration of the female genitalia in certain Palaeolithic figures. On the other hand, a resemblance of ♂ to the male genitalia may well satisfy those with the eye of faith so inclined, but I should like to have evidence from Palaeolithic paintings that it does so represent them.

Correction.—The leading article on remuneration of consultants (*Journal*, April 10, p. 860) should have read that the weighting allowed to part-time consultants and S.H.M.O.s is to be reduced from one and a quarter sessions to three-quarter sessions, not from one and three-quarter sessions to three-quarter sessions, as stated.

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RADIOTHERAPY IN ITS RELATION TO DERMATOLOGY*

BY

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The art and science of radiotherapy has been closely associated with dermatology ever since the first attempts at treatment with x rays were made within a few months of Röntgen's epoch-making discovery in November, 1895. It was the evidence of erythema of the skin, of dermatitis, and of necrotic ulceration, produced accidentally on the exposed hands and faces of enthusiastic workers or during prolonged demonstrations of the properties of the new-found rays, that gave the first indication of a biological reaction. Similarly the biological action of radium was discovered by the recognition of radium-produced dermatitis by Walkoff in 1900, and by the famous Becquerel burn in 1901 (Becquerel and Curie, 1901). Becquerel carried some radium in his waistcoat pocket and subsequently developed a painful ulcer on his chest wall.

Since those early days radiotherapy, by the use either of x rays or of the radiations from radioactive substances—in particular radium and radon and more recently some radioactive isotopes—has been used with benefit in a great number and variety of dermatological conditions. It has brought to dermatological practice an important method of treatment. Indeed, it is probably no exaggeration to say that for many dermatologists radiotherapy has been their most important single therapeutic agent. At the same time it must not be forgotten that radiotherapy has also brought to dermatology some new and difficult problems in the form of pathological conditions which are among the most distressing and tragic, and the most resistant to treatment which can occur.

In the content of this lecture it is not possible to describe all the dermatological conditions for which radiotherapy may be of value, but some discussion of the main groups and the underlying principles may be of interest.

In dermatological practice the effect which is required by radiotherapy is usually one which is limited to the skin and immediate subcutaneous tissues. It is therefore desirable to use a type of radiation which is soft and absorbed in the surface layers and does not penetrate deeply into the body. This is obtained by x rays of low voltage or by the beta rays from radium or other radioactive substances. There is no necessity, and it is undesirable, to use more penetrating radiation such as is useful for more deeply seated neoplasms, except in the case of some of the more infiltrating malignant skin tumours. What is commonly known as superficial x-ray therapy—that is, x rays generated at a tension of not more than 100 kV, and lightly filtered radium plates which allow a high proportion of the beta rays to emerge, have been the main methods of radiotherapy for skin diseases. In more recent years some beta-

emitting isotope such as P³² or strontium⁹⁰ has been used as a substitute for radium with certain advantages.

Action of Radiation in Dermatology

The use of radiotherapy in dermatology may be grouped into three main types of technique, each used for the treatment of distinct and different groups of disease with different dosage levels and with the object of producing different biological effects.

1. *Multiple Small Doses.*—A technique of multiple small doses is used for the treatment of inflammatory conditions and of many dermatoses. The size of each dose is often less and usually not more than 100 r—about a quarter of that which would produce a visible erythema—and the intervals between each dose are usually of about a week. It may be repeated four or five times in a course of treatment, but the repetitions must be strictly limited, as even with such small doses harmful sequelae will occur after prolonged or multiple courses of treatment. From the earliest days of x-ray therapy it became known that many inflammatory conditions, both acute and chronic, would regress and subside after such small doses of radiation, but although much work has been done and many facts have been accumulated the true nature of the action of radiation in effecting such results is not known. Theories have been advanced that the action is primarily on the blood vessels, causing dilatation and diapedesis, or that there is a destructive effect on the most sensitive cells, the lymphocytes, which are accumulated in the tissues irradiated, with the liberation of antibodies, or a destructive effect on developing fibroblasts. Whatever the exact mechanism may be there is some definite reaction produced, without any clinical erythema, which promotes the regression of these pathological processes. Similar techniques are used in the treatment of some haemangiomas in children and for keloids.

2. *Single Dose.*—A single-dose technique is used to produce temporary epilation in cases in which there is infection deep in the hair follicles. The dose given is one which will produce a mild erythema—that is, between 400 and 500 r with this quality of radiation—and it acts by causing damage to the sensitive cells lining the hair follicles. The hair falls out, leaving the follicles open and amenable to the application of fungicidal or bactericidal agents. The follicles regenerate after such dosage and the hair grows again.

3. In the treatment of malignant disease higher dosage is given, and it may be close to the maximum that the normal tissues will tolerate without irreparable damage. The whole basis of the radiotherapy of malignant tumours is that there is a difference between the radio-sensitivity of many malignant growths and the normal tissues in which they grow. Such malignant lesions of the skin can be destroyed by doses which are not

*Chadwick Trust Malcolm Morris Memorial Lecture given at St. Mary's Hospital, London, W.2, on December 3, 1953.

sufficient to cause permanent irreparable damage to the skin and subcutaneous tissues. In most cases, however, the dose necessary will cause a marked inflammatory reaction, with subsequent dryness and permanent depilation. The biological reactions involved in the destruction of the tumour cells are of a complicated nature and involve alterations in the molecular structure of the intracellular protoplasm.

A single-dose technique may be used in the treatment of some superficial malignant tumours of limited extent and known radiosensitivity. This is convenient in such cases because it allows the treatment to be completed without numerous attendances. In larger and more infiltrating lesions a safer result with less damage to normal tissues is obtained by spreading the total dose out over a more prolonged period of time. This may be achieved by using a fractionated technique—that is, the total dose is spread over a period of some days or even weeks, and a daily treatment is given, delivering a predetermined fraction of the total on each occasion. When radium is used the same type of effect may be obtained by continuous irradiation with a small quantity of radium, spread over a period of days.

Inflammations and Dermatoses

Before the days of chemotherapy, x rays were used to treat pyogenic infections such as boils and carbuncles, with marked improvement as regards the relief of pain and induration. There is more rapid subsidence and the inflammatory process becomes more circumscribed. Erysipelas also was treated as a routine in some institutions. These are matters of historical interest now, but there is still a useful field for radiotherapy in the treatment of chronic paronychia, which may be resistant even to modern chemotherapy and which can be healed in the great majority of cases by doses of the order of 100 r or less, repeated at weekly intervals for four or five doses.

A variety of the more chronic types of dermatosis are treated in the same way. Patches of neurodermatitis respond well to the same order of dosage, and chronic eczema with lichenification, resistant to other methods of treatment, usually heals after three or four exposures.

X-ray treatment is of real value in many cases of chronic acne vulgaris with induration of the subcutaneous tissues. There is more doubt about its value in acne rosacea, but I believe that here too it has an important place in the skin manifestations, and certainly it is at present the most valuable method of treatment available to promote healing of the corneal infiltrations and to alleviate the distressing symptoms of pain and photophobia.

Lupus Vulgaris.—The value of x-ray therapy in lupus vulgaris has been the subject of considerable discussion. There is no doubt that many cases have healed after repeated doses of the order of 100 r at weekly intervals. In the course of years many patients have received gross overdosage, with the development of telangiectasis, excessive fibrosis, and subsequent carcinomatous degeneration, and there has been a tendency to consider that carcinoma developing on lupus is always the result of the x-ray treatment. There are, however, examples of lupus carcinoma when no x-ray treatment has been given. The excessive scarring occurring in this disease is likely to give rise to carcinoma in the same way as carcinoma may arise in any other scar tissue, particularly the extensive scars from burns. Fortunately there seems to be good reason to expect that newer methods of treatment will be more efficacious and may make x-ray treatment unnecessary in this disease.

Psoriasis.—This was one of the first conditions to be treated by x rays. The lesions, whether on the skin or on the nails, respond well to small doses in most cases, but unfortunately they recur with almost unfailing regularity. The unfortunate patient then, not unnaturally, again seeks

the remedy which has been so successful, and the process is repeated. There have been many instances in which excessive radiation has been given, perhaps by the accumulation of dose over a period of years by a succession of practitioners, with resultant sclerosis and telangiectasis and ultimately the development of malignant disease. It has been truly said, and it particularly applies to x-ray therapy, that volumes have been written not only about the cures for psoriasis but about the cures for the conditions produced by the cures for psoriasis. Of course, it is not always radiotherapy which causes cancer in psoriasis. There are cases of development of malignant disease in the absence of any irradiation, but I believe that psoriasis should be subjected to radiotherapy only in exceptional cases, when patches resistant to other forms of treatment are causing distressing symptoms, or for involvement of the nails.

Pruritus.—The same arguments apply to the treatment of pruritus. In many instances x-ray therapy will immediately cause relief of symptoms, but only too often the condition recurs, and then recourse is had again to the miracle treatment. The dangers of accumulation of dose are enhanced by the fact that the perineum and perianal regions are parts of the body naturally soft and moist, which are particularly sensitive to irradiation, and do not tolerate heavy dosage. It is difficult for the patient to realize the dangers of this apparently simple and rapid method of alleviating his discomfort, and he may go off to another unsuspecting practitioner when the original one refuses further treatment. There have been many real tragedies with extensive necrosis due to such treatment, and I consider that pruritus also should be treated by radiotherapy only in exceptional circumstances when there is a real dermatitis with lichenification, and after due warning to the patient.

Angiomata

The mixed capillary cavernous type of haemangioma, the so-called strawberry naevus, is often treated by irradiation, and the results of such treatment are almost universally satisfactory. These lesions are present at birth or appear shortly afterwards. They may grow with considerable rapidity during the first year of life, causing great alarm to the mother or they may show little progress, becoming actually larger but with an increase in size only proportional to the growth of the child. In some cases there may be no increase in size, and they may begin to regress and disappear completely within a few months without any treatment.

There is a tendency for all of them to regress within a few years, and it is doubtful if any but a small proportion would remain until adult life even without any treatment. There is no doubt that radiotherapy will make them disappear more quickly and more completely, and, apart from the general desirability of curing the deformity as quickly as possible, there are some cases in which treatment is urgently required. An angioma on the lip may interfere with sucking, or one on the eyelid may interfere with the function of the eye. Others may ulcerate and, if situated in or near the napkin area, may become infected.

Two or three suberythematous doses of superficial x rays or applications of beta-ray radium plates will ensure gradual regression, and in most cases this will continue until there is no sign of the lesion and the overlying skin will gradually attain practically normal texture. Complete regression with this form of treatment may take a year or two, but it is preferable to any attempt to cause rapid disappearance with larger doses, as they may cause atrophy and scarring of the skin. There have been instances where such larger dosage has been responsible for severe deformity by interference with the growth of a limb or the proper development of the bones of the face or orbit. More deeply seated cavernous haemangioma may be effectively treated by the implantation of radon seeds with appropriately small dosage, which should be kept to 1,200 r as a maximum.

The use of radiotherapy in these lesions, if properly controlled with suitably small dosage, is in every way preferable

to treatment by carbon dioxide snow, which in most cases leaves an unsightly scar.

The central vein angioma, or spider naevus, is unsuitable for radiotherapy; and the capillary haemangioma, or port-wine stain, commonly occurring on the face and sometimes of considerable extent, also does not respond to this form of treatment. In order to obtain any improvement in the discoloration by the use of x rays or radium it is necessary to give such dosage that there will be some permanent damage to the texture of the skin. The cosmetic result is usually worse than if no treatment had been given except to cover it with make-up, and there is the real danger of severe scarring, necrosis, and even cancer formation in later years.

Thorium X has been used for the treatment of these stains, being contained in a solution which is painted on the surface of the lesion with the object of making use of its alpha rays with their limited power of penetration. Some dermatologists with experience of hundreds of cases so treated consider that a worthwhile improvement can be obtained, but I have not been able to convince myself of any appreciable effect.

Keloid

In the treatment of keloids and hypertrophic scars radiotherapy has an important part to play. When the keloidal scar is recent and still vascular and has not become organized into solid fibrous tissue, marked improvement can be obtained by the application of x rays or of radium two or three times at intervals of a month or six weeks. Each individual dose should be less than that which would cause an erythema, and care must be taken that the total dose is not excessive. There is subjective improvement with lessening of itching, tenderness, and pain, and the scar becomes paler, flatter, softer, and more pliable, so that there is an improvement in the amount of contracture that may be present. If the keloid is old, hard, and avascular it will not respond to radiotherapy. In such cases it should be removed surgically where possible, and the recent scar treated by radiotherapy to prevent recurrence of keloid. X rays are often used as a pre- or post-operative measure to prevent the development of thick and unsightly scars when surgical operations are undertaken in sites where a good cosmetic effect is essential.

Temporary Depilation

Ringworm of the scalp in children was first treated by Freund in 1897. Its success depends on complete temporary epilation of the affected area, which in fact means complete temporary epilation of the whole scalp. In the first years of radiotherapy there were many failures and accidents in the treatment of these children. Insufficient dosage at any point might mean that areas of infected hair remained on the scalp and the whole scalp became reinfected when the new hair grew again. There were cases of permanent epilation and of necrosis of the skin through overdosage, either in large patches or in strips between adjacent x-ray fields. There were also many successful cases. One of my colleagues had his scalp depilated for ringworm by Sir Malcolm Morris about 50 years ago. He has still an excellent head of hair.

In 1907 Kienböck described a method of giving irradiation to the scalp using five points of application. In 1909 Adamson, a British radiologist, described some modifications to this method, and ever since that time the Kienböck-Adamson technique has remained the most frequently used standard technique for irradiating the scalp in cases of ringworm. A four-field method is advocated by Shanks (1931) as a saving in time, but whichever is used the results, in careful hands, are now uniformly good. Ringworm of the scalp has been stamped out except for sporadic cases, and any real complications and sequelae from the treatment are of the greatest rarity.

Sometimes straight hair may grow back in curls after epilation and—much more serious—curly hair may turn straight. This fact has, however, its compensations. It is a well-known result among the coloured population of Washington, D.C., in the United States, and many mothers

will apply irritants to their children's scalps so that they will simulate ringworm, be treated by epilation, and run a chance of getting straight hair.

Temporary epilation may also be necessary for the cure of resistant cases of sycosis barbae.

Malignant Disease

In the treatment of malignant disease of the skin radiotherapy has a role of great importance. In some cases it is the method of choice and should be used as the sole treatment. In some cases it is better to use a combination of radiotherapy and surgery and in others surgical excision alone should be employed.

The choice of method of treatment, the technique, and the dosage will be decided according to the clinical and histological features of each individual case. Radiotherapy may be given by x rays generated at high or low voltage, by surface application of radium, by radium needle implantation, by telradium, or by some radioactive isotope used in any of these ways as a substitute for radium. A single dose, a continuous application, or a fractionated course of treatment may be the technique chosen.

Whatever it may be, it is essential for the curative treatment of malignant disease of the skin, as in cancer of other organs, to give the chosen form of radiotherapy as a single planned course of treatment. There is no place in the attempted cure of cancer for the multiple-small-dose technique. After possible initial regression the tumour becomes progressively more resistant and cannot then be cured even by more adequate dosage.

A second principle is that if failure has occurred after such a planned course of radiotherapy, a second attempt at treatment is unlikely to be successful and runs a risk of producing necrosis. Surgical ablation should then be carried out in the majority of cases, even though it may mean considerable disfigurement by sacrifice of tissue. In some cases of marginal recurrence outside the previously treated area a further course of radiotherapy may be successful, and may be undertaken without serious risk.

Rodent Ulcer

In small and superficial rodent ulcers there is little to choose between the curative results of radiotherapy and surgical excision. Radiotherapy may be chosen because of the better cosmetic effect in some situation, particularly in extensive lesions in which excision would entail a graft to cover the defect.

In superficial cicatrizing growths, which are often of considerable extent before the diagnosis is made, surgery may be impossible or may be practicable only at the expense of great deformity. Radiotherapy may be successful in such cases with only minimal resultant scarring. In some cases in which the eyelids or the conjunctiva is extensively involved the use of a combination of radiotherapy with surgery may be desirable. Preliminary irradiation may allow the surgical excision to be limited to a simple excision of the eyeball, instead of a wide exenteration of the orbit. Earlier, more limited lesions of the eyelids may be treated by irradiation with little scarring or deformity, and without damage to the eye if a contact shield is placed between the lids and the globe or if the beam of radiation can be directed away from the eye by displacing the eyelid during the treatment.

Squamous-cell Carcinoma

Squamous-cell carcinoma of the skin responds as well to radiotherapy as does basal-cell carcinoma. The percentage of cures is lower because the lesions are in general more extensive when they come for treatment, and because a proportion arise in scar tissue with poor blood supply. There are also a number of failures due to the development of glandular metastases. As a general rule involvement of bone or cartilage by direct extension of malignant disease means that the growth is less likely to be cured by irradiation and more likely to undergo necrosis. Careful technique with radiation of hard quality will, however, provide some

successes in these cases, and it is worth while attempting radiotherapy in the first place in cases such as those of the pinna of the ear, where subsequent surgical excision will not have been made more difficult or more extensive if recurrence or necrosis results.

Malignant tumours on the limbs are difficult to treat by irradiation owing to the likelihood of necrosis of underlying bone and tendons. Squamous-cell carcinoma of the lower limb which sometimes arises on the site of long-standing varicose ulceration is often extensive and infiltrating. It is usually best treated by amputation. In the upper limb, however, every effort should be made to conserve the functions of the hand, and success may be achieved even in lesions of great extent by surface application of radium on a moulded appliance over a period of not less than two or three weeks.

Epithelioma of Lip

Epithelioma of the lip may come within the province of the dermatologist. Here too the choice between radiotherapy and surgery must be carefully decided for each individual case. Radiotherapy may be chosen, particularly in growths extending along the lip margin, on account of the excellent cosmetic results. Surgery should be chosen in cases of recurrence after radiotherapy and in advanced cases with deep extension and involvement of bone. Surgery may be necessary for repair of the tissue defect where radiotherapy has successfully dealt with an ulcerating type of lesion.

In tropical and subtropical countries such as Australia or South Africa, where European populations have continuous exposure to hot sunlight, there is a much higher proportion of skin malignant disease than in this country. Radiotherapy is of enormous benefit, and is widely used for the treatment of multiple lesions, either hyperkeratoses which would progress to the development of cancer, or frankly cancerous lesions. There is a place for surgery too in the treatment of these patients with a multiplicity of lesions and the certainty that more will develop. The cosmetic results must be of minor importance, and anyway, in a dry and keratotic skin, the scars of multiple small incisions may not be more unsightly than those of multiple treatments by irradiation. Surgery is generally preferable to irradiation for malignant growths occurring on the trunk. The type of rodent ulcer is often the intradermal and superficial cicatrizing variety; when treated by irradiation they usually leave thin atrophic scars which are easily damaged if rubbed by clothing; the cosmetic effect is not important, and surgical excision is often quicker and easier for the patient than a fractionated course or prolonged continuous applications of radiotherapy.

Although successful results may be anticipated from adequate surgery or adequate radiotherapy of rodent ulcer and squamous cancer of the skin, even early growths which are superficial and apparently innocuous in appearance, if not adequately treated, will recur and they will infiltrate widely, causing destruction of underlying tissues and ultimately the death of the patient. There are also some few of them, with no obvious difference in their clinical appearance, which appear from the onset to be much less amenable to treatment and which, despite wide excision or apparently suitable radiotherapeutic technique, develop rapid and widespread recurrence.

Naevocarcinoma

Malignant melanoma, or naevocarcinoma, is one of the most rapidly developing and deadly forms of malignant disease. It is usually considered to be the supreme example of a radioresistant tumour for which surgery is the sole appropriate treatment. Recent observations have shown that some of these tumours are radiosensitive and that it is advisable to give wide and intense post-operative irradiation after surgical excision.

Reticuloses

The diffuse group of diseases affecting the reticulo-endothelial system, which includes mycosis fungoides, Hodgkin's disease, reticulum-cell sarcoma, lymphosarcoma, and the

leukaemias, have dermatological manifestations, sometimes as the first presenting feature. Radiotherapy is of great value in the treatment of many of these eruptions as well as in the more deeply seated lesions in glands, viscera, and skeleton. They often are very radiosensitive and disappear rapidly with small dosage, but unfortunately they are not permanently arrested, and widespread recurrence almost invariably leads to a fatal termination.

Local Reactions

Often there is misconception about the type of local reaction which occurs after irradiation for the treatment of malignant disease. It may be necessary to give the maximum dose which the normal tissues will tolerate, and this may produce a moist desquamative reaction of the epidermis. It is less frequently seen nowadays, and is avoided whenever possible. It will heal rapidly in 10 to 14 days, leaving a dry, rather inelastic, and hairless skin with some pigmentation, and in individual cases there may be later development of telangiectases. This is the maximum therapeutic reaction which should be produced on the skin and should not be confused with an area of necrosis, the x-ray or radium burn, which is a deeper ulceration involving the dermis or deeper tissues.

Necrosis

Necrosis is the most serious complication of irradiation. It may occur as an immediate sequel to treatment with high dosage, in the form of early or acute necrosis. In such cases, following an early developing erythema which becomes a deep purplish colour, with some oedema of the affected part, the ulceration may extend rapidly, and is associated with severe pain. There is little tendency to heal, because of lack of blood supply, due to endarteritis of the vessels in the affected area. There is always marked secondary infection.

Acute necrosis occurs as the result of some error or accident in technique such as the use of the wrong filter, the overlapping of adjacent fields of irradiation, or some miscalculation or error in measurement of the time for delivering a prescribed dose. It may also occur as the result of lack of appreciation in the prescription of treatment of the dose which some particular area will tolerate. There are individual variations in resistance according to age and certain pathological states: infected tissues necrose more readily; certain parts of the body are more sensitive than others, particularly if bone is close underlying the skin or there is a deficiency of blood supply; the previous application of local irritants may increase sensitivity; and, in particular, previous irradiation renders the tissues more liable to necrosis.

Necrosis may occur when a deliberate risk has had to be taken and heavy dosage has had to be used as the only possible chance of curing the disease. Although necrotic ulceration is often thought to be a sign of inaccurate treatment it is inevitable that occasional instances should occur in the treatment of large numbers of cases of cancer. It may sometimes be the price that has to be paid for the cure of the disease. Necrosis should never occur, and the risk should not be run, when dealing with non-malignant conditions which can be treated by other means.

Necrotic ulceration may occur as a late phenomenon. An area which has been heavily irradiated has some deficiency of blood supply due to increased fibrosis and sclerosis of the blood vessels. Such a volume of tissue may not withstand the effects of trauma occurring at a later date and may break down with the development of ulceration similar to that of acute necrosis. For example, after the treatment of a malignant tumour of the skin excessive exposure to the sun or to frost-bite may precipitate necrosis even many years later. Heavily irradiated bone and cartilage are particularly liable to late necrosis, and the precipitating cause may be some accidental blow or even a local infection of minor degree. Necrosis of the jaw may occur following dental extraction even five and ten years after heavy irradiation for cancer of the tongue or mouth.

Carcinogenesis

Repeated small and suberythematous doses, each of which has no apparent clinical effect, may cause irreparable damage to the skin. The effects come on gradually and may not be seen until years after the irradiation. There is dryness of the skin due to destruction of sweat and sebaceous glands, permanent depilation, and loss of elasticity due to fibrosis of the dermis. There is also a diminution in subcutaneous tissue, and the skin develops a drawn, shiny parchment-like appearance, sometimes with the development of disfiguring telangiectasis. This stage will go on to the development of hyperkeratoses and papillomata; if occurring on the hands, cracks and fissures will occur around the nails, which become ridged and brittle. Eventually cancer will develop with induration of the base of the hyperkeratoses, or by extension of ulceration from the unhealed fissures. This is the type of reaction and sequence of events which occurred in the pioneer radiologists.

In 1904, nearly 20 years before the formation of the British X-ray and Radium Protection Committee, which led the way in setting up safe working conditions, Dr. Cecil Lyster, medical officer in charge of the electric department of the Middlesex Hospital, discussed the loss of sensation in his own fingers after repeated daily exposure, and stated: "It was not until after three months' constant exposure that I noticed my nails were becoming hard and dry with a tendency to split. The hair came off the back of my hands and I soon found the skin, where most exposed to the rays, became dry and scaly." He then used a pair of wash-leather gloves painted with white lead, and his hands improved. His account goes on to describe the ulceration which developed on the back of his fingers following the exposure of his ungloved hand for 20 minutes to x rays in May, 1903. His hands healed on that occasion, but unfortunately he developed cancer of the hands and died 17 years later. He was one of that gallant and unfortunately numerous band of x-ray martyrs who died as the result of changes induced by overexposure to radiation. There were other pioneers, and among them dermatologists, who suffered from the general effects of irradiation and succumbed from aplastic anaemia.

Discrimination in Use of Radiotherapy

These local and general reactions and sequelae, occurring sometimes 10 and 20 years after multiple treatments or frequent exposures, have drawn attention to the urgent necessity for discrimination in the choice of the condition for which radiotherapy should be used. I consider that as a principle it should not be used in any non-malignant condition for which a simpler and safer method of treatment will give equal chances of success.

Warts.—The place of radiotherapy in the treatment of warts is a question on which there is by no means general agreement. Many of them will disappear after adequate irradiation, but in most instances single warts of long standing, particularly those around and under the finger-nails, need a dose to the small area involved which is sufficient to produce a sharp erythema and perhaps desquamation. Warts on the plantar surface of the foot are a special problem; they can frequently be treated with complete success by a single dose of x rays or a single treatment by radium. This is particularly true of the infective plantar warts of children. The sole of the foot, in common with the palms of the hands and the perineum, is one of the most dangerous areas to irradiate. It is very liable to trauma, and necrosis may occur after heavy dosage. Sometimes warts have failed to disappear or have recurred and have been given a further dose, perhaps by another practitioner. In some cases callosities caused by faulty weight distribution have been treated as plantar warts and have inevitably recurred. Whatever the reasons, there have been numerous cases of severe and crippling necrosis following the treatment of warts, and I consider that, even though the majority can be treated easily and successfully without accident, it is wiser to withhold

irradiation and to treat them all by safer methods such as surgical excision.

Cosmetic Treatments.—The use of radiotherapy for cosmetic reasons such as the removal of superfluous hair should be condemned, as it has been the cause of many real tragedies. Permanent depilation cannot be attained without running the risk of later skin changes, with much disfigurement and subsequent cancer formation. The permanent reduction in secretion of sweat can also be attained only with great risk, and hyperidrosis should be treated by irradiation only in exceptional cases. The risks inherent in the treatment of pruritus and psoriasis have already been discussed.

The type of skin cancer which occurs as the result of irradiation is usually squamous-cell epithelioma, but rodent ulcers have occurred and sarcoma has also been described.

Radiotherapist and Dermatologist

The advent of the radiotherapist has created some problems and some difficulties in deciding the exact place of the dermatologist and of the radiotherapist in the radiotherapy of dermatological conditions. These problems must be solved, and are being solved, by mutual good will and understanding, because both have some essential contribution to make. X-ray therapy is for many dermatologists such an important part of their work that they have installed their own x-ray therapy plants as a necessary adjunct to their dermatological practices. They have become accustomed to treating their patients with standardized techniques and have largely eliminated the dangers and accidents by using very small doses, which are all that is necessary for the majority of patients they treat. Naturally such experienced dermatologists consider that there is no necessity for the help of the radiotherapist and that they can be self-sufficient. On the other hand, there is a tendency for the radiotherapist to consider that all cases of malignant disease of the skin should undoubtedly be treated by him and should be in his sole care.

I do not think that these arrangements are satisfactory and in the best interests of the patient. Radiotherapy of all conditions is best conducted, and the best results will be obtained, if there is constant and close collaboration between the radiotherapist and his colleagues in other clinical specialties. In dermatological radiotherapy, collaboration between dermatologist and radiotherapist will bring the best results so far as the patient is concerned.

Apart from such technical questions as ensuring accuracy by proper calibration and measurement of dose, of ensuring homogeneity of irradiation over the field irradiated, and apart from questions of protection of patient and personnel and adequate maintenance of plant, the radiotherapist can bring his experience in the irradiation of other conditions. The use of this knowledge, added to the specialized clinical experience of the dermatologist, is most likely to ensure progress in this branch of therapy.

Such collaboration is also essential in the development of the proper use to be made of new methods of irradiation and new technical possibilities that are now available. The whole field of use of radioactive isotopes must be explored. Many of these are suitable for dermatological use, with greater convenience and safety than the established methods of irradiation, and can provide a variety of new techniques. There is also an urgent need for more knowledge of the biological effects produced by radiation in many of the conditions which are treated.

The period of 30 years since the death of Sir Malcolm Morris has seen many changes and much progress in radiotherapy in relation to dermatology. We are now in a period of intense activity and discovery, but there is still much to be done.

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TREATMENT OF ACUTE GASTRO-DUODENAL HAEMORRHAGE WITH PARTICULAR REFERENCE TO QUANTITATIVE BLOOD REPLACEMENT

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During the year beginning in May, 1952, we treated patients with acute gastro-duodenal haemorrhage by a method incorporating the following principal features: (1) initial treatment by conservative measures; (2) early estimation, by means of a blood-volume determination, of the amount of blood lost; (3) quantitative replacement of the blood lost; (4) repetition of the blood-volume estimation to determine if haemorrhage has ceased or has recommenced; (5) early surgical intervention in cases of haemorrhage continuing or recurring in spite of conservative treatment.

We have been impressed with the increased saving in life since the inception of this therapeutic regime, and, while our own trial continues, publication of clinical detailed results obtained to date seems to be warranted.

The treatment of acute gastro-duodenal haemorrhage is still controversial. Agreement is lacking on such points as the diet to be given, the quantity of blood to be administered and the rate of transfusion, and the indications for emergency surgical operations.

It is difficult to compare the results furnished by various means of treatment, because of fundamental differences in the material reported on by the authors. Such differences are particularly noteworthy in the age and social grouping of patients studied and in the average severity of the haemorrhage: whereas some authors include all cases of bleeding in their series, others select only those of "severe" or "massive" haemorrhage; and the criteria by which the assessment of the severity is made vary widely.

One further source of differences among the various published accounts is worthy of emphasis. While some report "personal" series treated by outstanding specialists in this field, others summarize work carried out at general hospitals by heterogeneous medical groups without special facilities for selection or segregation of patients. The treatment described in this paper was carried out by a staff of general physicians and surgeons of varying experience, and the results represent the work of some 15 individuals. We believe that a similar scheme could readily be organized at any well-equipped general hospital.

Definition.—The term "gastro-duodenal haemorrhage" as used here denotes bleeding arising from intrinsic lesions of the stomach or duodenum. It excludes bleeding from oesophageal varices. "Acute" means bleeding at or shortly before the first examination.

Principles of Treatment

At Christchurch Hospital, at the present time, all patients stated to be suffering from acute gastro-duodenal bleeding are initially admitted to a surgical ward and seen by the surgeon dealing with acute cases. A physician is always on call, particularly when a patient's suitability for operation is being considered. Emphasis is laid on conservative treatment in the early stages, and adequate blood transfusion is regarded as its most important part. Only when this is seen to have failed to arrest the bleeding, or in cases of recurrent haemorrhage, is surgical intervention considered. We believe that non-arrest of bleeding should be diagnosed within 48 hours of admission and that the decision to operate should be made during that period.

Blood Transfusion

The purpose of blood transfusion is twofold: to relieve shock and other symptoms resulting directly from loss of blood and to raise the patient's haemoglobin concentration to a level permitting adequate oxygenation of vital organs, such as the heart, liver, kidneys, and brain, and giving the best possible chance to the surgeon if he should be forced to intervene. It is widely recognized that emergency surgery carried out on anaemic patients is beset with a high and possibly prohibitive mortality, especially if the anaemia is of any length of standing. Prevention and rectification of anaemia seem to us to be the most important single aim in the initial treatment of acute gastro-duodenal haemorrhage, and we believe that, whenever there is evidence that blood has been lost, the extent of the loss should be ascertained and the deficit made good as rapidly as possible.

It was pointed out by Bennett *et al.* (1938) that in the early stages of most cases of acute haemorrhage an examination of the peripheral blood alone can give no valid information about the amount of blood lost, because cells and plasma are lost in equal proportion, and anaemia cannot be diagnosed until the plasma volume is restored by means of haemodilution. This classical paper has not received the attention it merits, and the severity of haemorrhage is still estimated by most investigators in terms of the haemoglobin level or red-cell count. Thus Crohn (1953) defines "massive" haemorrhage as that which is accompanied by shock and a lowering of the red-cell count to 3,000,000 or less per c.mm. or the haemoglobin level to 7.5 g. or less per 100 ml. In our series, following the advice of Bennett *et al.*, we have estimated the blood loss by means of a determination of the blood volume, and have used the figures so obtained for prescribing the quantity of blood to be transfused, the aim being restoration of the total red-cell mass to the figure calculated to be normal for each patient.

Other Therapeutic Measures

The diet is regulated according to individual requirements. Although we do not regard initial starvation as desirable we have found that many patients suffering from considerable degrees of gastro-duodenal haemorrhage tolerate early feeding badly and prefer to take only sips of fluid, at least during the first 12 hours. We give a semi-liquid gastric diet as soon as patients can take it comfortably. Nothing seems to be gained by forcing patients to eat or drink in the intervals between haematemeses.

Colloidal antacids have generally been given from an early stage, especially where pain persisted.

Sedation seems an important aspect of treatment, and includes not only drugs (we prefer not to use morphine in patients who are vomiting) but also liberal reassurance by the attending practitioner. When apprehensive patients are suddenly translated to an unfamiliar environment and then subjected to a series of investigations, which though necessary are puzzling to them, brief explanations and friendly reassurance can do much to ensure the success of treatment.

Surgery

During recent years it has become evident that in certain cases haemorrhage from the stomach or duodenum will not

subside under conservative treatment, however long continued, and that surgical removal or obliteration of the bleeding lesion is necessary. Two courses are open to the surgeon: either to operate on all except mild cases of haemorrhage (Finsterer, 1939; Stewart *et al.*, 1950) or to attempt to select those patients in whom conservative treatment is likely to be unsuccessful. We have adopted the second course, subjecting to emergency surgical treatment two classes of patients: (1) Those who in spite of conservative treatment, including adequate blood transfusion, showed evidence of bleeding at the end of 48 hours' observation in hospital—the operation, preceded by appropriate measures of resuscitation, being performed as soon as such a diagnosis had been made. (2) Those who, following cessation of the original haemorrhage, showed evidence of recurrent bleeding while still in hospital.

The operation of choice was partial gastrectomy, but in one case this was not thought to be feasible because of the patient's poor condition, and a local repair was done.

Technique of Blood-volume Estimation

We have used exclusively Gregersen's (1944) Evans blue method for determining the plasma volume (V_p), and have found it convenient and accurate enough for emergency use. Only slight modifications in Gregersen's technique have been necessary in our series. Thus the chromogenicity of the dye used by us was so high that the recommended injection of 25 mg. could sometimes not be repeated within 48 hours without producing a rather alarming slaty-grey staining of the patient's skin and mucosae. For this reason we injected the full dose only in exceptionally large patients, while in those of small and medium stature we gave 15 to 20 mg. on each occasion. Calibration standards were prepared from dye diluted solely with plasma. We have now performed well over 300 blood-volume estimations with this dye and have noted no sign of toxicity in any patient.

In the calculation of the total blood volume (V_b) and the total red-cell mass (V_c) we have made use of the venous haematocrit reading, multiplying it by a factor of 0.96 to correct for trapped plasma. We realize that an error was thereby introduced, as the total body haematocrit reading is lower than that of the venous haematocrit, and that the correction factor 0.86 would have given a more accurate result (Mollison, 1951). For the purpose of computing the amount of blood to be transfused the calculated V_c was compared with the "ideal" V_c . The latter was obtained by multiplying the patient's "ideal" weight (from Life Tables, using the patient's height and age) by the figure 36 ml. per kg. body weight. The work of Reeve and Veall (1949) has indicated that 30 ml. of red cells per kg. is a better estimate of the "ideal" V_c . The second error thus introduced into our calculations acted in the opposite direction to the first and partly cancelled it. We have calculated that by using the older figures mentioned we overestimated blood losses by from $\frac{1}{2}$ to $1\frac{1}{2}$ pints (284 to 850 ml.) per patient, according to the severity of the haemorrhage. This error does not appear to invalidate the results of our investigations, which were carried out under emergency conditions and not intended to supply fundamental data. When successive blood-volume estimations were compared for the purpose of establishing the presence or absence of continued bleeding the errors mentioned above did not influence our calculations, as we were comparing two sets of figures both obtained with the use of the same factors.

Using the Evans blue technique in non-bleeding patients, we have found successive estimations of the V_p to agree to within 5%, as claimed by Gregersen. Great care in injecting the dye, in removing samples of blood, and in estimating dye concentrations (using a Coleman spectrophotometer at a wavelength of 625 m μ) was, however, necessary to obtain such results, and all these operations were carried out by experienced senior laboratory staff. As few of our patients were able to take much food at the time of our examinations we have had little trouble with turbid plasma samples. Difficulties occasionally arose in estimating the

height and weight of gravely ill patients, and in some cases we found it inadvisable to use the "ideal" weight for calculating the "ideal" V_c owing either to the presence of gross obesity or to malnutrition. In these cases we used a figure lying between the actual and the "ideal" weight.

Technique of Transfusion

All patients were transfused by means of the continuous-drip method with either stored whole blood or packed red cells. The normal rate of transfusion was one pint (570 ml.) in four hours. This rate was generally exceeded for the first one or two bottles of blood in the more severe cases of haemorrhage; when active bleeding was obviously proceeding, and particularly when patients were being prepared for emergency operations, blood was often given at very rapid rates and sometimes simultaneously into two veins.

As already stated, our aim was to restore the total V_c to the "ideal" by means of transfusion. For this purpose we assumed a pint bottle of stored blood to contain 200 to 220 ml. of red cells. If, therefore, we found a deficit of 1,000 ml. in the V_c we would give four to five bottles of whole blood. Packed red cells were often given when a patient's V_p was found to be large compared with his V_c , and especially when heart failure was present. In a few cases incipient congestive heart failure with a large V_p appeared to make it advisable to leave the patients with a blood volume of only about 80% of the calculated normal.

Material

During the year since the adoption of this therapeutic regime we treated 88 cases of acute gastro-duodenal haemorrhage: males, 69 (78%); female, 19 (22%). Five of these were admitted twice during the year, so that the series comprises 93 separate admissions. In addition several other patients were on admission thought to be suffering from haematemesis or melaena, but were on investigation found to have lost only insignificant amounts of blood. We decided to exclude these from our series. Table I shows the age

TABLE I

Age Incidence among 93 admissions (88 patients):			
0-29 years	2	60-69 years	24
30-39 "	4	70-79 "	31
40-49 "	13	80-89 "	4
50-59 "	15		
Average Age, 62.6 years:			
Over 50 years	74 (78.5%)		
" 60 "	59 (63.5%)		
" 70 "	35 (37.7%)		

incidence among our patients. It will be seen that the great majority were middle-aged or elderly. This is in contrast to many other published accounts in which acute gastro-duodenal haemorrhage appeared to be most common among the younger age groups. As has been found by others, men were more commonly affected than women, although their preponderance was unusually heavy in our material.

Diagnosis

The diagnoses made in our 88 patients were as follows: gastric ulcer, 29 (male 25, female 4); duodenal ulcer, 26 (male 19, female 7); stomal ulcer, 2; probably peptic ulcer, 4; ulcer not visualized, 20; hiatus hernia, 2; gastritis, 3; carcinoma of stomach, 2. A definite diagnosis is indicated only when it was proved radiographically, at gastroscopy, operation, or necropsy. The group of four patients classed as cases of "probable peptic ulcer" had ulcers proved on previous occasions, but no ulcer was found during the current admission. Patients listed under the heading "ulcer not visualized" had strong histories pointing to peptic ulceration, but no actual lesion could be demonstrated. The policy at our hospital has so far been to wait at least one week after presumptive cessation of the haemorrhage before undertaking radiological or gastroscopic studies. Inevitably some of the more acute ulcers must have healed in the intervening period and their visualization thus became

impossible. A few emergency radiological examinations were carried out immediately before operation. In two cases no lesions were found at operation, but after gastrectomy bleeding ceased. It is probable that in at least one of these a high gastric ulcer was left behind.

Results

Table II shows the reduction in the red-cell mass found in those patients who had not been transfused at the time when their blood volume was first estimated, and in another six

TABLE II.—Reduction in Red-cell Mass (% of Normal)

	0-19%	20-49%	50+%
Patients not yet transfused	4	24	35
"transfused but suffering from recurrent haemorrhages	—	1	5
Total	4 (6%)	25 (36%)	40 (58%)

who had recurrent haemorrhages after their first transfusion. Following the suggestion of Bennett *et al.*, we have arranged these individuals into three groups according to the magnitude of the blood loss. The "mild" group, with a reduction of up to 19% in their V_C , comprised 6% of the total; the "moderate" group, with a reduction of 20 to 49% in the V_C , 36%; and the "severe" group 58%. The last-named group lost more than 50% of their V_C . If a reduction in the V_C of 40% or more had been taken as implying "severe" or "massive" haemorrhage, as was done by Stewart *et al.* (1950), 78% of our patients would have fallen into this class.

The quantity of blood given is indicated in Table III. It will be seen that only about 25% had small transfusions of up to 4 pints (2.3 litres), while over 20% had more than

TABLE III.—Quantity of Blood Given (93 Admissions)

0-2 pints (0-1.1 l.)	7	9-10 pints (5.1-5.7 l.)	5
3-4 " (1.7-2.3 l.)	16	11-15 " (6.3-8.5 l.)	13
5-6 " (2.8-3.4 l.)	22	16-20 " (9.0-11.4 l.)	4
7-8 " (4.0-4.5 l.)	23	Over 20 " (over 11.4 l.)	3
Average: 7.9 pints (4.49 l.)			

10 pints (5.7 litres) each. The average, 7.9 pints (4.49 litres) per patient, is among the highest reported. It equals that used by Stewart *et al.* in their patients undergoing emergency surgical treatment.

In the great majority of our patients the initial treatment was solely by medical means (Table IV). Only 14% had

TABLE IV.—Initial Treatment

Medical	80 (86%)
Surgical (Gastrectomy, 12; Closure of ulcer, 1)	13 (14%)
Diagnosis in surgical cases:	
Gastric ulcer	6
Duodenal ulcer	3
Gastritis	2
No lesion discovered	2

emergency surgical operations. "Interval" gastrectomies were carried out in another 17 patients (18%) after cessation of the bleeding. One-third of all individuals therefore underwent operations either during or after the haemorrhage.

Among 93 admissions there were seven deaths, making a mortality rate of 7.5% (Table V). One further patient died from a cerebral haemorrhage ten days after cessation of

TABLE V.—Mortality

	Survivals	Deaths	Mortality
Medical treatment	75	5	6.6%
Surgical treatment	11	2	15.4%
Total	86	7	7.5%

a bout of melaena. As he had advanced arterial disease with hypertension and a history of a previous cerebral accident, we believe that his death was coincidental with the condition for which he was admitted and that he should not be

included in our list of deaths from the effect of acute gastro-duodenal haemorrhage. With medical treatment alone the mortality was 6.6%, while among the 13 patients treated surgically two died (15.4%). If the patient treated by cauterization of the bleeding vessel who succumbed to a recurrent haemorrhage is omitted from the "surgical" group, the mortality among the 12 patients treated by emergency partial gastrectomy was 8.3%.

Particulars of the fatal cases are given in Table VI. Their average age was 65.4 years and did not differ significantly from that for the whole series. Several of them had serious

TABLE VI.—Particulars of Fatal Cases

Age	Sex	Diagnosis	Operation	Complications	Cause of Death	Death avoidable
71	M	Gastric ulcer (acute)	Closure of ulcer	Severe chronic asthma with heart failure	Recurrent haemorrhage	?
59	M	Gastric ulcer	—	Hypertension and obesity	Uncontrolled haemorrhage	+
45	F	Gastric ulcer	—	Abdominal and generalized tuberculous	Uncontrolled haemorrhage	—
84	M	Duodenal ulcer	—	Senility	Heart failure	?
70	F	Gastric ulcer	—	Excessive blood transfusion	Uncontrolled haemorrhage	+
67	M	Duodenal ulcer	Partial gastrectomy	Inhalation of vomit at operation for repair of ruptured gastrectomy wound	Shock and haemorrhage	+
62	M	Gastric ulcer	—	Perforation of gastric ulcer	Shock and haemorrhage	?

complicating diseases and were obviously poor surgical risks. Nevertheless we feel that at least three might have been saved by more rapid transfusion followed by operation. Only one patient, a 45-year-old Maori woman with gross abdominal and general tuberculosis in addition to an enormous gastric ulcer, appears in retrospect to have been doomed, whatever the treatment.

The following three cases are quoted to illustrate some of the details of our methods of diagnosing and treating acute gastro-duodenal haemorrhage.

Case 77

A man aged 37 was admitted eight hours after having vomited a small quantity of brownish fluid; he felt faint. He had had a similar episode nine years previously, when a diagnosis of duodenal ulcer was made. On examination he was a rather pale young man but not in distress. His pulse rate was 100; blood pressure 170/110; haemoglobin, 14 g. per 100 ml. Within two hours of admission the blood volume was found to be: V_B 62% of normal, V_P 68%, V_C 55%, indicating a deficit of 6 to 7 pints (3.4 to 4 litres) of blood (see Fig. 1). As this was an early case in the series

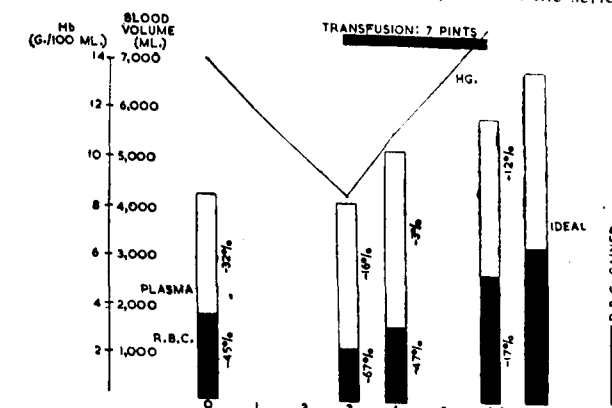


FIG. 1.—Case 77; blood-volume estimations.

and the patient's condition seemed to be good, no action was taken at this stage, but the blood volume estimation was repeated three days later. During this time there had been no further vomiting, the bowels had not moved, and the patient felt moderately well. The haemoglobin had fallen to 8.5 g. per 100 ml. The second estimation showed V_B 60%, V_P 84%, and V_C 33%, suggesting a further loss of about 3 pints (1.7 litres) of blood, with partial restoration of the plasma volume. Transfusion was now started, a total of 7 pints (4 litres) of whole blood being given. Further estimations demonstrated that the gain in V_C equalled the quantity of red cells administered, and this was evidence that bleeding had ceased. Large stools containing altered blood were passed from the fifth day onward. Radiography later demonstrated considerable deformity of the duodenal cap. The patient also suffered from advanced essential hypertension.

Comment.—This case history demonstrates an instance of an almost silent haemorrhage from a duodenal ulcer. On admission the patient's condition was good and his haemoglobin level normal. Yet a blood-volume estimation revealed a very considerable red-cell deficit. It was later possible to show by the same means first a further haemorrhage and then its arrest, all before there had been any overt signs of bleeding. When melaena occurred it was proved not to indicate renewed bleeding.

Case 53

A man aged 67 was admitted four days after a fainting spell. There was no vomiting or melaena. He had had abdominal pain for two and a half years. During a recent cholecystectomy for the relief of this pain a mass was discovered on the posterior surface of the stomach and interpreted as a probable penetrating gastric ulcer. Soon after admission the patient passed a large melaena and collapsed. His blood pressure was 90/55; haemoglobin, 8 g. per 100 ml. Blood-volume estimation showed V_B 73% of normal, V_P 98%, V_C 42% (Fig. 2), indicating a total deficit of about 6 pints (3.4 litres) of blood. A transfusion was started, with improvement of his condition. A second blood-volume estimation 36 hours later showed V_B 97%, V_P 105%, V_C 80%, and no significant difference between the quantity of blood administered and retained. It was concluded that bleeding had then been arrested.

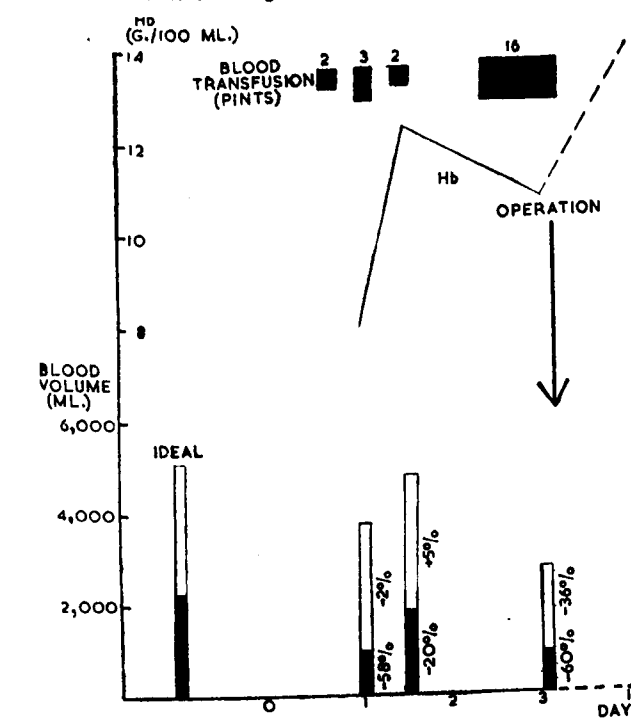


FIG. 2.—Case 53; blood-volume estimations.

Twenty-four hours later the patient collapsed again and passed another stool containing much blood. Blood-volume estimation showed V_B 53%, V_P 64%, V_C 40%. Emergency operation was decided upon, and was carried out after the transfusion of 6 pints (3.4 litres) of blood in three hours. At operation the splenic artery was found eroded by a large gastric ulcer adherent to the pancreas. The artery was tied and subtotal gastrectomy with splenectomy was performed, the ulcer being oversewn. The patient recovered. A total of 23 pints (13 litres) of blood had been given.

Comment.—The interest of this case lies in the use of blood-volume estimations to show a temporary arrest of bleeding and also the extent of both the primary and the recurrent haemorrhage. The blood volume was initially almost completely replaced by means of transfusion, and we believe that this enabled the patient to withstand the effects of the grave recurrent haemorrhage and to be prepared for a major emergency operation, which was successful.

Case 39

A man aged 47 was admitted with a history of severe upper abdominal pain for the past four days, black stools for two days, and vomiting of bright blood shortly before

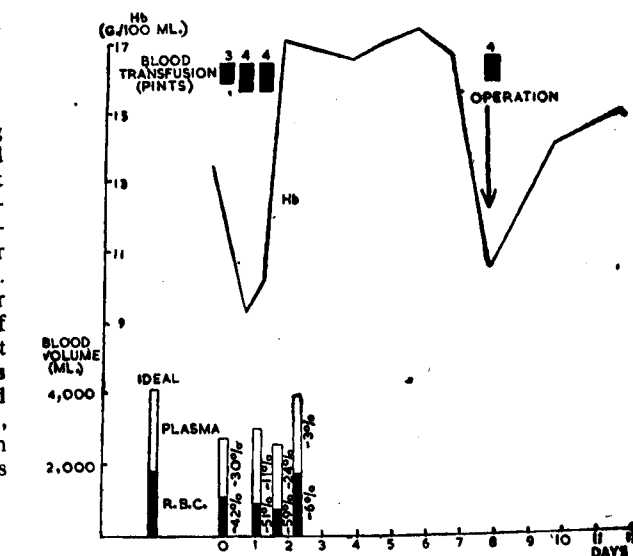


FIG. 3.—Case 39; blood-volume estimations.

arrival in the ward. He had had indigestion for seven to eight years, and asthma for the same period. He was shocked, sweating, and orthopnoeic. His blood pressure was 78/50. His chest was emphysematous, and there were marked movements of the accessory respiratory muscles. Blood-volume estimation showed V_B 65% of normal, V_P 70%, V_C 58% (Fig. 3), with an estimated deficit of 3½ pints (2 litres) of blood. Overnight he was given 3 pints (1.7 litres) of blood with clinical improvement, but a second blood-volume estimation, which showed V_B 71%, V_P 89%, V_C 49%, suggested a further loss of about 4 pints (2.3 litres) of blood when the transfused blood was taken into account. Further transfusions were given, his condition remaining poor mainly because of severe asthma. The next day there was great improvement and the blood volume was substantially normal. It was concluded that bleeding had now ceased, and the patient continued to make progress. Daily haemoglobin estimations showed a steady level, but six days later it was noted that it had dropped by 6 g. per 100 ml. in 24 hours. The patient looked a little pale, but his clinical condition was excellent and there had been no overt bleeding. An emergency operation was now carried out following the rapid transfusion of 4 pints (2.3 litres) of blood. Two large gastric ulcers were discovered—one with a large actively bleeding artery in its floor. After a partial gastrectomy the patient recovered. A total of 15 pints (8.5 litres) of blood had been given.

Comment.—This patient, in addition to bleeding from gastric ulcers, was suffering from severe chronic asthma and emphysema, and his condition during the first two days was extremely poor and probably precluded surgery. By means of repeated blood-volume estimations it was possible to show arrest of the bleeding within 48 hours of admission. Adequate blood transfusion restored his blood volume to normal and so improved his clinical condition that gastrectomy could be safely undertaken a week later, when haemorrhage recurred.

Discussion

The scheme of treatment here described was introduced in an effort to improve our results, which we had judged to be unsatisfactory. There were two fundamental considerations which led us to its adoption:

(1) It appeared improbable that we should be able to gauge the extent and duration of bleeding by the means usually employed—namely, an analysis of the clinical features plus estimations of the haemoglobin content of the peripheral blood. We therefore tested the possibility of using blood-volume estimations.

(2) We regarded prompt replacement of the lost blood as the single most important measure in conservative treatment, and also as an indispensable preliminary to surgery. The usually quoted indications for transfusion did not appear precise enough; it seemed logical, once the extent of the blood loss had been determined, to replace it as completely as possible and thereby to give the patient an optimum chance of healing his ulcer and of withstanding further bleeding, should that occur.

Below we examine the validity of these two considerations in the light of our findings.

The results of the initial blood-volume estimations are shown in Fig. 4, where the V_C on the abscissa is charted against the initial haemoglobin concentration. Only those

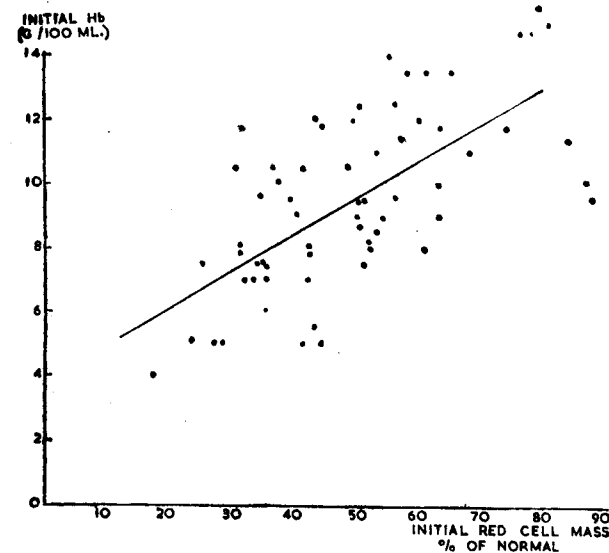


FIG. 4.—Results of initial blood-volume estimations.

patients who had not been previously transfused are included. It will be seen that, as might be expected, there is a general positive correlation between the two levels; however, more significantly, there are numerous striking exceptions in which a high initial haemoglobin concentration is paired with a low V_C . The findings reproduced in Fig. 4 are summarized in Table VII. In column 4 of this we also give the amount of blood calculated to be necessary to raise the initial V_C to normal in all patients in the various groups of severity. For instance, among the seven patients with initial haemoglobin concentrations of 4 to 5.9 g. per 100 ml. the initial V_C was 23 to 44% of normal, and 7 to 11 bottles of blood would have been required in individual cases to bring the V_C to the calculated normal. Again there is a general correlation between the initial haemoglobin level and the average amount of blood required. But the departures from the average become more and more marked as the initial haemo-

TABLE VII.—Correlation Between Initial Haemoglobin Level and Red-cell Mass (63 Admissions Previously Untreated)

Initial Hb (g. per 100 ml.)	No. of Patients in each Group	Initial red-cell Mass (% of Normal)	No. of Bottles of Blood required to raise Red-cell Mass to 100%
2-4	1	17	7-11
4-5.9	7	23-44	6-10
6-7.9	15	25-61	2-8
8-9.9	16	31-88	1-5.9
10-11.9	14	30-87	2.5-9.5
12+	10	43-81	

globin level rises. Thus among the 10 patients with levels exceeding 12 g. per 100 ml. the initial V_C varied from 43 to 81% of normal and the quantity of blood required to raise it to normal from 2.5 to 9.5 bottles.

We believe that these figures show vividly the difficulty of gauging the severity of bleeding from haemoglobin estimations. Whereas the lower levels generally give a good indication, the higher ones often do not: the reason is that the high haemoglobin levels tend to be found soon after an acute haemorrhage and before there has been time for haemodilution to occur. At that time there is no possibility of knowing the eventual haemoglobin level or how soon it will be reached. Consequently it is impossible to estimate the quantity of blood which it will be necessary to give.

The problem of establishing continuance or cessation of bleeding in some cases is too well known to need elaboration; yet on its solution depends the treatment to be given. By means of repeated blood-volume estimations we have often been able to come to a definite decision, and to distinguish between the two causes of a falling haemoglobin level—haemodilution and continued bleeding. In this connexion the limits of accuracy of our method must be taken into account: before it was possible to diagnose further loss of blood the difference in successive estimations must exceed the experimental error. We have taken deficits in excess of 200 ml. of red cells as positive evidence of bleeding. There have been only a few cases in which interpretation of the findings was doubtful.

The indications and purpose of blood transfusion in acute gastro-duodenal haemorrhage vary with the views of different authors writing on the subject: "the presence of sweating or restlessness; anaemic pallor, as shown in the palms of the hands and in the conjunctivae; or a haemoglobin level of 60% or under are our indications for immediate transfusion" (Ogilvie *et al.*, 1952); "the object [of transfusion] was to make the patient fit enough to stand a possible recurrence of haemorrhage or an emergency operation" (Ferguson and Wyman, 1951); "give [blood] at an estimated hydrated 3,000,000 [R.B.C. per c.mm.] and stop at 4,000,000" (Rosssett and Stephenson, 1952); "transfusion in every case" (Alsbrook *et al.*, 1952); "early transfusion with the aim of raising the red-cell count to 3,500,000 per c.mm." (Gott *et al.*, 1952). These few excerpts from recent papers show the wide divergence of opinion which still exists. In most of the older publications transfusion was the exception rather than the rule.

We regard transfusions as being of prophylactic as well as of immediate therapeutic value. When symptoms and signs of shock are present transfusion is obviously a matter of urgency; but people may lose large amounts of blood without accompanying shock, and the fallacy of judging the size of the loss from haemoglobin estimations has already been pointed out. Such patients may readily develop severe shock if further bleeding takes place, and their resuscitation at that stage may be a problem of the greatest difficulty, while emergency surgery may then be impossible. Moreover, a mild or moderate haemorrhage may progress to a severe one. Further, it is well recognized that the presence of anaemia impairs the action of organs like the heart, liver, and kidneys, and probably also the chances of healing at the ulcer site. It is likely that patients over 50 are progressively less tolerant of anaemia, and that this accounts for the rising mortality in the older age groups. Nearly 80% of

our patients were over 50. These arguments have persuaded us to transfuse every case of acute gastro-duodenal haemorrhage and to attempt to replace completely all the red cells which have been lost.

Many observers have in the past stated their fear lest transfusion may cause renewed bleeding once it has been arrested. Like other recent authors, we have found no evidence of this happening in our patients. It is probably of some importance to give the blood slowly so as to increase the blood volume and raise the blood pressure gradually, but this should not preclude rapid administration where there are signs of shock or the patient has to be prepared for emergency surgery. It is likely that prolonged hypotension contributes significantly to the fatal outcome in some cases, and slow transfusion may not be adequate to raise a dangerously low blood pressure to a safe level.

The transfusions given by us were generally large and often massive. The danger of overtransfusion has been widely discussed, and in our patients we have watched carefully for any signs which might have indicated it. It is gratifying that with one exception these have been completely absent. The exception was a man of 84 who died several days after arrest of bleeding from a chronic duodenal ulcer and after transfusion of 7 pints (4 litres) of whole blood. At necropsy moderate pulmonary oedema was present; possibly this was partly caused by the transfusion and might have been avoided if packed red cells had been given instead of whole blood. This patient was, however, extremely senile, and death did not occur during or soon after transfusion; nor were any signs of respiratory distress noted at any stage. For these reasons the significance of the transfusion causing death was doubtful. This fatality occurred early in our series, and since then we have often given packed red cells instead of whole blood, especially when the history of bleeding extended over several days and when the plasma volume was in the vicinity of normal. It should also be mentioned that severe haemorrhage in elderly patients sometimes causes signs of acute coronary insufficiency with or without congestive heart failure, and that in this series there were several instances—at least three with actual myocardial infarction. All of these were greatly benefited by adequate transfusions, and the signs of failure disappeared as a result.

Downie's (1952) suggestion that administration of large quantities of stored blood might interfere with wound-healing if surgery became necessary has not been borne out by our experience. It is improbable that the requirements of these patients could be met entirely from fresh as opposed to stored blood, however adequate the resources of the transfusion service.

It is not our purpose to discuss the still controversial question of the place of emergency operations in the treatment of acute gastro-duodenal haemorrhage. With the indications previously quoted such operations were performed in 14% of our patients. Mainly through lack of sufficiently vigorous resuscitation, it was impossible to make fit for surgery several other patients who might have profited from it and who died in its absence. We believe that 15 to 20% of the members of a series composed like ours will probably need to be operated on in the acute stage. Our mortality rate of 8.3% in 12 partial gastrectomies—several of which were performed on patients with serious complicating diseases—seems encouraging, and to bear out the statement made by Amendola (1952) that emergency subtotal gastrectomy if performed early may be done without significantly greater risk than the elective procedure. We are prepared to believe that our total mortality rate could have been lowered if we had followed the policy of Stewart *et al.* (1950), who perform emergency gastrectomy on all patients who have had a blood loss in excess of 40% of their V_C . This would have involved operations on nearly 80% of our patients, or about 75 emergency gastrectomies in one year. Emergency surgery on this scale would appear to demand very special facilities, which unfortunately do not at present exist at our hospital.

Comparison with a Control Series

We mentioned above the difficulty of comparing the results yielded by different methods of treatment of acute gastro-duodenal haemorrhage. Nevertheless some standard of comparison is necessary in order to assess the success of any therapeutic regime. For this reason we have analysed a second unselected series of 93 patients with acute gastro-duodenal haemorrhage who were treated at Christchurch Hospital during the eighteen months immediately preceding the introduction of the new regime.

This control series consisted of 68 men and 25 women, with an average age of 59 years; 71% were over 50 and 47% over 60 years. This series was therefore slightly younger than the experimental series. In 86 patients (92.5%) treatment was medical and in 7 (7.5%) by means of emergency surgery. The amount of blood given to these patients varied from 0 to 21 pints (11.9 litres), with an average of 2½ pints (1.4 litres). Half the patients received no transfusions. The distribution of diagnoses was very nearly the same in both series. The mortality rate among the controls was 17.2% (16 cases), with an average age of 64 years. One of the deaths followed emergency surgery.

The experimental and the control series appear comparable as regards age and sex distribution and diagnosis. It is difficult to compare the severity of bleeding as no blood-volume estimations were done on the controls. From a scrutiny of the clinical records it appears, however, that no gross difference existed, and such differences were not in any case likely to be important in what amounts to the two halves of one continuous list of 186 admissions. The two series differ, however, greatly in the quantity of blood which was given to individual patients. Whereas an average of 7.9 pints (4.5 litres) was transfused in the experimental series, the controls received only 2½ pints (1.4 litres), and 50%, among them three fatal cases, were not transfused at all. Five other fatal cases received fewer than 4 pints (2.3 litres) each. The percentage of emergency operations performed on the controls was about half that in the experimental series. We believe that these differences in treatment were probably largely responsible for the reduced mortality rate in the experimental series (7.5% as against 17.2%). This reduction of over 50% in the total mortality is statistically significant ($\chi^2=4.02$; $P<0.05>0.02$).

When comparing our results with those reported in the literature we can take into account only those series which resemble ours in age distribution and severity of bleeding. After a careful search we have found only one report which fulfils these conditions. Tanner (1951) includes in his "Period No. 5" a total of 74 patients 55% of whom were aged over 60 and 34% over 70; 18% of these had emergency operations. The total mortality was 13.5%. In Avery Jones's (1947) series of 411 cases the total mortality was 7.8%. The average age was, however, distinctly lower (33% over 60), although at the time of publication this appeared to be the oldest known series. It was interesting that among Avery Jones's patients 12% of those between 60 and 69 and 21% of those aged 70 and over died. The comparable figures for the present experimental series are 8.3% and 8.6% respectively. We may therefore conclude that our results compare favourably with those of other authors who were working with material similar to that encountered by us. It may also be tentatively concluded that increasing age among patients suffering from acute gastro-duodenal haemorrhage does not necessarily lead to a rapidly increasing mortality rate, provided that the criteria of severity and the methods of treatment are equally applied in all age groups. Of these methods the most important would appear to be early adequate blood transfusion together with emergency surgical operation in suitably chosen cases.

Summary

A method of treating patients with acute gastro-duodenal haemorrhage is described. Its most impor-

tant features are early complete replacement of the lost blood in all patients, and emergency surgical operation in selected cases.

Employment of this method led to a halving of the mortality rate at Christchurch Hospital.

The results in a series of 93 admissions compare favourably with those reported in the literature.

We acknowledge with gratitude the help of Mr. J. T. Murray, hospital biochemist, who standardized and supervised the blood-volume estimations and made many important contributions to our work; and of Drs. A. F. Burry and A. V. Kurta, who assisted throughout the course of these investigations. The following surgeons and physicians were in charge of the patients included in the experimental series: M. H. Aiken, L. A. Bennett, W. H. Bremner, P. W. Cotter, W. M. Cotter, J. K. Davidson, H. E. H. Deaham, D. McK. Dickson, M. K. Gray, J. F. Landroth, D. G. Radcliffe, and W. L. F. Utley. Without their help and co-operation this work could not have been undertaken.

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ARSENAMIDE TREATMENT OF FILARIASIS DUE TO *W. BANCROFTI* AND *A. PERSTANS*

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Arsenamide is a trivalent arsenical, and has the formula: $(\text{COOHCH}_2)_3\text{As} \begin{array}{c} \diagup \diagdown \\ \diagdown \diagup \end{array} \text{CO.NH}_2$. It was first employed in the treatment of *Wuchereria bancrofti* infections by Thetford *et al.* (1948), when they reported the treatment of six cases. Since then the compound has been used by various other workers as summarized in the discussion below. This paper describes the results obtained in the arsenamide treatment of 37 cases of filariasis in Gambia, British West Africa, and the action of suramin in two trypanosomiasis patients whose blood contained *bancrofti* microfilariae.

Methods.—Four groups of cases were investigated: (1) Two cases of yaws were treated under close observation in the ward as a preliminary test for tolerance. (2) Eleven cases of filariasis were treated in the ward under similar close observation. (3) Twenty-one cases were treated in a village; among these there was one fatality due to acute hepatic necrosis. (4) Five cases were treated in the ward with low doses and special

precautions against toxic effects. For the present work the drug was supplied in 5-ml. ampoules of 2.5% buffered solution.

Group 1. Two Cases of Yaws

Case 1.—A man aged 46 complained of pain all over the body. He weighed 60 kg. He was given one intravenous injection of 5 ml. arsenamide, followed the next day by one injection of 7.5 ml. and then 10 ml. daily for 10 days (2 mg./kg. arsenamide, 3 mg./kg., and then 4 mg./kg.). He vomited after the fifth and sixth injections; occasionally a trace of albumin was found in the urine. During treatment he lost 3 kg. in weight, which he subsequently regained. His previous symptoms cleared up.

Case 2.—A man aged 25 had ulcers on the legs and on an arm. He weighed 66 kg. He was given the same injections as in Case 1 (1.9 mg./kg. arsenamide, 2.8 mg./kg., and then 3.8 mg./kg.). He did not vomit at all, but lost 2 kg. in weight, which was regained; occasionally a faint trace of albumin was found in the urine. The ulcers cleared up rapidly.

These cases suggested that 10 ml. of the solution (approximately 4 mg./kg.) daily would be tolerated. The dose level which was adopted for the trial against *W. bancrofti* was half this—namely, 5 ml. (about 2 mg./kg.) daily for 12 days.

Group 2. Cases of Filariasis Treated in Hospital

Eleven cases were treated in the research ward at Fajara. On admission the patients were examined clinically for any contraindication to treatment; and then two or three days were allowed to elapse so that the microfilaria cycle could settle after the change in habits. At 10 p.m. on the evening before the injections of the drug were to begin, two lots of 20 c.mm. blood were taken from the finger-tip and spread on a slide for enumeration of microfilariae in the usual way. Throughout the trial all the slides were examined and the microfilariae enumerated by one of us (J. A. McF.). All subsequent measured quantities of blood in the cases treated in the ward were taken within a few minutes of 10 p.m. Conditions were further standardized by all the injections being given in most cases within a few minutes of 10 a.m. The urines from these cases were examined daily for albumin, each patient was weighed daily, and a watch was kept for any signs of toxicity of the drug, particularly vomiting.

Results

Table I records the microfilariae counts of the 11 patients treated in the ward. Four to five days after the first injection the total number of *bancrofti* microfilariae had decreased by 22%; at nine days it had decreased by 86%; and at 12 days the total reduction was 98%. Subsequently, only occasional microfilariae were found in the blood of these patients. Finally, when the last blood samples were taken (at six months) all the patients were free from microfilariae except for one who still had two microfilariae per 40 c.mm., and one who still had one microfilaria per 40 c.mm. (at three months).

In eight of the patients *perstans* microfilariae were also present initially; 70–200 days after treatment their total numbers were reduced by 70%, and in four the blood became negative.

Toxic Features

Vomiting.—Three patients vomited occasionally. One other patient (Case 10) vomited a quarter to three hours after each injection; she was receiving the largest dose per kg. of body weight, and treatment was stopped.

Headache (4 cases).—This is difficult to assess, as it is a common complaint among Africans.

Signs of Death of Adult Worms or Allergic Reactions.—Two patients had pyrexia. One other patient developed enlarged tender glands in the axilla and one developed a tender epididymis.

Loss of Weight (1 case).—This was the patient (Case 10) who vomited considerably.

TABLE I.—Treatment of 11 Cases of *Bancroftian Filariasis* (Group 2) in Hospital by Arsenamide, 125 mg. Daily

Case No.	Age	Weight (kg.)	No. of Injections	Bancrofti Microfilariae per 40 c.mm. (<i>M. perstans</i> in parentheses)							
				Start	Day 4-5	9	12	26	40-60	70-100	200-250
1	28	55	12	67 (115)	48 (67)	9 (58)	4 (62)	4 (53)	0 (23)	0 (39)	—
2	50	55	12	40 (124)	26 (125)	6 (125)	5 (98)	1 (167)	0 (46)	0 (50)	—
3	30	65	12	399 (4)	461 (8)	72 (7)	7 (11)	4 (4)	1 (4)	1 (4)	—
4	40	58	12	73 (63)	63 (70)	10 (73)	0 (30)	0 (39)	0 (37)	—	0 (10)
5	17	42	12	302 (7)	336 (10)	31 (4)	0 (5)	0 (0)	0 (0)	0 (1)	0 (9)
6	40	62	10	459 (41)	454 (14)	107 (10)	24 (6)	—	1 (11)	0 (6)	0 (0)
7	18	61	12	580 (19)	518	75	3	—	4 (3)	0 (1)	0 (0)
8	16	49	12	808	107 (0)	76 (2)	9 (0)	—	0 (0)	1	0
9	50	48	12	231 (1)	22	—	—	—	0	2 (0)	2 (0)
10	50	41	9	117	75	—	1	—	—	0	0
11	25	54	12	103	—	—	—	—	—	—	—

The days are recorded after the first injection. Cases 5 and 10 were females, the rest males.

Damage to Liver (1 case).—In one patient (Case 6) the temperature rose, finally reaching 104° F. (40° C.) after the tenth injection; two days later he vomited repeatedly; and the next day he developed jaundice, with bile and albumin in the urine. He made a satisfactory recovery, and one month later was much improved. It was difficult to assess the cause of the jaundice, as it was possible that there was either previous liver damage or a coincidental infective hepatitis, both of which are fairly common in Gambia. Since the patients previously treated had showed no other toxic features the trial was continued; and subsequently five more cases were treated satisfactorily in the ward.

Albuminuria did not occur in any of the patients, apart from the one case noted above.

Group 3. Cases Treated in a Village

Twenty-one cases of filariasis were selected for treatment in a village which had been previously surveyed. Heavy infections were chosen. Each patient was examined clinically. The projected dose schedule was a daily injection of 5 ml. for 12 days. Since the lowest weight of any patient selected was 50 kg. no patient received a dose greater than 2.5 mg. of arsenamide per kg. daily. After the group had received 10 injections, however, treatment was discontinued because one of the patients died (see below). The injections were given between 6 and 7.30 p.m., after the villagers had returned from their work in the fields. They were given intravenously and slowly with the patients lying down. Urine specimens were examined for albumin before treatment, and 3, 6, 9, and 15 days after the first injection. All patients were weighed before and after the course of injections. On the evening before the injections were begun, measured quantities of blood were taken as described above, between the hours of 10 and 11 p.m. Any information on

TABLE II.—Treatment of 21 Cases of *Bancroftian Filariasis* (Group 3) in a Village

Case No.	Age	Weight (kg.)	No. of Injections	Bancrofti Microfilariae per 40 c.mm. (<i>M. perstans</i> in parentheses)					
				Start	Weeks				
					2	5	12	17	30
14	35	65	10	228	0	1	0	0	0
16	38	56	10	52	0	0	0	0	0
17	40	70	10	65	0 (1)	0	0	0	0
18	37	67	10	185	0	0	0	0	0
19	37	67	10	185	0	0	0	0	0
20	21	31	10	132	0	0	0	0 (1)	0
21	60	62	10	284 (1)	0 (2)	—	—	—	—
22	45	68	10	35	0	0	0	0	0
23	50	31	10	116	0	0	0	0	0
24	35	61	10	166	0	0	0	0	0
25	35	50	10	141	0	0	0	0	0
26	25	64	10	21 (67)	0 (3)	0 (7)	0 (2)	0 (6)	0 (0)
27	28	65	10	263 (9)	1 (4)	1 (4)	0 (3)	0 (2)	0 (3)
31	50	67	10	59	0	0	0	0	0
32	35	52	10	652	0	0	0	0	0
28	36	58	40	1,337	0	0	0	0	0
29	55	30	9	64	0	0	0	0	0
30	18	63	9	132	0	0	0	0	0
13	36	61	8	230	0	0	0	0	0
15	35	50	5	834	0	0	0	0	0
12	55	53	3	19	Dead	—	—	—	—

The weeks are recorded after the first injection. Cases 13, 15, 19, 20, 23, 25, and 32 were females, the rest males. The dose was 125 mg. arsenamide per patient daily.

toxic features volunteered by the villagers was recorded, and direct questions were asked only after the course was completed.

Results

Table II records the microfilariae counts of these patients. In all the blood samples taken two weeks after the first injection, only a single *bancrofti* microfilaria was found. Sixteen of these patients had received 10 injections of arsenamide, but 2 had 9 injections, 1 had 8, and 1 had only 5. Seven months after treatment the blood of all the patients was free from *bancrofti* microfilariae. Two of these patients also contained appreciable numbers of *perstans* microfilariae in the blood; one patient became negative.

Toxic Features

Vomiting (7 cases, 33%).—One patient vomited after each injection, while the others vomited only occasionally.

Diarrhoea.—Four people complained of occasional loose stools during the course of injections. This feature is difficult to assess; it was not noted in the cases treated in the ward.

Dizziness occurred in two cases.

Generalized Pain.—One person complained of pains all over the body. This is a common complaint in Africans, and was probably associated with yaws.

Signs of Death of Adult Worms or Allergic Reactions.—One person developed a filarial abscess on the medial aspect of the thigh which subsequently broke down and discharged thick creamy pus; one developed a bilateral hydrocele; one had a transient enlargement of the scrotum; one had an enlargement of the epididymis. Several days after the injections had ceased one person developed weals on the skin associated with pruritus which cleared satisfactorily with mepyramine maleate.

Loss of Weight.—One person lost 3 kg. (associated with vomiting) and one lost 3.5 kg. (not associated with vomiting).

Signs of Liver Damage.—One man died from liver damage after receiving only three injections of the drug; this case is described in detail below. Another man developed jaundice four and a half weeks after the last injection; a fresh dry sterilized syringe and needle had been used for each injection, so this jaundice could not have been due to the passage of a virus.

Albuminuria did not occur in any case. The drug did not leak from a vein on any occasion.

The Fatal Case

The patient, a man aged 55, weighed 53 kg. He was given three daily injections of 5 ml. (2.4 mg./kg.). After the third injection he vomited and complained of vague retrosternal pains. The symptoms were mild and hardly seemed sufficient to contraindicate further treatment; but no more injections were given. Two days afterwards he felt well; but later that night developed pain in the back of the neck, staggered, and was unable to stand or sit up. This was reported next day, when the investigator returned to the village and found that the patient was comatose.

On admission to the ward he was still comatose but able to move his limbs. Reflexes were present and normal. Lumbar puncture showed: no increased pressure, Queckenstedt's test normal, Pandy's test positive, 60 lymphocytes per c.mm. No trypanosomes seen. Blood pressure, 230/120 mm. Hg. Urine contained no albumin or bile. There was some doubt whether or not he had a slight icteric tinge, but African observers considered that the colour of his conjunctivae was normal. Dimercaprol and penicillin were given, but he developed the signs of basal pneumonia and died four days later.

Post-mortem Findings.—The liver weighed 880 g. and was stained yellow, the kidneys 170 g. each, and the heart 284 g.; there was some atheroma of the heart and aorta. The urine contained no appreciable amounts of bile salts or pigments. **Histology.**—In the liver were numerous areas of recent focal damage from which most of the parenchymal cells had disappeared; there was considerable proliferation of fibroblasts, but no evidence of pre-existing cirrhosis. In the kidneys, the cells of the cortical nephrons showed the appearance of massive necrosis (part of this appearance could have been due to post-mortem autolysis); many of the medium and small arterioles showed medial fibrosis and irregular intimal thickening. It is concluded that death was due to widespread necrosis of the liver.

Group 4. Cases Treated with Low Doses in Hospital

The experience with the fourth group of patients indicated that although large doses of arsenamide were therapeutically effective they might also have dangerous toxic effects. Accordingly an investigation was made to discover whether a much lower dose, which would be small enough to be safe, might yet be sufficient to produce cure. For this purpose five patients were treated with strict precautions against toxic effects—namely, the dose was 0.3 mg./kg. daily (only one-eighth of that previously used), the patients were kept under careful supervision in hospital, and they were given 50 g. of dry skim-milk daily (protein-rich supplement) in addition to good hospital diet, so as to fortify the liver against the toxic effects of arsenic. No toxic effects were observed; and the therapeutic results are shown in Table III. Reduction of the microfilaria count was much

TABLE III.—Treatment of 5 Cases of Bancroftian Filariasis (Group 4) with 0.3 mg. Arsenamide per kg. Daily

Case No.	Age in Years	Weight (kg.)	No. of Injections	Bancrofti Microfilariae per 40 c.mm. (<i>M. perstans</i> in parentheses)			
				Start	Day 14	80	155
33	26	54	14	83	112	26	17
34	24	51	14	52	65	66	3
35	15	37	14	13	12	5	1
36	9	25	14	111	131	120	102
37	40	48	14	104 (58)	54 (21)	—	—

Case 35 was male, the rest females.

slower than it had been with large doses. Of the four patients who could be followed for five months the count was greatly reduced in two cases and probably the microfilariae will eventually disappear; in one case the count fell to a quarter of its original level, and in one case there has been no appreciable change. Thus the filaricidal effect of 0.3 mg./kg. daily, although considerable, is not completely satisfactory. From this small group of patients it might be deduced that 0.6 mg./kg. would be the minimum effective dose.

Treatment with Suramin

Suramin is very effective for the treatment of onchocerciasis, in which it kills the adult worm (Wanson, 1950). As regards its action on *W. bancrofti*, we have not found any reports which include an adequate follow-up of the patients for several months, to see whether the microfilariae disappeared. Such late disappearance would suggest that the adult worms had been killed or sterilized. Accordingly the

opportunity was taken of observing the action of suramin in two patients with trypanosomiasis whose blood also contained *bancrofti* microfilariae.

Case A.—A man aged 45, weight 60 kg., was given 1 g. of suramin intravenously on December 18, 21, and 23 and January 1 and 9 (total 5 g.). At 10 p.m. on December 18 his blood contained 7 microfilariae per 40 c.mm.; on March 7 (79 days after the first dose), 57; and on May 28, 62.

Case B.—A woman aged 35, weight 50 kg., received three intravenous doses of 1 g. of suramin between December 18 and January 4; and on January 9, 1 g. At 9.30 p.m. on January 9 her blood contained 23 microfilariae per 40 c.mm.; on March 7, 11; and on May 28, 10.

In these two cases there was no evidence that suramin was able to kill or sterilize the adult worms of *W. bancrofti*. Wanson (1950) states that it does not kill the adults of *W. bancrofti*, *Loa loa*, *Acanthocheilone perstans*, or *A. streptocerca*, although no evidence is given for this statement. In our laboratory at the National Institute for Medical Research, in London, suramin had no lethal action on *Litomosoides carinii*. Clearly the chemotherapeutic reactions of filarial worms differ according to the different species.

Discussion

The action of a chemotherapeutic drug must be considered from two aspects, that of the parasite and that of the host—that is, therapeutic action and toxicity.

Therapeutic Action

Arsenamide in high doses (2 mg./kg. daily) causes disappearance of the microfilariae of *W. bancrofti* from the blood within two weeks. Since this period is much less than their normal life span, their disappearance must be directly due to a lethal action of the drug. Such an action has been demonstrated *in vitro* in concentrations of approximately one in a million (Hawking, 1950). (The gradual disappearance of the microfilariae after small doses (0.3 mg./kg.) was presumably due to failure of replenishment after death of the adult worms.)

Since the disappearance of microfilariae caused by arsenamide is permanent (more than seven months, at least) there is evidence that death or permanent sterilization of the adult female worms has been brought about: on general grounds, and by analogy with the experimental findings with *Litomosoides* in cotton rats, it is almost certain that the adult worms have been killed. This effect is produced by doses of about 1 to 2.5 mg./kg., usually given daily for 15 days. Thus Thetford *et al.* (1948) and Otto *et al.* (1952, 1953) gave 1 mg./kg. for 15 days. In the present series the number of injections varied from 5 to 12 (9 patients received 12 injections, 17 received 10, 3 received 9, 1 received 8, and 1 received 5). Since the daily amount given was not calculated on a weight basis, the actual dose varied from 1.8 to 2.5 mg./kg., according to the weight of the patient. All the courses of injection were effective in removing microfilariae from the blood. With much smaller doses (0.3 mg./kg.) the antifilarial effect, although considerable, is not complete. Perhaps the minimum curative dose is about 0.6 mg./kg.

Arsenamide also causes considerable reduction in the number of *M. perstans* microfilariae in the blood. It is possible that arsenamide kills many of the adult worms of *A. perstans*, although a long period of observation might be necessary to obtain evidence of this, since these microfilariae may live over two and a half years in the absence of the adult worm (Gönnert, 1942). As this parasite is non-pathogenic, however, such action is of academic interest only.

Toxic Action

As described above, intensive treatment with arsenamide may produce various minor toxic effects—for instance, vomiting, dizziness, headache, loss of weight, and (possibly) diarrhoea. Localized inflammation or allergic reactions due to the death of adult worms may also develop during treatment. All these, however, are overshadowed by the

tendency of arsenamide to cause damage to the liver, which may proceed (as in the case described above) to fatal necrosis. In the present series of 35 patients treated with doses of 1.8 to 2.5 mg./kg. a day one patient developed pyrexia after the tenth dose, and jaundice appeared three days later; one man developed jaundice about four and a half weeks after the last of 10 injections (the relation of this to the treatment is not clear); and one man suffered fatal necrosis of the liver three days after receiving three doses of 2.4 mg./kg., total 7.2 mg./kg. Ampoules from this batch of material were returned to the manufacturers. Chemical examination revealed no alteration of composition, and biological assay showed no increase of toxicity. Therefore the toxic effect on the liver must be due to the unchanged compound, probably to the arsenic part of the molecule; there is no reason for believing that the benzamide part of the molecule has any significant toxic action.

There had been considerable previous experience with this compound, and many patients had tolerated much greater total dosages without ill effects. Thus Murgatroyd (1937) administered it (under the name K324) to eight patients with sleeping sickness in the Gambia in doses as high as 35 mg./kg.; doses greater than 2.5 mg. produced vomiting, abdominal pain, or diarrhoea, and in one case there was severe jaundice. Thetford *et al.* (1948) and Otto *et al.* (1952) treated 18 cases of filariasis with doses of 1 mg./kg. daily intravenously for 15 days and observed only minor toxic reactions. Similarly, Otto *et al.* (1953) treated a further 15 cases with the same dose schedule. The main toxic features observed were diarrhoea and nausea; one case had severe lymphadenitis. Hawking (1950) treated four patients with daily injections of 100 or 150 mg. for seven days—that is, 1.7 to 2.5 mg./kg. The larger doses were followed by vomiting and diarrhoea, but there was no suggestion of liver damage. In East Africa 36 cases have been treated with doses of 1 mg./kg. daily for about 14 days; one case of jaundice occurred (Filariasis Research Annual Report, 1952). We have also heard privately of two cases of non-fatal severe hepatitis with jaundice which occurred in the West Indies after treatment with arsenamide. No evidence of special toxic action on the liver of rabbits, dogs, or monkeys was seen by Otto and Maren (1950), or by Drudge (1952), who gave dogs 2.2 mg. of arsenamide per kg. intravenously daily for 15 days.

Apparently the death described above was another example of the tendency of arsenic compounds to cause extensive necrosis of the liver in a very small proportion of the cases treated with it. Such subjects must be predisposed to damage by accessory factors, but the nature of such factors and the causation of widespread liver necrosis in man are still largely unknown. The possible accessory factors include:

(a) *A Virus Infection, Latent or Incipient.*—Hepatitis, presumably infective, certainly occurs in Gambia, since several Europeans developed it recently. In the present investigation a clean sterile syringe and needle were used for each injection, so there was no possibility of passage of infection by this means; moreover, the incubation period was much too short for viral hepatitis to develop from the patients' injections.

(b) *Lack of Essential Nutrients, Especially Tocopherol and Cysteine.*—This food deficiency causes hepatic necrosis in rats (Himsworth, 1950). Many Africans are certainly malnourished, but there is no evidence that the state of nutrition of the present patient was worse than that of others in the same village who were treated. However, in any further trials with arsenical compounds it would be advisable to take the precaution of fortifying the liver against such toxic action by giving a protein-rich supplement—for example, 50 g. dried milk daily in addition to the usual food.

It is concluded that arsenamide, in daily doses of 1 mg. or more per kg. for 10 to 14 days, is an effective drug for the sterilization of bancroftian infection in patients, and that its use is not devoid of risk. Since filariasis is not a fatal disease, it is accordingly not justifiable to use arsenamide for general treatment. In any further investigation of this drug careful precautions should be taken to avoid damage

to the liver: the dose should be kept low, preferably below 0.6 mg./kg.; the patients should be treated in hospital under strict medical supervision; and the protein content of the patient's diet should be increased—for example, 50 g. of skim-milk powder daily in addition to a good general diet—in order to fortify the liver, the protein supplement being given for three days before, during, and three days after treatment.

Summary

Thirty-two cases of filariasis due to *W. bancrofti* were treated with arsenamide (*p*-bis-(carboxymethyl-mercapto)-arsino-benzamide). The dose was 125 mg. (1.8–2.5 mg./kg.) daily by intravenous injection, usually for 10–12 doses.

This treatment removed most of the microfilariae of *W. bancrofti* from the blood within two weeks after the first dose, and all but two of the patients were free from microfilariae six months later. It is concluded that the treatment killed or sterilized the adult worms; it also killed many of the microfilariae (and the rest disappeared in the absence of adult worms to replenish their numbers). The treatment also caused a significant reduction in the number of *A. perstans* microfilariae present, indicating a filaricidal action on this worm also.

The drug undoubtedly has a toxic effect upon the liver. In two cases the treatment was followed by jaundice, three days and four weeks respectively after the last injection; and one patient developed fatal necrosis of the liver after having received only three injections. Other minor toxic effects included vomiting, dizziness, headache, and loss of weight. A few patients showed localized inflammation or allergic reactions, apparently around worms which had been killed.

Five more patients were treated with much lower doses (0.3 mg./kg.) daily for 14 days under strict medical supervision, and with a protein-rich supplement to fortify the liver. No toxic effects were observed. Among the four patients who were followed for five months the microfilaria count was reduced almost to zero in two, it fell to a quarter in one, and it remained unchanged in one. Perhaps the minimum curative dose is about 0.6 mg./kg.

Arsenamide in doses of 1–2 mg./kg. daily is a potent filaricidal drug against *W. bancrofti*, but the danger of severe toxic action upon the liver is a contraindication to its use except under special conditions.

Two patients were treated with 4 g. and 5 g. respectively of suramin for trypanosomiasis. This treatment had no apparent effect during the next five months on the number of *bancrofti* microfilariae in their blood.

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A BIOLOGICAL APPROACH TO MEDICAL GEOGRAPHY*

BY

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Everyone knows that frost-bite occurs at the North Pole and heat exhaustion is more common in the Tropics. There is a tendency to look upon medical geography as merely an elaboration of this simple theme, but it is not merely a descriptive subject: it is a most fascinating part of human ecology or social biology—the vitally important sphere of human natural history to which geography is an essential background.

The method of approach followed in this paper was indicated by studies of the medical geography of scrub-typhus made in India and Burma during the war and followed up in Malaya (Audy, 1947; Audy and Harrison, 1951). An attempt is made to apply the ideas and methods of the biologist to the problem, with the support of facts gained by recent studies of animal parasites. The main object here is to stress the contribution that can be made by studying assemblages of parasites as a whole; it is therefore concerned almost entirely with diseases caused by organisms.

The term "parasite-pattern" is used here to describe the whole assemblage or array of parasites (including all pathogens) which are associated with a host population being discussed. By extension of this meaning, I also speak of the "pattern" of disease caused by some of the parasites. My object is to relate the parasite-patterns of various communities to those elements of human existence and behaviour which themselves reflect the geographical background in one way or another. To complete the associations I here call the relevant elements of existence and behaviour of a community its "social-pattern."

Patterns of Disease in Somaliland

I will first consider the semi-desert and thorn-scrub of Somaliland. There are great stretches of sparse grassy plains or thorny scrub with widely scattered water-holes. This sort of country must evoke a distinct type of response from the primitive community which first occupies it. It sets a low limit to the overall population, which is almost entirely pastoral and supported by drought-resisting beasts of burden and livestock, such as camels and mules, goats and fat-tailed sheep. The community soon learns that it cannot continue grazing its animals in one place. Not only is it forced to discover and use seasonal grazing areas, but this together with the scarcity of water will also encourage a natural tendency to form well-knit tribes, with tribal grazing areas and some sort of portable villages composed of tents or their equivalent, which can easily be folded up and taken elsewhere. Naturally, the use of such portable huts, which in Somaliland are small hemispherical cocoons of matting, encourages sleeping in a compact huddle. In such ways the geography of the place has a tremendous influence in guiding the pattern of existence of the community or what in this paper is referred to as the social pattern.

Linked to this social pattern in response to a particular and exacting environment is the pattern of disease. Relatively few rural diseases occur in Somaliland, but, as would be expected, there is a pattern related directly to the habitat. Malaria is highly seasonal and highly localized, spreading

*Based on a lecture on the geography of disease given at the University of Malaya in January, 1952.

outwards from small foci during the short rainy season. The general standard of nutrition is low and outbreaks of nutritional disorders occur in bad years. The incidence of desert sores following minor injuries, often leading to severe crippling, is high. In addition to the desert sores, there is a moderate incidence of mycetoma (Madura foot), the fungal spores being inoculated into the skin by the thorns and similar parts of plants on which the fungus concerned appears to grow naturally. Cataract and eye infections are associated with the flying sand and glaring sun, as well as with the flies which thrive in villages. The very free breeding of the flies is directly related to the dry climate. The presence of numbers of soft ticks carrying relapsing fever is also related to the climate. So also is the presence of many herds of animals, including packs of jackals and hyenas, among which rabies is permanently established.

Heavy and regular rainfall has a general cleansing effect which has not yet been properly assessed. Its absence in Somaliland may help to account for much of the spread of intestinal and respiratory infections as well as for the zymotic diseases. The intense dryness and frequent sandstorms encourage sore throats, which the Somalis have been led to treat heroically by snipping off the uvula, usually with slender home-made scalpel and a sharp hook made from an umbrella-rib. Respiratory infections, including tuberculosis, are encouraged by the huddling together in the tiny portable huts, while their effects are made worse by malnutrition.

Malaria in Ceylon

It would be desirable to draw parallel pictures of other places, but these pictures rapidly become much too complicated. I now turn to single diseases in particular places. Malaria offers countless illustrations of medical geography. Ceylon has a particularly fascinating malarial history, culminating in the mastery of epidemic malaria in recent years by a well-planned D.D.T. campaign. The vector mosquito is not very efficient and requires to be present in relatively large numbers for successful transmission. It breeds in clean open pools and puddles, especially in stream and river beds. When these biological requirements are imposed on the geography of the island a very distinctive and peculiar malarial pattern results.

A central mountain-mass breasts the prevailing monsoons and encourages heavy rainfall in the south-west quadrant of the island. Most of the island, however, has a very dry season. Malaria in this "dry zone" is perennial and there is a regular malaria season during the rains. By contrast, the lush, densely populated wet zone in the south-west offers little to the vector mosquito and it is curiously free of malaria in ordinary years. Occasionally during exceptionally dry years certain rivers almost dry up, forming extensive chains of pools in which the vector breeds by the million. This led to violent epidemics in the non-immune population—such as that in 1934-5, when over 80,000 deaths were attributed directly to malaria. Man has aggravated this situation by extensive deforestation in the hills, which results in less retention of water in the catchment areas and tends to produce more rapid changes of water-level in the rivers with more frequent pool-formation during dry spells.

The Typhus Fevers

The next example is the typhus fevers, caused by rickettsiae and transmitted by insects, ticks, and mites. These rickettsiae fall into three groups. The two most primitive groups, carried by ticks and mites, cause infections of small mammals and their parasites, and are only accidentally conveyed to man by a few of these parasites when he loiters in infested places. The vectors are restricted in their distribution in two ways: firstly, on a small scale to patches or "islands" such as a particular stretch of a valley or a single field; and, secondly, on a large scale to geographical regions where conditions are generally favourable for the development of the vectors. Ticks abound in drier tracts outside the rain-forest, so that tick-typhus is practically confined to such country. The mites which carry

scrub-typhus have their home in south-east Asia, where they now abound in the rat-infested scrub which follows deforestation. Scrub-typhus is confined by what are probably formidable barriers to the further spread to the vector—by tropical deserts, ice deserts, and great mountain ranges on the mainland, by extensive oceans which have almost stopped spread elsewhere, and by excessive dryness which has hindered all spread beyond a very small part of tropical Australia.

An interesting feature of both tick- and scrub-typhus is that the disease shows definite changes in character and severity from place to place. This can be correlated with serological types of the rickettsiae concerned. This is most pronounced with tick-typhus, in which local characters have given rise to a larger number of place-names for different forms.

The third group of rickettsiae is distinctive by having become adapted to life in the guts of insects. Flea-typhus, the more primitive member, is carried by various rat-parasites and transmitted to man by the same rat-fleas as carry plague. Because the domestic rat and its fleas are concerned, flea-typhus is urban and almost cosmopolitan in its distribution. In the most recently evolved member of this group, the flea-borne rickettsia has become adapted to the human body-louse. This at once results in three things: firstly, a restriction to cold climes or high altitudes, and cold seasons; secondly, a tendency to spread from man to man in the form of a swift epidemic; and, thirdly, an extension into regions where the rat-flea has no influence. Although both flea-typhus and epidemic or louse-typhus are essentially urban, the requirements of the vector have shifted the distribution of louse-typhus away from the equatorial belt and far into and beyond what Marston Bates calls the Intemperate Zones.

Parasite-patterns of Animals

These examples have been treated superficially. A deeper study confirms that there are important relations between the entire disease-pattern of a community and its geographical background. Recent investigations in Malaya have given some useful facts with which to approach this problem. Nearly 20,000 animals and their parasites, from forest, scrub, plantations, and towns, have been studied in Malaya since 1947 (Audy and Harrison, 1953). One of several objects of this study was to investigate the parasite-patterns of these animals and to attempt to use the parasites as "ecological labels" (Audy, 1947). The parasites concerned are all those viruses, bacteria, protozoa, fungi, worms, and arthropods which live on or in or at the expense of higher organisms such as the vertebrates, whether harmlessly or harmfully. At a rough estimate there are perhaps 50,000 known species of these parasites potentially able to parasitize the vertebrates, including man. Although very many parasites are available, the whole population of any host in any locality usually supports only a few dozen. The assemblage of these commoner parasites, of various kinds and in varying numbers, constitutes a pattern. I am concerned with the reasons why these patterns differ among themselves in different communities and why they involve but a fraction of the available parasites.

The tree-living squirrels in the Malayan rain-forest support some 30 species of parasitic mites which together make up a pattern broadly characteristic for these squirrels. Ground-rats which live in the same area have quite different parasite-patterns. There is a rat (*Rattus canus*), however, which has a pattern essentially like that of the tree-squirrels and unlike that of the ground-rats. A correct inference from this is that *R. canus* lives in the trees like the squirrels. The picture is completed by the ground-squirrels, whose parasite-pattern is like that of the ground-rats. There is reason to believe that other groups of parasites would give more or less similar contrasting patterns, and would suggest that the parasite-pattern is directly related to the environment, to the conditions of life, and to the way of living of the host.

This supposition is supported by the parasite-patterns found in certain rats. Three of these rats are very important commensals* of man in Malaya. They are either absent from or rare in the native forest but occur in great numbers in conditions created by man following deforestation and settlement. These three rats are the Malayan wood-rat (*Rattus rattus jalorensis*), the field-rat (*R. r. argentiventer*), and the house-rat (*R. r. diardii*). Although all the parasites of these rats are completely interchangeable, each kind of rat supports a distinct assemblage of parasites; each has a parasite-pattern of its own. This is entirely owing to the fact that these particular rats are living in different conditions—the wood-rat in oil-palms, the field-rat in grassland, and the house-rat in towns. In other words, the differences in parasite-patterns are related to small-scale geographical differences. A fourth rat, *R. r. jarak*, comes from an uninhabited island, Jarak, in the Malacca Straits. This rat is virtually an escaped house-rat, introduced long ago to the island and running wild on the forest floor. In the absence of predators and competition, the Jarak rat has overpopulated the island and is unusually heavily infested by worms and other parasites (Audy *et al.*, 1950). However, the parasite-pattern of the Jarak rat is found to be of the same type as that of a typical forest rat, *R. mulleri*.

Geographical Background and Disease-patterns in Man

The example given by these rodents establishes an important point of view. What has been illustrated by rats applies directly to man. Soil and vegetation are decided originally by climate and geology, and the vegetation and climate together decide the structure of the animal communities that will be found. If man appears on the scene, the climate, vegetation, and soil, and to a varying extent also the animal life, play a great part in deciding for him how his social pattern is to develop; how he will grow or hunt his food; how much clothing he will wear; what sort of shelter or house he will build; whether or not he will be subject to catastrophes such as floods or erosion or drought or the choking up of his clearings by intractable weeds; and whether or not he will wander about or remain to form either compact or scattered settlements. As his social pattern develops, his pattern of parasitism becomes established, and in these early stages the whole complex is related to the geographical background.

Man immediately starts altering the geographical background—for example, by widely destroying the vegetation. So his social-pattern and his pattern of diseases gradually change, but, even so, they are related to the environment. The change is largely one of emphasis.

The disease-patterns are, of course, greatly modified by various purely human social elements. Religious taboos relating to food affect the incidence of tapeworm; religious fasting may add to the effects of undernourishment. Schistosomiasis in the Yemen is almost confined to the ritual ablution pools in mosques (Kuntz, 1952). Social elements have a tremendous influence on the pattern of expression of all the treponematoses. The "civilization" of many communities, or the introduction to them of many outsiders with a higher standard of living, may unmask infections which have hitherto saturated the communities and kept up a general standard of immunity dating from childhood. Poliomyelitis and the viral encephalitides are important examples; in certain circumstances malaria is another example. Finally, a peculiarly human element is introduced by urbanization.

In due course there is always more or less urbanization of the community, and at the same time more frequent and wider traffic with other places. Many diseases, especially epidemic diseases, appear by introduction from areas which may be remote, to be added to a distinct urban pattern of disease. Traffic between urban centres leads to a dispersal

*Commensals include organisms and creatures that "parasitize" the nests of hosts or other parts of the environment which the hosts have characteristically modified, rather than the bodies of individual hosts.

of diseases and a tendency for urban patterns to be similar over very wide areas. Many urban epidemics tend to involve the rural population secondarily. Finally, there may be industrialization, which evokes its own elements in the disease-patterns. These industrial diseases are, like the rural diseases, often very closely related to the geographical background: an example is the pneumoconioses, which are related to the geology.

Conclusion

In developing our approach, the attention to assemblages rather than to individual parasites or diseases is very important—it would be described by the biologists as a synecological approach, concerned with the functional setting of organisms in relation to the other organisms, as opposed to an autecological approach, concerned with a single organism and its relations with the environment. Several workers have drawn attention to the pathology of social groups in their entirety. Ryle (1948) approached social pathology with the experience of a clinician: he rightly looked upon society as an organism which may be approached as such by the clinician as well as by the pathologist, the epidemiologist, and the psychiatrist.

Those who are sympathetic towards the philosophy of holism expounded by General Smuts (1936) will at once see that the synecological approach is also holistic. The lesson is that as soon as components have been sufficiently studied in isolation, they should then be set provisionally into their organized system or pattern and that the system should be studied as an organism in its entirety. Taking the analogous parasite-patterns of rodents, we have been enabled, from anomalies appearing in the patterns, to make inferences and plan investigations which would not otherwise have occurred to us. These anomalies could be detected only by studying the patterns as patterns and not by studying isolated parasites.

Summary

The whole assemblage of diseases from which a community suffers forms a pattern which can profitably be viewed as a whole. Those diseases caused by organisms form part of a general parasite-pattern. With examples of such patterns drawn from studies of rodents in Malaya, the parasite-patterns are considered to be decided largely by environment—that is, by the geographical background (which may be taken on a very small scale).

The distribution of diseases in different communities in different places is approached by a holistic study of the relationship borne by the entire disease-patterns of the communities to the social patterns and the geographical background. As a simple example, it is suggested that the disease-pattern in Somaliland is more or less evoked by the geography of the country. Further illustrations are drawn from malaria in Ceylon and from the typhus fevers.

In the earliest stages of man's occupation the link between geography and the disease-pattern appears to be very close. Man soon alters his environment, but the disease-patterns, while changing also, are still related broadly to the environment, and the change is largely one of emphasis. Urbanization, however, evokes urban patterns of disease, which tend to be widely distributed and uniform in nature, largely by interchange between urban environments, which are essentially the same everywhere. Industrialization evokes new elements, which again may become closely linked to the geographical background.

The methods and aims of medical geography, or medical ecology, are of interest even to those concerned with

preventive medicine in the most urbanized or stereotyped environments. A particular biological approach is here added to those which are already familiar.

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HAEMOLYTIC DISEASE OF THE NEWBORN CAUSED BY A NEW Rh ANTIBODY, ANTI-C^x

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Haemolytic disease of the newborn commonly occurs in Rh-negative women who are delivered of Rh-positive children, where the mother has Rh antibodies in her serum. Cases are also seen in which Rh-positive mothers are delivered of children affected with this disease: in the majority of such cases the maternal serum contains Rh antibodies anti-E or anti-c. Antibodies to other blood-group antigens—for example, anti-Kell—may also be present in the maternal serum and give rise to this condition. Occasionally, haemolytic disease of the newborn is caused by antibodies to much rarer blood-group antigens; these may belong to the Rh series—for example, C^w—but a number of cases have been described in which the cause has been a family antigen.

The family antigens appear to be of two kinds—those which have been observed because they have given rise to haemolytic disease of the newborn, and those which have been found within a family but are not associated with the occurrence of this disease. Those which have caused haemolytic disease of the newborn have been described by Levine *et al.* (1951) (Miltenberger); by Holman (1953) (Wright); and by Davidsohn *et al.* (1953) (Berrens). These blood groups are confined to the members of the family in which the case of haemolytic disease of the newborn occurred.

The present case occurred in a third pregnancy, and was originally thought to be due to a family antigen, but subsequent investigations suggested that it was, in fact, a rare Rh agglutinin at the C-c locus, C^x. It is proposed in this paper to describe the clinical history of the case and certain serological findings, and to discuss their importance. Detailed serological work and family studies will be described in full elsewhere.

Clinical History

The mother had had two previous pregnancies: in 1947 a full-term normal male child, who is alive and well; and in 1950 a 7-months pregnancy resulting in a stillbirth.

In 1953 a full-term male child, weighing 8 lb. 2 oz. (3.7 kg.), was delivered normally. The child was jaundiced at birth, but this had faded by the third day. He was artificially fed and gained weight normally. He vomited twice during the first week of life, and on the tenth day was noticeably

paler. When 15 days old he vomited and was noted to be very pale and slightly icteric, and showed reluctance to feed. There was no pyrexia or evidence of infection; stools and urine were normal; there was no external bleeding or any signs of internal bleeding. On the 18th day he was admitted to St. Mary's Hospital under the care of Dr. G. Komrower, when he was found on examination to be pale, slightly icteric, and lethargic.

The umbilicus was healthy, and examination of the abdomen revealed enlargement of the liver and spleen three fingerbreadths below the costal margin. No abnormality was detected in the heart and lungs; eyes, head, ears, mouth, and palate were normal. No abnormality was detected in the central nervous system. There were no congenital abnormalities. The blood count was: red cells, 1,200,000 per c.mm.; Hb, 22% (3.3 g.); C.I., 0.91; white cells, 9,000 per c.mm.; normoblasts, 80 per 100 white cells, some showing mitosis. The direct Coombs test on the child's cells was positive. The Wassermann reaction carried out on the mother's blood was negative, and antenatally her blood had been typed as Rh-positive.

A transfusion of 60 ml. of compatible whole citrated blood was given when the child was admitted, and the haemoglobin rose to 43%. On the 19th day after birth 90 ml. of group A Rh-positive compatible blood was transfused, and the haemoglobin increased to 59% (8.7 g.). On the 20th day the direct Coombs test was negative, and a further 100 ml. of blood was given; on the next day the haemoglobin was 72%, and the child was much improved. By the 26th day the haemoglobin had dropped to 63% (9.3 g.); 120 ml. of blood was given on the 27th day, and again five days later. The haemoglobin was now 93% (13.6 g.), and after this the child progressed well, and when 6 weeks old was in good health, both liver and spleen being impalpable.

Materials and Methods

Blood samples were obtained occasionally as citrated blood, but largely in the form of clotted blood; all random blood samples were obtained as clotted blood.

Methods.—Saline and albumin agglutination tests and titrations and the antiglobulin (Coombs) test were performed according to the techniques suggested by the Medical Research Council (1952). Papainization of the red cells was performed by the method described by Stratton (1953) slightly modified in order to increase the degree of papainization of the erythrocytes.

Serological Findings

Family Blood Groups

Below are shown the blood groups of the mother, the affected child, the father, and the healthy child of the family in which this case of haemolytic disease occurred:

Mother: A₁ R₁R₂ M.S.J P+ Le(a-b+) Lu(a+),K- Fy(a+) Cx- (CDe/cDE)
Affected child: A₁ R₁R₂ M.N.s P- Le(a-b-),Lu(a+),K- Fy(a-) Cx+ (CDe/cDE)
Father: A₁ R₁R₂ M.N.S P+ Le(a-b+) Lu(a+),K- Fy(a+) Cx+ (CDe/cDE)
1st child: A₁ R₁R₂ M.N.S P+ Le(a-b-) Lu(a+),K- Fy(a+) Cx- (CDe/cDE)

All members of the family were tested with the maternal serum. The father and the affected child were positive, but the first child and, of course, the mother were negative. The maternal serum was titrated by various techniques with the father's cells. The results are shown in Table I.

TABLE I.—Results of Titrating the Maternal Serum Against the Father's Cells

Cells	Method				
	Saline Agglutination		Albumin Agglutination	Coombs Test	Papainized Cells
	20° C.	37° C.	37° C.	37° C.	37° C.
Father	Neg.	1:1	1:4	1:8	1:64

Investigations on Maternal Serum

The maternal serum was tested with a series of Group O cells known to contain the antigens C,D,E, c,d,e, C^w, C^u, M,N,S,s,P, Le^a, Le^b, Lu, K, Fy^a, Fy^b, Jk^a, Jk^b, Levay positive cells (Callender and Race, 1946), and Wright positive cells (Holman, 1953). Negative results were obtained, using all techniques. The serum was also similarly tested with:

11 samples of blood of genotype rr	(cDe/cde)
23	R ₁ R ₂ (CDe/cDE)
6	R ₁ R ₂ (CDe/cDE)
7	R ₁ R ₂ (CDe/cDE)
2	R ₁ R ₂ (CDe/cDE)
3	R ₁ R ₂ (CDe/cDE)

and with blood samples of genotype R₁r (CDe/cde), R₂r (CDe/cde), R₁R₂ (C^wDe/cde), R₁R₂ (CDe/cde), R₁r (CD^ue/cde), R₂r (CD^ue/cde), and -D-/-D-.

The maternal serum was further tested with a total of 3,931 blood samples from healthy blood donors. These were selected only by reason of their ABO groups, and they comprised 1,727 Group A, 1,915 Group O, 210 Group B and 79 Group AB.

Initial testing of 267 samples was performed, using the tube albumin technique at 37° C., but the remainder of the tests were made with the papainized-cell technique in capillaries at 37° C. (Stratton, 1953). Control tests were used, each time employing a known positive reactor, and strong agglutination was obtained on each occasion. The Group O and A samples were tested with unabsorbed serum; the Group B and AB samples were tested with serum from which the anti-B agglutinins had been absorbed with papainized Group B Rh-positive cells. Four positive results were obtained when the 3,931 samples of blood were tested with the maternal serum; these were the 820th, 995th, 1,286th, and 1,779th samples tested. In each case the cell gave positive results with the maternal serum, using the albumin and Coombs techniques, as well as by the papainized-cell method. The four cell samples were tested further, with the following results:

Sample 1 (Lo): A₁ R₁R₂ M.S. P+ Le(a-b-) Lu(a-) K- Fy(a+) Cx+
" 2 (Oa): O R₁R₂ M.S. P+ Le(a-b+) Lu(a-) K- Fy(a-) Cx+
" 3 (Ho): O R₁R₂ M.N.S. P+ Le(a-b+) Lu(a-) K- Fy(a-) Cx+
" 4 (Pri): A₁ R₁R₂ M.S. P- Le(a-b-) Lu(a-) K- Fy(a-) Cx+

Each of these cell samples was shown to have a negative direct Coombs reaction. Tests on these samples and the father's cells with 20 fresh normal sera gave negative agglutination reactions in saline at 20° C. and 37° C.; polyagglutinability was thus excluded. The presence of the antigen A₁ was excluded in the case of the Group O propositi by testing them with the sera from Group O persons known to give strong reactions with A₁ cells. The father's cells and one of the propositi also gave a negative result when tested with anti-C^w, anti-Wright (Holman, 1953), anti-Miltenberger (Levine *et al.*, 1951), anti-Black, anti-Berrens (Davidsohn *et al.*, 1953), and anti-Graydon (Graydon, 1946) sera.

Investigation of Cell Samples Giving a Positive Result With the Maternal Serum

The father's cells and the four other cell samples described above were titrated with five anti-C typing sera in saline at 37° C. In Table II are shown the titres which were obtained by testing the sera with these cells, and with a number of cells containing the C agglutinin, the latter giving negative results with the maternal serum of this case. It will be observed that several of the sera give much lower titres than they do with the control cells of genotype R₁r (CDe/cde) or R₁R₂ (CDe/cDE), although with one anti-C serum the results of testing the control cells and those giving a positive result with the maternal serum do not differ from one another. The detailed scoring of the titration of one of these anti-C sera with cells which gave positive results with the maternal serum, and with two control cells which did not, are shown in Table III. It will be seen that not only in certain cases are the titres lower, but the individual reactions between the various dilutions of the serum and the cells are weaker. Hence the titrations

TABLE II.—Titration of Anti-C + Incomplete Anti-D Sera,
Using Various Cells

Cells	Rh Type	Result with Maternal Serum	Sera				
			Anti-C (i)	Anti-C (ii)	Anti-C (iii)	Anti-C (iv)	Anti-C (v)
Father	R ₁ r (CDe/cde)	+	1	1	16	2	4
Lo	R ₁ r (CDe/cde)	+	2	2	8	1	1
Pri	R ₁ r (CDe/cde)	+	2	2	16	4	2
Os	R ₁ r (CDe/cde)	+	4	2	16	4	4
Ho	R ₁ R ₂ (CDe/cDE)	+	4	2	16	2	2
A	R ₁ r (CDe/cde)	—	64	8	8	32	16
B	R ₁ R ₂ (CDe/cDE)	—	32	2	16	16	8
C	R ₁ R ₁ (CDe/CDE)	—	32	8	16	32	16
D	rr (cde/cde)	—	—	—	—	—	—
E	R ₁ R ₂ (CDe/cDE)	—	—	—	—	—	—

TABLE III.—Results of Titration of Anti-C (i) with Normal Cells and Cells Positive with Maternal Serum

Cells	Results with Maternal Serum								
		1:1	1:2	1:4	1:8	1:16	1:32	1:64	1:128
R ₁ r (CDe/cde)	—	+	+	+	+	+	+	+	+
R ₁ R ₂ (CDe/cDE)	—	+	+	+	+	+	+	+	+
Father	+	+	+	+	+	+	+	+	+
Lo	+	+	+	+	+	+	+	+	+
Pri	+	+	+	+	+	+	+	+	+
Os	+	+	+	+	+	+	+	+	+
Ho	+	+	+	+	+	+	+	+	+
Control	—	—	—	—	—	—	—	—	—

with the control cells and with cells containing this special C antigen, as shown in Table III, have a characteristic pattern of reaction. Titration of anti-c showed that the father's cells contained only a single dose of c-agglutinin.

Family Studies

The original family in which the case occurred has been studied as well as four other families. In these families it has been shown that the cells of members of the families which gave positive results with the maternal serum of the above case were all of type R₁r (CDe/cde), R₁R₂ (CDe/cDE), or R₁R₁ (CDe/CDE). Where the members of the families were of type R₁r or R₁R₂ the C antigen showed a similar modification to that described above, but in cases of type R₁R₁ the modification was masked by the presence of a normal C in the red cell. The family studies were consistent with this new Rh antigen (C^x) being inherited as a Mendelian dominant character.

Discussion

When this case first came to our notice it might not have received detailed consideration if it had not been for two factors. The first of these was the fact that the child was a severely affected case of haemolytic disease of the newborn and the diagnosis was not in doubt. The child's cells gave a strongly positive direct Coombs reaction when first examined on the 18th day. The second factor was that it is customary in this laboratory to make direct tests between the husband's cells and the maternal serum in those cases in which there is a suspicious history and in which no antibodies are found in the maternal serum by the usual methods of testing with standard cells. These include tests by saline and albumin agglutination techniques, by the Coombs technique, and using papainized red cells.

Following the direct tests between the husband's cells and the maternal serum the antibody was detected. It was obvious that this was an antibody of very unusual character, and consideration was given to the possibility of its reacting with a family antigen similar to others that had been described. This was thought to be especially likely when it was found that negative results were obtained with the usual test cells that were known to contain all blood-group antigens. The maternal antibody, nevertheless, was

found to give strong positive results with the father's cells when these were treated with papain; the titre in this latter case was 1:64, whereas using the anti-globulin technique it was only 1:8. Several blood-group antibodies are known to give strong positive results with papainized red cells positive for the homologous antigen when they are prepared by the method of Stratton (1953). Since this was an ABO compatible pregnancy, and since Lewis and P antibodies are not known to be associated with haemolytic disease of the newborn, our attention was directed to the possibility of some antibody of the Rh series, or possibly a variety of anti-S or, on the other hand, some unknown antibody, which was responsible for this strong positive result when papainized cells were employed.

Tests for the rare Rh antibody, anti-C^w, proved to be negative, and when the maternal serum was tested with cells of type C^uDe/cde—a very uncommon type of cell (kindly provided by Dr. R. R. Race)—the results were also negative.

Our attention was further directed to the Rh antigen by the fact that when the father's cells were first typed they were routinely typed as R₀r (cDe/cde), and it was only on further examination, using several anti-C typing sera, that they were found to be of type R₁r (CDe/cde). It is not proposed to go into details in this paper concerning the reactions between these cells and various anti-C sera except to say that the cells appeared to have a modified C antigen which gave characteristic reactions. Cells which gave positive results with the maternal serum all gave this characteristic pattern of reaction except where this was masked by the presence of a normal C antigen, as in the genotype CDe/C^xDe. Had it not been for this characteristic pattern of reaction with various anti-C typing sera and the strong reaction which the maternal serum gave with papainized red cells we might not have thought the antibody to be one associated with the Rh blood group, but might have assumed it was reacting with a family antigen. This latter contingency was quite likely, since when testing random cell samples the first positive result was not obtained until 820 blood samples had been tested. These results suggested, therefore, that we were identifying an allele of Rh at the C-c locus. Moreover, family studies suggested that this was inherited as a Mendelian dominant character. That the serum of the mother was recognizing an allelic form of C could no longer be doubted when it was found with the peculiar form of C and the antigen recognized by the maternal serum showed absolute linkage in the family studies.

This antigen, which we proposed to call "C^x," appears to be analogous to C^w and to be a modification or mutation of C at the C-c locus. Unlike C^u, D^u, and E^u, but like C^w, it has an antibody which reacts with it specifically and characteristically. Anti-C^w antibodies occur in persons of genotype R₁r (CDe/cde), and similarly in this case a mother of genotype R₁R₂ (CDe/cDE) was immunized by a father of genotype C^xDe/cde. It is interesting to note that the difference between C^x and C is sufficient to cause immunization of the mother and the child to be affected with haemolytic disease of the newborn. Although this is the first C^x-positive living child that the mother has borne it is not necessarily the first antigenic stimulus, however, since the second pregnancy resulted in a stillbirth.

This case brings to our attention certain important factors. The first is that when a suspicious case of haemolytic disease of the newborn is observed, or where the clinical history suggests this diagnosis—for example, when there is a history of children affected with jaundice or anaemia or hydrops, or of multiple stillbirths—if no atypical maternal antibodies are found by routine methods then a direct test should be made between the father's cells and the mother's serum. The other interesting feature of this case is that the immunization of the mother might so readily have been thought to be due to a family antigen if the testing of a large number of random cell samples had not been undertaken. From our experience in this case it would seem that very large numbers of random tests need to be made before

one can conclude that an antigen is a true family antigen. Particularly is this so if there is the possibility of immunization to an antigen of the Rh series.

This antigen is very infrequent in the English population; it might be that in other populations the frequency would be greater.

Summary

A description is given of a case of haemolytic disease of the newborn due to a new Rh antibody, anti-C^x.

Anti-C^x antibody gives very few positive results when tested with random blood samples from the English population. Out of 3,931 random samples tested, four positive results were obtained.

The C^x antigen is considered to be an allele of Rh at the C-c locus. Its inheritance has been demonstrated.

The desirability of including direct tests between the husband's cells and the maternal serum in suspected cases of haemolytic disease, as well as the need for extensive investigations on antibodies thought to be reacting with family blood groups, is discussed.

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PORPHYRIN EXCRETION IN A PATIENT WITH DELAYED LIGHT- SENSITIVE PORPHYRIA

BY

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Extensive knowledge based on modern techniques is becoming available on the porphyrin excretion in patients with acute porphyria (Nicholas and Rimington, 1953), but the present state of knowledge on the porphyrins of "delayed light-sensitive porphyria" is much less advanced. This term has been used (Prunty, 1952) in a suggested modified classification of porphyria to include cases referred to by previous authors as "porphyria cutanea tarda." The condition usually occurs in men of adult age and is not familial. Amongst the other changes, one important clinical manifestation is a bullous eruption of the skin produced by light and trauma. The present paper concerns additional data obtained from one of the rare cases of this condition seen by chance in this country.

Clinical Description of the Patient

A man aged 54, normally resident in South Africa, was admitted to St. Thomas's Hospital for investigation. He complained that he had had blisters on his hands for the past year. He has also suffered from arthralgia of the left hip, left knee, right ankle, and right shoulder for three years. There was no relevant family history. He had had blackwater fever in 1915, appendicectomy in 1924, and a cholecystectomy in 1945 for an illness accompanied by abdominal pain and jaundice. In 1952 radiological evidence of the presence of colonic diverticula had been obtained; at about this time he had had symptoms of diverticulitis. Apparently the porphyria became manifest a year before admission. Recurrent crops of blisters about 0.5 cm. in diameter occurred on the backs of his hands and fingers. They took four or five days to develop and then burst. They often contained a clear reddish fluid. This blistering did not appear to be related to exposure to sunlight. He had been treated with a sulphonamide for the diverticulitis without influencing the skin condition. There was some evidence that trauma to the skin favoured the production of these blisters. During the year his urine had been the colour of "dark ale," and had occasionally been dark during the last four years.

Physical examination showed a number of small circular scars on the backs of the hands and fingers, with a circular zone of slight pigmentation around some of them. When first seen three weeks before admission he had three blisters about 0.25 cm. in diameter on his hands, containing yellowish fluid, but these had disappeared by the time of his admission. There was a small rodent ulcer on the right cheek. The liver was enlarged one fingerbreadth below the costal margin, and scars from his two abdominal operations were present. There was a minor degree of osteoarthritis in the knees, hips, and right shoulder.

His urine on examination had a rosy hue and not the brownish-purple appearance of acute porphyria urine containing porphobilin. Porphobilinogen was never detected. On three consecutive days his pigment excretion measured:

Day	Urobilinogen mg./day	Total Porphyrin mg./day	Total Porphyrin Minus Uroporphyrin μg./day
1	9.4	2.4	37
2	6.6	4.8	80
3	3.0	4.4	126

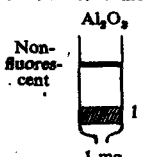
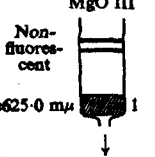
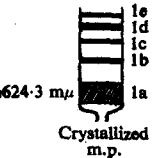
The serum and cerebrospinal fluid contained no porphyrin. Faecal urobilinogen excretion was 295 mg. a day—a normal quantity. Serum total protein was 7.7 g. per 100 ml. (albumin 4.3 g. and globulin 3.4 g.). Thymol turbidity was 4 units; serum bilirubin 0.7 mg. per 100 ml.; cholesterol 159 mg. per 100 ml., of which 65% was esterified. The prothrombin time was 12 seconds (normal). The blood urea was 21 mg. per 100 ml., and endogenous creatine clearance 83 ml. a minute. The haemoglobin was 16.2 g. per 100 ml., and the packed cell volume 48%.

Urine Porphyrin

The porphyrin was isolated as previously described (McSwiney, Nicholas, and Prunty, 1950). Chromatography of the esters on columns of Al₂O₃ (Sayory and Moore) and MgO Grade III (Nicholas, 1951) (see Diagram) to clean up the porphyrin gave a single main band (1), which on further chromatography on MgO Grade IV yielded a main band (1a) and traces of two other bands. This main fraction was crystallized, and the product had a melting-point at 211 to 213° C., and its α band at 624.3 mμ. Each band obtained from these three columns was submitted to paper chromatographic analysis, with the results shown in the Diagram. It should be noted that most of the urinary porphyrin was lost during preliminary purification.

There were two very faint bands, 1c and 1e, too little for any paper chromatography at all.

Fractionation of Urine Porphyrins

Urinary porphyrin. 24 mg. total from 6 litres of urine	Results of Paper Chromatographic Analyses		
	Method 1 (Nicholas and Rimington, 1949)	Method 2 (Falk and Benson, 1953)	Method 3 (Chu <i>et al.</i> , 1951)
Non-fluorescent  1 mg.	1. Mainly 8* + trace 6, 5, and 4		
Non-fluorescent  α 625.0 m μ	1. Mainly 8* + some 6 and 7 and trace 4	Like Uro III, but Rf slightly greater	Strong spot be- tween uro and copro I posi- tion
 α 624.3 m μ Crystallized m.p. 211-213° C.	1d. Mainly 4 and trace 3 1b. Mainly 6+7 and trace 8* 1a. Mainly 8* and some 6 and 7	Like Uro III, but Rf slightly greater	Strong spot be- tween uro and copro I posi- tion

* All octacarboxylic spots had relative fronts (Rf's) slightly greater than pure uroporphyrin; the appearance of these spots also was different, and the material cannot be regarded as typical uroporphyrin.
† The numerals indicate that porphyrins bearing this number -COOH groups in side-chains were found by the paper chromatographic method (cf. Nicholas and Rimington, 1949).

Faecal Porphyrin

This was extracted as ester (McSwiney *et al.*, 1950). Paper chromatography in the lutidine-water system (Nicholas and Rimington, 1949) of the crude ester extract showed only an atypical octacarboxylic porphyrin. Chromatography on MgO Grade III gave two small green-brown bands which were discarded and a main band (α band 620.8 m μ). This main fraction, derived from material which originally appeared to contain only octacarboxyl porphyrin, now on paper chromatography showed spots corresponding to a major component with either 6 or 7 carboxyl groups, together with traces of porphyrins with 3, 4, and 5 carboxyl groups. The evidence for degradation on the MgO column to substances with fewer -COOH groups was in this instance very clear. On paper chromatography after Chu, Green, and Chu (1951) there were three spots. The major component ran in the same position as pure coproporphyrin III, and there were two smaller amounts of material, one behaving like protoporphyrin, the other moving slightly slower than coproporphyrin III.

Discussion

The case described was fairly typical, but in relative remission at the time of the examination. The most interesting feature was the apparent absence of light sensitivity, although blisters which almost certainly had contained porphyrin had clearly been present at times. The large urobilinogen excretion in the urine and slight enlargement of the liver suggested hepatic abnormality, and it may be that the attack of jaundice and abdominal pain for which cholecystectomy had been performed was related to the porphyria. The other features worth mention were the rosy colour of the urine, due to increased porphyrin excretion, and the absence of porphobilinogen. Both of these are important points of differentiation from the findings in acute porphyria, in which condition the brown colour is largely due to porphobilin.

Of special interest were the porphyrins found in the urine and faeces. It has been most usual to find uroporphyrin in the urine (Waldenström, 1937), apparently the isomeric uroporphyrins I and III being present together (Macgregor,

Nicholas, and Rimington, 1952). These authors and Canivet and Rimington (1953) have together shown the presence of porphyrins with 2, 3, 4, 5, and 6 carboxyl groups, some of which have been more carefully characterized than others. Gray, Rimington, and Thomson (1948), however, in their case noted a remarkable instability of the ether-insoluble porphyrin fraction, and Macgregor *et al.* (1952) noted an unstable faecal porphyrin. This state of affairs was also apparent in the present case with regard to both urine and faecal porphyrins. The only stable porphyrin which could be isolated from the urine was a substance the ester of which had melting-point 211 to 213° C. and α band at 624.3 m μ . Apart from these two differences it also differed from uroporphyrin on paper chromatograms (see Diagram). It appears to be identical, by all three paper chromatographic methods employed, with the octacarboxylic porphyrin isolated by Canivet and Rimington (1953) for the first time from the pooled urine of five similar patients. Its similarity to the porphyrin of these authors extends to likeness of α band and melting-point. Neither of these porphyrins appears to be a known uroporphyrin.

The faeces of our patient yielded some protoporphyrin and coproporphyrin III, as might be expected. In addition there was plenty of evidence of decomposition of more highly carboxylated porphyrins, and it is impossible to state with any certainty what the original porphyrins were.

Summary

A brief case report of a man with "delayed light-sensitive porphyria" (porphyria cutanea tarda) is presented. The urine porphyrins were very unstable. The only porphyrin which could be isolated was an atypical octacarboxylic porphyrin like that of Canivet and Rimington (1953). The more highly carboxylated faecal porphyrins present underwent decomposition during processing, but an atypical octacarboxylic porphyrin was observed on paper chromatography of an early fraction.

We are greatly indebted to Professor C. Rimington for his interest.

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The 54th annual report of the Liverpool School of Tropical Medicine records that a number of cases of leprosy in persons resident in Britain came to light last year. "All these patients had been imported into this country actually with the disease, as a result of the repatriation of British subjects from India and of the immigration of individuals from various parts of the world following the disturbance in populations due to the recent war. Leprosy is a very chronic disease, which may not display itself for many years after its acquisition and which, when unsuspected, may escape diagnosis for years. In spite of the frequent importation of cases of the disease over many years, it does not spread here, and no case of infection acquired in this country has been seen at the school during the last 50 years. Thus the risk to our own population of the presence of such imported cases of the disease can be ignored as a public health problem. Contrary to popular belief, leprosy is the least infectious of all infectious diseases. The results of treatment with the recently introduced sulphone series of drugs have been most encouraging; but the treatment must be sustained under expert supervision over very long periods to prevent relapse."

THE NEUROMUSCULAR ACTIVITY
OF SUCCINYLMONOCHOLINE IODIDE
IN ANAESTHETIZED MAN

BY

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It was reported by Whittaker and Wijesundera (1952) that succinylcholine (succinylidicholine; SDC) is hydrolysed by horse serum cholinesterase in two steps: first one molecule of choline is split off at a fairly rapid rate from the SDC molecule and then the resulting succinylmonocholine (SMC) is hydrolysed more slowly to succinic acid and choline. Subsequently, Tsuji and Foldes (1953) and Lehmann and Silk (1953) have shown that SDC is hydrolysed in the same manner by human plasma and concentrated human plasma cholinesterase respectively. Foldes and Tsuji (1953) and Foldes (1953) also reported that SMC-I in doses of 2 to 2.5 mg. per kg. caused complete neuromuscular block for about 10 to 15 minutes and partial block for about 20 to 30 minutes in the sciatic-gastrocnemius preparations of cats anaesthetized with pentobarbitone. Lehmann and Silk (1953) found that in rabbits SMC (active cation) in doses of 2.5 mg. per kg. and 3.5 mg. per kg. produced paralysis without apnoea for 150 and 550 seconds respectively. Doses higher than 5 mg. per kg. regularly caused respiratory paralysis in rabbits. Ellis *et al.* (1953) investigated the neuromuscular effects of SMC-I in several species and found that on a molar basis its activity varied from 1/24 to 1/62 of that of SDC-Cl₂. They also found that in mice SMC-I is 1/14 as toxic as SDC-Cl₂.

Present Investigation

In view of the fact that SDC-Cl₂ is being used with increasing frequency for the production of muscular relaxation for operative procedures, and that occasionally as much as 12 mg./min. of SDC-Cl₂ has been administered to patients for prolonged periods (Bourne *et al.*, 1952), it seemed worth while to investigate the muscle-relaxant properties of SMC-I in humans to find out whether or not the SMC concentrations resulting from the hydrolysis of the relatively large quantities of SDC-Cl₂ administered to patients in the course of long operative procedures might have any effect on pre-neuromuscular conduction. Since it is not possible to predict from the effects of muscle relaxants observed in one species the effects to be expected on another species (Paton and Zaimis, 1950; Unna *et al.*, 1950) such information could be obtained only by observing the effect of the administration of SMC-I on human volunteers or on patients requiring muscular relaxation for various operative procedures. We chose the latter course.

At first SMC-I was administered in doses of 1 mg. per kg. to patients anaesthetized with combinations of thiopentone sodium/N₂O-O₂/pethidine according to a previously described technique (Foldes *et al.*, 1952). This dose of SMC-I had no discernible neuromuscular effect. Therefore the initial dose of SMC-I was gradually increased in subsequent patients to 5 to 7 mg. per kg. body weight. With this dosage, muscular relaxation developed in three to five minutes and lasted

from eight to twelve minutes. This relaxation could be maintained by the repeated intravenous injections of 3 to 4 mg. per kg. of SMC-I at intervals of eight to twelve minutes. The resulting muscular relaxation was adequate for the performance of various intra-abdominal operations. The respiratory depth of the patients was hardly affected at times when good abdominal relaxation was present. It has been the impression of the anaesthetists and surgeons that increased diaphragmatic activity compensated for the intercostal paralysis in the maintenance of adequate respiratory depth.

The jaw musculature and the vocal cords were not as well relaxed even after 7 mg. per kg. as after the use of some other neuromuscular blocking agents, but the patients could be intubated without major difficulty.

It was observed that SMC-I markedly potentiated the neuromuscular blocking activity of subsequent doses of SDC-Cl₂ at a time when the patients had apparently recovered from the effects of the former. In a 22-year-old woman weighing 75 kg. the injection of 20 mg. of SDC-Cl₂ produced in 40 seconds slight respiratory depression for 225 seconds. Seven minutes after the intravenous administration of 350 mg. of SMC-I, an identical 20-mg. dose of SDC-Cl₂ produced in 25 seconds respiratory arrest for 270 seconds, and some respiratory depression for an additional 210 seconds.

Owing to the limited supply of SMC-I at our disposal, it was used for the production of muscular relaxation in only 10 patients. The operative procedures included 3 appendectomies, 4 cholecystectomies, 2 hysterectomies, and 1 exploratory laparotomy. Satisfactory abdominal relaxation was obtained in all patients without the development of respiratory arrest or more than a moderate degree of respiratory depression. The pulse and blood pressure of the patients remained remarkably constant. The muscular relaxation had a tendency to wear off abruptly unless a fractional dose was administered at the first sign of its fading effect. In general, the relaxation obtained with SMC-I resembled that obtained with decamethonium.

No prolonged post-operative respiratory depression was observed in any patient in this small series. Respirations became normal within 8 to 12 minutes after the administration of the last fractional dose in all instances.

Muscular twitches occasionally seen with decamethonium and more frequently with SDC-Cl₂ were not observed with the use of SMC-I.

The urinary excretion of SMC-I was followed in two patients. Urine was collected during and 15 minutes after the administration of a relaxant dose of SMC-I. The patients excreted 11.8% and 14.5% of the administered SMC-I during this period. In contrast to this less than an average of 3% of the administered SDC-Cl₂ could be recovered from patients under identical circumstances (Foldes and Norton, to be published).

Discussion

The neuromuscular effect of SMC-I represents a transition between that of decamethonium and SDC-Cl₂. The onset and duration of the neuromuscular blockade with SMC-I resembles that seen with the use of decamethonium. On the other hand, its elimination from the body is similar to that of SDC-Cl₂. Whereas decamethonium can be recovered almost quantitatively unchanged in the urine after its administration (Paton and Zaimis, 1952), most of the SMC-I is hydrolysed in the body to succinic acid and choline. However, since the hydrolysis of SMC-I by the plasma cholinesterase is much slower than that of SDC-Cl₂, urinary excretion plays a greater part in the elimination of SMC-I than is the case with SDC-Cl₂.

The findings presented indicate that in the average patient 0.3 to 0.4 mg./kg./min. of SMC-I gave adequate muscular relaxation without the development of undue respiratory depression. It has been our experience that the administration of 0.05 to 0.15 mg./kg./min. of SDC-Cl₂ was necessary in a large group of patients for the production of good

muscular relaxation. Since the ratio of the molecular weights of SMC-I and SDC-Cl₂ is about 0.8, the hydrolysis of 0.05 to 0.15 mg. of SDC-Cl₂ will produce the equivalent of 0.04 to 0.12 mg. of SMC-I. This dose of SMC-I has little or no effect on neuromuscular conduction in patients whose ability to hydrolyse and excrete SMC-I is unimpaired. However, in patients with low cholinesterase activity, especially if their kidney function is also diminished, the administration of relatively large doses of SDC-Cl₂ for prolonged periods might lead to the accumulation of SMC in sufficiently high concentrations to potentiate the neuromuscular action of the unhydrolysed SDC-Cl₂. Such a set of circumstances can arise if muscular relaxation is maintained in patients with low plasma cholinesterase activity with SDC-Cl₂ by the "apnoeic technique."

With this technique the administration of SDC-Cl₂ is carried to a point where the patient's voluntary respiratory movements are completely abolished and gas exchange is maintained by manual compression of the breathing-bag of the anaesthesia machine. Since the administration of SDC-Cl₂ in amounts many times higher than the apnoeic dose has no discernible effect on blood pressure, pulse rate, or any other physiological process, there is no sign that would indicate whether just enough SDC-Cl₂ is administered for production of apnoea or whether large doses of SDC-Cl₂ accumulate in the organism. If the latter of the two possibilities occurs in patients with low plasma cholinesterase activity and with decreased urinary excretion, prolonged post-operative respiratory depression will result. Since adequate muscular relaxation can be obtained with SDC by utilizing the difference in sensitivity to this agent between the diaphragm and intercostals, there seldom is a need for the application of the apnoeic technique.

It is unlikely that SMC plays a similar part in the prolonged respiratory depression occasionally observed after the administration of a single large dose of SDC-Cl₂ (Hewer, 1952; Love, 1952; Harper, 1952; and others). The hydrolysis of as large a dose as 100 mg. of SDC-Cl₂ will yield only about the equivalent of 80 mg. of SMC-I, and this dose is not likely to have any neuromuscular blocking effect. The prolonged apnoea under such circumstances is caused either by an exceptionally low plasma cholinesterase activity of the patient or by the combination of apnoea due to too energetic controlled respiration, and reflex breath-holding arising from the stimulating effect of the endotracheal tube on the larynx and trachea in the patient in whom the level of general anaesthesia was allowed to become too light.

Owing to the relatively large doses in which SMC-I has to be administered, the less satisfactory relaxation obtained, and the lack of rapid and easy controllability of its neuromuscular effect, SMC-I does not seem to offer any advantages in comparison with other available muscle relaxants, especially SDC-Cl₂.

Summary

In man SMC-I in doses of 5-7 mg. per kg. produced in three to five minutes muscular relaxation of 8 to 12 minutes' duration.

Muscular relaxation could be maintained by repeated intravenous injections of SMC-I in doses of 3-5 mg. per kg. 8 to 12 minutes apart.

These doses of SMC-I caused little respiratory depression.

The administration of SMC-I markedly potentiated the neuromuscular action of subsequent doses of SDC-Cl₂.

The possible role of the accumulation of SMC in the development of prolonged apnoea after the use of SDC-Cl₂ is discussed.

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BACTERIAL ENDOCARDITIS DUE TO CHROMOBACTERIUM PRODIGIOSUM

REPORT OF A CASE

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Chromobacterium prodigiosum (*Serratia marcescens*) is usually regarded as non-pathogenic for man, and Wilson and Miles (1946) were unable to quote any indubitable report to the contrary. However, Patterson, Banister, and Knight (1952) reported a case of septicaemia due to this organism, and the literature concerning human infection by members of the *Chromobacterium* group. They quoted 21 records of infection by *Chr. prodigiosum*, including their own, only one of which was a case of endocarditis (Wheat, Zuckerman, and Rantz, 1951).

Case Report

An African man aged 38 was admitted to the Gold Coast Hospital, Accra, on April 30, 1953, after a month's sickness; this began with fever and headaches, accompanied by rigors. After taking mepacrine and "phenic" tablets he was able to continue his work as an omnibus inspector. About a week before admission he had had further headaches with fever and pain in the neck. He attended the out-patient department on April 25, when a blood film proved negative for malarial parasites, but the urine was found to contain albumin. He was given an injection of sulphalocine, 5 ml., and another of quinine, 10 gr. (0.65 g.), both intramuscularly, as well as 2 ml. of mersalyl. He was subsequently referred to A. J. H. and was admitted for investigation.

On admission he complained of feverishness and pain in the umbilical region. His temperature was 101° F. (38.3° C.). A blood film was again negative for malarial parasites and there was a heavy cloud of albumin in the urine. He was systematically examined on May 1. It was noticed that he had lost weight. He was obviously a sick man, but in no way distressed. No rash was found on his skin and his temperature was 104.2° F. (40.1° C.). His bowels had been open daily and the stools were semi-solid. His tongue was moist and a little furred. Except for the complaint of pain in the umbilical region no abnormality was found in the alimentary system. The chest was clear and the sinuses appeared to be normal; the respiration rate was 30 a minute. The cardiovascular system showed nothing abnormal beyond a pulse of 120 a minute. The patient complained of a frontal headache, which was worse when the fever was high in the evenings, but a clinical examination

of the central nervous system proved negative. There was no lymphadenitis. The urine was passed freely without pain.

A white blood cell count showed a total of 11,200 leucocytes (70% polymorphs, 25% lymphocytes, 2% eosinophils, 2% monocytes, 1% basophils). Coliform bacteria were cultured from the urine, and were at the time reported as *Bact. coli*, a finding which was later doubted. Serological reactions with *Salmonella* antigens were negative. A Weil-Felix test gave the following result: *Proteus* OX₂ 1/160, X_k 1/40 X₁₉ 1/80. Two successive stool cultures on May 6 and 8 proved negative. Blood culture on May 2 was discarded as sterile 21 days later.

On May 6 treatment was begun with alkalis and "sulphatriad" in full doses. After three days, since there was no response, he was given chloramphenicol, 2 g., as a loading dose and 1 g. every four hours thereafter; after four days, when he had received 25 g., the available supply of chloramphenicol was exhausted, and although there had been a favourable response this was not maintained when the drug was stopped. By this time blood had appeared in the urine. The patient's condition had deteriorated, and he was very weak; he was thought to be too ill for cystoscopy or pyelography, both of which had been considered. Streptomycin was given from May 16 in doses of 1 g. daily, but with no beneficial effect.

On May 20 a further blood culture was taken, by which date the only positive finding had been the growth of coliform bacteria from the urine. On May 11 a re-examination revealed a full appearance of the abdomen; because of general resistance palpation was difficult, but the liver, spleen, and kidneys could not be felt. Rectal examination revealed, generally, tenderness only. The lungs remained free of signs, but an apical systolic cardiac murmur. The significance of the latter finding was overruled by the continued to show a heavy albuminuria with white blood cells. On May 25 a third blood culture was taken which five days later yielded a pure growth of *Chr. prodigiosum*, which was reported as being probably a contaminant. The patient's condition continued to deteriorate, and he died on June 2 without a diagnosis having been made.

Post-mortem Examination

A post-mortem examination was made 19 hours after death by Dr. F. C. Harris. The main finding was a friable vegetation, buff in colour, attached to the free margin of the posterior cusp of the mitral valve; there was some erosion of the cusp. A haemorrhagic nodule, 0.5 cm. in diameter, was found on section of the liver. There were five recent infarcts in the spleen, which was moderately enlarged, and a large white infarct involving the whole of the upper pole of the right kidney.

On the following day the blood cultured on May 20 was found to have produced a belated pure growth of *Chr. prodigiosum*, after 15 days' incubation in a combined liquid and solid medium put up in the same bottle by a technique modified by Hughes (1953) from that described by Castañeda (1947); the important feature of this technique is that it prevents contamination of the culture between the inoculation of the medium and the isolation of the organism, and it is thus quite certain that the growth of *Chr. prodigiosum* in a second blood culture could not have been due to laboratory contamination. The cut surface of the mitral vegetation removed at necropsy was rubbed on the surface of a blood-agar plate, and this also yielded a pure culture of *Chr. prodigiosum*. Thus *Chr. prodigiosum* was isolated from two ante-mortem blood cultures taken on different dates, and also from the mitral vegetation after death.

Bacteriology

The culture of *Chr. prodigiosum* isolated from this case had the following characteristics: Motile Gram-negative coccus-bacillus without a capsule. Good growth on nutrient agar, sheep's blood agar, MacConkey agar, and "bacto" SS agar. Growth at room temperature (about 25° C.) was

slightly better than at 37° C. No haemolysis on blood agar. On nutrient agar the colonies after 24 hours were from 0.5 to 1 mm. in diameter, smooth, shiny, and low convex with entire edge, and bright red in colour. After 48 hours the confluent growth was orange-red, and the single colonies were between 1 and 2 mm. in diameter, umbonate, surface becoming granular, with pink centre and orange-red periphery. After five days the colonies were from 3 to 4 mm. in diameter with a rough appearance.

The pigment was very slightly soluble in water, moderately soluble in absolute alcohol, and completely removed from a peptone water culture by chloroform. In peptone water and in gelatin a red surface ring was formed, but this did not occur in broth or in glucose phosphate medium. The colonies on MacConkey agar were bright red; this appearance, coupled with a red colour in lactose-peptone water simulating that of acidified Andrade's indicator, probably resulted in an erroneous report of *Bact. coli* in the patient's urine, although if *Chr. prodigiosum* had been recognized at that time it is improbable that the finding would have been regarded as significant.

In peptone water "sugar" media, acid and a moderate amount of gas were formed from dextrose, saccharose, maltose, mannitol, and salicin; there was no fermentation of lactose, dulcitol, arabinose, rhamnose, xylose, and inositol. There was no growth in Koser's citrate. Indole was not formed. H₂S was formed on liver infusion agar, but not in peptone water, when tested for by a lead acetate strip in the top of the tube. Catalase was not formed. The methyl red test was negative. In a five-day glucose phosphate culture the Voges-Proskauer test was negative by O'Meara's method but positive by Barritt's modification of the test. Coagulated serum and gelatin were both liquefied.

In vitro sensitivity tests showed the strain to be completely resistant to penicillin and aureomycin, but sensitive to chloramphenicol and streptomycin. White mice died within 12 hours when injected intraperitoneally with 0.5 ml. of a 24-hour broth culture; these mice showed pleural exudates.

The specific identity of the organism described by us as *Chr. prodigiosum* may be open to doubt. Breed, Murray, and Hitchens (1948) used the formation of gas in carbohydrate media as a criterion for the separation of species within the genus *Serratia*, and on this ground our organism could not be *Chr. prodigiosum*. Wilson and Miles (1946), however, stated that some strains of *Chr. prodigiosum* do form gas. Again, Breed *et al.* used acetyl-methyl-carbinol formation as a means of separating species, but without specifying what method they used for testing for this metabolite; the results with our strain were equivocal by this standard also, and it was not possible to classify it according to the criteria of *Bergey's Manual*. Without aspiring to taxonomic authority we have therefore thought fit to call our organism *Chr. prodigiosum*, a course in which we are fortified by the treatment of this group of organisms by Wilson and Miles.

It is of interest to note that both in our own case and in that described by Patterson *et al.* (1952) there was some clinical response to chloramphenicol, although in both cases the treatment with this drug was interrupted by extraneous circumstances. Patterson *et al.* also found that their strain was highly sensitive to neomycin, and one of these two antibiotics would appear to be the treatment of choice in cases of infection by this organism.

Summary

A case of acute endocarditis is described in which *Chr. prodigiosum* was isolated twice from the blood during life and again from an endocardial vegetation after death. The strain was sensitive *in vitro* to streptomycin and chloramphenicol, and slight improvement followed treatment with the latter drug. The characteristics of the organism are described. Chloramphenicol, or perhaps neomycin, may be the

treatment of choice should further cases of this rare infection by a common saprophyte be brought to light.

Our thanks are due to Dr. F. C. Harris for permission to make use of his necropsy report, and to Dr. L. G. Eddey, Chief Medical Officer, for permission to publish this paper.

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Medical Memorandum

Congenital Tuberculosis after Pleural Effusion in the Mother

A woman aged 23 was admitted to a general hospital with a left pleural effusion on December 1, 1949, when five months pregnant. There was no family history of tuberculosis or known contact. She did not remember having had any illness until July, 1949, when her husband was at home on leave and she had a cold and lost weight. In the early weeks of her pregnancy she gained weight, but began to get pains in the left chest in October. The findings on aspiration of approximately 500 ml. of straw-coloured fluid were: red cells, moderate numbers; lymphocytes, fairly numerous; polymorphs, nil. The blood picture was: haemoglobin, 64%; leucocytes, 8,000 (polymorphs 66%, lymphocytes 30%, monocytes 3%, eosinophils 1%). There was nothing abnormal on urinary examination. On January 7, 1950, after the illness had run a typical course, she was discharged home, apyrexial, to await admission to a sanatorium.

On February 7, when admitted to a chest hospital, she was symptomless. The physical signs were those of a small pleural effusion, the anaemia persisted, and the sedimentation rate was 18 mm. (Westergren). Radiologically an opacity remained in the left lower zone. Treatment was by rest and haematinics whilst the pregnancy proceeded uneventfully to full term.

On April 17 she complained of generalized aches and pains and there was an evening pyrexia to 99.2° F. (37.3° C.). Next day the symptoms were improved, and on the 19th she went into labour and was delivered of a normal female child the same day, after transfer to the maternity hospital. The child was isolated. The placenta was examined and recorded as "complete." During the puerperium she had an evening pyrexia of 101° F. (38.3° C.) and was readmitted to the chest hospital on April 25, when treatment was begun with streptomycin, 1 g. daily, and 18 g. of para-aminosalicylic acid. On April 27 the baby died, aged 8 days.

FINDINGS AT NECROPSY ON THE BABY

The body was well nourished and of normal colour. About 5 ml. of clear yellow fluid was present in both pleural cavities, and a little less than 5 ml. in the peritoneal cavity. Both lungs showed severe congestion and oedema. Weight, right 62 g., left 58 g. Dispersed throughout the lung substance of both sides and beneath the pleural surfaces were miliary tubercles consisting of grey-yellow areas 2-3 mm. in diameter and some the size of a small pinhead. The tubercles were either one size or the other, there being none of intermediate size.

The heart showed no congenital or acquired abnormality. The peritoneal cavity contained about 10 ml. of free fluid. There was matting together of the structures around the spleen and yellowish-white exudates were present in small amount. The spleen weighed 35 g. and measured 7.5 by 4

by 3 cm. It was engorged and contained tubercles similar in size to those in the lungs. A direct smear from the cut surface revealed many tubercle bacilli. The liver weighed 260 g., and contained tubercles throughout, and beneath its peritoneal surface. The most interesting feature of this organ was the presence of a mass of glands in the hilum. These measured 3 by 2.5 by 2 cm. The cut surface was yellow and caseous-looking. The kidneys, bladder, uterus, and alimentary tract appeared to be normal. The brain was not congested and seemed normal in every respect, no evidence of tubercle being present.

PROGRESS OF MOTHER

The woman continued to have an evening pyrexia until June 15, by which date 50 g. of streptomycin had been given. Apart from the pyrexia the post-puerperal period continued normally, but the reappearance of menstruation was delayed until August 12. No abnormal physical signs were present in the chest, and radiography demonstrated only a clearing of the pleural opacity. Clinical improvement with a gain in weight began with the subsidence of the pyrexia, but chemotherapy was continued until August 28, when 120 g. of streptomycin had been given. At this time no clinical or radiological abnormality could be detected. She was discharged home on October 19, apparently a healthy woman, the sedimentation rate being 4 mm. (Westergren) and her weight 128 lb. (58 kg.).

Subsequent progress during 1950 was uneventful and her weight increased to 143 lb. (64.8 kg.). On February 26, 1951, a laparotomy was performed and section of the Fallopian tubes and appendectomy were carried out. No abnormality of the pelvic organs was detected. Progress was again uneventful until December, 1951, when a fluctuant swelling was detected in the left breast. At incision in February a localized abscess was removed.

Microscopically, non-specific chronic inflammation was reported and culture of the material evacuated remained sterile, but a sinus persists, although the patient remains well three and a half years after the birth of her child.

COMMENT

The primary lesion in the hepatic glands of the infant is consistent with haematogenous infection via the placenta, whilst its size and maturity would suggest that it originated a considerable time before birth, probably coincident with the onset of pleurisy in the mother. The miliary tuberculosis in the lungs, spleen, and liver would seem to be a secondary haematogenous dissemination in which the mother shared infection just before delivery, the usual effects of such dissemination being suppressed by streptomycin.

Any typical primary focus other than the pleural effusion in the mother remains undisclosed, but it has been shown (Kayne *et al.*, 1948) that quite a large proportion of "idiopathic" pleural effusions occur in close time relationship with the primary infection.

This case contrasts with the almost invariable sequel of healthy infants born to mothers suffering from progressive, advanced, or miliary tuberculosis.

I am informed by Mr. L. E. Perkins that in veterinary practice congenital tuberculosis was not so uncommon and was found in association with primary tuberculous infection, usually believed to be in the uterus, rather than in association with established or widely disseminated tuberculosis.

CONCLUSIONS

Treatment by chemotherapy is justified in primary tuberculosis occurring in pregnancy. Routine B.C.G. vaccination at birth of babies born to such tuberculous mothers should be preceded by a Mantoux test.

I am indebted to Dr. J. F. Horley for the necropsy findings.

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Reviews

PITUITARY CHROMOPHOBE ADENOMAS

Pituitary Chromophobe Adenomas: Neurology, Metabolism, Therapy. By Professor John I. Nurnberger, M.D., and Saul R. Korey, M.D. (Pp. 282; illustrated. 55s.) New York: Springer Publishing Company Inc. London: Lange, Maxwell and Springer. 1953.

On the first page of the introduction the authors rather shock the conventional by suggesting that the original case of Fröhlich, always thought to be due to craniopharyngioma, and the painful adiposity case of Dercum and McCarthy, 1902, were both probably due to chromophobe adenomas, presumably with involvement of the adjacent hypothalamus. This conclusion may be questioned. In the first chapter the authors consider the anatomy of the pituitary and the detailed main paths of the secretion of the anterior pituitary gland directly entering venous channels. They also discuss the influence of the hypothalamus on the anterior pituitary gland and evidence of mediation by humoral means, such as by hypothalamic hormones or metabolites, being conveyed by the blood stream to the anterior pituitary gland. Diagrams showing the amazing variation in the shape of the sella turcica in normal individuals are of value, as it is not infrequent to meet queries, or wrong interpretations, about sella turcica that do not conform to the usual shape.

Metabolism is discussed along modern lines but with attention to historical landmarks. The authors indicate that a low level of activity of the thyroid gland and of the adrenal cortex persists after complete hypophysectomy. Inactivation of thyrotrophic hormone by the thyroid gland may explain why this hormone may not be found in the blood in thyrotoxicosis by methods that detect an excess in myxoedema. The contrasting effects of pituitary growth hormone and adrenal glucocorticoids on protein metabolism are well brought out, but in considering the mechanisms by which the anterior pituitary causes nitrogen retention the authors mention the production of gonadal testosterone without making clear the importance of adrenal androgens, a contribution which is noteworthy physiologically and pathologically.

The authors give an adequate account of the neurological signs and complications and the metabolic defects that follow destruction of the anterior pituitary gland. Optic atrophy and bilateral hemianopia were frequent, but papilloedema occurred in 7% due to involvement of the third ventricle or to venous compression. Third-nerve involvement was more frequent than fourth or sixth. Large tumours produced a variety of neurological features. Haemorrhage into a cystic tumour was the cause of rapid onset of neurological signs. Detection of hypothalamic compression was made by encephalography, showing distortion of the floor of the third ventricle, and was found to be present in as high as 88% of cases, although in 30% of these there were no referable symptoms. Eighteen of the 68 patients with hypothalamic involvement showed agitation, attacks of drenching perspiration, and occasional hypothermia. A similar number suffered from lethargy, emotional depression, and excessive somnolence. Epileptic phenomena associated with drenching perspiration and peripheral vasodilatation was observed in 6 of the 68 patients with hypothalamic involvement. Obesity with polyphagia occurred only in six.

None of the cases of chromophobe adenoma showed any pigmentation, and this is recorded as being true of another 100 patients observed by German. In contrast with this was the presence of pigmentation in 25% or more of patients with Simmonds's disease and, according to Davidoff, in one-half of the acromegals. The contrast between patients with chromophobe adenoma and with Simmonds's disease is attributed by the authors to the fact that in Simmonds's disease the posterior pituitary usually remains intact. Apart from this, it should be pointed out that occurrence of pigmentation with Cushing's syndrome and with A.C.T.H. or cortisone therapy has complicated our conception of its origin as a deficiency manifestation. A.C.T.H., or an associated substance, seems to be an important factor in explaining the difference between the frequency of pigmentation in Addison's disease and its relative rarity and mildness in Simmonds's disease.

The chapter on radiography indicates how a chromophobe adenoma may enlarge and invade in all directions, and the frequency and extent of invasion and distortion of the third ventricle and hypothalamus, as shown by pneumo-encephalography, comes as a surprise to the endocrinologist (reviewer). Further information on the radiographic differentiation of craniopharyngioma (for example, the frequency of calcification, particularly in children) would be welcome in a subsequent edition of this book.

The section on pathology is a little disappointing, but this may be innate in the problem. Malignant changes are rare, but cystic degeneration and haemorrhage not infrequent. 10% of the tumours showed transitional eosinophil cells, and clinical evidence of mild acromegaly was traced. Transitional basophil cells are recorded as being very rare. It should also be recognized that a typical Cushing syndrome has been recorded, paradoxically and rarely, with a chromophobe pituitary tumour. In most cases in this present study there was no clue to the origin or cause of the chromophobe adenoma. However, the authors draw attention to the fact that oestrogens can cause chromophobe adenoma in rats, and that this may be associated with dwarfism, atrophy of thyroid and gonads, but enlargement of the adrenal cortex. The latter circumstance would hardly support their hypothesis that the pathogenesis of chromophobe adenoma in man is similar. Surgery, radiography, and medical substitution therapy are also ably discussed.

This book is a very valuable and brief summary of present-day knowledge of pituitary chromophobe adenomas, to which knowledge the authors have made careful and important contributions.

S. LEONARD SIMPSON.

HYPERTENSIVE DISEASES

Hypertensive Diseases: Cause and Control. By Henry A. Schroeder, M.D., F.A.C.P. (Pp. 610; 164 illustrations and 3 coloured plates. 75s.) London: Henry Kimpton. 1953.

The author of this book and his colleagues at St. Louis have been studying hypertension for a number of years, and the book contains a vast amount of knowledge derived from their own work and that of others. The index of authors contains some 900 names. The book deals exhaustively with the pathology of hypertension, its biochemistry, diagnosis, and treatment; but, as is not unusual in American books, less attention is paid to natural history and morbid anatomy. Nevertheless there is a case report of what must be one of the longest periods of observation of a patient with hypertension yet recorded. This concerns a woman who was found to have a systolic pressure varying from 160 upwards at age 26 and who was followed till her death from a heart attack at age 67.

Dr. Schroeder does not attempt any final definition of hypertension and hypertensive cardiovascular disease beyond the fact of raised blood pressure, but he devotes a good deal of attention to certain special aspects and clinical types. These are nephrogenic, neurogenic, and endocrine hypertension. He does not think that much can be expected from dietetic treatment except in endocrine disturbances, and, though he gives a fair description of sympathectomy and subtotal adrenalectomy, he quotes with approval the fifth of Loeb's rules of therapeutics—"Keep the patient out of the hands of the surgeon." The numerous drugs used in treatment of hypertension, many of them introduced in the last few years, are fully considered. Finally, Dr. Schroeder lays down a schedule for investigation of patients with hypertension and for their treatment with a combination of 1-hydrazinophthalazine ("apresoline") and hexamethonium by mouth. Apresoline is believed to neutralize the hypertensive factors which are derived from the ischaemic kidney. This is therefore a two-pronged attack on the nephrogenic and neurogenic factors in hypertension. Few cases have been treated for longer than two years and it is therefore too early to appraise the results, but striking improvement has been observed in malignant hypertension. The book is well produced, indeed perhaps too expensively for what is essentially a progress report. Nevertheless it is a mine of information about this common disease.

L. J. WITTS.

TUMOURS OF BONE

Tumors of Bone: A Roentgenographic Atlas. Annals of Roentgenology, Volume XXI. By Bradley L. Coley, M.D., F.A.C.S., and Norman L. Higinbotham, M.D., C.M., F.A.C.S. (Pp. 216; 172 figures. 75s.) London: Cassell and Co. Ltd. 1953.

That the present atlas of radiology has been written by two orthopaedic surgeons, and is being reviewed for these columns by a pathologist, indicates the extent of overlap of interests in the field of diagnosis of bone tumours. This overlap is, in fact, a most desirable thing, and one of the great assets of the present volume, which comes from the Bone Tumour Service of the Memorial Centre for Cancer and Allied Diseases in New York, is the almost equal familiarity with the clinical presentation and behaviour, the radiological appearance, and the pathology of tumours of bone that its authors possess.

Within the confines of a brief atlas it is not possible to present scientifically all the data in each of these fields on the cases selected for illustration. Radiographs have pride of place—as, in a radiographic atlas, they should—though there is usually a brief clinical note with each x-ray picture and occasionally a photograph of the pathological specimen from the case or an appropriate photomicrograph placed beside it.

With few exceptions biopsy examination has been carried out in the cases chosen for illustration, and the radiological diagnosis thus substantiated or modified. While the reader has to take the authors' word for the authenticity of the biopsy reports, he has the feeling that his confidence in them is rarely misplaced. The general classification of the various conditions discussed, and views on the extent of their practical separation from each other, are in keeping with present-day trends in pathology. Among the benign tumours of bone, for example, the conditions discussed and illustrated include "osteoid osteoma," "nonosteogenic fibroma," and "benign chondroblastoma," although it is surprising to find no mention of "chondromyxoid fibroma."

A subject to which repeated reference is made, and one where the authors give an accurate and balanced account, concerns the degree of correlation to be expected between radiological and biopsy diagnosis in the field of bone tumours. With cartilaginous tumours, in particular, when a biopsy diagnosis of "chondroma" is suggested, just emphasis is given to the importance of radiological evidence of possible malignancy in areas of the tumour outside the region of biopsy. Indeed, the authors' general principle should be as acceptable to the pathologist as to the clinician that "where the x-ray film and the clinical setting suggest a malignant tumor and a study of microscopic sections does not corroborate this impression, one must be extremely hesitant about accepting the pathologist's report as the final word." Both radiological and histological diagnosis have their limitations, and the clinician dealing with bone tumours should be aware of them in some detail.

The standard of illustration of the book is good; it is well arranged and well indexed. In short, it is a volume which can be depended on to make its mark as a reliable account of the radiological characteristics of each of the very numerous "entities" with which we are concerned in the diagnosis of tumours of bone.

H. A. SISSONS.

EMOTIONS AND PELVIC SYMPTOMS

Psychosomatic Approach to Gynecology and Obstetrics. By Fritz Wengraf, M.D. American Lecture Series. (Pp. 346. 50s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

The author of this monograph sets out to emphasize the need to recognize the emotional factor in the aetiology of pelvic disease and symptoms if they are to be properly understood and treated. It is clearly intended mainly for general practitioners and for those who specialize in obstetrics and gynaecology, so that abstruse terms are avoided so far as possible, and the main body of the book is introduced by

general psychiatric considerations, with definitions of states such as anxiety and hysteria and explanations of concepts such as conversion and organ language.

In the two sections dealing respectively with gynaecological and obstetrical conditions are to be found the expected favourites such as dysmenorrhoea, amenorrhoea, functional uterine haemorrhage, frigidity, menopausal symptoms, menstrual tension, nausea, and vomiting of pregnancy, and the effect of the emotions on pregnancy, labour, and lactation, and vice versa. There are also others less expected such as leucorrhoea, abortion, and pica in pregnancy, and a helpful section on a woman's mental reactions before and after a gynaecological operation. As is usual in books of this kind, illustrative cases are quoted in detail.

It is all very readable and, if anything, errs on the side of making the subject appear too easy—glib conjectures sometimes masquerading in the guise of explanations of abstruse problems. However, in the section on treatment the author makes a real attempt to guide the general practitioner in the handling of the difficult class of patient concerned. Whether it all be accepted or not, it is an interesting book, and it presents an aspect of obstetrics and gynaecology which the good doctor cannot overlook.

T. N. A. JEFFCOATE.

GUIDE TO PHYSIOTHERAPY

The General Practitioner's Guide to Physiotherapy. By Janet Dennison, M.C.S.P. (Pp. 39. 6s.) London: William Heinemann. 1953.

This little book is agreeably written and contains much good sense. The author comments on the wide scope of physiotherapy and the popularity of these forms of treatment in present-day medicine. The history of the Chartered Society of Physiotherapy is briefly recalled, and she emphasizes the ethical laws of the chartered physiotherapist, which bind her to work only under a registered medical practitioner. She makes a plea for the close co-operation of the doctor and the physiotherapist. In the following chapters she outlines the various forms of treatment which the chartered physiotherapist is trained to give, rightly emphasizing the value of active movement. She advocates massage and various forms of electrotherapy with the keenness of one who is an expert practitioner of these arts, and, while there is a welcome tendency to make it clear that there are things that such forms of treatment cannot be expected to do, their positive effects are naturally advanced with some enthusiasm. The chapter on "Manipulation by the Physiotherapist" will not be accepted with equanimity by all the medical profession.

Finally, we are presented with a list of conditions for which certain forms of physiotherapy are advocated. This covers more than 200 conditions, ranging from purulent keratitis to haemorrhoids. We are told that in mucous colitis galvanism to each iliac fossa and salicylic ionization of the rectum have proved useful. Such statements will undo much of the good impression given by the early chapters, and the addition of the list of conditions containing such extraordinary prescriptions detracts from the value of the book.

WILLIAM TEGNER.

Artrite Reumatóide, by Jacques Houli (Rio de Janeiro: Tese do Concurso de Livre Docência de Clínica Médica; N.P., 1953), is a study of rheumatoid arthritis and is based on 100 patients. In these days of big battalions of cases this may seem a small number, but the work has been done thoroughly and much consideration given to most points: nevertheless, in a disease so variable and so widespread, numbers tell. There is not much information about cardiovascular complications, for instance. The remarks on Still's disease are based on two examples. The syndrome of Felty likewise has been treated very briefly. The author has studied the literature of the subject thoroughly; there are over 500 references; some are just apt quotations, reaching back to Garrod one hundred years ago. Perhaps the quotations from the literature outweigh the personal observations. The photomicrographs are good; the skiagrams less so. Unfortunately there is no index.

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FAT AND THROMBOSIS

The suggestion that there may be some association between lipaemia and thrombosis is not new, and evidence that such an association is at least possible has been accumulating for many years. Most of the evidence has been rather indefinite, and consequently the subject has not received as much attention as it would now appear to deserve. Information about thrombosis in general and about coronary thrombosis in particular is of special interest to all medical men, for the death rate from coronary thrombosis is high among members of the profession. It is little comfort to reflect that the apparently high incidence may be partly due to better diagnosis; the risk is still a grave one.

It has long been known that there are a number of conditions in which both lipaemia and thrombosis are commonly found. These include acute blood loss, pregnancy, diabetes mellitus, leukaemia, and ether anaesthesia.¹⁻³ In all these conditions, however, other factors might well be responsible for thrombosis, and on evidence of this kind alone it would be unjustifiable to infer that there is any causal connexion with lipaemia. Rather less indirect evidence pointing the same way comes from some studies linking thrombosis with dietary fat intake. Dock⁴ maintained that men who are neither diabetic nor hypertensive but who subsequently develop myocardial infarction often consume diets rich in butter, cream, and eggs. Malmros⁵ and Closs and Dedichen⁶ have both called attention to a striking difference between Norway and Denmark during the war. In Norway there was a great reduction in dietary fat intake and a marked fall in the incidence of myocardial infarction. In Denmark both fat consumption and the prevalence of myocardial infarction continued at their usual high level.

One serious difficulty in studying the pathology of coronary occlusion seems to have been cleared away by the work of Professor Duguid and his colleagues. At necropsy gross coronary atherosclerosis is an invariable finding, whereas evidence of recent thrombosis is sometimes not obvious. Hitherto the orthodox teaching has been that atherosclerosis is a degenerative process arising within the arterial wall. This was Virchow's contention, and it has gone un-

challenged for many decades. But in fact Rokitsky had previously taught that an atheromatous plaque developed from something deposited on the inner wall of the vessel, and it now seems that Rokitsky was right. Professor Duguid has shown in a careful series of histological studies that a thrombus adherent to the inner arterial wall becomes organized and covered with a cellular layer morphologically indistinguishable from the normal intimal lining. As the process of organization continues, the deposit becomes flattened and the lumen resumes more or less its circular outline. Thus, if the earlier stages have not been observed, the ultimate appearance suggests the development of something within the wall of the artery rather than the organization of a deposit originally lying wholly within the lumen. Many of these organized mural thrombi undergo fatty change and come to show the characteristic appearance of an atheromatous plaque. Such a process has been reported by Duguid in the coronary arteries⁷ and in the aorta,⁸ by Harrison in the pulmonary arteries,⁹ and by Duguid and Anderson in arterioles in cases of hypertension and diabetes.¹⁰ The observations on aortic atheroma have been confirmed by Crawford and Levene,¹¹ who carefully followed the changes by histochemical methods. It therefore seems reasonable to look for a common cause or group of causes for both thrombosis and atherosclerosis.

In view of these facts evidence of an association between lipaemia and atherosclerosis is relevant in discussing the relationship between lipaemia and thrombosis. A strong suggestion that such an association exists has been one outcome of work on plasma cholesterol levels in atherosclerosis. Anitschkow¹² showed that rabbits fed with large amounts of cholesterol develop arterial lesions resembling human atheroma. In man there seems to be no connexion between dietary cholesterol intake and atherosclerosis,¹³ but on the other hand high plasma cholesterol levels are undoubtedly associated with atherosclerosis.¹⁴⁻²⁰ Variations in plasma cholesterol levels seem to be closely associated with

¹ Joslin, E. P., *Ann. clin. Med.*, 1927, 5, 1061.

² Boyd, E. M., *J. clin. Invest.*, 1934, 13, 347.

³ Pernokis, E. W., and Freeland, H. R., *J. Lab. clin. Med.*, 1941, 26, 1310.

⁴ Dock, W., *J. Amer. med. Ass.*, 1946, 131, 875.

⁵ Malmros, H., *Nord. Med.*, 1949, 42, 1785.

⁶ Closs, K., and Dedichen, J., *Lancet*, 1949, 2, 1242.

⁷ Duguid, J. B., *J. Path. Bact.*, 1946, 58, 207.

⁸ — *Ibid.*, 1948, 60, 57.

⁹ Harrison, C. V., *ibid.*, 1948, 60, 289.

¹⁰ Duguid, J. B., and Anderson, G. S., *ibid.*, 1952, 64, 519.

¹¹ Crawford, T., and Levene, C. I., *ibid.*, 1952, 64, 523.

¹² Anitschkow, N., *Arteriosclerosis*, by E. V. Cowdry, 1933, New York, p. 271.

¹³ Keys, A., et al., *Lancet*, 1952, 2, 209.

¹⁴ Boas, E. P., et al., *Amer. Heart J.*, 1948, 35, 611.

¹⁵ Gubner, R., and Ungerleider, H. E., *Amer. J. Med.*, 1949, 6, 60.

¹⁶ Duff, G. L., and McMillan, G. C., *ibid.*, 1951, 11, 92.

¹⁷ Gould, R. G., *ibid.*, 1951, 11, 209.

¹⁸ Keys, A., *Johns Hopk. Hosp. Bull.*, 1951, 88, 473.

¹⁹ — *J. Amer. med. Ass.*, 1951, 147, 1514.

²⁰ Katz, L. N., *Circulation*, 1952, 6, 101.

²¹ Macfarlane, R. G., et al., *J. Physiol.*, 1941, 98, 7P.

²² Fullerton, H. W., et al., *British Medical Journal*, 1953, 2, 250.

²³ Duncan, G. G., and Waldron, J. M., *Trans. Ass. Amer. Phys.*, 1949, 62, 179.

²⁴ Waldron, J. M., et al., *Gastroenterology*, 1951, 17, 360.

²⁵ Tulloch, J. A., et al., *Amer. J. Med.*, 1953, 14, 674.

²⁶ Morris, J. N., *Lancet*, 1951, 1, 69.

alterations in dietary fat intake, and moreover in populations living on a high-fat diet the average plasma cholesterol level increases steadily with age.¹³ Thus the most likely explanation of these observations is that a high dietary fat intake is linked with atherosclerosis.

Studies on the part played by fatty substances in blood coagulation provide yet another approach to the same problem. Macfarlane and his colleagues²¹ showed that plasma freed from fat by high-speed centrifuging or by carbon tetrachloride extraction lost its power of coagulation in the presence of Russell's viper venom. The defect could be restored by a number of fatty substances, including even cream from the top of a milk bottle. A distinction of importance is that blood coagulation and thrombosis are different processes: the only undoubted similarity between them is the final formation of fibrin. Nevertheless, the efficacy of anticoagulant drugs in thrombotic conditions suggests that at least part of the mechanism is common to both processes. Therefore the paper in this *Journal* last year by Fullerton, Davie, and Anastasopoulos²² showing that fat ingestion has a direct effect on blood coagulation reported an advance of fundamental importance. They found that a breakfast of bacon and eggs and bread-and-butter was followed by a shortening of the accelerated plasma clotting time with Russell's viper venom, and a shortening of the whole-blood clotting time in siliconed tubes. Similar results had been reported following cream ingestion by Duncan and Waldron²³ and by Waldron *et al.*,²⁴ but Tulloch *et al.*²⁵ have shown that part at least of the change reported was due to failure to use clean syringes for successive venepunctures. However, Tulloch and his colleagues seem to have gone too far in concluding that "the blood clotting time is not altered by the oral administration of cream." They decided quite arbitrarily that any shortening of the clotting time by less than 30% would be disregarded. In fact, by the usual criteria of statistical significance they have convincingly demonstrated that a change occurs.

Thus there is a considerable body of evidence which seems to show that lipaemia is a factor in the causation of thrombosis. It is clearly not the only factor of importance. Morris²⁶ claimed that coronary atherosclerosis was if anything less common than formerly, while deaths from myocardial infarction appear to be on the increase. Some different explanation is required for this observation. Again, the higher incidence of myocardial infarction in bus drivers than in bus conductors is most unlikely to be associated with any difference in fat consumption. But at least it is evident that a number of promising lines of inquiry are opening up in what has appeared until recently to be a depressingly unrewarding field for investigation.

CIVIL SERVICE DOCTORS

The pay increases for three grades of medical officer in the Civil Service which have just been agreed (see *Supplement*, p. 194) are the outcome of over four years' protracted negotiation. It was in August, 1949, that a joint committee of the B.M.A. and the Institution of Professional Civil Servants first lodged a pay claim with the Treasury on behalf of Civil Service M.O.s. This claim was turned down in the following February. In the summer of 1950, however, anxiety over recruitment, already at an increasingly low ebb, and a serious shortage of doctors in the Civil Service, forced the Treasury to take some action, and it moved in the natural way of things towards setting up a committee of inquiry (the Howitt Committee¹). If the 650-odd doctors in eighteen Government departments expected anything from this committee their expectations were rudely shattered by the trifling increases which it recommended in November, 1951. As we said in a leading article at the time,² "It [the Howitt Committee] is content to advocate salaries that are second-best when the Civil Service ought to be attracting men of the highest quality for these important posts." The B.M.A. supported the joint committee in its refusal to advise Government medical officers to accept the Howitt Committee recommendations, and in February, 1952, the Council of the Association decided to refuse to advertise Civil Service medical appointments in the *Journal*. This decision was ratified by the Representative Meeting of that year. Reluctantly the Treasury in due course entered into direct negotiations with the Joint Committee, which, in its turn, has kept the Council of the B.M.A. fully informed at every stage.

The conditions of the agreement are fully set out in this week's *Supplement*. It will be seen that both sides will be free to make representations to the Royal Commission on the Civil Service, which is now sitting, particularly on the rates of pay for senior and principal medical officers, whose increases in the present agreement are regarded by both sides as purely token. Furthermore, the Joint Committee, which will continue to act for the Civil Service M.O.s on behalf of the B.M.A. and the Institution of Professional Civil Servants, is free to ask the Royal Commission to consider its full claim for the medical officer grade or, for that matter, any grade. Whatever recommendations may come from the Royal Commission—and there can be no doubt that the need for attracting recruits of high quality to this small but important branch of our profession will be well in its mind—the B.M.A., working through the Joint Committee, has in its persistence in a right cause achieved a

¹ Report of the Committee on Pay and Organization of Civil Service Medical Staffs, 1951, H.M.S.O.

² *British Medical Journal*, 1951, 2, 1206.

notable feat in moving an unyielding Treasury on behalf of a minority of its members, even though it did not move it all the way.

STRUCTURE AND LIFE

Scientific knowledge of proteins indirectly influences practical medicine at many points. The preparation of immunizing toxoids from toxins is a manoeuvre of protein chemistry; the use of plasma transfusion substitutes rests on appreciation of the nature and role of the natural plasma proteins; and some hormones, such as A.C.T.H. and insulin, are proteins, and their manufacture and the possibility of synthetic substitutes depend on protein chemists. Collagen is a protein fibre, and full knowledge of its structure might shed light on "collagen diseases," on the puckering of scars, and on keloids. Myosin and actin are the "contractile" proteins of muscle, and even if the treatment of myopathies were not helped by such study it would still be interesting to know precisely how a muscle contracts, or what happens when a spermatozoon lashes its tail. The genes on the chromosomes of the cell nucleus are made of nucleic acid; the treatment of many diseases might be changed if it was known how the nucleic acid molecules reproduce themselves at each cell division and how they exert their genetic influence. It is therefore not surprising that the research on the structure of proteins and nucleic acids is a big part of the programme of post-war science.

Chemists are beginning now to be able to say how all the amino-acids are arranged in sequence in the peptide chains which form a protein molecule. Sanger at Cambridge was recently able to do this for insulin. But how the peptide chains are arranged together in the three dimensions of insulin, or any other protein molecule, is altogether a more complex unsolved problem. Physicists, however, are beginning to find an answer with the help of x rays. Just before the first world war it was found that a single inorganic crystal, such as that of common salt, reflected and diffracted a beam of x rays, so that little beams emerged from the crystal in many directions to give a pattern of spots on a photographic film arranged round it. This was entirely analogous to the way a diamond (a crystal of carbon) or cut glass breaks up a light beam into a number of sparkles. But, whereas the directions and intensities of the light sparkles depend on the cut of the crystal surfaces, the emergent spots of x rays depend on the arrangement of atoms inside the crystal. With simple crystals it is fairly easy from measurement of the directions and intensities of the emergent beams to deduce what the atomic structure of the crystal must be to give such

a diffraction pattern. With a complex crystal, such as that of insulin or haemoglobin, containing perhaps 10,000 atoms in each molecule (as against the two of common salt), a pattern is certainly obtained, indicating that the crystal has an ordered, repeating, atomic structure, but it is a very complex one, with over 2,500 reflections, which so far defies complete mathematical analysis. There are various ways of tackling this problem. One is purely mathematical, seeking new descriptive analytic methods. Another is theoretical: one formulates a possible structure for the molecule, deduces what kind of pattern such a structure would give, and compares this pattern with the one actually obtained. The structure of penicillin was settled thus by x-ray diffraction study, since the pattern obtained agreed with only one of the several possible formulae put forward by organic chemists. A third approach is experimental, studying how the diffraction pattern changes when the crystal is gently dried, or when mercury atoms are combined with the free sulphhydryl groups in the protein.¹

Such methods have been extended to substances not obviously crystalline, such as hair, muscle, and collagen. These do give diffraction patterns of a kind with x rays, which means that they must have some degree of order or arrangement within them on an atomic or molecular scale. From the pattern obtained it is possible to say that there are regularities which repeat themselves every 1.5 Å, 2.86 Å, or 5.1 Å (or whatever it may be: 1 Å = 10⁻⁸ cm.), and the problem is to decide what it is which repeats with this regularity in the molecular structure. There have been various theories, but Pauling and Corey's proposal that fibrous proteins are peptide chains coiled in a tight spiral known as an α -helix at present holds the field.² Thus in collagen the chain would make one complete turn every 3.7 amino-acid lengths along it, and each turn would be 1.5 Å from the next. Nucleic acids also appear to be fibrous in the natural state. Members of the Medical Research Council's Biophysics Research Unit at King's College, on the basis of x-ray diffraction pictures, have proposed³ a special ribbon structure, the two edges formed by chains of alternating desoxyribose (sugar) and phosphate radicles held together by cross-links of purine and pyrimidine units. Their theory is not only in accord with x-ray and chemical data, but explains how variations in the same general structure could give rise to different nucleic acids, specific genes, and mutants, and how the gene may reproduce itself. It may suggest, too, how a virus reproduces itself, and therefore the kind of chemical to destroy it.

¹ Bragg, W. L., and Perutz, M. F., *Proc. roy. Soc. B.*, 1952, 213, 452.

² Kendrew, J. C., *Nature (Lond.)*, 1954, 173, 57.

³ Watson, J. D., and Crick, F. H. C., *ibid.*, 1953, 171, 964.

THE TREATMENT OF VOMITING

Even healthy people after mild dietary indiscretion find nausea and vomiting unpleasant. How much more distressing it is when it occurs as part of some general disease, or, as so often, during recovery from the combined effects of an operation and anaesthetic. Efforts to prevent or treat vomiting have not been lacking through the centuries. The literature of the last fifty years in particular reports a large number of remedies, each one, in the opinion of its sponsor, a certain specific. The substances which appear in this list are as diverse as iodine, insulin, glucose, olive oil, chloretone, and dimenhydrinate ("dramamine"). The causes of vomiting are many, and most approaches to its treatment in the past have been along the rational line of diagnosis and treatment of the causal factor. In some papers the blame is laid on the temperament of the patient, and such "vomiting-prone" patients receive little more than a shrug of the shoulders. In others, it is the fault of the disease, of the surgeon, of the anaesthetist, or of something else. There is truth in all these observations, for there is little doubt that some people are nauseated more easily than others. Many operations on the abdominal viscera are more likely to be followed by vomiting than operations on, say, the foot; ether is more apt to cause vomiting than nitrous oxide.

Two recent papers on this vexing problem advocate drugs structurally belonging to the general group of antihistaminics. The first¹ reports diphenhydramine hydrochloride ("benadryl") given intravenously. The authors consider it to be a good prophylactic against post-operative nausea and vomiting when administered intravenously just before the induction of anaesthesia, and also a good method of stopping vomiting when given in the post-operative period. It has also been reported that the vomiting associated with general disorders such as chronic nephritis, chronic pyelonephritis, subarachnoid haemorrhage, pregnancy, and gastroenteritis is relieved for varying times. The well-known major side-effect of diphenhydramine—namely, drowsiness—occurred in some cases; in others stupor, visual hallucinations, muscular twitchings, dryness of the mouth, and phlebitis were also seen, although they were not considered to be serious disadvantages. This paper confirms the anti-emetic properties of diphenhydramine already demonstrated by many others, notably Glaser and Hervey.²

The other recent report³ concerns the controversial substance chlorpromazine, known commercially as "largactil." It has already been shown that this substance could overcome the emetic effect of apomorphine.⁴ Now it is reported as being used successfully in a wide variety of conditions in which vomiting is a prominent feature. These include carcinomatosis, labyrinthitis, lymphomatosis, and uraemia. Chlorpromazine was also apparently effective in preventing or controlling vomiting caused by "antabuse" administration to alcoholics

and that associated with therapy by aureomycin, codeine, morphine substitutes, and morphine itself. The only side-effects reported are dryness of the mouth, mild sedation, and occasional faintness, palpitation, and flushing of the face.

There seems, therefore, to have been some change of opinion on the prevention and treatment of nausea and vomiting. The attempt to distinguish specific aetiological factors and to treat them seems to be giving way to the practice of administering drugs believed to have an anti-emetic effect independently of the cause of the vomiting. Another observation on this subject may be timely. The evaluation of an anti-emetic drug is not an easy matter and should not be lightly undertaken without careful preparation. Of the many reports through the years, most are of little value because the design of the experiments has been poor and statistical treatment of the data either suspect or not carried out. Two papers within recent years might be cited as examples of the way anti-emetics should be studied. In both the design and tests of significance were adequate. One paper, by Gordh and Rydin,⁵ described an investigation into cerium oxalate, the other, by Mushin and Wood,⁶ an investigation into the effect of nicotinic acid on post-operative vomiting. Both showed that the drugs in question had no significant effect on the incidence of vomiting. The latest reports on diphenhydramine and chlorpromazine do not indicate that the experimental observations were planned along these lines.

SYNTHETIC DETERGENTS

Synthetic detergents, though overcoming some of the imperfections of soaps and alkalis used as cleansing agents, especially in hard water, have introduced some new difficulties of their own. Last year the Minister of Housing and Local Government appointed a committee under the chairmanship of Sir Harry Jephcott "to examine and report on the effects of the increasing use of synthetic detergents and to make any recommendations that seem desirable with particular reference to the functioning of the public health services." The committee's full report on the subject will not appear until further extensive investigations have been carried out, but an interim report¹ has now been published which contains some fairly reassuring information. It seems that despite the widespread use of detergents the incidence of dermatitis of the hands has not increased—a finding supported by recent evidence² from the U.S.A. But these substances may irritate some skins—for instance, the washing of babies' napkins in strong detergents can cause a contact dermatitis of the napkin area—and the committee advises that, after their use, the hands should be thoroughly rinsed in fresh water and dried. The wearing of household rubber gloves is a sensible precaution which should be taken by housewives whose hands become rough and sore from constant immersion in water—which, as the committee points out, often contains much more detergent than is really necessary. So far there has been no evidence of any

ill effects from the possible ingestion of minute traces of synthetic detergents left on crockery, but it is a good hygienic practice to rinse all utensils in hot water before draining.

Housewives as a whole are said to prefer the types of detergents which produce foam, though this quality is unrelated to degreasing and cleaning power. Unfortunately foaming is persistent, and at sewage disposal works, especially where the activated sludge method is used, foam may rise to several feet. This is a serious inconvenience and actual danger to the operators, and the foam may drift and be offensive to the neighbourhood because of contained particles of unpurified sewage matter. Drifting foam can also have a blanketing effect on vegetation. The committee views with concern the possibility that the increasing use of detergents may make it more difficult for sewage works to produce effluents up to the required standard of purification. Since some of the constituents of detergent preparations are only partially removed or destroyed during sewage treatment, further investigation is being carried out to assess how far the presence of these materials is likely to harm river life or river-drawn water supplies. However, the committee thinks that the problem of foaming at sewage works, though calling for speedy solution, is not sufficiently serious to warrant alarm.

FAITHFUL SERVICE

It is a happy characteristic of medicine that its tradition of service readily infects all who come in intimate contact with its work. This is particularly noticeable in that devoted band of lay helpers—yearly increasing—who without regard for the clock, day in day out, smooth the doctor's burden for him and ease his lot. It is true to say that these people, secretaries, receptionists, and surgery assistants, can make or mar a practice, and it is very seldom that they do the latter. It is good news in this week's *Supplement* (p. 194) that the B.M.A., through the Medical Insurance Agency, has sponsored a pension and sickness scheme for doctors' employees. It will satisfy a long-felt need and will enable medical men and women to fulfil in a business-like way obligations which they have always sincerely felt but have been at a loss to know how to carry out.

BIRDS AND VIRAL ENCEPHALITIS

Birds have long been recognized as the source from which man is occasionally infected with psittacosis, or with other viruses of the ornithosis group, usually by the inhalation of infective material. Recent reports from Japan,¹ Australia,^{2,3} and Malaya suggest that birds may also be the carriers of certain viruses which cause encephalitis in man. West Nile viruses and those causing St. Louis encephalitis, Japanese B encephalitis, and Murray Valley encephalitis (M.V.E.) are serologically related: no information is available on the epidemiology of West Nile virus infections, but the other three viruses have several features in common in addition to their

similar size and shared antigens. For example, the proportion of subclinical to clinical infections in man is high; they are transmitted by culicine mosquitoes; and birds are highly susceptible to infection with the viruses, and usually show a transient high-titre viraemia, but no clinical symptoms.

The most obscure feature of the epidemiology of all these diseases is the reservoir of the virus during the winter, or, in the case of M.V.E. virus and Japanese B encephalitis virus in Japan, the reservoir from which the virus periodically invades areas in the temperate zones. Investigation of this problem demands what Dr. J. R. Audy, in a paper appearing elsewhere in this issue, describes as a biological approach to medical geography. Two hypotheses have been suggested, both of which bring birds into the foreground of the picture. Australian workers have suggested that persistence of M.V.E. virus is confined to areas near the Tropics where vector mosquitoes are present throughout the year. The appearance of the disease in temperate regions during the summer is thought, on this hypothesis, to be due to bird movement through a region in which vector mosquitoes were present. A migratory bird might well be infected in one place and develop viraemia a week later in another place hundreds of miles away, and thus infect local mosquitoes with the virus. These mosquitoes could then infect local birds and establish a new focus of infection. The appearance of M.V.E. in southern Australia at long intervals of time might then be due to exceptional meteorological conditions which may cause exceptional bird movements.

The other view derives from the isolation⁴ of St. Louis encephalitis virus from chicken mites (*Dermanyssus gallinae*) collected in St. Louis County during a non-epidemic period. In contrast to the negative results obtained with mosquitoes, the transmission of infection through the eggs of ticks and mites (and hence the possibility of indefinite survival apart from vertebrate hosts) has been reported with several viruses, and Smith and his colleagues⁵ have shown that the eggs of *Dermanyssus gallinae* can harbour the virus of St. Louis encephalitis and that larvae hatched from the eggs can transmit the infection. Thus St. Louis encephalitis virus may survive the winter in the mites of domestic fowls and other birds. In view of the close similarities in the biological behaviour of the other three related viruses, it is possible that a similar cycle may occur with them also.

Both hypotheses may ultimately prove correct. A mite-bird cycle may provide the reservoir of some of these infections in tropical regions: bird migration, annual or exceptional, could then result in the infection of birds in more temperate areas, with a consequent overflow of infection into the susceptible local human populations. The ultimate reservoir of Japanese B encephalitis and Murray Valley encephalitis may be best sought in tropical regions such as Malaya rather than in Japan and Australia, where the clinical diseases were first recognized.

Sir Russell Brain was re-elected President of the Royal College of Physicians of London on April 12. He was first elected President of the College in 1950.

¹ Warrington, W. R., et al., *Surgery*, 1953, 34, 837.
² Glaser, E. M., and Hervey, G. R., *Lancet*, 1951, 2, 749.
³ Friend, D. G., and Cummins, J. F., *J. Amer. med. Ass.*, 1953, 153, 480.
⁴ Laborit, H., et al., *Presse med.*, 1952, 60, 206.
⁵ Gordh, T., and Rydin, H., *Anesthesiology*, 1946, 7, 526.
⁶ Mushin, W. W., and Wood, H. M., *British Medical Journal*, 1944, 1, 719.

¹ Interim Report of the Committee on Synthetic Detergents, 1954, H.M.S.O.
² Sture, A. M. J., et al., *Arch. Derm. Syph. (Chicago)*, 1953, 68, 643.

¹ Hammon, W. McD., Reeves, W. C., and Sather, G. E., *Amer. J. Hyg.*, 1951, 63, 249.
² Miles, J. A. R., and Howes, D. W., *Med. J. Aust.*, 1953, 1, 7.
³ Anderson, S. G., and Eagle, M., *ibid.*, 1953, 1, 478.
⁴ Smith, M. G., Blattner, R. J., and Heyes, F. M., *Science*, 1944, 100, 362.
⁵ ——— and Miller, A., *J. exp. Med.*, 1948, 87, 119.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

LABORATORY INVESTIGATIONS IN SUSPECTED INDUSTRIAL POISONING

BY

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There are two situations in which a general practitioner may need the help of the laboratory in dealing with patients he suspects to be suffering from industrial poisoning: (1) When the history and clinical picture point to industrial poisoning but he has no direct evidence of such exposure, nor of its magnitude; here both doctor and patient may be unaware of any danger in the patient's work, and a laboratory investigation may be the only way of establishing that exposure has occurred. (2) When the doctor is supervising (as an industrial medical officer) the health of a group of work-people; here the fact of their exposure is known to him, but laboratory tests are required to estimate its degree and identify individuals who are running into danger.

Only a few industrial poisons give rise to specific laboratory findings. The toxic metals can be detected in the body fluids, and carbon monoxide gives rise to a characteristic change in the haemoglobin. Investigations of this nature require not so much an experienced biochemist as a biochemist experienced in the particular technique, as well as a laboratory set aside for the work (the determination of lead in biological fluids provides a good example). These conditions can rarely be fulfilled in general hospital laboratories. In consequence it has been the practice in some regions to attempt to concentrate work of this nature in one or two special laboratories. Unless special facilities of this type are available results may be inaccurate, and it cannot be too strongly emphasized that incorrect results are worse than no results at all. The clinician, therefore, should explore the facilities available to him before requesting unusual investigations to assist him in diagnosis.

The more important use of laboratory investigations in those exposed to industrial poisons lies in prevention. Unfortunately, this work does not fall within the ambit of laboratories associated with the National Health Service, and the practitioner requiring these examinations will have to make special arrangements. Large firms usually establish a laboratory to deal with their own particular health problems, but difficulty arises where the numbers of workmen involved make such provision uneconomical.

It is often possible for the research biochemist to devise tests which will enable a check to be kept on workers exposed to particular poisons. But the methods to be used and the interpretation of results in the prophylactic field raise special problems, and general practitioners wishing to institute this type of routine supervision would be well advised to seek the advice of an expert in industrial medicine.

Whether the laboratory test is to be used for diagnostic or prophylactic purposes it must be carried out with due care, and this may involve much labour in the laboratory. Equal care is necessary, however, in

the collection of specimens, and the practitioner would be wise to consult the laboratory about their tests and the times at which unusual specimens should be submitted.

Details of some of the industrial poisons giving rise to specific changes are briefly discussed below.

Lead-Poisoning

Lead-poisoning still continues to occur and the diagnosis is often missed. Help can be obtained from laboratory investigations provided these have been carried out in a suitable laboratory. In detecting minute quantities of lead in body fluids the biochemist has to take the greatest care: reagents must be "delead" and special glassware used. The latter is prepared by washing with pure hydrochloric acid and rinsing with water twice distilled from all-"pyrex" apparatus. All these time-consuming precautions in the laboratory, however, are of no avail if proper care has not been observed in the collection of samples by the practitioner.

Lead in Urine.—A true and uncontaminated 24-hour sample would theoretically be most suitable, but in practice the collection of spot samples of at least 200 ml. is to be preferred. The urine should be passed direct into all-glass stoppered pyrex flasks (with or without the use of a pyrex funnel). Great care must be taken to avoid contamination of the specimen from lead on the clothing. To avoid the addition of trace metals no preservatives must be added. The normal lead content of urine ranges up to 100 µg. per litre. Values in excess of this are found in nearly all lead-workers and no particular level can be taken as indicating poisoning. Raised urinary excretion of lead merely indicates raised absorption and confirms what may be already known, that the patient is a lead-worker. Low-grade absorption will give a urinary figure of up to 150 µg. per litre and suggests good working conditions. Repeated values of 200 µg. indicate substantial absorption. If values are frequently found above 300 µg. absorption is excessive and poisoning may occur at any time. There is considerable daily variation in urinary lead output and reliance should not be placed on single observations. In the supervision of lead-workers the importance of group trends cannot be overemphasized. A high lead level in urine in an individual does not indicate poisoning, nor does a low one completely rule it out. Diagnosis must rest upon the clinical picture taken in conjunction with all laboratory findings.

Lead in Faeces.—This investigation has no place in the detection of individual cases of industrial lead-poisoning and is of little value in assessing an industrial hazard.

Lead in Blood.—This determination has been widely used in the United States. Ten millilitres of blood should be collected in a dry all-glass syringe, cleaned as described above, with a stainless steel needle. The blood should be transferred to a similarly cleaned test-tube and allowed to clot. The normal range of values is 0-80 µg. per 100 ml. of blood.

Coproporphyrin in Urine.—While urinary coproporphyrin concentration is a useful index of the lead hazard in groups of lead-workers in industry, the excretion of this substance is also raised in a number of other diseases and the test has little diagnostic importance.

Blood Examination

While by no means entirely specific, blood examination for punctate basophilia offers a useful test for certain types of lead absorption (not lead tetraethyl). Blood for this purpose is most easily obtained from the lobe of the ear. Films should be spread on thin glass slides (to facilitate the use of dark-ground technique in the laboratory). The film should be thin—in a person not markedly anaemic the spreading slide should be at an angle not greater than 20 degrees. It is easier to judge the quality of the film if the slide lies on a white background—a piece of white blotting-paper is very suitable. Several films should be prepared and these should be allowed to dry in air.

Results must be interpreted with care. Actual counts will depend on factors such as the stain used and the experience of the technician. Many laboratory workers content themselves with reporting "punctates per field"; others use even more cryptic remarks such as "numerous." In the absence of other disease likely to produce this condition (pernicious anaemia, malignant disease) punctate basophilia suggests lead absorption. It is observed in minor degrees in most lead-workers, but large numbers of stippled cells—three or four per field, especially if the granules are large—suggest excessive absorption and the possibility of poisoning. Associated with a haemoglobin estimation, and a limited number of lead-in-urine determinations, this method provides a cheap and objective method of supervising lead-workers.

Mercury

The level of mercury in the urine gives a useful indication of the quantity being absorbed. The collection of the specimen is carried out with the same precautions as for lead.

The normal range of urinary mercury is up to 80 µg. per litre and values in excess of 100 µg. are abnormal. Very high values are often found in those exposed to metallic mercury; for instance, values exceeding 1,000 µg. have been found in such a group of workers, and in isolated cases values exceeded 2,000 µg. These men were all at work, but many showed the rather indefinite clinical picture associated with chronic mercury poisoning. Symptoms should be looked for when the value persistently exceeds 300 µg. per litre.

Arsenic

The patient should be sent to the laboratory so that a fresh specimen of urine can be obtained for examination by the molybdenum-blue colour method. Normal urinary arsenic has been given as 170 µg. of arsenious anhydride per litre.

Carbon Monoxide

Carbon monoxide is one of the commoner poisons, both in industry and in the home, and its detection in the blood is often important for medico-legal purposes. The percentage of carboxyhaemoglobin can readily be measured in the laboratory either by the use of reversion spectroscopy or by the sensitive palladium-ammonium molybdate method.

Ten millilitres of blood should be collected with a sterile dry syringe and oxalated.* The blood should be transferred under paraffin to a test-tube and more paraffin should be added to fill the tube, which should be securely corked. Shaking should be avoided, the tube wrapped to exclude light, and the specimen taken to the laboratory without delay so that the analysis can be carried out as soon as possible.

The blood takes up carbon monoxide very readily and minor quantities are not noticed. For instance, the blood may contain as much as 5% carboxyhaemoglobin after

*The oxalate anticoagulant should preferably be Heller and Paul's solution, which is prepared from 1.2 g. of ammonium oxalate, 0.3 g. of potassium oxalate, and 1 ml. of 40% formaldehyde, the solution being made up to 100 ml. with water: 1 ml. of this solution is suitable for 10 ml. of blood.

smoking cigarettes. In a healthy person at rest concentrations up to 15-20% may remain undetected. When the carboxyhaemoglobin reaches 30% a throbbing headache and dizziness are likely to appear, at 50-60% the patient becomes unconscious. If 80% of the haemoglobin is combined with carbon monoxide death occurs rapidly.

Aromatic Amino- and Nitro-Compounds

Aniline, nitrobenzene, and related aromatic compounds give rise to the formation of abnormal haemoglobin derivatives in blood. The erythrocytes of patients who are cyanosed may contain sulphaemoglobin and methaemoglobin, and methaemalbumin may be present in the plasma.

To examine for these, 10 ml. of blood should be withdrawn by syringe and transferred to a tube, where it must be preserved with a mixture of sodium fluoride and thymol,† which acts as a preservative and anticoagulant. Air should be excluded by filling to the stopper with liquid paraffin and the estimation should be made as soon as possible. Sodium citrate should not be used as an anticoagulant as it interferes with the methaemoglobin determination.

Probably about 1% of the total haemoglobin in the red blood cells is normally present as methaemoglobin. It is only when the methaemoglobin concentration reaches levels of approximately 40% that dyspnoea occurs on exertion, although obvious cyanosis may be present at much lower levels. The cyanosis from methaemoglobin clears in a day or two, but that resulting from sulphaemoglobin may persist for several weeks.

Trinitrotoluene

Workers exposed to trinitrotoluene excrete metabolites in the urine which give a positive Webster test. This consists in adding alcoholic potash to an ethereal extract of the acidified urine, when a violet colour appears. This test is of value only in demonstrating—what is usually well-known—that the patient is working with T.N.T.

Benzene

Blood changes following benzene absorption are important but not specific. Leukopenia, anaemia, or even leukaemia may be observed.

New Chemicals

New chemicals are continually being developed for use in industry. When there is any suspicion of their being poisonous it is one of the duties of the research biochemist to devise methods for their detection and estimation in body fluids. If this is impossible he should attempt to devise an indirect method for assessing the degree of intoxication. Some of the newer chemicals used in agriculture illustrate this.

Selective Weedkillers

Dinitro-ortho-cresol (D.N.O.C.), which is used as a selective weedkiller, gives rise to poisoning in man. The clinical picture in mild cases is not clear cut, though help in diagnosis can be obtained from the estimation of this substance in the blood. This is a comparatively simple procedure and can be carried out on small samples of blood. It is particularly useful in supervising the health of those whose work involves exposure to the poison.

The practitioner should submit a sample of 2 ml. of blood to the laboratory. This allows of duplicate tests. The sample is best withdrawn from a vein and must not be allowed to clot. A 2-ml. syringe with a fine hypodermic needle serves well. The best anticoagulant is heparin, and suitably prepared tubes can usually be obtained from the laboratory. If such a prepared tube is not available, any clean dry tube may be used; clotting should then be prevented by the previous addition of a few crystals of sodium

†One gramme of sodium fluoride mixed with 0.1 g. of thymol crystals: 0.1 g. of this mixture is taken for 10 ml. of blood.

citrate. Accidental contamination of the sample by chemicals on the skin must be carefully avoided by thorough cleansing of the site of venepuncture with spirit. In order to avoid false peak values, samples should not be taken within eight hours of the patient's last exposure. It is not necessary to add any preservative, as D.N.O.C. determinations can readily be carried out on whole blood which is over a week old.

Normal values are usually supplied by the laboratory doing the test. Since D.N.O.C. is a cumulative poison and is only slowly excreted, Bidstrup and her colleagues* recommended that a man should be removed from further contact for at least six weeks, if the blood level, eight hours after his last exposure, is 20 µg. per g. or higher.

Organic Phosphorus Insecticides

The organic phosphorus insecticides are now being widely used all over the world. These substances are toxic to man and produce their effects by inhibiting cholinesterase. In order to detect excessive absorption in workmen using these insecticides, it is necessary to estimate the quantity of this enzyme in the blood. This is not a simple procedure but arrangements have been made for it to be carried out in certain National Health Service Laboratories in suspected cases of poisoning.†

There are micro-methods for this determination, but the practitioner would be wise (unless advised to the contrary by his laboratory) to submit a blood sample of at least 2 ml. and preferably 5 ml. Should a micro-method be in use and the practitioner be advised to submit small samples such as can be obtained from a finger prick, it is most important to see that the site is adequately cleaned before pricking, since traces of the insecticide in the sample lead to false low cholinesterase readings. Clotting should be prevented by the use of a heparinized tube or sodium citrate (as for D.N.O.C.); oxalate should not be used. No preservative is required, as enzyme activity of the blood is unimpaired even after a few weeks.

In the absence of an agreed international unit of cholinesterase activity, the amount of enzyme is expressed as a "number."‡ The normal range in healthy adults for whole blood is 80-130 units. Signs of systemic poisoning occur when this figure drops to 20-30 units, though a few patients have shown symptoms when the "number" was in the normal range. The results will almost certainly be interpreted for the practitioner by the laboratory according to the scale in use locally.

The greatest value of this test lies in prevention. In this work the wide range in the normal makes it advisable to have pre-employment determinations carried out on men who are about to be exposed to this poison, and they should subsequently be tested at weekly intervals. A marked fall in a man's cholinesterase number should be regarded as a danger sign and he should be removed from further exposure until his enzyme activity has returned to normal. This recovery is not rapid and may well take six to eight weeks.

Next article on Clinical Pathology.—"Tropical Diseases in Britain," by Professor A. W. Woodruff.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

*Bidstrup, P. L., Bonnell, J. A. L., and Harvey, D. G. (1952). *Lancet*, 1, 794.

†Dr. E. N. Allott, Group Laboratory, Lewisham Hospital, London, S.E.13; Dr. D. H. Fulton, Department of Pathology, Memorial Hospital, Peterborough; Dr. E. M. Darmady, Central Laboratory, Milton Road, Portsmouth; Dr. P. Kidd, Department of Pathology, Royal Infirmary, Worcester.

‡Aldridge, W. N., and Davies, D. R. (1952). *British Medical Journal*, 1, 945.

Reports of Societies

THE CRIMINAL AND THE DOCTOR

The contemporary crowding of our prisons and the frequency with which young men and women are turning to crime for a living have shocked modern society. Lately, also, the publicity accorded to cases of homosexuality and other sexual offences has heightened the demand that vigorous steps should be taken to mend matters. Unfortunately, no two people agree about what should be done. The psychiatrist has one remedy, the police another, and utterances on the subject from the Bench are conflicting. All are agreed, however, on two things: the urgency of reclaiming all those who can be saved from a life of crime, and the need to protect society from those who cannot.

It is against this background that the International Society of Criminology, with the help of Unesco and the British Council, arranged a two-weeks course in London on "Recent Advances in the Study and Treatment of Offenders." The course ran from March 24 to April 13, and brought together lawyers, magistrates, doctors, psychiatrists, police, prison administrators, sociologists, and other interested people. It consisted of lectures and discussions, and visits to prisons, Borstals, approved schools, and other institutions. The course was directed by Dr. DENIS CARROLL, president of the International Society of Criminology, and Dr. HERMANN MANNHEIM, reader in criminology at London University. Below are reported four of the medical contributions. They deal with electroencephalographic studies, hormone treatment of sex offenders, psychotherapy in prison, and "typological" research on adolescents sent to Borstal institutions.

Electroencephalographic Studies

Speaking on "Electroencephalographic Studies of Offenders," Dr. DENIS HILL (senior lecturer in clinical neurophysiology, Institute of Psychiatry, London University) gave a general survey of work in this field. While the electrical patterns found in epilepsy, brain tumour, and other structural brain disorders were different in kind from the normal record, 10% of the general population showed minor differences in degree, and the study of these was only just beginning. These "variant" records did not indicate any gross structural abnormality, and would be considered normal for children or adolescents in whom, under experimental conditions, they could be produced occasionally by emotional frustration. As the personality trait most often accompanying these aberrant records was undue aggressiveness, it was reasonable to suppose they indicated some failure of the brain to mature and reach integrated functioning, with a resulting imbalance and lack of emotional control. Individuals showing such patterns were more susceptible to physiological stresses, such as a low blood sugar, oxygen lack, and alcohol, and they were also less able to tolerate emotional frustration.

Turning to studies of offenders, Dr. Hill emphasized that no connexion could be found between the E.E.G. tracing and antisocial behaviour as such. Nevertheless, in a recent study of young delinquents, only 16% showed normal recordings. In the prison population, 80% of psychopathic personalities showed variant recordings, a similar proportion to psychopaths in mental hospitals, but among the remainder of the prisoners variant recordings were also abnormally frequent, and these variant patterns were related to aggressiveness. Studies of murderers had been negative in those cases where killing was incidental to another offence, but in those cases where there appeared to be no motive, or where the motive was trivial, three-quarters showed variant records, a fact which indicated the need for close investigation in such cases. There was also a surprisingly high incidence of epilepsy among the

murderers studied, though no case had been found in which the crime was related to a seizure. No explanation for this could be given, but there was evidence suggesting that both epilepsy and an abnormal personality could result from brain damage from anoxia or trauma at birth, probably to the temporal lobes, the last part of the brain to mature. Recent studies showed that where slow waves were obtained from this region there was a 50% chance of a general personality disorder, chiefly shown by irritability, aggressiveness, and antisocial behaviour. Apart from such possible birth trauma and other forms of brain disease, all evidence at present indicated that E.E.G. patterns were primarily determined by heredity.

Treatment of Sex Offenders

Discussing the hormone treatment of sex offenders, Dr. R. SESSIONS HODGE (consultant psychiatrist to the South-western Regional Hospital Board) said that sexual offences could be regarded as due to a lack of balance between primitive drives, probably originating in the hypothalamus and other lower brain centres, and the inhibitory effect of the cerebral cortex which normally regulated them and ensured that they received only socially and ethically acceptable outlets. Drugs could be used either to diminish the drives or to increase the cortical control. Amphetamine "alerted" cortical function via the thalamo-reticular diffusion system and probably diminished enuresis or aggressiveness for this reason. Alternatively, one could depress the drives. In cases of aberrant sexual activity, oestrogens could reduce the sexual impulse to a point where the cortex could control it. Progesterone had a similar effect on women, and could also abolish the outbursts of aggressive behaviour that sometimes occurred premenstrually. In treating the homosexual, Dr. Sessions Hodge felt that the best results occurred when the effects of the drug were frankly discussed with the patient, it being made clear that the responsibility for taking the drug, and so for controlling aberrant behaviour, rested with him.

Though hormones could diminish the drive, they could not alter its direction, and the homosexual remained homosexual when the drug was stopped. Psychotherapy therefore remained the most important form of treatment, though if it was to be effective it would need to be given much earlier in life than was the rule at present.

Psychotherapy in Prison

Dr. H. K. SNELL (director of the Prison Medical Service), dealing with administrative aspects of the psychiatric treatment of prisoners, said that where such treatment was recommended by the courts, or later by medical officers of prisons, prisoners were sent to selected establishments such as Wormwood Scrubs, Wakefield, or Holloway. At Wormwood Scrubs most forms of psychiatric treatment were available, and analytic treatment was given by two visiting psychotherapists. This method was time-consuming, and therefore allowed few to benefit. Group therapy was more promising, and perhaps more suited to the type of case met with. At Wormwood Scrubs the 10 men forming the nucleus of those receiving this treatment lived together in a special ward between group sessions, and there was a full programme of activity, including painting and psychodrama, supplementing the prison routine. Though prison discipline was always in the background, the group was encouraged to develop responsibility for disciplining itself, and the standard was high.

Dr. Snell pointed out that only a small proportion of offenders were suitable for psychotherapy, for reasonable intelligence was needed, and there must be a strong and genuine desire for change; this was often not sufficiently recognized by the courts recommending treatment. It was unfortunate that, because of the time involved, little could be done where the sentence was less than six months, for this group might be expected to include men who would

benefit most from psychotherapy. But, as in many cases much could be achieved in only a few interviews by a doctor with psychological insight, prison medical officers should be able to give simple psychotherapy. The practice of N.H.S. psychiatrists visiting short-term offenders in prison, who could then continue to attend as out-patients on release, was another way of overcoming this difficulty.

Prognosis after Borstal

Speaking on "Typological Research on Adolescent Offenders," Dr. D. A. OGDEN (medical officer, H.M. Borstal Institution, Portland) said that he had been struck by the errors that were often made in predicting how lads would turn out when they left Borstal institutions. He had therefore taken a sample of 250 lads and divided them into 10 groups according to the predominant reaction to Borstal training they showed. The grouping of the cases was performed by several officials at the institution after a discussion. Medical opinion counted as one vote equal with the others except in one category which included all cases showing mental abnormality high enough to affect normal reaction to training. The lads had been followed up for four years after their discharge, and analysis of the number of reconvictions in each group had shown significant differences. The "adolescent" and "emotionally unstable" types, which gave so much trouble during training, did well in the long run, though the reconviction rate was high during the first year. By contrast the "submissive," who gave little trouble, had a bad prognosis, as did the "ego-centric," "the hysterical swindler," and "unethical" types. However, the "shiftless" type, which had done very badly soon after release, had recovered very well over the longer period. Although there was a marked connexion between broken homes and chronic delinquency, it was interesting that the "unethical" type lads who took to crime deliberately, regarding it as a gamble worth the risk, showed good home backgrounds and high mental stability and ability, perhaps indicating a criminal type. Possibly the most striking performance by any of the types was by the one containing the "abnormals," showing only a 30% rate for more than one reconviction. This was markedly better than many other types and strongly encouraged the view that such "abnormal" adolescents could be trained under close medical and administrative co-operation.

Nova et Vetera

THE BIBLE AND MEDICINE

The Bible and Modern Medicine: A Survey of Health and Healing in the Old and New Testaments. By A. Rendle Short, M.D., F.R.C.S. The Second Thoughts Library, No. 9. (Pp. 142. 6s.) London: The Paternoster Press. 1953.

Mr. Rendle Short is widely known as a teacher and writer on surgery and as one of the editors of the *Medical Annual*. His devout little book discusses the differences between the medicine of the Old and the New Testament—which can be summarized by saying that "possession" is very rare in the former and very common in the latter. He considers also the linguistic evidence on whether St. Luke was a trained physician, the nature of possession and of the miracles of healing, the sanitary code of the Old Testament, the interpretation of the word translated as "leprosy," the physical cause of the death of Christ, and the Biblical conception of disease. His treatment throughout is along lines that may reasonably be described as moderately though definitely conservative. His readable and tolerant pages will be of use to the many, like-minded to him, who must often be seeking such a summary.

CHARLES SINGER.

Correspondence

Perforation of the Colon

SIR.—I was very interested to read Mr. Roger Brearley's medical memorandum (*Journal*, March 27, p. 743) on "Spontaneous Perforation of the Colon due to Alkaline Medication" and his ingenious explanation of the perforation. A paper on unusual perforations of the large bowel is in preparation, but it may be of interest to record here a personal case, rather similar to Mr. Brearley's in that perforation of an otherwise normal colon occurred in a patient who had recently developed constipation and who was receiving alkaline treatment for a suspected duodenal ulcer.

A 41-year-old labourer was admitted to hospital in November, 1953, with a six-hour history of very severe pain, sudden in onset, in the lower abdomen. This was preceded for 24 hours by lower abdominal colic and tenesmus. Five weeks prior to this emergency he had had diarrhoea lasting three days. For several years he had had symptoms very suggestive of duodenal ulceration, for which he had been in the habit of taking a self-prescribed bismuth preparation, and during the few months previous to this hospital admission he had developed increasing constipation. General examination showed a very ill man; his abdomen was silent and rigid throughout with diffuse tenderness and release tenderness, both of the latter being most marked just below the umbilicus and in the suprapubic region. No confident diagnosis could be made other than generalized peritonitis, but in view of the maximum median tenderness the possibility of a perforated Meckel's diverticulum was entertained.

At laparotomy purulent free fluid and liquid faeces were found in the peritoneal cavity and a perforation 3.5 cm. by 1.75 cm. was found on the anti-mesenteric border of the apex of the sigmoid colon loop; protruding through the perforation was a hard faecal mass. Many similar faecal masses were present in the rest of the pelvic colon and rectum, but in no sense could the term faecal impaction be applied. The bowel wall adjacent to the perforation was involved in the generalized inflammation but appeared otherwise normal, as did the remainder of the colon and rectum. Treatment, as in Mr. Brearley's case, was by exteriorization of the affected loop through a muscle-split incision in the left iliac fossa using the perforation as a colostomy and drainage of the pelvis. He received aureomycin during his post-operative course, which was satisfactory, and subsequent sigmoidoscopic and radiological examinations of the colon and rectum failed to demonstrate any abnormality. Two months later his colostomy was closed intraperitoneally and to date he has had no further symptoms; barium enema examination has been repeated and shows no lesion in the large bowel. A biopsy specimen from the edge of the perforated ulcer suggested that the ulcer was a chronic one with continued activity rather than acute, and in view of this histology and the operative findings the ulcer was cast on to the scrap-heap of chronic ulcer pathology—the simple solitary ulcer—although perhaps wrongly.

There is little doubt that diarrhoea due to faecal impaction is a not infrequent occurrence after any operation for peptic ulcer, including simple closure of a peptic perforation, and in my experience, limited to acute surgical practice, faecal impaction occurs by far most commonly under those circumstances. As certain alkalis tend to produce dry hard stools, their use may well lead to faecal impaction, as Mr. Brearley has pointed out. Yet, with constipation very common, faecal impaction relatively so, and a large proportion of the population, constipated and otherwise, taking alkaline medicaments over long periods, it is a little surprising that the complication of perforation of the bowel, if due to faecal impaction, does not in fact occur more often. The complication is an exceptional rarity, and Mr. Brearley reports his case as "almost unique." It would have been interesting to know the histology of the edge of the perforation in Mr. Brearley's case.—I am, etc.,

London, W.3.

A. J. M. MATHIESON.

SIR.—An interesting account has recently been published by Mr. R. Brearley of large bowel perforation associated

with alkaline medication (*Journal*, March 27, p. 743); we wonder if this is as rare as the author claims. A similar case occurred at this hospital in 1951.

A man aged 55, known to have a chronic duodenal ulcer for which he consumed large amounts of bismuth, was admitted because of recent onset of constipation and colicky abdominal pain, superimposed on his ulcer symptoms. While in hospital, on the day of admission, he suddenly developed agonizing pain in the left iliac fossa, with shock and abdominal rigidity. At laparotomy, the stomach and duodenum were intact, but free in the abdominal cavity were large, odourless concretions and free fluid. No site of intestinal perforation was found, but the patient's general condition was too poor to allow an extensive search, and in fact the patient only survived the operation for a short period. At necropsy a small perforation of the sigmoid colon was found, the wall of the intestine being intact throughout.

Perhaps the most striking features of this case were the rapidly developing severe shock, and the failure of treatment, despite early operation.—We are, etc.,

M. PEMBERTON.
N. F. KIRKMAN.

Manchester, 20.

Whither Neurophysiology?

SIR.—The study of neurophysiology is now recognized as a basic subject in the training of psychiatrists. It might appear logical that those concerned in the treatment of mental illnesses should have a fair knowledge of the normal functions of the nervous system, and perhaps be confident to diagnose neurological disorders on clinical examination. Yet too many psychiatrists are content to leave the organic field to their colleagues, and have little time for the academic approach to nervous function.

Modern ideas on the brain that have resulted from scientific experiment, including the application of electronic techniques, indicate quite clearly that the existence of a "functional" field must be seriously challenged. It is only one step from the activity of the sense organs to the mental experiences of perception, and the neurophysiologist is finding himself in a sphere that was formerly the undisputed territory of philosophers, psychologists, and psychiatrists. A physical basis has now been established for many aspects of emotional behaviour, and in selected lesions of the brain the type of behavioural disturbance can actually be predicted. Psycho-surgery has been accepted as a useful therapeutic tool without any real understanding of its physiological effect; but its acceptance must be regarded as an admission of a mind-body relationship that is only too plainly material. It might be argued that the brain is merely a medium for the expression of mental activity, which itself belongs to some non-material dimension and cannot be dissected by instruments of science. If this view is correct, it is surely an invitation to psychologists and others to join in this problem of the borderline, discard unwanted theories and speculation, and contribute in some practical way by the use of a common terminology.—I am, etc.,

Leeds.

P. P. NEWMAN.

Short-term Use of A.C.T.H. in Rheumatoid Arthritis

SIR.—Much has been written about the long-term use of cortisone and A.C.T.H.—some in favour and perhaps more against. Less has appeared in the literature on the value of short courses of these hormones.

There are five main ways in which short courses can perhaps advantageously be applied in this chronic disease: (1) when surgery is necessary during an active phase of the disease; in those cases that flare up after surgery a short course of A.C.T.H. or cortisone may be very helpful; (2) in connexion with the correction of deformity by manipulation, but here intra-articular injection of hydrocortisone is often to be preferred; (3) in tiding over an emergency in a patient with rheumatoid arthritis more or less under control, to cover a period of shock or fatigue, or in convalescence after a severe infection; (4) for the patient that is nearly, but not quite, capable of work, or recently bedridden as the after-effect of an illness, in order to assist rehabilitation to a

slightly higher but vital grade; and (5) for the patient whose condition in spite of all other treatment, rest, gold, etc., continues to deteriorate.

A questionnaire has recently been sent to 30 such cases who have received a course of injections of A.C.T.H. gel 20–30 mg. or A.C.T.H. 60 mg. daily for an average period of three weeks, the dose being gradually tailed off. The patients were asked in retrospect their opinions of the effect of their injections on their "rheumatism" and their general health. While realizing that this is an uncontrolled series of cases and only subjective criteria have been used, the results summarized in the table appear of some interest. In assessing these results it must, however, be remembered that all these cases were deteriorating before treatment in spite of several weeks' rest in hospital and having received all other accepted forms of treatment.

	Much Improved	Slightly Improved	Same	Worse	Total
<i>Joint and Rheumatic Pains</i>					
Directly after treatment	16	9	5	0	30
6 weeks after stopping treatment	8	8	6	8	30
3 months later	2	6	6	6	20
6 " "	2	3	5	4	14
<i>General Health</i>					
Directly after treatment	11	12	5	0	28
6 weeks after stopping treatment	11	6	9	2	28
3 months later	5	5	8	2	20
6 " "	4	2	6	2	14

The results from the questionnaire, from the point of view of general health and feeling of well-being, on the whole ran in parallel with the answers about rheumatic pain and disability. While feeling that the indiscriminate use of hormonal treatment in rheumatoid arthritis is to be condemned, these figures help to bear out a clinical impression that A.C.T.H. in small dosage for a short time may be of value in some of those cases that are progressively getting worse in spite of, and after utilizing, all other accepted methods of treatment.—I am, etc.,

Bath.

G. D. KERSLEY.

Treatment of Pernicious Anaemia

SIR.—A short while ago in this *Journal*,^{1,2} and later in the *Practitioner*,³ I drew attention to a small group of cases resistant to vitamin B₁₂ injections and parenteral liver extracts, which can be satisfactorily treated with oral proteolysed liver. Recently I have studied a further similar patient, and, as I think that these cases are important and have a bearing on research into the treatment of pernicious anaemia, I am now reporting the relevant clinical details of this case.

A female aged 41 first reported ill in May, 1953, giving a short history of diarrhoea, vomiting, lower abdominal pain, pallor, weakness, and dyspnoea on exertion. After admission to hospital it was found that there was slight pigmentation of the conjunctivae with pallor of the mucous membranes. No other physical signs were discovered. The following investigations were carried out to establish the diagnosis: red blood cells 1,920,000 per c.mm.; haemoglobin 44%; white blood cells 4,400 per c.mm. The differential white cell count being: polymorphonuclear cells 66%; lymphocytes 23%; monocytes 1%; eosinophils 10%. The marrow was extremely cellular. The red cell precursors consisted almost entirely of megaloblasts, while the myeloid series showed bizarre formation with atypical mitosis and giant metamyelocytes. The megakaryocytes appeared normal. Red cell fragility, within normal limits; direct Coombs test, negative; barium meal, negative; fractional test meal, no acid was found in the stomach, but after an injection of histamine traces of acid appeared; serum bilirubin, 0.5 mg.%; fat balance test, within normal limits.

A diagnosis of pernicious anaemia in relapse was made. Treatment was started with 100 µg. of vitamin B₁₂ given by intramuscular injection three times a week, and there was no response after 19 days. The red cell count and haemoglobin concentration continued to fall, so a potent intramuscular liver extract was given in doses of 2 ml. every third day, and within

six days a satisfactory reticulocyte peak of 21.4% occurred followed by a steady rise in the red cell count and haemoglobin concentration until the figures reached were 3,500,000 red cells per c.mm. and 60% haemoglobin. She continued to have weekly injections of this preparation and reported at regular intervals to the haematological clinic, where a gradual deterioration in the red cell count and haemoglobin concentration occurred during the next 15 weeks, until the figures reached were 1,540,000 per c.mm. and 38% respectively.

She was readmitted to hospital and fully reinvestigated and similar results were obtained as previously. A diagnosis of megaloblastic anaemia of the Addisonian type refractory to vitamin B₁₂ and parenteral liver extracts was made. Shortly after admission to hospital she was saturated with 1 mg. of vitamin B₁₂, followed by 100 µg. three times a week for 14 days, with no haematological response whatever. Proteolysed liver was substituted in doses of ½ oz. four times a day. On the fourth day there was a dramatic reticulocyte response, the figure remaining between 27% and 22% for the next three days. The marrow reverted to a normoblastic state and there was a gradual rise in the red cell count and haemoglobin concentration, and they are now within normal limits.

From a study of these brief clinical details it must be concluded that this is another example of megaloblastic anaemia distinguishable from Addisonian anaemia which is refractory to both vitamin B₁₂ and parenteral liver extracts and only responds to proteolysed liver by mouth.—I am, etc.,

Birmingham, 18.

R. O. GILLHESPY.

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- ¹ *British Medical Journal*, 1952, 2, 1204.
- ² *Ibid.*, 1953, 1, 332.
- ³ *Practitioner*, 1953, 171, 648.

Clergy and Doctors

SIR.—I wonder if I may, as an ordinary working clergyman of the Church of England, make a humble request for a far greater measure of co-operation betwixt the general practitioner and the parochial clergy. There seems little doubt that of late there has been an increasing awareness of the importance of the spiritual element in the human psyche, and the part it plays in a properly integrated physical and mental life. Yet so often one still encounters those old antagonisms on the part of medical men which are to my mind redolent rather of the 19th than the 20th century. Scathing comments about "the parson" are still made to patients, and letters addressed to them seeking help and co-operation remain unanswered.

If, of course, such conduct is based on a personal knowledge of the inadequacy of the minister and his lack of professional qualifications, much could be forgiven, but too often it is taken for granted that "the parson" is an incompetent without any effort being made to ascertain either who he is or what he is. I respectfully submit that the rift between the Church and the medical profession is one which must be removed if either is to do its appointed work in the healing of "the whole man." As in all "oecumenical movements," however, progress can only be made by a general willingness to take seriously the essential contributions of each to the common task. Similarly it must begin where the bulk of the work is done, in the hurly-burly of parish and practice.—I am, etc.,

Dorset.

TONY CLEMENS.

Animal Technicians

SIR.—With regard to your statement in the annotation (*Journal*, April 3, p. 808) that the animal technician should be of equal status with the medical laboratory technologist, while I have great respect for the animal technicians, and much sympathy with their efforts to increase their status, may I point out that they are after all only an offshoot of my profession? You yourself point out that for such workers to have a high standard of education is not important. The medical laboratory technologist must, however, have such an education before being even admitted as a student.

You refer also to the animal technician as "a new type of scientific assistant." The days when the medical laboratory technologist was merely an assistant are long gone—except perhaps in certain university laboratories. The work performed by the technologist nowadays is nearly always done without direction, and the subsequent reports are sent out on his responsibility. In fact he may surely, by now, be regarded as a scientist in his own right—albeit a junior one. A further relevant point is that the care of animals is included as an important part of the syllabus of the intermediate examination of the Institute of Medical Laboratory Technology, and I think it is true to say that the animal technician has only come into being because of the increased status of the medical laboratory technologist. Therefore I think that it must be admitted that, if a careful and unbiased study is made of the work and examinations of the medical laboratory technologist, it will be realized that he is of far higher status than a thwarted "groom or kennel maid."—I am, etc.,

St. Helens, Lancs.

A. E. BROWN.

SIR,—With regard to the annotation dealing with "Animal Technicians" (*Journal*, April 3, p. 808), I was staggered by its postulations and inference. To compare the status and training of these no doubt useful people to that of the medical laboratory technologist shows a most ill-informed and, to my mind, ridiculous conception of the work performed in pathological departments.

It must be obvious to all but the most conservative and die-hard of medical men that an extremely large proportion of all laboratory investigations and, in many cases, the interpretation of findings have passed, or are passing, from the domain of the pathologist to that of the technician. It will be found, particularly in the field of blood transfusion serology, that some of the greatest authorities in the country are not medical men but technologists. Doubtless these men would be astounded to learn that the knowledge of a subject which occupies so small a part of their intermediate examination entitles animal technicians to be considered co-equal to themselves. A cursory inspection of the requirements of the Institute of Medical Laboratory Technology would reveal a world of difference to those of the Animal Technicians' Association—a point not overlooked by the Minister of Health in his recent survey of auxiliary services.

Part of the duties of the senior grade technologist is to instruct those duly qualified medical officers who wish to become pathologists. It would seem, therefore, to be more justifiable to state that in many respects the technologist has, or should have, equal status to the pathologist. Since, however, we appear to have taken a retrograde step, after 40 years of progress, it can be taken as an example of the maxim "*Facilis descensus Averno*,"—I am, etc.,

Liverpool, 9.

F. MATHER.

Intravenous Iron

SIR,—Recent correspondence (*Journal*, March 6, pp. 583-4) suggests that Dr. J. A. Nissim's article (*Journal*, February 13, p. 352) on reactions following intravenous iron therapy was both timely and stimulating. Since 1947, one of us (F. F.) has given approximately 3,000 injections of iron saccharate, mainly in doses of 100 to 200 mg. Fe. The incidence of early, mild reactions was 0.2%, but we endorse Dr. Jeffrey's comments on the importance of an adequate injection technique. The pH of iron saccharate solutions is about 9.5 or greater, and they are hypertonic, which explains their thrombogenic and locally irritant properties. Slow administration is desirable, and dilution of the solution in the syringe with blood assists in this respect and reduces the risk of paravenous injection.

Dr. Nissim states that these solutions are stable in blood or plasma *in vitro*, although he has previously observed precipitation on lowering the pH of the mixtures.^{1,2} We found that rabbits' plasma containing the equivalent of 0.1% Fe as iron saccharate

immediately precipitated in the pH range of 7.5-7.7, and showed slight turbidity between pH 7.8 and 8.2. A plasma iron concentration of 0.005%, similar to that achieved immediately following a single intravenous dose of 200 mg. Fe (as iron saccharate) to an adult, resulted in initial turbidity over the pH range 6.5 to 7.0 and marked precipitation between pH 6.0 and 6.5. Similar results were obtained at 25° C. and 37° C. These findings might explain the higher incidence of reactions following rapid injection of doses exceeding the recommended maximum of 200 mg. Fe. We suggest that the relative instability of the complex in plasma, as the physiological pH is approached, contributes to *in vivo* precipitation in animals and reactions in man.

Nissim refers to Ramsey's³ suggestion that a sudden increase in reticulo-endothelial activity results in reactions. Although it is true that the administration of certain colloids in large doses to patients is frequently unattended by reactions, we feel that the rate of removal of the colloid, or some fraction of it, by the reticulo-endothelial system might be an important factor. Thus, when an iron complex tends to be unstable in the circulation, its removal is rapid compared with more stable preparations, and the rate of its disappearance is related to toxicity in animals. Since reactions sometimes follow the first administration of saccharated oxide of iron, it is difficult to believe that antigenicity alone is always responsible.

The mean LD₅₀ of 313 batches of iron saccharate solution was found to be 238 mg. Fe per kg. of body weight in mice (standard deviation ± 72). A standard batch repeatedly tested for five years was found to possess a mean LD₅₀ of 231 mg. Fe (standard deviation ± 64). It would appear, therefore, that the LD₅₀ values of Dr. Nissim's solutions (LD₅₀ 180 and 300 mg. Fe/kg. respectively) do not necessarily indicate a significant difference in toxicity and clinical safety. A heated, iron-free, sucrose solution (non-analar) treated as in the preparation of the iron complex, possessed an LD₅₀ > 17.5 g. sucrose/kg. in mice. It would therefore appear that this component does not contribute significantly to reactions, although acute lethal effects in animals are not always related to factors producing reactions in man.

Finally, we believe that this problem will be overcome by the discovery of more stable iron complexes, and especially solutions suitable for intramuscular administration. Since 1951 we have prepared several new iron complexes, one of which is approximately one-third as toxic in mice as iron saccharate solutions. It also possesses increased *in vivo* and *in vitro* stability and does not precipitate in plasma over a very wide pH range. The solution has a pH of 6.0 to 7.0 and is isotonic with tissue fluids, whilst containing the equivalent of 5% Fe. It is well tolerated intravenously or intramuscularly and well absorbed by the latter route, producing satisfactory remissions in hypochromic anaemia in animals and man. The detailed results of these investigations will be reported shortly.—We are, etc.,

FRANK FLETCHER.
E. LONDON.

Research Department, Benger's Ltd.

REFERENCES

- ¹ *Lancet*, 1949, 1, 686.
- ² *Guy's Hosp. Rep.*, 1953, 102, 164.
- ³ *British Medical Journal*, 1950, 1, 1109.

Physical Signs of Mesenteric Vascular Occlusion

SIR,—I have recently had under my care two cases of thrombosis of the superior mesenteric artery, which later came to necropsy. In both cases, on examining the abdomen before death, there was a dullness to percussion in the left iliac fossa and resonance in the right iliac fossa and hypochondrium. Although one might expect to find the abdominal wall covering the small bowel dull on percussion due to exudation of fluid into the cavity of the small bowel, it is less easy to explain why the caecum and ascending colon should remain resonant though gangrenous in both these cases. Perhaps it may be merely a question of the greater size and rigidity of the colon.

I should be interested to know whether others have found this a useful physical sign in differentiating the condition from perforated peptic ulcer or general peritonitis.—I am, etc.,

Carshalton, Surrey.

J. F. H. BULMAN.

Ferrous Sulphate Poisoning

SIR,—Following the recent cases of pyloric stenosis after ferrous sulphate poisoning, reported in the *Journal* (August 2, 1952, p. 285; November 28, 1953, p. 1200; and January 16, 1954, p. 156), the following case may be of interest.

On December 23, 1946, a boy aged 2½ was admitted to hospital with a history that he had swallowed approximately 25 of his mother's "fersolate" tablets at 12 noon that day. About one hour later he was screaming with severe abdominal pain which doubled him up. Two hours later he became semi-comatose and was brought to hospital. On examination he was very drowsy but could be roused. His stomach was washed out and a brownish fluid obtained. He subsequently had haematemesis at 3 p.m., 4 p.m., and 9 p.m. He then gradually improved, but on January 14, 1947, began to vomit again and peristalsis was observed in the epigastrium. He became dehydrated. He failed to improve on intravenous saline, suction from an indwelling gastric catheter, lavage with sodium bicarbonate, and atropine methonitrate ("eumydrin"). Accordingly, on January 29, 1947, the child was operated on and a posterior gastro-enterostomy performed. The surgeon noticed a dark blue, semi-necrotic mass of mucous membrane occupying only the distal third of the stomach; the upper two-thirds of the gastric mucosa seemed to be fairly normal. He made an uninterupted recovery. Five years later, March 4, 1952, a barium meal showed that no barium passed the pylorus and that all emptying was taking place by the stoma. I last examined him on January 29, 1953, when he was keeping very well, had no digestive symptoms, and his height and weight were within normal limits. He has also a congenital heart lesion (subaortic stenosis).

This case is similar to those mentioned at the beginning of this letter in that the pyloric end of the stomach was mainly involved, leading to stenosis. I wish to support others who have written to emphasize the need to try and prevent these cases of poisoning with ferrous sulphate. I note that Professor A. G. Watkins and Drs. P. T. Bray and O. P. Gray have seen 15 cases in their department in the past 7 years (*Journal*, February 6, p. 335). It is not sufficient safeguard to state on the label of the bottle that the tablets are dangerous to young children. Dr. I. O. B. Spencer in his excellent article on the subject (*Journal*, November 10, 1951, p. 1112) has suggested wrapping the tablets separately and securely in small packets, and he daily dose separately and securely in small packets, and he mentions that in the German Army Medical Service nearly all tablets were supplied in packets of five. This suggestion seems to have passed unheeded so far by the manufacturers. An alternative suggestion is to make the pills less palatable for children. Some manufacturers now incorporate a bitter substance in the coating of their pills—for example, some of the antihistamine drugs. This practice could be extended to all such pills which have the appearance of children's sweets, and I do not believe this will stop adults swallowing them for therapeutic purposes.

The above case was originally treated by Dr. E. J. Glynn and Mr. N. L. Shepperd. I have only seen the child recently and I thank them for allowing me to publish the details.—I am, etc.,

Bexhill.

LESLIE SCOTT.

"What's What's Syndrome"

SIR,—On opening the *Journal* these days we often see case reports of, shall we say, "What's What's" syndrome associated with gout or "Istheresucha's" syndrome with the less psittacosis, etc. Might I appeal for a definition of the less widely known (e.g., Raynaud's) syndromes by writers referring to them? Too often correspondents either assume that their readers know what they are writing about, or perhaps attempt to impress the less informed. A very recent encyclopaedia is not always at hand to enlighten us, and in one of your recent issues two syndromes were referred to, neither of which is mentioned in a recently published textbook of medicine consisting of over 2,000 pages. Little extra space would be required for a brief statement by your correspondents of what constitutes the syndrome to which they refer. May I enlist their sympathy?—I am, etc.,

Cardiff.

LAMBERT ROGERS.

Cancer of Uterus

SIR,—The letter of Dr. Robert P. Towers (*Journal*, March 20, p. 704) and the paper by Dr. J. W. Magner and Professor W. Kearney (*Journal*, February 20, p. 434) on the relative incidence of carcinoma of the uterine body and cervix prompt us to submit the corresponding figures for East Kent, based on material examined histologically during the period January, 1951, to the present day.

One hundred and twenty primary uterine cancers were encountered. Eighty-one were of cervical origin (80 epidermoid carcinomas and 1 adenocarcinoma) and 39 were endometrial adenocarcinomas, 3 showing extensive epidermoid metaplasia. This 2:1 ratio of cervical to corporeal carcinoma occupies an intermediate position between those recorded in most textbooks and those given by your contributors, who found an equal incidence or a preponderance of endometrial tumours. The material was drawn from a mixed urban and rural community which includes the full range of socio-economic groups. Care has been taken to exclude from our totals cases of carcinoma (all cervical) who attended the radiotherapeutic centre from localities outside the specified area.

We feel that our findings are probably representative of the relative frequency of these two types of carcinoma throughout the country, but evidence from other areas is needed before a conclusion on this point can be reached.—We are, etc.,

Canterbury.
Thaxet.G. B. FORBES.
H. STERNDAL.

Smoking and Mouth Cancer

SIR,—In commenting on my article "Cancer of the Tongue, Mouth, and Pharynx: Sex Differences in Prognosis following Radiotherapy" (*Journal*, February 20, p. 430), Dr. Phyllis Wade, using lung cancer as an analogy, expresses the opinion (*Journal*, March 27, p. 761) that "prognostic differences which appear to be linked with sex or age could be due, wholly or in part, to differences in smoking habit and/or duration of smoking."

Had my observation been limited to this particular study I should have shared Dr. Wade's opinion and added the smoking factor to the other suggestions described as "three obvious lines of inquiry." It seemed to me, however, that, for the situation to be analogous with lung, one would expect to see not only the worse response to treatment already demonstrated in male patients, but also an increased incidence.

It was stated in the article that incidence rates and their changing pattern (based on a population of approximately 4½ million) are the subject of a separate survey in course of preparation. Measured over an interval of a decade by the calculation of a comparative morbidity index to evaluate the effect of changes in the age-constitution of the population, this survey will show a marked decrease in cancer of the tongue and mouth in men, a substantial increase in women (a trend concealed largely in mortality rates because of the better response to treatment), and an appreciable increase in cancer of the pharynx in both sexes.

Faced with these conflicting trends in incidence and behaviour, I felt loath at this stage to put forward smoking habits as a possible explanation of the difference in results between men and women. Nevertheless, although the picture seems rather complex to me at present, this is not to say that Dr. Wade's suggestion may not prove to be a useful line of investigation.—I am, etc.,

Manchester, 20.

MARION H. RUSSELL.

Recurrent Intussusception in Children

SIR,—The article by Mr. D. A. Macfarlane and Mr. L. P. Thomas on "Recurrent Intussusception in Children" (*Journal*, March 6, p. 559) prompts me to record the experience with this condition at the Royal Belfast Hospital for Sick Children.

While reviewing the results in 200 consecutive cases of acute intussusception admitted over a ten-year period (1943-52), I found that 12 of these young patients had had recurrences, one little girl having had three separate intussusceptions in as many weeks. In four other cases there were histories very suggestive of a previous attack, but not confirmed by operation. Nine of the 12 proven cases were in boys, and two-thirds of the patients were more than 1 year of age—in the entire series of 200 acute intussusceptions, three-quarters of the patients were aged 1 year or less. The interval between attacks varied from 5 days to 19 months, with an average of 6 months, and in only one case was a possible aetiological agent found at the second operation. Two of the patients had had a brother or sister who also had suffered from intussusception, and in half the cases recurrence took place at a different site. All 12 patients survived, although one boy had a burst abdomen—probably the skin stitches should be left in a little longer than usual to prevent a complete breakdown of the wound. Fraser¹ reported a case (not included here) from this hospital of a girl of 2½ years who had had an intussusception on four separate occasions, and Hipsley (quoted by Clubbe²) had a similar case. Wansbrough and Cram³ have also reported a case which recurred three times, and another which recurred four times, but gave no details apart from stating that the recurrences did not take place in the immediate post-operative period.

Your contributors point out that in most cases the aetiology of intussusception is unknown, and theories blaming weaning, etc., have gained credence more by repetition than by any scientific proof. The enlarged glands so often found in many ways resemble those of non-specific mesenteric adenitis of older children, and if they played any part in the aetiology their continued presence might explain the recurrences. Gross⁴ thinks that an enlarged ileo-caecal valve may be responsible and advises the removal of the ileo-caecal part of the bowel if there has been a recurrence, although he is against preventive operations in the treatment of first attacks of intussusception.—I am, etc.,

Belfast.

JAMES KYLE.

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- ¹ *Lancet*, 1939, 1, 874.
- ² *Diagnosis and Treatment of Intussusception*. 1921. Hodder and Stoughton, London.
- ³ *Surgery of Infancy and Childhood*, 1953. Saunders, Philadelphia and London.
- ⁴ *Canad. med. Ass. J.*, 1952, 67, 307.

Burns and the Adrenal

SIR,—Dr. H. F. West's criticism (*Journal*, March 27, p. 763) that my paper on "Adrenocortical Function in Burned Patients" (*Journal*, March 6, p. 541) "does little to clarify the indications for cortisone therapy" requires an answer. The uses of cortisone may be divided into two main groups. First, there are uses based on the physiological correction of a known endocrine deficiency, such as in the treatment of Addison's disease, and, secondly, there are uses based on the pharmacological (may I say "non-specific"?) action of the drug in conditions like rheumatoid arthritis, in which there is no evidence of adrenocortical failure.

In the opening sentence of my article I stated: "This paper is concerned with the activity of the adrenal cortex of burned patients, and in particular with a search for evidence of adrenocortical failure arising during the illness"—in other words, with indications for "replacement" therapy. The pharmacological or non-specific use of the drug in burned patients was outside the scope of the paper. In my opinion only a carefully-controlled clinical trial, involving many patients, could answer whether cortisone is or is not a life-saving measure in some burned patients. This has not been answered in the enthusiastic reports, mainly from the U.S.A., involving the treatment of a few patients. My information is that the initial enthusiasm has waned as experience has grown. It should not be forgotten that cortisone therapy is not without potential danger. A large burn becomes an extensive open wound infected with various bacteria. The infection is difficult enough to control with modern antibiotics, and cortisone therapy might well increase the number of septicæmic complications and the fatality rate.

Both Dr. West and Dr. J. A. Strong (p. 763) make certain criticisms of the methods I used in determining adrenocortical activity. I agree that any indirect method, including those based on changes in the blood eosinophil count, is open to fallacies. So too are the urinary steroid estimations advocated by Dr. West. While such estimations have their use and place, they are even less reliable than the blood eosinophil count. For example, only a very small (about 1%) and apparently variable fraction of parenterally administered cortisone can be recovered from the urine. Only results based on a satisfactory, direct method of determining the changes in the corticoid level of the blood after burning will be free from these criticisms. Such an investigation using polarography is taking place elsewhere in Britain, the results of which will be interesting to compare with my indirect evidence based on the eosinophil count.

Dr. Strong states: "There must be few who regard subcutaneous or intramuscular adrenaline as an adequate adrenocortical stimulus." This is rather surprising, since there is abundant evidence that adrenaline can stimulate the production of A.C.T.H. by the anterior pituitary and thereby induce hyperactivity of the adrenal cortex.¹⁻³ Indeed, the eosinopenia occurring after subcutaneous adrenaline in some adrenalectomized mice can be correlated with the presence of accessory adrenals or with adrenal remnants⁴ and subcutaneous adrenaline is advocated as a test of completeness of adrenalectomy.⁵ Moreover, adrenaline does not have a direct eosinopenic effect on eosinophil leucocytes, since it fails to reduce the eosinophil count in totally adrenalectomized animals. We can safely conclude that eosinopenia following subcutaneous injection of adrenaline into animals with intact adrenals is due to stimulation of the adrenal cortex. The difference of real opinion is in interpreting how much of the eosinopenic activity is due to indirect stimulation of the adrenal cortex (via the pituitary) and how much is due to direct stimulation of the gland. While there is general agreement that adrenaline stimulates the production or release of A.C.T.H., some workers claim that the eosinopenic activity of adrenaline is not entirely due to the release of A.C.T.H. and that adrenaline may directly stimulate the adrenal cortex in hypophysectomized mice.^{6,7} Consequently the difficulty of the adrenaline test is in interpreting how much of the eosinopenia is due to direct stimulation and how much is due to indirect stimulation of the adrenal cortex. In this connexion, the dosage of adrenaline may play an important part. Large doses may directly stimulate the gland, while smaller doses fail to do so. Consequently the dose of 0.3 mg. of adrenaline—a small dose was eliminated the direct stimulatory effect of adrenaline and to increase the selectivity of the adrenaline as an indirect stimulator of the adrenal cortex.

The two patients giving abnormal results with adrenaline were considered worthy of report because repeated tests failed to produce satisfactory eosinopenia during a phase of mental abnormality, and because later the adrenaline became eosinopenic when the mental condition of the children was returning, or had returned, to normal. Would Dr. Strong and Dr. West not agree that the 12 patients in whom the A.C.T.H. tests gave normal results had more stimutable reserves of the adrenal cortex? Would they not agree that the post-burn phase of eosinopenia which occurs in all patients indicates adrenocortical hyperactivity? The interpretations of the abnormal results in two patients were, I had hoped, critically and cautiously dealt with: against adrenocortical failure (Cases 30 and 52). Inactivation of the injected A.C.T.H. may well have been the cause of the abnormal results obtained in Case 52, as there was no other evidence supporting adrenocortical failure.

May I criticize your annotation of my paper (p. 572)? I believe that the main conclusion should be, not "that there is a case for treating some burned patients with cortisone," but that 90% or more of burned patients do not require replacement therapy either with cortisone or A.C.T.H. Finally you state that "patients were found in whom intravenous adrenaline was ineffective" (my italics). This is incorrect: adrenaline was used subcutaneously or intramuscularly.—I am, etc.,

Birmingham, 15.

SIMON SEVITT.

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Fructose in Diabetes Mellitus

SIR,—In your annotation (*Journal*, February 27, p. 510) concerning the intravenous administration of fructose, you state that "fructose may prove to be a more useful sugar in conditions where glucose has a time-honoured place—for example, in the treatment of hypoglycaemia." It is the purpose of this letter to draw attention to another hexose sugar that merits study—namely, mannose.

Mannose is slowly absorbed from the gastro-intestinal tract, but if given intravenously there is every evidence that it is well utilized and capable of forming glycogen in the liver and muscles. As long ago as 1924 mannose was shown to be as effective as glucose, and much better than fructose, in preventing the symptoms of insulin hypoglycaemia in experimental animals.¹ Moreover, like fructose but not like glucose, mannose disappears rapidly from the blood stream in the absence of insulin.² It is as effective as either glucose or fructose in supporting the respiration of isolated brain tissue.³ Mannose is as good as glucose, and much better than fructose, in supporting the metabolic turnover of pentosenucleic acid⁴ and phospholipid⁵ in respiring brain slices. Mannose, like glucose and unlike fructose, can maintain the life of an animal after the removal of the liver⁶ and, again like glucose and unlike fructose, can restore to normal the changes in the electro-encephalogram observed during the progressive hypoglycaemia in hepatectomized animals.⁷

The evidence is that insulin is not necessary for the peripheral utilization of either fructose or mannose, but that mannose, possibly because of its greater affinity for the brain phosphorylating enzyme, hexokinase,⁸ is much more effective in maintaining cerebral functions. It is to be hoped that in any further trials conducted along the lines suggested in your annotation mannose, as well as fructose, will be investigated.—I am, etc.,

London, Canada.

R. J. ROSSITER.

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Congenital Hydrocephalus and Vitamin-A Deficiency

SIR,—Having worked for some years on vitamin-A deficiency,¹ I may perhaps comment on your annotation (*Journal*, April 3, p. 809). Your annotator rightly and cautiously underlines the importance of vitamin-A deficiency in the production of hydrocephalus in all 16 rabbits used in the Cambridge experiment.² However, most of the recent experimental work in this field has been carried out on rats. The offspring exhibited in decreasing frequency congenital defects of the eyes, diaphragm, urogenital system, aortic arch, and heart; administration of vitamin A to the deficient mothers at progressively earlier times during pregnancy resulted in a progressive decrease in the rate of malformations.³ It was therefore surprising to learn⁴ that an excessive intake of vitamin A in rats from the second to the sixteenth day of pregnancy causes gross developmental abnormality of the skull with an extrusion of the brain to the external surface of the head as well as more sporadic congenital abnormalities. As the quantity of vitamin A, not only its absence, in the antenatal diet seems to have an important influence on congenital defects, would it not be instructive to repeat the Cambridge experiments with an overdose of vitamin A?—I am, etc.,

London, W.1.

Z. A. LEITNER.

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Undescended Testicles

SIR,—Dr. G. I. M. Swyer (*Journal*, April 3, p. 815) attacks Dr. N. S. Craig's letter (*Journal*, March 20, p. 706) as being reminiscent of a mediaeval schoolman because, in support of his opinion that hormone treatment of undescended testicles is futile, he follows the universal practice of scientists and quotes published work. What else is he to do? If Dr. Swyer follows up the references he has been given, he will find he is being referred not to opinion nor to authority, but to questions of verifiable fact, that is to say, of gross anatomy. The best way of stopping this method of treatment would be to get its enthusiasts (preferably accompanied by professors of anatomy) into the operating theatre, and there demonstrate to them the structure of the region they treat, and in particular the misconception on which their treatment depends. In my experience, however, this is impossible; and I would suggest that what is really reminiscent of mediaeval theologians is a refusal to examine the truth of statements which conflict with one's own opinions.

I see two or three cases every week which have been diagnosed as "undescended testicles." Of these some 80% are demonstrably normal, that is to say the testicles can, by those who know how to do it, be brought well into the scrotum. The less anatomical knowledge a practitioner has, the less skill in palpation, and the earlier he tackles these cases, the more "cryptorchids" he will find: there should also be a significant increase during spells of cold weather. Quite a number of these normal cases are sent along for operation because hormones have made no difference in their condition; when left alone the testicles take the normal adult position in their own good time. In my experience hormones are quite unreliable as a means of distinguishing the congenital deformities which need operation from the delayed descent which does not.

Originally hormones were written up as a cure for all varieties of cryptorchidism, and testicles were regularly reported as being brought out of the inguinal canal and the abdomen. In fact I have just received a commercial puff which advises that the testicle should not be brought out of the abdomen too rapidly, in order to give time for the processus vaginalis to close behind it in its flight. One early writer stated that so powerful was the action that he had known the testicle descend twenty minutes after the injection: in default of more exact information of what Dr. Swyer means by curing cases "there and then," I regard this as the record.

However, since I described the retractile testicle, and stated that hormone successes only occurred in this variety,¹ these claims are gradually being abandoned. Now hormones are used to distinguish between ectopic and retractile varieties, on the principle that if the treatment succeeds it is shown to have been unnecessary. I see a number of unilateral cases with one testicle well down in the scrotum which have had hormone treatment, apparently on the notion that in their case the natural substances have been confined to one side of the body. In two seen recently injections had gone on for three and four years respectively before hope and finance failed. As to the psychological aspect, worry about the absence of testes from the scrotum is unknown in the small children whose treatment is being advocated, whereas terror and distress are invariably caused by regularly recurring needle pricks. Worry about non-descent comes on late in development when nearly all cases are in need of surgery; it is curiously rare in any event.

Regarding the claim that in the congenital deformities the cord is lengthened by hormone treatment and facilitates operation, I have never found this effect myself, even after years of injections. I should be grateful for a reference to any exact work on this subject. I do know, however, of some interesting though alarming reports of the effect of hormones on the spermatogenic cells of the rats on whom the original work was founded.—I am, etc.,

London, W.1.

DENIS BROWNE.

REFERENCE

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The Sickle-cell Trait and Sickle-cell Anaemia

SIR.—It is unlikely that any one factor by itself will represent the complete answer to the question why a potentially lethal gene can survive at a high incidence. The particular purpose of this letter is to prevent workers in this field from neglecting three approaches:

(1) *The Anthropological Importance of the Sickling Gene.*—The fact that a gene has a selective value and that its frequency may be influenced by known external conditions such as malaria (Allison¹) does not deter from the fact that knowledge of its distribution will be of value in anthropology. One might as well deny the anthropological value of skin-colour determination on the basis of its being accepted that the pigmentation of a race depends on the climate where this race has been living. All genes exist for one reason or another, and those which we think to be neutral are merely genes of which we have not yet been able to recognize the part they play in evolution. The population of Africa changes rapidly, and tribal barriers may disappear within the next few years. It is hoped that collectors of sickling data will continue to take into account the anthropological classification of the people they investigate.

(2) *The Homozygous-Sickle-cell Anaemia, Heterozygous-Sickle-cell Trait Theory.*—While a very severe sickle-cell anaemia patient will be homozygous for the S gene and a perfectly healthy and normal sickler a heterozygote, there will be a variety of intermediate states. There are factors of which we know yet little (modifiers) which determine the actual quantity of the S haemoglobin in different individuals. Why, for instance, is the proportion of S haemoglobin <50% in S-heterozygotes with normal, and >50% in S-heterozygotes with C haemoglobin? There are other factors which determine that one sickle-cell anaemia patient suffers more from crises than another with the same haemoglobin level. Dr. Edington² has reported that in his experience a sickle-cell anaemia patient may cease having crisis attacks, and I have already commented³ why I thought that this finding might help in explaining that in some areas a discrepancy exists between the number of sickle-cell disease diagnoses and the calculated incidence of S-homozygotes. In the United States I was impressed by the number of known sickle-cell anaemia patients—adults of both sexes and parents of children who had a persistently lowered haemoglobin level of about 9–11 g.%, but who had otherwise no complaints. Such individuals—presumably homozygotes—are not discovered easily, and to search for them in Africa will require careful surveys. A past history (of crises) which would help in recognizing them is rarely available in Africa. Family studies are often quite impossible and the chemical proof of homozygosity by determining the percentage of S-haemoglobin has only recently come to hand. It is therefore likely that more such people exist in Africa and that they hitherto escaped attention. I believe, in retrospect, that I have seen such individuals in Uganda and for that matter in India. Perhaps some of the cases described by Foy⁴ belong to this category. On the other hand, Dr. Edington (*Journal*, April 10, p. 871) is not convinced that sickle-cell crises may not occur in heterozygous individuals. There certainly exists in the United States increasing evidence for yet another condition, a specific intermittent haematuria of sickle-cell trait carriers. No sickle-cell disease patient should be classified as a homozygote unless this has been borne out at least by chemical determination of the haemoglobin composition and if possible also by a family study.

(3) *The Role of Malaria in Maintaining a High Sickling Frequency.*—Edington² and for that matter Choremis and his colleagues⁵ have both claimed the reverse of Brain's⁶ and Allison's⁷ suggestion that there was evidence for Raper's⁸ tentative proposal that sickling protected against malaria (see also Mackey and Viverelli, *Journal*, January 30, p. 276). They stated that malaria seemed to precipitate sickle-cell crises. It is not necessary to assume that such influence of malaria on sickling conditions should necessarily be disadvantageous. Here again it will be important that one should clearly differentiate between sickle-cell anaemia by itself and the anaemia plus the deleterious crisis, the sickle-cell disease. It is striking that sickle-cell disease is found to be frequent where sickling exists in the absence of malaria or where malaria has recently been eradicated: in the U.S.A., in the Lake Kopais area of Greece, and in the last years in certain townships of Africa. Yet although I was shown many sick infants in the Nilgiri hills in India, where malaria incidence is high, I did not see one with sickle-cell crises. It may be said that areas where malaria has been exterminated are also places where medical services are above average and the diagnosis of sickle-cell crisis will be made more often because of better medical facilities. This can hardly explain why an experienced child specialist should be unable to find at any frequency patients with

sickle-cell crises at the most important hospital of Nigeria and yet be able to diagnose the condition in large numbers of people at the University Hospital of Jamaica.⁹ If malaria were to have a protective effect against, or a beneficial modifying effect on, sickle-cell anaemia and sickle-cell crisis, this would be another factor helping in sustaining the gene in malarious areas at a higher frequency than one might expect. Sickle-cell crisis where established has such a serious prognosis that the exploration of any possible beneficially modifying agent would be justified.

There will now be a number of investigations such as Dr. Edington's evaluating elsewhere Dr. Allison's findings in East Africa. I would like to plead that an open mind should be kept as to whether malaria could maintain sickle haemoglobin frequency not only by preferentially killing off the non-sickling homozygotes but also by diminishing the disadvantages of the gene in the sickling individuals.—I am, etc.,

London, E.C.1.

H. LEHMANN.

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International Nomenclature for ABO Groups

SIR.—Dr. W. Smith (*Journal*, March 13, p. 643) will be interested to know that there is international agreement regarding the nomenclature of the sera used for ABO blood group testing. The World Health Organization set up two international standard sera for ABO blood grouping in 1950¹; these are called anti-A and anti-B, and many countries, including the United Kingdom, have similarly named national standards. All sera for ABO grouping issued by the Blood Group Reference Laboratory have been labelled in this way since 1946, and the same nomenclature was in general use in this country throughout the war. The "Minimum Requirements" of the National Institute of Health, Washington, D.C., U.S.A., which corresponds roughly to the Therapeutic Substances Regulations in this country, have used the nomenclature anti-A and anti-B at least since 1946.—I am, etc.,

London, S.W.1.

A. E. MOURANT.

REFERENCE

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The Longevity of Cambridge Sportsmen

SIR.—Sir Alan Rook in his admirable report (*Journal*, April 3, p. 773) has shown why his conclusions are tentative. It could also be argued that the athletic group on entering the university would reasonably be expected to live longer than the control group if it did not participate in strenuous sport. I do not suggest this was the case and obviously this aspect cannot be tested. The conclusions therefore must be tentative. I am, etc.,

New Barnet, Herts.

L. L. WYNN JONES.

Osler Memorial Tablet

SIR.—I read the letter from Dr. L. Carlyle Lyon in your columns in 1952¹ about the placing of an Osler Memorial tablet on his old home in Oxford. Visiting Oxford the other day, I looked in vain for a tablet or plaque on the exterior of No. 13, Norham Gardens, commemorative of the fact that the late Sir William Osler, whom it is no exaggeration to describe as "the world's best doctor," lived there during the whole of his tenure of the chair of medicine at the University till his death in December, 1919.

I beg to request the small amount of space required in your columns to bring this matter, for necessary action, to the notice of all who share my view—I feel they must be many.—I am, etc.,

Tilbury.

JOHN S. MEIGHAN.

REFERENCE

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Obituary

W. H. S. NICKERSON, V.C., C.B., C.M.G.
M.B., D.P.H.

Major-General W. H. S. Nickerson, who was awarded the Victoria Cross during the South African War, died at his home at Kintyre, Argyllshire, on April 10 at the age of 79.

William Henry Snyder Nickerson was born at New Brunswick, Canada, on March 27, 1875, the son of the Reverend D. Nickerson, who was an Army chaplain. From Portsmouth Grammar School he went on to study medicine at Owens College, Manchester, and graduated M.B., Ch.B. from the Victoria University of Manchester in 1896. Two years later he entered the R.A.M.C. as a lieutenant, and served throughout the war in South Africa from 1899 to 1902, winning the Victoria Cross at Wakkerstroom on April 20, 1900. According to the citation, "Lieutenant Nickerson went, in the most gallant manner, under a heavy rifle and shell fire, to attend a wounded man, dressed his wounds, and remained with him till he had him conveyed to a place of safety."

When war broke out in Europe in 1914 Nickerson, who had by then attained his majority, served with the cavalry in the retreat from Antwerp, and saw further action in the first and second battles of Ypres, at Neuve Chapelle, and on the Somme. Later he served in Salonika. He was mentioned in dispatches six times, promoted to brevet colonel, appointed C.M.G. for his war services in 1916, and C.B. for service in the Black Sea theatre of the war in 1919, in which year he was also awarded the Greek Medal for Military Merit. His promotion was exceptionally rapid all through his Army career, and he was made a major-general at such a young age that when he had served in that rank for the statutory period he was permitted to continue in it for another four years. In 1927 he was appointed Director of Medical Services in India, in succession to the late Sir Walter H. Ogilvie. He was an honorary surgeon to the King from 1925 to 1933, the year he retired. During the last war Major-General Nickerson served variously as a medical officer in an Atlantic convoy, in the Port of London Authority's river emergency service, and in the Home Guard. He married Miss Nan Waller in 1919, and she survives him, together with the son and daughter of the marriage.

Mr. A. E. WYNNE, who died at his home at Margate, Kent, on February 7, was for many years anaesthetist at the Incorporated Dental Hospital of Ireland in Dublin. He was 88 years of age. Albert Edward Wynne was born at Birmingham on September 14, 1865, and had a distinguished career, both academically and on the sports field, at King Edward VI School before he went on to Trinity College, Dublin, to study medicine. He qualified L.A.H. in 1890, taking the Scottish triple qualification in the same year. In 1900 he was elected a Fellow of the Royal College of Surgeons in Ireland, and seven years later he proceeded to the degrees of M.A. and M.D. In Dublin he combined the work of a busy general practice with that of anaesthetist to the Dental Hospital, where he will be long remembered. He continued in practice until his 70th year, when he retired to live at Margate to be near his son, Mr. W. E. C. Wynne, a general surgeon at the Ramsgate and Margate General Hospitals. During the first world war he served as a captain in the R.A.M.C. and acted as assistant surgeon to Drumcondra Hospital. He is survived by his son, Mrs. Wynne having died in 1948.

Dr. CHARLES MELVILLE died on March 25 at the age of 57 after a long illness. Born at Falkirk, he studied medicine at Glasgow University and graduated M.B., Ch.B. in 1920, his studies being interrupted by a period of service in the Army during the first world war. In 1922 he entered general practice at Grangemouth, but managed to continue his studies and took the D.P.H. in 1925. Later he became assistant in the Ear, Nose, and Throat Department of Falkirk Royal Infirmary, and on the retirement of his chief, Dr. George B. Brand, took over full charge of the department. He carried on this work in addition to that of his general practice until the advent of the National Health Service, when he resigned from his practice to devote himself to consultant work. In 1951 the onset of a vascular lesion forced him to give up all active work.

Dr. G. M. FERGUSON writes: Dr. Melville was one of the most widely known and respected members of the profession in central Scotland. As a busy general practitioner for 26 years in Grangemouth, he gained the confidence and affection of his patients for his continuous devotion to their interests, and later as a consultant he merited and obtained the gratitude and trust of his colleagues. He took a leading and energetic part in the affairs of the B.M.A. during most of his career. His work for its charities and as a member of a number of its committees, and his services as chairman of the local panel committee, were recognized in 1948 by a presentation from his colleagues. In the same year he was elected vice-chairman of the executive council, a post which he held until his illness. He was honorary secretary of the Stirling Branch of the B.M.A. from 1927 to 1932 and president of the Branch in 1934–5. He also represented his constituency at eleven Representative Meetings from 1937 to 1948. Dr. Melville was also well known in the world of cricket, captaining both his university and county teams in his younger days and playing for Scotland against the Australians on one occasion. In addition he was an expert angler and deeply interested himself in his later years in the study of bird life. In spite of all these activities, his main interest was always centred in his work, and even during his last illness his greatest desire was to be allowed to continue that work. He had a strong sense of duty, and was a loyal colleague and a trusted friend, unsparing of his own time and health in the service of his patients. His loss will be widely mourned. He is survived by his wife and daughter, both medical graduates, and a son, to all of whom deep sympathy is extended.

Medico-Legal

VICARIOUS RESPONSIBILITY OF HOSPITAL AUTHORITIES

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

The vexed question of the vicarious responsibility of hospital authorities for the negligence of various members of the hospital staff was once more canvassed in the Court of Appeal in the case of *Roe and Woolley v. Minister of Health*,¹ although the appeal was dismissed on grounds which involved no decision upon it.

At the trial Mr. Justice McNair had decided that, if Dr. Graham had been negligent—though in fact the judge found he had not been—the hospital authority would not have been vicariously liable for his negligence. Dr. Graham's position was that he was visiting anaesthetist to the hospital, paid from a fund set aside for the purpose from the hospital funds, and under an obligation with another doctor to provide regular anaesthetic services. Mr. Justice McNair considered that his position was equivalent to that of "consulting physicians and surgeons," and based his decision that the hospital authority as employer was not responsible if Dr. Graham had been negligent on the judgments of Lord Greene in *Gold v. Essex C.C.*² and of

Lord Justice Somervell and Lord Justice Morris in *Cassidy v. Ministry of Health*.^{1,2} He impliedly rejected the judgment in *Cassidy's case* of Lord Justice Denning, which was based upon broader grounds than those of Lords Justices Somervell and Morris. Lord Justice Denning had decided that, since the hospital authority is under a duty of care towards the patient, it cannot escape liability by delegating the performance of the duty to a consultant employed under a "contract for services" any more than by delegating it to a house-surgeon employed under a "contract of service."

In his judgment in the Court of Appeal in *Roe and Woolley's case* Lord Justice Somervell decided that Mr. Justice McNair had been wrong in holding that Dr. Graham was in a position similar to a consultant. In his view the anaesthetists were in the same position as the house-surgeon in *Cassidy's case*. The Lord Justice did not deal with the matter on the wider ground on which Lord Justice Denning had based his judgment in *Cassidy's case*. Lord Justice Denning, consistently with his previous judgment in *Cassidy's case*, held that Mr. Justice McNair was wrong because the hospital authority was vicariously responsible for the negligence of the whole of its staff. Lord Justice Somervell added that the position of hospitals in this respect under the National Health Service Act might be different from that of voluntary or municipal hospitals and would have to be decided when it arose.

By the decision of this appeal the law in England is left where it was left by *Cassidy's case*, and it remains to be seen whether, if the hospital authority's vicarious responsibility for consultants were litigated to the House of Lords, the House would adopt the wider principle as exemplified in the judgments of Lord Justice Denning.

The law as applied in Scotland is the very reverse, and is still based on Lord President Clyde's judgment in *Reidford v. Magistrates of Aberdeen* in 1933, that—

"All the managers undertake to provide an efficient, heated, clean, wholesome sick-house, equipped with the necessary furniture and fittings for the reception of patients; to employ a competent staff; and to provide the necessary medicine and food. But they do not, as I understand any conceivable view of their functions, undertake to treat or to dose or to operate upon any of those who come into their institution."

This sturdy view is broadly the same as had been taken in *Hillyer's case*³ in England. Although attractive, it leads to the sort of logical difficulties expressed by Lord Goddard in *Gold's case*, where he said: "I cannot understand on what principle a hospital authority is to be exempt from liability if a nurse carelessly administers a dose of poison to a patient instead of medicine, and yet is liable if the cook mixes some deleterious substance in the patient's food."

Although in many fields the law of England and the law of Scotland are wholly different, negligence is not in theory one of those fields. It is evidently high time some gallant litigant on one side of the Border or the other appealed to the House of Lords to give that august tribunal the opportunity to resolve the conflict.

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- ⁵ [1909], 2 K.B. 820.

The Services

Major-General A. G. Harsant, C.B., O.B.E., late R.A.M.C., has relinquished his appointment as Director of Surgery and Consulting Surgeon to the Army.

Lieutenant-Colonel J. D. Galloway, R.C.A.M.C., has been appointed O.B.E. (Military Division) in recognition of gallant and distinguished services in Korea.

Colonel F. R. Langmaid, O.B.E., T.D., R.A.M.C., T.A., has been appointed Honorary Physician to the Queen in succession to Colonel F. R. Sandford, C.B.E., M.C., T.D., who has been transferred to the T.A.R.O.

Medical Notes in Parliament

Welfare Foods

Sir GUY LLOYD (Renfrew, East, Con.) asked the Minister of Food what were the proportions of welfare foods available through his department for children and expectant mothers that were being taken up. Major LLOYD GEORGE stated on April 12 that about 97% of those entitled to obtain milk or national dried milk under the welfare foods service did so. The quantities of the vitamin supplements taken up in 1953 expressed as a proportion of the full entitlement were as follows: orange juice 29.4%; cod-liver oil 23.8%; vitamin tablets 32.6%. The percentage of persons who obtained the vitamin supplements was higher than these figures suggested, because many did not take up their full entitlement.

Clean Food Rules

Lieut.-Col. M. LIPTON (Brixton, Lab.) asked the Minister of Food on April 14 what representations he had received from the National Caterers' Federation relating to the Food and Drugs (Amendment) Bill, and what reply he had sent. Dr. CHARLES HILL, the Parliamentary Secretary, said that the department received a letter and memorandum from the Federation on March 16 expressing certain views about the new legislation and suggesting further consultation with trade interests about the form of public food hygiene regulations. They attended a conference on April 5 and made a number of points, which would be carefully considered.

Iodized Salt

Mr. J. B. HYND (Sheffield, Attercliffe, Lab.) asked the Minister of Food whether he had considered, in connexion with the proposed legislation for the compulsory use of iodized salt, the number of people who were allergic to iodine, and whether he would give the House assurances on their behalf. Dr. CHARLES HILL, the Parliamentary Secretary, replied on April 14 that no decision had yet been taken to add iodine to salt. Before any such decision was taken full consideration would be given to the point raised.

Tuberculosis Among Kikuyu

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked the Secretary of State for the Colonies on April 14 what percentage of Kikuyu prisoners were suffering from tuberculosis, and what precautions were being taken to prevent the spread of this disease among the prisoners. Mr. H. L. HOPKINSON, the Minister of State, said that he would obtain the figure from Kenya. The following precautions were taken against the spread of the disease: regular inspection by medical officers of hygiene conditions in all prisons; medical examination of all convicts on admission to prison; special diets and medicine for all convicts in low physical condition; isolation of all tuberculosis suspects; and evacuation of all infected cases to tuberculosis wards in the prison hospital in Nairobi.

Diphtheria Inoculations in Scotland

Mr. JAMES STUART, Secretary of State for Scotland, supplied Mr. S. P. VIANI (Willesden, West, Lab.) with figures showing the estimated percentages of children under 15 years and under 5 years of age in each Scottish county who had been inoculated against diphtheria. Those under 15 ranged from 96% in Peebles to 45% in Orkney, and those under 5 from 99% in Midlothian to 34% in Orkney.

Cancer Experiments on Mice

Sir DAVID MAXWELL FYFE, Home Secretary, informed Mr. PETER FREEMAN (Newport, Lab.) on April 15 that since 1907, when records were first kept, to the end of 1952, a total of 1,367,820 experiments had been made on animals—almost all of them on mice—for cancer research. He gave the list of annual totals, which (apart from war years) varied

between 8,083 in 1924 to 95,991 in 1952. In the early years 1907-11 the numbers were between 40,000 and 49,000, then fell to 24,000 and continued falling until 1928, spurted to 43,000 and 50,000 in 1933 and 1934, fell again until 1947, and since 1948 have been 56,585, 75,343, 78,192, 91,410, and 95,991 respectively.

Dental Technicians

Mr. R. E. WINTERBOTTOM (Sheffield, Brightside, Lab.) drew attention on April 15 to unemployment among dental technicians, and the loss of highly skilled craftsmen to the Health Service, which he attributed to the cuts in the Service.

Miss PAT HORNSBY-SMITH, Parliamentary Secretary to the Ministry of Health, disputed this, and suggested that the cause was that there had been too many entrants. In 1950, owing to the immediate and high demand, 5,000,000 dentures were supplied under the Health Service. Even without the imposition of the charges for dental treatment the level of 5,000,000 could not possibly have been maintained. In 1953 the number of dentures supplied was 2,000,000, and she thought this figure would represent the average annual demand for some years, and she hoped that it would gradually get less as the effect of greater emphasis on conservation work became apparent.

Myxomatosis Outbreaks

Mr. G. R. H. NUGENT, Parliamentary Secretary, Ministry of Agriculture, informed Mr. A. HURD (Newbury, Con.) on April 15 that there were 17 established centres of myxomatosis infection among rabbits, five of which had been confirmed in the past month. The Minister would report from time to time on the spread of the disease into new areas, but weekly statements for which Mr. Hurd had asked did not seem justified at present. The advisory committee would continue to watch closely the extent and character of the outbreaks.

Coroners Bill.—The Coroners Bill was given a third reading in the House of Commons on April 9 and has been sent to the House of Lords.

Universities and Colleges

UNIVERSITY OF OXFORD

The following elections are announced: To the War Memorial Medical Scholarship at University College, I. G. McGill (Bablake School, Coventry); to a Nuffield Scholarship in Medicine at Pembroke College, D. C. E. Speller (Caterham School); to a Nuffield Medical Scholarship at Worcester College, W. R. A. Muntz (Oundle School); to a Nuffield Scholarship in Medicine at Somerville College, S. N. Clayton (St. Felix, Southwold); to an Exhibition in Medicine at St. Hugh's College, G. M. Roberts (North London Collegiate School).

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN MEDICAL RADIOLOGY (DIAGNOSIS).—P. L. Brangwin, Edwina R. Goodall.

ACADEMIC POSTGRADUATE CERTIFICATE IN PUBLIC HEALTH.—*London School of Hygiene and Tropical Medicine*: G. A. Ademola, Doreen P. Allan, N. K. Bharucha, D. W. Boatman, S. C. Bose, H. H. S. Brown, J. Chatterjee, H. J. S. Coldham, C. P. Collins, L. P. Darmanin, C. B. Drew, Y. G. Farran, E. R. Gauld, G. S. Godiwalla, G. McL. Gorrie, Catriona M. Gourlay, A. Grut, K. L. Gupta, T. B. Harrison, M. A. Heasman, F. M. James, H. James, B. Lall, R. J. Lande, I. Laufer, W. S. Millar, S. L. Morrison, B. J. L. Moss, H.-H. Mueller, K. W. Newell, Joycelyn Quantrell, C. J. Radway, D. H. Shennan, Rachel E. W. Sillett, C. Slome, C. I. Somaya, R. J. K. Tallack, Pin Hui Teng, A. E. P. Twort, K. L. Vasa, R. B. Walker, F. A. Wickremasinghe, F. Zangen.

ACADEMIC POSTGRADUATE CERTIFICATE IN TROPICAL MEDICINE AND HYGIENE.—*London School of Hygiene and Tropical Medicine*: L. Noronha.

J. M. Ledingham, M.D., M.R.C.P., Lecturer in Medicine at the London Hospital Medical College, has been appointed to the University Readership in Medicine tenable at that College.

The following candidates have been approved at the examinations indicated:

M.D.—Part I: C. P. T. Alexander, J. A. S. Amos, P. B. Cook, P. W. Darby, Katharine M. Dormandy, J. H. Evans, J. T. Groves, C. P. Handforth, P. M. Higgins, Margaret A. Holroyde, E. T. Hughes, A. R. Kagan, C. S. Livingstone, Eunice Lockey, C. J. Lucas, R. P. Michael, G. R. J. Moodie, R. Moore, J. D. Pollit, F. C. Rose, A. L. Slater, C. K. M. Thacker.

M.S.—Part I: P. J. W. Monks.

Professor Charles Singer has been appointed to represent the University at the XIVth International Congress of History of Medicine, to be held at Rome and Salerno from September 13 to 20, 1954.

Professor J. M. Mackintosh has been re-nominated for appointment as a representative of the University on the governing body of the London School of Economics and Political Science.

The following have been appointed representatives of the University on the committees of management of the federated and associated institutes of the British Postgraduate Medical Federation, indicated in parentheses, for the three years ending December 31, 1956: Dr. C. F. Harris and Dame Lillian Penson (Institute of Basic Medical Sciences); Mr. W. P. Cleland (Institute of Cardiology); Professor W. E. Herbert (Institute of Dental Surgery); Sir Archibald Gray (Institute of Dermatology); Dr. E. Bonham Carter (Institute of Diseases of the Chest); Mr. V. E. Negus (Institute of Laryngology and Otolaryngology); Professor R. W. Russell (Institute of Neurology); Professor W. C. W. Nixon (Institute of Obstetrics and Gynaecology); Professor J. Z. Young, F.R.S. (Institute of Orthopaedics); Professor F. R. Winton (Institute of Psychiatry); Mr. D. F. Ellison Nash (Institute of Urology).

Professor J. E. Roberts and Professor J. Whillis will be the representatives of the Board of Pre-clinical Studies on the Board of Advanced Medical Studies for 1954.

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *London Hospital Medical College*, Mr. Geoffrey Flavell (Surgery); *Charing Cross Hospital Medical School*, Dr. H. I. Winner (Pathology); Dr. J. B. E. Baker (Pharmacology); *University College*, Dr. M. de B. Daly (Physiology); *Guy's Hospital Medical School*, Dr. J. A. Nissim (Pharmacology).

Mr. J. B. Kinmonth has been appointed a representative of the Board of Advanced Medical Studies on the Special Advisory Board in Veterinary Medicine, in place of Sir James Paterson Ross, who has resigned.

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *St. George's Hospital Medical School*, Dr. J. A. Dudgeon (Pathology); *Institute of Psychiatry*, Dr. A. D. Leigh, Dr. D. A. Pond, Dr. P. D. Scott, and Dr. F. K. Taylor (Psychiatry); *University College Hospital Medical School*, Dr. E. N. Rowlands (Medicine).

UNIVERSITY OF EDINBURGH

At a Graduation Ceremonial held on December 18, 1953, the following degrees and diplomas were conferred:

M.D.—R. C. Humphreys, J. D. Kerr, T. W. Lees, R. G. Mitchell, C. F. Rolland.

Ch.M.—A. I. S. Macpherson.

Ph.D.—*In the Faculty of Medicine*: W. St. C. Bauld, D. S. Chowdhary, M. Ishaq. *In the Faculty of Science*: A. B. Monro.

M.B., Ch.B.—A. McI. Anderson, B. R. Bayne, A. T. Burnet, G. Gilray, I. B. Grant, Christine F. Hannah, J. L. Leadbitter, W. D. W. Miller, Jadwiga M. Weyndling.

DIPLOMA IN MEDICAL RADIODIAGNOSIS.—G. M. Ashurst, A. A. Donaldson, H. Gardner, H. Levon, Margaret C. Macleod, A. M. Stewart.

DIPLOMA IN MEDICAL RADIOTHERAPY.—N. R. Mackay, J. McLelland, J. Newall, J. G. Pearson.

The following scholarships, etc., in the Faculty of Medicine were awarded: *Wilkie Surgical Research Scholarship*, H. A. F. Dudley. *Andrew Graham Ritchie Bursaries*, C. J. W. Huston and Rosemary McCredie. *Mackie Bursaries*, J. B. Rae and J. T. Wilson. *E. B. Jamieson Prizes in Anatomy*, Joan E. G. Cave. I. D. Heath, C. J. W. Huston, Joan L. Young. *Russell-Crichton Prize*, D. Dow.

¹Highly commended for thesis. ²Commended for thesis. ³In absentia.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At the annual meeting of the College held on December 3, 1953, Dr. L. S. P. Davidson was elected President, Dr. Ian G. W. Hill, C.B.E., T.D., was elected Vice-President, and the following were elected Members of Council: Dr. Edward R. C. Walker, Dr. W.

Lindsay Lamb, Dr. I. Simon Hall, Dr. R. M. Murray-Lyon, and Dr. Thomas Anderson. Dr. J. Halliday Croom was reappointed Secretary, and Dr. J. Alastair Bruce was reappointed Treasurer.

At a quarterly meeting of the College held on February 2, with the President, Professor L. S. P. Davidson, in the chair, the following were elected Members of the College: J. H. Bowie, B. Ghosh, M. E. Mahdi, S. S. Manchanda, J. C. Simson, C. W. Marsden, J. B. Mackay, K. P. N. Pai, K. Parameswaran, H. Klevansky, G. Larkins, S. N. Sengupta, W. B. Muston, A. Horden, M. K. El Shawarby, I. C. Brannen, N. Radhakrishnan, J. A. Clark, J. Hampson, C. R. R. Pillay, S. A. R. Ali, V. P. Datta, M. H. M. Gaber, P. N. Mathur, R. G. Willison.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the College held on December 16, 1953, with Professor Walter Mercer, President, in the chair, the following were admitted Fellows after having passed the requisite examinations: S. Ansari, G. O. Clark, A. K. Das, R. A. Daws, D. C. D'Netto, F. H. Gamali, A. Ghani, P. Goldstein, I. M. Grant, W. McI. S. Ironside, F. D. Johnston, R. N. Katariya, G. Kerridge, P. Kilburn, J. S. Lekias, I. Opekin, M. G. Pearson, M. Q. K. Raja, J. R. Salas, G. R. T. Serpell, R. P. Sharma, P. R. Shroff, A. M. Shukri, E. H. J. Smyth, M. J. Twohig, W. B. Young.

Vital Statistics

Some Vital Statistics of 1953

The estimated home population of England and Wales at December 31, 1953, was 44,166,000 (21,249,000 males, 22,917,000 females).¹ This is an increase of about 420,000 since the 1951 census. Projections of the population show that, on certain assumptions, the total population will increase to 45,378,000 in 1963, 46,175,000 in 1973, and 46,617,000 in 1983, declining to 46,382,000 in 1993. On the basis of the death rates for the year 1952 the expectation of life of a boy at birth is 67.06 years and of a girl 72.35. This compares with 48.53 and 52.38 respectively on the basis of the death rates for the years 1901-10.

Deaths from accidental poisoning rose, reaching 659 in the first three quarters of 1953 compared with 586 during the corresponding nine months of 1952, while deaths from accidental burns dropped from 593 to 522. The number of suicides increased in the same period from 3,299 to 3,541.

In the December quarter the death rate per 1,000 population in Greater London was 9.8. This compared with 10.1 in New York and Copenhagen, 9.0 in Stockholm, 8.7 in Oslo, and 8.2 in Rome. A comparison of death rates of children under 1 year of age in September quarter, 1953, shows that the England and Wales rate of 22 per 1,000 related live births compared with Netherlands 19, Australia 25, U.S.A. 26, Scotland 28, France 33, and Italy 64.

Venereal Diseases

In England and Wales during the quarter ending September 30, 1953, 1,446 new cases of syphilis were reported as attending the clinics. Of these, 256 were classified as primary, secondary, or latent in first year of infection. 23 cases of congenital syphilis in children aged under 1 year were reported, and 172 cases in people over that age. New cases of gonorrhoea numbered 5,588, of chancroid 84, and of non-gonococcal urethritis (males only) 3,682.

Northern Ireland in 1952

Live births numbered 28,760 in Northern Ireland in 1952, giving a rate of 20.9 per 1,000 population. This was 0.2 above that for 1951 but 0.8 below the average rate for 1947-51. The infant mortality rate was 39 per 1,000 live births, the lowest so far recorded in Northern Ireland. The total number of deaths registered was 14,812, giving a rate of 10.8 per 1,000 population. This was 2.0 below the rate for 1951, and 1.1 below the average rate for 1947-51. The

¹ Registrar-General's Quarterly Return No. 420. H.M.S.O., 2s.

death rate from tuberculosis continued to fall, being 0.3 per 1,000 population as compared with the average rate of 0.39 for 1947-51.

England and Wales in First Quarter

The incidence of infectious diseases was generally below the average of the first quarter, the only exceptions being dysentery and enteric fever. The number of notifications of dysentery has steadily increased throughout the quarter from 322 in the first week to 1,642 in the thirteenth. The high level of enteric fever was due to the recent outbreak of paratyphoid fever in South Wales: 170 of the 244 cases of enteric fever were notified in Wales. The fall in the number of notifications of diphtheria was quite small, and it seems that an irreducible hard core of infection is being reached.

A comparison of the number of notifications for the last five first quarters is given below:

Disease	1950	1951	1952	1953	1954
Scarlet fever	24,802	12,088	18,013	20,550	15,868
Whooping-cough	23,619	66,865	35,042	34,207	28,985
Diphtheria	955	572	456	264	246
Measles	54,568	311,709	64,596	350,836	23,340
Acute pneumonia	13,720	26,536	12,960	20,005	10,507
Meningococcal infections	536	662	562	595	515
Acute poliomyelitis	512	339	288	345	332
Dysentery	3,938	13,995	6,936	4,449	10,808
Enteric fever	154	149	126	123	244

Infectious Diseases

The largest fluctuations in the trends of the notifications of infectious diseases in England and Wales during the week ending April 3 were increases of 327 for dysentery, from 1,315 to 1,642, and 263 for measles, from 2,067 to 2,330, and a decrease of 132 for acute pneumonia, from 661 to 529.

The largest increases in the notifications of measles were 91 in Cumberland, from 58 to 149, and 90 in Lancashire, from 339 to 429, and the largest decrease was 56 in Staffordshire, from 264 to 208. 1,474 cases of scarlet fever, 18 fewer than in the preceding week, were notified, and only small fluctuations were reported in the local trends. The number of notifications of whooping-cough were 2,546, being 7 fewer than in the preceding week, and the only large variation in the returns was an increase of 59 in Yorkshire West Riding, from 143 to 202. 22 cases of diphtheria were notified, being 8 more than in the preceding week. The chief features of the returns for diphtheria were a rise in Lancashire from 3 to 6 and in Durham from 0 to 3.

The number of notifications of paratyphoid fever declined from 20 to 11 and in Wales from 17 to 7. The chief centre of infection was Glamorganshire 5 (Cardiff C.B. 4).

21 cases of acute poliomyelitis were notified. These were 1 fewer for paralytic and 2 fewer for non-paralytic than in the preceding week. The largest returns were Warwickshire 4 (Birmingham C.B. 3), Somersetshire 3, and Nottinghamshire 3 (Beeston and Stapleford U.D. 2).

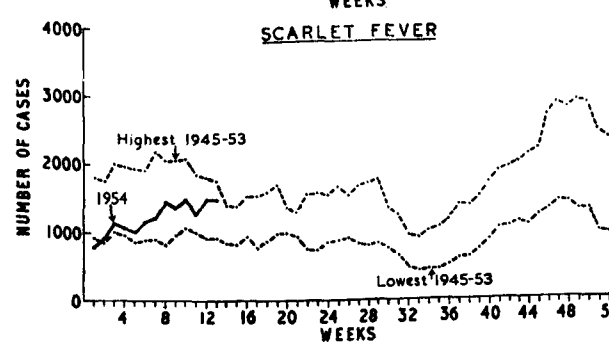
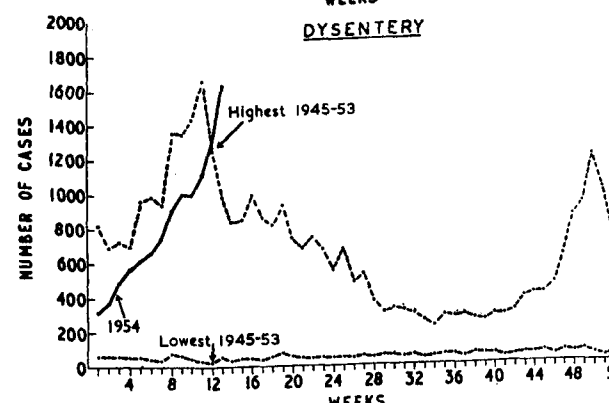
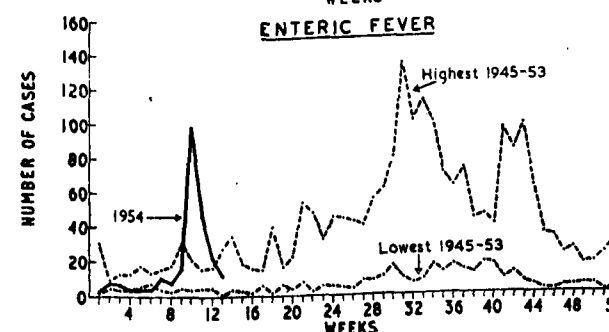
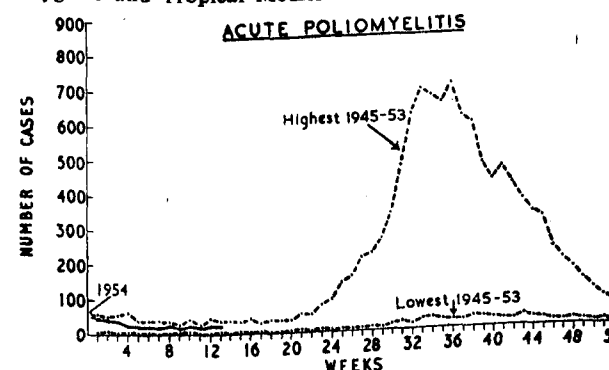
The notifications of dysentery were the largest since this disease was made notifiable in 1919, except for the week ending March 17, 1951, when 1,672 cases were notified, 30 more than in the week reviewed here. The largest returns were London 266 (Islington 84, Lewisham 36, Chelsea 29, Hackney 19, Hampstead 12, Shoreditch 10), Lancashire 226 (Salford C.B. 57, Bolton C.B. 30, Manchester C.B. 20, Eccles M.B. 20, Preston C.B. 13, Liverpool C.B. 10, Worsley U.D. 10), Yorkshire West Riding 198 (Brighouse M.B. 47, Bradford C.B. 26, Leeds C.B. 26, Hebden Royal U.D. 22, Dewsbury C.B. 21, Sheffield C.B. 19, Keighley M.B. 13), Leicester 121 (Leicester C.B. 115), Middlesex 107 (Hornsey M.B. 28, Southall M.B. 18, Willesden M.B. 18, Ealing M.B. 10), Carmarthenshire 86 (Carmarthen M.B. 81), Berkshire 78 (Maidenhead M.B. 69), Essex 64 (West Ham C.B. 16, Walthamstow M.B. 12), Norfolk 52 (Norwich C.B. 51), Surrey 47 (Epsom and Ewell M.B. 37), Kent 45 (Margate M.B. 28), Warwickshire 45 (Birmingham C.B. 35), Oxfordshire 41 (Oxford C.B. 36), Devonshire 40 (Exeter C.B. 34).

Staffordshire 37 (Cannock U.D. 20), Cheshire 30 (Ellesmere Port U.D. 29), Sussex 23 (Hove M.B. 13), and Gloucestershire 20 (Bristol C.B. 12).

In Scotland dysentery reached a new high level with 438 notifications. The largest returns were 235 in Glasgow, 89 in Lanark county, 42 in Edinburgh, and 35 in Dundee.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus -----. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 3 (No. 13) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	22	1	11	1	1	11	1	6	1	
Dysentery	1,642	266	438	3	5	423	60	89	2	
Encephalitis, acute	6	0				10	0	0	0	
Enteric fever: Typhoid Paratyphoid	1 11	0 2	4 1	0 1	1 0	6 7	0 1	1 0	0 0	4
Food-poisoning	178	18		0		63	14		1	
Infective enteritis or diarrhoea under 2 years				7	26				11	7
Measles*	2,330	45	161	55	498	21,166	953	401	208	232
Meningococcal infection	39	5	17	2	2	43	6	14	0	2
Ophthalmia neonatorum	30	5	5	0		36	4	9	0	
Pneumonia†	529	29	250	12	2	937	72	290	22	6
Poliomyelitis, acute: Paralytic Non-paralytic	14 7	0 0	0 0	2 1		31 7	2 1		0 0	
Puerperal fever‡	245	42	16	0		221	27	11	0	1
Scarlet fever	1,474	76	153	40	43	1,403	96	146	40	38
Tuberculosis: Respiratory Non-respiratory	777 103	85 7	144 19	34 5			135 29	42 2		
Whooping-cough	2,546	105	400	45	42	2,508	148	273	31	76

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0		0
Dysentery	0	0	0	0		0	0			
Encephalitis, acute			0		0		0			0
Enteric fever	0	0	0	0		0	0			
Infective enteritis or diarrhoea under 2 years	11	1	0	2	0	9	1	1	3	1
Influenza	6	1	0	0	0	52	7	7	3	1
Measles			0	0	1		0	0		0
Meningococcal infection			0	0			2	0		
Pneumonia	235	28	25	9	7	267	32	25	12	9
Poliomyelitis, acute	0	0			0	4	1			0
Scarlet fever			0	0	0		0			0
Tuberculosis: Respiratory Non-respiratory	99 10	6 2	5 0	8 0		115 20	15 3	4 0	11 2	
Whooping-cough	2	0	1	0	0	7	1	0	0	2
Deaths 0-1 year	212	17	26	8	30	226	28	26	15	18
Deaths (excluding stillbirths)	5,438	720	721	125	211	5,587	775	599	144	159
LIVE BIRTHS	8,231	1,227	982	217	448	7,185	1,009	925	231	379
STILLBIRTHS	218	23	26			199	28	21		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Holiday Exchanges Abroad.—The International Medical Visitors' Bureau of the British Medical Association is able to assist doctors in Britain, through the medical associations of the countries on the Continent, to find medical families on the Continent interested in arranging holiday exchanges for their children, *au pair* visits for older children, or occasionally exchange of houses. Last year more than 50 families (Continental and United Kingdom) are known to have made satisfactory exchange arrangements. Notices about exchange hospitality wanted by Continental doctors are published from time to time under "Notes and News" in the *Supplement*. Anyone interested in this scheme should write, giving full details, such as children's ages, when and where they would like to go, what facilities are offered in this country, etc., to Brigadier H. A. Sandiford, Medical Director, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Residential Unit for Psychotic and Maladjusted Children.—In every area there are some children who are so mentally disturbed that they cannot attend any recognized school, or benefit by treatment in child guidance clinics or hospital psychiatric departments. To meet their need the North-west Metropolitan Regional Hospital Board has established a small residential unit in a large country house, "High Wick," near St. Albans. The unit aims to provide a stable, friendly environment and the necessary psychotherapy for about 20 psychotic and maladjusted children aged between 3 and 10 years. It will be staffed by a matron, a teacher, and house mothers, each of whom will endeavour to establish and maintain a continuous relationship with the individual children. The Mid-Herts Group Management Committee, which is responsible for the unit, regards it as experimental in nature, and its development will be guided by experience of its working. The unit opened officially on April 23.

Royal College of Surgeons of England.—On April 18 the council met for the last time in the old Council Room of the College which has been used for these meetings for over 100 years. The next meeting will be in the new room in the rebuilt College. The honorary Fellowship was conferred on Dr. G. Gavin Miller, of Montreal, and the following were admitted to the Fellowship without examination as medical practitioners of at least 20 years' standing: Mr. J. W. H. Grice (Tunbridge Wells), Mr. D. M. E. Thomas (Sully, Glamorgan), Professor G. Hadfield (London), Professor J. Trueta (Oxford), and Mrs. D. R. Campbell (Coventry). Others admitted to the Fellowship were Mr. W. A. Jackman (Bristol) and Mr. R. R. Simpson (Hull). Dr. W. D. Paton, reader in pharmacology and therapeutics at University College Hospital Medical School, London, was admitted as the first professor of pharmacology at the College.

British Cardiac Society.—The thirty-third annual general meeting of the British Cardiac Society was held at Downing College, Cambridge, on April 9 under the chairmanship of Dr. Leslie Cole. Both the morning and afternoon sessions were devoted to short communications, and included papers on the pathological lesion in endomyocardial fibrosis, baroreceptor responses in acute rhythm change, the diagnosis of mitral incompetence by cardiac catheterization, a review of 30 cases of isolated pulmonary stenosis, valvotomy for both acquired and congenital aortic stenosis, and the action of hexamethonium bromide on the pulmonary circulation in mitral stenosis. A dinner was held in college.

Conference on Industrial Atmospheric Pollution.—The British Occupational Hygiene Society held a conference on April 6 at the London School of Hygiene and Tropical Medicine to discuss problems of atmospheric contamination in industry. In his opening address, Professor E. J. King,

the president, thanked Dr. Thomas Bedford, on behalf of members, for his work in founding the Society and for leading it through its first year of life. He also welcomed visitors from overseas. The papers presented at the conference were "The Investigation and Control of Atmospheric Contaminants in Factories," by Drs. M. W. Goldblatt and J. C. Gage, of the Industrial Hygiene Laboratories, I.C.I., Ltd.; "The Measurement of Dust Exposure," by Dr. B. M. Wright, of the Medical Research Council's Pneumoconiosis Research Unit; and "Permissible Levels of Exposure to Ionizing Radiations and Radioactive Materials," by Dr. W. G. Marley, of the Atomic Energy Research Establishment, Harwell. The conference was attended by 150 members and visitors. Copies of the proceedings will be available from the Hon. Secretary, Mr. Peter C. G. Isaac, Public Health Engineering Laboratory, King's College, Newcastle-upon-Tyne.

Jacksonian Prize.—The 1953 prize was awarded by the council of the Royal College of Surgeons to Mr. J. H. Peacock, lecturer in surgery at Bristol, for his essay on "Pathology and Surgery of Peripheral Vascular Occlusion." The subject for the 1955 Jacksonian prize essay will be "Diaphragmatic Hernia."

Metropolitan Regional Board's Clinical Prizes. Last year we announced that the South-west Regional Hospital Board was offering up to nine £100 research prizes during 1953 (*Journal*, January 31, 1953, p. 283). A similar competition is being held this year. The winners in last year's competition were:—*Consultants and S.H.M.O.s*: Dr. M. Hamilton, Dr. A. M. Read, and Dr. D. A. J. Williamson; *Senior Registrars and Registrars*: Mr. G. Bennett, Dr. G. S. Crockett, and Dr. C. Donovan; *House Officers*: Mr. A. O. Wilson and Mr. M. Wynyard.

Sir Russell Brain, P.R.C.P., has been elected an honorary Fellow of the American College of Physicians.

Irish Honorary Degrees.—On April 8 the honorary degree of LL.D. of the National University of Ireland was conferred on Dr. E. P. Carey, president of the Graduates Club of the N.U.I. in London for six years, and on Dr. P. P. Lynch, a member of the Dental Council and the Medical Research Council of New Zealand.

Professor G. I. Strachan, professor of obstetrics and gynaecology in the Welsh National School of Medicine, is to receive the honorary degree of LL.D., Glasgow University, at a ceremony on June 16.

COMING EVENTS

Renal Association.—The annual general meeting will be held at the Ciba Foundation, 41, Portland Place, London, W.1, on April 28 at 4.30 p.m., not on May 28 as stated in our issue of April 17, p. 943.

Hunterian Society.—The annual general meeting will be held at the Talbot Restaurant, London Wall, E.C.2, on April 26 at about 8.30 p.m. It will be preceded by the fourth dinner meeting at 7 for 7.30 p.m. An address will be given by Mr. W. R. Le Fanu, librarian of the Royal College of Surgeons, on "The Hunter-Baillie Manuscripts." Further information from Mr. R. S. Murley, 95, Harley Street, London, W.1.

Contraceptive Technique.—A lecture and demonstration will be given by Dr. Marie Stopes, Ph.D., at the Mothers' Clinic, 108, Whitfield Street, London, W., on May 6 at 2.30 p.m. Tickets must be obtained in advance.

Christian Medical Fellowship.—A week-end house party will be held at the Belsfield Hotel, Windermere, from May 7 to 10, and a week-end conference at the Linden Hall Hydro, Bournemouth, from May 21 to 24. Details are obtainable from the secretary of the Fellowship, 39, Bedford Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, April 26

ASSOCIATION OF PSYCHIATRISTS: SOUTH-WEST METROPOLITAN REGION.—At B.M.A. House, 5.30 p.m., general meeting.
● HUNTERIAN SOCIETY.—At Talbot Restaurant, 64, London Wall, E.C.2, 7 for 7.30 p.m., annual general (dinner) meeting. Mr. W. R. Le Fanu: Hunter-Baillie MSS. in the Library of the Royal College of Surgeons.
ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: The Hypermetropic Patient. Astigmatism. Bifocals.

Tuesday, April 27

ROYAL STATISTICAL SOCIETY: STUDY CIRCLE ON MEDICAL STATISTICS.—At Westminster Medical School, 6 p.m., Discussion of the Report of the Working Party set up to examine the Assessment of the Need for Clinical Services.
SOCIETY FOR ENDOCRINOLOGY.—At Royal Society of Medicine, 5.15 p.m., special lecture by Dr. G. Pincus: Pathways of Steroid Synthesis in the Animal Organism.
WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., neurological demonstration by Dr. T. Rowland Hill.

Wednesday, April 28

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At Queen Elizabeth Hospital, Birmingham, 8 p.m., clinical meeting.
INSTITUTE OF DENTAL SURGERY.—5.30 p.m., Dr. R. W. G. Wyckoff: Significance of the Electron Microscope in Biology and Medicine.
RENAL ASSOCIATION.—At Ciba Foundation, 4.30 p.m., annual general meeting. Mr. L. H. Griffiths: Renal Arteriography; Dr. R. M. Gaunt: Studies on the Experimental "Eclampsia-like" Syndrome.
ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Neurology (4).
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. T. A. H. Munro: lecture-demonstration in psychiatry.

Thursday, April 29

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., 33rd Sir Ivan Thompson Memorial Lecture by Professor J. K. Robertson: An Experiment in Medical Education.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—5.30 p.m., Professor F. C. Ormerod: Some Aspects of Sinusitis.
● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 2 p.m., Professor A. Duncan: Histamine and Histamine in Pregnancy.
INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. Gregory Pincus (Massachusetts): Steroids in Aging.
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., debate: That Quackery Plays a Useful Part in Medicine To-day. Proposed by Dr. M. Marcus and Dr. S. H. Chazen; opposed by Dr. D. Preiskel and Mr. I. Preiskel.
LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5 p.m., special university lecture in hygiene and public health by Dr. E. L. French (Melbourne): Epidemiological Aspects of Murray Valley Encephalitis.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor I. P. Todd: Role of Elective Surgery in the Management of Diverticulitis of the Colon.
ROYAL EYE HOSPITAL.—5.15 p.m., Dr. T. H. Whittington: Non-paralytic Squint—The Aim of Modern Methods of Treatment.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Mr. W. M. Dennison: Advances in Surgery of Infancy and Childhood.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. J. H. Paterson.

Friday, April 30

BRITISH INSTITUTE OF RADIOLOGY.—5 p.m., meeting of medical members.
FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 4 p.m., Radiotherapy Section meeting. Professor D. W. Smithers: Rotation Therapy.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., clinical meeting for general practitioners. Mr. W. D. Dooy: Indications for Tonsillectomy.
MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—7.30 p.m., general meeting. Presidential Address: Personal Reflections regarding the Trichomonas Vaginalis.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor A. G. R. Lowdon: Surgical Management of Intestinal Obstruction; 4 p.m., Dr. J. E. Caughey (New Zealand): Hypopituitarism.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Professor J. C. Moir: Obstetric/Gynaecological Conference.
● SOCIETY OF CHEMICAL INDUSTRY: FINE CHEMICALS GROUP.—At National Institute for Medical Research, 6.15 p.m., Dr. R. K. Callow: Medical Research and Fine Chemicals.

Saturday, May 1

ASSOCIATION OF CLINICAL BIOCHEMISTS: SOUTHERN REGION.—At Radcliffe Infirmary, Oxford, 2 p.m., meeting. Scientific papers.
● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 11 a.m., Mr. J. Hamilton: Breech Presentation.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Ball.—On April 9, 1954, at the Central Middlesex Hospital, London, N.W., to Francesca, wife of Dr. Keith Ball, a daughter—Phyllida Jane.
Chalmers.—On April 16, 1954, at St. David's Hospital, Cardiff, to Doreen, wife of Dr. T. M. Chalmers, a son.
Gibson.—On April 11, 1954, at The Shiel, Elgin Road, Weybridge, to Graeme (formerly Galbraith) wife of Dr. Eric Gibson, a son.
Helsby.—On April 12, 1954, at Liverpool Maternity Hospital, to Joyce, wife of Raymond Helsby, F.R.C.S., a daughter.
McCarthy.—On April 6, 1954, at Stamford, Lincoln, to Agnes (formerly Baker), M.B., B.S., D.A., wife of Cedric McCarthy, a son—James Whyte.
Richardson.—On March 5, 1954, at the Phyllis Memorial Home, Melton, Woodbridge, Suffolk, to Pamela, wife of Dr. J. Derek Richardson, a daughter—Jennifer Anne.
West.—On April 15, 1954, at the Plummer Hospital, Saulte-Ste.-Marie, Ontario, Canada, to Kathleen (formerly Stanhope), wife of Michael H. West, M.D., M.R.C.P., of Thessalon, Ontario, a daughter.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Bags Under the Eyes

Q.—Is there any treatment—surgical or medical—for "bags" under the eyes?

A.—If the puffiness which occurs in the lower lids with advancing age is due to atony of the muscles of the lower lid allowing the peri-orbital fat to project forwards, fatigue increases the bagginess and this accounts for the variation in degree which is constantly noted.

The treatment is surgical, and consists in removing the herniated fat and tightening up the eyelid by a lateral pull. Very rarely should eyelid skin be removed from the lash edge. The operation is attended by good results, but should be carried out only by a competent plastic surgeon.

The Reticuloses

Q.—What diseases are included in the "reticuloses"? What criteria are required for diseases to be included in this group?

A.—Reticulosis is one of those generic terms like neuritis or gastritis which can have a definite connotation but is more often used to mean anything or nothing.

The term was introduced by Letterer¹ in 1924 to describe the histopathology in the organs of a child aged 6 months who died following an acute illness characterized by pyrexia, purpura, aural discharge, and generalized lymph node enlargement with hepato-splenomegaly; there was found to be a widespread proliferation of primitive histiocytes or reticulum cells in the lymph nodes, liver, spleen, bone marrow, and skin. The case is the first clearly described account of the condition known as Letterer-Siwe disease.

Subsequent to this case report, a number of other cases showing generalized proliferations of histiocytes were described, and classifications relating these cases to the leukoses, storage disorders such as Gaucher's disease, and the lymphosarcomata were propounded. Pullinger,² in a detailed study of the histology of Hodgkin's disease, suggested that a group of diseases of the reticular tissue exists in which differentiation is possible into one or several of the possible cell progeny, and following this Ross³ and Robb-Smith⁴ put forward detailed classifications based on anatomico-histological divisions which included both definite disease entities such as Hodgkin's disease, the leukaemias, and storage disorders, as well as reactive change of lymphoreticular tissue; there have been numerous modifications of these classifications such as those of Symmers⁵ and Israels.⁶ On the Continent there has of recent years been a tendency, as shown by van der Meer and Zeldenrust⁷ or Cazal,⁸ to restrict the term reticulosis to those conditions in which there is a proliferation of histiocytes or their precursors rather than to use it in the broad sense of English writers. In America the term reticulosis is little used, as they have adopted an all-embracing term "lymphoma" (Custer and Bernhard)⁹ which includes the progressive hyperplasias and the sarcomata, whereas in England and on the Continent there is a clear distinction made between these two types of tissue reaction, although in certain instances the progressive hyperplasia may alter so as to become sarcomatous.

If we follow English usage of the term "reticulosis" we can define it as a generic histological term to describe all the hyperplasias of the reticular tissue. These can be divided into two large groups, the reactive or reversible

hyperplasias or the progressive or irreversible hyperplasias; usually the term "reticulosis" is restricted to the latter group. The reactive or reversible hyperplasias of reticular tissue include a large range of infective disorders characterized by hyperplastic or granulomatous proliferations of reticular tissue, such as typhoid fever, tuberculosis, perhaps sarcoidosis, histoplasmosis, malaria, leishmaniasis, and many more; it also includes the reactive conditions in which there is no known aetiological cause, such as sinus catarrh, reactive hyperplasia, and perhaps the storage disorders, because, although these are not usually reversible, they may be on occasions and there is some knowledge of the proximate biochemical lesion. The progressive hyperplasias include the leukoses (lymphoid, myeloid, and monocytic, whether aleukaemic or leukaemic), di Guglielmo's disease and myelomatosis, lymphoid follicular reticulosis (follicular lymphoblastoma), lymphoreticular medullary reticulosis (the majority of cases of Hodgkin's paraneoplasia (Jackson and Parker¹¹) and benign Hodgkin's disease (Harrison¹²), Hodgkin's disease (lymphadenoma verum), mycosis fungoides, myelocytosis (osteosclerotic myelopathy), histiocytic medullary reticulosis, and reticulum-celled medullary reticulosis (Letterer-Siwe syndrome, eosinophil granuloma, Hand-Schüller-Christian syndrome, reticuloendothelial granuloma, histiocytosis X (Lichtenstein¹³)).

It should be realized that the term "reticulosis" is a generic morphological term and not a clinical term, unless qualified by its specific histological characters. To say that a patient has "a touch of reticulosis" is probably less informative than to say that a patient has enlarged lymph nodes, though, as Arnold of Villanova pointed out a long time ago in respect of another term, it might sound more impressive.

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- ¹² Lichtenstein, L., *Arch. Path.*, 1953, 56, 84.

Deodorants in General Practice

Q.—I would be grateful for your suggestion for a good deodorant which can be used by our district nurses in private houses when doing very offensive dressings.

A.—No deodorant is known which gives satisfactory results under the conditions stated. The problem presents two phases for consideration: (1) Is it possible to deal quickly with a relatively large volume of foul gas suddenly released into the air of the bedroom when dressings are removed? (2) Is there a method for dealing with the slow trickle of foul gas which is continuously escaping from the affected tissues?

There is much to be said theoretically for spraying the room with solutions of substances which react chemically with the offensive gas and thus change it to an odourless compound. In practice there are difficulties: the deodorizing solution must be non-toxic to man and animals, and it must not damage the furnishings by staining, bleaching, corrosion, etc. It has been claimed that certain chlorophyll derivatives act as deodorants in this way, but the claim has been vigorously disputed.

The cleansing and deodorizing of offensive wounds and skin surfaces can be achieved by the local application of active carbon (charcoal), but only those preparations should be used which are guaranteed by the manufacturers to be

potent adsorbents. There may also be a place for an inexpensive air-filtering apparatus consisting of a box fitted with a fan which sucks the air through a deodorizing screen containing active carbon. The method is most effective against gases which have a high molecular weight—such as the mercaptans—and *per contra* least effective when the molecular weight of the gas is low, for example, with sulphuretted hydrogen and ammonia.

A charcoal blanket has been devised for use in cases where there is intractable foul discharge—for example, in inoperable cancer of the uterus or rectum. The principle consists in screening the patient from the neck to the feet with material which contains particles of active carbon. This has been shown to be effective under controlled experimental conditions and in clinical practice. Nevertheless it fails if the nurse or the patient omit to carry out the simple instructions; and of course it ceases to act as a filter when it is removed with the other bedclothes preparatory to dressing the wound.

Patients with offensive discharges from colostomies can also be treated with active carbon in small doses by mouth, say half a teaspoonful four times daily. The powdered carbon is made more manageable if it is moistened with water to make a paste. The same method can be used for other patients who pass offensive stools. It must be remembered, however, that prolonged oral medication with active carbon may possibly interfere with nutrition by adsorption of enzymes and other essential substances in the alimentary canal.

Luminous Paint

Q.—How much radiation is given off by luminous paint? Have any examples been reported of radiation damage to users (as opposed to manufacturers) of articles coated with luminous paint?

A.—Radioactive luminescent compound usually contains radium, though occasionally a mixture of radium and mesothorium is employed. The amount of radium used per gramme of compound is of the order of 70 μC for instrument dials (for example, for aircraft), of 38 μC for watches, and of 12 μC for alarm clocks. As will be appreciated, only minute quantities of compound are used for luminizing watches and clocks. No case has been reported of radiation damage to users of luminized objects.

3-D in a Medical Journal.—The editorial manager of *Medicine Illustrated* has written to point out that last November's issue of that journal included a supplement with stereoscopic illustrations. This controverts the claim for priority made by the editor of *Anaesthesia* (see *British Medical Journal*, April 10, p. 886).

"Any Questions?" Book.—The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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BRITISH MEDICAL JOURNAL

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A MILESTONE IN MEDICAL HISTORY*

THE CENTENARY OF THE METROPOLITAN COUNTIES BRANCH

BY

J. ARTHUR MOODY, M.B., B.Ch., B.A.O.

Twenty years previous to the foundation of this Branch the Provincial Medical and Surgical Association had just been formed, and the medical profession had undergone in that time great and striking changes in its social and educational aspects and in its general tone, the well-informed practitioner tending to displace the apothecary, and the level in the standard of treatment in all fields already becoming more expert. The year 1853 was a milestone in the history of our Association (then known as the Provincial Medical and Surgical Association), not only for the newly founded Metropolitan Counties Branch. The Association's journal—till then known as the *Provincial Medical and Surgical Journal*—had up to this date been edited in Worcester and published in London, and by a decision of the Annual Meeting at Oxford in 1852 it was in future to be edited as well as published weekly in London with its better literary and scientific facilities. Furthermore, it was to have a new editor.

One cannot read the *Journal* of the period (1853–6)—then named the *Association Medical Journal*—without sensing in most of the controversies of the time a considerable gulf between the London doctors and those in the provinces. Membership of the Provincial Medical and Surgical Association did not involve attachment to any particular local unit of the Association; indeed, membership was on a rather scattered geographical basis, and it was later found necessary to establish some kind of local unit. This local unit, one of the first steps in our organization, appears to have been the Branch. The Metropolitan Counties Branch, then, started its career on November 26, 1852, as a District Branch (as it was called) of the Provincial Medical and Surgical Association, consisting of members of that Association resident in Middlesex and "such parts of Essex, Kent, Surrey, and the adjoining counties as are not included in any existing Branch."

Notable Original Members

Who were some of the original members? The *Journal* of December 8, 1852, gives an account of the first meeting of the Metropolitan Counties Branch, with a list of some of the members present. Many of them became famous, and I trust that my somewhat modest research into the paths they took may be of interest.

Sir John Forbes

In the chair was Dr. Forbes, later to become Sir John Forbes. He was a schoolfellow and lifelong friend of

* The Presidential Address delivered at the Annual Meeting of the Metropolitan Counties Branch of the British Medical Association on June 9, 1953.

Sir James Clark, Physician to Queen Victoria, and was himself appointed to the Queen's Household in 1840. After obtaining a diploma in surgery at Edinburgh he entered the Navy in 1807 as assistant surgeon, and on discharge in 1816 he returned to Edinburgh, graduating M.D. in 1817. Not only was he a popular and very successful physician, first at Penzance and later in Chichester, where he appears to have succeeded men who, like himself, later moved to London, but in his early days he was the author of papers on meteorological and geological subjects. In 1827, while at Chichester, he was mainly instrumental in founding the Infirmary, which was the first general hospital established in the county.

Forbes appears to have combined very successful practice at Chichester with much literary activity. For instance, he translated and published Laennec's work on the stethoscope, which went to a fifth edition. His chief credit here, however, is that he was in advance of most of the physicians of the day, who appear to have treated Laennec's great discovery with contempt and ridicule. Although Forbes was certain that the stethoscope would be acknowledged to be one of the greatest discoveries in medicine he does express some doubt whether it would come into universal use. He followed up this translation with another (1824) on the same subject—Auenbrugger's remarkable work on percussion—and he added to the translation an account of his own with the title "Original Cases Illustrating the Use of the Stethoscope and Percussion in the Diagnosis of Diseases of the Chest."

He next undertook with John Conolly—his professional rival in Chichester—the *Cyclopaedia of Practical Medicine*. The most eminent physicians of the day contributed to it; the same applies to a periodical known as the *British and Foreign Medical Review*, a quarterly journal, in which he was also associated with Dr. Conolly. This quarterly review was a great event, not only in Forbes's life, but also in medical literature. It soon became the leading medical journal in the country—its reputation extended not only all over Europe but also to America, where it was reprinted. Chiefly with the object of improving the *Review*, Forbes moved to London in 1840—a move which must have involved him in considerable pecuniary loss, for he could never expect at the age of 53 (even though through the influence of his friend Sir James Clark he was appointed to the Queen's Household) to pick up a London practice equal to that which he enjoyed at Chichester. After 12 years the circulation of the *Review* began to fall off and he had to terminate the

publication, which, although it had been self-supporting for eight years, had cost him £500 in the undertaking. An article on homoeopathy in which he appeared to be too fair to the homoeopaths gave considerable offence to the profession, and may have had something to do with its discontinuance. The *Review* was amalgamated with a rival which enjoyed an even larger circulation—Johnson's *Medico-Chirurgical Review*—under a new title, the *British and Foreign Medico-Chirurgical Review*, and continued on similar lines until 1877.

Forbes became F.R.C.P. and Hon.D.C.L. Oxford, and in 1853 was knighted. He was a member of various learned and scientific societies, both in Europe and in America. He gave some attention to the question of mesmerism, and wrote an amusing account of his detection of certain impostors in this particular field. Towards the end he devoted himself, in London, chiefly to benevolent and literary work, and to travel on the Continent, publishing accounts of his visits to Germany and Switzerland. He died in 1861 at Whitchurch, near Reading, in the house of his only son, and through all his life was loved and honoured. Few men of the nineteenth century have done more to promote the cause of sound medical literature than this Founder-President of our Branch: the Branch was most fortunate in starting its career under a President of such distinction and versatility—literary and medical.

John Rose Cormack

Probably the next personality of interest present at the first meeting was Dr. John Rose Cormack. A Scot, like Forbes, and a son of the manse, he resembled Forbes in his literary ability. His great distinction, so far as our Association is concerned, is of course that he became editor of the *Journal* in 1853. With his M.D. Edinburgh in 1837 he received the gold medal for his thesis on the presence of air in the organs of circulation. After studying in Paris he started practice in Edinburgh, was appointed Physician to the Royal Infirmary and the Fever Hospital, and greatly enhanced his early reputation by a paper on the relapsing fever epidemic in 1843. He resigned his appointment at the Royal Infirmary on being refused permission to give clinical lectures, and in 1847 removed to London. By this time he had had much experience in medical journalism, for in 1841 he had established the *Edinburgh Monthly Journal of Medical Science*, known and referred to as *Cormack's Journal*, and later the *Edinburgh Medical Journal*. Incidentally, he had been President of the Edinburgh Royal Medical Society in the year of its centenary festival.

On arriving in London Cormack settled in practice at Putney, and soon started another monthly periodical—the *London Journal of Medicine*. As with Forbes's periodicals, so with Cormack's—the names of most of the physicians and surgeons of distinction at that time in London appear on the list of contributors. That journal ceased to appear when the *Association Medical Journal* began. He remained editor of the latter until 1855, and a perusal of the leading articles of the period manifests a high standard of literary style and expression. Ill-health compelled him to settle in Orleans in 1866, and in 1869 he removed to Paris, graduated M.D. Paris, and became Physician to the British Embassy. Cormack's fame and his knighthood in 1872 (also Legion of Honour in 1871) were the reward for his devoted services to the distressed foreigners and to the sick and wounded during the siege of Paris. An unselfish, public-spirited man, he died poor in 1882, and his family had to be helped by subscription among his former colleagues. He seems to have been a man of great industry and fine character, highly respected by the British colony in Paris. He was the first editor of the Association's *Journal* to have a name and reputation outside its ranks. He had been appointed

physician to the Hertford British Hospital in Paris, established by Sir Richard Wallace, who incidentally provided the medical education for Cormack's only surviving son. His publications, apart from his editorial work, included a collection of clinical studies on cholera, diphtheria, paralysis, and a translation of four volumes of Trousseau's *Clinical Lectures*. (Trousseau was the first to aspirate the pleural cavity, and actually invented an aspirator.)

Daniel Hack Tuke

The third notable figure who deserves mention is Daniel Hack Tuke (1827-95). He came from a family of Quaker philanthropists—his grandfather and his great-grandfather were closely associated with the designing of the York Retreat for the Insane, and he himself became famous as a mental specialist. Before contemplating the study of medicine he appears to have entered the service of the York Retreat, and not only to have studied the literature of insanity but in his spare time to have made some informal study of the patients. At Bart's, as a student, he distinguished himself by gaining several prizes, and in 1853 obtained the M.D. Heidelberg. His career was sadly interrupted for 15 years by pulmonary tuberculosis, which necessitated his retirement as physician to the York Retreat and Infirmary: but in 1875, when his health permitted his re-entry into practice, he settled in London as a consulting mental specialist, becoming a governor of Bethlem Royal Hospital, and a lecturer and examiner in mental disease at Charing Cross Hospital. He was one of the founders of the After Care Association (an association which takes charge of the poorer class of convalescents from insanity). He wrote and published extensively on mental illness, and his *Manual of Psychological Medicine* kept its place for many years as a standard treatise. In 1880 he, like Forbes and Cormack, also became an editor—joint editor of the *Journal of Mental Science*. He was President of the Medico-Psychological Association in 1881, and Glasgow University conferred on him its LL.D. in 1883. He appears to have been encyclopaedic in his knowledge of lunacy and prolific in his writing, and to him and his family must go a great deal of credit for the humanizing of the treatment of the mental patient in asylums.

John Conolly (1794-1866)

John Conolly graduated at Edinburgh in 1821, and devoted himself from the start to the study of insanity. He began practice in Chichester, where Dr. (afterwards Sir John) Forbes was already in practice, and the young men at once formed a strong and lasting friendship. They were, however, rivals, and together they concluded that the "district" did not afford sufficient employment for both, and in a year's time Conolly moved to Stratford-on-Avon. He remained there about five years, but does not appear to have been very successful so far as the general practice of his profession was concerned. Like Forbes and Cormack, he was much attracted by literary work, and edited (with Dr. James Copland) the *London Medical Repository*—a large part of their endeavour being to call attention to the numerous medical books then appearing in France and Germany. While at Stratford Conolly took a prominent part in public affairs, and was twice mayor of the town. He interested himself in every matter for the public good and was enthusiastic for sanitation and public health.

In 1827 Conolly moved to London, and in the following year was appointed Professor of the Practice of Medicine at University College, London. While he held that chair he published his work on *Indications of Insanity*, but failed in his endeavour to introduce at London University systematic clinical instruction into the curriculum. In London he was the friend of influential men like Lord Brougham and Lord John Russell, but in spite of these friendships he seems to have failed in London as a physician: nor does he appear to have filled the professorial chair with any great ability.

In 1830 he left London and returned to Warwick, there resuming his post of inspecting physician to the asylums in

Warwickshire. He continued to write a good deal, and assisted his old friend Forbes in editing *British and Foreign Medical Review* and the *Cyclopaedia of Practical Medicine*. While living at Warwick Conolly maintained his interest in the neighbouring town of Stratford-on-Avon, and successfully led the inhabitants of the town against a proposal to remove the body of Shakespeare from its resting-place. Not only was he one of the pioneers—if we may refer to them as such—of the Metropolitan Counties Branch, but earlier (about 1830) he was most closely associated with Hastings and Forbes in the foundation of a medical society—the Provincial Medical and Surgical Association—afterwards to become the British Medical Association.

Conolly returned to London in 1839, and was appointed resident physician to the Middlesex Asylum at Hanwell, then the largest institution of its kind in England. He devoted himself there to the principles enunciated by the Tukes, emancipating the asylums from the role of prison houses, and freeing the lunatics literally from their strait-jackets and chains. Within the 12 years during which he was supreme at Hanwell a revolution was effected throughout the country in the management of the insane. His sincerity and enthusiasm overcame every difficulty, and by dint of great devotion and eloquence he was able to convert not only our profession but also the public to a complete reorientation of attitude towards the insane, and a consequent revolution in their treatment. In all this he generously acknowledged his obligations to the Tuke family, and the methods of which in this country they were the pioneers at the York Retreat. He maintained positively, in his own words, "There is no asylum in the world in which mechanical restraint may not be abolished, not only with safety, but with incalculable advantage." From this flowed a further great advantage—the proper study of insanity; for the study of insanity as a disease began when asylums ceased to be prisons. Unfortunately, some of Conolly's literary labour was devoted too much to destructive criticism of the older methods of asylum management, rather than to constructive minute investigation or patient research, and, being of Irish descent (his father mentioned by Dean Swift), his writings are tainted with some sentimentalism and on occasion an overindulgence in rhetoric, which detracts from their scientific value. About 1852 he resigned his post at the asylum, but ran a private asylum in the village of Hanwell, and although, as I have already indicated, his early years do not shine with success, he appears now to have had a large consulting practice in mental disease.

Conolly's best and most eloquent works belong to the later period of his life, when he wrote extensively on the treatment of the insane. Oxford University awarded him the Hon.D.C.L. in 1852, and on the occasion of his resignation from Hanwell a great public testimonial and his portrait were presented to him, the presentation being made with imposing ceremony by Lord Shaftesbury, Chairman of the Lunacy Commission. He died in 1866 at Hanwell, after a series of what would appear, in the light of modern knowledge, to be cerebral vascular attacks.

Francis Sibson

Francis Sibson (1814-76) (whose name appears here as Chairman of Council in 1865-6 and 1867-8) is worthy of note for his varied career. Like many of his contemporaries, he took his diploma (1831) at the Royal College of Surgeons, Edinburgh, as a first step. Before turning to a more serious and thorough study of medicine, Sibson was apprenticed to a surgeon—and served in the cholera wards around Edinburgh and Leith, then settled in general practice at Cockermouth, but soon left to continue his studies at Guy's, where he had the distinction of being a friend and pupil of Hodgkin. He had the further distinction of being the first physician appointed to St. Mary's Hospital, which was opened in 1851, and one of the first lecturers at its Medical School. He published papers on the flexible stethoscope and on the "mechanism of respiration" and articles on

ether, chloroform, and narcotic poisons. These publications were all made before he came to London, and in fact while he was in Nottingham, as resident surgeon and apothecary to the General Hospital; and when he came to London about 1850 he obtained the M.D. London, becoming F.R.C.P. in 1853; he was made an F.R.S. in 1849. At the Royal College of Physicians he was Goulstonian, Croonian, and Lumleian lecturer and curator of the Museum. He was a member of the Senate of London University, and it may interest the ladies to know that he opposed the admission of women to degrees of the University.

Sibson's remarkable versatility was also exemplified in his demonstrations of visceral anatomy—a course which he arranged at his own house in Brook Street, and which commanded a remarkable attendance. He also published an atlas of anatomy, illustrated with coloured plates—a laborious and useful work of reference, illustrating specially the relative positions and movements of the internal organs. He wrote extensively, and was a man of great industry. All his works of permanent importance are published in four volumes—the *Collected Works of Francis Sibson*, including several contributed to *A System of Medicine*, by Sir John Russell Reynolds. He was particularly expert in publishing his own observations. He died suddenly at Geneva. During his lifetime he appears to have enjoyed a considerable practice as a physician, in addition to his innumerable adventures as anatomist and author.

Ogier Ward

Thomas Ogier Ward (1803-79) is worthy of our attention as the first Secretary of the Metropolitan Counties Branch—a position which a perusal of the *Journal* shows he filled with much industry and all the initiative, intuition, and tact necessary on any new venture. I am grateful for the collaboration and help of his grandson—also Ogier Ward—whom many of you undoubtedly know as consulting surgeon to St. Peter's Hospital, who has been kind enough to supply at my request a few facts regarding his grandfather. They demonstrate not only his unique ability as our first Secretary, but his originality and, as with Francis Sibson, his expertness in observation. While practising in his early days at Wolverhampton, during the great cholera epidemic of 1834, he achieved a greater measure of success in treatment by putting into practice his observation that the collapsed patient was much helped by hot baths. Another of his observations was made while holding the post of physician to the Birmingham Dispensary—this time in cardiology. He showed that the "bruit de diable" (now known as the "venous hum") was produced in the veins and not in the arteries.

As with his contemporaries, he seems to have moved about, practising in Kensington at the time of his secretaryship, and ending up, like his friend and colleague Sir John Rose Cormack, in France. Indeed, while Cormack was tending the British colony during the siege of Paris, Ogier Ward was experiencing the discomfort entailed by the billeting of German troops while living at Caen and St. Germain.

It may be of interest that the conception of the Metropolitan Counties Branch first arose at the Annual Meeting at Oxford, as a result of a conversation between Dr. Cormack and Dr. Ogier Ward.

Formation of the Branch

The actual proposal to form the Branch was, strangely enough, made by Dr. Charles Cowan, of Reading, who expressed the hope that places within convenient railway distance of London, such as Reading, would be embraced in the Metropolitan Branch, and that it was to be representative enough to exclude any cleavage as between "provincial" and "metropolitan." It appears to have been one of the first Branches formed throughout the country. Membership of a Branch was automatic upon the payment of 2s. 6d., in addition, of course, to the £1 ls. membership to

the parent Association. A rather amusing and potentially serious interlude arose very early upon the question of this automatic membership. It was sought to exclude a member, and the method adopted was to add to the clause relating to the admission of members the words "provided the majority of members present at a general meeting concur in their admission." This particular gentleman had paid over his 2s. 6d. to one of the officials of the publishing department, but next day found himself without membership, owing to the rather precipitous alteration of the by-law, and minus 2s. 6d. He was none other than Mr. Wakley, the editor of the *Journal's* great rival, the *Lancet*, and the lead in excluding him appears to have been openly taken by none other than the *Association Medical Journal's* editor, Dr. Cormack, who committed himself so far as to say that "as Mr. Wakley was so highly unacceptable to the majority of the members his presence among them would destroy the Branch from the numerous resignations it would occasion." A number of collateral issues and problems were connected with this episode, and did literally stir the profession and its conscience. There was a practice, very prevalent at the time, of the publication of biographies of medical notabilities and other aspirants seeking public notice during their lifetime, often with portraits. This system of biographies of the living (sometimes indeed autobiographies) had almost become a kind of moral pestilence in the profession, and amounted frequently to open advertising, as in the case of one gentleman who had ordered 15,000 copies of his biography to be distributed throughout the country, and in that of another who permitted his butler, when his patients were leaving the house, to offer each of them a book, saying, "Have you seen my master's biography?" Or the traffic in biographies could go the other way, leading almost to victimization and ruin, by the publishing of abusive biographies in medical periodicals. The unpopularity of Wakley was bound up with this, for the *Lancet* of 1853 was accused on more than one occasion of murdering its victim, even if it did subsequently bury him with honours. Possibly the first great meeting of doctors to be held in this country took place at the Hanover Rooms, London, organized by this Branch in 1853—the issue being biographical advertising. The meeting, however, was not ostensibly called for this purpose. It was called—as indeed similar meetings were called throughout the three kingdoms and all well attended—to protest against the dismissal of a surgeon, a Mr. John Gay, from the Royal Free Hospital. Mr. Gay seems to have had no responsibility for or initiative in the biographical sketch which was the cause of his dismissal, and which would appear to have been offensive to the management committee chiefly because of the statement that the hospital would be unknown were it not for the repute of Mr. Gay. Wakley, whose son was also on the staff of the Royal Free Hospital, was suspected of having had some hand in the initiation of Gay's dismissal. The case was not a good one for the purpose of making an example of doctors by doctors, but it provided wide opportunity for the ventilation of the whole subject of biographical advertising, which was profoundly disturbing the profession. The proceedings were remarkable not only for the immense attendance at the London meeting of 1,200 doctors, and similar attendances throughout the country, but also for the fine discrimination manifest in debating the two big issues—the palpably wrong dismissal on this occasion by a lay management committee, and, secondly, the growing evil of biographical advertising.

Representation in Parliament

One of the questions which exercised the Branch in its first year was the representation of the profession in Parliament. The comparatively imminent measures of medical reform and public health, already much in the minds of leaders in the profession and others, provided the chief stimulus for the obviously altruistic desire for medical representation in Parliament; indeed, a special Franchise Committee was appointed, and the rather roundabout pro-

cedure was advocated of first securing Parliamentary representation of the University of London, when presumably it was anticipated that the medical element amongst the graduates would be strong enough to secure the election of a medical member to Parliament. The University of Edinburgh at that particular time, and possibly for some time afterwards, would appear to have had a preponderating number of medical graduates, and might reasonably have been expected to compete with London for the honour of actual representation.

In these days of almost penal taxation it may be of interest to note that the problem of what they called "the income tax" absorbed sufficient attention in 1852 for the Association to appoint a special Income Tax Committee, and that the second meeting of this Branch was called for the purpose of petitioning both Houses of Parliament and of appointing a deputation to the Chancellor of the Exchequer, protesting against the iniquities of taxation. The overriding preoccupation of the meeting seems to have been that taxation of income (as against property), which, as you may know, fell into abeyance for a short time, would be reimposed, and the fear was expressed by Dr. Cormack that "the income tax" might even become permanent. To us, with our considerable sophistication in matters of taxation, the pleas put forward by our predecessors 100 years ago demonstrate a refreshing innocence, and may even be regarded as amusing; for instance:

"The Humble Petition . . . sheweth—

"That your petitioners have, for the most part, no other income than that derived from their professional exertions.

"That their income so derived is uncertain and precarious, necessarily ceasing under illness, in advanced life, and at death.

"That considering their position in society, the exercise of their profession requires them to maintain unusually expensive establishments, involving considerable direct taxation.

"That your petitioners are, for the most part, married men with families, for whose education and present and future support they have to provide by these uncertain and precarious incomes, and under the contingencies of illness, advanced age, and death.

"That your petitioners represent, moreover, that their lives are shorter, they are more liable to accidents and disease, frequently communicated by their patients; and that the decline of their professional incomes is earlier than in any other profession.

"That for the above reasons and others that might be adduced, the capitalized value of the precarious income of a medical man is not only below that of an income derived from a permanent annuity, but is also even considerably below the value of a received life annuity, which itself is scarcely half the value of a permanent annuity.

"That for the above reasons and others that might be added your petitioners feel it a great grievance, and cannot but consider it most unjust that their professional incomes, thus precarious, should be taxed at the same rate as incomes derived from realized property.

"And your petitioners, therefore, humbly pray that it may please your Honourable House so to deal with the income-tax, if it be indispensable to retain it, that its pressure on medical men and others whose incomes are temporary and uncertain, may be equitably adjusted in proportion to their real value.

"And your petitioners will ever pray, etc."

Seed of Medical Reform

The year 1852 is also marked by the germination of the seed of medical reform. The seed had been sown many years before and the subject had been discussed for a long time in a rather desultory manner by the doctors, amongst others; but it was only at the Annual Meeting at Oxford in 1852 that a decision was taken that a draft Bill on medical reform which had been prepared by the Central Council should be referred to Parliament. A strong deputation, headed by Sir Charles Hastings and the President and other leading members of the Branch and about 60 M.P.s, waited on Lord Palmerston to present the draft Bill, whose provisions, as you well know, were uniformity of qualification,

equal right to practise throughout the United Kingdom, and the adoption of the representative principle in the formation of the councils and other governing bodies.

As might be expected, one of the greatest difficulties throughout the long controversy on medical reform had been the clash of interests, the interests now of this College of Physicians and Surgeons, now of that. Viewed in retrospect, this was not without its humorous side. When, for instance, there arose the high probability that there would be registered as surgeons persons who were only licentiates of the Society of Apothecaries, one well-known critic expressed his conviction that the examination at Apothecaries' Hall was more conducive to public safety than that of the R.C.S., and that the examination of the College was no test of fitness for the discharge of any duty connected with the profession: that the object of the College of Surgeons appeared to be to form two distinct classes—the one a superior grade, the consulting surgeon, the other an inferior grade, to make and find work for the superior. It is of much interest at the present moment to recall the proposition made about this time for the establishment of "The Royal College of General Practitioners." There is in the minutes of the R.C.S. a record of negotiations between the R.C.S. and the R.C.P., the Society of Apothecaries, and a body known at the time as the National Association of General Practitioners; and an account of a meeting at the R.C.P., with a resolution that a Charter of Incorporation should be granted to the surgeon apothecaries of this country under the title of the Royal College of General Practitioners of England. It is also of interest that the medical Bill drafted in 1852 which substantially became the epoch-making Act of 1858 was drafted by a barrister, Mr. George Hastings, M.P., the son of the founder of the Association and Secretary of the Medical Reform Committee.

One of the anomalies of the time was that even if a doctor had the highest university honours he had not the right to practise in London, but must also obtain a licence from the College of Physicians, and this particular licence did not qualify him to practise out of London.

The highly commendable aims for the better education of the doctors, and their increase in status and usefulness, was probably the chief stimulus in seeking medical reform. Another stimulus was undoubtedly the considerable competition of quacks, of whom in 1851 there were estimated to be 21,400 in the country. As a forerunner of osteopathy, with its original and only pathology in the spine, came also from America the system known at the time by the rather significant name of "Coffinism." In this system the pathology of all disease is in the stomach, and consists of a "canker or vitiated secretion" that forms in the stomach or bowels to a greater or less extent, and interferes, presumably, with the function of the stomach. The adherents of the "Coffinite" school did appear to exhibit some versatility in their choice of what they considered necessary to remove this "vitiated secretion." At one inquest we read of the death of a woman suffering from hernia, a treatment consisting of jalap, cayenne pepper, and gin, a drachm glassful every morning—the verdict, "Death from natural causes." At another inquest a man of 27 suffering from cholera, so common in Britain at the time as to require the establishment of special cholera hospitals, was found at the post-mortem examination to have present in his stomach the same ingredients, plus ginger, plus lobelia. Lobelia seems to have figured very largely in the therapy. Dr. Letheby, lecturer on chemistry at the London, at this particular inquest stated that he had known 22 deaths from lobelia (whilst in America the cases were very much more numerous). The coroner in this case observed in the summing-up that he had on two occasions sent this particular quack for trial for manslaughter at the Old Bailey, but that the judges took a view of the cases different from that entertained by the juries. The juries, we can be pretty sure, did not themselves always entertain the correct view. The Coffinites were also referred to as "botanical physicians" or "Thompsonians," one Thompson being the first plausible

exponent of the system. Thompsonian quacks maintained several journals in America and one in London, although the actual cult seems to have been more widespread in the provinces than in London. The textbook was entitled *The Practice of Medicine on Thompsonian Principles*, by J. W. Comfort, M.D. The terms "Coffin" and "Comfort" in the same context are noteworthy and even cynical! The textbook had reached its fourth edition by 1853, and was a portly tome of 582 octavo pages.

Homoeopathy, which appeared to start as a reaction simply against over-drugging, was classified by orthodox physicians at the time as quackery, and our Association did draw up regulations for keeping homoeopaths out of the Association and for expelling them if they were found to profess or practise homoeopathy.

Other aspects were troubling the doctors and guiding their thoughts in the direction of medical reform. There was, for instance, no protection against any man calling himself M.D., M.B., or surgeon; and the registration of pharmaceutical chemists had given them a status and recognition, especially in the towns and villages of the provinces, which the doctor did not possess, and which had every appearance of supplanting him. Then there was also the facility with which the advertisements of quacks and their nostrums were published in the newspapers and in religious periodicals, especially of the provinces and in the Colonies.

The profession therefore had every reason at the time for seeking the highest possible representation in Parliament, with a view to ultimately securing the largest measure of medical reform.

Another of the formidable problems of 1852–3 concerned the Vaccination Act, making vaccination compulsory about that time. The controversy is interesting, as demonstrating the first efforts to crystallize medical opinion on a question of social policy. The effort was late, it is true, for the Act appears to have been rushed through Parliament in the first instance, without reference to or collaboration with the profession. The doctors at the time appeared to speak with different voices, and presumably when an amendment to the Act was suggested they did get together in a really representative way. It is of interest, also, that for the first time the suggestion was made that the opinion of counsel should be sought on how far the Government, by putting vaccination in the hands of the Registrar-General, had made itself responsible for all the expenses which might be incurred.

The Gratuitous Advice Committee

The question of gratuitous advice and the abuses alleged in hospital and dispensary practice appear to have assumed such high proportions that in 1853 the Branch actually called a further special committee into being, the Gratuitous Advice Committee. The abuses alleged would appear to have existed only in the metropolis, hence the special move in this Branch, but the impact of these abuses would appear to have affected not merely the pockets of the doctors but also their ethics—so much so that we find this particular committee working with the Ethical Committee of the Association in the collection and digesting of facts and opinions of various contributors. In the machinery for collecting these we also see the first suggestion of a questionnaire.

While recognizing the motives of kindness and charity, and the definite moral obligation of a generous profession to give unpaid advice to the poor and the necessitous, the allegation was made that special dispensaries or clinics sometimes sprang into existence, not to meet the exigencies of the poor, but to bring before the public notice some struggling member of the profession, to make himself known. There was the further charge that, although these gentlemen gave their advice gratis, some of them had entered into collaboration with the chemists, receiving a percentage on every prescription; and it was even reported that an F.R.C.P. who was the proprietor of a chemist's shop

constantly attended there to audit his accounts. Something had to be done about it, and the terms of the special committee were those of inquiry in the first instance. Ten questions were sent out to the whole profession, questions which admitted of an answer more than a simple "yes" or "no." In comparison with the charge of apathy which seems to afflict us in this modern age, it would appear that, even then, 2,000 such inquiries drew only 250 replies.

Medical News Items in 1853

Those were the chief problems and controversies of the times, which I have purposely not followed historically to their solution. Many of them, indeed, are much too protracted and involved to be dealt with in the time at my disposal, but it may be of interest to mention a few of the subjects treated in the articles and correspondence at the time and debated at meetings. In 1853 there was a report of a court-martial on a medical officer acquitted of the charge of "conduct disgraceful to the character of an officer and a gentleman," in having subjected himself to the indignity of being publicly kicked; all he appeared to have done was to decline to fight a duel.

On April 7, 1853, Dr. John Snow administered chloroform to Queen Victoria in labour, and this event gave rise to much discussion and many letters in the pages of the *Journal*.

On June 7, 1853, the Irish Medical Association was formed at Dublin upon the model of our own Association. Interesting articles of the time appear on medical ethics, arrears in subscriptions, lunacy acts, advertising, apathy, cholera, and a suggestion for "the establishment in London and other medical schools of a Medical Students' Association."

The year 1853 also saw the foundation of the Medical Benevolent College at Epsom. There are articles illustrating the poor conditions and salaries of medical men doing Poor Law work and of medical officers in the Army and Navy, also on sanitary legislation and preventive medicine.

Conclusion

This review of our founders and their problems has been necessarily sketchy. You may have been impressed, as I have, with the versatility of many in that generation. Certainly their accomplishment in languages and in the literary field reached a perfection which most of us must envy. Compared with them, our present set-up and our outlook is rigid. They seem to have been at all times flexible, not only in thought but in method and in action. We must marvel for instance at the facility with which some of them changed the location of their practices and appeared to take up new roots with great success and with no inhibition as to the future. Above all, certainly on the great question of medical reform and everything that went with it—the increased stature of the doctor, protection of the public, and so on—these pioneers played their necessarily formidable part, as did the parent association. On the question of medical reform they were nearly 40 years ahead of contemporary thought, for the Act of 1858 only granted half of what was in the profession's mind 20 years before, and which did not become law until 1886, and it is probably no exaggeration to say that they blazed a trail through a forest of contention and prejudice, even of the medical corporations at the time, one of which was even accused of selling midwifery licences, and encouraging the creation of a vast number of Members and Fellows for pecuniary gain.

On medical reform the ideal and the approach of our medical forebears transcended the narrow and self-centred outlook of the licensing bodies, and indeed of some universities. As an Association it should give us heart to recall their courage and their altruism, so that, when necessary, we can remind modern public bodies, whether educational or administrative, of the greatness of our heritage.

AN OUTBREAK OF TRICHINOSIS IN LIVERPOOL IN 1953

BY

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[WITH SPECIAL PLATE]

An outbreak of trichinosis occurred in the Liverpool area in late October and early November, 1953. In the past, localized epidemics of this disease have occurred in various parts of the country, and these have been reviewed by Young (1947). Sheldon (1941) and Jolly (1941) reported the epidemiological features of an outbreak in Wolverhampton, and Evans and Lennox (1953) a somewhat similar occurrence in the Borough of Barry. The main reason for giving an account of this outbreak is that it presented an admirable opportunity of studying the epidemiology and clinical features of trichinosis. The parasitological and pathological findings will be reported in greater detail in the *Annals of Tropical Medicine and Parasitology*.

The first of the 82 cases traced came to our notice when Dr. Robert Kemp telephoned on Friday, November 6, to say that he had just seen a case on a domiciliary visit which he suspected was trichinosis. This patient was admitted to hospital and the diagnosis was later confirmed by muscle biopsy. However, as the clinical findings were so suggestive of trichinosis, inquiries were made immediately in the same and other hospitals, and three further suspicious cases came to light.

It was felt that these cases might be part of a more widespread outbreak, so a letter was sent from the medical officer of health to all general practitioners and consultants describing features of the cases already seen and requesting that he be informed of any further suspected cases. There was a prompt and most helpful response, and cases continued to be reported until the third week in November. All patients were visited by a doctor from the Health Department, and the clinical data presented below were collected in this way. Epidemiological investigations were carried out by two sanitary inspectors, and health visitors undertook the follow-up visits on all the cases.

Epidemiology

The first case occurred on October 25 and the last one on November 18, and the dates of onset of the cases are shown in Fig. A. Those cases in which the diagnosis was confirmed by muscle biopsy are specially

marked; it will be seen that they include the first and last cases. The outbreak rapidly rose to a peak during the first week of November, but died away more slowly, 24 days separating the date of onset of symptoms in the first and last cases.

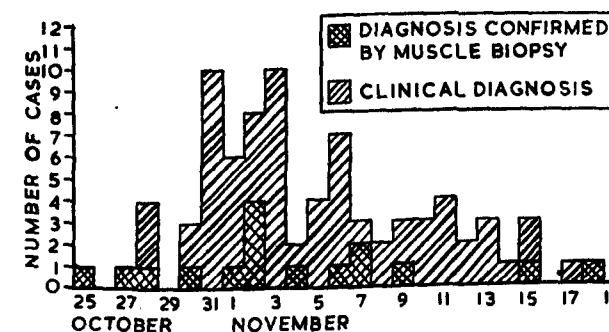


FIG. A.—Date of onset of the cases.

Patients were traced from all parts of the city and surrounding districts on the north bank of the River Mersey, but the majority lived in the northern part of this area. There was no evidence that different dates of onset were related to the area in which the patient lived.

Source of Infection

(1) *Sausages*. The earliest inquiry suggested that sausages of a certain local firm were most likely to be the cause of infection as the early cases gave a history of eating these sausages, and many of the patients had eaten them raw. Further confirmation came when one of the patients was found to be working in the sausage factory concerned, and reported that she habitually nibbled at raw sausage-meat whilst at work. The diagnosis in her case was established by muscle biopsy. Later, another worker in this factory was found to have developed trichinosis at the same time, and he also gave a history of tasting raw sausage meat whilst at work. As more and more patients were questioned, the connexion between this firm's sausages and infection became more firmly established, as 12 of the patients were employees of the firm—seven butchers, three grocery personnel, and two workers in the sausage factory. Of 82 cases (Table I) 67 gave a history of eating these sausages (34

TABLE I.—Eating Habits in 82 Cases of Trichinosis	
	No. of Cases
Infected sausage eaten (raw in 34 cases; cooked in 33 cases)	67
Persons handling infected sausage but not eating any, or any pork product except bacon	5
Persons who ate cooked sliced ham from firm handling infected sausage meat	5
Persons eating pork from different sources (no sausage and no product at all from firm handling infected sausages)	2
Story unreliable through lack of data	3

raw and 33 cooked). In 10 further cases there was a less definite connexion, as these persons had either handled infected sausage or eaten cold sliced ham bought from a shop known to have dealt with infected sausages. It was impossible to obtain accurate information in three of the cases.

(2) *Pork*. There were two persons, however, both reliable witnesses, who were emphatic that they had not handled or eaten any material from the firm involved, and the diagnosis in both cases was undoubted, on clinical grounds, though it was not possible to carry out muscle biopsy. These two cases suggest that at least two or more infected carcasses must have been involved. One of these patients was a widow of 63 living with her two daughters; she bought a joint of pork on October 31 from her butcher, cooked and ate it hot with her daughters on Sunday, November 1. The pork was then placed in the meat safe and she finished off the joint cold on Wednesday, November 4; in doing so, she ate the meat close to the bone.

She then gave her dog the bone; this animal was violently sick the following day. The patient developed a typical clinical attack, with swollen eyes, headache on the 12th, and was found to have an eosinophilia. In addition, the dog developed swollen eyes and conjunctivitis on the 14th. A biopsy on the dog was refused, but there seems little doubt that this animal had also developed trichinosis. The other patient in whom no connexion was traced also gave a history of eating pork at the same time as the case just described, and it was found that both butchers, who were widely separated in the city, received one half-carass of pork from the abattoir on October 24. No record mark is kept of the individual animal carcass delivered, and it has been impossible to trace whether both came from the same pig. There is a need for some form of record which would permit the tracing of such a finding to a particular animal and piggery. In both cases epidemiological investigation pin-pointed the particular carcass involved, but it was impossible to follow up our findings any further.

The investigation was then concentrated to see whether there was any possible connexion between the infected pigs delivered to the sausage factory and those delivered to the two butchers on October 24, as it was felt that the obvious disadvantage of suggesting two different infected sources would be greatly minimized if it could be shown that the pigs came from the same piggery. Once again the lack of adequate marking of individual pig carcasses made it impossible to check on this point. It is, however, of interest that the abattoir supplied both sausage factory and butchers, and that at that time a large consignment of pigs which was going to a bacon factory was diverted for ration meat but was found to be too fatty and, in consequence, most was used for sausage-making. It is, however, possible that one or two carcasses went to butchers for rations and that these, together with the carcasses which went to the sausage factory involved, came from the same infected source.

Methods of Infection

Anderson and Arnstein (1953) state that heating to a temperature of 58° C. for a few minutes kills the *Trichinella* larvae in pork, and that freezing to a temperature of —18° C. for at least 24 hours is required to kill them.

It is easy to understand how infection occurred in the 34 patients eating raw sausage. In a further 33 cases there was a history of eating cooked sausage (Table I), although this group also contained many who handled raw sausages and cooked them. Many of these persons were emphatic that their sausages were not grossly undercooked, and this suggests that what is regarded as ordinary cooking may not destroy all larvae. This is not surprising when it is recalled that the centre of a sausage is often relatively undercooked. The two cases traced to pork roasted at home also suggest that larvae deep in the joint may not be destroyed, and that thorough cooking may be required to render pork completely safe.

The experience of the five persons giving a definite story of handling but not eating any infected sausage, or any other product connected with the outbreak, is most interesting. Infection in these cases probably resulted from either infected sausage-meat on the hands being conveyed accidentally to the mouth indirectly, or by a knife used first to cut sausages and later to prepare a cold dish without adequate cleansing. The former probably occurred in the butchers infected and the latter in the kitchen when the housewives became infected. In all these cases the individual readily agreed that one of either suggestions could have occurred. Infected knives also probably resulted in the five cases traced to cold cooked sliced ham bought from a shop also selling infected sausages.

Characteristics of the Outbreak

Age and Sex Incidence.—Out of 82 cases, 20 were males and 62 females. The full age and sex incidence is given in Table II. The higher incidence in the females than the males is made the more impressive when it is realized that

TABLE II.—Age and Sex Incidence

Ages	Men	Women
0-14 years ..	1	4
15-24 " ..	0	5
25-34 " ..	8 (2 butchers + 1 sausage worker)	12 (1 sausage worker)
35-44 " ..	4 (2 butchers + 1 grocer)	20 (1 grocer)
45 years and over	7 (3 butchers + 1 grocer)	21
Total ..	20	62

10 of the men were employees of the firm involved (butchers, grocery assistants, or worker in the sausage factory), but only two of the women worked for the sausage company implicated. Forty-one of the cases occurred in women over 34, and of the 21 cases in women over 44, 11 were habitual raw-sausage eaters or nibblers. That these women, most of whom have eaten raw sausages for years, should develop trichinosis so late in life suggests that either overt infection is uncommon in Liverpool or that the immunity from any previous infections is inadequate to suppress completely the clinical symptoms on further exposure.

Occupation.—It was noted time and again that the only person affected in the household was the housewife who did the cooking. Further evidence that those handling raw food were in a more vulnerable position came from the finding that 10 male workers in the firm were clinically affected. In most instances the association could be easily explained by the eating or tasting habits of the individual involved. Occasionally there was an emphatic denial of these habits, and the inadvertent finger in mouth or infected knives probably explained these.

Incidence of Raw-Sausage Tasters in General Population (Adult Females)

Sheldon (1941) showed that the eating of raw sausage-meat was a fairly common habit in Wolverhampton. During the present outbreak health visitors, on every routine visit made in the course of their work, were asked to inquire into the habits of the housewife in the family. The following results were obtained:

Housewives interviewed ..	3,412
No. of housewives eating or tasting raw sausage ..	497
No. of housewives not eating or tasting raw sausage ..	2,915
No reply ..	320

From the 3,092 replies received 497 (16.1%) of the housewives were found to be habitual raw-sausage eaters or tasters.

Incubation Period

In only very few cases was it possible to obtain accurate information on the incubation period. This was mainly because most persons usually ate the same kind of meals from week to week, obtaining their supplies from the same source. In two cases there were two phases of the illness. The first case was that of a man who developed an acute attack of diarrhoea and vomiting on October 25. He was very ill, had blood in his stools, from which, however, no pathogenic organisms were isolated, and was admitted to the isolation hospital. He was discharged from hospital on November 4, but developed sudden swelling of the eyes, headache, and pyrexia on November 7, and was readmitted. Larvae were found in a muscle biopsy on November 21. If it is assumed that the acute gastro-enteritis symptoms developed within one to two days of eating the infected meal, this gives an incubation period measured to the initial general symptoms of 14-15 days. This patient's wife was also affected, but her first symptoms were general, developing on November 8. The second case had an interval of 13 days between diarrhoea and eye-swelling. In three other patients there were intervals of 10, 12, and 15 days between the last meal of sausages or pork products and symptoms.

Symptomatology

In former outbreaks of trichinosis in this country the symptomatology has been described mainly of the more serious cases which had been admitted to hospital. An attempt has been made in this outbreak to obtain full clinical details from all types of patients affected, including many of the milder cases treated at home; 22 were admitted to hospital and 60 remained at home. Most of the patients seen were treated by their general practitioner, but a few, who had not attended a doctor for their symptoms, were discovered by health visitors; these persons were advised to consult their general practitioners.

It is of importance in such an investigation to ensure that no case was included which was not suffering from trichinosis. The only certain method of establishing the diagnosis is the demonstration of larvae by muscle biopsy; this was obtained in 16 cases, and included three patients with milder disease treated at home. In most of those patients in whom a muscle biopsy was not carried out the diagnosis was easy to make clinically, as they presented a clear history, together with typical physical signs, and showed a marked eosinophilia. In the absence of eosinostances, but it was found that four patients in whom larvae were found on muscle biopsy had normal eosinophil counts on the 11th-17th day of disease. All cases doubtful on clinical grounds were excluded.

The incidence of the symptoms presented by 82 patients is given in Table III, and it will be seen from this list that these varied considerably from case to case. The classic

TABLE III.—Incidence of Symptoms in 82 Cases

	No. of Cases	%		No. of Cases	%
Swelling of eyes ..	82	100	Delusions and light-headedness ..	9	11.0
" " face ..	61	74.4	Splinter haemorrhages under nails ..	8	9.8
Muscular pains ..	77	94.0	Diarrhoea ..	7	8.5
Headache (frontal in 64 cases) ..	72	87.8	Cough ..	5	6.1
Photophobia ..	54	65.9	Conjunctival haemorrhage ..	3	3.7
Insomnia ..	46	56.1	Swelling of legs ..	2	2.4
Constipation ..	29	35.4	Semicomatose ..	1	1.2
Neck stiffness ..	26	31.7	Cerebellar signs ..	2	2.4
Lethargy ..	26	31.7	Monoplegia ..	1	1.2
Vomiting ..	24	29.5	Wrist-drop ..	1	1.2
Disturbance of balance or dizziness ..	23	28.0	Coma ..	1	1.2

picture of an illness of infection or a gastro-intestinal upset, followed 10-14 days later by general symptoms, was seen in only two cases. In spite of this, many of our patients presented a somewhat similar history, and the following is a detailed description of the commonest signs and symptoms.

Signs and Symptoms Commonly Seen in Patients During the Outbreak

Onset.—In most cases this was sudden, the usual story being that of a patient noticing marked swelling of the eyelids on waking one morning. This swelling was the only finding constant in every patient, and varied from puffiness just below the lower eyelids to gross oedema of the eyelids spreading on to the face, sufficient almost to obscure the eyes. It was usual for the oedema to increase for two to three days and then to disappear more gradually. The oedema became more noticeable after the patient had been lying in bed for some hours. Patients almost invariably have had some pyrexia at the time of the swelling of the eyes, and the temperature most commonly was in the range 100-103° F. (37.8-39.4° C). Some pyrexia often persisted for two to three weeks, and usually the temperature gradually subsided over this period.

Headache.—This was present in 72 patients (87.8%), was mainly frontal, and was located by many as being behind the eyes. It usually began after the swelling of the eyes had been present for about 24 hours; in a few persons, however, headache did not develop till a few days later. Headache was a distressing symptom; many patients described it as severe and likened it to a feeling as if the

A. B. SEMPLE, J. B. M. DAVIES, W. E. KERSHAW, AND C. A. ST. HILL: OUTBREAK OF TRICHINOSIS IN LIVERPOOL IN 1953

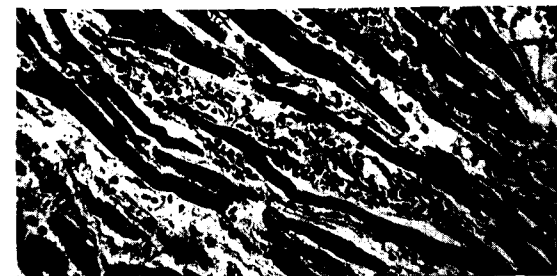


FIG. 1.—An area of early polymorphonuclear and eosinophilic infiltration between heart muscle fibres. (x120.)

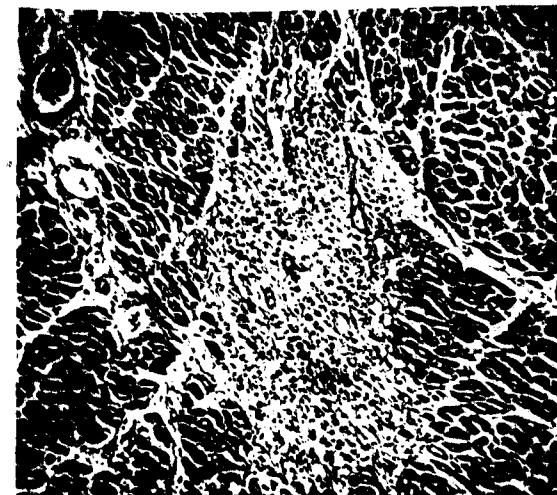


FIG. 2.—A small area of necrosis of heart muscle fibres. (x40.)

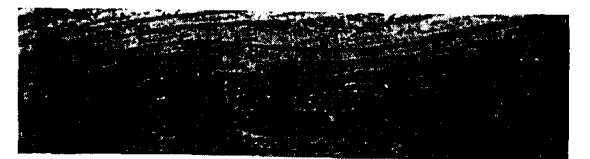


FIG. 3.—Showing a partially developed larva bent upon itself and lying longitudinally in the axis of the muscle fibres in an unstained fresh preparation. Seen with some difficulty. (x54.)



FIG. 4.—Showing a more developed larva arranged spirally in the muscle in an unstained fresh preparation. A cyst wall has not yet been formed. (x54.)

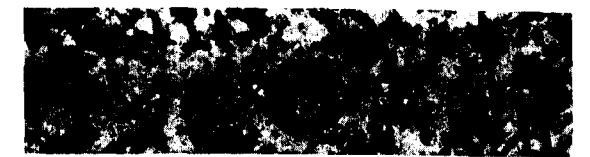


FIG. 5.—Showing a nearly mature larva in the muscle digest. (x54.)



FIG. 6.—Showing a larva lying in the muscle in a fusiform focus of necrosis with cellular reaction at each end. The cavity in which the coiled-up larva lies is probably an artifact and probably does not represent the early stages of formation of the cyst. (x54.)

P. JEWELL, T. PILKINGTON, AND B. ROBINSON: HEPARIN AND ETHYL BISCOUMACETATE IN PREVENTION OF VENOUS THROMBOSIS



FIG. 1.—Section of an ear vein showing a small mural thrombus. Rabbit had received ethyl biscoumacetate. (H. and E. x60.)

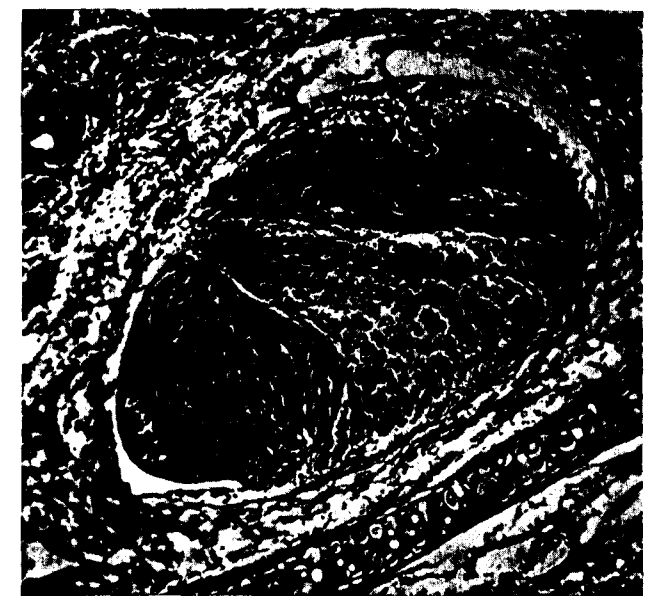


FIG. 2.—Section of an ear vein showing complete occlusion. Rabbit had received heparin. (Picro-Mallory. x50.)

K. L. MARKS: CONGENITAL SYPHILIS DIAGNOSED BY BONE CHANGES



FIG. 1.—Showing marked decalcification of the submetaphyseal zone in the radius and ulna. FIG. 2.—Showing thickening of the temporary zone of calcification in the femur. FIG. 3.—Showing irregular decalcification at the proximal end of the tibia.

G. SZABÓ: NUMBER OF MELANOCYTES IN HUMAN EPIDERMIS



FIG. 1.—Epidermis of skin from behind the ear (Sp. 16): dopa preparation. Note the abundance of melanocytes and the conformation of the epidermis. ($\times 95$.) FIG. 2.—Epidermis from skin of thigh (Sp. 12): dopa preparation. Contrast with Figs. 1, 3, and 4: melanocytes are relatively sparse and the epidermal pattern much less boldly defined. ($\times 95$.)

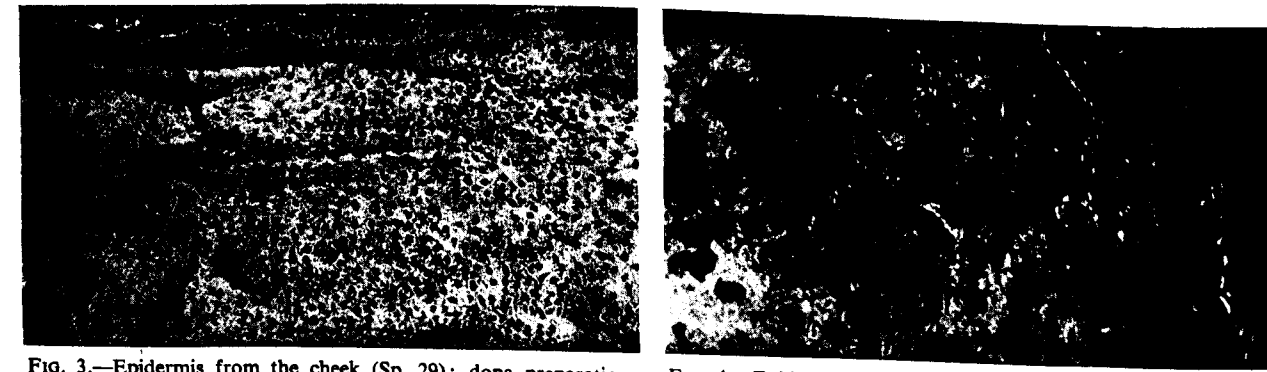


FIG. 3.—Epidermis from the cheek (Sp. 29): dopa preparation. Note the abundance of melanocytes. ($\times 95$.) FIG. 4.—Epidermis from skin of cheek (Sp. 45): dopa preparation counterstained with paracarmine, showing dimorphism of melanocytes into large, multiple-branched, and small forms. ($\times 390$.)

J. T. SCALES AND J. M. ZAREK: BIOMECHANICAL PROBLEMS OF THE ORIGINAL JUDET PROSTHESIS

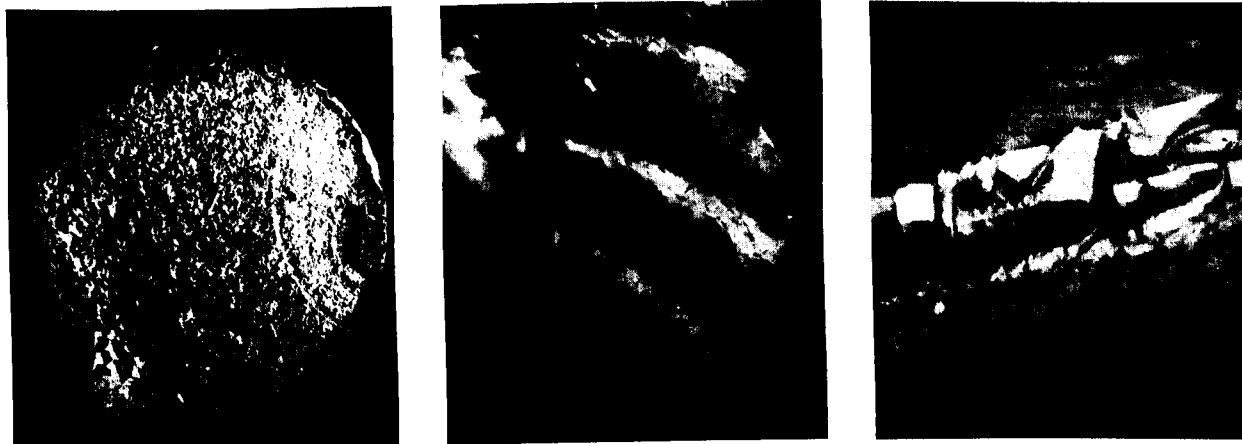


FIG. 1.—Fracture surface of metal rod. ($\times 8$.) Oblique illumination. FIG. 2.—Transverse section of fractured part of stem which failed in fatigue. Note grooves acting as stress raisers. ($\times 10$.) FIG. 3.—Longitudinal section of stem of new prosthesis illustrating depth of crazing. Fragments of polymethyl methacrylate 1-2 mm. in thickness adhering to metal rod. ($\times 15$.)

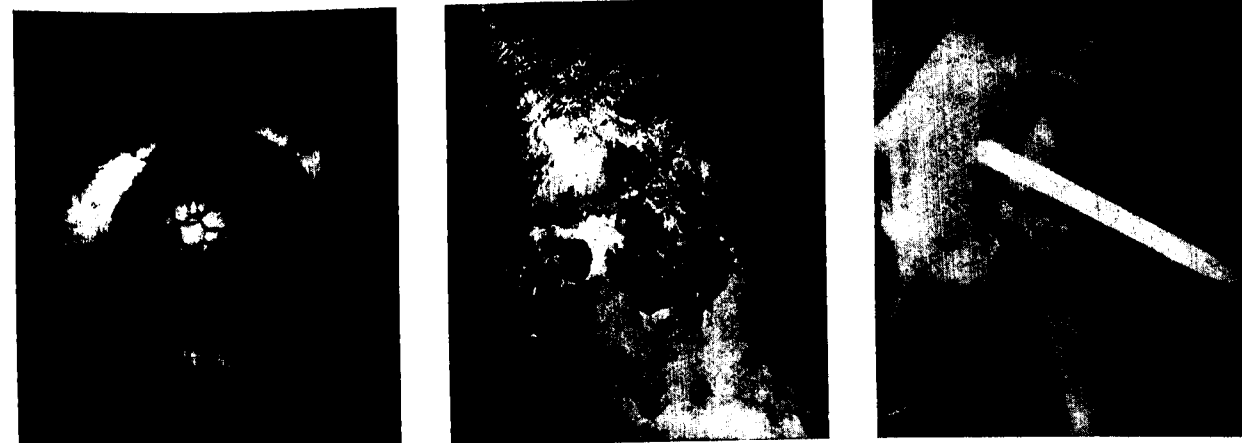


FIG. 4.—Metal rod seen through head of prosthesis, showing crazing. ($\times 10$.) FIG. 5.—Surface of metal rod showing corrosion pits. Prosthesis of which this rod was a part was in body for 18 months. ($\times 11$.) FIG. 6.—Case 1. (March 30, 1953.) Rarefaction of inferior cervical margin with enlargement of track resulting in shift of fulcrum laterally.

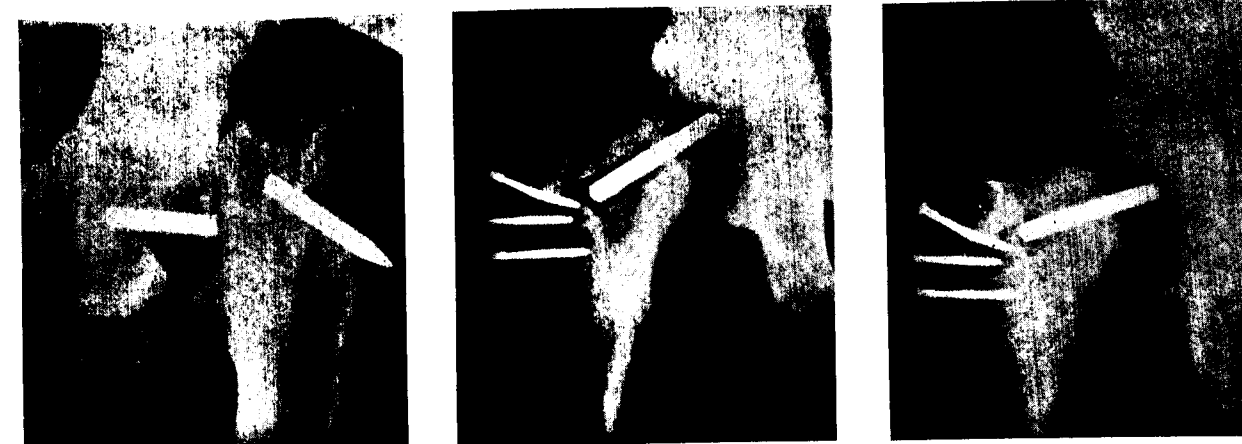


FIG. 7.—Case 1. (May 4, 1953.) Fracture of stem of prosthesis and of bone inferiorly. FIG. 8.—Case 2. (July 21, 1952.) Excessive varus insertion of prosthesis. Note short metal reinforcing rod. FIG. 9.—Case 2. (October 30, 1952.) Widening of track.

J. T. SCALES AND J. M. ZAREK: BIOMECHANICAL PROBLEMS OF THE ORIGINAL JUDET PROSTHESIS

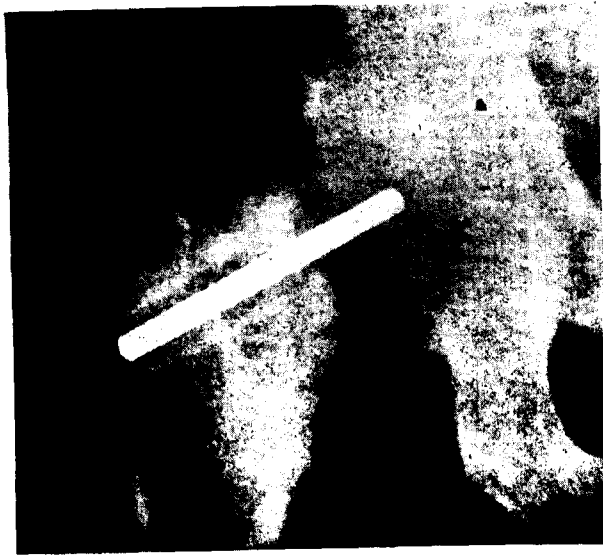


FIG. 10.—Case 2. (December 1, 1952.) Following insertion of second prosthesis with extended head. Length of neck further reduced.



FIG. 11.—Case 2. (February 16, 1953.) Shows fracture of stem at theoretical position.



FIG. 12.—Case 3. (September 26, 1952.) Five weeks after insertion of prosthesis. Appearance of avascular necrosis of superior medial portion of neck. No widening of track.



FIG. 13.—Case 3. (May 21, 1953.) 29 weeks later. Great trochanter not united. Absorption of femoral neck and widening of track with shift of fulcrum to region of fracture of stem.



FIG. 14.—Case 4. (July 30, 1951.) Prosthesis does not penetrate lateral cortex.

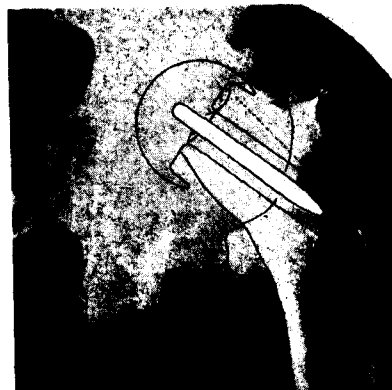


FIG. 15.—Case 4. (November 17, 1952.) 68 weeks post-operative. Widening of track. Superimposed outline shows skirt must have impinged upon superior margin of neck of femur. Fracture of skirt has probably occurred, giving rise to pain and limitation of movement.



FIG. 16.—Case 4. (March 25, 1953.) 18 weeks later. Further widening of track with fracture of inferior part of neck of femur. There is reorientation of trabeculae in relation to distal end of stem.



FIG. 17.—Judet prosthesis after 21 months in the body, showing crazing of unworn area of the surface of the head. ($\times 100$.)

front of the head was about to burst. Photophobia usually accompanied this violent headache and lasted often for four to five days.

Muscular Pains.—These nearly always first occurred two to four days after the swelling of the eyes, and varied considerably from case to case, but the intensity of muscular pain did not seem to depend upon the severity of the case. Patients found it unusually difficult to describe the type of pain which they experienced; the most commonly used descriptions were those of a "stiffness type of pain" or of a "heavy dull pain," and many patients reported that their pains increased on movement, especially on moving a muscle after rest, although when the muscle was further exercised the pain became less apparent and often disappeared. In this way patients themselves noticed that their muscular pains were similar to those felt in muscles following unusual exercise, such as the pains experienced by any athlete at the beginning of a new season of sport. Muscular pains have not been the predominating symptom of most patients, although they were very acute in a minority. In most persons the severe headache usually developed before the muscular pains, and was more troublesome.

Insomnia.—At the start of their illness 46 patients (56.1%) suffered from marked insomnia. This finding was commented upon by patients and relatives who, having noticed that the patient was very lethargic and found concentration difficult, were surprised at the difficulty in sleeping. This insomnia has been a characteristic of so many patients that it has suggested a useful additional diagnostic sign, for, in most persons, the insomnia could not be explained satisfactorily by the symptoms, and represented an obvious feature of its own.

At the end of the first week of illness, the swelling of the eyes had largely disappeared and the picture in most cases was that of a persisting pyrexia, with some muscle pains and marked lethargy and weakness, and this condition usually then slowly improved until after two to three weeks the patient was free from symptoms although still feeling very weak.

Splinter Haemorrhages.—Splinter haemorrhages under the finger-nails as described by Sheldon (1941) were seen in eight cases (9.8%).

In all instances these haemorrhages developed late in the disease (second and third weeks) and therefore were of no value in early diagnosis. Characteristically, the haemorrhages occurred under the tips of the nails (see Fig. B), and in all but one patient they occurred under all the finger-nails.

Eosinophilia.—Apart from four persons, in all of whom larvae were demonstrated by muscle biopsy, an eosinophilia was present in all cases, varying from 550 to 12,000 eosinophils per c.mm.

Other Signs and Symptoms.—Constipation was reported in 29 cases (35.4%), and was a much commoner finding than diarrhoea (7 cases, 8.5%). Vomiting occurred in 24 patients (29.5%), and was usually of short duration, being most commonly reported on the first and second days of the illness. Lethargy was a very obvious feature of 26 cases (31.7%), although a much larger number reported that they felt tired and washed out. Neck stiffness was reported in 26 persons (31.7%), and included in roughly equal proportions a stiffness when moving the head antero-posteriorly and from side to side.

Complications in Central Nervous System

In five patients (6.1%) obvious abnormal central nervous system signs developed. In four these began at the end of

the first week of illness and in the other at the end of the second week. One patient developed signs of cerebellar involvement and later a monoplegia; another quickly lapsed into coma, adopting a meningeal position and cry. A further case developed a wrist-drop. Two additional patients lapsed into a semicomatose state and remained critically ill for one to two weeks—one of these also developed a monoplegia. In the five cases with C.N.S. involvement lumbar puncture showed no abnormality.

Nine cases showed minor psychic disturbances, with either delusions or an obvious personality change; these findings resulted in one family considering seeking psychiatric advice, while three patients confessed that they thought they must be going mad. The personality changes mainly took the form of the patient behaving in an unusual manner. One sang constantly; another climbed out of bed and calmly urinated on the floor. Hallucinations and visual disturbances were not reported.

Disturbances of balance mainly associated with dizziness occurred in 23 cases (28.0%). This was not a troublesome symptom and usually cleared up within a few days.

Cardiac Complications (Including Details of a Fatal Case)

In the whole series there was one fatal case (see below). Another patient died from a pulmonary embolism during the third week of the disease.

Report of Fatal Case.—A man aged 45 began his attack on November 3 with sudden swelling of the eyes; frontal headache developed a day later. The initial part of his illness lasted one week, at the end of which he began to suffer from cramp-like pains in the back of his neck. At this stage his family had become extremely worried on account of his unusual behaviour. On November 17 he noticed that his right hand felt very heavy and that he was unable to lift it up.

He was admitted to hospital on November 20, and on examination was found to have a right wrist-drop, but, with the exception of a doubtful positive Babinski sign, no additional abnormalities were found in his central nervous system. Lumbar puncture findings were normal. He had a low-grade pyrexia, and on November 21 a blood count showed an eosinophilia of 3,800 cells per c.mm. He was treated with cortisone, 100 mg. daily, beginning on November 21. By the 23rd an obvious improvement in the condition of his right hand was noticeable as well as in his general condition. Next day he felt further improved, had breakfast, but, on sitting up, suddenly collapsed and died within a few moments.

At necropsy, no abnormality was found on naked-eye examination in any organ except the heart, which showed moderate left ventricular hypertrophy. Patchy atheroma was present in the coronary arteries, but complete occlusion was not found.

Histological examination of the heart showed a widespread focal destruction of the muscle fibres with an acute inflammatory reaction, the cells consisting of polymorphonuclear leucocytes with a high proportion of eosinophils (Plate, Figs. 1 and 2). The foci varied in size, some consisting of small clusters of inflammatory cells, others being about 1 mm. in diameter. The foci seemed to be of different ages, the youngest being at the stage of cellular infiltration, the oldest showing the changes of early organization. No parasites were found in any of these foci, nor were masses of foreign material seen which might have been the remnants of partially absorbed parasites.

Sections of the voluntary muscle of a limb showed a much more marked eosinophilic and polymorphonuclear leucocytic infiltration, but no focal areas of necrosis were found such as occurred in the cardiac muscle. In contrast, the cells were widely scattered between the individual muscle fibres and separated them. Larvae were found in fusiform gaps between muscle fibres which contained an inflammatory reaction at both ends. No cysts had formed. Neither parasites nor tissue reactions were found in sections in any other organ, including the brain.

The absence of any abnormal macroscopic signs at necropsy to account for this patient's sudden death suggested that he might have died from a sudden failure of the heart similar to that seen occasionally in diphtheria, and the subsequent microscopical findings supported this theory. Consequently a very careful watch was kept for any other patients developing signs late in their illness suggestive of a possible heart failure.

Three cases of sudden unexplained breathlessness beginning at the end of the third week of illness were traced.

All these patients had an obvious breathlessness and one had oedema of the legs, but there was no venous congestion in any of them and all had a regular rhythm of the heart. All did, however, show some tachycardia of 110-120 a minute. Unfortunately, further detailed examinations, including E.C.G. tests, were not carried out.

When the findings of these cases are considered in conjunction with the microscopical findings in the heart muscle of the fatal case, it seems suggestive that unexpected cardiac failure may occur in trichinosis as a late complication, especially towards the end of the third week of the disease. Certainly any unexplained fainting or breathlessness at this stage of the illness, particularly if associated with tachycardia or a low blood pressure, should be taken seriously and the patient nursed in the recumbent position.

It is interesting to consider the possible causation of the myocarditis in the fatal case, which occurred two to three weeks after the first larvae had migrated from the bowel. As no larvae were found in the heart muscle it is unlikely to be a direct reaction to their continued presence. It is usually believed that the larvae encyst mainly in the muscles with a high metabolic rate, such as the oesophageal muscle, diaphragm, and the intercostal muscles. The fate of other larvae in the rest of the body—and there must be a very large number of them—is unknown. By analogy with experimental animal infections with trichinellae, destruction of the larvae in muscles of low metabolic rate would occur from the second week onwards. This raises the possibility that the myocarditis occurred at the time of larvae destruction in the heart muscle and may have been due to the products of destruction.

Sequelae

Fifty-two of the cases were followed up by health visitors four to six weeks after their illness. Only 15 of these patients reported that they felt fully recovered. The majority complained of tiredness and lack of energy, and 24 had not returned to work. Nine of the group had some transient breathlessness which lasted a few days, developing in every case from the third to fifth week. Further visits were paid to all patients still showing some symptoms, and at the time of writing this report 16 were still being visited. The general picture is of an exhausting debilitating disease from which recovery is very slow.

Laboratory Investigations

The methods used in examining the muscle are described in detail, since it is only by this means that the diagnosis can be established with certainty in a suspected clinical infection. A piece of muscle about 2 c.cm. in size was removed under local or general anaesthesia from the deltoid or the outer aspect of the thigh, or wherever local symptoms suggested, with due regard to cosmetic results. A small flat disk about 5 mm. in diameter, with the muscle fibres running along the surface, was pressed between two glass slides until it was about 2 cm. in diameter, and examined unstained under the low power of the microscope. Coiled larvae were usually seen clearly, but the smaller earlier stages, which have less well-defined morphological features and which lie along the axis of the muscle fibres, were seen only with difficulty. In a heavily infected case a larva was usually found in a few minutes, but in others half an hour or an hour was spent before one was found. As will be seen from Table IV in seven cases no larvae were found by direct examination, though they were found in a digest.

Digestion of the muscles was done in all cases. A weighed quantity about 2-5 g. was cut into small fragments and incubated overnight in 250 ml. of 1% acid pepsin, then centrifuged and a little formol saline added to the deposit. The fixed deposit was examined in a "perspex" cell 4 cm. by 3 cm. by 3 mm. on a inverted microscope. Since the larvae are much heavier than the debris, they can be

TABLE IV.—Results of Muscle Biopsy

Patient	Direct Film	Digestion	Larvae per g. of Muscle	Nature of Illness
1	Larvae present	15 larvae in 2 g. muscle	7.5	Moderate
2	Nil	40 " " 2 " "	20	"
3	Larvae present	12 " " 3.5 " "	3.4	"
4	" "	58 " " 1.2 " "	48.3	"
5	" "	19 " " 1.3 " "	14.6	Severe
6	Nil	66 " " 2 " "	33	"
7	" "	6 " " 5.3 " "	1.1	Moderate
8	Larvae present	511 " " 4.3 " "	118.6	Severe
9	Nil	1 larva in 1.6 " "	<1	Mild
10	Larvae present	23 larvae in 1.4 " "	16.4	Moderate
11	" "	1 larva in 1.19 " "	<1	"
12	Nil	1 " " 1.5 " "	<1	"
13	" "	1 " " 1.6 " "	<1	"
14	Larvae present	131 larvae in 1.6 " "	81.8	Severe (died)
15	Nil	2 " " 3.62 " "	<1	Moderate
16	Larvae present	64 " " 3.01 " "	21.3	"

seen clearly as refractile objects with definite morphological characteristics lying on the bottom of the cell against the vague background of the debris (Plate, Figs. 3, 4, 5, and 6).

Summary

An outbreak of trichinosis is described which occurred in Liverpool in the late autumn of 1953 and involved 82 persons.

Infection was traced to sausages in most cases. In two instances pork roasted at home was responsible. Although epidemiological investigation traced the infection to a particular carcass of pork, it was impossible to trace this finding back to a piggery, as no records existed to enable this to be done. There is an obvious need for such records to be kept by the Ministry of Food.

Women were affected more often than men (60 to 22). Analysis of the eating habits of 3,412 housewives in Liverpool showed that 16.1% habitually ate raw sausage.

The symptomatology of 82 cases is considered in detail. Oedema of eyelids, headache, muscular pains, pyrexia, photophobia, and insomnia were the most commonly reported signs and symptoms.

A fatal case is recorded, together with the post-mortem findings. The complication of myocarditis developing in the second and third weeks of disease is considered, and it is emphasized that any suggestion of cardiac involvement should be treated seriously and the patient nursed in a recumbent position, as there is a possibility of sudden death.

Larvae were isolated from the muscles of 16 patients.

Thanks are due to the many general practitioners and consultants, hospital staff, and our public health colleagues in neighbouring districts who, by their whole-hearted co-operation, made this epidemiological and clinical study possible.

We are indebted to Professor B. G. Maegraith, Dean of the Liverpool School of Tropical Medicine, for his assistance with the photographs and to Mr. J. Brady for taking them.

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The Welsh National School of Medicine has received covenants from some firms interested in anaesthetics and anaesthetic apparatus guaranteeing for seven years annual grants of £700 to aid research in the department of anaesthetics.

BIOMECHANICAL PROBLEMS OF THE ORIGINAL JUDET PROSTHESIS

BY

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[WITH SPECIAL PLATE]

In the treatment of pathological conditions of the hip-joint much surgical ingenuity has been exercised in the development of various types of arthroplasty. Recently the Judet technique seemed to offer a considerable prospect of success, and indeed the preliminary results published by J. and R. Judet (1950) were encouraging. The results achieved in this country, however, have been less satisfactory than those claimed by the Judets in 1952. In their later report they state that "fracture of the stem of the prosthesis has not occurred in 500 operations since the stem of the prosthesis has been reinforced with a steel core. Undue wear of the surface of the head has occurred in three cases, and we are seeking its cause."

In view of the number of breakages and instances of wear of prostheses manufactured in this country, however, it was decided to investigate the reasons for these mechanical failures. The work has been made possible only by the generous co-operation of a number of orthopaedic surgeons. Our investigations suggest that both the design of the prosthesis and the combination of materials used in this country are unsatisfactory.

It seems that delayed failures of the operation are commonly attributable to one or more of the following: (1) failure of the materials; (2) malposition of the prosthesis; (3) interference with the local blood supply to the bone.

Before giving examples of causes of failure it is important to consider the mechanics of the hip-joint, the materials used in the prosthesis, the design, the method of manufacture, and the blood supply of the neck of the femur.

Mechanics of the Hip-joint

In a person standing erect with both feet together the weight of the head, arms, and trunk is distributed equally between both hip-joints. For example, assuming the total weight of the patient to be 70 kg., and the weight of each lower limb 15 kg., there will be 20 kg. carried by each femoral head, with the body weight acting vertically downwards in a sagittal plane. If now the patient stands on one leg, keeping the pelvis horizontal, the hip-joint becomes the fulcrum of a lever (Fig. A). The weight of the body carried by the supporting hip-joint becomes 40 kg. for head, arms, and trunk, plus 15 kg. for the non-weight-bearing limb. Because the femoral head represents a fulcrum of a lever, the total moment about this point which has to

be resisted by the contraction of the glutei, tensor fasciae latae, etc., can be calculated as follows from Fig. A:

Assuming that the distance OW from the symphysis pubis to the centre of the area of contact of the femoral head with the acetabulum is 10 cm., then the moment due to the weight of the head, upper limbs, and trunk is $40 \text{ kg.} \times 10 \text{ cm.} = 400 \text{ kg.cm.}$ The moment due to the non-weight-bearing limb is $15 \text{ kg.} \times 20 \text{ cm.} = 300 \text{ kg.cm.}$ The total moment is therefore 700 kg.cm.

Assuming that the resultant force due to muscle pull acts on the great trochanter at a distance OQ of 5 cm. from the centre of the femoral head and at an angle of 45 degrees, then, from the consideration of moments, $Q = 140 \text{ kg.}$, and the vertical reactive force (R_1) is equivalent to $140 + 40 + 15 \text{ kg.} = 195 \text{ kg.}$

From a consideration of statics the total reactive force carried by the head is equal to 240 kg. (R) and acts at 36 degrees to the vertical. Therefore the angle between the axis of the prosthesis in the bull's-eye position and the direction of the force transmitted by this joint is 12 degrees. As in the process of obtaining this result a certain number of assumptions

had to be made, the results will vary from patient to patient, but they give an indication of the magnitude and direction of the acting forces under static conditions.

When the patient is walking, accelerating and retarding forces come into operation and, according to their magnitude, may produce a load on the joint which will exceed the static value. At times the line of body weight may move further from the hip-joint, and this will also increase the load carried by the joint. Under shock load conditions, as when a patient accidentally steps off a kerb, the instantaneous loading value will be even greater. Considerable work on the mechanics of the hip-joint has been done by Ros y Codorniu (1949), by Osborne and Fahrni (1950), and by Endler (1953b).

Materials, Design, and Method of Manufacture

Materials.—The development of organic synthetic materials has resulted in a range of materials which appear suitable for use in contact with body tissues. Any material to be used inside a joint must fulfil certain requirements (Scales, 1951). It should be chemically inert, physically unaffected by tissue fluids, incapable of provoking an inflammatory or foreign-body response in the tissues, non-carcinogenic, incapable of producing a state of allergy or hypersensitivity, capable of standing up to the mechanical strains imposed upon it, and capable of being fabricated simply into the form required. Because polymethyl methacrylate satisfies most

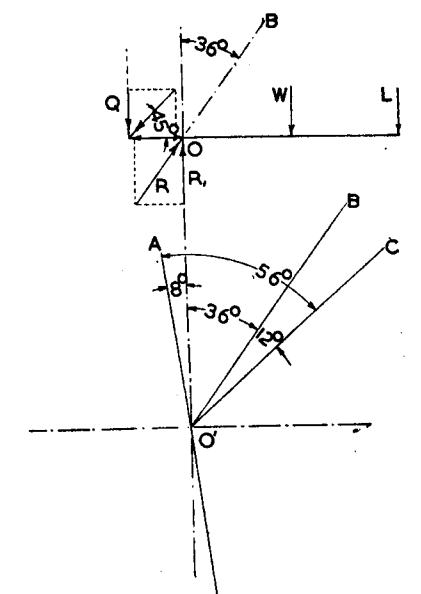


FIG. A.—Patient standing on one leg, assuming pelvis horizontal. $W = 40 \text{ kg.}$ $L =$ pendant limb $= 15 \text{ kg.}$ $O =$ fulcrum of joint. $O'A =$ axis of femur. $O'B =$ direction of resultant force transmitted through joint. $O'C =$ axis of neck of femur and prosthesis when inserted in bull's-eye position.

of these requirements, the Judets, in 1946, used it for their reconstructive procedure. In this country the material used is unplasticized polymethyl methacrylate produced by Imperial Chemical Industries, Ltd., under the trade name "perspex." The mechanical properties of thermoplastics are a function of temperature, and it may be taken that the following values for perspex apply at 37° C.: maximum tensile stress, 490 kg./cm.²; modulus of elasticity, 2.625×10^4 kg./cm.²; Vickers pyramid hardness, 15-18. The linear coefficient of thermal expansion at 37° C. is 9.7×10^{-5} per °C.*

Design.—The standard Judet acrylic prosthesis used in this country up to the time of writing is a "mushroom-like" structure. Various stem lengths and head diameters are available. The head is approximately two-thirds of a sphere and is recessed to take the shaped basal part of the head and adjacent neck of the femur. The grooves on the stem and the squared taper are devices to prevent rotation, and vary according to the manufacturer. The stem is reinforced with a metal rod which is totally enclosed by the resin.

Method of Manufacture.—The shape of the prosthesis having been turned from the solid block, a hole of slightly less diameter than the metal rod is drilled up the stem into the head. The method of insertion of the rod depends on the ideas of the manufacturer. The hole is filled with a solvent or cement in order to soften the surrounding acrylic locally, thus allowing a metal rod to be forced into the cavity—a type of "shrinking" fit being obtained. A perspex plug is next inserted to fill the remainder of the hole, and the tapered end of the stem is subsequently fashioned. The coefficient of expansion of polymethyl methacrylate is eight times that of steel, and consequently the bond between the acrylic and the metal rod is subject to disturbance when the temperature of the prosthesis is raised either during sterilization by heat or, to a less extent, when it is placed in the body after formalin sterilization. For greatest reinforcement of a structure there must be, of course, adequate bonding between the two materials used, and a sufficient anchorage. We have found that in a number of cases the reinforcing rod had such a loose fit that it rattled. One manufacturer drilled a hole through the metal rod; the acrylic cement filled this hole and thus prevented the rod from rattling.

Biomechanical Analysis of the Design.—The design of the prosthesis should be such that: (1) it is strong enough to transmit the forces due to body weight and the action of the gluteal muscles to the shaft of the femur, without danger of mechanical failure; (2) it can distribute the load on the femur as uniformly as possible without endangering the blood supply and without producing local crushing of the bone; (3) the dimensions of the head will give greatest loading area with least limitation of movement of the femur.

Theoretical Considerations

Fig. B shows a prosthesis with a stem correctly penetrating the cortex; it rests on an area represented by the point B₁, where the bone may be either cancellous or cortical or both. The resultant action of the weight of the body and the action of muscles is represented by force P acting medially to B. This force can be resolved into two components, P₁ and P₂. Thus the prosthesis is subjected to bending and shearing due to P₁ and direct stress in the direction of the stem due to P₂. Torsional stresses should be negligible. Owing to the penetration of the cortex the direct stresses due to the component P₂ are taken up by the annular part of the prosthesis under the skirt. The stem will thus be subject only to bending and shearing stresses due to P₁ as indicated diagrammatically by I and II in Fig. B.

As the angle i increases, the component in bending P₁ also increases, since $P_1 = P \sin \alpha$, the angle α being directly

proportional to angle i . The moment about B thus increases, since it is a product of P₁ × AB.

Should AB increase because of the movement of the point of support laterally, as occurs with absorption of the cancellous of the inferior cervical cortex, then there will be a further increase in the value of the moment about B₁ (Fig. C). This distance AB is necessarily large when a prosthesis with an extended head is used. As the value of the bending moment increases, so the value of R₁ must also increase. There are thus three situations which may arise: (1) a state of equilibrium of the structure is reached; (2) the flexural strength of the stem of the prosthesis is exceeded and failure occurs; and (3) fracture of the bone takes place. When the stem does not penetrate but abuts against the lateral cortex, or where there is incomplete penetration of the cortex by the taper of the stem and the annular part of the prosthesis is not in contact with the transected neck, then direct stress will be additionally introduced in the stem. Should the stem not be long enough to reach the cortex, the direct stress will again be taken up by the annular surface, but the prosthesis will undoubtedly be in a less stable equilibrium.

When comparing the loading of the neck of a normal femur with that in which a Judet prosthesis has been inserted, it is clear that the distribution of load through the prosthesis is far from favourable. As seen in Figs. B and C, the reactive force R₁, which may be either local at B₁, or distributed along a greater or lesser extent of the lower surface of the stem, may be excessive; nor does its direction of action correspond with the normal anatomical "lines of force" in the region of the calcar femorale.

As the ratio of the modulus of elasticity of stainless steel to that of polymethyl methacrylate is as high as 86:1, full advantage of the metal insertion can be achieved only if adequate anchorage of the reinforcing rod is provided and the bonding stress between the two materials is high enough to ensure that no movement between the plastic and the metal insert takes place during straining. If the bond is poor or the insert is actually loose, then failure of the plastic part of the stem will take place under a very low load.

Experimental Findings

Preliminary tests on the prosthesis under static load were carried out. A prosthesis of the Judet type but without a metal reinforcement, fitted into a femur, failed under a vertically applied load of 470 kg., giving a failing stress in bending in the stem of 490 kg./cm.² This result agreed with the one obtained by Endler (1953a).

In order to test prostheses reinforced with steel, a metal reproduction of the femur was made

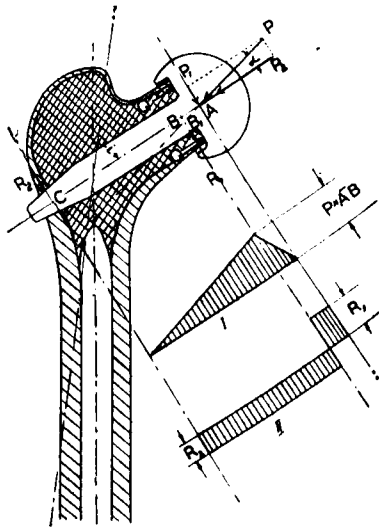


FIG. B.—Prosthesis in bull's-eye position. I = Bending moment diagram. II = Shearing force diagram.

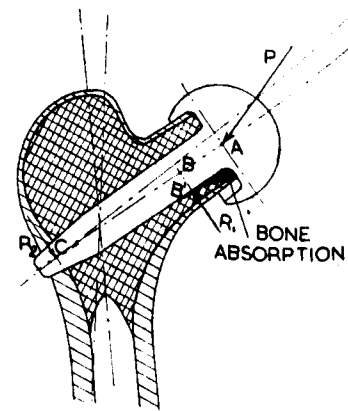


FIG. C.—Shift of fulcrum B, due to absorption.

for the plastic part of the stem of a number of tested prostheses were in the range of 420-560 kg./cm.²

If the prosthesis is correctly fitted the forces involved during normal movement of a patient produce much lower stresses in the stem, but nevertheless cause failure. It was evident that other factors such as fatigue of the materials and stress corrosion must be responsible. Examination of a number of prostheses which had failed in the body confirmed this belief. The results of a typical metallurgical investigation are given below.

The metal pin under investigation was part of a prosthesis which failed in service after insertion. It was supposed to be made from austenitic stainless steel of the 18% chromium and 8% nickel variety, but when reference was made to the makers no indication of the exact type or condition of the steel could be obtained. Examination of the surface of the pin showed that it was badly polished, having the appearance of a "filed" type of finish. The fractured surface (Plate, Fig. 1) of the rod consisted of two parts: first, a fairly smooth area marked with a series of concentric rings, the centre of which was a point on the periphery of the pin; and, secondly, an area with a fine-grained "crystalline" type of fracture. These findings are typical of a fatigue failure.

In order to examine the micro-structure of the rod, a longitudinal section was polished and examined in the unetched condition. The following observations were made: no sign of cracking was noticed either immediately adjacent to the fracture, or anywhere on the specimen; and the steel did not contain any non-metallic inclusions, or any other signs of defects.

Subsequently the specimen was etched in Murakami's reagent to examine for carbides, and the following observations were made: the structure now showed a number of black particles and pits; these particles appeared to be parallel to the direction of the working of the pin; no other structure was visible.

It was considered that free carbides were present in the material. Finally, the specimen was repolished and etched in aqua regia and the following observations were made: (a) The general structure was typical of an 18/8 austenitic stainless steel. (b) The structure again showed the presence of particles elongated by working, which were assumed to be carbides; another constituent, the nature of which was not established, was probably free chromiferous ferrite. (c) There was no plastic deformation of the surface of the grains over the fractured surface, or any signs of defects.

The hardness of the steel was of the order of 230 Brinell, which is equivalent to a tensile strength of 7,560 kg./cm.² and represents a nominal figure for this type of steel. In conclusion it may be said of the fracture that: (a) It is a fatigue fracture. (b) It may have been due to either too low a fatigue limit of the material used or a lowering of the fatigue limit by structural or corrosive effects. (c) The material, although an 18/8 stainless steel, shows in its microstructure the presence of a certain amount of included material. These inclusions, unusual in this type of steel, may consist of free ferrite or free carbide, and could act as stress raisers and thus seriously reduce the fatigue strength of the steel. (d) The presence of these constituents in the structure would seriously reduce the corrosive resistance of the steel, and only a slight corrosion of the pin would be sufficient to reduce the fatigue strength even further. No evidence of corrosion was found in the specimens, but it should be noted that corrosion effects are rarely seen in stainless steels when failure occurs by corrosion fatigue.

Polymethyl methacrylate, according to the makers' tests, loses 50% of its strength when subjected to a constant load well below its breaking strength for about 1,000 hours at 20° C. (Hoff, 1952). Its ultimate static strength also depends on the straining rate (Maxwell and Harrington, 1952). Fluid absorption, which according to the makers may reach 2%, will also have some effect on its mechanical properties.

When a material is subject to cyclic stressing well below the value of the static failing stress, a progressive deterioration of its strength takes place and may finally result in failure. For the investigation of the behaviour of metals suitable methods of testing have been developed, resulting in reliable information.

It is realized that the characteristics of metals and plastics differ widely. As there are no suitable methods of fatigue testing for plastic materials, we have adopted the well-established method used in the investigation of metals, which, we believe, should give an approximately correct result.

Specimens of perspex made from rods as supplied by the makers were fatigued in flexure with full reversal of stresses at 2,000 cycles a minute. Curve A in Fig. D shows that the stress fatigue limit is in the range of 110 kg./cm.²

As it is a customary procedure to sterilize the prosthesis by boiling, a series of tests were performed as for Curve A, but, before testing, the specimens were boiled for 30 minutes and then plunged into cold water. It is evident from

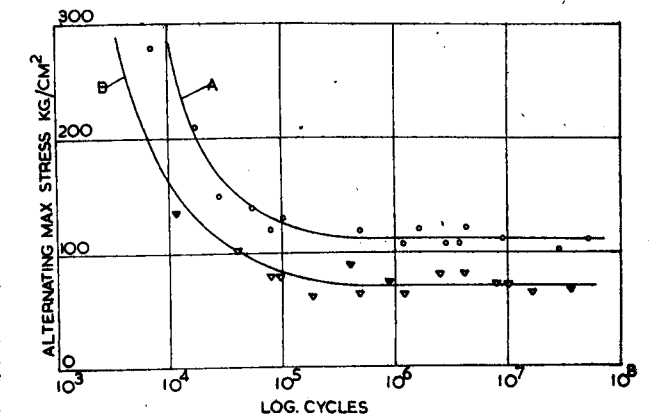


FIG. D.—Fatigue test results on polymethyl methacrylate. Curve A = material as supplied by the makers. Curve B = test specimen, boiled and cooled before testing.

Curve B (Fig. D) that this procedure has reduced the fatigue limit to approximately 70 kg./cm.². The same degree of reduction in strength was observed when, after boiling, the specimen was allowed to cool very slowly.

From these tests the following comments can be made: (1) The fatigue strength of polymethyl methacrylate when subjected to rapidly fluctuating stresses is from 15% to 25% of its ultimate strength. In both tests the results indicate a high degree of scatter which may, in part, be attributed to poor heat conductivity of the material and high hysteresis losses. (2) The decrease of strength of the material after boiling may be due to water absorption or to an alteration in the structure of the polymer. (3) In application to the human body the frequency of 30 cycles per minute may be accepted as around normal and therefore a certain percentage of strain recovery is possible.

Fig. E shows results of fatigue tests in flexure on prostheses with a 6.3 mm. stainless-steel reinforcing rod. In

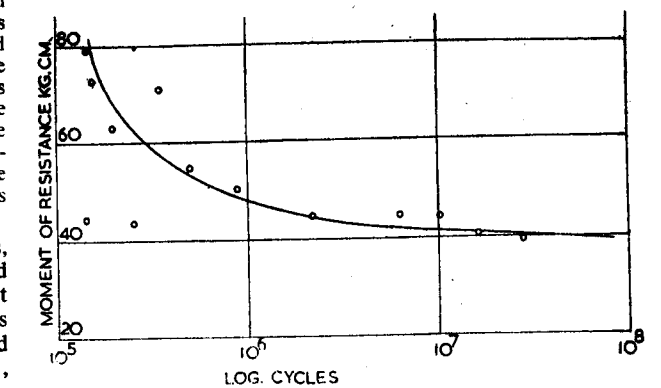


FIG. E.—Fatigue tests in flexure on prosthesis with a 6.3-mm. diameter metal reinforcing rod.

two cases the plastic and the rod failed simultaneously. In all others the plastic part of the stem failed and slipped off the metal rod. The tests suggest that the value of the moment of resistance of 41 kg./cm. may be accepted as a fairly safe limit. From simple calculations, assuming the force transmitted by the joint to be 240 kg. and the angle of insertion i to be 56 degrees, it is found that in the human body the above moment of resistance will be exceeded only if the point of application A of

*Values as given by Imperial Chemical Industries.

load P (Fig. B) is further than 8.2 mm. from the point of support B. This figure was obtained using the experimentally determined safe value for stress in the plastic part of a stem with a 6.3 mm. reinforcing rod. Again, simple calculations indicate that if an 8.0 mm. steel rod were used the critical value for the distance AB would be about 18 mm.

This critical condition could be satisfied with much greater ease if the 0.67 sphere of the Judet head could be replaced by a hemisphere. All these calculations are based on experimental results obtained under laboratory conditions with a frequency of 2,000 cycles a minute. It is realized, however, that the carrying capacity of the Judet stem may be greater under actual working conditions, because the less frequent straining may allow strain recovery. Nevertheless it seems that the distance AB should not exceed 2 cm.

The average failing strength of the prostheses in which both the steel reinforcing rod and the acrylic failed was appreciably higher than that in which the acrylic alone failed. The two different types of failure of the stem may be explained in terms of anchorage and bonding stress between the acrylic and the metal rod. The better the bond the higher is the fatigue failing strength of the prosthesis. Sterilization by boiling disturbs the bond, and therefore other methods not involving a rise in temperature should be used. Qualitative analysis of bonding stresses in a great number of prostheses, by means of the photo-elastic method, indicated that the bonding stress between the acrylic and the metal rod of an initially good prosthesis was reduced considerably in the process of boiling. Immediately after boiling, residual thermal stresses were present in the head of the prosthesis, causing high stress concentration at the point of junction of the stem and the head. These decreased slowly, disappearing in about two hours.

A prosthesis in a state of stress will be more vulnerable to impact, which may cause failures during insertion.

The grooves in the stem vary in length, depth, shape, and surface finish. When a structure is subjected to cyclic stresses it is of the utmost importance that a perfect polished-surface finish should be obtained, as a rough finish is a source of stress raisers (Plate, Fig. 2).

Examination of new prostheses which failed in fatigue under laboratory conditions revealed a brown deposit on the inner wall of the acrylic stem and the surface of the reinforcing rod. A chemical analysis indicated that this was iron oxide, and the quantity formed was directly related to the magnitude of the stress in the metal rod, the deposit being greatest at the point of maximum bending moment.

It is known that materials which in an unstressed condition show no signs of corrosion may behave differently when in a stressed condition. In engineering practice the term "corrosion fatigue" is used to describe the simultaneous action of corrosion and fatigue. It has also been found that corrosion which takes place in a material before subjection to cyclic stress has a far less damaging effect than a slight corrosion taking place simultaneously with the applied stresses. It is thus of great importance to investigate the behaviour of materials under the action of body fluids and the chemical constituents of the resins and solvents, both in the stressed and in the unstressed condition.

In an effort to overcome the shortcomings of the Judet prosthesis, some surgeons have resorted to the use of stainless steel or vitallium prostheses. It is only in recent years that materials have been used in orthopaedics in situations where they will be subjected to constant fatigue stresses in contact with tissue fluids. Most metal appliances have been used for temporary fixation of fractures and have rarely been exposed to prolonged fatigue stresses once union of the fracture has occurred. A metal prosthesis may initially have a better load-carrying capacity, but the problem of stress corrosion remains.

Polymethyl methacrylate is also subject to crazing (Russell, 1948; Sauer and Hsiao, 1953) which is defined as

fine mechanical cracking over the surface of the material, penetrating to a depth which depends on the intensity of the cause. It may be brought about by the simple or compound action of such factors as mechanical stressing, solvents, and high energy radiation. Only the first two factors, however, are significant. It has been found that only tensile stresses produce crazing, the direction of cracks taking place at right angles to the direction of action of the tensile stress. The intensity depends on the magnitude, rate, and duration of the stress applied, the dimensions of the specimen, and its heat treatment. Solvent crazing patterns are irregular, in contrast to the well-orientated ones produced by tensile stresses, although the physical effects are the same. Stresses due to the forced fitting of the metal rod in the presence of solvent cause crazing of the inner wall of the stem; it has been found that the penetration of crazing was considerable even before stressing the prosthesis externally (Plate, Figs. 3 and 4). It is evident that serious defects exist in the prosthesis even before it is put into use.

Blood Supply

The blood supply to the head and upper neck of the femur is derived from three main sources: the nutrient artery, the retinacular vessels, and the trochanteric fossa anastomosis.

The proportion of flow from each of these sources is variable from patient to patient. The retinacular vessels are arranged in three main groups (Tucker, 1949) postero-superior; postero-inferior; anterior—which pass up beneath the synovial membrane reflection and penetrate the base of the head and upper neck through a number of foramina to anastomose with branches of vessels from the nutrient artery and trochanteric fossa. We have found that the vessels supplying the cortex of the femur originate mainly from the medullary network (J. T. Scales, unpublished observations). Any reaming of the neck to take the skirt may cause considerable damage to the retinacular vessels. The insertion of the stem of the prosthesis must further interfere with the vascularity of the bone. Revascularization is made more difficult by occlusion of parts of the neck by the skirt. It is vital that the cortex should be interfered with as little as possible and that prostheses with occlusive cuffs should not be used.

Analysis of Clinical Material: Prostheses

Thirty prostheses removed because of structural failure have been examined. In most cases the clinical notes and radiographs have been made available to us.

Of the 30 prostheses sent to us 21 were removed because of fracture of the stem. In 17 cases the site of the failure was within 2 cm. of the base of the head. This was found to coincide with the most probable position of the point of support B₁ (Fig. B)—that is, the position of the greatest bending moment. Here also the surface of the stem is interrupted by the beginning of the milled grooves. The stems of six were broken near the distal end of the rod, in the region of C. Two stems had fractured in both regions.

Coarse crazing of the surface due to the milling operation was present in all stems examined. In many cases deductions made about the position of the fulcrum B₁ and the distally situated point of reaction C on radiographs were confirmed by worn areas on the acrylic stem in the corresponding positions.

Leakage of tissue fluid around the stem plug was seen in a number of cases. This is a serious matter when the reinforcing rod is not inert.

Of the 30 broken prostheses studied the metal rod had failed in 15. In 12 cases the site of the fracture was about the mid-point of the rod, coinciding with the position of failure of the acrylic part of the stem. In three instances in which the metal rod had been drilled at its distal end failure occurred in the cross-section of the rod. In six cases the rod was intact, although the stem had fractured,

and the site of failure in these cases was either immediately adjacent to the base of the head or at the distal end of the metal rod. The rods examined were from prostheses produced by five different manufacturers. Their diameters, together with the number of failures in each category, are given in the Table. Nitric acid (S.G. 1.200) was applied to

Diameter of Metal Rods, With Number of Failures in Each Size

Diameter of Metal Rod (mm.)	No. of Rods	No. Broken
4.5-	1	1
5.0-	1	1
5.5-	19	11
6.0-	3	1
6.5-	3	1
7.0-	0	0
7.5-8.0	3	0

28 rods and a positive reaction was obtained in 11 cases, indicating that these rods were not stainless steel. Of the 17 that were negative to nitric acid, eight were magnetic and were therefore most probably not of the austenitic variety of steel. (Austenitic steel can become slightly magnetic during working, but usually loses this property in a short time.) Corrosion pits were visible in nine of the rods (Plate, Fig. 5), all giving a reaction to nitric acid. One manufacturer used rods of a copper-zinc-nickel alloy, which had been chromium-plated and had the appearance of stainless steel. The surface finish of most of the rods was poor. A mirror finish should be obtained, as small scratches and grooves are apt to be centres of corrosion.

In a few instances, when the acrylic stem was cut and the metal rod withdrawn, a quantity of liquid was found which smelt strongly of burnt sugar. After a few minutes the inner surface of the stem turned yellow. This phenomenon was unexplained. A number of rods were surrounded by a white powder which fluoresced under ultra-violet light. In a number of instances the surface of the polymethyl methacrylate and the metal rod were not every-

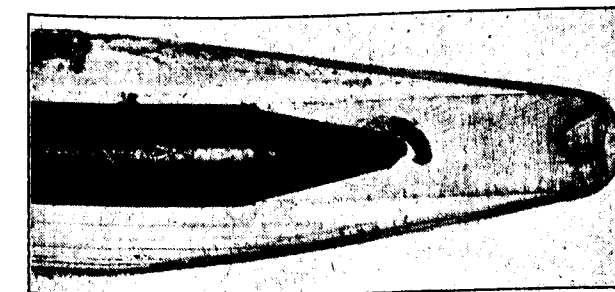


FIG. F.—Voids at metal/acrylic interface. Note also leakage around plug and crack in acrylic at pointed end of metal rod. (x3.)

where in contact (Fig. F), so there was a very poor bond between the metal and plastic. Wear of the weight-bearing area of the acrylic head was plainly visible in 12 of the 30 prostheses. The Vickers diamond test (1 kg. load at 20° C.) gave hardness numbers between 22 and 26, with one at 18, on 23 prostheses, the worn areas giving slightly higher values.

Examination of 21 heads by ultra-violet light revealed crazing of the surface (Plate, Fig. 17)—never in the worn part, but always in the surrounding area. In the nine heads showing no apparent wear, crazing could not be demonstrated, suggesting that crazing precedes wear.

It is possible that wear of the head is a cause of pain and limitation of movement in those patients in whom the prosthesis appears to be mechanically satisfactory.

The movement of any synovial joint has two components—sliding and rotation. The conditions for efficient lubrication are critical, being related to the nature of the two surfaces in contact, their relative velocities during move-

ment, and their area of contact (MacConaill, 1950). Even if a cartilaginous acetabular roof is present initially, it is unlikely that the dimensions of any implant made in eight sizes of head and having a surface which is not congruous with the acetabulum will fulfil the critical requirements. The surface hardness of a foreign body used as a component of a joint must be such that it will not wear when in contact with bone. If local wear of the prostheses takes place, then in certain positions during movement an excess loading/unit area will result.

Our radiographic studies suggest that the load-carrying capacity of a joint is determined early in life. It is possible that one of the causes of osteoarthritis is an increase in load per unit area which the head of the femur has to carry when the weight of the patient increases in middle and later life. It is suggested that the acetabulum therefore should be reamed so as to accommodate an artificial head of abnormally large diameter, so that the load should be distributed over a greater area.

It has not been possible to correlate wear of the prosthesis with sclerosis of the roof of the acetabulum or with irregularity of its radiographic outline. It was found, however, that wear occurred when the depth of the acetabulum exceeded two-thirds of the diameter of the prosthesis, or, in other words, when the head was relatively small. Thus the femoral head selected should be as nearly congruous with the acetabular cavity as possible.

Examples of Mechanical Failure of Prostheses in Patients

In view of the many interdependent mechanical features, it is not possible to assign a simple reason for failure on radiographic evidence. It is clear from Figs. B and C, however, that where the angle of insertion i is large and where the fulcrum B₁ occurs some distance down the stem, the prosthesis is subject to a large bending moment. Both these factors may be assessed qualitatively on the radiograph. As the direction and point of application of the forces acting through the hip-joint cannot be estimated accurately, it is not possible to predict quantitatively the values of the transverse force P₁ and the direct force P₂, and the bending moment (P₁ × AB). A standardized radiographic technique could be developed which would enable these values to be measured. The method would include the use of the scanogram technique.

Two main methods have been used in the examination of the available radiographs. (1) The dimensions of the radiograph shadow of the metal rod, and the metal rod of the Judet prosthesis which was removed from the patient, have been measured. From these measurements the magnification was determined for each x-ray film. In this manner a reproduction of the outline of the prosthesis was made from transparent cellulose acetate film. (2) The angle of insertion of the prosthesis is defined as the acute angle included between the line of the stem and the axis of the femoral shaft with the limb in the neutral position. This angle may be called the stem-shaft angle. It is, of course, realized that there are a few degrees difference in anteversion from patient to patient.

It has been found that when it was possible to measure the angle of insertion, and either the stem or the skirt, or both, were broken, the angle of insertion always exceeded 40 degrees. In the radiographs of nine patients in which the prosthesis was apparently satisfactory the angle of insertion was in the region of 40 degrees or less.

Case 1

This case illustrates the effect of too great an angle of insertion.

The patient, a married woman aged 65, developed osteoarthritis of the left hip after a fall four years previously. On November 12, 1952, a Judet prosthesis, 43/80, was inserted, the neck being reamed to take the skirt of the prosthesis. On January 13, 1953, she was discharged, the movements being as

follows: flexion with extended knee, 90°; flexion, 90°; extension, 10°; abduction, 15°; adduction, 10°; external rotation, 10°; internal rotation, 10°.

When seen as an out-patient on March 13 she was not complaining of any pain and could walk one mile. Fig. 6 (Special Plate) is a radiograph taken at four and a half months and shows the angle of insertion to be approximately 60 degrees. Thus from Fig. 6, since $P_1 = P \sin \alpha$, the value of the transverse component is large. Also the distance AB exceeds the theoretical value of 8.2 mm.

On April 13 the patient felt a sudden snap in the left hip with pain down the leg. Radiographs showed fracture of the prosthesis (Plate, Fig. 7).

The skirt would, of necessity, be broken, because the neck of the femur is displaced upwards. Other factors such as crazing of the acrylic and the use of unsuitable metal were found to have contributed to the failure.

Case 2

This case shows the combined effect of a large angle of insertion, too short a metal reinforcing rod, and the use of an extended neck.

The patient, a man aged 59, had a five-years history of osteoarthritis of the right hip. A Judet arthroplasty was performed in May, 1952. A large cystic space was found in the postero-inferior aspect of the neck, and consequently the stem was inserted as high as possible (Plate, Fig. 8). A radiograph taken in October, 1952, showed a fracture of the acrylic part of the stem of the prosthesis near the distal end of the metal rod (Fig. 9). From the radiographs it will be seen that the stem pierced the lateral cortex, and that the fulcrum was slightly medial to the position of the break. Note that here again the angle of insertion is large and the distance AB is greatly in excess of the theoretical value. The fracture was due to the discontinuity of structure of the stem at a point near the fulcrum.

At operation in November, 1952, it was found that there had been a fracture of the inferior aspect of the femoral neck. It is probable that fracture of the bone, under high bending moment, occurred first, resulting in a shift of the fulcrum laterally. The primary cause of fracture may have been interference with the blood supply at the time of operation. The prosthesis was not available for examination.

The neck was further cut back and reamed and a second prosthesis with an extended head was inserted; Fig. 10 shows that the skirt is impinging on the lower portion of the neck. The distance AB has been further increased. Ten weeks later this prosthesis broke (Fig. 11). The design of the second prosthesis and the unsuitable metal used for reinforcement were contributory factors in its failure. The metal rod, diameter 6.1 mm., was of non-austenitic steel. There was no bonding between the metal rod and the acrylic. The radius at the junction of the skirt with the base of the head was insufficient and there was crazing of the head and stem. There was a visible leak around the acrylic plug.

Case 3

This case illustrates excessive bone absorption and fracture of the stem of the prosthesis through a weak part.

A married woman aged 79, suffering from osteoarthritis, had a right Judet arthroplasty performed in August, 1952. The angle of insertion was approximately 43 degrees (Fig. 12). Progress was satisfactory with no pain until April, 1953, when she complained of severe pain in the hip with some crepitus on movement. A radiograph shows that the stem of the prosthesis had fractured at the cross-section where the metal rod had been drilled, and that there had been considerable widening of the track, the angle of insertion having now increased to 55 degrees (Fig. 13). No fracture of the neck of the femur was visible, but there had been considerable bone absorption of the neck, and the base of the head no longer appeared to be in contact with the bone. The stem was apparently firmly held at its distal end, but with gradual bone absorption the fulcrum was shifted laterally, and this resulted in a high bending moment in the region of the fracture site. This bone absorption was probably caused by interference with the blood supply to the proximal part of the neck. Wear of the head of the prosthesis could not be demonstrated. The surface hardness was 23.2. There was no crazing of the surface of the head or skirt, although crazing was present along the stem. The metal rod was of a non-austenitic steel and was positive to the nitric acid test. Corrosion pits were found in the region of the fracture. No leakage of the stem plug could be demonstrated. The reasons for failure were both anatomical and structural.

Case 4

This case illustrates the detection of a failure by means of a transparent outline model.

The patient, a man aged 71, suffering from bilateral osteoarthritis, had a Judet arthroplasty performed on the left side in July, 1951 (Fig. 14). In November he was free from pain and walking well. Movements were as follows: flexion, 45°; extension, 0°; abduction, 20°; adduction, 20°; external rotation, 20°; internal rotation, 20°.

From January to October, 1952, attacks of pain were relieved by diathermy and other physical treatment, but in November the left hip became much worse. A radiograph revealed widening of the track with downward displacement of the prosthesis (Fig. 15). In December, 1952, movements were: flexion, 70°; extension, -20°; abduction, 20°; adduction, 20°; external rotation, 30°; internal rotation, 0°. There was squeaking of the joint on movement.

His condition deteriorated until March, 1953, when little movement was present (Fig. 16). The hip was re-explored and the skirt of the prosthesis was found to be broken. The larger fragments of the skirt were not found. There was considerable wear of the head and eburnation of the stem just below the base of the head.

On examination the prosthesis was found to have a surface hardness in the worn area of the head of 24.7 and in the unworn area of 23.3. There was considerable crazing of the surface of the unworn part of the head although none was visible on the worn area. There was also crazing of the stem and skirt. The nitric acid test on the metal rod was positive, and it was found to be a chromium-plated copper-nickel-zinc alloy rod.

As the stem of the prosthesis did not penetrate the cortex, it was able to rotate downwards about a point situated near the distal end of the stem, the cancellous bone not offering enough resistance to the reactive force at the fulcrum. A transparent model of the outline of the prosthesis when superimposed on the radiograph taken in November, 1952, suggested that failure of the skirt had already occurred.

Intramedullary new bone formation in the neck of the femur has not been seen in any of the radiographs that have been examined. The normal head of the femur is a structure designed to carry considerable load and to distribute it to the neck and shaft by means of the trabeculae, each one being subjected to a small portion of the stress. Insertion of any prosthesis must destroy the three-dimensional structure and result in the overloading of too few trabeculae. The Judet prosthesis is particularly apt to produce this effect, because of the relatively small surface area of the stem and base of the head. The survival of their blood supply. As part of the blood supply comes through the great trochanter, it would seem advisable not to remove it at operation.

It has not been possible to correlate failure of the prosthesis with the sex, weight, or post-operative activity of the patient. The time between insertion and removal of the prosthesis has varied between two and twenty months.

Discussion

Various defects in the British manufactured prostheses could have been avoided if a detailed specification had been available. There is no doubt that the design and method of manufacture of all implants should be very carefully considered, so as to avoid the great number of mechanically unsound features with which the original design of the Judet prosthesis as made in this country is overloaded. It is interesting to note that an improved design has recently been developed by Judet *et al.* (1954) in an endeavour to solve some of the problems. They have, for example, abandoned the skirt of the prosthesis. The head has been set at an angle of 60 degrees to the shaft in order to retain more of the head and neck and so distribute the load to a greater area of bone and reduce the distance AB (Fig. B).

There are a number of problems associated with the properties of synthetic materials and metals, especially when they are combined to form a structure which is subjected to the simultaneous action of stress and tissue fluids at body temperature.

Not the least important point is the individual operative technique. This, however, is beyond the scope of this paper, and those primarily concerned with the use of this prosthesis will be able to draw their own conclusions from the observations we have made.

Summary

The mechanics of the hip-joint have been examined, with special reference to the Judet prosthesis. The materials used in the manufacture of the prosthesis and its ultimate strength have been investigated under laboratory conditions. Thirty prostheses which were removed from patients either because of pain and/or mechanical failure were examined in conjunction with the clinical records of the patients concerned.

The disadvantages of the present design can be summarized as follows: (1) The stem is not strong enough. Flexural strength is diminished by fatigue; the acrylic is weakened by crazing and the metal by stress corrosion. Unless the prosthesis is placed in the most favourable position its load-carrying capacity will be exceeded. (2) The skirt is weak and vulnerable, and interferes with revascularization. (3) The head has not sufficient surface hardness. The distribution of the forces acting upon the prosthesis has been examined. It is clear that both the angle of insertion i and the distance AB (Fig. B) must be as small as possible. (4) The local blood supply should be interfered with as little as possible. The great trochanter should not be divided, for both mechanical and anatomical reasons.

The reasons for the large number of worn prostheses require further investigation. In the light of our present knowledge, the use of any prosthesis must be regarded as an experimental procedure. The need for a standardized method of radiological follow-up of cases has been apparent in this work, as well as for a method of recording the clinical results of treatment.

While there are many reasons for failure over which no one can have control, the development of standards governing the materials to be used in the manufacture of prostheses could by now have been devised.

Since writing this paper a further 20 prostheses that have had to be removed from patients have been examined. The information gained has further substantiated the conclusions drawn from our previous work.

We wish to express our thanks to Professor S. J. Davies, Faculty of Engineering, King's College, University of London, for his enthusiastic support in carrying out this work; Professor D. H. Hey and Mr. L. Singlehurst-Ward, King's College, University of London, for their help on metallurgical and chemical problems; and to Mr. G. D. Winter, technical assistant, Plastics Research Unit, for his unfailing willingness in working long hours while engaged with us on the Judet problem. We are indebted to Messrs. Down Bros. Ltd., Lusterlite Ltd., the London Splint Co. Ltd., and the Medical Supply Association Ltd. for supplying samples of material and Judet prostheses.

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HEPARIN AND ETHYL BISCOUMACETATE IN PREVENTION OF EXPERIMENTAL VENOUS THROMBOSIS

BY

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[WITH SPECIAL PLATE]

In recent years anticoagulant drugs have been increasingly used for the treatment of thrombo-embolic disease. There are two groups of these drugs—those which lengthen the clotting-time (heparin group), and those which lengthen the so-called prothrombin time (coumarin derivatives): of the latter group ethyl biscoumacetate ("tromexan") is a typical example.

Many clinicians believe that heparin is more efficient in preventing thrombosis, and choose ethyl biscoumacetate only because it can be given by mouth. We have, however, found no clinical or experimental evidence for this belief; the only experiment reported in the literature which compares the ability of heparin with that of dicoumarol in preventing thrombosis following damage to the vein wall was one performed in rabbits, and led to the conclusion that neither drug was effective (Moses, 1945). This lack of support for clinical impressions prompted us to study the relative actions of heparin and ethyl biscoumacetate in preventing thrombosis following experimentally induced phlebitis in rabbits. The drugs were given in a manner as closely comparable as possible to the methods of administration used in clinical practice.

Methods

Buck rabbits weighing from 1.8 to 3 kg. were used; they were fed on a mixture of bran and oats, with fresh greens and an unrestricted amount of water.

Administration of anticoagulants was controlled by frequent examinations of venous blood taken from a marginal ear vein reserved for this purpose. In the case of heparin, clotting-times were estimated by Wright's capillary

tube method, which is simpler than the Lee and White method, and was found by us to give equally satisfactory results. Normal clotting-times varied from 5 to 12 minutes. Ethyl biscoumacetate administration was controlled by prothrombin times estimated by Quick's one-stage method, using human brain thromboplastin. Owing to the rapidity with which rabbit's blood will clot, consistent prothrombin times could not be obtained unless the following technique was adopted: all the glassware was treated with silicone and cooled before use, a solution of potassium oxalate was used as anticoagulant in the syringe, and the estimations were made within half an hour of taking the blood. With this method the normal prothrombin time varied between 11 and 16 seconds in rabbits, compared with 15-16 seconds in man.

A total of 95 rabbits was used: of these, 31 were treated with ethyl biscoumacetate and 34 with heparin, while 30 were used as controls. A satisfactory anticoagulant effect was first established and then the vein wall was damaged by chemical irritation. In both control and treated animals 0.1 ml. of monoethanolamine oleate ("ethamolin") was injected into one of the marginal ear veins in the direction of the blood flow and held in a 4-cm. length of vein for five minutes, by digital pressure above and below. The irritant effect of this procedure was confirmed by the fact that microscopical examination showed inflammation in and around the vein wall even when there was no thrombosis. Following the injection of monoethanolamine oleate the anticoagulant drugs were continued for a further five days. The rabbits were then lightly anaesthetized with sodium thiopentone, and phlebograms of the ear veins were made, using 1 ml. of 50% diodone. The animals were immediately killed and the ears were preserved for histological examination.

Experimental Heparin

Throughout, the heparin was used in a concentration of 5,000 units per ml.; the doses per kilogram were two to three times those used in man. Monoethanolamine was injected 24 hours after treatment had started.

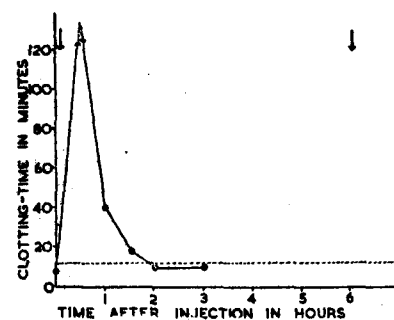


FIG. A.—Rabbit No. 95. Clotting-times following an intravenous injection of 800 units of heparin: six-hourly administration. The dotted line indicates the upper limit of the normal clotting-time, the arrows indicate times of injections.

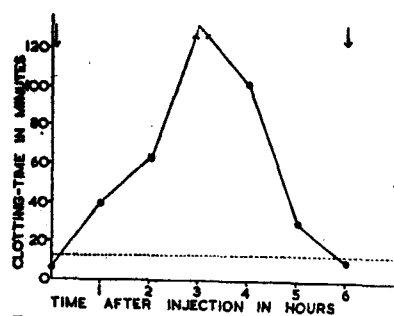


FIG. B.—Rabbit No. 81. Clotting-times following an intramuscular injection of 1,200 units of heparin: six-hourly administration.

mals did not return to normal until just before the next injection was due (Fig. B).

An attempt was then made in 13 rabbits to prevent the clotting-times from ever falling to normal. Intramuscular injections of 500 to 1,000 units were given every four hours. In most instances prolonged clotting times were well maintained (Fig. C), but of the 50 estimations made before injections were due 12 showed a fall to normal.

The only form of bleeding which occurred in any rabbit receiving heparin was into the site of the injection, which in the last group was occasionally sufficient to produce a temporary but obvious anaemia.

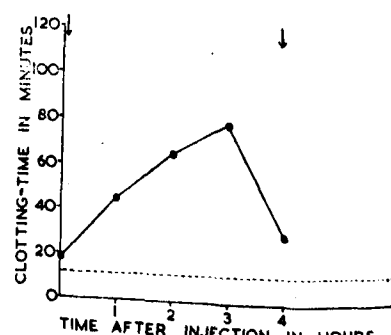


FIG. C.—Rabbit No. 103. Clotting-times following an intramuscular injection of 800 units of heparin: four-hourly administration.

This dose varied from 20 to 80 mg. a day, and was two to three times the dose used in man. In most cases the prothrombin time reached a steady level in three to four days and the injection of the sclerosing agent was then given.

Rigid control of the effect of ethyl biscoumacetate was difficult, resulting in a wide range of prothrombin times, and according to these it was found that the animals could conveniently be divided into three groups. The prothrombin times for one rabbit in each group are shown in Fig. D.

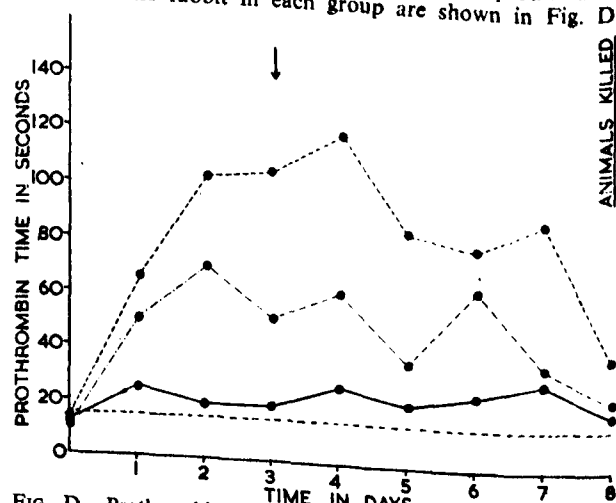


FIG. D.—Prothrombin times in three rabbits during an eight-day period on ethyl biscoumacetate. The arrow indicates injection of sclerosing agent.

Seven animals had prothrombin times which rose above 75 seconds, in 12 they rose to between 35 and 75 seconds, and in 12 to between 19 and 35 seconds. The last two groups had times comparable to those maintained with safety in man. With ethyl biscoumacetate there was no example of spontaneous external or internal bleeding, although in the presence of the more prolonged prothrombin times it was sometimes difficult to arrest the bleeding at the site of venepuncture.

Results

The phlebograms showed one of three findings: (a) complete patency, (b) a filling defect representing a partial

block, or (c) complete occlusion (Figs. E, F, and G). Similarly the microscopical examination of the vein made on 5-8 transverse sections of the traumatized area showed (a) absence of thrombus, (b) small mural thrombus, (c) large mural thrombus, and (d) blockage by thrombus (Plate, Figs. 1 and 2).

Control Group.—In 28 of the 30 control animals extensive thrombosis occurred, and there was radiological evidence of this in 26 of the 27 veins examined.

Heparin-treated Group.—The effects of heparin are summarized in Table I. As many as 25 of 34 veins of



FIG. E.—Phlebogram of an ear showing apparently normal veins in a rabbit which received ethyl biscoumacetate. The marker indicates the point of injection of the sclerosing agent.

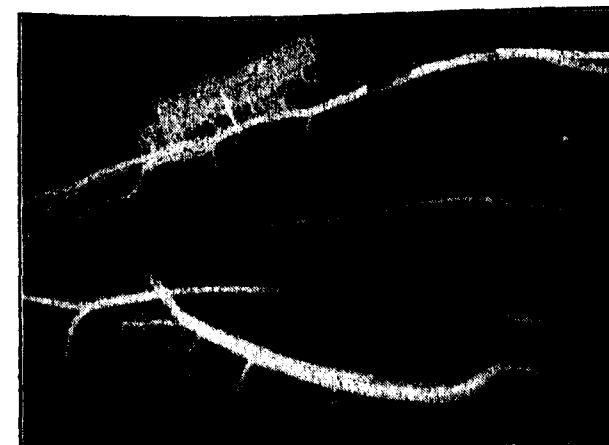


FIG. F.—Phlebogram of an ear showing partial blockage in a rabbit which had received heparin.



FIG. G.—Phlebogram of an ear vein showing complete blockage in a rabbit which had received heparin.

heparin-treated animals showed extensive thrombosis, six showed mural thrombosis, and only three veins were quite normal: in fact, there was no significant difference between these results and those of the control group. When the results with the three different modes of heparin administration were examined it was found that they were all equally unsuccessful (Table II). Even when the prolonged clotting-times were almost continuously maintained the results were not significantly better.

TABLE I.—Effects of Heparin on the Occurrence of Venous Thrombosis

A. Phlebography				
	Total	Patent	Partial Block	Complete Block
Heparin	32	5	8	19
Control	27	1	3	23

0.2 > P > 0.1

B. Histology					
	Total	Normal	Small Mural Thrombus	Large Mural Thrombus	Complete Occlusion
Heparin	34	3	6	10	15
Control	30	1	1	8	20

0.2 > P > 0.1

TABLE II.—Effect of Different Methods of Administration of Heparin on the Occurrence of Venous Thrombosis

A. Phlebography				
Method	Total	Patent	Partial Block	Complete Block
Intravenous	10	1	1	8
Intramuscular 6-hourly	9	1	4	4
Intramuscular 4-hourly	12	3	3	6

B. Histology

Method	Total	Normal	Small Mural Thrombus	Large Mural Thrombus	Complete Block
Intravenous	11	0	2	3	6
Intramuscular 6-hourly	10	1	2	4	3
Intramuscular 4-hourly	13	2	2	4	5

Group Treated with Ethyl Biscoumacetate.—The results with this drug are summarized in Table III. Of the 31 animals which had received ethyl biscoumacetate, only four showed extensive thrombosis. It is interesting to note, although not statistically significant, that the four animals in which ethyl biscoumacetate failed came into the group with the least-prolonged prothrombin times. Even in this group, however, there was significantly less thrombosis than in the control animals ($P < 0.01$).

TABLE III.—Effects of Ethyl Biscoumacetate on the Occurrence of Thrombosis

A. Phlebography				
	Total	Patent	Partial Block	Complete Block
Ethyl biscoumacetate	26	24	0	2
Control	27	1	3	23

$P < 0.01$

B. Histology					
	Total	Normal	Small Mural Thrombus	Large Mural Thrombus	Complete Occlusion
Ethyl biscoumacetate	31	22	5	3	1
Control	30	1	1	8	20

$P < 0.01$

Discussion

Our experiments indicate that heparin fails to prevent the occurrence of thrombosis in veins damaged by chemical irritation. Even when achieving almost continuous prolongation of clotting-time, with heparin given intramuscularly every four hours, no significant inhibition of thrombosis was obtained. This failure might be explained in part by the fact that we used discontinuous administration, either intravenously or intramuscularly, as suggested by Swedish workers (Crafoord, 1939; Jorpes, 1950), and in no rabbit could we be sure that the clotting-time was always above normal. Our results would seem to support those obtained in the original experiments with heparin, in which good effects were achieved only when the drug was given by continuous transfusion (Murray *et al.*, 1937).

On the other hand, ethyl biscoumacetate was found to be highly successful in preventing thrombosis. Similarly successful results were obtained with ethyl biscoumacetate using the arteries of dogs (Reinis, 1950), and also with dicoumarol (Dale and Jaques, 1942; Richards and Cortell, 1942; Thill *et al.*, 1943). The doses of ethyl biscoumacetate used by us were only slightly (two to three times) greater than those used in man, and they produced a comparable prolongation of prothrombin time, which differs from the findings of Wright *et al.* (1953), who found it necessary to give much larger doses of ethyl biscoumacetate (more than 20 times the human dose) to achieve comparable effects.

While experimental results in rabbits cannot be applied directly to man, we feel that the unexpected differences found between the two drugs makes it desirable that their comparative value in the prevention of thrombosis in man should be critically assessed.

Summary

A comparison was made between the actions of heparin and ethyl biscoumacetate in preventing thrombosis in chemically induced thrombophlebitis in rabbits. Ethyl biscoumacetate was strikingly successful when given in doses comparable to those used in man, whereas under the same conditions heparin did not significantly reduce the incidence of thrombosis.

We are extremely grateful to Professor T. Crawford for his guidance and for performing all the histological examinations, to Dr. S. D. Elek and Dr. J. N. M. Chalmers for their help and encouragement, and to Dr. Fraser Roberts for the statistical analysis. We are indebted to Evans Medical Supplies Ltd. for the supplies of heparin, and to Geigy Ltd. for supplies of tromexan. We wish to thank the Board of Governors of St. George's Hospital for a grant from their Endowment Fund towards the expenses of the investigation.

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An Ehrlich-von Behring Centenary postage stamp was issued in March by the West German Government. It is a 10-pfennig stamp with the heads of Ehrlich and von Behring facing right on a mid-green background, the names of the two scientists and the dates "14 und 15 März 1854." The stamp has now been included in the Ehrlich exhibition arranged by the Wellcome Historical Medical Museum at 183, Euston Road, London, N.W.1.

THE NUMBER OF MELANOCYTES IN HUMAN EPIDERMIS

BY

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[WITH SPECIAL PLATE]

Melanomas of skin (cf. Raven, 1950; Pack *et al.*, 1953; Clark and MacDonald, 1953; Wright *et al.*, 1953) have a characteristic regional frequency distribution. Melanomas are more frequent per unit area on the face, neck, feet, and external genitalia than on other regions of the body. It is now almost universally believed that, in cellular origin, melanomas of skin arise from pigmentary dendritic cells, "melanocytes."

There are alternative (but not mutually) exclusive reasons why the frequency of melanomas should vary from one part of the body to another: (a) the individual melanocytes have different degrees of susceptibility to malignant change, or are more exposed in certain areas to stimuli predisposing them towards this transformation; or (b) the likelihood of a melanocyte's undergoing malignant transformation is fairly constant throughout the body, and the observed differences of frequency are mainly due to differences of population density. Wright *et al.* (1953) have already suggested that there may be a greater concentration of "melanoblasts or precursors" in the skin of lower limbs, head, and neck than of upper limbs. Their opinion was based on observations of the duration of sun-tanning and not on statistical cellular counts.

The present investigation therefore represents a first attempt to estimate the frequency distribution of melanocytes in different regions of the human body. It was founded upon the use of Bloch's "dopa reaction" in conjunction with the "skin-splitting" technique of Billingham and Medawar (1951), which causes the epidermis to separate cleanly from the corium by enzymatic fission. By using these methods, counts of melanocytes were carried out by the methods described in full by Billingham and Medawar (1953). These authors have already shown that there are about twice as many melanocytes per mm.² in guinea-pig's ear skin than in trunk skin, but both showed great variation between individuals. There was no correlation between melanocyte concentration and differences of colour.

This report contains only a first series of estimations, relating chiefly to the melanocytes of the skin of the thigh and arms.

Material and Methods

Human skin was obtained in the course of plastic surgical operations through the kindness of Mr. Rainsford Mowlem, at the Middlesex Hospital. The skin samples, removed as Thiersch (thin "split thickness") grafts, were incubated in buffered commercial trypsin solution to bring about the disengagement of the epidermis. The epidermis was thereupon stuck to a cover-glass, inner (dermal) side uppermost, with paraffin and rubber stopcock lubricant, fixed in 1-2% formal-saline overnight or sometimes longer (two to four days), and then incubated at 38° C., until the melanocytes, alanine adjusted by phosphate buffer to pH 7.4. After a second fixation in 4% formal-saline, followed by dehydration and cleaning, the pure epidermal sheets were permanently mounted in Canada balsam for inspection from the inner

side (Plate, Figs. 1-4). On a number of occasions very thin Thiersch grafts were impregnated with the dopa reagent without splitting: in these specimens the dermis was thin enough to be transparent. Paracarmine was sometimes used as a counterstain, to make the epidermal pattern more easily visible.

These methods are unsuitable for counting melanocytes in hair follicles.

Observations

The numerical results are set out in the accompanying Table, with information on the sex and age of the subject, the position and extent of the area counted (usually in 10

Population Densities of Melanocytes in Various Regions of the Body

Specimen No.	Sex	Age	Area Counted mm. ²	Population Density mm. ²	Notes	
Thigh						
11	M	21	0.3424	790 ± 40	Fig. 2	
12	F	44	0.3424	900 ± 50		
30	F	19	0.3424	1,230 ± 30		
33	F	56	0.3424	1,400 ± 64		
36	M	37	0.3424	1,850 ± 90	No epidermal pattern	
44	F	73	0.3424	580 ± 44		
53	M	75	0.3424	670 ± 40		
63	F	44	0.3424	500 ± 30		
65	M	60	0.3424	900 ± 50		
68	F	53	0.3424	560 ± 40		
Overall mean: 940 ± 140 melanocytes/mm. ²						
Upper Arm						
15	F	44	0.1150	1,540 ± 130		
27	F	61	0.1712	950 ± 10		
28	M	51	0.3424	820 ± 20		
38	M	45	0.3424	1,490 ± 130		
Overall mean: 1,200 ± 180						
Forearm						
24	M	17	0.3424	820 ± 50		
45	M	15	0.1150	1,070 ± 70		
62	M	42	0.0804	1,210 ± 60		
Head and Neck						
13	M	44	0.1150	4,500 ± 100	Cheek	
29	M	25	0.3424	2,050 ± 70		
45	M	15	0.1150	3,500 ± 170	Cheek, normal and scar, Fig. 3	
34	F	39	0.1712	2,300 ± 100		
53	M	75	0.3424	1,100 ± 100	Cheek, Fig. 4	
16	M	9	0.3424	1,280 ± 150		
55	F	44	0.1140	2,600 ± 200	Behind ear, Fig. 1	
Neck, freckled						
Different Areas of Same Individual						
45	M	15	0.1150	{ 1,070 ± 70 3,500 ± 170	Forearm Cheek, Fig. 4	
53	M	75	0.3424	{ 670 ± 40 1,100 ± 100 940 ± 60		
55	F	44	0.1150	{ 2,600 ± 200 1,920 ± 90	Neck, freckled Axilla	
56	"	"	0.3424	{ 1,640 ± 80 800 ± 60		
123	M	73	0.1150	{ 1,640 ± 80 800 ± 60	Dorsum of hand Palm	
124	"	"	0.1150	{ 1,640 ± 80 800 ± 60		

randomly chosen samples), and the mean number of melanocytes per mm.² of the epidermis in plane projection ± the standard error of the mean. The following preliminary conclusions can be drawn from the numerical and histological analyses.

(1) There are great differences between the numbers of melanocytes in corresponding areas of different human beings.

(2) There are also well-defined differences between the numbers of melanocytes in different areas of the same individual. The higher population densities were found on the ear (Fig. 1), cheek (Figs. 3 and 4), forehead and neck areas; the lower densities on the upper arm, forearm, and thigh (Fig. 2).

(3) Within any one sample of skin, melanocytes are principally concentrated in the epidermal ridges or "hills"—that is, in those areas which appear in orthodox transverse sections as inwardly directed projections of the epidermis

into the corium. Between the ridges—that is, in the areas underlain by the dermal papillae—their concentration is lower.

(4) Melanocytes vary greatly in shape. They may be fully dendritic cells, with branches projecting in many directions, or they may be almost fibroblast-like, with only two terminal processes. Although the shapes of melanocytes may be largely influenced by mechanical factors, such as the pattern and mode of packing of neighbouring Malpighian cells, there appears also to be a clear-cut dimorphism, particularly in the skin of the cheek and forehead (Fig. 4): large melanocytes with abundant cytoplasm lie among the more numerous smaller melanocytes with relatively little cytoplasm.

Comment

The results of this numerical investigation are in favour of the second of the alternative explanations proposed above to account for differences in the frequencies of melanomas between the face and neck on the one hand, and the trunk and thigh on the other—that is, the differences of frequency may be due to differences in the population densities of melanocytes. As no melanocyte counts are yet available from the foot, it is impossible to say whether a similar interpretation may not account for the high frequency of melanomas in this region; it is relevant, however, that melanocytes are very much more abundant in the sole of the guinea-pig's foot than in the skin of the ears and trunk (Billingham and Medawar, 1948, 1950).

The population densities of melanocytes in different regions of the body are, of course, correlated with differences in the thickness and mitotic activity of the epidermis as a whole. Both may be at least partly under the influence of environmental factors—for example, differences in the degree of exposure to mechanical irritation and radiation—but cell counts on infants would be necessary to determine what proportion of the difference was due merely to environmental factors. It is already known that some differences of epidermal thickness—for example, between trunk and sole-of-foot skin—are of developmental origin.

A dimorphism of melanocytes was also found by Grand *et al.* (1935) among the melanocytes of melanomas of mice and of human origin, cultured *in vitro*.

Summary

In human epidermis the population density of melanocytes (pigmentary dendritic cells) is of the order of 1,000 per mm.² in the skin of the thigh and arms, but may be twice to four times as great in the skin of the face and forehead. There is nevertheless a wide range of variation between the corresponding areas on different individuals. It is suggested that regional differences in the frequency of occurrence of melanomas may be primarily due to differences in the population density of melanocytes.

I am grateful to Mr. Rainsford Mowlem, whose co-operation, interest, and help have made the collection of specimens possible; to Professor P. B. Medawar for suggesting this line of investigation and for correcting the manuscript; and to Mr. R. E. Billingham for his many helpful suggestions. Thanks are also due to Mr. W. Brackenbury for taking the photomicrographs.

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CONGENITAL SYPHILIS DIAGNOSED BY BONE CHANGES

BY

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[WITH SPECIAL PLATE]

With the improvement in medical care of the syphilitic woman at the time of marriage and during pregnancy, congenital syphilis is becoming a comparative rarity. Many working outside special centres have never had the opportunity of examining an infant who is suffering from the disease. The following is a case history of a patient presenting in the classical manner.

Case Report

A full-term male child born on December 13, 1952, was brought to the casualty department on February 25, 1953, with the history that after an outing in his perambulator the preceding afternoon he had refused to move the left upper limb. When his mother attempted to move the arm the child screamed with pain. He was referred to the fracture clinic as a possible case of pulled elbow or as a doubtful case of greenstick fracture of the left upper humerus.

Clinical examination showed a normal healthy-looking baby of 10 weeks. Movements of all the limbs except the left upper limb were normal. That limb was held by the side, and any attempt at movement was resented. There was tenderness on palpation over the metaphysis at both the proximal and the distal end of the left humerus. A doubtful greenstick fracture of the upper humeral shaft without displacement was demonstrated radiologically. The arm was placed in a collar-and-cuff sling and an appointment was made for the child to be seen in a week's time.

The next day the mother returned to the clinic stating that not only did the child resent movement of the arm but he now refused to move the left lower limb.

Further clinical examination confirmed the loss of function of both the left upper and lower limbs. There were no visible physical signs other than the "paralysis," but the metaphyseal regions of all four limbs were found to be tender on palpation. Radiographic examination demonstrated well-marked osteochondritis and chondro-epiphysitis in the long bones of all four limbs. Figs. 1 and 2 (Special Plate) show the right upper limb and the left lower limb. The temporary zone of calcification in the distal metaphysis in the radius and ulna, and particularly the femur, is thickened and shows as a white line. The submetaphyseal zone is decalcified and is shown best in the radius and ulna. The width of this zone indicates roughly the length of intra-uterine infection. The irregularity of the decalcification is best shown at the proximal end of the tibia (Fig. 3). Further radiographs one month later demonstrated increasing irregularity of decalcification and commencing periostitis. The Wassermann reaction was +++; Kahn reaction +; and quantitative Kahn 240 units.

Only after positive serological findings did the mother concede the positive family history. Both parents had received treatment at a special centre from October 2, 1946, until September 13, 1947, when both defaulted. There was an older child born on May 27, 1948, who was serologically and clinically normal.

Discussion

Jones and Lovett (1933) state that osteochondritis is the most common manifestation of congenital syphilis in infants. As in this patient, it is symmetrical and may give rise to the classical pseudo-paralysis. Gumpesberger (1951), in an investigation of x-ray changes in 571 infants and young children of treated and untreated syphilitic mothers, noted

that of 57 serologically positive cases with congenital syphilis 34 showed syphilitic bone changes.

In the above case the diagnosis was made from the positive radiographs. These in turn led to confirmatory serological tests. Had the child not presented with pseudo-paralysis in both the left upper and lower limbs the diagnosis might well have been missed.

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TABETIC CHARCOT'S SPINE

REPORT OF EIGHT CASES

BY

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AND

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In 1868 Charcot first described tabetic arthropathy of the spine. The condition is believed to be the rarest arthropathy occurring in tabes dorsalis and is a relatively uncommon disorder. Charcot's spine is diagnosed largely on circumstantial evidence (stigmata, history, Wassermann reaction) rather than on local recognition. It may be discovered quite accidentally during the course of a barium-meal examination.

The following eight cases seen during the past two years in the Department of Venereology, Sheffield Area, are thought to be interesting enough to merit publication.

Case Reports

Case 1.—A labourer aged 50 was admitted on November 14, 1950, to the medical ward, City General Hospital, with severe abdominal pain, and a twelve-months history of delay in micturition. He had clinical signs of tabes—Argyll Robertson pupils, absent knee- and ankle-jerks, positive Romberg's sign—and "lightning" pains in the limbs and chest. Barium meal and fasting test meal were normal. He had been treated for syphilis 15 years previously, but defaulted. The blood Wassermann reaction and Kahn tests were negative. On November 24 he complained of pain in the lumbar area. X-ray report on lumbar spine: "Lesion involves second and third lumbar vertebrae chiefly; there is considerable destruction of bone, with the separation of the fragments and new bone formation. Mainly a destructive lesion with little if any sclerosis. There is fairly marked scoliosis." Examination of the cerebrospinal fluid showed: clear fluid; Wassermann reaction positive 1:2; white cells, 10 per c.mm.; protein, 120 mg. per 100 ml.; globulin, very slight increase; Lange, 0000000000. Despite treatment with penicillin, arsenic, and bismuth, in August, 1952, the patient complained of tenderness of the right foot, and the radiologist reported the appearances as those of well-developed Charcot's disease.

Case 2.—A millwright aged 53 attended the special treatment centre, Sheffield Royal Infirmary, on March 1, 1948, complaining of "shooting" pains in his legs of three years' duration. He had clinical signs of tabes dorsalis—Argyll Robertson pupils, knee- and ankle-jerks absent. The blood Wassermann reaction was positive 1:160, Kahn + + + +. Penicillin, tryparsamide, and bismuth gave little relief of symptoms. On February 21, 1952, he complained of pain in the lumbar region. Examination revealed marked scoliosis. Lumbar puncture was attempted, but was not

successful. X-ray report on spine: "In the lumbar spine there is gross destruction and deformation of the second and third lumbar vertebrae with some bone sclerosis. In the absence of injury this could well be accepted as an example of Charcot's spine." Clinically there was no limitation of spinal movements.

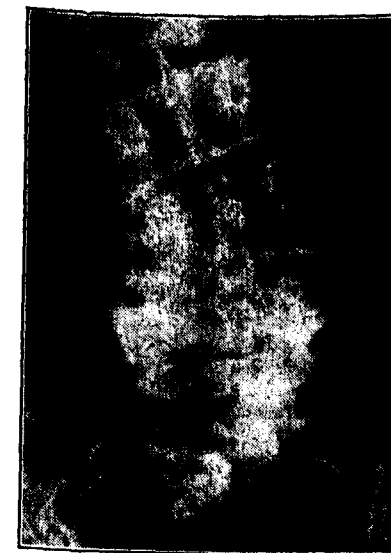
Case 3.—A retired man aged 68 attended Sheffield Royal Infirmary on March 10, 1952, complaining of severe shooting pain in his legs on and off for the past 20 years. He had been treated for syphilis in 1929. Examination revealed typical signs of tabes—bilateral ptosis, Argyll Robertson pupils, knee- and ankle-jerks absent, Romberg's sign strongly positive. Blood Wassermann reaction was negative, Kahn reaction negative. Cerebrospinal fluid: clear; Wassermann reaction, negative; cells, 0 per c.mm.; protein, 40 mg. per 100 ml.; globulin, no increase; Lange, 0000110000.

Procaine penicillin G in oil, followed by arsenic and bismuth, were given, but he continued to get severe shooting pains in the legs. On April 13, 1953, the x-ray report on the spine read: "There is a slight forward displacement of the fourth lumbar vertebra on the fifth, and the appearances are consistent with a moderate degree of neuropathic spine."

Case 4.—A housewife aged 55 had had asthma since early childhood. Routine Wassermann reaction and Kahn test were positive in March, 1952. She was referred to the special treatment centre on March 27, where she complained of "shooting" pains in her legs and back of nine months' duration. There were clinical signs of tabes dorsalis—Argyll Robertson pupils, knee- and ankle-jerks sluggish, Romberg's sign positive. Cerebrospinal fluid: clear; pressure normal; white cells, 46 per c.mm.; protein, 50 mg. per 100 ml.; Lange, 3221000000; Wassermann reaction not reported on. She continued to get low back pain, also pain in the rectum, especially at night, and over buttocks. X-ray report on spine: "There is an increase in lumbar lordosis with scoliosis, subluxation of the fourth lumbar vertebra and loss of disk space between it and the third. There is new bone formation in the tissue to the left of the third and fourth vertebrae and sclerosis of the bodies of the third, fourth, and fifth lumbar vertebrae. The appearances are those of a neuropathic spine."

Case 5.—A labourer aged 40 attended the special treatment centre of Doncaster Royal Infirmary on May 4, 1952, complaining of swelling of the left testicle for two days.

He denied extra-marital intercourse. He had been treated for syphilis at another hospital from July, 1944, to June, 1946, when his blood Wassermann reaction was found positive after his first wife's infidelity, and then defaulted from surveillance. Examination showed a gumma of the left testicle and typical signs of tabes dorsalis—pupils dilated and fixed, knee- and ankle-jerks absent, Romberg's sign positive. Blood Wassermann reaction and



Case 5. Radiograph of spine.

Kahn test were doubtful. His mother had been treated for venereal disease and his four brothers and three sisters had died in early childhood. One brother had no nose and one sister had only one arm. The patient had a well-marked

kyphoscoliosis and swelling of the right knee-joint. X-ray report on spine on May 7: "A well-marked scoliotyphosis of the dorsal spine with reverse curve in the lumbar region. In the latter region the lower three lumbar vertebrae show a marked deformity due to bone destruction and proliferation. The intervening disks are disorganized and there is a marked hyperostosis of the articular processes. The appearances are consistent with neuropathic bone disease" (see illustration). An x-ray film of the right knee showed a neuropathic joint. In August, 1945, whilst attending another hospital, an x-ray examination showed extensive scoliosis and osteoarthritis of the spine. The patient had no symptoms referable to the spine or right knee-joint. In view of the family history he would appear to be suffering from hereditary Charcot's spine. He later developed a perforating ulcer on the ball of the right foot.

Case 6.—A labourer aged 59 attended the orthopaedic department of Doncaster Royal Infirmary on October 4, 1952, with a spontaneous fracture of the left femur. A Smith-Petersen pin was inserted, and during serial x-ray control arthritic changes were noticed in the lumbar spine. The changes are consistent with Charcot's spine, although not absolutely typical. The blood Wassermann reaction was positive 1:80; Kahn + + +. He had clinical evidence of tabes dorsalis and slight scoliosis with the convexity to the left, but there were no symptoms referable to the spine. Cerebrospinal fluid examination showed: clear fluid; pressure normal; cells, no increase; globulin, negative; Lange colloidal gold curve, 0011100000; Wassermann reaction not reported on. In 1918 he had had 12 injections of arsenic for syphilis.

Case 7.—A miner aged 57 had classical signs of tabes dorsalis—pupils fixed, knee- and ankle-jerks absent, Romberg's sign positive. The blood Wassermann reaction was positive 1:20; Kahn + + +. Had been treated at the special treatment centre of Doncaster Royal Infirmary from November 4, 1949, to July 14, 1950, with penicillin, arsenic, and bismuth; then defaulted. In May, 1953, he developed a swelling of the ankles and reattended. Examination showed pitting oedema of the ankles; nothing gross in the cardiovascular system; urine normal; scoliosis with the convexity to the left; tenderness on pressure over the third lumbar vertebra. X-ray report on spine: "The lumbar spine shows a marked scoliosis convexity to the left with flattening of the disk and tipping on the concavity of the spinal curve. There is a good deal of sclerosis of the vertebral bodies and the upper cartilage plate of the fifth lumbar vertebra is collapsed. The appearances are consistent with neuropathic disease." The patient had had an injury to the spine in a coal-mine on October 20, 1947. An X-ray film taken next day was reported on as follows: "Lumbar scoliosis, congenital abnormality of sacrum or last lumbar vertebra. Marked osteoarthritis of spine. No recent bony injury. Developmental abnormality at lumbosacral junction."

Case 8.—A miner aged 55 was referred to the special treatment centre of Doncaster Royal Infirmary in April, 1951, as a case of tabes dorsalis. There were classical signs of tabes, including Argyll Robertson pupils, knee- and ankle-jerks absent, Romberg's sign positive. He complained of severe "shooting" pains in his legs and trunk. The blood Wassermann reaction was positive; Kahn + +. Cerebrospinal fluid: clear; pressure normal; cells, no increase; protein, 15 mg. per 100 ml.; Lange, 1122100000. Penicillin, arsenic, and bismuth produced no improvement in shooting pains. Later he complained of severe pain in the right hypochondrium somewhat suggestive of gastric ulcer pain. Barium-meal examination revealed no ulcer in either the stomach or the duodenum. However, during screening marked arthritic changes were noticed in the lower lumbar spine, somewhat suggestive of neuropathic disease. Further x-ray films of the spine revealed very extensive changes in the lower lumbar spine with bone destruction and new bone formation, the appearances being those of Charcot's spine. Clinically there was no deformity of the spine or any limitation of spinal movement.

Discussion

According to Herndon (1927), one of the most characteristic features of Charcot's spine is the disproportion between the severity of the process disclosed by the x-ray film and the slight discomfort and disability complained of by the patient. Usually, clinical evidence of tabes is present. One of the earliest and most constant signs is deformity which is due to bone destruction and subsequent compression of the vertebral body with posterior or lateral displacement. This process is usually limited to one or two vertebrae, and is most often found in the lower dorsal and lumbar spine. The resulting deformity is usually a kyphus with more or less lateral curvature and rotation. There is usually no tenderness and no muscle spasm.

Considerable discomfort is often caused by pressure of the collapsing spine or that of hypertrophic bone formation upon the spinal nerves. These root pains are usually gradual and insidious in onset and of moderate severity. Occasionally, however, they attain considerable intensity, somewhat simulating gastric crises or peptic ulcer pain. The mobility of the spine is little involved unless in cases of excessive destruction.

The existence of hereditary Charcot's spine has long been doubted, but it is now an acknowledged fact. Various observers consider many cases of apparent Pott's disease associated with other joint involvement in young children as luetic.

It is claimed that radiologically the alternation between sclerosis and rarefaction, bone absorption and bone apposition, is the most striking feature in Charcot's spine. In some cases the destructive, in others the proliferative, changes prevail. Often both are seen concomitantly.

The treatment of Charcot's spine consists in general antiluetic therapy and local measures for support and immobilization of the spine.

Summary

Tabetic Charcot's spine probably occurs much more commonly than most textbooks lead us to believe. Severe persistent shooting pains, especially of a girdle distribution, should indicate an x-ray examination of the spine in order to rule out Charcot's disease. Brief case histories of eight tabetics with Charcot's spine are presented.

In Case 7 trauma would appear to have been a predisposing factor in the aetiology of the Charcot's spine.

We are indebted to Drs. M. M. Beveridge and A. I. Morrison, of the Department of Venereology, for assistance in the preparation of this paper.

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Because reports were being received that some nurses and doctors working both in hospital and in public health services were suffering from dermatitis after giving injections of streptomycin and penicillin, an inquiry was instituted into the best way of preventing it. As a result, recommendations for an improved injection technique for giving antibiotics were approved by the Standing Medical Advisory Committee of the Central Health Services Council and announced to hospitals and local health authorities (see *British Medical Journal*, 1953, 2, 40). The Ministry of Health has now made a ten-minute 16-mm. film to illustrate the technique. The film is for use in teaching student and postgraduate nurses, and is also suitable for showing to doctors, pharmacists, and medical students. Copies of the film may be hired (5s. for the first day, 1s. for subsequent days) from the Central Film Library, Government Building, Bromyard Avenue, Acton, London, W.3. The film was written and directed by Margaret Thomson and made by Basic Films.

VITAMIN K₁ IN ANTICOAGULANT THERAPY

BY

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Vitamin K₁ has proved to be a most potent antidote to anticoagulant drugs with a prothrombogenic action, and is clearly the antidote of choice in controlling the dangers of anticoagulant therapy. The use of large doses of vitamin K₁ in patients on anticoagulant therapy, with the consequential restoration of the blood prothrombin to normal or near normal levels, only, however, replaces the danger, or possible danger, of haemorrhage by that of a possible further thrombotic or embolic episode. In addition, large doses of vitamin K₁ are very likely to make the patient refractory to further anticoagulant therapy. Valuable time may therefore be lost in assessing the correct dose of the anticoagulant drug required to restore and maintain an adequate reduction in the blood prothrombin level. Therefore, whenever it is intended to continue anticoagulant therapy it is essential to use vitamin K₁ with the utmost discretion and to prescribe, so far as is possible, the minimum effective dose.

Assessment of Minimum Effective Dosage

To assess the minimum effective dose of vitamin K₁ required to antagonize the action of anticoagulant drugs is not easy. In addition to the actual level of the blood prothrombin (which is, of course, in itself very important) and the presence or otherwise of haemorrhage, several other factors must be considered, including the type of anticoagulant used and the general condition of the patient. Long-acting cumulative anticoagulants such as dicoumarol, phenylpropyl-hydroxycoumarin ("marcoumar"), and cyclo-cumarol ("cumopyran") require larger doses of vitamin K₁ than the short-acting anticoagulants, such as phenylindandione ("dindevan") or ethyl biscoumatate ("tromexan").

The stage of anticoagulant therapy reached must also be taken into account; sometimes in the first few days of anticoagulant therapy, owing to the unavoidable difficulty of assessing the correct dose of the anticoagulant, the blood prothrombin may be reduced to too low a level. In most cases merely withholding further doses of the anticoagulant within a therapeutic and safe range. Where, however, the blood prothrombin is so severely reduced that haemorrhage is likely it is wise to give vitamin K₁, but small doses will in most cases be effective. This is because, unless the dose of the anticoagulant has been grossly miscalculated, there is no large accumulation of the anticoagulant in the body which would require large doses of vitamin K₁ to counteract its effect.

The general condition of the patient is also of prime importance in assessing the minimum effective dose of vitamin K₁ required to antagonize the action of anticoagulant drugs. For example, the presence of heart failure, shock, or deficient renal or liver function will mean that large doses of vitamin K₁ are needed if it is to be effective. The only failure met with in vitamin K₁ therapy has been in desperately ill patients who subsequently died within a short period.

It has been shown previously (Toohey, 1952) that 500 mg. of vitamin K₁, given orally, is entirely effective in antagonizing and controlling haemorrhage due to massive doses of such anticoagulants as dicoumarol, phenylindandione, and ethyl biscoumatate. Such massive doses of anticoagulants as were used in these experiments would not, however, normally be given in clinical practice; nor, therefore, are

such large doses of vitamin K₁ needed. In the series of experiments under review in this paper doses of vitamin K₁ varying from 5 to 50 mg. were given orally on approximately 96 different occasions to 70 patients on anticoagulant therapy, and as a result it was found that these smaller doses of vitamin K₁ were always effective in counteracting the action of the anticoagulant drugs except in two instances (see later).

Classification of Cases

Most of the uses of vitamin K₁ in anticoagulant therapy may be considered in connexion with the following three groups of cases. Group 1: Cases of frank haemorrhage or of a severe lowering of the blood prothrombin to a dangerous level in which it is not intended to continue with anticoagulant therapy. Group 2: Cases of frank haemorrhage in which it is intended to continue with anticoagulant therapy. Group 3: Cases of severe lowering of the blood prothrombin to a dangerous level, with or without minimal haemorrhagic manifestations, in which it is intended to continue with anticoagulant therapy.

Group 1.—In this group little difficulty should arise. As anticoagulant therapy is not being continued, fairly large doses of vitamin K₁ can be given. If the anticoagulant in use is one of the short-acting variety (phenylindandione, ethyl biscoumatate), then 20–25 mg. of vitamin K₁ will be sufficient. If, however, long-acting anticoagulants (dicoumarol, phenylpropyl-hydroxycoumarin, cyclocumarol) are in use, the initial dose of vitamin K₁ should be 25 to 50 mg., according to the degree of haemorrhage. This dose may in a few cases have to be repeated. Doses of vitamin K₁ in the region of 25 to 50 mg. will in nearly all cases result in the blood prothrombin level returning to normal or near normal. In addition, the patient may become refractory to further anticoagulant therapy for some days. As, however, it is not intended to continue with anticoagulant therapy this factor can be ignored.

Group 2.—It is in this group of patients that most anxiety will arise. Here it is essential to give a dose of vitamin K₁ sufficient to restore the blood prothrombin quickly to a safe level. At the same time the prothrombin must be kept within a safe therapeutic range, otherwise a further thrombo-embolic episode may occur. Also, as mentioned above, too large a dose of vitamin K₁ may render the patient refractory to further anticoagulant therapy for a few days. If the patient is receiving the short-acting anticoagulants, 15 mg. of vitamin K₁ should in most cases be enough. Larger doses than 15 mg. should be given only in exceptional cases. If, however, the patient is receiving the long-acting anticoagulants, 15 to 25 mg. of vitamin K₁ should be given, depending on the urgency of the case. The lower the blood prothrombin level, the more severe the haemorrhage, and, most important, the more seriously ill the patient, the larger the dose of vitamin K₁ required. It is in this group of patients with a severe reduction in the blood prothrombin accompanied by frank haemorrhage that most difficulty will arise in estimating the correct dose of vitamin K₁. Frequent blood prothrombin estimations are essential to assess the response to treatment and to decide whether further doses of vitamin K₁ are necessary.

Group 3.—In this group, in which there is a severe reduction in the blood prothrombin, but no or only minimal haemorrhagic manifestations, the urgency and anxiety are not as great as with patients in Group 2. For nearly all patients receiving the short-acting anticoagulants 5 to 10 mg. of vitamin K₁ will be sufficient. Patients receiving the long-acting anticoagulants will need slightly larger doses of vitamin K₁, but it is rarely necessary to give more than 15 mg., at least as an initial dose.

For all patients it is best to assess the response to vitamin K₁ therapy by means of prothrombin estimations taken about eight hours after the initial dose. In patients in Group 3, however, in whom there is no evidence of bleeding, it is usually sufficient to do the first prothrombin estimation after vitamin K₁ therapy the following day if this is

more convenient. In Group 2 patients, however, especially those receiving the long-acting anticoagulants, prothrombin estimations should be routinely made eight (or even six) hours after the initial dose of vitamin K₁. If an appreciable rise in the blood prothrombin level has not occurred a larger dose of vitamin K₁ should then be given.

Results of Vitamin K₁ Therapy

Given in the doses quoted above, in only 2 out of 70 patients did vitamin K₁ fail to have an effect. Both patients were seriously ill, suffering from myocardial infarction accompanied by shock and heart failure, and both died several days after admission to hospital. It was realized that each was desperately ill, and smaller doses than usual of the anticoagulant drugs were given. Nevertheless, the blood prothrombin fell to a dangerously low level, with microscopical haematuria in one case. Repeated doses of 20 to 25 mg. of vitamin K₁ had only a slight effect in raising the blood prothrombin. At necropsy there was no sign of haemorrhage in either case.

Desperately ill patients with signs of shock and heart failure therefore need initial doses of 25 mg. of vitamin K₁, even when there is little or no haemorrhage, in order to counteract the effect of anticoagulants, especially the long-acting ones. If there is no response to this initial dose—that is, if there is no rise in the blood prothrombin after six to eight hours—then 50 mg. of vitamin K₁ should be given. If a patient fails to respond to vitamin K₁ therapy it is an ominous prognostic sign, and it will be found that most such patients die.

In conclusion it should be stressed that vitamin K₁ is a most powerful drug, and unless the dose is carefully controlled its use will give rise to added difficulties in anticoagulant therapy. Vitamin K₁ should therefore be used only if haemorrhage has occurred as a result of anticoagulant therapy or if the reduction in the blood prothrombin is so great that haemorrhage is very likely to develop. In most patients, except those who are extremely ill, merely withholding further anticoagulant therapy will be enough to raise the blood prothrombin to a safe level without the need to use vitamin K₁. This is especially true when the short-acting anticoagulants are used. With the long-acting cumulative anticoagulants vitamin K₁ therapy will, however, be more often required.

Conclusions and Summary

In 68 patients out of 70 on anticoagulant therapy, vitamin K₁, in oral doses of 5 to 50 mg., was entirely effective in counteracting the action of the anticoagulant and restoring the blood prothrombin to a safe level. In two of these patients in whom slight haemorrhage (haematuria) had occurred the bleeding soon ceased. In only 2 of the 70 patients did vitamin K₁ fail to have effect. Both these patients were extremely ill and died from heart failure and shock following myocardial infarction.

Vitamin K₁ should be used only if haemorrhage has actually occurred or if the blood prothrombin is so low that haemorrhage is very likely to develop. Uncontrolled vitamin K₁ therapy may rescue the patient from the danger or possible danger of haemorrhage, only to render him liable to the risk of further thrombo-embolic phenomena.

In all cases in which it is intended to continue with anticoagulant therapy the minimum dose of vitamin K₁, which will be effective in restoring the blood prothrombin to a safe therapeutic range must be aimed at. In assessing this minimum effective dose of vitamin K₁, the general condition of the patient and the type of anticoagulant used are most important, in addition to the actual blood prothrombin level.

Patients receiving the short-acting anticoagulants require only small doses of vitamin K₁ to restore the blood prothrombin to a safe therapeutic level. In nearly all cases 5 to 15 mg. will be sufficient, and it is rarely necessary to exceed 15 mg.

Patients receiving the long-acting anticoagulants require larger doses of vitamin K₁ if the desired effect is to be achieved, but 10 to 25 mg. will usually be enough. The larger doses of vitamin K₁ should be given if haemorrhage has actually occurred or if the patient is desperately ill, especially if there are signs of shock and heart failure.

In cases of frank haemorrhage in which it is not intended to continue with anticoagulant therapy 25 to 50 mg. of vitamin K₁ should be given. The larger dose should be administered to patients who had been given the long-acting anticoagulants and also to the more seriously ill patients.

Response to vitamin K₁ therapy should be assessed by estimation of the blood prothrombin six to eight hours after the initial dose of vitamin K₁. If an appreciable rise in the prothrombin level has not occurred a larger dose of vitamin K₁ must be given.

I wish to thank Roche Products Ltd. for the generous supplies of the vitamin K₁ used in this work.

REFERENCE

Toohey, M. (1952) *British Medical Journal*, 2, 687.

Medical Memorandum

Orthograde and Retrograde Intussusception

Although it is stated that 80% of cases of intussusception occur in patients under 2 years of age, this was not my experience in North Szechwan, China. A number of cases were seen in adults of all ages and some in older children, but none in infants or young children. Although sometimes there was obvious cause such as a pedunculated tumour of the ileum or inflammatory swelling of a mobile caecum, often none was found. The following two cases were different from usual in that both also had retrograde intussusceptions. Although such a condition is not unknown, it seems uncommon enough to merit reporting.

CASE 1

A man aged 24 was seen in the out-patient department on October 31, 1949, complaining of abdominal pain for a little more than a month. He was admitted with a diagnosis of intussusception. Amoeboma was thought to be a possible cause, and therefore general treatment and a course of emetine injections were prescribed. This seemed justified by improvement in symptoms and resolution of the palpable mass, but one week later acute symptoms recurred with an enlarging mass in the right upper abdomen.

Laparotomy was performed under general anaesthesia. There was an intussusception of the terminal 3 in. (7.5 cm.) of ileum into the caecum and ascending colon, almost to the hepatic flexure. In addition there was a reverse intussusception of about 3 in. of the right half of the transverse colon, thus leaving a small length of normal colon at the hepatic flexure. Both intussuscepta were reduced with comparative ease; a lump about the size of a walnut could then be felt in the caecum. An end-to-side ileo-transverse colostomy was then performed. Three weeks later, under spinal anaesthesia, right hemicolectomy was performed, from which the patient made a good recovery.

On macroscopic examination of the specimen the wall of the caecum was found to be much thickened; there was no ulceration or definite tumour. Unfortunately, microscopic examination was not possible.

CASE 2

A boy aged 11 was admitted on November 3, 1951, with a diagnosis of intussusception and acute intestinal obstruction for about one day. During the previous six weeks he had been seen at intervals in the out-patient department complaining of abdominal pain and a lump. Apart from slight distension and poor nutrition, no definite physical signs had been noted. Ascariasis had been treated successfully, and the possibility of tuberculous peritonitis (which is common in the district) had been considered.

On admission he was seriously ill and dehydrated; the abdomen was distended and there was a large firm mass on the left side: this seemed to be a large firm mass in the left hypochondrium, with a smaller one rather lower and a small gap between. The apex of the intussusception could be felt about 1 in. (2.5 cm.) within the anal canal.

After saline infusion, laparotomy was performed under general anaesthesia (ether with an Oxford vaporizer). Considerable difficulty was experienced in determining the true condition namely, an intussusception starting in the terminal ileum and traversing the whole colon to the anus; and also a secondary reverse intussusception of the primary intussusception (all three layers) starting about the middle of the descending colon and extending back to the middle of the transverse colon, thus making the big mass palpable before operation. The apex of the intussusception could be reached only with the help of an assistant pressing digitally per anum, but even then reduction could not be effected. With considerable difficulty the secondary intussusception was first reduced by combined movements: digital dilatation of the secondary intussusceptions, pressure on the secondary apex, and gentle traction. When this was eventually reduced the primary intussusception was reduced with great ease. The gut was carefully examined, but, apart from deep congestion, oedema, and plastic exudate, there was no obvious pathological condition to account for the intussusception, nor was there serious question of viability. The whole colon from caecum to rectum was exceedingly mobile with long mesenteries. The colon was replaced in the approximate anatomical position and the abdomen closed.

The patient made an uninterrupted recovery; two and a half months later he was well and obviously gaining weight.

COMMENT

Aetiology.—The cause in Case 1 was thought to be inflammatory thickening of the caecum, but in several such cases I have wondered whether the caecal thickening was primary or secondary to the intussusception. Histological examination has not been possible. In Case 2 it was obviously a chronic condition with partial resolution over a period of several weeks, possibly initiated by ascariasis; the exceptionally mobile colon can be regarded as a facilitating factor. Disordered peristaltic movements seem the only explanation of the retrograde intussusceptions, though not a complete one.

Treatment.—The remittent course of both these cases raises the question whether intussusception ever undergoes complete reduction spontaneously. At operation one often finds that reduction is comparatively easy except for the remissions? If so, then earlier exploration is called for. In Case 2 the diagnosis was missed and operation delayed till it was almost too late, because insufficient importance was attached to the boy's description and no lump was felt when he attended the out-patient department. It is not usual to do anything to prevent recurrence unless there is an obvious removable cause. Such has been my practice, except with a suspicious lesion in the caecum. This course was successfully followed in Case 1. In Case 2 nothing was done beyond replacing the colon anatomically, in the hope that the exudate would form some anchoring adhesions. The condition at operation precluded anything further, and the subsequent course seemed entirely satisfactory.

F. CHRISTOPHER MADDIX, M.B.

Reviews

KIELLAND'S FORCEPS

Kielland's Forceps. By E. Parry Jones, M.B., B.S., M.R.C.O.G. (Pp. 212; illustrated. 35s.) London: Butterworth and Co. 1952.

The Kielland forceps has climbed slowly to favour. Introduced in 1910 for the delivery of the foetal head arrested in the high transverse position, it at first received scant attention. Soon, however, it was championed by Döderlein and other leading obstetricians, and by the late 1920's it was firmly established in many European clinics. It was in Vienna that I was introduced to this instrument, and in the 25 years since that time I have used it with satisfaction, if not with burning zeal, for transverse arrest of the head.

In present-day practice neither the Kielland nor any other obstetric forceps is used to deliver the head from the brim of the pelvis; Caesarean section is now the method of choice. But for the head arrested in the low transverse position the Kielland forceps undoubtedly has a place, and is an important alternative to manual rotation followed by "ordinary" forceps delivery. In this country the principles behind the Kielland forceps have never been very adequately explained. Some workers have used the instrument like any other for "normal" forceps deliveries; others have restricted it to use in special circumstances. Some enthusiasts have insisted on the original "Kielland method" of application—a method which in unsuitable cases or in unskilled hands may easily lead to a rupture of the lower segment of the uterus. Others—rightly in many instances—have introduced the blades by more conventional methods, but in applying traction have failed to observe other rules on which the advantage and safety of the instrument depend.

An altogether admirable monograph has now come to hand. In a well-documented and reasoned discussion Dr. Parry Jones discusses the history, the theory, the indications, the technique, the dangers of, and the results obtained with the Kielland forceps. Many of his views and arguments apply to forceps in general, but more are strictly applicable to the Kielland instrument. If he overstates his case—which in my opinion he occasionally does—this is an excusable fault in a publication intended to "convert" a new body of obstetricians.

There is little to criticize and much to praise. Dr. Parry Jones has the gift of explaining difficult technical points tersely and clearly. The treatment of deep transverse arrest of the head is fully considered, and a distinction is rightly drawn between this condition and that of deep transverse position of the head. The virtue of the Kielland forceps as an axis-traction instrument, to which Heidler many years ago directed attention, is again expounded. There is an optimistic reference to the correcting of asynclitism by the forceps (pages 72 and 111). I doubt if this is justified: if the position of the head can be so easily altered as is implied, it would seem that "accommodation," moulding, and other changes normally associated with labour have not yet had time to take place. The danger of compression of the foetal skull is emphasized, and the warning given that the forceps handles should not be gripped but that traction should be applied only by means of the index and middle fingers applied over the shoulders of the forceps. The possibility of maternal injury such as the occurrence of vesico-vaginal fistulae is admitted, but it is pointed out that in some of these cases the damage may be caused by the conditions which necessitated the use of the forceps. The claim is made, though I doubt its substance, that there is less chance of causing injury to the foetus, and especially facial injury, if the Kielland forceps is used. More important in my opinion is the care and understanding with which the chosen instrument is used; and here it is pertinent to quote Dr. Parry Jones's own words (p. 55):

"Whenever the obstetrician finds that a reasonable amount of traction exerted in the right direction does not produce descent

of the foetal head, he should re-examine to confirm the position of the presenting part. If he is then certain that the foetal head is flexed and is lying correctly, he should conclude that he is faced with a dangerous degree of disproportion and should desist from further attempts at vaginal delivery. The only condition other than disproportion which may be causing difficulty is a constriction ring, and if this has not been relaxed by general anaesthesia and anti-spasmodics it is best to resort to Caesarean section."

Later (p. 73), referring to a head which remains high in the pelvis, he states:

"... the greatest care is necessary to exclude disproportion ... the operation should be undertaken tentatively with plans already made to proceed immediately to Caesarean section if the delivery proves more difficult than anticipated. A carefully made tentative pull is without danger to the foetus or to the maternal birth canal. It does not fall within the class of 'failed forceps' cases as ordinarily understood, and might well become an established, although rare, hospital procedure."

This book is convenient in size, and by virtue of the style of writing and the many clear headings is easily read. Numerous diagrams clearly illustrate the arguments presented in the text. Printing errors seem entirely obviated, though there is a mis-spelling of Moloy's name on page 53. There are two appendices: one contains tables dealing with the results of the forceps operation in the Liverpool Maternity Hospital; the other is a translation of the original publication by Kielland entitled "The Application of Forceps to the Unrotated Head; a Description of a New Type of Forceps and a New Method of Insertion."

I regard this as an important publication and strongly commend it to every doctor who gives serious attention to operative obstetrics. While it is particularly concerned with the Kielland instrument, it contains much factual information and wise counsel concerning the use of forceps in general.

J. CHASSAR MOIR.

OBSTETRIC FORCEPS

The Obstetrical Forceps. By L. V. Dill, M.D., F.A.C.S. (Pp. 156; 91 figures. 37s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications Ltd. 1953.

This monograph is one of the American Lecture Series and is delightfully printed, illustrated, and bound. Its text, too, is attractive in its clarity and simplicity. The author sets out to cover the history of the development of obstetric forceps as well as the indications, mechanics, and technical details governing the use of various instruments. This is a large subject and it is obvious that in a small book of this kind many of its aspects can be covered only in barest outline. The author has simplified his task, however, by assuming that his readers already have some practical experience, and he aims to give them most help by generally picking out for mention only those forceps which are well known internationally and which are in current use. In this he shows commendable freedom from prejudice. He describes the basic principles governing the use of forceps in relation to the Anderson or Simpson type of instrument, and this is perhaps the best section of the monograph; it is detailed and contains several useful hints. The Tarnier, Kielland, Barton, and Piper forceps each receive a small chapter to themselves, and the description of their particular features and the circumstances under which they may be applied with advantage is generally adequate.

"Forceps should be compared to golf clubs, not to tennis rackets; that is, optimum utility is obtained by a set, not by familiarity with a single favourite." This is the underlying theme of the monograph, but it is open to question and it would be an ideal subject for debate. Practice makes perfect; proficiency in the use of more than one instrument calls for a very large practice and daily opportunities for carrying out forceps delivery in varying circumstances during several years, so that many experts with wide experience are content with one pattern of forceps, and few use more than two. Dr. Dill's arguments may or may not persuade them to change their outlook in this respect. The

book will prove of most value to the specialist and potential specialist, although according to the dust-cover it is also intended for students, house-surgeons, and general practitioners. These last, however, have relatively so few opportunities to practise the forceps operation that most of them cannot expect to become familiar with more than one instrument. A putter is what they require, and if the situation calls for a driver, mashie, or niblick, then surely expert assistance and sometimes another method of delivery are needed.

T. N. A. JEFFCOATE.

SURGICAL TECHNIQUE

Surgical Technique and Principles of Operative Surgery. By A. V. Partipilo, M.D., F.A.C.S. Fifth edition, revised. Foreword by Alton Ochsner, M.D., F.A.C.S. Original illustrations by W. C. Shepard and Hooker Goodwin. (Pp. 704; 548 figures containing 998 illustrations. 110s.) London: Henry Kimpton. 1953.

In this volume Professor Partipilo presents the fifth edition of a textbook of surgical technique as practised in the hospitals of Chicago, but the scope is limited, except for a postscript on the thyroid, to the abdomen and the thorax. Although there are ten other contributors, Professor Partipilo himself dominates the scene, and one cannot but be impressed by the experience and mature judgment which his articles present. Equally impressive is the thoroughness with which every subject is developed, whether it be the tying of a knot, the opening and closing of the abdomen, or the most complex detail of different methods of gastrectomy. Every item is well described and superbly illustrated, so that the details can be grasped at once without any possibility of error.

The standard of all the articles is high, but two appear outstanding—that on the gall-bladder and bile ducts by Oberhelman, and that on duodenal obstruction by Professor Partipilo. The first is not only a most finished article on technique but describes in full detail the variations which may occur, the unusual difficulties which these may present, and the means by which these may be overcome. The second is a most original and interesting contribution to a subject whose importance every abdominal surgeon will appreciate. The whole volume is well produced and the illustrations are superb, combining high artistic skill with obvious appreciation of the surgical problems. It is a worthy tribute to a great surgical school and one for which every surgeon may well be grateful.

HENRY SOUTTAR.

SYNOPSIS OF ANAESTHESIA

A Synopsis of Anaesthesia. By J. Alfred Lee, M.R.C.S., L.R.C.P., M.M.S.A., D.A., F.F.A.R.C.S. Third edition. (Pp. 488. 72 illustrations. 21s.) Bristol: John Wright and Sons Ltd. 1953.

We have much pleasure in welcoming the third edition of Dr. Lee's admirable synopsis. The book has already obtained the reputation of being a compendium of accurate information on all the varied aspects of anaesthesia and analgesia, and the present volume brings this knowledge up to date. The tremendous advances in this subject are indicated by the fact that the third edition has nearly twice the number of pages as the original volume, and it is difficult to see how the author will be able to cope with future progress without considerable omissions. It is quite difficult to pick on a subject connected with anaesthesia, however remotely, which is not found in the excellent index. We note, however, that Dr. Lee does not discuss hypothermia, hibernation, or "lytic cocktails," doubtless waiting to see whether these innovations prove their worth.

This type of book does not give much scope for literary style, since brevity must be the overriding consideration, but in spite of this limitation it is quite readable. The lay-out is good, full use being made of different forms of type in the numerous tables and classifications. Most of the illustrations are printed on glossy paper, which improves their clarity.

There is little doubt that this book gives the reader with a basic knowledge of anaesthesia the best value obtainable at the present time.

C. LANGTON HEWER.

CHEMICAL MYSTICISM

The Doors of Perception. By Aldous Huxley. (Pp. 63. 6s.) London: Chatto and Windus. 1954.

Mescaline, used in American Indian religious ceremonies, has fascinated psychiatrists for many years now. This drug can produce schizophrenic-like symptoms in many normal persons, and its near chemical relationship to substances in the body, like tyrosine and adrenaline, has been known for some time. Each new generation of psychiatrists feels this should at least provide a clue to the causation and treatment of certain types of schizophrenia; but so far nothing has come of this hope.

Now Aldous Huxley covers the same ground with a brilliant mind and pen. He compares experiences he had under mescaline with those that have been previously reported in the vast literature of mysticism. He learned how intolerable ordinary living can seem to those to whom even an ordinary chair or a flower becomes so all-absorbing and full of inner meaning, and who cannot switch back to everyday thinking and feeling again. Refuge may finally be sought in suicide, as in the case of van Gogh. Huxley suggests that what has to be done for the insane is to help them to "remain undistracted—undistracted by the memory of past sins, by imagined pleasures, by the bitter taste of wrongs and humiliations, by all the fears, hates, cravings. . . ."

Psychiatrists have to face this problem in treatment every day of their working lives. How is it to be done? After personally experiencing a chemically induced schizophrenia for only a few hours, Huxley returns to some of his earlier "Brave New World" ideas for an answer. Other philosophers, too, might try out the same drug instead of waiting for an attack of the toothache to put their treatment concepts to the test. Huxley argues that if such abnormal experiences can be induced chemically it may sometimes only be possible to use other drugs to relieve them. He discusses some of those now available, and why used despite their attendant dangers. Unfortunately only a full posterior leucotomy can as yet produce the result he demands in the quotation given above. He also suggests that mescaline might from time to time be used to give certain people "self transcendence" who are too much tied to day-to-day living to learn other methods of acquiring more euphoriant drugs.

This book should be very interesting reading to doctors and especially to psychiatrists. It will make us even more uneasy at our present failure to relieve so much of the mental suffering of our patients, so vividly brought to life by this book. It may put in better perspective our sometimes too detached philosophic viewpoints on such problems. One can only hope it will persuade general medicine to take a greater interest in the physiological aspects of psychiatry, for if drugs so near to adrenaline can create mental disorder others should almost certainly be found to antagonize them. With half the hospital beds in the country filled with psychiatric patients, the Medical Research Council should at least consider spending more than it does out of its annual budget of £1,500,000 on psychiatric research, apart from its purely psychological aspects.

WILLIAM SARGANT.

Methuen's Monographs are extremely handy guides to recent work in fields which touch medicine at many points. They are well documented and slip easily into the pocket. *Sex-Determination of the Nucleic Acids* by J. N. Davidson (second edition, 10s. 6d.); and *Tissue Culture* by E. N. Willmer (second edition, 9s. 6d.) bring the reader thoroughly up to date in these subjects.

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TRICHINOSIS

Infection with *Trichinella spiralis* occurs focally at a low endemic level throughout Great Britain, as shown by Young,¹ but it is only rarely recognized clinically. A recent outbreak of trichinosis in Liverpool, described in the *Journal* this week by Professor Semple and Drs. Davies, Kershaw, and St. Hill, illustrates clearly the characteristic features of the clinical pattern and the epidemiology. The classical course of the infection is a sharp gastro-intestinal upset, with diarrhoea and vomiting beginning one or two days after the infecting meal and followed about ten days later by general symptoms. The initial alimentary symptoms were rarely present in the Liverpool outbreak and elsewhere have occurred in under 10% of cases. As a rule the first signs appear some ten to sixteen days after infection, and they almost always consist in swelling of the eyelids and often of the face, accompanied by remittent fever of 100°–103° F. (37.8°–39.4° C.) or higher. Distressing headache, sometimes associated with photophobia, is common. These preliminary symptoms are rapidly followed by aching stiffness of the muscles, which, when it is detected in the neck, may suggest meningitis. Insomnia is commonly present, even at the same time as lethargy and apathy. Splinter haemorrhages under the finger-nails occur in about 10% of cases and are a valuable diagnostic sign when present. The eyes sometimes show episcleral haemorrhages and a waxy-yellow, swollen appearance of the conjunctiva. Involvement of the central nervous system is common, usually in the form of dizziness or disturbance of balance but occasionally as psychic disturbances or a monoplegia or hemiplegia. A dry cough is often present. Symptoms start to subside about a month after infection, when the adult worms in the intestine begin to die. Myocarditis and derangement of the central nervous system are apt to appear about the fifth week after infection, and in severe cases death may occur. Convalescence is often protracted and normal health may not be restored for some months.

Diagnosis of the first cases in an outbreak is usually established by accident. During routine examination the patient's blood count is investigated and an

eosinophilia of 25 to 50% is found. It is this which directs attention to the possibility of trichinosis. Eosinophilia appears about fourteen days after infection, soon after the first appearance of symptoms, and reaches a maximum about the twentieth day. The urine is usually normal, but albumin or blood may occasionally be present for a few hours. The cerebrospinal fluid is always normal. Conclusive proof of *T. spiralis* infection is provided by finding larvae in a small piece of muscle removed from a limb by biopsy. This should be strongly compressed between glass plates and examined directly under the microscope. The larvae resulting from recent infection lie along the axis of the muscle fibres, and they are more difficult to recognize than when coiled or encysted. Heavy infections are rapidly identified by this examination and moderate infections after careful searching. In light infections when direct examination is negative the biopsy specimen should be incubated overnight in an acid-pepsin mixture and the centrifuged deposit examined for larvae. A presumptive diagnosis may also be made by complement deviation, which usually becomes positive during or soon after the third week. This test is not absolutely reliable.

The symptoms and signs of trichinosis can be very diverse, and it may have to be distinguished from typhoid, influenza, acute rheumatic fever, nephritis, exanthematous fevers, and other conditions. Cases which do not show facial oedema but begin with disorders of the central nervous system are not likely to be recognized unless an outbreak of the disease is known to exist at the time. The presence of a marked eosinophilia will help in clarifying the diagnosis and should direct suspicion towards the cause. The gastro-intestinal upset immediately after infection will probably be regarded as food-poisoning or a dysenteric attack. The diagnosis is usually not established until general symptoms appear some ten days later.

In Liverpool and in the outbreak in Wolverhampton described by Sheldon² the incidence of infection was found to be considerably higher among women than men, though this is not always so. A higher incidence among women results from their habit of eating raw sausage meat. In Sheldon's series 80% were women, and he found that raw sausage meat was eaten by some members of about half the working-class households investigated. In Liverpool, where 75% of the patients were women, 16% of over 3,000 housewives admitted to this habit. Among male cases occupation was an important factor, half of them being concerned with the preparation or sale of pork products. Some of these patients were prob-

¹ *J. Helminth.*, 1947, 22, 49.

² *Lancet*, 1941, 1, 203.

³ *J. Amer. med. Ass.*, 1954, 154, 653.

⁴ *Ann. trop. Med. Parasit.*, 1950, 44, 357.

ably infected accidentally by handling infected pork or by contaminating their food from the knives used in cutting infected pork. Sausages are the principal source of human trichinosis, and only occasional cases are infected from inadequately cooked pork joints.

Personal protection against trichinosis consists in adequately cooking all pork and pork products before consumption. It is a legal obligation on pig farmers that all food should be thoroughly cooked before being given to pigs. Pork which is processed for eating without cooking can be made safe by adequate heating or by rapid freezing to -35°C . for a few minutes or at slightly higher temperatures for a longer time. Recently experiments have been made in controlling trichinosis by irradiating pork with x or γ rays. Gould, Gomberg, and Bethell³ have reported the effect of γ radiation from cobalt⁶⁰ or from waste fission material in old nuclear fuel rods on infected pork joints of large size. A suitable exposure was found to prevent subsequent maturation of the larvae without affecting the quality of the meat.

One disquieting feature is mentioned in the report on the Liverpool outbreak. It proved impossible to trace back the infected pig beyond the abattoir. Some form of record is required which will permit the tracing of pigs from birth to the consumer so that in the event of an outbreak of trichinosis the infection may be traced to the particular piggery responsible. Griffiths⁴ noted the same difficulty in his investigation of the increased incidence of cysticercus bovis in cattle. While it would be difficult to provide a record of the movement of cattle through many hands over some years, it should be comparatively simple to record the movements of pigs, which change owners infrequently and are slaughtered when only a few months old. This matter deserves the serious attention of the Ministers of Health and Agriculture.

THE SMALL-LIST PRACTITIONER

While endorsing in its entirety the Working Party's scheme for redistributing the central pool of money for the payment of general practitioners consequent upon the Danckwerts award, the Special Conference of Local Medical Committees meeting in June, 1952, wisely put in a caveat for those doctors who might be found in the light of experience to be unfairly penalized by the scheme after it came into effect. The Special Conference passed the following resolution:

"That if, when the new scheme of distribution has been endorsed by both parties, it is found in the light of experience that certain groups of practitioners who under the terms of reference of the Working Party might have expected to have benefited have, in fact, not done

so, it be left to the Working Party provisionally to allocate an appropriate proportion of the final settlement monies for the purpose of remedying any obvious defects in the distribution scheme, such allocation to be subject to confirmation by the next Conference before it becomes a permanent feature of the scheme."

In the discussions which followed the acceptance of the Working Party's report it became clear that some G.P.s with small lists might be adversely affected by the new method of distribution. But the size of the problem and who would suffer most could not be told precisely until the new scheme was in operation. In accordance, therefore, with the Conference rider quoted above, and at the request of the Ministry and the General Medical Services Committee of the B.M.A., the Working Party was recalled to look at the problem in the light of available evidence since the scheme began on April 1 last year. It has now finished its task, and its report and recommendations are printed in full in this week's *Supplement* (p. 206) as Appendix F of the Supplementary Report of the G.M.S. Committee to the forthcoming Annual Conference of Local Medical Committees which meets on June 3.

The Working Party has examined the remuneration from Health Service sources of those doctors with lists of under 1,200 patients, and of these it has concerned itself with doctors in single-handed practice only. It found that two groups, amounting to some 500 to 600 practitioners in all, could be said to have been placed at a disadvantage by the new arrangements—the first group, a small number who had lost income because of the replacement of their fixed annual payments by the new initial practice allowance; and the second, and larger, group, the elderly doctors. The Working Party's proposals are, therefore, designed to assist both these groups. There are two main recommendations. First, that there should be a basic payment of £250 per annum for single-handed doctors with National Health Service lists of not less than 300 and not more than 1,200 patients. Secondly, and in addition to this basic payment and to the normal capitation fee, there should be a loading of 10s. on each capitation fee for every patient on the list between 300 and 500. But no loadings under the usual arrangements will be paid for patients on the list above 500. Thus a doctor with a list of 300 will get normal capitation fees amounting to £255 plus the basic payment of £250, making a total of £505—an increase on his present remuneration of £250. The doctor with a list of 400 patients will get, in addition to normal capitation fees of £340, the £250 basic payment plus £50 from the special loading on 100 capitation fees—a total of £640, and an increase of £300 on the present. The doctor with 500 patients will

be remunerated on the basis of £425 from normal capitation fees, plus £250 basic payment, plus £100 from the 10s. loading on 200 capitation fees. His total payment will come to £775 and his increase will be £350. Lists from 600 upwards to 1,200 will attract the basic payment of £250 plus the £100-worth of loading from the capitation fees for the 200 patients on the list between 200 and 500: but, since the normal loadings are not to be paid, the increase over the present scale will be a diminishing amount until parity is reached with a list of 1,200 patients. The comparative figures are clearly set out in an explanatory table attached to the report. All payments are to be retrospective to April 1, 1953.

There are certain conditions attached to the proposals. Young doctors previously in receipt of a fixed annual payment will not receive the new payment for more than five years and they must be genuinely trying to build up their practices. Their lists must normally be increasing, and payments will be withdrawn if their lists fall substantially and continually. Elderly doctors must have been in single-handed practice in the same area for at least ten years and must be over 60 years of age to qualify for the new payment. It will be stopped if their lists drop to, and remain below, 300. Eligibility for payment will be reviewed at the age of 70, but will not necessarily cease.

The General Medical Services Committee has already accepted the Working Party's proposals and is recommending them to the Annual Conference. A welcome feature is that there is not that smack of charity about them which in the eyes of many tainted the hardship payments, which they will gradually replace. The new payments are to be made solely in relation to the size of the doctor's Health Service list and without regard to his income from other sources. Furthermore, the cost, which it is estimated will be about £120,000 per annum, will come from money already allocated for the purpose. In any scheme which gives priorities in the distribution of a fixed sum of money—and such a distribution scheme was inherent in the Danckwerts award—it is inevitable that some groups must gain greater advantage. Within the existing distribution scheme these new proposals seem likely to commend themselves to the Conference and to the small-list doctors as a well-thought-out plan to interpret the Conference's wishes fairly.

HAEMOGLOBIN C

In 1949 Pauling *et al.*¹ discovered that sickle-cell haemoglobin (haemoglobin S)² differs from normal adult haemoglobin (haemoglobin A)² in electrophoretic

mobility—that is, in speed of movement in an electric field—and this opened the way for rapid advancement in our understanding of the hereditary haemolytic anaemias. In the same year Neel³ and Beet⁴ put forward the modern interpretation of the genetics of sickle-cell disease: people who are heterozygous for the sickle-cell gene have the sickle-cell trait, which is not in itself a significant cause of morbidity, while those who are homozygous for the gene suffer from sickle-cell anaemia. On this hypothesis both parents of every patient with sickle-cell anaemia should have the sickle-cell trait. In most cases this is true,⁵ but undoubted exceptions to the general rule have come to light. It has been found^{6,7} that people who inherit the sickle-cell gene from one parent and the thalassaemia gene from the other parent develop a haemolytic disease very similar to sickle-cell anaemia. Then Kaplan *et al.*⁸ described a patient with a mild form of sickle-cell anaemia in which the haemoglobin, investigated by Itano and Neel,⁹ consisted partly of the sickle-cell type and partly of a new type, which was designated haemoglobin C. The haemolytic anaemia was termed sickle-cell-haemoglobin-C disease. Haemoglobin C is characterized by its electrophoretic mobility, which is distinct from that of both haemoglobin A and haemoglobin S; in other properties haemoglobin C closely resembles haemoglobin A. The presence of haemoglobin C is determined by a single gene, evidently an allele of the gene controlling normal adult haemoglobin synthesis, and inherited independently of haemoglobin S, which is determined by another allele of the same gene. In sickle-cell-haemoglobin-C disease the sickle-cell gene is inherited from one parent and the haemoglobin-C gene from the other parent.

Until 1953 the electrophoretic analyses had all been carried out in the Tiselius apparatus. The introduction of a simple, rapid, and inexpensive filter-paper electrophoretic technique¹⁰⁻¹² has made the study of abnormal haemoglobins possible in many haematological laboratories. Kaplan *et al.*⁸ had reported that people with the haemoglobin-C trait (that is, the heterozygous condition) have a few target cells (so called because they look like targets) in the circulating blood but exhibit no other detectable haematological abnormalities. This has been amply confirmed in two recent communications,^{13,14} in which investigations of many American Negroes with the haemoglobin-C trait are reported. Each of these papers describes, in addition, a case of haemoglobin-C disease, the patient being homozygous for the haemoglobin-C gene. This disease is characterized by the presence in the peripheral blood film of numerous target cells, anisocytosis, poikilocytosis, and slightly increased polychromasia. A haemolytic tendency is revealed by the somewhat elevated reticulocyte counts

¹ *Science*, 1949, 110, 543.

² Standard nomenclature, 1953, *Blood*, 8, 386.

³ *Science*, 1949, 110, 64.

⁴ *Ann. Eugen. (Camb.)*, 1949, 14, 279.

⁵ *Cold Spr. Harb. Symp. quant. Biol.*, 1950, 15, 141.

⁶ *Haematologica*, 1946, 29, 455.

⁷ *Blood*, 1950, 5, 887.

⁸ *Ibid.*, 1951, 6, 1240.

⁹ *Proc. nat. Acad. Sci. (Wash.)*, 1950, 36, 613.

¹⁰ *J. Lab. clin. Med.*, 1953, 41, 161.

¹¹ *J. clin. Invest.*, 1953, 32, 1070.

¹² *Bull. Johns Hopk. Hosp.*, 1940, 67, 309.

¹³ *Pediatrics*, 1953, 12, 483.

¹⁴ *J. clin. Invest.*, 1953, 32, 1277.

¹⁵ *Proc. nat. Acad. Sci. (Wash.)*, 1951, 37, 775.

¹⁶ *New York Times*, March 28, 1954.

and serum bilirubin. That the haemolysis is due to a corpuscular defect is indicated by the short survival time of the erythrocytes of haemoglobin-C disease when transfused into normal recipients.¹³ The haemolysis in both cases was mild, however, and in spite of minor haemolytic crises, with joint swelling, the patient of Ranney *et al.*¹⁴ had survived to 35 years of age, had four uneventful pregnancies, and produced four healthy children. This observation is important genetically, since it establishes that the haemoglobin-C gene (unlike the thalassaemia and sickle-cell genes) is not sub-lethal when homozygous, and has little, if any, adverse effect on reproduction. If haemoglobin-C genes are being eliminated in the Negro population of the United States, this must be mainly due to the failure of patients with sickle-cell-haemoglobin-C disease to reproduce. But the haemolytic manifestations in these cases, of which Ranney *et al.* have seen twelve, are relatively mild. Hence the elimination of haemoglobin-C genes as a result of disease seems to be much slower than the elimination of sickle-cell and thalassaemia genes.

The incidence of the sickle-cell trait in United States Negroes is about 9%,⁵ and that of the haemoglobin-C trait is about 1.8%.¹² The expected frequency of sickle-cell-haemoglobin-C disease is 1 in 2,273, and the expected frequency of haemoglobin-C disease is 1 in 11,365 American Negroes. Spaet *et al.* and Ranney *et al.* are to be congratulated on finding their cases against such odds.

Another inherited abnormal haemoglobin type, haemoglobin D, has been identified,¹⁵ and more recently yet another, haemoglobin E, was reported to the American Chemical Society.¹⁶ In five years this field of investigation has grown to occupy a respected place in human genetics and clinical pathology. Many problems remain unsolved, among them why the haemoglobin-C mutation seems to be practically confined to people of African extraction.¹² There is every indication, now that techniques of haemoglobin analysis are generally available, that progress in this field will continue to be rapid.

MELANOCYTES AND MELANOMAS

Melanocytes (otherwise pigmentary dendritic cells) are the cells in skin epithelium which are responsible for cutaneous pigmentation. It was at one time believed that ordinary Malpighian cells were capable of making pigment, particularly after actinic stimulation, but it is now known with certainty that Malpighian cells are only a passive repository of pigment granules synthesized in the melanocytes near by.

The melanocytes of white human skin reveal themselves in transverse section as "clear cells"^{1 2}—a term which applies to their appearance but not to their visibility, for they are not easy to see. Indeed, some textbooks of histology disregard clear cells and melanocytes altogether. Until now the omission has perhaps been excusable, for it is only in the last few years that suitable methods have been devised for showing them up.

The only satisfactory way of inspecting melanocytes is from the under side of a whole-mount of the epidermis after it has been split away from the corium by some method which preserves both the structure and the vitality of the cells. Such a method has been used for several years by Billingham and Medawar,^{2 3} and Mr. G. Szabó, as he describes in a paper published at p. 1016 of the *Journal* this week, has now extended its use to the study of human skin. His photographs of "split" skin preparations impregnated with the "dopa" reagent illustrate the structure, ubiquity, and abundance of epidermal melanocytes. Each melanocyte is a branched cell lying in the basal layer of the epidermis and surrounded by a little cluster of Malpighian cells, upon which its branches end. Mr. Szabó finds that melanocytes vary in number from one person to another and from one part to another of an individual. There are about 1,000 per mm.² in thigh skin (roughly one to every 10-15 Malpighian cells) and anything from 2,000-4,000 per mm.² in the skin of the face and forehead.

These facts should be taken into account in any theory which attempts to account for the different frequencies of melanomas in different parts of the body. There are several by no means incompatible reasons why their frequency should vary from place to place. One is that melanocytes show regional variation in their innate susceptibility to cancerous transformation; a second that melanocytes of different areas are unequally exposed to stimuli (such as irritation or actinic influences) which promote malignant change. A third possibility is that the frequency of melanomas is an expression of the regional population densities of melanocytes. Mr. Szabó's census shows that this third interpretation is anatomically well founded—which is by no means to say that the others are untrue. At all events, no future theory to account for the spatial distribution of melanomas can neglect these differences of melanocyte population density, and much more work is needed of the type that Mr. Szabó has begun.

PRIMIDONE IN EPILEPSY

A new anticonvulsant, primidone, known by the trade name "mysoline," was introduced for clinical trial by I.C.I. in 1949 after extensive experimental trials on animals. This substance is closely linked in chemical structure to phenobarbitone, the only difference being the substitution in the former of an -H₂ radical for -O at one carbon atom of a pyrimidine ring. It has already proved an effective clinical agent. The first report of its use by Hanley and Stewart,¹ on 40 patients in an epileptic colony, suggested that it was effective for grand mal and petit mal and also had a beneficial effect on some of the temperamental difficulties shown by epileptics. Butter² also gave an encouraging report of its use in a colony. Whitty,³ using it in neurological

¹ Hanley, R., and Stewart, A. S. R., *Lancet*, 1952, 1, 742.

² Butter, A. J. M., *ibid.*, 1953, 1, 1024.

³ Whitty, C. W. M., *British Medical Journal*, 1953, 2, 540.

⁴ Nathan, P., *Lancet*, 1954, 1, 21.

⁵ Burton-Bradley, B. G., *Med. J. Aust.*, 1953, 2, 705.

⁶ Game, J. A., *ibid.*, 1953, 2, 707.

⁷ Selby, G., *ibid.*, 1953, 2, 709.

⁸ Greenstein, L., and Sapirstein, M. R., *Arch. Neurol. Psychiat. (Chicago)*, 1953, 70, 469.

⁹ Briggs, J. N., and Tucker, J., *Lancet*, 1954, 1, 19.

out-patient practice, found it benefited both grand mal and to a lesser extent petit mal, and remarked especially that it seemed to reduce both the seizures and the personality difficulties of some patients in the psychomotor group. He found it effective as a symptomatic remedy also in seizures due to cerebral trauma and neoplasm. This was confirmed by Nathan,⁴ who also noted that the drug was usually effective within a few days of starting if it was going to be of benefit and that its initial therapeutic effect sometimes became less after a few weeks. Three recent papers from Australia⁵⁻⁷ confirm these initial findings. However, Greenstein and Sapirstein⁸ found it ineffective in psychomotor attacks and sometimes aggravating in petit mal, though this conclusion was reached on only two cases, and is contradicted by the experience of Briggs and Tucker⁹ in 22 cases of clinical petit mal. All these authors claimed that attacks were controlled or much improved in 50-80% of cases, and as all used the drug in patients whose disease was unsatisfactorily controlled by other anticonvulsants their results are the more impressive. All report an absence of any severe toxic effects and seem agreed that drowsiness, ataxia, and occasional vomiting are observed early in treatment but are usually transient. Confusional states with adverse personality changes were noted by Whitty, but these also were usually short-lived.

In general it seems clear that primidone constitutes a valuable addition to the medical treatment of epilepsy. It is most convincingly effective in grand mal, and present evidence suggests it may prove more beneficial than most drugs used for the psychomotor group: certainly extensive trial is important here. There is no convincing evidence that it aggravates petit mal: indeed, the weight of opinion is that it may improve this condition also. Dosage is important, because toxic effects are more likely with an initial high dosage. It is probably best to start with half a 250-mg. tablet two or three times a day, and gradually increase this to 3 or 4 tablets a day if necessary. If other drugs are already being used, the dosage of barbiturates should be reduced as that of primidone is increased, since the combination of these two is sometimes extremely soporific. The hydantoins may prove a useful adjuvant to primidone in controlling attacks, though it is best also to reduce their dosage slightly when adding the primidone. Amphetamine can be used here to reduce drowsiness, just as with other anticonvulsants. From the results so far reported, and especially the lack of toxicity, there is a strong case for using this drug as the initial treatment for grand mal and psychomotor epilepsy, combining it with a hydantoin if necessary. In petit mal also, if the "-diones" have proved ineffective, it should be given a trial.

TWENTY-FIVE YEARS OF OPIUM CONTROL

The Permanent Central Opium Board has now been established for 25 years. It began its work in the heyday of the League of Nations and survived the vicissitudes of war into the period of United Nations. The Board, which has its headquarters at Geneva, con-

sists of eight members representing as many countries; its newly elected chairman is Sir Harry Greenfield, the United Kingdom representative. The latest report of the Board¹ describes what has been achieved during the last quarter of a century. When the first statistics were compiled the consumption of opium for non-medical purposes was permissible in eighteen countries and territories of Asia, and in most of these the sale to addicts was a monopoly of the State. By 1953 the consumption for opium smoking and other non-medical purposes had ceased to be legal in eleven of these countries, and the most important of the others are now taking steps to bring such consumption gradually to an end with a view to total prohibition by 1959. The total production of raw opium used licitly for non-medical purposes in 1952 was 166 tons as against 1,585 tons a quarter of a century ago. The world production of morphine at the time the Opium Board was constituted amounted to 55 tons a year, and it was considered at that time that an annual average of 15 tons of the drug found its way into illicit traffic. The production of morphine has steadily increased over the last twenty years, reaching 75 tons in 1952, but 90% of it is used for the manufacture of other drugs, mainly for codeine and ethylmorphine, which are little liable to cause addiction. The production of cocaine in 1952 was only 38% of what it had been in 1929, yet no shortage has been experienced in the licit market. The production of diacetylmorphine (heroin), the drug most favoured by addicts, has fallen even more strikingly. In 1952 the world production was only 3.3% of what it had been in 1929.

Nevertheless, a considerable illegal traffic in drugs of addiction still exists. The clandestine production of Indian hemp, which is the basis of hashish or marihuana, continues to present a serious problem. A large quantity of diacetylmorphine also still finds its way into the wrong hands. So long as this drug is extensively used in medicine there is always a danger of supplies being diverted into the illicit market. The amount medicinally consumed per million inhabitants has fallen markedly over the last six years in Finland, Italy, Sweden, and New Zealand. In the United Kingdom there have been fluctuations, but the amount in 1952 (1.79 kg. per million inhabitants) was the smallest since 1947. Forty-two countries, including Soviet Russia, are listed as no longer using the drug at all, and three others have declared that they are now using up their stocks, and when this is completed the use of the drug will be stopped. Italy is admonished by the Board for having reacted to the discovery of illicit manufacture of diacetylmorphine by suspending only for fifteen days the licence of the firm on whose premises this had been going on since 1948. This, it is pointed out, can only have the effect of encouraging transgressors and might again lead to the creation of centres of illicit traffic. Complaint is also made that Persian statistics are contradictory, and that reporting from certain Asiatic and South American countries is not as regular as it should be.

¹ Report to the Economic and Social Council on Statistics of Narcotics for 1952, and the Work of the Board in 1953, United Nations, Geneva, 1953.

CLINICAL PATHOLOGY IN GENERAL PRACTICE TROPICAL DISEASES IN BRITAIN

BY

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The problems most commonly confronting the practitioner dealing with patients who have returned from the Tropics are those concerning the investigation of fevers and alimentary upsets. The possible causes of the illness, and therefore the way in which the investigation is conducted, depend to a considerable extent on the time which has elapsed since leaving the Tropics. Thus air travel enables patients to be first seen at the onset of tropical infections with short incubation periods such as primary malaria, sandfly fever, dengue, yellow fever, rickettsial fevers, and bacillary dysentery. Among those falling ill after arrival in this country by sea, malarial relapses, dysentery, enteric fevers, and kala-azar have been most commonly found. Diseases in which the incubation period is long are, however, as likely to occur among those travelling by air as they are in those travelling by sea. Air travel merely adds to the list of diseases it is possible to encounter by reducing the time elapsing between leaving the Tropics and arriving in this country.

Malaria

Malaria is the commonest cause of fever in those who have visited endemic areas less than 18 months before the onset of their symptoms. Awareness of the possibility of the infection is the first step towards its diagnosis, and light might be thrown on many diagnostic problems besides that presented by malaria if an inquiry into the patient's recent movements were made in all cases in which such information is not already known to the practitioner. The two commonest forms of malaria are malignant tertian, caused by *Plasmodium falciparum*, and benign tertian, caused by *P. vivax*. It is important to keep the former in mind, especially with patients who have very recently visited tropical Africa, as unless this infection is promptly diagnosed and treated grave illness with cerebral complications and possibly a fatal outcome may result. Infections with *P. vivax* are more commonly encountered among patients who have lived in the Middle or Far East, and latterly have constituted a special problem in soldiers returning from Korea. In these the possibility of malaria is commonly overlooked, as there may be no history of a primary attack in the endemic region, this having been adequately suppressed by the routine administration of antimalarial drugs. Such patients may have chronic ill-health until the infection is adequately treated. It is important to stress that if *P. falciparum* infections are similarly overlooked the result is usually much more serious.

The Search for Malarial Parasites

In cases in which malaria is suspected, the most important investigation is examination of one or more blood films, and these should invariably be made before treatment is started. Whether they are thought to show or to fail to show parasites they should be retained for possible further examination, as mistakes may be made by platelets or artifacts being confused with parasites. To prepare a blood film is one of the simplest medical procedures, yet it is amazing how seldom it is done well. Microscope slides must first be rendered grease-free, and for this a good method is by washing with "monkey brand" or similar

soap, soaking in alcohol, and flaming. A spreader is made by breaking off the corners of a slide after scratching with a diamond. The lobe of an ear or the tip of a finger is then cleaned with spirit or ether. The lobe of the ear is to be preferred to a finger, as it is not only less sensitive to pain than the finger but is also less exposed to infection. Ether is perhaps best for cleaning the skin, as its use reduces the possibility of grease interfering with the spreading of the film. Hypodermic needles are unsuitable for puncturing the skin, for the drop of blood obtained is often too small to make a satisfactory film. A special skin-puncturing needle or, if none is available, a large-sized venepuncturing needle is more satisfactory. A sharp jab causes less discomfort to the patient than a wound made slowly and hesitantly.

Thick and thin preparations should be made, the former by using a pin to smear the drop of blood on the slide over a circular area of approximately $\frac{1}{4}$ in. (12 mm.) in diameter, the latter by spreading the drop with the spreader already prepared. The drop is placed at one end of the slide and allowed to run across the width of the spreader, which is held at an angle of 45 degrees and pushed along the length of the slide. Thick preparations must be allowed to dry thoroughly for 20-30 minutes. Their contained blood is then laked in an aqueous solution of 2% formalin and 1% glacial acetic acid. They are washed in distilled water and stained with dilute Giemsa stain, one drop being added to 1 ml. of distilled water and allowed to remain on the slide for 20-30 minutes before being poured off, and the slide allowed to dry without heating or blotting.

If large numbers of slides are to be stained, Field's method is conveniently rapid and labour-saving. For this a solvent is made by dissolving 10 g. of anhydrous disodium hydrogen phosphate and 12.5 g. of anhydrous potassium dihydrogen phosphate in 1 litre of distilled water. Solution A is prepared by dissolving 0.8 g. of powdered methylene blue and 0.5 g. of azure I in 500 ml. of the solvent. Solution B is prepared by dissolving 1 g. of yellow eosin in 500 ml. of solvent and filtering. Films are stained by immersing in solution A for one to three seconds, rinsing for five seconds in tap-water or in solvent, immersing for one to three seconds in solution B, and washing for three seconds in tap-water. They are then allowed to dry. In using this method films are not fixed and care is therefore necessary in handling them lest they become detached from the slide.

Thin films are most conveniently and satisfactorily stained with Leishman's stain. The slide is covered with undiluted stain, the number of drops required being noted, and after 10 seconds three times this volume of distilled water of pH 7.2 is added. This pH is obtained by adding lithium carbonate to the water till an aliquot gives a yellow reaction with bromthymol blue. The slide is stained with the diluted stain for 30 minutes and then flushed with the distilled water of pH 7.2 and allowed to dry. This method has the advantage of showing up well the Schüffner dots in cells infected with *P. vivax*.

A description of the various malarial parasites is outside the scope of this article, and for that the reader is referred to the standard works on tropical medicine and parasitology. It should, however, be mentioned that, unless parasites are being searched for frequently, errors, even by trained pathologists, are not uncommon. Perhaps the commonest is to regard an artifact as a parasite; less commonly, parasites when scanty are overlooked.

It is often questioned whether antimalarial treatment should be begun before a definitive diagnosis has been

made. There can be no doubt that falciparum malaria in non-immune subjects, if not promptly treated, may give rise to severe and even fatal illness. Thus when it is considered that possible delay in treatment would be dangerous and the blood cannot be examined promptly, it is best to start treatment, though blood films should be made for later examination and confirmation of the diagnosis. To give treatment without awaiting the report on, or making a personal examination of, a blood film may be a method of managing cases in emergency, but it is not a method of diagnosis. If the temperature comes down following treatment in such cases, it is unwise to deduce that malaria was the cause of the fever unless confirmation of the diagnosis is ultimately obtained from examination of blood films. Therapeutic diagnoses of this kind are associated with innumerable pitfalls, and such slipshod methods are harmful alike to the patient and to the profession.

Investigation of Non-malarial Fevers

Non-malarial causes of fever in persons recently returned from the Tropics include bacterial diseases such as bacillary dysentery, typhoid and paratyphoid fevers, brucellosis, tuberculosis, urinary infections, and tonsillitis; protozoal infections such as kala-azar (visceral leishmaniasis), trypanosomiasis, amoebic dysentery, and amoebic liver abscess; and virus infections including the common cold and its upper respiratory complications, especially maxillary sinus infection, influenza, and rarely sandfly and dengue fevers. Typhus and psittacosis are occasionally encountered. These may be confused with malaria, and patients with them have at various times been sent to the Hospital for Tropical Diseases in London diagnosed as cases of malaria. In some such cases slides have been recovered in which artifacts or platelets have been shown to have been wrongly mistaken for parasites. In others no slides had been examined before admission to hospital, but it is remarkable that even so not uncommonly the diagnosis of malaria had been regarded as so incontrovertible that the malaria was said to be of a type insensitive to the drug used. In the Tropics, where the disease is commoner and laboratories may be lacking, or overburdened with work, such errors are more often made. They are responsible for many of the false notions regarding the efficacy of anti-malarial drugs which from time to time become widely held.

The investigation of patients presenting with symptoms suggesting dysentery is discussed below. Tests which may help to differentiate malaria and urinary and respiratory infections from the other causes of fever mentioned include the white blood cell count. This should be carried out as a routine; it is usually low in enteric fevers, brucellosis, kala-azar, and sandfly and dengue fevers, and a differential count shows a reduction in the proportion of polymorphonuclear cells. The urine and the deposit obtained from it after centrifuging should be examined microscopically for pus cells and cultured if any are found. In males mid-stream specimens of urine collected after cleansing the glands may be used for the purpose, in females a catheter specimen is essential. A radiograph of the chest should be taken in all cases in which the cause of the fever is not apparent, even if there are no symptoms or signs referable to the chest.

In cases in which the diagnosis does not become clear as a result of these investigations enteric fever, brucellosis, and typhus must be considered, and blood should be collected for culture, for enteric and brucella agglutination tests, and for the Weil-Felix reaction. For the cultural investigations 5 ml. of blood is added to 100 ml. of broth containing 0.5% sodium taurocholate, and a second 5-ml. sample is added to 100 ml. of plain broth. In taking the blood it is advisable to use a dry sterilized syringe; boiling should be relied upon only in emergencies. It is commonly said that for positive cultural results in enteric fever blood must be taken within the first few days of the attack. This, however, is not strictly true; the chances of obtaining a

positive culture at that time are greater than they are later, but positive results may be obtained at any stage in the illness and it is never sound practice to omit this investigation. It is important to inoculate the broth with the blood as soon as it is withdrawn from the vein and to transfer the specimen to an incubator with the minimum of delay. Where brucellosis is suspected the fact should be clearly stated, as cultures should then be incubated in air containing 10% carbon dioxide, for in primary culture *Brucella abortus* will often grow only under increased CO₂ tension. *Br. melitensis* and *Br. suis* will, however, grow satisfactorily in atmospheric air.

Blood for the Widal and brucella agglutination tests and for the Weil-Felix reaction should be collected in a dry sterile syringe and allowed to clot in a dry sterile tube or screw-capped bottle. If the journey to the laboratory is one occupying more than an hour or two, the serum should be pipetted off the blood clot and sent in a sterile screw-topped container or in a sealed glass ampoule.

Kala-azar should be suspected especially in those chronically or intermittently febrile and who have hepatosplenomegaly without marked prostration. Isolation of the causal parasite, *Leishmania donovani*, is the only satisfactory way of making a diagnosis, and it should first be searched for in blood films. In these, however, parasites are invariably scanty; they are more numerous in films of sternal marrow. In making the films it is important for the microscope slides to be absolutely dry, otherwise the parasites will be damaged and may not be recognizable. If examination of blood and marrow films gives negative results, blood should be cultured on N.N.N. (Nicolle, Nory, and MacNeal), Adler's, or Lourie's medium. On these media blood is sown in single drops, and great care must be taken to exclude secondary bacterial infection. The culture is kept at 28° C. and growth is to be expected within three weeks. Material in which *L. donovani* can be found may also be obtained by splenic puncture, but this procedure is best carried out only in hospital and by those trained in the technique. The formol-gel and antimony, or Chopra, tests are useful guides to the diagnosis of kala-azar. These tests are positive when serum globulins are increased, but as this occurs in several other diseases they are not specific. The formol-gel test is carried out by adding a drop of commercial formalin to 1 ml. of the patient's serum, which in positive cases becomes opaque and sets into a gel in 10-30 minutes. In the Chopra test a few drops of a 4% solution of any pentavalent antimony compound are added to a 10% solution of the patient's serum in distilled water. In positive cases the mixture becomes opaque in a few minutes.

Alimentary Disorders

In patients recently returned from the Tropics and presenting with symptoms referable to the alimentary system the most common causes are amoebic dysentery, amoebic hepatitis, amoebic abscess of the liver, and a functional or nervous upset. Less common causes include bacillary dysentery, schistosomiasis, ulcerative colitis, and neoplasms of the bowel wall.

Dysentery

Examination of the stools macroscopically and microscopically will do more to elucidate the diagnosis than any other tests. Thus in bacillary dysentery blood, mucus, or a purulent cellular exudate will be found; in amoebic dysentery exudate is less abundant, the specimen more faeculent, and *Entamoeba histolytica* or its cysts are present. In functional or nervous alimentary upsets the stool may be fluid, semi-formed, or formed—it is not uncommon for several small formed stools to be passed daily. Intestinal spasm may cause the stools to be ribbon-shaped. In such cases there is often an excessive amount of mucus, and sometimes this is passed as casts of the intestinal wall or in long strings.

There is often disagreement on the number of stools which should be examined before a diagnosis of amoebic dysentery

is excluded. Wenyon and O'Connor have said, "If *E. histolytica* are giving trouble, the probability is that amoebae or their cysts will be found at once." Their experience is similar to that of most others practising tropical medicine. Much depends on the skill and experience of the person examining the specimens; if he is fully conversant with the appearance of the parasite and is practised in stool examination, a series of six specimens is usually regarded as sufficient. It should be stressed that, unless a person is examining such specimens frequently, he is liable to commit errors in identification of parasites and objects resembling them, and in view of this it is highly desirable that these investigations should be carried out at a centre established for the purpose. Some advocate that stools should be collected after saline purgation, but the consensus is that purgation does not increase the chances of finding amoebae or cysts; there is also the possibility that salines may destroy amoebae by their osmotic effect.

Cultural methods of isolating amoebae are not recommended for routine use, as it is not uncommon for cultures to be negative even when stools are known to contain the amoebae. Various concentration techniques increase the chances of finding cysts in a specimen, but these methods are not suitable for the isolation of vegetative amoebae, as the latter are destroyed by the solution of zinc sulphate or other salt used in the process. Some state that the chances of finding amoebae or cysts are increased by giving the patient one or two doses of emetine by injection. But no reliable evidence of the effectiveness of this so-called provocative emetine has ever been put forward. It seems probable that such popularity as the method obtained was based on confusion with the use of provocative arsenic in syphilis. Each specimen should be collected in a dry bedpan at room temperature, as parasites may be damaged by undue warmth or by water which sometimes remains in bedpans after they have been washed. When collecting faeces for examination it is important to warn the patient not to micturate into the container into which the faeces are being passed.

Vegetative forms of *E. histolytica* become immobile and disintegrate within a few hours; thus any examination for them must be carried out as quickly as possible. Nevertheless, undue emphasis is sometimes placed on this point. There is certainly no truth in the oft-stated belief that if a specimen cannot be examined immediately it should be kept warm to preserve motility of the amoebae. The reverse is in fact true, for if they are kept cool they remain alive much longer than if kept warm. When chilled, amoebic trophozoites lose their motility, but this rapidly returns when they are again brought up to body temperature. Amoebic cysts remain identifiable for several days in faeces kept in a closed container at room temperature.

In the diagnosis of amoebic dysentery the complement-fixation test is as yet completely unreliable; the same can also be said of barium enemata and other radiological procedures. Sigmoidoscopy is occasionally helpful, but it is remarkable how seldom it affords positive evidence of the disease in cases in which the diagnosis has not already been proved by stool examination. It is, of course, of great value in distinguishing ulcerative colitis or neoplasms of the bowel from dysentery, and negative sigmoidoscopic findings also assist in excluding organic disease. An increasing number of observers are becoming sceptical of small pits in the bowel mucosa as evidence of previous amoebic infection. These received much publicity towards the end of the second world war and were supposed to be the scars of amoebic ulcers. Such ulcers, however, unless of great size, normally heal and their scars completely disappear. In this respect they are similar to abrasions and ulcers of other mucous surfaces and parts of the body. It is probable that many of the depressions to which attention was drawn were the mouths of mucous glands normally present in the rectum and colon.

Thus, in dysentery, the most valuable diagnostic procedure remains the examination of a series of specimens of faeces

and particularly of any blood or mucus adherent to or intermingled with such specimens. The specimens are best collected without purgation or the use of provocative emetine.

Amoebic Hepatitis and Liver Abscess

Amoebic hepatitis is usually an accompaniment of an acute attack of amoebic dysentery; its presence is indicated by pain and tenderness in and enlargement of the liver, by leucocytosis, and sometimes by pain in the right shoulder. Acute hepatitis of this kind usually settles down satisfactorily with adequate anti-amoebic treatment and is seldom difficult to diagnose. An amoebic abscess of the liver may, however, cause a more complicated diagnostic problem. Months or years may elapse between the time of the original infection and that at which the first symptoms develop. In some patients there may be no antecedent history of amoebic dysentery, the bowel infection having been subclinical or mild and regarded as transient enteritis only. In the diagnosis of amoebic liver abscess the investigations of greatest value are screening of the liver and diaphragmatic areas, the white blood cell and differential counts, and aspiration of the abscess contents. Stool examination usually gives negative results, for by the time the abscess has developed the original alimentary infection has in most cases been adequately treated or resolved spontaneously. In such cases radiological screen examination usually shows elevation and paradoxical movement of the right diaphragm on respiration. There may also be collapse or patchy consolidation of the base of the right lung. A moderate leucocytosis is usual with some increase of the polymorphonuclear cells, though this is by no means invariable and cases occur in which the white blood cell and differential counts depart but little from normal.

If the clinical picture and/or radiological appearances suggest that a collection of pus is present in the right lobe of the liver, a diagnostic aspiration should be carried out. Aspiration of the left lobe of the liver should not be attempted, as it cannot be reached other than by open operation without incurring risk of damaging vital structures. The right lobe is best aspirated with a large-bore needle introduced in the right mid-axillary line in the ninth or tenth intercostal space or in the right scapular line in the eleventh intercostal space. Any pus obtained should be examined microscopically and cultured. Amoebae are only rarely obtained in such pus, as they live in the abscess wall. Unless there has been secondary infection the pus is sterile on culture. In cases in which it is not infected it is of the same colour as the liver and is commonly likened to anchovy sauce. When infected it has a greenish or yellowish tint.

Schistosomiasis

When schistosomiasis is suspected examination of both urine and faeces is important. Ova of *Schistosoma mansoni* are most commonly found in the faeces or in material removed by biopsy of the rectal wall. Ova of *S. haematobium* are more numerous in the urine though they may be found in the faeces or in rectal mucosa. It is in the last few drops of urine expressed during micturition that the eggs of *S. haematobium* are most numerous. If examination of such a specimen reveals no eggs a 24-hour collection of urine should be allowed to sediment, three-quarters of the collection is then siphoned off and the remainder centrifuged and examined microscopically. In schistosomiasis the differential white blood cell count often shows an eosinophilia. At the Hospital for Tropical Diseases, London, a complement-fixation test for schistosomiasis can be done and this gives reliable results.

Conclusion

The diagnosis in most tropical diseases can be reached by carrying out simple laboratory procedures often involving the use of little more than the microscope, but the interpretation of results and the recognition of the various parasites and or the structures and artifacts which may simulate them call for considerable training and experience. The late effects of errors in interpretation and consequent

mismanagement are not uncommonly encountered at the various tropical centres in Great Britain, and such mismanagement may lead to chronic ill-health and in some cases even to the death of the patient. It is therefore in the patients' interest that whenever possible they should be investigated in a centre for tropical diseases. Apart from various military establishments there are three of these in Great Britain—namely, the Hospital for Tropical Diseases, 4, St. Pancras Way, London, N.W.1.; the School of Tropical Medicine, Pembroke Place, Liverpool; and the Tropical Diseases Unit, Eastern General Hospital, Edinburgh.

Next article on Clinical Pathology.—"Pituitary Function," by Dr. G. A. Smart.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

MEDICAL ART

[FROM A SPECIAL CORRESPONDENT]

Gaiety once again is the keynote of the exhibition¹ of work by members of the Medical Art Society. Nearly all the paintings evade the criticism of much contemporary art that it cannot be lived with; indeed, any of these would lend distinction to the kind of rooms that most of us are condemned to inhabit. But if the gay spontaneity of this work betokens the amateur, the technique often suggests a more practised hand. Mr. Elliott Blake's impressionist oil painting of autumn leaves in a Sussex lane (No. 23) catches the eye immediately as a fine piece of painting, though the composition is somewhat precisely balanced. Another plastic surgeon, Sir Harold Gillies, also enchants the eye with a landscape of winter, "Beech Trees in Snow" (No. 20). Dr. A. B. Hewlett, as usual, contributes one of the outstanding paintings of the show, "The Upper Reaches" (No. 42), a beautiful evocation in his highly distinctive style of a typical corner of the English countryside. "The Edge of the Downs" (No. 64), by Dr. G. M. Archer, is also a most successful landscape; though more conventional in technique, it glows with unusual warmth of feeling. Other pictures in this room that should not be missed include the two negroid heads by Dr. W. Hartston (Nos. 2 and 6), "Summer Mist" (No. 26) by Dr. E. P. Scott, and "The Reef" (No. 54) by Dr. A. G. Duncan.

Few of these week-end painters—or of any amateur painters in this country—owe much of their technique to any of the artistic movements that succeeded the Impressionists. However, Mr. R. T. Payne shows some fanciful abstractions, attached to rather than illustrating texts from Genesis; Mr. W. M. Van Essen has evidently had an encounter (No. 111), not altogether fruitless, with Picasso; and Mr. Geoffrey Parker's "Bruges" (No. 89), misprinted in the catalogue, suggests some affinity with the German expressionist movement of the 'twenties. Dr. H. Hales's *jeu d'esprit* in wire (No. 80) belongs more to the realm of doodling than of art, but it is an amusing contrivance all the same. On the opposite wall near by is a particularly colourful and decorative painting by Lady Whitby, "Dahlias" (No. 98). Here we are back with the Impressionists again, and it is an easy step to Dr. Joy Patrick's striking portrait of "Cecilia" (No. 107).

Among the water-colours Dr. A. E. O'Donnell shows an excellent snow scene that yet communicates a feeling of

¹At Walker's Galleries, Bond Street, London, W.1, until May 8. Open 10 a.m. to 5 p.m., Saturdays 10 a.m. to 1 p.m.

warmth derived from the pleasure of painting it. Mr. Holmes Sellors catches the passer's eye with some gay scenes (Nos. 183 and 184), and Dr. Reginald Morshead has recorded Sussex's "Chanctonbury" (No. 171) in a refreshingly cool study. In this same room is a beautiful piece of sculpture by Dr. Geoffrey Konstam, a head of a baby (No. 141). This exquisite work deserves long contemplation.

The president of the society, Sir Philip Manson-Bahr, himself contributes several paintings, in No. 9 giving an agreeable portrait of his horse, and in No. 150 bringing to Sussex an eye that seems to have been averted only momentarily from tropic climes. He and the members of the society deserve our thanks as well as our congratulations for putting on this exhibition of such enchanting talent.

THE CHANGING AND THE UNCHANGING FACE OF MEDICINE

FIRST SYDNEY BODY LECTURE BY
Sir FRANCIS WALSH, F.R.S.

The first lecture under the Sydney Body Trust was delivered at Southend-on-Sea Hospital, Rochford, on April 14 by Sir Francis Walshe. This Trust has recently been instituted under a benefaction by Mr. Sydney Body, M.P.S., to provide for a lecture to be given every year designed to promote sympathetic understanding between the medical profession and the public; also a gold medal to be awarded, not necessarily annually, to a medical man or woman for outstanding merit in some field of research or achievement.

Sir FRANCIS WALSH addressed a large and distinguished audience on "The Changing and Unchanging Face of Medicine." Medicine, he said, was the oldest learned profession in the world, and each successive generation of doctors stood on the shoulders of its predecessors. During the forty years of his own professional life medicine had undergone vast changes, but equally there were aspects of it which had not and would not change.

When he started medicine there was no scientific chemotherapy as they now saw it. Patients suffering from pernicious anaemia survived for about four years, and nothing could check the ruthless course of their malady. Surgery of the lung, the heart, and the brain had developed during his lifetime. The triumphs of asepsis, anaesthesia, and post-operative care had transformed the surgical operation. Preventive medicine had advanced out of all knowledge. The men of his generation in medicine had been privileged to live in an era of more rapid advance than anything the previous history of medicine had seen.

At the same time he looked back occasionally on the doctor of 40 years ago, and realized how often he had possessed that clinical judgment without which none of the modern techniques could be used to full advantage. These modern resources were two-edged weapons, and it was easy for zeal to outrun discretion.

The Impact of the Health Service

Since the introduction of the National Health Service, Sir Francis Walshe continued, many people seemed to have developed an attitude of helplessness concerning their own and their children's health. In former days if a child fell down and grazed his shin his mother bathed it and put on a plaster, but to-day he was sent to join the queue at the surgery. "After all, why do what the doctor is paid to do? We pay for welfare; why should we not have it?"

Doctors were only human beings: they had their private lives, their foibles, too; they sometimes made mistakes. It was not unknown for them to make errors of judgment

when the diagnostic situation was difficult or they were tired or working under pressure. There was too general an assumption that when misfortune occurred someone was to blame. But if such an assumption grew it might well entail a shrinkage on the part of the doctor from taking any bold action at all. He might recall those lines of A. H. Clough:

Thou shalt not kill; but need'st not strive
Officiously to keep alive.

"Safety First" was often a miserable motto, but it might be encouraged by the growing practice on the part of patients to have recourse to law.

He sometimes wondered whether judicial pronouncements in cases of alleged negligence or misdoing on the part of the doctor might not be a little more restrained if litigants could proceed against counsel when they failed in their actions, or even against a judge for negligence should his decision be reversed on appeal. But no profession had a keener sense of self-preservation than the law. The lawyers had seen to it that nothing could happen to them.

Corruption by the State

The unchanging face of medicine was its obligation of prudence which the ancients spoke of as practical wisdom and placed in the category of moral virtues. The doctor must be informed in his actions by a wise regard for the individual patient, which did not necessarily mean doing what the patient asked of the doctor. The Hippocratic oath told the doctor in general terms what he might or might not do. Throughout recorded history kings, prelates, and judges had on occasion been responsible for the most monstrous inhumanity to man, but until our own age the profession of medicine had never stained its record in this respect. As a body of men they had endeavoured sincerely to serve the human race. But in Continental concentration camps in the last war they had been made aware of the attempted corruption of the profession by the State, and the abandonment by some members of it of all that the Hippocratic oath involved.

The doctor must refuse to betray his principles at the bidding of any State. He must have the courage and the practical wisdom to use his powers only for proper ends and decline to use them for base ones. It was so easy to believe that what could be done might be done. If we believed that there was a divinity that shaped our ends, it was not for us to rough-hew them how we would. In the world of medicine the moral issue abided. However brilliant in scientific achievement the future of medicine might be, he trusted that the activity of doctors would always be inspired by the moral virtue of practical wisdom, whose name was truth.

Presentation to Dr. William Evans

After a vote of thanks had been accorded to Sir Francis Walshe on the proposition of Dr. T. Rowland Hill, Mr. SYDNEY BODY presented to Dr. William Evans the first gold medal of the Sydney Body Trust for his work in cardiology, and spoke of the high esteem in which he was held in Southend and its neighbourhood, and the reputation he had achieved in the field of medicine. Dr. WILLIAM EVANS, in acknowledging the honour, paid a tribute to all those who had helped him, including his colleagues at the hospital and his patients.

A factory for producing D.D.T. will shortly be established in North Ceylon to ensure adequate supplies for the country's antimalarial campaign. Unicef will provide essential equipment costing 250,000 dollars, while the Government of Ceylon will bear capital costs equivalent to 415,000 dollars and annual operating costs of 450,000 dollars. It is estimated that an annual production of 700 tons of D.D.T. will be sufficient for the island's needs.

Preparations and Appliances

A MICROSCOPE LAMP FOR USE IN THE FIELD

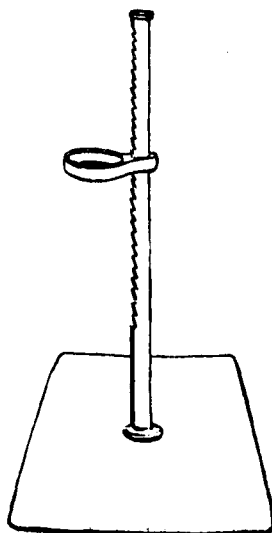
Mr. J. SMILES and Dr. J. A. McFADZEAN, of the National Institute for Medical Research, London, N.W.7, write: At present there is no satisfactory source of illumination available for microscopy in the field. Six-volt electric lamps may be run from an accumulator, but accumulators are often unreliable, particularly in the tropics, and require



to be charged at intervals. Dr. W. E. Ormerod suggested the use of a Tilley lamp. The photograph shows a paraffin pressure lamp made by the Tilley Lamp Co., Ltd. (model No. AL.21), which has been adapted at the National Institute for Medical Research for use as a field microscope lamp in West Africa. The lamp is mounted on a base in conjunction with a small optical bench which carries a collector lens with a diaphragm, and a filter-holder. There is a metal baffle in front of the lamp, with an opening 2 in. (5 cm.) in diameter, which prevents stray light and heat reaching the observer. The lamp is easily detached from the unit and may thus be used for general purposes. The unit has been tested for transmitted light, dark-ground illumination, and phase-contrast, and is satisfactory for all three systems. We wish to express our thanks to Mr. A. S. Maslen, who constructed the unit.

JACK FOR SUSPENDING THE BOYLE-DAVIS GAG

Mr. W. BRYCE MCKELVIE, consultant E.N.T. surgeon, Booth Hall Hospital, Manchester, writes: The jack for suspending the Boyle-Davis gag in dissection tonsillectomy here illustrated is simple to make and does not include screws or springs liable to rust, or rubber. It is constructed of stainless steel by Allen & Hanburys Ltd. A prototype has been in use for over five years.



Correspondence

Changes in Skin Response in Asthma

SIR,—The place of clinical allergy in medical teaching and practice has long been bedevilled by controversy regarding the methods of investigation and the validity of the results obtained. On the whole, there has been much "false pleading" on the part of the critics, since they have attributed to the allergist much greater confidence in the prognostic significance and validity of skin-test results than he has himself claimed. The immunological validity of these results, on the other hand, can be demonstrated by methods of refined precision, provided that all efforts are made to minimize sources of error in testing. In his article (*Journal*, February 13, p. 370) and in his later spirited reply (*Journal*, April 3, p. 818) to Dr. R. S. Bruce Pearson's pertinent criticism of his technique (*Journal*, March 13, p. 642), Dr. A. G. Ogilvie has arrived at conclusions regarding skin-test results, in the course of which he has employed methods which reduce the reliability of testing. It is as well to point out that there has been concern in recent years over the variability of biochemical and other laboratory investigations as between different laboratories handling the same specimens. The reactions to skin-testing are made manifest by tissue and vascular responses, and careful technique is made all the more necessary.

For precise detailed study, prick testing is a most suitable method, although the incidence of positive reactions may be lower than with intradermal testing. If, however, intradermal testing is employed the ideal method is one in which negative or nearly negative reactions are produced at control tests. Wide experience has shown that the smallest dose consistent with accuracy which can be injected into the superficial dermal tissues is 0.01–0.02 ml. If the injection is given into the deeper layers of the skin reactions can be markedly altered. The dose of 0.1 ml. employed by Dr. Ogilvie's assistants is far in excess of this, and, in spite of his protest to the contrary, this volume injected into the superficial layers of the skin can be both painful and irritant. He describes the disappearance within 10 minutes of the bleb raised by the injection of 0.1 ml. of fluid, and this too is far shorter than the time regularly observed for the disappearance of a similar volume of saline in tests of the absorptive capacity of the skin (Aldrich-McLure test). Even though this volume is too large for test purposes, positive reactions are undoubtedly obtained, but the size of the control reactions vitiates its value for follow-up studies of the variability of skin-test reactions. Even when prick testing is used for threshold testing variability of reactions can be seen. For example, the prick test can elicit reactions with grass pollen extracts containing from 5–10 units per ml., and multiple tests carried out simultaneously can show discernible differences, due either to local skin factors or to imperceptible differences in the prick itself. It would be surprising if differences in intensity of reactions did not appear at tests carried out at different times. This problem has already been considered previously, although Dr. Ogilvie was unable to find any pertinent references, for Vaughan in his *Practice of Allergy*¹ lists variation in intensity of reactions to skin testing in the index, and he gives a tabulated record of scratch-test results to 49 different allergens in the same subject over a period of 12 years. He suggested that tests should be repeated from time to time, since there may be variations in intensity due to technique or to changes in the subject's sensitization. It would seem then that, whilst there is agreement with regard to the variability and prognostic value of skin-test results, studies, however worthy, which purport to illustrate this should employ the most precise techniques, and should respect the sources of error in testing.—I am, etc.,

J. PEPYS.

London, W.2.

REFERENCE

¹ *Practice of Allergy*, 1939. London.

Drinking Sea-water

SIR,—The crossing of the Atlantic by Dr. Alain Bombard on a rubber raft, and his subsequent claims regarding survival methods, have caused much discussion. In particular, his views on drinking sea-water have been widely disseminated, and his heterodox opinions have caused some alarm among those who have responsibilities in advising on survival policy. Dr. Bombard will soon return to this country to give a second series of public lectures, in which no doubt he will reaffirm his belief that sea-water should be drunk by castaways. There has as yet been no public denial of Bombard's claims, and this might suggest that his theories have been accepted. Nothing could be further from the truth, and it seems appropriate to say again that the bulk of experimental evidence has shown that sea-water drinking must do castaways more harm than good.

Criticism of Bombard's physiological notions is often misunderstood as criticism of his achievement. His courage and determination have never been in doubt, and the difficulties he has overcome in his attempts to "prove that man can exist for a long period of time at sea are indeed formidable. However, it is not upon psychological issues alone that survival at sea depends. In addition to many other factors, the concentrating power of the kidney, which has a known physiological limit, plays no small part in regulating the conservation of body water. Bombard's advice to drink sea-water is not backed by any acceptable evidence which would show that our present concepts of renal function are inaccurate, and Bombard's own evidence is unsatisfactory and contradictory.

Bombard is wrong when he supposes that traditional advice is based upon the fact that sea-water could not be drunk. The advice given against sea-water drinking depends upon the fact that it *should* not be drunk. The fact is that at the present moment the experimental evidence shows quite clearly that it is possible to drink sea-water but never to advantage. Those who are cast away at sea who do not drink sea-water and wait for the rain that saved Bombard will be more certain to survive than those who do drink sea-water, provided they are equally courageous.—I am, etc.,

T. C. MACDONALD,
Director of Hygiene and Research,
Air Ministry.

London, W.C.2.

Action of Chlorpromazine and Promethazine

SIR,—At a discussion on chlorpromazine and promethazine at the Royal Society of Medicine on April 2 Professor J. H. Burn (*Journal*, April 17, p. 931) noticed that little interest was taken in the temperature falls produced by these two drugs. While it is true that a fall of temperature occurs under ordinary methods of anaesthesia, this is not so pronounced as that resulting from chlorpromazine. A drug which produces a marked fall of temperature and presumably reduction in metabolism is surely interesting.

The doses of chlorpromazine and promethazine used in my cases have not exceeded 50 mg. of each drug, but large doses of pethidine (200 mg. and over) or morphine have been given to a number of cases to demonstrate potentiation. The analgesia of both these drugs has been undoubtedly enhanced, but curiously enough the respiratory depressant effects have been reversed. For want of a better term, paradoxical potentiation is suggested. The "nalorphine"-like effect of chlorpromazine has restarted respiratory arrest due to pethidine and morphine in every case. The effect of promethazine, however, is unreliable. For instance, respiration was abolished by 200 mg. of pethidine in a fit female with bilateral hallux valgus, artificial respiration being carried out with closed circuit air and basal oxygen. The insertion of towel clips was resented but the respiratory rate was still nil. After 35 mg. of promethazine the skin incision was tolerated, but respiration did not restart. Three minutes after 35 mg. chlorpromazine was given, respiration restarted. The bilateral operation proceeded uneventfully with a respiratory rate of 11 per minute,

and no supplementary anaesthesia was given. In this series (so far) the potentiating effect of chlorpromazine on pethidine or morphine is greater than with promethazine. The effect of chlorpromazine and promethazine on thiopentone is dependent on the amount of pethidine in the mixture.

After 35 mg. each of chlorpromazine and promethazine have been given, respiratory tracings show that little reduction of amplitude occurs after 350 mg. of thiopentone given slowly. In another tracing in which 70 mg. of pethidine was added to the chlorpromazine and promethazine, respiratory arrest occurs with 200 mg. of thiopentone.—I am, etc.,

Edware, Middx.

DAVID RECKLESS.

SIR,—During the past six months I have been able to observe the separate and combined effects of chlorpromazine, promethazine, and pethidine as suggested by Professor J. H. Burn (*Journal*, April 17, p. 931).

When either chlorpromazine or promethazine is given separately by the oral or intramuscular route there is a similarity of the central effect which is characterized by a state of indifference and detachment rather than a true hypnosis and analgesia. However, the action of chlorpromazine is clearly more pronounced in depth and duration, extending fully over 24 hours compared with a maximum of 12 hours with promethazine. The central effect of pethidine on the other hand is predominantly analgesic and sedative. When combined with either chlorpromazine or promethazine each provides a quality that the other lacks, supplementing each other in a most satisfactory manner.

Neither pethidine nor promethazine, separately or combined, have been able to confer protection against haemorrhagic or traumatic shock in the manner obtained when chlorpromazine is added. Neither does either bring about that marked facial pallor and emptiness of capillaries that is characteristic of chlorpromazine and which French workers contend is explained by its strong central sympatholytic action.

There is certainly need for careful evaluation of the precise action of these three drugs. However, I hope that no one will take Professor Burn's suggestion too literally and give a patient 200 mg. of chlorpromazine either intramuscularly or intravenously. A state of permanent "hibernation" might well follow and make Drs. F. S. Preston and H. Y. Wishart's difficulties following a dose of 25 mg. seem quite trivial (*Journal*, March 13, p. 645).—I am, etc.,

London, S.E.11.

D. A. B. HOPKIN.

Prostatic Obstruction Due to Ephedrine

SIR,—At last I have seen in print a description of the annoying side-effects produced by ephedrine in elderly male asthmatics, and it has puzzled me for years that this problem has never been fully discussed, or that I have seen no reference to it.

Dr. H. J. Wright, in "Points from Letters" (*Journal*, April 10, p. 878) draws attention to the difficulty of micturition experienced by this group of patients. He attributes the symptoms, which have amounted to acute retention of urine in a number of my own cases, to an effect of ephedrine on the prostate gland. Surely the action is either on bladder sphincter tone or on bladder muscle, or both, increasing the former and decreasing the latter. I have based my conclusions on personal observations. Twenty years ago I used to take ephedrine because of hay-fever and noticed a remarkable diminution of the force and volume of the urinary stream. More recently I have seen the same symptoms on taking the amphetamine group of drugs, and it has made me wonder if the benefit claimed in nocturnal enuresis is produced by this "local" action on the bladder rather than by the decrease in depth of sleep, which is put forward as the explanation.

Those people who are predominantly sympathetico-tonic would be particularly affected, the vago-tonics much less so, hence the discrepancies in results reported in the enuretics,

and the qualms I feel when I go to bed having left an old man with ephedrine to take for his nocturnal wheezing for the first time.—I am, etc.,

Llminster.

HUGH CARTWRIGHT.

SIR,—In answer to Dr. H. J. Wright (*Journal*, April 10, p. 878) I would refer him to Hale-White's *Materia Medica*,¹ which mentions the fact that urinary retention may occur with ephedrine medication, particularly in children. I have myself on occasions seen acute retention in adults as a result of heavy ephedrine medication.

I have, on several occasions, seen elderly males admitted in a state of left hypertensive failure associated with bronchospasm who have, as an incidental finding, a retention of urine due, probably, to ephedrine therapy which has been given before admission for the bronchospasm.—I am, etc.,

Liverpool, 6.

WILFRED FINE.

REFERENCE

¹ *Materia Medica*, 1952, revised by A. H. Douthwaite. London

"New Cure for Gastric Ulcer"

SIR,—Some time ago you wrote to me about rumours of a new vitamin allegedly discovered by me. These rumours have now culminated in the statement in the lay press that I have announced the discovery of a new dietary factor which cures gastric ulcer in humans in 10 to 30 days. I have not made such an announcement. And I should like to disclaim any responsibility for it and the accompanying sensationalism.

For a number of years I have studied the dietary development and prevention of gizzard ulcers in chicks, a subject which may or may not be related to the human ulcer problem. At present certain dietary materials (not "new vitamins") that counteract gizzard ulcers in chicks are being tested for their value as dietary constituents in the treatment of gastric ulcer in man. An American gastro-enterologist is studying the problem, and several Danish physicians have begun clinical trials too.

Since, to my knowledge, no clinical reports have appeared in the medical literature, newspaper articles about "the cure for ulcer," and, concomitantly, direct or indirect advertising of preparations purported to cure the disease, are, to say the least, premature.—I am, etc.,

Copenhagen.

HENRIK DAM.

Dangers of E.C.T. in Elderly Psychotics

SIR,—Whilst agreeing with Dr. G. I. Tewlik (*Journal*, April 10, p. 876) in his criticism of the statement by Drs. Vera Norris and Felix Post (*Journal*, March 20, p. 675) that "fainting turns, transitory pareses, or speech disturbances . . . even in the absence of neurological signs or patchy intellectual defects, was regarded as indicative of cerebral arteriosclerosis," I cannot agree that the concept of arteriosclerotic dementia is based on shaky pathological and clinical criteria. Certain clinical pictures correlate too well with the necropsy findings of atherosclerosis in cerebral vessels coupled with areas of cerebral infarction on microscopic examination, or even gross cerebral haemorrhage or cyst formation,¹ deposits of iron in the extrapyramidal system and senile plaques in the cortex. Many old patients suffering from cerebral arteriosclerosis are labelled senile dementia.²

Clinically, cerebral arteriosclerosis should be diagnosed by emotional lability, patchy amnesia, confusion, relatively well-preserved personality, and retention of insight, with some evidence of generalized arteriosclerosis, or focal signs in the C.N.S. I do not think one should be so enthusiastic about giving E.C.T. in such cases, because the increased metabolic demands resulting may precipitate a prolonged amnesia; I have known such patients die from left ventricular failure due to coronary ischaemia, even when treatment has been modified by succinylcholine chloride.—I am, etc.,

Willesby, Yorks.

F. HOUSTON.

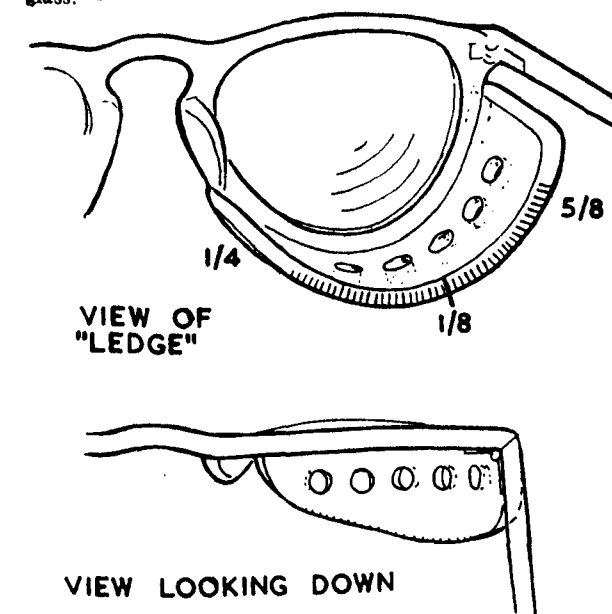
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- ¹ Boyd W. (1947). *Textbook of Pathology*. London.
- ² Strassmann, G., and Krush, T. (1947). *J. Geront.*, 2, 45.

Relief for Entropion Sufferers

SIR,—For about three years I have suffered from entropion with the resultant constant irritation by the hairs of my lower lid on the cornea. A first-class oculist on two occasions removed skin below my lower eyelid. Neither operation proved successful and indeed each time he informed me that they might not be.

About eight weeks ago a lay friend, who observed me constantly drawing down the lower lid, suggested that if I wore an eyeglass frame inside my glasses it might be helpful. For some reason I was unable to keep the frame in situ. I asked an optician to fit a "ledge" along the lower right eyeglass which by its weight would fit snugly on to my cheek and so keep the lower lid everted. The ledge is $\frac{1}{4}$ in. (16 mm.) at its widest part, tapering to about $\frac{1}{8}$ in. (6.4 mm.) at its narrowest, and $\frac{1}{4}$ in. (3.2 mm.) thick. It lies slightly more than at right angles to the rim of my glasses. It is slightly serrated on its edge and has perforations along its middle to prevent condensation on the eyeglass.



This idea may have been used before, but neither my oculist nor other doctors to whom I have shown it have ever seen it. I have now perfect comfort and am free from all irritation. I will be glad to know if such a treatment for relief from entropion has been previously tried.—I am, etc.,

Dublin.

CECIL W. C. ROBINSON.

Pregnancy Following Haematosalpinx

SIR,—In the medical memoranda (*Journal*, October 10, 1953, p. 814) Dr. J. G. Dumoulin reported a case of pregnancy following haematosalpinx, and he commented on his failure to find a similar case reported in the literature.

On November 6, 1944, a girl of 16 was admitted to hospital with a history of lower abdominal pain and dysuria. She had never menstruated. She had a mid-line tumour arising out of the pelvis and was diagnosed as a case of congenital retention of the menses. At operation dense tissue replacing the lower part of the vagina was incised and a haematocolpos was reached at a depth of $1\frac{1}{4}$ in. (3.7 cm.). About 18 ounces (0.5 kg.) of an odourless, more or less tarry fluid was evacuated. The cervix was patulous and admitted a No. 7/8 Clifford and Walls dilator. A bimanual examination showed a uniformly enlarged uterus, and a tubal swelling on the left side. The enlarged uterus was a haematometra which was draining slowly. A new introitus was fashioned by undercutting the lower end of the vaginal skin and suturing it to the edges of the original incision. The abdomen was then opened with the intention of dealing with a suspected haematosalpinx by salpingectomy. There was a little dark free

fluid in the pelvis. The right tube appeared to be normal. On the left side was a haematosalpinx which seemed to be getting smaller when it was exposed and handled. An attempt was made to reduce the size of the haematosalpinx still further by milking it gently towards both ends. Although there was no further reduction in size, the decision to remove the tube was revoked and the abdomen was closed. After a follow-up examination on December 15, 1944, I never saw the patient again. Mr. O. Vaughan Jones, of Bangor, has very kindly traced this patient for me and has written to tell me that she has had normal deliveries of full-term live infants in 1949, 1951, and 1953.

Dr. Dumoulin mentions the fact that most textbooks only briefly describe haematosalpinx from congenital vaginal atresia. Many British textbooks are either silent or equivocal on procedure. W. Shaw¹ recommends salpingectomy. Conservation of the tube is suggested by Eden and Lockyer.² American textbooks are much the same. In successive editions of Curtis (now Curtis and Huffman³) there has appeared a drawing of a specimen of haematocolpos, haematometra, and bilateral haematosalpinx—"removed from a girl of fourteen." Te Linde,⁴ however, states clearly that "one should be restrained from doing salpingectomy. . . ." Well-known Continental authors like Martius⁵ and Guggisberg⁶ advise salpingectomy. In their classical paper "Congenital Retention of the Menses," Christie Brown and Alan Brews⁷ collected and analysed 50 cases in 21 years in the largest teaching hospital in London. Of the 50 cases, only 7 had a haematosalpinx. In the 7 case notes of haematosalpinx, Christie Brown and Alan Brews record that 3 were unilateral and 4 were bilateral (there was another case of a ruptured tube that might have been another unilateral haematosalpinx). This illustrates the rarity of the condition and possibly explains the dearth and conflict of advice on what should be done.

In these days when the possibility of infection should not influence the operator one can at least make a plea for conservation of the tube in cases of haematosalpinx from congenital atresia of the vagina.—I am, etc.,

Carmarthen.

J. R. E. JAMES.

REFERENCES

- ¹ *Textbook of Gynaecology*, 1952, p. 144. London.
- ² *Gynaecology*, 1935, p. 168. London.
- ³ *Textbook of Gynaecology*, 1950, p. 707. London.
- ⁴ *Operative Gynaecology*, 1953. London.
- ⁵ *Die Gynäkologischen Operationen*, 1950, p. 315. Stuttgart.
- ⁶ *Lehrbuch der Gynäkologie*, 1946, p. 62. Basel.
- ⁷ *J. Obstet. Gynaec. Brit. Emp.*, 1930, 37, 233.

Domiciliary Obstetrics

SIR,—In his account of obstetric practice in the Gloucester area, Dr. Ivor Cookson (*Journal*, April 10, p. 841) has rightly pointed out several dangerous types of patient who cannot safely be confined at home. But I think that he has made some unjustifiable assumptions from the data which he has examined, and has painted altogether too idyllic a picture of the ease with which domiciliary midwifery can be practised. Dr. Cookson says: "It does not need postgraduate experience to select for hospital, women who have had many previous deliveries and those with a history of an abnormal third stage. . . . Interest in obstetrics and adequate instruction as a student are the only essential qualifications for the family doctor who wishes to practise obstetrics in an area where consultant support is available." He has, I think, forgotten how much or how little knowledge a student possesses after his final examination. Such a student is uncertain about his findings on abdominal examination, and more so about those on vaginal examination. He will quickly forget much that he has learnt unless he is practising it daily. In theory, he can easily book a patient for hospital confinement if she has a history of post-partum haemorrhage, provided he recalls that this is an indication for delivery in hospital and remembers to ask her if she has such a history: he can send her to have her breech delivery in hospital, provided he has diagnosed breech presentation correctly. Every student should know that a vaginal examination must not be performed on a patient with antepartum haemorrhage

in her own home, yet the number of such patients arriving at hospital who have been examined vaginally is still appallingly high.

To someone like Dr. Cookson, who has postgraduate experience of obstetrics and is continuing to practise it, such counsels of safety are readily appreciated. He knows the danger of neglecting these precautions because he has seen the accidents which follow; but the doctor who has not seen them, but has merely been told that they occur, will appreciate them less readily, and will much sooner forget them. I doubt if such a doctor will, for long, resist his patient's insistent demands to have her twins delivered at home. We all have a strong tendency to hope that everything will be all right. Even in his personal cases, Dr. Cookson states that "it was decided with some reluctance to deliver one breech and two sets of twins at home." The inexperienced doctor might easily decide to do so too, but would not be able to deal with intrapartum haemorrhage from premature separation of the first placenta by rapid extraction of the second twin, as Dr. Cookson did. He says also of his difficult cases: "All these could, of course, have been transferred to hospital." Why, therefore, was this not done if it is so simple and advisable? The statement that pelvic contraction "is rare and likely to become rarer" may be true of some areas of the country. It is certainly not so of others. In the industrial areas of the North of England and in Scotland, pelvic contraction is still common and a most serious danger, especially in multiparae, in whom it is most likely to be overlooked.

His article states of forceps extraction: "Domiciliary forceps delivery is inevitable in a small proportion of cases, but the risks are not great." Now, the simplest rule which the adequately instructed student should know is that forceps should never be applied until the cervix is fully dilated; yet in an industrial area of the north where consultant support is easily obtained the commonest cause of failed forceps is incomplete dilatation of the cervix (Gadd, *Journal*, March 27, p. 735). Surely there can be no other reasonable explanation for this than that the doctor without practical experience has failed to recognize the degree of dilatation of the cervix. The fact that forceps are still being applied under such circumstances and that grandes multiparae and patients with a history of post-partum haemorrhage are still commonly confined at home seems to indicate to me that something more than simple teaching is required to convince most doctors of the dangers of such practices. Dr. Cookson admits that it will take an average doctor ten years to accumulate records of 150 cases. He will require better experience than this to make him convinced of what he is feeling on abdominal and vaginal examination, and to give him the skill to interpret his findings correctly.

Not only is it necessary for the practitioner in the country districts to have experience in obstetrics, but also for his colleague in the less remote areas to have it too in order that he can recognize when consultant help is required. It will not matter how much consultant support is available if such support is not asked for.—I am, etc.,

Sheffield, 3

C. J. DEWHURST.

SIR,—Dr. Ivor Cookson is to be congratulated on his revised version of his Sir Charles Hastings Clinical Prize Essay (*Journal*, April 10, p. 841). It well deserved your careful and important leading article (p. 861). The essay succeeds in demonstrating the excellent results which can be obtained in domiciliary obstetrics by a general-practitioner obstetrician who has some training and obviously exceptional enthusiasm. There will be much agreement with his conclusions on the selection of cases for hospitalization, but there remains a strong case for having all primigravidae under the care of a hospital, if only for the earlier detection of pre-eclampsia and a more energetic management of this complication in its earliest phases. The hospital would be much concerned with weight increase and with the labile blood pressures and take action on these findings. It is true that we now see fewer cases of "contracted pelvis," but we are still meeting disproportion in small women and dystocia arising from perversions of pelvic shape. Further, though few primigravidae in respect of their pelves rate a "trial of labour," all are very much on a trial of the uterus and a trial of the soft tissues. Tables VI and X, dealing with delayed labour and perineal damage respectively, demonstrate this clearly.

It seems likely that the demand for confinement in a hospital will not diminish while the present differential maternal mortality as between hospital series and domiciliary series persists. In this area (Stirlingshire and Clackmannan) between the years 1947 and 1951 inclusive there were 10,570 institutional confinements with 5 maternal deaths and 12,195 domiciliary confinements with 20 maternal deaths. This gives maternal death rates of 0.46 per 1,000 and 1.64 per 1,000 respectively. Professor Baird¹ showed a very similar disparity between the two forms of service for Aberdeenshire and Aberdeen City for 1946-50. At a meeting of the Edinburgh Obstetric Society during this session it was stated by an official that the domiciliary maternal death rate for Scotland at the present time was four times higher than for the institutions.

Baird in the same article declared that maternal mortality in well-equipped hospitals could possibly fall to about 0.25 per 1,000. I believe that the domiciliary maternal death rate can also be reduced, but the general-practitioner obstetrician carries three severe handicaps. First, very few practitioners carry a "giving" set and a suitable fluid with which to combat haemorrhage and shock. A great deal of experience as well as matched blood and an armamentarium are required to deal satisfactorily with the haemorrhagic emergencies which are now the chief cause of death. Secondly, few general practitioners are alert to note the onset of pre-eclampsia early enough and to act vigorously at once. For this, teaching is probably at fault. We should be taught that pre-eclampsia (meaning oedema, hypertension, and albuminuria) is an end-state of which in most cases there has been adequate warning, and that complete pre-eclampsia practically never can be cured and not often ameliorated until the pregnancy is terminated. Thirdly, the presence or intercurrent onset of anaemia in pregnancy is not sufficiently regarded. Especially the onset of anaemia after infections—for example, after pyelitis—too often escapes notice and greatly intensifies the effects of haemorrhage, shock, and toxæmia. The simplest haemoglobinometry would suffice, since great accuracy is unnecessary. I am, etc.,

Stirling.

D. S. GREGG.

REFERENCE

¹ *Brit. Bull. (Edinb.)*, 1952, 10, 51.

SIR,—I was most interested in Dr. I. Cookson's article on domiciliary obstetrics (*Journal*, April 10, p. 841), but would like to inquire on one or two points which seemed not quite clear.

It is stated that most general practitioners will be able to apply forceps, yet admitted that this is not taught in the curriculum; where has this art been learnt? A little later the inexperienced practitioner is advised to call a consultant with little or no hesitation; the busy consultant, however understanding, is surely not likely to encourage this practice. Suturing the perineum, it is stated, should be taught to students. I considered myself fortunate to perform one such operation during my midwifery training. Thus I and my contemporaries can hardly be considered competent to suture perineums on our own.

Would Dr. Cookson agree with me that the best way of overcoming these difficulties could be to serve six months as obstetric house-surgeon prior to starting a career in general practice?—I am, etc.,

Disby, Linco.

P. WINTERSHILL.

Nocturnal Enuresis and Frequency

SIR,—With regard to nocturnal enuresis, apart from the usual effort along the lines of altering the drinking habits, or the use of phenobarbitone, ephedrine, nicotinic acid, or amphetamine sulphate, I have during the past six years made considerable trial with posterior lobe pituitary snuff ("dispidin"). The patients take a pinch of the snuff at night, and thus get the benefit of renal inhibition during the next five to seven hours. On the whole small children have not done so well with the snuff, but in older children or in cases in the second and third decades I have found it very useful.

My best case is a man of 36 who, since using the snuff, has been able to cut down his "accidents" from about every night to one or two a month. He has got married on the strength of this, and has been using it successfully for three to four years, but if he stops using the snuff he relapses.

I have also used the snuff to relieve nocturnal frequency in elderly patients where other measures fail and where their rest is seriously disturbed by having to micturate at frequent intervals. I have found it most effective in these cases, and have several very grateful elderly men who, by using the snuff, cut down the nightly disturbances from five to two times to one or two. I have never seen any written reference to the use of this snuff for such cases before, but so far, from my own experience, I have encountered no unpleasant effects from its use.—I am, etc.,

Clitheroe.

R. E. A. S. HANSEN.

Retention of Urine

SIR,—Mr. J. A. Lloyd Davies (*Journal*, April 3, p. 796) has drawn attention to the increased risk in operating on prostatic cases when they are in a state of bladder distension with overflow or acute added to chronic urinary retention, and has shown the high proportion of cases which come to hospital in the more dangerous conditions.

In the Victoria Infirmary, Glasgow, and Hairmyres Hospital, Lanarkshire, 770 patients have had operations for prostatic obstruction in the last five years: 412 cases (53.6%) have been admitted in acute retention. In many cases it is not possible to say whether there was chronic retention before the acute attack. Ninety-six cases (12.4%) had bladder distension with overflow, and 262 cases (34%) had chronic retention and difficult micturition. In the last group both clinical features were usually present; in some, one or the other predominated. These figures show a close relationship to the corresponding ones given by Mr. Lloyd Davies—53.6, 12.4, 34; 52, 13, and 35%.

Mr. Lloyd Davies points out that many patients fail to seek advice about apparently mild symptoms. He attributes this failure to ignorance of the great advances in the surgical treatment of prostatic obstruction. I believe that another factor is equally important. Many patients, and some of their doctors, believe that a consultation with a surgeon is equivalent to making arrangements to have an operation. They have known men who have had mild bladder symptoms for very many years and never suffered anything more than minor inconvenience. The significance of mild bladder symptoms in an old man can only be assessed by the intelligent interpretation of the history, rectal examination, intravenous urography with post-micturition film, and the bacteriological examination of the urine. We cannot expect to have patients referred for the investigation of mild urinary symptoms until patients and their doctors realize that an operation will be advised only when there is good reason to believe that the symptoms will increase in severity and become a danger to life.—I am, etc.,

Glasgow, C.3.

T. L. CHAPMAN.

Strangulated Hernia

SIR,—In answer to Mr. V. J. Downie's letter (*Journal*, April 10, p. 877), 28 infants in our series were treated by emergency operation and 17 were treated successfully by sedation and gentle taxis.

With regard to the second question: two infants only had an elective operation within a few months of the successful reduction of the incarcerated hernia by conservative means. Recurrent incarceration was found in one infant only, this a few hours after conservative treatment had been successful. In view of the fact that recurrence is unusual, elective herniotomy is not essential, but in practice the repair of an infantile hernia is such a safe operation in good hands that we feel that it should certainly be performed as soon as the patient's condition allows—usually a matter of a few days.—We are, etc.,

Penarth, Glam.

JOHN RENDLE-SHORT.
C. HAVARD.

Single Incision for Bilateral Orchidectomy

SIR,—I was dismayed to learn from his letter (*Journal*, April 17, p. 934) that Sir Heneage Ogilvie advocates a scrotal approach to the testis, and I hope that young surgeons, particularly when dealing with such conditions as spermatocele, hydrocele, etc., will not be tempted to revert to this technique. Of course, one feels that Sir Heneage speaks with his tongue in his cheek, for how else could one account for the remark: "Nature pushed the testicles into the scrotum: why pull them out, trim or enucleate them, and then push them back again?" (the italics are my own).

Twenty-five years ago I learned from bitter experience that the position and the corrugated surface of the scrotum hampered efficient pre-operative cleansing and the maintenance of post-operative asepsis. In a large series of cases I recorded far fewer complications and a shorter period of hospitalization after inguinal than after scrotal incisions. As regards the risk of haematoma, it must be remembered that in the inguinal approach oozing is only likely to occur from the coverings of the testis. When the scrotum is incised, however, there is the added fear—in spite of drainage—that blood may infiltrate quite extensively between its layers. I would never agree that oozing following the scrotal approach was "harmless." Personally, I limit direct exposure to cases in which there is either a fluctuating abscess or a sinus connecting the organ with the skin surface.

Finally, if a good cosmetic result were the only matter of importance, how could one improve upon a neatly sutured inguinal incision situated entirely within the pubic hair field?—I am, etc.,

Swansea.

C. J. CELLAN-JONES.

The False Positive Jelly Test

SIR,—I have now collected 33 children out of a group of 550 who have a positive tuberculosis jelly test. All of them have a negative Mantoux reaction and show no radiological evidence of tuberculosis in the lungs. All of them exhibit clinical signs and symptoms of a catarrhal state of the upper respiratory tract and are prone to develop febrile catarrh. This condition is thought to be due to a hitherto undetected virus.¹ These same children are most frequent victims of acute inflammatory disease in tonsils, adenoids, and middle ear clefts.

In the opinion of the writer, the correlation of a positive tuberculosis jelly test with a stereotyped clinical syndrome and a predictable natural history are not fortuitous. This acceptance of the "false positive" is obstructing a new avenue of investigation. Perhaps others have noted and searched for the significance of these positive jelly tests in the absence of classical tuberculosis and would be able to enlighten the writer?—I am, etc.,

Harold Wood, Essex.

P. D. MULKERN.

REFERENCE

¹ Stuart-Harris, C. H. (1953). *Influenza and Other Virus Infections of the Respiratory Tract*. London.

Cortisone and Carcinogenesis

SIR,—In relation to your leading article on "The Pituitary and Carcinogenesis" (*Journal*, February 6, p. 321), may I report the following case?

Twelve years ago a woman, then aged 45 years, was operated on for carcinoma of the breast and a radical mastectomy was performed. About the same time she began to suffer from recurrent attacks of bronchial asthma and from the onset was under my continuous observation at the allergy clinic of the Hadassa Municipal Hospital, Tel Aviv. She was one of the severest cases in my practice and visited the clinic frequently. Eighteen months ago she began taking cortisone tablets (generously supplied by her relatives in the U.S.A.), and became so used to them that hardly a few days passed without her taking tablets (cortisonism). In all she had about 15 g. of cortisone. In May, 1953, radiological examination showed no evidence of pulmonary pathology. In September, 1953, an ulcer appeared in the operation scar, which on biopsy proved to be metastatic

carcinoma. Radiological examination at that time showed pleural effusion with disseminated infiltration of both lung bases. The patient died in March, 1954, but unfortunately a necropsy could not be performed.

I wish to report this case for the sake of record only, and do not draw any conclusions. Have similar cases been observed?—I am, etc.,

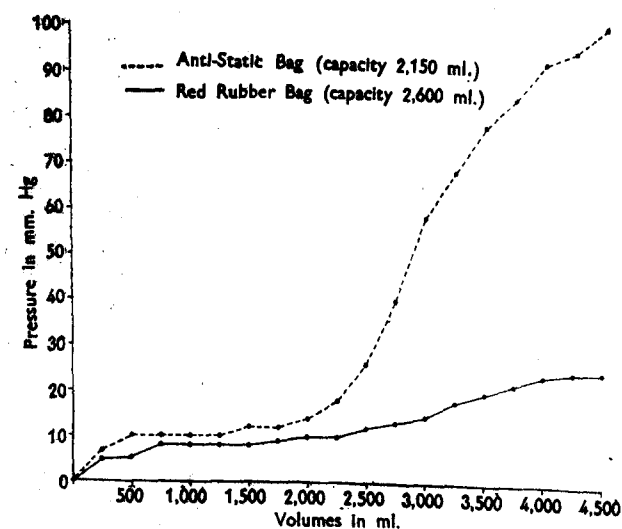
Tel Aviv, Israel.

N. LASS.

Distension Pressure in Rebreathing Bags

SIR,—The physical characteristics of the anti-static rebreathing bags which are in current use on anaesthetic machines are of some concern to anaesthetists. That there is some danger in their resistance to distension we have for some time been aware, but to what extent this would influence the pressure in the system in the event of an expiratory valve sticking or being accidentally left screwed down has not been the subject of precise examination.

Similar tests were made with a red rubber rebreathing bag and an anti-static bag as follows. A rubber bung bear-



ing two glass tubes was wired into the neck of the bag. The tubes were brought out through another rubber bung in the neck of a large aspirating bottle. The aspirating bottle was inverted and filled with water and a bicycle pump and valve attached to one tube and a mercury manometer to the other. When the bag was inflated it floated upwards and had room to expand freely, displacing its volume of water through the tap (now uppermost) at the bottom of the aspirating bottle. The graph shows the results. The pressures recorded before the bags were full are mainly hydrostatic.

Dangerous pressures may therefore easily and rapidly develop in the system when anti-static bags are in use.—I am, etc.,

Edinburgh, 3.

J. G. ROBSON.

Change of Sex

SIR,—Everyone will agree with your correspondent, Dr. A. P. Cawadias (*Journal*, April 10, p. 876), regarding intersexuals and hermaphrodites, on which he is an acknowledged expert, but for him to class transvestists as a form of intersexuals surely shows a grave confusion of thought. No one so far has managed to discover an endocrine basis for homosexuality,¹ and how much less is such a basis to be found in the considerably less abnormal transvestist. He does not tell us to what writers he is referring when he says that "we find definite endocrine, genital, and other physical stigmata pointing to a definite intersexuality." Over the past twenty years I have seen as many transvestists as anybody in England, and a large number of these were seen in conjunction with Mr. L. R. Broster, but we have never noticed these "physical stigmata."

Transvestism is a psychical disease related, to some extent, to homosexuality—some homosexuals are transvestists, but not all transvestists are homosexual.² If this is the case—and to anyone who has had a chance of studying the psychosexual constitution of these people it obviously is so—then the abnormal minds should be treated in order to conform them with the normal body and not *vice versa*. For it must be accepted that it is impossible to change a person's sex. It is true that we can castrate a man, inject oestrogens and so on to enlarge the breasts, but this is not a transformation, it is a mutilation. Why is this mutilation contemplated? So that the patient can pose as a woman—which he is not—and wear female clothes.

There is nothing in the law of England which states that a man must not wear feminine clothes, but the police arrest anyone so doing for "insulting behaviour likely to lead to a breach of the peace." The right course, therefore, is to modify the conduct of the police so that they adopt a more tolerant attitude. This, surely, is more desirable than that men should be maimed and mutilated into travesties of the opposite sex, and to my mind it is derogatory that medical men should be asked to cut off or put on sexuality like a jobbing plumber lays on gas or water.—I am, etc.,

London, W.1.

CLIFFORD ALLEN.

REFERENCES

1. Swyer, G. I. M. (1954). *Practitioner*, 172, 374.
2. Allen, Clifford (1949). *The Sexual Perversions and Abnormalities*, p. 145. Oxford University Press, London.

* This correspondence is now closed.—ED., B.M.J.

"Edwardian" Adolescents

SIR,—The stimulating leading article on adolescence (*Journal*, March 27, p. 748) omits, I think, one factor of great importance. This is the driving need felt by a large proportion of adolescents, particularly male adolescents, for emotional adherence to a group with a ritual. It is this drive which has so often proved both the danger and the strength of insurgent political bodies. In Garibaldi's days it led British youth to Italy, and later it formed the core of the blackshirt movement in Great Britain. Surely it is an inadequate description of a dominant quality of adolescents to concentrate wholly upon training and give no place to the consideration of the need for emotional expression.

In primitive communities the need of adolescents for training, for ritual, and for identification with their future life as adults is recognized as an integral part of the life of the community, and in the national outlook of a civilized society this need is forgotten. A need, however, denied legitimate expression and honourable integration with society finds its own ways to satisfaction, and we are now seeing a very curious form of this satisfaction in the odd appearance of small groups of youth in the self-invented uniforms of a travesty of male Edwardian masculine attire. These groups, armed sometimes with razors, show the force of adolescent need for ritual by the invention of a queer, creeping, circular "dance" which seems to be part of their characteristic. In a big city it seems natural that all variants of behaviour should appear, but the fact that these "Edwardian" creepers are now appearing in small country towns some distance from the city should surely convince us that it is time to take this phenomenon soberly and to direct some attention to it.

Are these youths wage earners, and can they pay the cost of their equipment? An odd phenomenon is therefore before us: do the parents of the boys meet the expense of their "Edwardian" clothes, and, if so, what sort of parents are these? Can the general practitioner help us here? Have any of the readers of this *Journal* families under their care whose sons have been drawn into or who lead these groups? Could they tell us something of these families? Will not the sociologists help us in study of this emotional chicken-pox of the community? Cannot we do better for our lads than this?—I am, etc.,

London, W.11.

Depression Treated by E.C.T.

SIR,—I read with interest the letter of Dr. S. Karagulla (*Journal*, March 13, p. 646) and well remember the flutter in the doves of the protagonists of E.C.T. produced by her article in the *Journal of Mental Science* four years ago. In the evaluation of treatment of depressive states by E.C.T. it is necessary, as she says, to have an adequate control group, and her series from 1930 to the time of introduction of E.C.T. provides that control group.

In 1941 I described the recovery, etc., rate in a series of 212 consecutive cases at the Latchmore Hospital, Ham Common, for mentally affected officers in the 1914-18 war, all of whom I saw from beginning to end of their hospital career, excepting a few remaining after October, 1919.² The rates were: recovered 60.4%, relieved 17.5%, not improved 19.8%, died 2.3%. These 212 were of course of different types, including schizophrenics and paralytics, who lowered the recovery rate. The material was usually good, most cases were young, many were exhaustion cases, and a good recovery rate was to be expected. Although occurring so long ago, they may be considered, like Dr. Karagulla's earlier cases, as a control group. In the annual report of the Board of Control for 1952 the number of direct admissions is given as 66,773, of whom 16,552 were discharged as recovered, about 25%; and 29,052 were, however, discharged as relieved, about 45%; combined rate of discharge 70%. In 1921, the recovery rate was 32.5%, and had been much the same for many years previously. In 1946 the relieved rate practically equalled that of the recovered, combined 62%, as compared with 48% just before the Mental Treatment Act of 1930.

I must say I was surprised at the low recovery rate of 1952, and can only presume there must have been a greater proportion of senile admissions. The high relieved rate, I believe, is due to the large number of voluntary admissions. I think it is generally conceded that many more comparatively mild cases are now sent to mental hospitals, although these milder cases do not necessarily have a better prognosis as regards recovery.

My impression is that the value of E.C.T. has been overrated, with the possible exceptions of involution cases, and I agree with Dr. Karagulla that a critical review of physical methods of treatment is necessary. Indeed, Mr. Harvey Jackson, in an article on leucotomy, suggests that electro-convulsive therapy has been responsible for much atrophic change, possibly arising out of repeated diffuse petechial haemorrhages.³—I am, etc.,

Hastings.

HARVEY BAIRD.

REFERENCES

1. *J. ment. Sci.*, 1950, 96, 1060.
2. *Ibid.*, 1941, 87, 109.
3. *Ibid.*, 1954, 100, 62.

Dangers of Induced Hypotension

SIR,—It is a relief to read Dr. Harry F. Griffiths's letter (*Journal*, March 20, p. 706) giving support of the technique of induced hypotension. During the past three years I have personally employed this method using hexamethonium bromide in 250 patients, for the operations of radical mastectomy, block dissection of glands of neck, major plastic repairs, prostatectomy, vaginal hysterectomy, and colporrhaphy. No serious complications have arisen, and I have met with no catastrophes, nor delayed ill effects which might be attributed to the anaesthesia. I have been much impressed by the excellent operating conditions, by the reduction in operating time, and by the satisfactory post-operative condition of the patients.

Is it not possible that the deaths reported with induced hypotension might have been largely due to unsatisfactory anaesthetic technique associated with the induced hypotension, rather than the hypotension itself? The following case illustrates how readily induced hypotension might have been incorrectly blamed for a post-operative hemiplegia.

In December last the patient, a woman aged 63, with a B.P. of 220/120, had a wide excision of malignant melanoma of cheek, and a graft. The anaesthetic was given by a registrar and induced hypotension was not used. On the third day this patient developed a sudden hemiplegia. She came to the theatre again last week, having partially recovered from the hemiplegia, for a block dissection of malignant glands of neck. The B.P. was 215/120 and I hesitated as to the advisability of using induced hypotension, but decided in favour, and employed my usual technique. The total dose of hexamethonium bromide used was 20 mg. Conditions were satisfactory, the systolic pressure remaining between 80 and 60 throughout the operation lasting 1½ hours. The patient was returned to the ward with a systolic B.P. of 60, and the foot of the bed slightly raised. One hour later the B.P. was 95 and it gradually returned to the previous level over three days. It is now ten days since operation and there has been an uneventful recovery.—I am, etc.,

Manchester, 3.

FLORENCE FAULKNER.

Medical Needs in the Gold Coast

SIR,—The Council of the Gold Coast Branch of the British Medical Association has read with interest the recent correspondence on the medical needs in the Gold Coast. It is suggested that members of the Association wishing to come to the Gold Coast should communicate with the secretary of the local Branch, as conditions in the Gold Coast are changing daily. I would do my best to supply any information about local conditions that may be required.—I am, etc.,

P.O. Box 297, Accra.

M. J. COLBOURNE,
Secretary, Gold Coast Branch.

Clergy and Doctors

SIR,—No one who has been in general practice can fail to realize that there are many problems that affect both doctors and clergy. Have we not all had patients whose complaints start from worry over some moral problem—perhaps one which they would rather disclose to us than to a clergyman? And do not the clergy constantly hear details of illness? There is surely overwhelming need for co-operation between us.

I would, however, suggest to the Rev. Tony Clemens (*Journal*, April 24, p. 983) that whilst co-operation must take place in the hurly-burly of parish and practice, it should not begin there. There are many difficulties to be faced—not merely those of preserving confidence—and I would suggest that the best way to begin would be by quiet thought and discussion in a small group of clergy and doctors, where difficulties could be foreseen and personal idiosyncrasies ironed out.—I am, etc.,

East Hothly.

F. GRAY.

London Medical Orchestra

SIR,—Congratulations to those who are responsible for the formation of the new London Medical Orchestra. Their inaugural concert on Saturday, April 3, showed a wonderful degree of precision, confidence, and musicianship under an evidently first-rate conductor. Not even a hint of the untidiness so noticeable in the writing of prescriptions. Without derogating the strings, I was particularly impressed with the quality of the wind playing, as it is on the whole harder to come by amateur wind players than strings. It is invigorating to meet with busy practitioners able and willing to devote leisure to so admirable a pastime—a real recreation for themselves and for us, their appreciative colleagues. I hope they enjoyed it as much as I did. I am glad to hear that they mean to aid medical charities. These will get more of my money than before. Good luck to these blenders of cures and keys.—I am, etc.,

London, W.12.

R. PATRICK ROSS.

Obituary

COLIN D. LINDSAY, M.D.

We record with regret the death on April 19 at his home at Plymouth at the age of 82 of Dr. Colin D. Lindsay, a Past President of the British Medical Association.

Colin Dunrod Lindsey (he changed his name to Lindsay in 1926) was born on May 22, 1872, his father being Assistant Commissary General to the Indian Army. From Plymouth College he went on to study medicine at St. Mary's Hospital, qualifying M.R.C.S., L.R.C.P. in 1894. He took the London M.B. in 1898, and proceeded to the M.D. six years later. After



qualification he held the appointment of junior demonstrator in anatomy at St. Mary's Hospital Medical School, and later became house-surgeon at Horton Infirmary (now Horton General Hospital) at Banbury in Oxfordshire. He then returned to Plymouth and settled in general practice. Always keenly interested in diseases of the lungs, he was appointed assistant physician to the then South Devon and East Cornwall Hospital in 1913, becoming senior physician

in 1926, and succeeding the late Dr. A. B. Saltau as principal senior physician in 1930. When he retired in 1937 the title of emeritus physician was conferred upon him. He was also for many years consulting physician to the Royal Eye Infirmary, Plymouth, and to Tavistock Hospital. Dr. Lindsay always strongly supported the proposal that the three voluntary hospitals in Plymouth—the South Devon and East Cornwall, the Royal Albert Hospital in Devonport, and the Central Hospital—should be amalgamated, but it was not until 1934 that the complicated negotiations were completed and the Royal assent given to the amalgamation.

During his long life Dr. Lindsay took a leading part in medical affairs in Plymouth, and was chairman of the Plymouth Division of the B.M.A. from 1929 to 1931 and president of the South-western Branch in 1933-4. He was also a past president of the Plymouth Medical Society. When the Annual Meeting of the British Medical Association was held at Plymouth in 1938 the nomination by the local executive committee of Dr. Lindsay as a suitable candidate for the Presidency of the Association was received with unanimous approval. His address was on the always topical subject of the relationship between the profession and the public, and his remarks are as apposite now as they were sixteen years ago, for they crystallized the opinions of a man of great practical wisdom and common sense who had been in practice for forty years both as a general family doctor and as a consultant physician. Under his guidance and by his example the Plymouth Meeting was a particularly happy and successful one.

Dr. Lindsay married the youngest daughter of Colonel Henry C. Creak, of the Bengal Cavalry: she survives him, together with one son, Mr. Donald Lindsay, who became headmaster of Malvern College last year, and one daughter.

Dr. STEPHEN M. DAVIDSON writes: Rarely can it be said that a man had no enemies, but with Colin Lindsay one can go further and say that everyone who came in contact with him admired and respected him. To his patients he was not only their trusted physician, he was their friend. To his colleagues his advice was sound and marked by considered restraint, and also by his ability to respect the viewpoint of the younger generation. Colin Lindsay was a man with great moral courage, high principles, and a strict ethical code, and these virtues were warmed and made lovable by his grand sense of humour, which endeared him to young and old alike. He was one of the last consultants who engaged in general practice—a factor which enhanced his value to the general practitioner and the patient, and enabled both to benefit from his humanity and far-sightedness. His forte lay in diseases of the chest, and for many years he was the leading figure in the work and organization of the old tuberculosis dispensary in Plymouth and was the first in the district to collapse a lung. Those who were fortunate enough to work with him have lost a colleague whose like will never be seen again; whose honesty was forthright; whose courtesy was old-fashioned and charming; and whose wisdom was profound and liberally leavened with humour.

H. T. EVANS, D.M., M.R.C.P.

Many former students of the Welsh National School of Medicine will have learnt with deep regret of the death of Dr. H. T. Evans, consulting physician to the Cardiff Royal Infirmary, on April 7 at the age of 80.

Herbert Thomas Evans was born on December 4, 1873, near Corwen, Merionethshire, the youngest of the three sons of the Reverend David Evans, who later became vicar of Dolanog, Montgomeryshire. He received his early education at Bancroft's School, London, and at Christ College, Brecon, and then entered Jesus College, Oxford, with an exhibition in mathematics. His first profession was that of schoolmaster, and he held posts at Christ College, Finchley, and then at Talmont, in Scotland. He then decided to become a doctor and studied medicine at St. George's Hospital Medical School, obtaining the B.M., B.Ch. degrees of Oxford as well as the M.B., B.S. degrees of London University in 1912. His first medical appointment was that of house-surgeon at the Radcliffe Infirmary, Oxford, and shortly afterwards, in 1914, he was appointed assistant physician to the King Edward VII Memorial Hospital, now known as the Cardiff Royal Infirmary. In the same year he obtained the M.R.C.P., and in 1915 proceeded to the D.M. In the first world war he served in the R.A.M.C.; first in France and later at Milton Hill Hospital. His services were recognized by the award of the King Albert Medal by the King of the Belgians.

Dr. Evans, despite his small stature, was a keen athlete: he created a record for hurdling at his school which remained unbroken for several years. From an early age he derived great pleasure from exercising his skill as a fisherman, and he also spent much time walking and cycling, pastimes which gave him ample opportunity to indulge in his fondness for nature studies. He often visited the Continent, and for many years went to Switzerland regularly for winter sports.

During his early years as an assistant physician to the Cardiff Royal Infirmary Dr. Evans also held an appointment as demonstrator in the department of anatomy, where his patience, tact, and kindness to students in their early years, and his sympathetic approach to their problems, endeared him to all. As a physician he devoted himself with skill and understanding to the care and interest of his patients, and he rarely missed an attendance at hospital in the days when such services were rendered voluntarily. Although of a shy and retiring disposition, he was always ready to help those who sought guidance or advice. His professional ability, integrity of character, and honesty of purpose gained for him the admiration and respect of his colleagues, students, and nurses. When the British Medical Association held its Annual Meeting at Cardiff in 1928 he served as a vice-president of the Section of Diseases of Children. He retired from the Cardiff Royal Infirmary in 1939, but he remained in private practice and was able to continue to walk long distances and to cycle until the onset of his fatal illness some six months before his death. Dr. Evans was married, and the sympathy of his colleagues is extended to his widow in her great loss.—L. H. H.

THOMAS CARNWATH, D.S.O., D.Sc., M.B., D.P.H.

Mr. S. T. IRWIN writes: I first met Tom Carnwath, whose obituary was printed in the *Journal* of April 17 (p. 937), when he entered the old Queen's College, Belfast, in October, 1896. He was then a conspicuously handsome young man, tall and straight, with jet-black wavy hair, a small moustache, and expressive features. From the first he took a prominent part in all student activities, especially the Students' Union, which was opened in January, 1897. He was a keen but not very successful athlete. His outstanding ability allowed him to spread his interests while still leaving him supreme in the examination-room. His personal charm made him popular in all student gatherings, then almost entirely male, but made him perhaps even more admired at evening mixed parties.

He was not an entrance scholar, but the following year, when he transferred from arts to medicine, he was awarded a first-year scholarship in literary subjects. By then he had established himself as one of the first men of his year, and scholarships followed year by year. He interrupted his medical course to read science, with chemistry as his main subject, in which he graduated with first-class honours. Automatically he therefore became senior scholar in chemistry in the session 1900-1, and the following year was elected to the Dunville studentship, the most valuable prize then in the gift of the College. Returning to medicine, he served as resident pupil in the old Royal Hospital in Frederick Street, and graduated with first-class honours in the Royal University in 1903.

After qualification he did not, I think, seek a hospital resident post, but became demonstrator of anatomy under Symington. At the same time he joined a brilliant coterie of young men who surrounded J. Lorrain Smith in the pathological laboratory. These were Tom (afterwards Sir Thomas) Houston, R. J. (afterwards Sir Robert) Johnstone, and John C. Rankin (still happily with us). This was at a time when bacteriology was in its infancy but was beginning to attract many of the ablest of the younger men. They worked far into the night, and I believe it was a great

occasion when John Rankin first demonstrated the *Spirochaeta pallida*. It was here that Carnwath made up his mind to devote himself to public health, and, by the influence of Lorrain Smith, obtained the 185th Exhibition, which took him to Hamburg and Berlin, where he worked in the years 1905-6.

After retirement in 1940 he came back to live in Northern Ireland and devoted his attention to his old school, which by this time had become Queen's University of Belfast. He received the coveted honorary degree of D.Sc., and represented Convocation on the Senate and on many of its committees, especially the Board of Curators, where he showed his wide knowledge and sound judgment in the making of appointments to the teaching staff. At first these were purely university posts, but later they extended to the joint appointments scheme of the university and the hospitals authority, a method of dealing with clinical teachers still peculiar to Northern Ireland.

Dr. W. V. TOTHILL died at his home at Capetown on March 25 at the age of 67. Though he had more than his fair share of illness and operations during the past two and a half years, he never complained and his courage was an example to all who knew him. Walter Vincent Tothill was born on April 15, 1886, and qualified L.M.S.S.A. from the London Hospital in 1913. After qualification he just had time to take a post as ship surgeon to Australia and act as a locum in a few practices before war broke out in 1914, and for the next four years he served with the R.A.M.C., first in West and then in East Africa. After the war he became the first British medical officer in Tanganyika, a position he was reluctantly forced to relinquish after an attack of blackwater fever. When he had completed the tropical diseases course in London and recovered his health, he returned to the Tropics, against medical advice, and spent fifteen happy and useful years in Trinidad, doing postgraduate work in Austria and Russia when on long leave. Again ill-health made a change of climate advisable, and to the sorrow of his patients—black and white, poor and rich—he left the West Indies and bought a practice in Western Australia. Before he could begin his new work he was involved in a car accident which resulted in a maimed left hand, among other injuries, and meant that it was useless to keep a practice where surgery brought in half the income. Eighteen months later he accepted the position of medical officer to the British Phosphates Commissioners on Nauru Island, in the Central Pacific, where he thoroughly enjoyed the work. But the entry of Japan into the last war enforced the evacuation of most of the Europeans and the Chinese labourers to Australia. On arrival in Australia he was asked to accompany the Chinese to Central Australia, and he worked there for two years under the greatest difficulties and in the utmost discomfort. When able to leave he went to New Zealand, where he put in eight years of useful medical and social work, until ill-health obliged him finally to retire from practice. His book, *Doctor's Office*, was written while convalescent after the car accident, and another, in an equally amusing vein, was written during his last illness and is being prepared for publication. He is survived by his widow, who, as Bridget Ristori, was formerly matron of the Colonial Hospital, San Fernando, Trinidad.

The death occurred at Aberdare on March 23 of Dr. M. LL. JONES in his 86th year. Martin Llewelyn Jones was born on August 28, 1868, the eldest son of the late D. W. Jones, J.P., of Aberdare, and was educated first at a private school and later at Perry's School, Cardiff. Receiving his medical training at St. Bartholomew's Hospital, he qualified M.R.C.S., L.R.C.P. in 1890 at the early age of 21. Three years later, after passing the Fellowship examination of the Royal

College of Surgeons of England, he found himself in the somewhat unusual position of having to wait until the prescribed age of 25 before being admitted a Fellow. Not many months before his death he received congratulations from the President and Council of the College on having completed 60 years as a Fellow. After qualification he held several resident appointments at St. Bartholomew's Hospital. He was always particularly proud of having been house-surgeon to Sir Tom Smith, who was Surgeon to Queen Victoria. Llewelyn Jones's qualities and qualifications might well have taken him to a high place in the wider world, but his home town and its surrounding hills and its people had a strong pull for him, and, returning to Aberdare to practise in 1894, he led a full and active life until his enforced retirement due to blindness in 1944. Taking the first steps in co-operation with the Powell Duffryn Company and the miners, he was one of the founder surgeons of the Aberdare General Hospital, a project which in the early years of the hospital and throughout his active life was very near to his heart. His experience was great, and, though recognizing keenly his responsibilities, he was a fearless and skilful operator: there are still many older patients who remember with gratitude his skill and kindness. He was medical officer to the Post Office for many years and a medical referee under the Workmen's Compensation Acts. He had a wide and expert knowledge of literature, for he was an avid reader with a remarkably retentive memory. Owing to a busy practice his recreations were of necessity curtailed, but he loved to fish and was an expert shot. He was confined to his house for the last four years of his life, but older townspeople still remember vividly his tall, straight figure, fine bearing, and grave but courteous manner, for he was a man of most distinguished appearance, the personification of what a doctor should look like in the eyes of the layman. He married Ethel, second daughter of Mr. and Mrs. Brunel White, of Carmarthen, in 1906, and she survives him together with two sons, the elder an ophthalmic surgeon at Salisbury, the other a solicitor and town clerk of Durham.

Dr. H. P. JAMESON died very suddenly from coronary thrombosis at his home at St. Albans on March 31. He was 50 years of age. Harold Parnell Jameson was born at Edgbaston, Birmingham, on February 29, 1904, and was educated privately and at Birmingham University, where he had an outstanding career as a medical student. He graduated M.B., Ch.B., with first-class honours, in 1925 at the age of 21, and proceeded to the M.D. three years later. In 1930 he took the M.R.C.P. After graduation he held appointments at the General Hospital and at the Children's Hospital, Birmingham, and later at the London Hospital. He then held a resident post at The Hospital for Sick Children, Great Ormond Street, for about two years. In 1929 he settled in practice at St. Albans, attracted there chiefly because there were children's beds at St. Albans City Hospital (then known as Osterhills), of which he had full clinical charge for ten years. As a medical officer in the Territorial Army attached to the Honourable Artillery Company, Dr. Jameson was mobilized a few days before the outbreak of war in 1939. He had a distinguished Army career as a medical specialist and served in India, Iran, and Ceylon. He attained the rank of lieutenant-colonel and was officer in charge of a medical division of Indian and British hospitals and consultant to a wide area. After the war he returned to his practice at St. Albans for a period before taking up the appointment of consultant on the medical staff of the St. Albans City and Hitchin group of hospitals. Although his early interest in the welfare of children never waned, his new work brought him more into contact with elderly people, and the state in which he found many of them greatly depressed him and he devoted much time to their care. He was a foundation member of the Medical Society for the Care of the Elderly, of which he was secretary for the past year. He also took an active interest in the voluntary nursing service of the British Red Cross Society as lecturer and examiner, and was medical

officer to a Hertfordshire detachment. For five years he was deputy coroner for the St. Albans and Barnet areas. He was chairman of the Mid Herts Division of the British Medical Association from 1948 to 1952. His contributions to the medical literature included articles published in the *Archives of Disease in Childhood* and other journals. An enthusiastic sportsman, Dr. Jameson was a keen and expert horseman, and he supported the Aldenham Harriers and the Hertfordshire Hunts for over 20 years. He was medical officer to point-to-point races at Friars Wash, having himself raced before the war. Rock-climbing and mountaineering, too, held a fascination for him, and only a few days before his death he had been rock-climbing with one of his sons. He was also a keen tennis player. In 1932 he married Joan Isabel Colthurst, and she survives him, together with the daughter and two sons of the marriage.

A. P. R. writes: Dr. Jameson's sudden and untimely death was a considerable shock and distress to his many friends in Hertfordshire, a county which he both loved and served well. Equally it has been a very considerable distress to his colleagues. He was essentially a quiet man, loving deeply his family and his gentle and peaceable pursuits. It is indeed a grief to his friends that a man who so tenderly cared for the plight of the old and sick should so early be taken from us. The problem of the old is one of the major issues we have to face in general practice to-day. Many of us are aware of it now: Jameson saw it earlier. In particular, I would remember, in common with many, his true kindness to younger colleagues, and the good will and unfailing hospitality he and Mrs. Jameson showed them. Even in this material age I am quite confident that there are many people, young and not so young, who will remember him with real affection.

By the death of Dr. H. G. CARLISLE on April 7, at the age of 76, Merseyside has lost a much-respected medical practitioner. Only two weeks before his death he was elected a life member of the Liverpool Medical Institution. Henry George Carlisle was born at Liverpool on November 12, 1877, but spent his early life in Edinburgh, where in due course he entered the university as a medical student. He graduated M.B., Ch.B. in 1899 and proceeded to the M.D., with honours, five years later. After graduation he held the appointment of assistant demonstrator in anatomy and physiology in Edinburgh University and later became house-surgeon at Chester General Infirmary. When he returned to Liverpool at the turn of the century it was with the intention of specializing in orthopaedic surgery, but the death of his father left him with the responsibility of supporting his brothers and sisters, so he entered an old-established general practice at Heswall. He still maintained a strong interest in orthopaedic work, however, and assisted the late Sir Robert Jones at his Liverpool clinic and in founding the Heswall branch of the Royal Liverpool Children's Hospital. During the first world war Dr. Carlisle served as a captain in the R.A.M.C. In 1916 he and the late Professor H. D. Dakin, F.R.S., who died two years ago, presented a report to the Medical Research Committee (now the Medical Research Council) on the use of sodium hypochlorite prepared by the electrolysis of sea-water for disinfectant and antiseptic purposes on shipboard, especially in hospital ships. During the last war Dr. Carlisle carried on the general practice alone while his five partners were away in the Services. A member of the British Medical Association for over forty years, he was chairman of the Birkenhead and Wirral Division in 1943-4. He is survived by a widow, one son, who is also a doctor, and three daughters.

K. W. M. writes: Dr. H. G. Carlisle, who died on April 7 after a few hours' acute illness, was in practice in the Wirral for some fifty years in association with partners in Neston and Parkgate. So eminently was he a doctor at heart throughout all these years that it is impossible to imagine him in any other profession. To say that he easily won the

confidence of his patients is to say only half the truth; he was their friend, and there can have been few of them who did not give him their affection in return. Outside his general practice he was on the staff of the Heswall Hospital for Children from the time it was founded by Sir Robert Jones, whose close friend he became. For about forty years he was the local medical officer of this hospital, visiting regularly and on call day and night; it is not therefore surprising that his knowledge of the orthopaedic treatment of children in all its detail was notable. After the first world war he had charge of many crippled pensioners, and from this experience he contributed an article on war fractures to the *Manual of Orthopaedics* edited by Sir Robert Jones. He was an expert fisherman and some of the salmon he landed were the season's records, but the chief recreation which helped him to live a life which always had the air of enthusiasm was his garden. His wife and he designed and made a famous rock garden, and there persuaded many rare plants to grow which were the envy and despair of other gardeners. In his work, and above all in his home, he spent a life that seemed to his friends always as happy as it was full.

The sudden death of Dr. CHARLES BEWICK on April 10 at the age of 48 came as a great shock to his many friends, colleagues, and patients. He had been in general practice in Durham since the end of the war, and had only recently built himself a house and moved to an expanding suburb at Framwellgate Moor. Born on December 21, 1905, William Charles Dickerr Bewick was educated at the University of Durham. Originally a science graduate—he took the B.Sc. with honours in physiology—he spent two years in America and then returned home to take his medical degrees at Newcastle-upon-Tyne in 1931. Before the war he was in practice for eight years at Welshpool, in Montgomeryshire. Like that of many others, his career was seriously interrupted by war service. He joined the R.A.F. in 1941 and spent three years in the Middle East. Of a shy, retiring nature, he did not seek the limelight, but he lived up to the best traditions of a family doctor. His one absorbing interest was medicine, and it always puzzled his friends how he found time in the midst of a very busy life for all the reading that he did. His early training in physiology and biology equipped him to grasp the complexities of modern scientific medicine.

J. R. McD. writes: The death of Dr. Charles Bewick has brought to a close in the prime of life a career that was an ornament to our profession. A student all his days, he was most conscientious and patient in his work, keeping careful records and following up those avenues where his interests lay. His chief recreations were mountaineering and painting. He had some of his works accepted at local exhibitions. As a man he exuded vigour and energy. Often he would spend a day climbing hills in the Lake District; the journey of over a hundred miles there and back seemed nothing to him. One cannot write of Charles without mentioning Helen, his wife and perfect helpmeet: for her and their children, one son and two daughters, the deepest sympathy is felt in their tragic loss.

Dr. H. E. THORN writes: The death of Dr. H. LINCOLN HATCH, whose obituary was printed in the *Journal* of February 13 (p. 400), is a great loss to general practice. I first met him when I came to Harrow thirty-five years ago. He was well established in Pinner and showed good fellowship to a newcomer. I found at once that he was one of the most active members of the local Division of the British Medical Association and well liked by all his colleagues. He maintained the old-established family adviser attitude as a practitioner and was duly appreciated by all his patients. He also did a good deal of refraction work. His views on current problems discussed at B.M.A. meetings were always well expressed and, although extremely moderate, tenaciously held. He was a man who lived for his patients, and his memory should be an example to the younger generation in medicine.

Medico-Legal

FOSTER CHILDREN

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

It was recently contended in an action before Mr. Justice Lloyd-Jacob in the Chancery Division that children at a boarding school for backward children were "foster children" within the meaning of s. 206 of the Public Health Act, 1936.¹ That section provides that a person who undertakes for reward the nursing and maintenance of a child under the age of 9 apart from his parents or having no parents should give notice of the fact to the welfare authority, and such children are called foster children.

The judge held that children away at boarding school were not properly to be regarded as "apart from their parents." The words involved an intention by the parents to part with the child, together with an intention to deny the child parental guidance and control or inability to provide it.

Most fee-paying pupils at boarding school had homes and parents, and went home for the holidays and could be visited at the school or removed from it by their parents. No distinction could be drawn between pupils whose fees were paid by their parents and pupils whose fees were paid by the local authority: in paying the fees the local authority did so as *alter ego* of the parents, and parental guidance and control could be regarded as susceptible of delegation to the local authority. None of these children could therefore be properly regarded as being "apart from their parents," and they were therefore not foster children within the meaning of the Act of 1936.

DEATH AFTER ANTICOAGULANT THERAPY

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

In May, 1953, Dr. J. L. Macaulay, a ship surgeon aged 66, had a cerebral thrombosis while on a voyage to the United States; it resulted in complete hemiplegia and affected his speech. He was flown home and ultimately went to live with his son in Kensington. He received no special treatment until he was seen in December, 1953, by Dr. T. C. Porter, who decided on anticoagulant treatment as a prophylactic measure.

Dr. Porter advised Dr. Macaulay to go to hospital, but he refused to do so. "Marcoumar," which Dr. Porter had found successful in a previous case, was the drug used, there being no contraindications. Treatment was started on December 18 with a dose of one tablet per day by mouth, and was not controlled by regular prothrombin estimations, which could be done only in hospital. It was carried on until January 22, 1954, when Dr. Porter was told that on the previous day Dr. Macaulay had had bleeding per rectum, and he treated him. The next day, after acute haemorrhage and vomiting, Dr. Macaulay was admitted to St. Stephen's Hospital, Chelsea. On admission he was unconscious, pulseless, exsanguinated, and suffering from shock. He died a quarter of an hour later after a massive haematemesis.

At the inquest before Dr. H. Neville Stafford at the Hammersmith Coroner's Court Dr. Margaret Briggs, medical adviser to Roche Products Ltd., gave evidence that marcoumar, although well known on the Continent, had been used in the United Kingdom only since November, 1953, and not very widely. It was especially useful in controlling thrombosis, and there was no agreement among doctors whether regular prothrombin estimations were necessary in controlling dosage.

The verdict was recorded that death was due to haemorrhage into the small intestine following anticoagulant therapy.

¹The Times, April 14.

Vital Statistics

Births and Deaths in First Quarter

Provisional figures for England and Wales show that this year for the first time since 1947 the number of births registered in the March quarter is greater than the number registered in the corresponding quarter of the previous year. Live births registered numbered 173,784, representing a rate of 16.0 per 1,000 population. Comparable figures for the first quarters of 1953 and 1952 were 171,705 (rate 15.8) and 173,338 (rate 15.9).

There were 153,116 deaths registered, representing a rate of 14.1 per 1,000 population, compared with a rate of 15.8 in the first quarter of 1953 (when influenza was widely prevalent) and 13.5 in the first quarter of 1952. Deaths of children under 1 year of age numbered 5,239, giving a record low rate for a March quarter of 31.0 per 1,000 related live births, compared with a rate of 33.8 in the corresponding quarter of 1953. In the first quarter of 1938 the corresponding figure rate was 69.3. There were 4,220 stillbirths, giving a rate of 23.7 per 1,000 total live and stillbirths, compared with a rate of 22.5 in the corresponding quarter of 1953. The rate for the first quarter of 1938 was 38.3.—*Registrar-General's Weekly Return No. 15.*

Week Ending April 17

The notifications of infectious diseases in England and Wales during the week included pneumonia 451, scarlet fever 994, whooping-cough 1,980, diphtheria 14, measles 1,912, dysentery 919, acute poliomyelitis 17, paratyphoid fever 5, and typhoid fever 1.

Infectious Diseases

The incidence of infectious diseases in England and Wales during the week ending April 10 declined. The largest falls in the number of notifications were 100 for scarlet fever, from 1,474 to 1,374, 88 for dysentery, from 1,642 to 1,554, 84 for whooping-cough, from 2,546 to 2,462, and 37 for measles, from 2,330 to 2,293.

Only small fluctuations were reported in the local incidence of scarlet fever. The largest variation in the returns for whooping-cough was an increase of 57 in Yorkshire West Riding, from 202 to 259. The largest falls in the local incidence of measles were 87 in Norfolk, from 433 to 346, and 86 in Cumberland, from 149 to 63, and the largest rises were 126 in Staffordshire, from 208 to 334, and 70 in Lancashire, from 429 to 499. 12 cases of diphtheria were notified, being 10 fewer than in the preceding week. The chief feature of the returns of diphtheria was a fall in Lancashire from 6 to 3.

Only 10 cases of acute poliomyelitis were notified. This was the smallest total for five years. The notifications were 7 fewer for paralytic and 4 fewer for non-paralytic cases than in the preceding week. Two cases were notified in the counties of Cheshire, Lancashire, and Yorkshire West Riding.

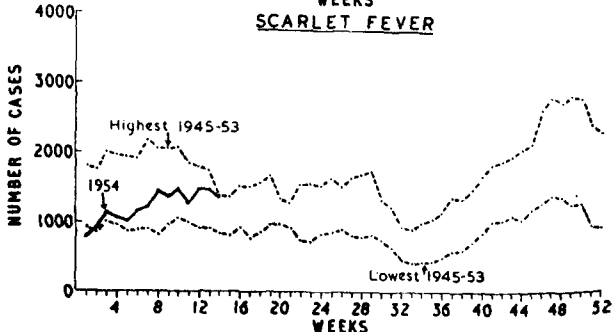
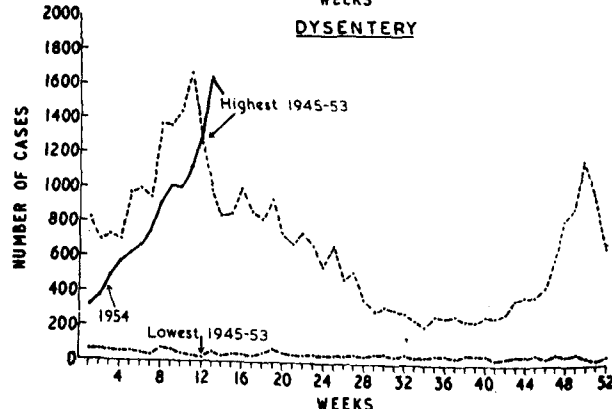
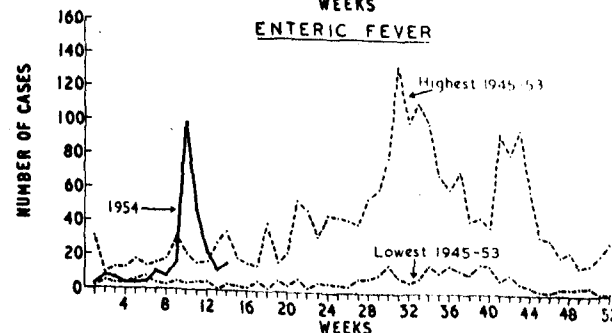
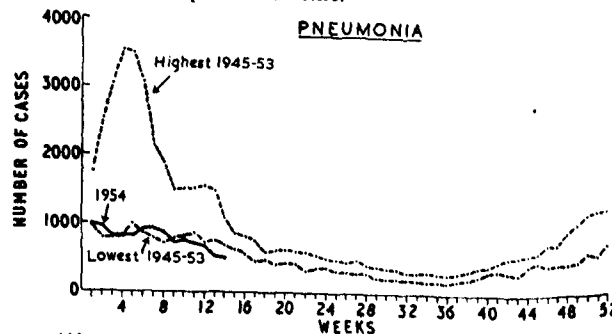
The largest centres of dysentery were Yorkshire West Riding 236 (Sheffield C.B. 42, Bradford C.B. 36, Brighouse M.B. 27, Keighley M.B. 21, Leeds C.B. 19, Hebden Royd U.D. 18, Wortley R.D. 11), London 230 (Islington 67, Chelsea 43, Lewisham 28, Shoreditch 20, Hackney 11, the other 61 cases were scattered through 18 boroughs), Lancashire 199 (Salford C.B. 22, Urmston U.D. 13), Bolton C.B. 18, Southport C.B. 15, Eccles M.B. 15, Manchester C.B. 14, Liverpool C.B. 13, Leyland U.D. 13), Leicestershire 121 (Leicester C.B. 118), Surrey 85 (Epsom and Ewell M.B. 30, Reigate M.B. 20, Bagshot R.D. 11, Croydon C.B. 10), Middlesex 85 (Edmonton M.B. 32, Hornsey M.B. 13, Willesden M.B. 10), Devonshire 53 (Exeter C.B. 45), Warwickshire 52 (Birmingham C.B. 44), Cheshire 48 (Ellesmere Port U.D. 42), Essex 46 (West Ham C.B. 15), Kent 37 (Chatham M.B.

14), Oxfordshire 35 (Oxford C.B. 35), Norfolk 35 (Norwich C.B. 34), Berkshire 33 (Maidenhead M.B. 27), Nottinghamshire 30 (Nottingham C.B. 24), Staffordshire 28 (Cannock U.D. 19), Lincolnshire 22 (Lincoln C.B. 9), Bedfordshire 20 (Luton M.B. 19), Gloucestershire 20 (Bristol C.B. 11), and Northumberland 20 (Hexham U.D. 15).

In Scotland the number of notifications of dysentery declined from 438 to 399. The largest returns were 211 in Glasgow, 100 in Lanark county, 22 in Edinburgh, and 15 in Dundee.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus ———, the figures for 1954 thus ———. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 10 (No. 14) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	12	0	3	0	0	19	0	9	0	0
Dysentery ..	1,554	230	399	3	6	325	45	81	8	8
Encephalitis, acute ..	7	0	0	0	0	5	0	0	0	0
Enteric fever: Typhoid ..	6	2	0	0	0	2	1	0	0	0
Paratyphoid ..	10	0	4	0	0	9	2	2(B)	0	0
Food-poisoning ..	107	16		1		65	7		0	
Infective enteritis or diarrhoea under 2 years ..				13	19				23	22
Measles* ..	2,293	67	175	61	420	23,388	1032	280	209	255
Meningococcal infection ..	43	3	12	3	3	60	3	17	2	4
Ophthalmia neonatorum ..	36	4	7	1		40	1	11	0	
Pneumonia† ..	516	29	220	4	1	925	51	302	15	6
Poliomyelitis, acute: Paralytic ..	7	0	0	0	1	28	6	0	0	2
Non-paralytic ..	3	0	0	0	0	10	0	0	0	0
Puerperal fever‡ ..	272	26	10	2		265	32	16	1	
Scarlet fever ..	1,374	76	157	35	43	1,266	69	171	36	52
Tuberculosis: Respiratory ..	787	80	110	39				155	29	
Non-respiratory ..	112	10	20	5				31	4	
Whooping-cough ..	2,462	102	432	46	23	2,618	178	288	22	95

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0			
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0	0		1	0	0		
Infective enteritis or diarrhoea under 2 years ..	5	1	1	0	1	6	2	3	3	0
Influenza ..	12	0	1	3	1	44	5	2	2	2
Measles ..			0	0	1		0	1		0
Meningococcal infection ..	0	0				0	2			
Pneumonia ..	203	22	27	9	8	260	38	28	16	8
Poliomyelitis, acute ..	0	0			0	3	1			0
Scarlet fever ..		0	0	0	0		0	0		0
Tuberculosis: Respiratory ..	96	12	12	0	8	100	17	26	2	7
Non-respiratory ..		3	3	0	1		3	4	1	2
Whooping-cough ..	3	0	1	0	0	8	1	0	0	0
Deaths 0-1 year ..	232	22	29	7	15	270	25	30	15	12
Deaths (excluding stillbirths) ..	5,517	758	669	127	186	5,654	784	681	136	176
LIVE BIRTHS ..	7,663	1188	930	219	406	8,298	1227	1050	233	410
STILLBIRTHS ..	211	28	23			219	33	24		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Rockefeller Grants.—During the first quarter of this year the Rockefeller Foundation disbursed nearly one and a half million dollars in grants. As usual, much of this money went to support medical projects. By a grant of \$125,000 to the Medical Research Council, the continuance of the Rockefeller travelling fellowships in medicine is assured until 1959. Biophysics is generously supported by a grant of £\$24,000 to London University for the purchase of an additional electron microscope for Professor J. T. Randall, F.R.S., and his colleagues at King's College, London, while Professor T. Caspersson at the Karolinska Institutet, Stockholm, receives \$30,000 for his studies of the effects of radiation on the cell. Perhaps of outstanding interest among the other medical projects receiving support are the study of the working of the Health Insurance Plan of Greater New York, and the central register of the Institute of Human Genetics at Geneva. Founded in 1950 with the help of a Rockefeller grant, the Institute has developed a central register for recording hereditary diseases by the medical profession in Switzerland, and it is hoped that the register will contribute to a better definition of the role of heredity in disease. A grant of \$12,000 has been given to University College, Dublin, to support Professor E. J. Conway's researches on the behaviour of tissue electrolytes. Recipients of individual grants, mostly for travel in America, include Professor H. J. Eysenck (Institute of Psychiatry, London), Miss Margaret B. Swann (Department of Psychological Medicine, Glasgow), Dr. J. R. Ellis (London Hospital Medical College), Professor F. W. Rogers Brambell (University College of North Wales), Dr. F. P. Glees (Department of Physiology, Oxford), and Dr. James Walker (Department of Obstetrics, Aberdeen).

European League for Mental Hygiene.—Under the presidency of Dr. Doris Odium, the European League for Mental Hygiene held a conference in Rome last month. The hosts were the Italian League for Mental Hygiene, and the meetings were held at the Institute of Research associated with the University Medical School. In her presidential address Dr. Odium defined the field of mental hygiene as twofold. On the one hand the treatment of those with mental disorder or arrested mental development and the education of the public about mental health; on the other the prevention of mental ill-health by attention to problems of human relations and development. The British delegation to the conference included Dr. Isobel Wilson, Dr. J. R. Rees, and Dr. E. Stengel.

Danish Medical Bulletin.—In its official organ, *Ugeskrift for Læger*, the Danish Medical Association has for many years published short English summaries of its original articles. Now it has gone a step further by the publication of *The Danish Medical Bulletin*, entirely in English, which is issued as a monthly supplement to the weekly *Ugeskrift*. The *Bulletin*, whose first number accompanies the April 8 *Ugeskrift*, is sponsored not only by the Danish Medical Association but also by the Danish Government through the Universities of Copenhagen and Aarhus and the National Health Service. Subscribers to *Ugeskrift* will receive the *Bulletin* free. Hitherto the *Index Medicus Danicus*, a bibliography of Danish medical papers, has been published by the University Library of Copenhagen. It will now be incorporated in the *Bulletin*, two of whose monthly issues will be devoted entirely to the *Index* so that it can be bound separately. The other issues of the *Bulletin* are expected to contain about 350 pages every year. In addition to original articles there will be short communications, annotations, and notices.

Mitchiner and Lady Cade Medals.—The first awards of of these medals for outstanding services to military and aviation medicine respectively were made by the Council of the Royal College of Surgeons on April 8. Brevet Colonel H. D. Chalke received the Mitchiner Medal for his outstanding

service over many years in improving the health of the Army, and Squadron Leader R. R. L. Pryer the Lady Cade Medal for meritorious service, and in particular for demonstrating that intra-arterial transfusion is readily practicable under Service conditions. These medals will be awarded annually.

Standards for Hospital Equipment.—The British Standards Institution has issued a Sectional List of British Standards for Hospital Equipment (P.D. 1821, March, 1954). It includes details of standards of medical and surgical apparatus, laboratory glassware and scientific apparatus, furniture and fittings, textiles and clothing, photographic and radiological material, testing materials, and electrical equipment. Copies may be obtained from the B.S.I., 2, Park Lane, London, W.1.

May "Family Doctor."—A 1s. 6d. pamphlet on "Slimming the Safe Way" (by Dr. Alan Porter) is given away with this month's *Family Doctor*. In the medical section, Sir Heneage Ogilvie writes about chest surgery and what it can achieve. Dr. T. Traherne explains the electroencephalogram, and Dr. Grey Walter contributes a note about children's "brain waves." Dr. T. Anderson gives plain advice on how long the infectious diseases stay infectious. The Birmingham City Analyst, Mr. H. H. Bagnall, is made the subject of an informative "profile." Professor Alvarez continues to tell us how to live with our blood pressure. No doctor can afford to skip the "Expert Advice" columns, where questions on such subjects as "drugs and mother's milk" and "inherited allergy" are answered.

Change of Address.—The Metropolitan Ear, Nose, and Throat Hospital has now moved to St. Mary Abbots Hospital. Its new address is: Metropolitan Ear, Nose, and Throat Hospital, at St. Mary Abbots Hospital, Marlborough Road, Kensington, London, W.8. (Telephone: WESTern 8201.)

Sir John McNee, lately Regius Professor of the Practice of Medicine at Glasgow, and **Professor J. H. Dible**, Professor of Pathology at the Postgraduate Medical School of London, are to receive the honorary degree of LL.D. at a ceremony at Glasgow University on June 16. Both graduated in medicine at Glasgow.

Dr. V. F. Hall, Dean of King's College Hospital Medical School since 1951, has been appointed a Fellow of King's College.

Dr. Dennis Geffen, M.O.H. of St. Pancras and Hampstead, is going to Greece, Cyprus, and Turkey to lecture on poliomyelitis and public health. His tour is sponsored by the British Council and the Cyprus Government.

COMING EVENTS

The Midland Tuberculosis Society and the North-western Tuberculosis Society will hold a joint meeting at the Cheshire Joint Sanatorium, Market Drayton, on May 8. The subjects to be discussed are "What is the Place, if any, of Mass Radiography?" and "An Analysis of the Place of Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis." Further particulars may be obtained from Dr. G. R. W. N. Luntz, Romsley Hill Sanatorium, Halesowen, near Birmingham.

Ciba Foundation Lecture.—The sixth annual lecture will be given by Sir Macfarlane Burnet, F.R.S., on May 11 at 5 p.m. in the lecture hall, Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, London, W.1. His subject is "The Problem of Virulence in Virus Disease." Admission is by ticket only, obtainable free from the assistant secretary, Ciba Foundation, 41, Portland Place, London, W.1.

Dr. Evarts A. Graham will deliver the second Sir John Fraser Memorial Lecture on May 11 at 5 p.m. in the Surgery Lecture Theatre, University New Buildings, Teviot Row, Edinburgh. His subject will be "Cancer of the Lung, with Special Emphasis on the Aetiology."

French Cancer Film.—A French documentary film on cancer will be shown by the Institut Français du Royaume Uni and the Scientific Office of the French Embassy on May 12 at 8 p.m. at the Institut Français, 15, Queensberry Place, London, S.W.7. The film was prepared for the general public as part of the French anti-cancer campaign. Admission is by invitation, to be obtained in advance from the Scientific Office, French Embassy, 22, Wilton Crescent, London, S.W.1 (Telephone: SL. Oane 0797, Ext. 5).

Dr. Alfred Blalock, of the Johns Hopkins Hospital, Baltimore, will deliver the Moynihan Lecture in the Riley Smith Hall of the University Union of Leeds on May 14 at 3.30 p.m. His subject will be "The Expanding Scope of Cardiovascular Surgery."

Fourth Varrier-Jones Memorial Lecture.—Professor Harold G. Trimble, of Stanford University, California, will deliver a lecture on "Current Therapy in Pulmonary Tuberculosis" at Manson House, 26, Portland Place, London, W.1, on May 14 at 5 p.m.

Provincial Medical Exhibition.—A medical exhibition on similar lines to that held in London will be held at Victoria Rooms, Bristol University, from May 17 to 21. Further information may be obtained from the organizers, London Medical Exhibition, 194-200, Bishopsgate, London, E.C.2.

Professor H. F. Humphreys will deliver the Webb-Johnson Lecture at the Royal College of Surgeons of England on May 21 at 5 p.m. His subject will be "The Value of the Teeth as Evidence—Scientific, Clinical, and Forensic."

NEW ISSUES

British Journal of Ophthalmology.—The next issue (Vol. 38, No. 5) is now available. The contents include:

EFFECTS OF AREA AND INTENSITY ON SIZE AND SHAPE OF THE ELECTRO-RETINOGRAM. EXCLUSION OF STRAY LIGHT EFFECTS. A. Wirth and B. Zeppenfeld.
SLIT-LAMP STUDIES ON THE FLOW OF AQUEOUS HUMOUR. T. H. Hodgson and R. K. MacDonald.
OCULAR DISEASE DUE TO BRUCELLA. K. Dean Forgy.
EQUATORIAL CATARACT AFTER CORNEO-SCLERAL TREPHINING. H. E. Hobbs and Redmond Smith.
PRIMARY TUMOURS OF THE OPTIC NERVE IN VON RECKLINGHAUSEN'S DISEASE. W. A. Manschot.
EVALUATION OF THE WATER-DRINKING TEST. Wolfgang Leydhecker.
DEGENERATIONS OF THE DOG RETINA. IV. RETINOPATHIES ASSOCIATED WITH DOG DISTEMPER-COMPLEX VIRUS INFECTIONS. H. B. Parry.
INTRANASAL RHINO-DACRYO-CYSTOSTOMY FOR PERSISTENT EPIPHORA IN CHILDHOOD. H. S. Sharp.
CHOROIDAL CARCINOMA METASTATIC FROM THE MAMMARY GLAND. C. H. Greer.
LAMBLER KERATOPLASTY FOLLOWED BY CATARACT EXTRACTION IN MALIGNANT PAPILLOMA OF THE LIMBUS. P. Sivabramaniam and T. Hoole.

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Archives of Disease in Childhood.—The April issue (Vol. 29, No. 144) is now available. The contents include:

THE ANAEMIA OF PREMATURITY. B. L. Coles and Ursula James.
CONGENITAL ECTROPION OF THE UPPER LIDS. Robert J. Young.
CONGENITAL STRIDOR CAUSED BY AN ABERRANT PULMONARY ARTERY. T. M. Welsh and I. B. Munro.
THE RESPONSE OF INFANTS TO A LARGE DOSE OF WATER. R. A. McCance, N. J. B. Naylor, and E. M. Widdowson.
THE SERUM PROTEIN LEVELS OF NEWBORN AFRICAN INFANTS. M. W. Stanier and M. D. Thompson.
SOME DIFFERENTIAL CHARACTERISTICS OF CEREBRAL MOTOR DEFECTS IN INFANCY. Eileen Collis.
DIFFERENTIAL DIAGNOSIS OF FACIAL AND DENTAL MANIFESTATIONS IN CONGENITAL SYPHILIS. G. O. Horne.
HONEYCOMB LUNG AND XANTHOMATOSIS. A. M. MacDonald and Robert A. Shanks.
FEMALE PSEUDOPHYLLIDITIS WITH ADRENOCORTICAL FAILURE IN IDENTICAL TWINS. Sulamith Wolff.
EPILOIA AND ENDOCARDIAL FIBRO-ELASTOSIS. L. Crome.
BACTERIAL ENDOCARDITIS COMPLICATING SEPTICÆMIA IN AN INFANT. Ian C. Lewis.
THE AGE OF CHILDREN WHEN GROWTH IN STATURE CEASES. E. M. B. Clements.
TWO CASES OF PRIMARY TUBERCULOSIS AFTER IMMERSION IN SEWAGE CONTAMINATED WATER. F. J. W. Miller and J. P. Anderson.
TWELVE CASES OF LYMPHOBLASTOMA IN CHILDREN. George M. Maxwell.
SCROTAL GANGRENE IN A NEWBORN BABY. Nicholas Alders.
NEONATAL THROMBOCYTOPENIC PURPURA IN TWO INFANTS. M. L. Neville and L. M. Masterman.

Published six times a year; annual subscription £3 3s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Friday, April 30

CAMBRIDGE MEDICAL SOCIETY.—At Addenbrooke's Hospital, 3 p.m., Dr. L. B. Cole: Hexamethonium in the Treatment of Hypertension.

Monday, May 3

INSTITUTE OF CARDIOLOGY.—9.30 a.m., Dr. K. W. Donald: Exercise in Heart Disease.
INSTITUTE OF CHILD HEALTH.—5 p.m., Professor G. Frontali (Rome): Proteins in Child Nutrition.
INSTITUTE OF NEUROLOGY.—5 p.m., Professor Klaus Conrad (Homburg-Saar): New Problems of Aphasia.
INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. E. S. Clarke: Cervical Spondylosis with Cord Compression.

Tuesday, May 4

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. E. J. Moynihan: Urticaria.
INSTITUTE OF NEUROLOGY.—5 p.m., Dr. I. Wickham (Gothenburg): Choice of Encephalography or Ventriculography for the Examination of Intracranial Tumours (with special reference to Posterior Fossa and Basal Tumours).
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Croonian Lecture by Dr. J. F. Smith: Nutrition and Child Health.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnott Demonstration by Professor M. F. Lucas Keene: Development of the Pharynx.
ROYAL MICROSCOPICAL SOCIETY.—11 a.m. to 1 p.m.: 2.30 to 4.30 p.m.: 6 to 7.30 p.m., symposium on the Golgi Apparatus.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Almroth Wright Lecture by Sir Wilfred Fish: Dental Research in the Inoculation Department.

Wednesday, May 5

EDINBURGH UNIVERSITY: FACULTY OF MEDICINE.—At Surgery Lecture Theatre, University New Buildings, 5 p.m., Macarthur Postgraduate Lecture by Professor H. K. Beecher (Massachusetts): Resuscitation and Other Early Care of the Severely Wounded Man.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Lichen Planus and Lichenoid Eruptions.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. M. Bodian: Hirschsprung's Disease and Chronic Constipation in Childhood.

Thursday, May 6

EDINBURGH UNIVERSITY.—At Anatomy Lecture Theatre, University New Buildings, 5 p.m., Cameron Prize Lecture by Professor Gerhard Domagk (Münster): Development of Chemotherapy in Tuberculosis.
INSTITUTE OF CARDIOLOGY.—9.30 a.m., Dr. Maurice Sokolow (California): Some Aspects of Quinidine Therapy.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnott Demonstration by Professor G. W. Causey: Sterno-mastoid Muscle; 5.30 p.m., Otolaryngology Lecture by Professor G. A. G. Mitchell: Sympathetic Nervous System in Relation to the Throat, Nose, and Ear.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. D. J. Williams.
ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.30 p.m., clinical meeting.
●SOCIETY OF CHEMICAL INDUSTRY: MICROBIOLOGY GROUP.—At Microbiological Research Department, Experimental Station, Porton, near Salisbury, Wilts, 11 a.m., papers by Mr. R. Ellsworth and Mr. L. R. P. Meakin, Dr. D. Herbert, and Mr. E. O. Powell.

Friday, May 7

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. M. S. Thomson: Lichen Planus.
LEBANON HOSPITAL FOR MENTAL AND NERVOUS DISORDERS.—At Cora Hotel, Upper Woburn Place, London, W.C., 5 p.m., 55th annual meeting.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. E. T. C. Milligan: Surgery of the Anal Canal and Fistula-in-Ano. 4 p.m., Dr. H. G. Miller: Allergic Disorders of the Nervous System.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Mr. R. A. Brews: Obstetric/Gynaecological Conference.
WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., clinical meeting.

Saturday, May 8

MIDLAND TUBERCULOSIS SOCIETY.—At Cheshire Joint Sanatorium, joint meeting with North-Western Tuberculosis Society.
SOUTH-EAST METROPOLITAN TUBERCULOSIS SOCIETY.—At Preston Hall, near Maidstone, 10.30 for 11 a.m., extraordinary general meeting. Dr. A. Stocker (Illinois, U.S.A.): Preferences in Surgery for Tuberculosis.
WEST MIDLANDS PHYSICIANS ASSOCIATION.—At Royal Salop Infirmary, Shrewsbury, 11 a.m., spring meeting.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Davies.—On April 7, 1954, at the R.N. Hospital, Trincomalee, Ceylon, to Elizabeth (formerly Rose), wife of Surgeon Lieutenant John M. Davies, R.N., a son.
Jacobs.—On April 6, 1954, at the Nottingham Hospital for Women, to Jean, wife of Dr. Brendan Jacobs, a daughter—Stella Jean.
Morgan.—On April 2, 1954, at St. Michael's Hospital, Lethbridge, Alberta, Canada, to Helen (formerly James), S.R.N., S.C.M., M.T.D., wife of John E. Morgan, M.B., B.S., M.R.C.O.G., a sister for Joanna and David—Susan Gail Margaret.

MARRIAGES

Zeitline.—Roberts.—On April 2, 1954, at the Paddington Register Office, London, W., L. L. B. Zeitline, M.R.C.S., L.R.C.P., of 16, Norfolk Place, London, W., to Miss Jane Roberts, of 30A, Sussex Place, Hyde Park, London, W.

DEATHS

Badcock.—On April 6, 1954, at Flodden Lodge, Cornhill-on-Tweed, Northumberland, Vincent Edgar Badcock, M.C., M.D.
Burgess.—On April 22, 1954, at 454, Perth Road, Dundee, William Leslie Burgess, C.B.E., M.D., F.R.C.P.Ed., D.P.H., D.T.M.&H., aged 68.
Carlisle.—On April 7, 1954, Henry George Carlisle, M.D., of Ardair, Hexwall, Cheshire.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

The Use of the Toothbrush

Q.—Is the regular use of the toothbrush really worthwhile? Does it not damage the gums as much as it saves the teeth? The best teeth I have seen have been in those who have never used a toothbrush.

A.—The use of the toothbrush is an essential habit for everyone who wishes to have healthy teeth and gums. Brushing the crowns of the teeth removes debris and keeps the surfaces polished, thereby minimizing the risk of decay. Places, such as the interdental spaces, where the bristles cannot reach are always the danger spots for the start of decay. There is good statistical evidence that toothbrushing immediately after meals reduces the incidence of caries.¹

But just as important is the good, not harm, derived from brushing the gum margin, provided it is done with a soft brush and a rotary motion so that the bristles pass from the gum to the tooth surface. Most individuals eating civilized diets need to use a toothbrush regularly to prevent gum diseases, which are caused by stagnation of food debris and tartar around the teeth. The correct use of a soft toothbrush is an essential part of the treatment of all gum diseases, though damage to the gums and teeth can be produced by the incorrect use of a hard toothbrush.

REFERENCE

¹ Fosdick, L. S. (1950). *J. Amer. dent. Ass.*, 40, 133.

Sensitivity Tests before Radiological Investigations

Q.—Is there any real advantage in performing sensitivity tests before intravenous pyelography, bronchography, or cholecystography? If so, what tests are advised?

A.—It is very doubtful if sensitivity tests for intravenous pyelography, whether intravenous, subcutaneous, oral, or ocular, are of sufficient reliability to warrant their routine use, and they are probably best reserved for cases with a positive indication for their performance. To select these cases, a routine history should be taken from every patient before injection, directed to determine whether there is a history of any allergic phenomena (such as asthma or urticaria); whether there is any known sensitivity to iodine; and whether there has been a previous pyelogram, and if so whether there was any reaction. With this information a decision as to the necessary precautions can be taken, and a suggested scheme is as follows.

If the past history is clear, no special precautions are indicated.

If there is an allergic history, it is known there is an increased incidence of sensitivity reactions (Mullen and Hughes¹) and the injection should be given very slowly, with a pause of about two minutes after the first 1 ml. Restoratives, such as oxygen, adrenaline, and promethazine hydrochloride (for intramuscular use), should be immediately available. There is a certain amount of evidence (Inman²) that, in the presence of a history of allergy, iodoxyl is preferable to diodone.

If there is a history of sensitivity to iodine, or of a mild reaction to previous pyelography, it is as well to postpone the examination until sensitivity tests have been performed. As little as 1 ml. of diodone given intravenously as a test dose has proved fatal (Dotter and Steinberg³), so it is advisable to start with 1 ml. of 1/100 solution and proceed at ten-minute intervals to 1 ml. of 1/10 solution, 1 ml. of full-strength solution, and 5 ml. of full-strength solution. If there is no reaction then the full dose can be given.

If there has been a severe reaction to a previous pyelogram, desensitization to the medium should be performed. A suitable course of desensitization is to start with oral doses at three-hourly intervals, beginning with 0.25 ml. and increasing by about 50% each time, and then to proceed to intravenous desensitization (two-hourly injection, starting with 0.5 ml. of full strength and again increasing by approximately 50% with each dose).

In bronchography, consideration must be given to the local analgesic and to the contrast agent. Whichever local analgesic is used, a short-acting barbiturate should first be administered to combat the potential toxic effects on the cerebral cortex. The best local analgesic for bronchography is lignocaine; a sensitivity test is probably not necessary when using this drug. With amethocaine a sensitivity test is, perhaps, advisable (0.1 ml. of 2% amethocaine subcutaneously), although in many centres it is dispensed with. There is no indication for using cocaine in bronchography; if it is used, however, a sensitivity test should certainly be performed (0.2 ml. of 5% cocaine subcutaneously).

Before oral cholecystography sensitivity tests are not indicated.

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 Inman, O. K. E. (1952). *Brit. J. Radiol.*, 25, 625.
 Dotter, C. T., and Steinberg, I. (1951). *Angiocardiography*, p. 43. P. B. Hoeber, New York.

T.A.B.T. Vaccine in Children

Q.—A child of 3 was given a first dose of 0.1 ml. of T.A.B.T. vaccine before going abroad. Two and a half hours later he had a reaction consisting in slight cyanosis, rapid respirations and pulse, and a temperature of 101.8° F. (38.8° C.). In view of this, do you advise a second dose of 0.2 ml. in one month's time, or what alternative do you recommend?

A.—T.A.B.T. (typhoid-paratyphoid vaccine and tetanus toxoid) was introduced for the immunization of adults and is unsuitable in its present form for young children. The dose injected into this child—that is, 0.1 ml.—contained a reasonable first dose of T.A.B. vaccine, but only one-fifth to one-tenth of the required dose of tetanus toxoid. It would be well to give these prophylactics separately to complete immunization.

Probably the T.A.B. constituent of the combined preparation caused the trouble reported, and not the tetanus toxoid, which is an exceptionally innocuous prophylactic at all ages. The dosage of T.A.B. vaccine for children is arbitrary, but in general young children tolerate injections of vaccines better than adults, and are therefore given larger doses in relation to body weight. Possibly this patient has an allergic personal or family history, or has been sensitized in some way to bacterial protein. Another and more probable explanation is that leakage occurred from the inoculation site into a vein, and caused symptoms which are unlikely to be repeated. It is suggested that further immunization might be attempted with two doses each of 0.1 ml. (or 0.2 ml.) of T.A.B. vaccine, spaced by four weeks. As a safeguard in this child, the injections might be administered in the evening, adrenaline and antihistaminic drugs being kept in readiness to control any allergic symptoms that develop. Care should also be taken to ensure that the route of administration is subcutaneous rather than intramuscular.

Protein and Resistance to Tuberculosis

Q.—What is the evidence that a diet rich in protein raises resistance to tuberculosis?

A.—There is experimental evidence that animals fed on diets adequate in protein and subsequently infected with tuberculosis survive longer, and with fewer lesions, than controls on diets poor in protein. In clinical and statistical studies it is often difficult to dissociate nutrition from other social factors, but there is much evidence which suggests

its importance. For instance, a world food survey showed an inverse relationship between animal food intake and tuberculosis mortality in European countries. There was a sharp rise in mortality from tuberculosis among French prisoners of war when Red Cross food parcels ceased. In the first world war the rise and fall of tuberculosis mortality in Denmark was closely associated with the supply of meat in the towns. A similar association with intake of first-class protein has been suggested in England and Wales in the second world war. This and much other evidence is reviewed in the chapter entitled "Food and Tuberculosis" in *Causes and Prevention of Tuberculosis*, Brice R. Clarke: E. and S. Livingstone, Edinburgh, 1952; in *Tuberculosis, a Global Study in Social Pathology* (pp. 359-373), John B. McDougall: E. and S. Livingstone, Edinburgh, 1949; and in *The Pathogenesis of Tuberculosis* (pp. 318-325), Arnold R. Rich: Blackwell, 2nd ed., Oxford, 1951.

Spermatorrhoea and Sexual Neurosis

Q.—What investigations and treatment are advised for a case of spermatorrhoea? At first there was an occasional loss of a drop or two of semen after urination, but now it happens regularly. The patient is worried about his symptoms.

A.—The drop squeezed out at the end of micturition is more likely to be prostatic than testicular secretion, although it will doubtless contain a certain number of spermatozoa. The genital tract should first be examined and the existence of any such lesion as a prostatitis excluded. The key to the case almost certainly lies in the words: "The patient is worried about his symptoms." He is probably a man with no sexual outlet who has not yet come to terms with his sexuality and who is in process of developing a sexual neurosis. In other words, he is more likely to be in need of psychological than of physical help. The physical symptom complained of is often associated with a sexual neurosis.

Arsenic and Bromide Rashes

Q.—As students we were taught that a small dose of arsenic prevented bromide rashes. Is this true? Could very small doses of arsenic, such as a few minims of liquor arsenicalis, taken over a long period have any harmful effect?

A.—The belief at one time widely held that small doses of liquor arsenicalis in a bromide mixture prevented bromide rashes rests upon no scientific basis nor on any controlled clinical trials. In the days when bromide was commonly taken over a prolonged period of time for the control, say, of epilepsy, the liquor arsenicalis usually given with it quite often caused hyperkeratosis and bronzing of the skin.

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AN APPRECIATION OF MITRAL STENOSIS*

PART I. CLINICAL FEATURES

BY

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During the past three years mitral valve disease has been studied intensively at the Institute of Cardiology and at the Cardiac Department of the Brompton Hospital. It is the purpose of this paper to present a comprehensive review of the facts ascertained during this period. The work represents an elaboration of one of the papers opening the discussion on mitral stenosis at the European Congress of Cardiology held in London on September 9 to 12, 1952, and summarized in the Abstracts of Scientific Communications.

Material

The material comprises 150 cases submitted for operation, and another 150 which were considered unsuitable for surgical treatment. Amongst the surgical cases were four put up for repair of mitral incompetence; amongst the medical cases were 50 believed to have predominant mitral incompetence and another 32 in which mitral incompetence was thought to be as important as stenosis, if not more important. A further 50 patients have been studied, but are not included in the main series because they are awaiting either catheterization or valvotomy.

The material is analysed more fully in Table XXIII in the Summary, at the end of Part II. All cases were examined and assessed personally by the author, who was responsible for their medical care, including that before and after operation.

Method

These 300 cases were analysed in respect of 50 medical points, including those pertaining to radiography, fluoroscopy, and electrocardiography. Auscultation was often checked but rarely influenced by phonocardiography; and fluoroscopy was sometimes checked but never influenced by electrokymography. Where applicable, all cases were also analysed in respect of eight points relating to cardiac catheterization, 14 to valvotomy itself, and 20 to the subsequent course. Thus the great majority of those treated surgically were subjected to a 90-point analysis. All symptoms, measurements, and graphic patterns were graded from 0 (absent) to 4, the four positive grades representing the common English adjectives of degree—slight, moderate, considerable, and

*Delivered before the San Francisco Heart Association on October 29, 1953, and modified for the Strickland Goodall lecture of the Society of Apothecaries of London, March 24, 1954.

gross. If thought desirable, the moderate grade was divided into grades 2A and 2B, A being less severe than B.

Cardiac catheterization was carried out in 125 of the surgical cases, 42 of the medical, 17 of those with pure mitral incompetence, and in 23 awaiting valvotomy—that is, in a total of 207 cases. Pressures were recorded with reference to the sternal angle by means of a Sanborn electromanometer and polyviso, the oxygen consumption was measured by means of a Sanborn metabolator, and blood gas analysis using a Haldane type instrument. The left atrial pressure was obtained by wedging the catheter in a peripheral pulmonary artery as described by Lagerlöf and Werkö (1949). The tracing was accepted as an accurate record of the left atrial pressure if it was venous in form. This assumption has been proved valid in our laboratory at Brompton by Epps and Adler (1953). The data for calculating cardiac output and pulmonary resistance were obtained in quick succession, but not simultaneously. In one-third of the cases the left atrial and pulmonary artery pressures were also measured during and after standard exercise. The pulmonary vascular resistance was expressed in simple units obtained from dividing the mean pulmonary artery pressure minus the mean left atrial pressure (mm. Hg) by the pulmonary blood flow (l./min.), as explained in the section on resistance.

Nearly two-thirds of the surgical cases were operated on by Mr. R. C. Brock, who performed the first mitral valvotomy at Brompton on March 29, 1950. In the remainder, valvotomy was undertaken by Sir Clement Price-Thomas (5), Mr. Norman Barrett (14), Mr. Oswald Tubbs (3), Mr. W. P. Cleland (14), and Mr. Ian Hill (5) at the Brompton Hospital; by Professor R. Pilcher (13) at University College Hospital; and by Mr. Holmes Sellors (2) at the Middlesex Hospital.

The surgeons' observations with regard to the presence or absence of clot, mitral incompetence (before and after valvotomy), mitral calcification, mobility of the cusps, valve structure, and size of the mitral orifice before and after valvotomy were accepted without question. Direct pressures from the left atrium and pulmonary artery were recorded before and after valvotomy in about two-thirds of the cases. A biopsy from the left atrial appendage was obtained routinely, and from the lung in many cases. The post-operative physical signs and the general assessment of the situation and

operative achievement were recorded as a routine before the surgeon's report was read. Follow-up notes were then made at intervals of three, six, or twelve months.

Incidence

In his Harveian oration of 1945, Sir John Parkinson produced statistical evidence indicating that in 1942 there were approximately 144,000 men between the ages of 18 and 44 with established heart disease in Great Britain, and that 80% of these—that is, 115,200—were rheumatic. Since the incidence of rheumatic heart disease is higher in women than in men, and since there are rather more women than men in the country, the total incidence of rheumatic heart disease in both sexes between the ages of 18 and 44 must be not fewer than 240,000. At least two-thirds of these, or 160,000, are predominantly mitral.

It is clear from the material comprising this paper that about one-half of all mitral cases—that is, 80,000 in the age group stated above—require valvotomy. At a conservative estimate, therefore, there should be approximately 3,000 valvotomies carried out in Great Britain per annum in order to cope with the situation.

Incidence of Individual Valve Involvement

It has never been quite clear what determines the relative frequency with which each particular valve is involved in rheumatism. According to Cabot (1926) the mitral valve is involved in 85%, the aortic in 44%, the tricuspid in 10 to 16%, and the pulmonary in 1 to 2%. These figures would not be seriously disputed at the present time. Various attempts have been made to correlate them with the frequency with which each valve was vascularized—for example, Gross and Kugel (1931). But Wearn *et al.* (1936), using indian ink instead of a barium gel, were unable to demonstrate any such correlation; they found blood vessels in 66% of the mitral valves studied, in 64% of the tricuspid valves, in 28% of the pulmonary, and in only 16% of the aortic. It has long seemed obvious to me that there might be a much simpler explanation for the phenomenon under discussion—that it depended on the degree of stress to which each valve was subjected. In a child of 10 the systemic blood pressure is about 100/60, the pulmonary about 15/6. Thus the load against which the mitral, aortic, tricuspid, and pulmonary valves have to work is in the proportion of 100, 60, 15, and 6 mm. Hg respectively. If the mitral valve was involved in 80% of cases the expected frequency of aortic, tricuspid, and pulmonary valve involvement would be 48, 12, and 5% respectively. This approximates very closely to Cabot's figures.

Age and Sex

The average age of patients in various groups and sub-groups is presented in Table I. It was usually around 37.6 years, the average for the whole series. Surgical cases with simple mitral stenosis tended to be younger than their medical counterparts, although usually more severe; and patients with auricular fibrillation were usually considerably older than those with normal rhythm; but neither

TABLE I.—Age Incidence

	Groups			Total	M.S. Uncomplicated		M.S. M.I.		Extreme Resistance		Rhythm	
	Surg.	Med.	M.I.		Surg.	Med.	Surg.	Med.	Surg.	Med.	Normal	A.F.
Average age ..	36.8	37.5	37.2	37.6	35.4	41.5	37.6	38.8	37.6	38	33.6	41.5
Range ..	18-58	19-66	13-65	13-66								

mitral incompetence nor an extreme pulmonary vascular resistance was related to age.

The sex incidence in the various types of mitral valve disease is presented in Table II. The figures confirm the well-known bias that mitral stenosis has for women and

TABLE II.—Sex Incidence

	Sex Ratio	
	Male	Female
M.S. with active pulmonary hypertension	1	7
" uncomplicated	1	4
" with trivial M.I.	1	3
" serious M.I.	1	1
Mitral incompetence	3	2
All cases	1	2

that mitral incompetence has for men. The extraordinarily high proportion of women in the group with a high pulmonary vascular resistance (active pulmonary hypertension in the table) may be due partly to the same sex factor that operates in primary pulmonary hypertension and partly to the fact that it is stenosis rather than incompetence which favours the development of a high resistance (see below).

History of Rheumatic Fever, Chorea, or Growing Pains

A previous history of the active rheumatic state was obtained in 68% of the whole series. In relatively pure mitral stenosis, with or without a high pulmonary vascular resistance, a history of previous rheumatism was obtained in 60%; when there was a serious degree of mitral incompetence with or without clinical stenosis, the incidence rose to 71.7%, and when more than one valve was causing trouble it was as high as 96%. Thus pure mitral stenosis would seem to be the least florid form of rheumatic heart disease.

Of those giving a previous history of the rheumatic state 45.7% had had a single attack of rheumatic fever, 31.5% recurrent attacks, 12.5% chorea alone, 4.8% both chorea and rheumatism, and 5.5% had had only subacute rheumatism or growing pains. Cases with significant mitral incompetence or multiple valve lesions were ten times more likely to have had recurrent rheumatic fever than isolated chorea; in relatively mild cases of pure mitral stenosis, on the other hand, a previous history of chorea alone was twice as common as recurrent rheumatic fever. This supports the conclusion drawn from the previous paragraph.

Life History

The chief landmarks in the life histories of all patients with symptoms are presented in Table III. The cases were divided into two groups according to whether mitral sten-

TABLE III.—Life History

	Latent period			Duration of Symptoms					From Onset Symptoms to Total Incapacity (Years)
	Age at Onset (Years)	Latent Period (Years)	Age at Onset (Years)	Grade 1 (Years)	Grade 2 (Years)	Grade 3 (Years)	Grade 4 (Years)		
Mitral stenosis	12	19	31	2.7 (0-17)	2.7 (0-18)	1.94 (0.5-11)	2 (0.5-4)	7.3	
Mitral incompetence	12.5	20	32.5	2 (0-9)	1.1 (0-5)	2.25 (0-7)	>1 (0.3-3)	5.4	

osis or incompetence was predominant. The figures for each grade were computed only from those cases which had completed their period in the grade under consideration by deteriorating sufficiently to enter the next grade. Thus the duration of grade IV symptoms could be assessed only from those who died from medical causes.

The rapid deterioration shown in the table suggests that there can be little point in delaying mitral valvotomy long in anatomically suitable cases once unmistakable symptoms of stenosis have developed; to do so is to invite complications such as embolism and to deprive patients of good physical health at a time of life when they have the right to expect it. Against operating too soon, however, are the surgical mortality of 6%, the 24% incidence of poor or indifferent results, and the possibility that stenosis may recur.

Pregnancy

In the whole series there were 83 mothers who between them had had 140 pregnancies. Cardiac symptoms had developed or increased during pregnancy in 43, but not in the other 97. On account of these symptoms two cases had been terminated at three months, one had had a hysterotomy at five months, one had been medically delivered at eight months, and two had had caesarean section; the remainder had been delivered naturally at term.

Of the 43 patients who deteriorated during pregnancy, 19 subsequently regained their previous state of health and 24 did not. Thus 24 out of 140 pregnancies, or 17%, precipitated permanent disability. In those cases in which pregnancy caused no trouble, cardiac symptoms did not develop for an average period of 10.4 years afterwards (range 1 to 28).

Cardiac symptoms developing during pregnancy were always due to pulmonary venous congestion and consisted of cough, breathlessness, orthopnoea, paroxysmal cardiac dyspnoea, or pulmonary oedema; sudden haemoptysis (pulmonary apoplexy) occurred in 12 out of the 43 cases (28%). Auricular fibrillation, systemic embolism, and congestive failure were rare complications. There was no evidence that those patients who developed symptoms during pregnancy were more or less likely to present later with a high pulmonary vascular resistance (34%) than those who did not (28%).

SPECIAL SYMPTOMS

Dyspnoea and Grading

Effort intolerance commonly due to dyspnoea was graded according to its severity as mentioned in the introduction under "Method." Patients in grade 1 were able to lead normal lives, but could not keep up with their fellows physically, although they might not be deterred from attempting to do so. They became unduly breathless on hurrying, running, walking up hills, or playing games. Patients in grade 2 were unable to run or hurry and found walking up hills difficult; they could walk indefinitely on the level, and were not orthopnoeic. To clarify the situation further this grade was usually divided into 2a and 2b. In grade 3 patients could walk only a few hundred yards on the level, and shopping and housework were carried out only with difficulty. Walking up hill was almost impossible and stairs had to be negotiated slowly. Patients who were more or less totally incapacitated were placed in grade 4; they could hardly manage 100 yards on the level and had abandoned their shopping and housework; many of them were virtually confined to bed. The majority of patients with orthopnoea, paroxysmal cardiac dyspnoea, or pulmonary oedema were in grade 3 or 4; out of respect for custom, cases with indisputable congestive heart failure were arbitrarily placed in grade 4.

Of the 150 patients selected for surgical treatment 19% were in grade 2 (all but two in grade 2b), 41% in grade 3, and 39% in grade 4. One patient with no effort intolerance was operated on because of recurring systemic embolism.

There were many patients in the medical and mitral incompetent groups who were only slightly breathless on effort or not at all, and it may be observed here that when such patients were catheterized the left atrial pressure was usually well below 10 mm. Hg with reference to the sternal angle. In striking contrast is the fact that of all the patients treated surgically there was only one with a left

atrial pressure in this range, and that was the individual with recurrent embolism just mentioned. The belief that breathlessness in mitral valve disease is closely associated with pulmonary venous congestion is thus strongly supported.

Orthopnoea and Paroxysmal Cardiac Dyspnoea

Orthopnoea occurred in 69% of the surgical patients, in 30% of the medical, and in 44% of those with mitral incompetence—that is, in 53% of the whole series. The respective figures for paroxysmal cardiac dyspnoea were 49%, 16%, 32%, and 35%. It should be remembered that there were a number of relatively mild cases in the two medical groups.

In attempting to find out what particular factors governed the incidence of the major pulmonary venous congestive symptoms, patients with paroxysmal cardiac dyspnoea were compared with those who had neither paroxysmal cardiac dyspnoea nor orthopnoea, only cases with well-marked disability (grade 2b to grade 4) being selected for study, so that the two groups were matched in this respect. There were over 50 cases in each group.

The most important results of the analysis are shown in Table IV. It will be seen that the degree of stenosis was certainly not responsible for the difference in func-

TABLE IV

	Normal Rhythm (%)	L.A.P. mm. Hg	C.O. l./min.	Unusually Tight or Extreme Stenosis (%)	Resistance Units				
					1-3.9 %	4-5.9 %	6-9.9 %	10-30 %	Average
Pulmonary oedema (history of)	76	23	4.6	36	66.5	33.5	—	—	2.9
Paroxysmal cardiac dyspnoea (history of)	59	23	4.0	50	50	26	20	4	4.6
Cases without P.C.D. or orthopnoea	42	22	3.5	46	21	26	15	38	9.2
Whole surgical series	59	22.5	3.8	43	38.4	26	23	12.6	6.0

tional behaviour between the two groups. The left atrial pressure and the cardiac output at rest were both a little higher, and the rhythm was more often normal in those with paroxysmal dyspnoea, but these differences were not great. The pulmonary vascular resistance, on the other hand, showed a remarkable difference, the level in cases of paroxysmal dyspnoea being exactly half what it was in the others. If the figures are examined more closely it will be noticed that the important difference is confined to the extreme grade of resistance which was found nine times more frequently in those without paroxysmal dyspnoea or orthopnoea. Resistance lower than 10 units did not protect the lungs adequately.

It may be tempting to assume that in their natural life history all cases of tight mitral stenosis sooner or later develop orthopnoea and paroxysmal cardiac dyspnoea, and that they then either die from pulmonary oedema or are protected by developing a high pulmonary vascular resistance; by obstructing the circulation proximal to the pulmonary capillaries this prevents dangerous rises of pulmonary venous pressure, so that patients are saved from drowning at the expense of a low cardiac output, and symptoms of pulmonary venous congestion are replaced by fatigue and oedema. This attractive hypothesis, however, is not properly supported by the facts. In the whole series such a life history was encountered in only six instances, or in 22% of all those with a resistance of 10 units or more. On the contrary, 78% of patients with a really high pulmonary vascular resistance had never had orthopnoea or paroxysmal cardiac dyspnoea at any stage. One is forced to conclude that if an extreme resistance is going to develop in mitral stenosis it does so relatively early in the course of the disease.

Frank Pulmonary Oedema

Manifest pulmonary oedema occurred in 11% of the surgical cases, in 2% of the medical, and in 6.5% of those with mitral incompetence, or in 7.5% of the whole series. Nearly 80% of such cases had more or less pure mitral stenosis, 15% combined stenosis and incompetence, and only 5% pure incompetence. Amongst the cases with stenosis 94% were women; in the small group with incompetence 75% were men.

The series is analysed in Table IV. The patients were distinctly younger (average age 32) than those who had never had pulmonary oedema (average age 37), and normal rhythm was more frequent. At rest, when free from attacks, the left atrial pressure averaged 23 mm. Hg, which was no higher than in the other cases; but in two or three instances, when an attack was threatened during cardiac catheterization, it was between 30 and 35 mm. Hg. The average cardiac output was relatively high (4.6 litres/minute). The pulmonary vascular resistance was remarkably low, averaging only 2.9 units, and never exceeding 5.2 units. The mitral orifice at operation was a little less tight than in the surgical series as a whole, not more tight.

It is concluded that pulmonary oedema tends to occur in relatively young women with average stenosis, when the pulmonary vascular resistance is unusually low. Sudden surges of cardiac output are possible because the pulmonary blood flow is not damped by the pulmonary resistance, and this allows extremely high pressures to develop in the pulmonary venous system. Thus, although these cases are rightly given top surgical priority, they are not necessarily advanced cases of mitral stenosis—rather to the contrary.

Haemoptysis

There are five kinds of haemoptysis complicating mitral valve disease: (1) the sudden unexpected profuse haemorrhage (pulmonary apoplexy); (2) blood-stained sputum associated with attacks of dyspnoea due to acute pulmonary venous congestion; (3) blood-streaked sputum associated with attacks of winter bronchitis, presumably due to a combination of bronchial inflammation and pulmonary venous congestion; (4) pink frothy sputum accompanying acute pulmonary oedema; and (5) frank haemoptysis due to pulmonary infarction.

Pulmonary Apoplexy

This was never seen in truly mild cases of mitral valve disease. Its incidence is given in Table V. By "serious cases only" in that Table are meant all the surgical cases,

TABLE V.—Percentage Incidence of Haemoptysis

	Whole Series				Serious Cases Only			Resistance Units		
	Surg.	Med.	M.I.	Total	M.S.	M.S., M.I.	M.I.	1-5.9	6-9.9	10-30
Pulmonary apoplexy...	24	13	13	18.3	22	33	15	25	20	12.5
Congestive haemoptysis: All cases...	24	9	9	16.5	30	19	8.3	20	30	21
Recent cases								16	10	4
Pulmonary apoplexy, congestive haemoptysis, or both...	44	25	20	34						
Pulmonary infarction	6	11	2	8.5						

but only those of comparable severity in the two medical groups, so that the relative importance of stenosis and incompetence might be probed. This column does in fact reveal that persons with combined lesions are particularly prone to pulmonary apoplexy.

It has often been stated, though with little factual support, that haemoptysis (meaning pulmonary apoplexy)

occurs especially in cases of mitral stenosis complicated by pulmonary hypertension (e.g., Logan and Turner, 1953), presumably with the idea that it is akin to cerebral haemorrhage in essential hypertension. This statement is incorrect. Pulmonary apoplexy is rare when the pulmonary arterial resistance is really high, for the haemorrhage is venous and the high resistance tends to protect the pulmonary venous system from developing too high a pressure. This is shown in the third major column of the Table. Moreover, when haemorrhage was recorded in a case with extremely high resistance it had always occurred several years previously, at a time when the resistance may well have been lower. There was no single instance of pulmonary apoplexy occurring within a period of three years previous to the actual measurement of the high resistance. In the cases that have come to be regarded as being only partly protected (pulmonary resistance 6 to 9 units) pulmonary apoplexy had ceased in two-thirds.

Again, pulmonary apoplexy was a truly early symptom of mitral valve disease in 68% of the cases in which it occurred: it pre-dated the onset of grade I effort intolerance in 12.7%, initiated symptoms in 42.5%, and was an early symptom occurring within a year or so of the onset of effort breathlessness in 12.8%. It was a relatively late symptom in only one-third of the cases, occurring about half-way through the period of symptoms in 17% and being really late in 15%. The same truth was established in another way: the average duration of symptoms in all the cases with pulmonary apoplexy was 6.8 years; the average time of the onset of haemoptysis was one year after the onset of effort dyspnoea; and the average time at which haemorrhages ceased was three years before the patient was seen.

Pulmonary apoplexy was recurrent in 58% of the cases in which it occurred and was single in 42%; it was precipitated by pregnancy in 27%, and was sometimes provoked by physical effort.

This analysis suggests that sudden profuse haemoptysis in mitral stenosis is due to a venous haemorrhage occurring at a time when the pulmonary venous pressure has risen rather suddenly, and that such haemorrhages tend to cease when abrupt rises of pulmonary venous pressure are prevented by a high pulmonary vascular resistance, and also perhaps when the pulmonary veins and their anastomotic communications with the bronchial venous system have had time to hypertrophy in response to the raised pressure within them. It follows that pulmonary apoplexy is not a serious symptom, and this is borne out by the fact that it has never proved fatal in my experience. Indeed, this sort of haemorrhage may be regarded as a safety valve and is inevitably self-limiting, ceasing when the pulmonary venous pressure has fallen sufficiently. Whether the haemorrhage arises from rupture of a pulmonary vein or from rupture of a bronchial vein or broncho-pulmonary venous communication is beyond the scope of this paper (see Gilroy *et al.*, 1952).

Congestive Haemoptysis

This refers to blood-stained or blood-streaked sputum associated with attacks of severe dyspnoea. The haemoptysis is far less important than the dyspnoea. Its incidence is given in Table V. The second main column shows that, unlike pulmonary apoplexy, congestive haemoptysis favours mitral stenosis rather than combined lesions or pure mitral incompetence. In the third main column the lower set of figures refers only to cases with recent haemoptysis, and may correct a false impression that might be gained from the upper set, which refers also to blood-spitting many years ago.

It is worth noting that 44% of the surgical cases had either pulmonary apoplexy or congestive haemoptysis: one of the outstanding results of mitral valvotomy has been the abolition of these haemoptyses, which have occurred subsequently in only two cases. In one of these it was found impossible to perform a valvotomy, and in the other, which

was the first case operated on at Brompton Hospital, mitral stenosis has just recurred, the haemoptysis is very recent, and the patient has been advised to have a second operation.

Haemoptysis Associated with Winter Bronchitis

These cases were not separately analysed, because it was rarely possible to distinguish them from the congestive group. A few of them appear to have been included in Table V among the 25% with pulmonary apoplexy, congestive haemoptysis, or both, in the medical group.

Haemorrhage in Pulmonary Oedema

Whether acute pulmonary oedema is associated with pink frothy sputum or not is a matter of small moment, and such cases have not been specially studied.

Pulmonary Infarction

This was a less common cause of haemoptysis, as shown in Table V. It is invariably a late development, all such cases but two being totally incapacitated. Phlebothrombosis in the legs was nearly always responsible for the infarct; in only two was local thrombosis in a peripheral pulmonary artery or vein thought possible. In 58% of the cases with infarcts the pulmonary resistance was unduly high, usually extreme. Indeed, amongst the 100 medical cases there were eight deaths: seven of these were due to pulmonary embolism, and in six of them the pulmonary vascular resistance was over 10 units. Since this danger has been recognized, all high-resistance cases have been maintained on anticoagulants while awaiting valvotomy, and have been given high priority. The phlebothrombosis is attributed to the low cardiac output.

Angina Pectoris

Angina pectoris, indistinguishable in site, radiation, quality, duration of attacks, and relationship to effort from that encountered in occlusive coronary atherosclerosis, occurred in 12% of the surgical cases, 5% of the medical,

and in 3% of those with almost pure mitral incompetence—that is, in 8.4% of the whole series; all of the medical cases also had serious incompetence. The average age of these patients was 36 years, or about the same as those without angina. The sex ratio was 5.5:1 in favour of women. One-third of the cases had auricular fibrillation. No significant coronary atherosclerosis was found in the four that came to necropsy. Angina disappeared in all those who had a technically successful valvotomy.

The pulmonary vascular resistance was extremely high, averaging 19.5 units, in just over a quarter of the cases, an incidence twice that in the surgical series as a whole. It is clear from Table VI, however, that angina was by no means confined to that group; a high resistance seemed to contribute to the development of angina, but was certainly not solely responsible for it.

There was some correlation between angina pectoris and the size of the mitral orifice. Thus about 40% of the cases with angina had extreme stenosis, an incidence twice as high as in the surgical series as a whole. Combined stenosis and incompetence was also twice as frequent as expected. Angina was rare in cases with virtually pure incompetence, and was not encountered at all in mild cases of any kind.

The resting electrocardiogram did not show ischaemic depression of the ST segment in any of the cases, but an ischaemic graph was sometimes obtained after effort, and the depression was then seen in left ventricular surface leads or their equivalents, even in cases with an extremely high pulmonary vascular resistance (Fig. 1).

It is believed that angina pectoris in mitral stenosis is due to functional insufficiency of the coronary blood flow resulting from strict limitation of the cardiac output, and that it is the left ventricle which suffers most. A high pulmonary resistance may encourage angina more by limiting the cardiac output than by increasing the work of the right ventricle.

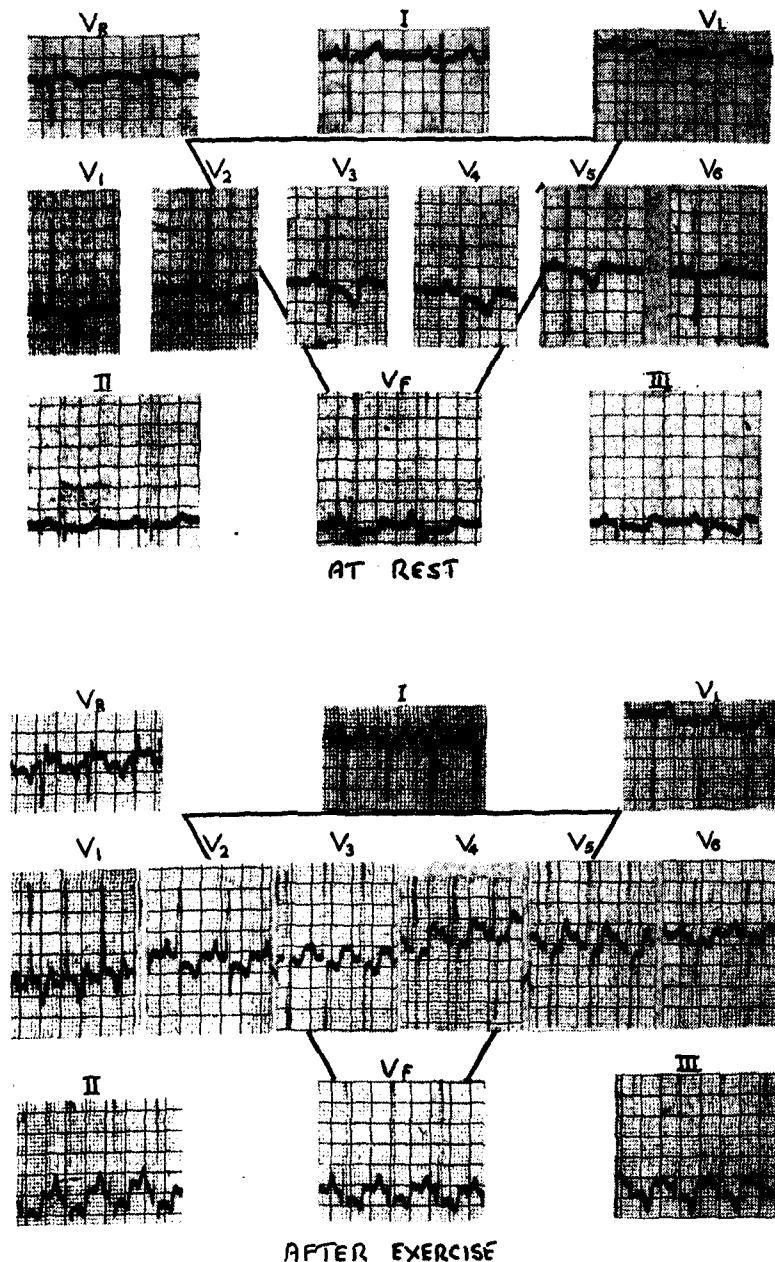


FIG. 1.—The electrocardiogram at rest and after exercise in a patient with angina pectoris complicating mitral stenosis with an extreme pulmonary vascular resistance. Note the changes in leads V₅ and V₆.

TABLE VI.—*Angina Pectoris*

	Resistance Units					Size of Mitral Orifice (mm.)				
	Average	1-3.9	4-5.9	6-9.9	10-30	M.I.	13×7	10×5	8×4	5×3
Angina pectoris	8	45	14	14	27	20	10	15	15	40
Whole surgical series	6	38	26	23	13	10	5	46	18	21
All groups (estimate)	4.2	60	20	12	8					

Systemic Embolism

A history of systemic embolism was obtained in 14% of the surgical cases, 11.5% of the medical, 9.7% of those with mitral incompetence, and in 13% of the whole series. The embolism was cerebral in 75%, peripheral in 33%, and visceral in 6%; 22% of the afflicted patients had both cerebral and peripheral emboli.

Auricular fibrillation was present in two-thirds of these cases, which is appreciably higher than in the rest of the series (Table VII). Just how often paroxysmal fibrillation was responsible for embolism in those who were regarded as having normal rhythm is unknown.

TABLE VII.—*Systemic Embolism. The Incidence of Auricular Fibrillation, Serious Mitral Incompetence, Left Atrial Dilatation, Left Atrial Thrombosis Found at Operation, and Operative Embolism in Cases Giving a History of Peripheral Embolism and in Cases Giving no such History*

History of embolism	Aur. Fib. %	M.S. M.I. %	Left Atrial Dilatation. Grade		L.A. Clot at Operation %	Embolism at Operation %
			Surg. Group	All Cases		
No previous embolism	66	44	1.74	1.86	21	10.5
History of embolism	42	28	1.48	1.79	22.6	8

A significant degree of mitral incompetence was present more often than in cases without a history of embolism (Table VII). The influence of regurgitation on the size of the left atrium or left atrial appendage might seem to explain this; but less correlation than expected was found between the incidence of embolism and the estimated size of the left atrium (Table VII), although the figures for the surgical group may be significant.

No correlation was found between the incidence of embolism and the pulmonary vascular resistance, the cardiac output, or the size of the mitral orifice. In 12.5% of the embolic cases embolism was the first symptom, occurring at a time when there was no effort intolerance, and when the rest of the data indicated that the mitral lesion was not advanced.

At operation a clot was found in the left atrium or left atrial appendage in 21% of those who gave a history of embolism and in 23% of those who did not. Embolism was an immediate complication of mitral valvotomy in 10% of the surgical cases. A clot was detected in the left atrium in two-thirds of these. The incidence of embolism at operation was not significantly higher in those who gave a history of previous embolism than in those who did not (Table VII). Of those cases in which a clot was found in the left atrium at the time of operation one-fifth developed an embolism. This was either noticed then and there or was discovered when the patient regained consciousness in the ward. Embolism occurred only once during the post-operative course, on the third day, and has not been recorded so far at the follow-up clinic.

Several interesting conclusions can be drawn from this analysis: (1) The risk of embolism occurring at operation is almost as high as the risk of spontaneous embolism (10% compared with 13%). It is therefore unwise to advise mitral valvotomy in order to prevent future embolism in

someone who has so far been free from this complication. (2) In advising mitral valvotomy to prevent a recurrence of spontaneous embolism there need be no special fear that the operation itself may cause a recurrence, the risk being no greater in those who have had previous emboli than in those who have not. (3) The infrequency of left atrial clots in patients who have given a history of embolism suggests that only fresh clots are thrown out into the circulation, and that once a clot is organized there is little danger of embolism from that source. Operative intervention alone is likely to dislodge a fragment of old thrombus.

Winter Bronchitis

Attacks of acute bronchitis, commonly in the winter, occurred in 28% of the surgical group. Its incidence was not dissimilar in medical cases of equal severity. No special correlation could be found between bronchitis and any of the other factors analysed, except that it was not a feature of mild cases. It was at first thought probable that the high incidence of bronchitis in advanced mitral valve disease depended on an excessive bronchial reaction to trivial upper respiratory tract infections because of the congested state of the bronchial mucosa. On this hypothesis the incidence of bronchitis was expected to be higher in patients with symptoms of pulmonary venous congestion than in those without. No special correlation, however, could be established. For example, the average left atrial pressure for the cases giving a history of bronchitis was 23 mm. Hg, which is practically the same as in the whole surgical group (Table VIII). Again, the incidence of bron-

TABLE VIII.—*Bronchitis*

	L.A.P. (Average) mm. Hg	Resistance Units			Aur. Fib. %	L.A. Size. Average Grade	Art. Oxygen Sat. %			C.O. l./min.
		1-5.9	6-9.9	10-30			96-92	91-88	87-83	
Bronchitis (surgical group only)	23	61	23	16	50	1.6	46	38	16	3.6
Whole surgical group	22.5	64	23	13	41	1.6	52	34	14	3.8

chitis was not influenced by the pulmonary vascular resistance, although this is known to prevent excessive pulmonary venous congestion. Finally, auricular fibrillation was present rather more often in cases with bronchitis than in the controls, and it has already been shown that auricular fibrillation does not encourage pulmonary venous congestion. These negative findings do not entirely invalidate the hypothesis defined above, but seem to demand some other determinant.

It is well known that great dilatation of the left atrium may compress either main bronchus and cause collapse of the lung. It was thought possible that partial bronchial compression might encourage bronchitis. The size of the left atrium in the bronchitic group was therefore compared with that in the rest of the series, but no difference was found (Table VIII); nor was bronchitis more common in cases of mitral incompetence with grade 3 dilatation of the left atrium than in cases of pure mitral stenosis with relatively small left atria.

No serious effects of recurrent bronchitis on the pulmonary circulation were detected in the majority of patients. Figures for the arterial oxygen saturation, cardiac output, and pulmonary resistance are given in Table VIII, where they are compared with figures compiled from the surgical group as a whole; there was no significant difference. It is clear that cor pulmonale does not ordinarily develop from recurrent bronchitis and emphysema associated with mitral stenosis.

One of the remarkable results of technically successful mitral valvotomy is the disappearance of winter bronchitis. This certainly supports the view that the bronchitis depends on a state of chronic pulmonary venous congestion in the majority of cases.

Auricular Fibrillation

Persistent auricular fibrillation (Table IX) occurred in 41% of the surgical cases, 40% of the medical, 30% of those with pure mitral incompetence, and 39% of the whole series; the respective figures for paroxysmal fibrillation were 5%, 7%, 6%, and 6%. Although auricular fibrillation was rather

TABLE IX.—*Auricular Fibrillation*

	Age (Yrs.)	+ve Biopsy (%)	Atrial Dilatation Grade	Resistance Units					C.O. l./min.	Stenosis	
				Average	1-5.9	6-9.9	10-30			Mild or Average (%)	Tight or Extreme (%)
Auricular fibrillation	41	13	1.78	7.0	52.5	35.5	12	3.6	66	34	50
Normal rhythm	33.6	24	1.45	5.9	72	18.5	9.5	4.1	50		

less common in those with pure mitral incompetence, it was most common when a significant degree of mitral incompetence was associated with mitral stenosis, being present in 69% of such cases.

Patients with auricular fibrillation tended to be older than those with normal rhythm, the average age for the two groups being 41 and 33.6 respectively (surgical cases only).

The relationship of auricular fibrillation to systemic emboli has been described in a previous section. Something more should be said here, however, about the relationship of auricular fibrillation to paroxysmal cardiac dyspnoea. It was stated, when discussing that subject, that normal rhythm rather than auricular fibrillation favoured attacks of paroxysmal dyspnoea. There is, however, a rider to that: seven out of ten surgical cases with paroxysmal auricular fibrillation had paroxysmal cardiac dyspnoea, and in three of these cases paroxysmal auricular fibrillation was known to have precipitated the attack of dyspnoea. There is reason to believe that the sudden onset of auricular fibrillation may precipitate severe dyspnoea or right ventricular failure, according to the response of the cardiovascular system to the altered haemodynamics and to the type of case in which it occurs. When the pulmonary vascular resistance is relatively normal a sudden increase of heart rate may interfere with left ventricular diastolic filling and so increase the degree of pulmonary venous congestion (Gorlin *et al.*, 1951).

On the other hand, when the pulmonary vascular resistance is high the right ventricle is more likely to fail, particularly since it is denied the auricular support which it needs under these circumstances. Again, if the rate is too fast, even with a normal pulmonary vascular resistance, the right ventricular output may fall and so relieve pulmonary venous congestion, or a grossly irregular rhythm may have a similar effect. In short, the symptomatic pattern that results from the onset of auricular fibrillation depends on several factors which include the pulmonary vascular resistance, the rate of the heart, and the degree of irregularity of the rhythm. In cases of relatively mild mitral stenosis with attacks of dyspnoea due to paroxysmal auricular fibrillation, symptoms may be abolished by permanent digitalis therapy. This does not prevent the rhythm change, but by controlling the ventricular rate when attacks do occur it prevents the dyspnoea.

It is often stated that if auricular fibrillation occurs under the age of 20 rheumatic activity may be safely assumed. Whether this is so or not, it must not be concluded that rheumatic activity is in any way responsible for auricular fibrillation in established mitral stenosis. In the present series only 13% of cases with auricular fibrillation had positive biopsies (Aschoff nodes in the left atrial appendage), compared with 24% of those with normal rhythm. The difference is no doubt due to the age factor. Even so, the two youngest patients with auricular fibrillation (aged 18 and 23) both had negative biopsies.

It would naturally be expected that auricular fibrillation in mitral stenosis might be related to the size of the left atrium. In fact, the average size of the left atrium in the group with fibrillation was grade 1.78 compared with grade 1.45 in those with normal rhythm. This is a significant difference, but does not indicate whether the enlargement caused the fibrillation or vice versa. It should be noted, however, that the grade of right atrial enlargement was also 1.78 in the group with fibrillation and only 1.04 in the group with normal rhythm, an even greater difference. Since the right atrium is not ordinarily enlarged in mitral stenosis unless the pulmonary vascular resistance is high, it follows that atrial enlargement is more likely to be the result than the cause of auricular fibrillation, unless the latter can be shown to be closely related to pulmonary hypertension.

The pulmonary vascular resistance averaged 7.0 units in those with auricular fibrillation and 5.9 units in those with normal rhythm. Further details are given in Table IX. It may be seen that a high resistance (6 to 9 units) was nearly twice as frequent with auricular fibrillation as with normal rhythm, but the relationship did not embrace extreme resistances. The paradox may be explained by the rarity of mitral incompetence in cases with an extreme resistance. Although these figures do not deny that a dilated right atrium from pulmonary hypertension may precipitate auricular fibrillation, they are not convincing. There is no doubt that the left atrium is apt to be greatly distended in cases of combined mitral stenosis and incompetence, and auricular fibrillation is particularly common in this group. This certainly suggests that atrial dilatation can cause fibrillation. The same conclusion may be drawn from the fact that in pure mitral incompetence grade 3 or 4 left atrial dilatation occurred in 75% of those with auricular fibrillation, and in only 16.6% of those with normal rhythm.

The cardiac output tended to be lower in patients with auricular fibrillation than in those with normal rhythm, averaging 3.6 litres a minute in the former and 4.1 litres a minute in the latter (analysed from the surgical group only).

Auricular fibrillation could not be correlated directly with the size of the mitral orifice. Cases complicated by serious mitral incompetence were excluded from this analysis, for these are particularly prone to fibrillate and would therefore load the figures in favour of auricular fibrillation being associated with a relatively large orifice. Despite this precaution, however, cases with auricular fibrillation had unusually tight or extreme stenosis less often than cases with normal rhythm (Table IX).

The chief conclusions from these observations are that auricular fibrillation in mitral valve disease tends to be provoked by age and distension of the left atrium especially as a result of mitral incompetence, but that it also causes dilatation of both atria; it is not related to rheumatic activity or to the degree of stenosis itself. Uncontrolled auricular fibrillation may cause intense dyspnoea or congestive heart failure in cases which would not otherwise develop serious symptoms at the time.

Essential Hypertension

Only 3% of the present series had a blood pressure of 160/100 or above, and only 1% had a diastolic pressure as high as 120 mm. Hg. This figure is in harmony with Bechgaard's (1946) converse finding that only 1% of cases of essential hypertension have mitral stenosis.

PHYSICAL SIGNS**Mitral Facies**

Peripheral cyanosis in the face and hands was common, and has been attributed to peripheral vasoconstriction secondary to a low cardiac output. In order to test this hypothesis, patients with the characteristic mitral facies of at least moderate degree were compared with cases in which there was no cyanosis of either face or hands. The

TABLE X.—Mitral Facies

	Pul. Vasc. Resistance Units	C.O. l./min.	Grade 4 Eff. Intol. (C.F.) (%)	Aur. Fib. (%)	Reduced Art. O ₂ Sat. 83-89% (%)
Mitral facies	11.7	3.3	73	68	52.4
No peripheral vasoconstriction	4.1	4.25	9.3	25	20

results are shown in Table X, and strongly confirm the hypothesis. An extreme pulmonary vascular resistance tends to keep the output low and fixed. Grade 4 effort intolerance or complete incapacity usually means congestive heart failure proper (low output type), and auricular fibrillation also tends to keep the output low. The only other factor which seemed to contribute to the mitral facies was an arterial oxygen saturation of less than 90%.

In three cases with an extremely high pulmonary vascular resistance a bright palmar flush and hot hands were observed instead of peripheral cyanosis. This unexpected finding was attributed to hepatic dysfunction.

Peripheral Pulse

The quality of the brachial pulse was noted carefully and recorded as a routine in all cases. Quality should not be confused with amplitude (quantity). The latter was small in the great majority of all groups, being considered normal in only 11.5% of the whole series. A water-hammer quality (abrupt and collapsing) was detected in 26% of the whole series; but, whereas it was present in only 8% of the surgical cases, it was found in 29% of the medical and 84% of those with pure mitral incompetence. Again, a water-hammer pulse was recognized in only 5% of the surgical cases which were proved at operation to have no significant incompetence, whereas it was recorded in 71% of all cases with a serious degree of incompetence. It is concluded that a small water-hammer pulse is an important sign of mitral incompetence. Cases complicated by aortic incompetence were excluded from this analysis.

A careful study of routine arterial pressure tracings in many cases of mitral valve disease has confirmed this clinical observation. In cases of more or less pure stenosis the arterial tracing was blunt; the upstroke was rarely abrupt and took at least 0.08 second to reach the beginning of the summit; the summit itself was rounded and occupied about 0.07 second. The down-stroke proper was not unduly steep and rarely began before 0.15 second after the onset (Fig. 2). In mitral incompetence, on the other hand, the upstroke was often abrupt and the beginning of the summit was usually reached within 0.07 second; the peak itself was sharper, and occupied only about 0.05 second; the down-stroke proper was earlier, usually within 0.12 second after the onset and was more precipitous (Fig. 3).

The characteristic pulse of mitral incompetence may be attributed to a combination of overfilling of the left ventricle, a systolic leak into the left atrium, and a low cardiac output. Left ventricular systole is hyperdynamic and im-



FIG. 2.—Intra-arterial pressure tracings from six unselected cases of mitral stenosis.

parts an abrupt wave front to the pulse; the low resistance at the mitral orifice causes systolic collapse; the poor cardiac output results in peripheral vasoconstriction, which diminishes the amplitude of the pulse.

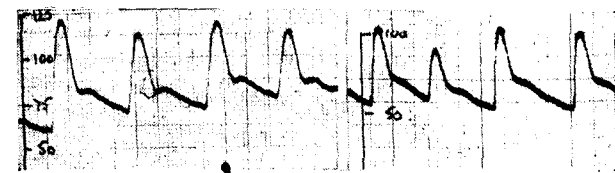


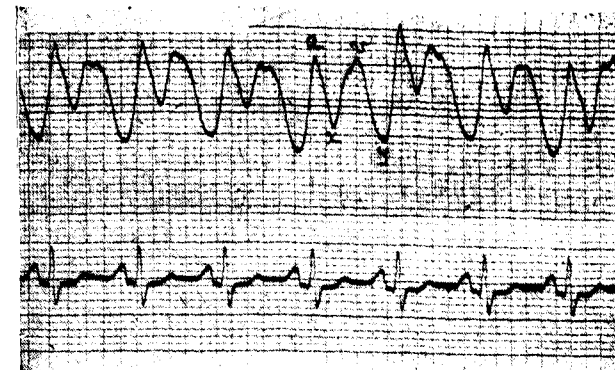
FIG. 3.—Intra-arterial pressure tracings from two cases of serious mitral incompetence. Neither had aortic incompetence.

Jugular Venous Pressure and Pulse

The jugular venous pressure was raised in 25% of the whole series. This means that the top of the oscillating venous column in the neck was at least 5 cm. of saline above the sternal angle when the patient was propped up at 30 degrees.

A giant *a* wave (Wood, 1950, 1952; Abrahams and Wood, 1951) was seen in 12 cases (4%) and always denoted an extremely high pulmonary vascular resistance (9 cases) or tricuspid stenosis (3 cases).

A combined *va* wave followed by an *x* descent, necessarily associated with sinus tachycardia, was recorded as such in five cases. None of these had a high resistance, and it is doubted if any of them were in true heart failure.

FIG. 4.—Jugular phlebogram illustrating the steep *y* descent in a patient with heart failure secondary to mitral stenosis with an extreme pulmonary vascular resistance.

This sort of venous pulse was seen in cases of severe mitral stenosis with intense pulmonary venous congestion and passive pulmonary hypertension.

a and *v* waves of equal amplitude were found in nine cases (3%). When the venous pressure level was around 5 cm. above the sternal angle these cases did not differ from those in the previous paragraph. When the pressure was higher, however, around 10 cm. of saline, the *v* wave was followed by a steep *y* descent which was seen only in congestive heart failure proper (Fig. 4). An extremely high pulmonary vascular resistance was responsible for the failure in the few cases of relatively pure mitral stenosis that showed this type of venous pulse; four others, however, had dominant or pure mitral incompetence, and in these the pulmonary vascular resistance was not unduly high. It is believed that some other factor operates in mitral incompetence which causes congestive heart failure with a low cardiac output in the absence of extreme pulmonary hypertension.

Mackenzie's ventricular form of the venous pulse, which is characterized by a single systolic wave, was recorded in

right atrial pressure tracings in all cases of auricular fibrillation and was associated with a raised venous pressure, as previously defined, in 10% of the whole series: the pulmonary vascular resistance then averaged 9 units in those with mitral stenosis; the lowest resistance was 6.4 units.

In the same group there were eight cases with a serious degree of mitral incompetence and only one of these had a high pulmonary resistance. There were also two cases with tricuspid stenosis and one with coronary embolism; the resistance was relatively normal in each of these.

Tricuspid incompetence was diagnosed when the amplitude of the *v* wave was very much greater than that ordinarily seen in normal rhythm or auricular fibrillation.

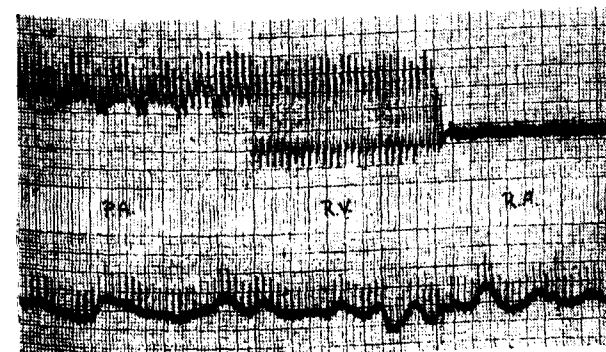


FIG. 5.—Case of tricuspid stenosis showing a diastolic pressure gradient across the tricuspid valve.

and as a rule the top of the oscillating venous column was exceptionally high. A venous pulse of this kind was seen in 6% of the whole series. Tricuspid stenosis was excluded by means of cardiac catheterization (see below). The average pulmonary vascular resistance for this group was 14.5 units, being extreme in all but three of the 18 cases and between 6 and 9 units in the exceptions. Functional tricuspid incompetence associated with mitral valve disease clearly results from right ventricular stress of a high order.

When tricuspid stenosis was associated with normal rhythm, a giant *a* wave was seen in the venous pulse as described above; when auricular fibrillation was present, however, there was no clinical means of recognizing tricuspid stenosis from the character of the venous pulse, but it was suspected when there were no clinical, electrocardiographic, or radiological signs of a high pulmonary vascular resistance despite a really high venous pressure; in seven such cases the presence of tricuspid stenosis was subsequently established by means of cardiac catheterization, a diastolic pressure gradient across the tricuspid valve being demonstrated when the catheter was withdrawn from the right ventricle to the right atrium (Figs. 5 and 6).

The most important conclusions to be drawn from these observations are that (1) a giant *a* wave means extreme pulmonary hypertension if the clinical signs are in harmony, or tricuspid stenosis if they are not; (2) mitral stenosis does not ordinarily cause congestive failure in the absence of a high pulmonary vascular resistance—that is, passive pulmonary hypertension does not cause congestive failure; (3) tricuspid incompetence implies a pulmonary vascular resistance in the extreme grade; (4) a high venous pressure in the absence of signs of pulmonary hypertension may well mean tricuspid stenosis; and (5) some other mechanism seems to be involved in cases of congestive heart failure associated with mitral incompetence. As a corollary to all this is the very important fact that in mitral stenosis neither congestive heart failure nor tricuspid incompetence

was ever seen as the result of myocarditis itself. In other words, the so-called myocardial factor was conspicuous by its absence. In isolated or other forms of myocarditis proper, including gross rheumatic myocarditis in children, congestive heart failure is associated with a high venous pressure, a low cardiac output, and a relatively normal pulmonary vascular resistance. The only type of case in the present series in which a dominant myocardial factor has not been excluded as a cause of right ventricular failure is that with a serious degree of mitral incompetence. No further comment can be made about this possibility as yet.

Cardiac Impulse

A left ventricular thrust at the apex beat was recorded in 12% of the surgical cases, 38% of the medical, and 86% of those with pure mitral incompetence. Of the 18 cases in the surgical group, eight had a significant degree of mitral incompetence, and two had aortic stenosis. The sign was recorded erroneously in three cases in which a huge right ventricle occupied the apex of the heart; this error was suspected in view of the physical signs, but was not finally laid by the heels until the electrocardiogram was inspected. Thus there were only five cases (3.3%) in which a thrusting left ventricular impulse was unexplained. No further light was thrown on these cases as the result of valvotomy, but an enlarged left ventricle was confirmed by direct inspection of the heart. It is suspected that previous mitral incompetence may have been responsible.

Of the medical cases with this type of cardiac impulse three-fifths had a serious degree of mitral incompetence, and one-quarter had significant aortic valve disease. One patient had cardiac infarction from coronary embolism, and one had essential hypertension. There were only two cases (2%) in which the thrusting left ventricle was unexplained.

Little need be said about the 50 cases with relatively pure mitral incompetence, since 86% showed this sign. When all these cases of significant mitral incompetence in the whole series were reviewed it was found that 70% had a hyperdynamic left ventricular thrust. The importance of this sign cannot be overestimated.

There was close correlation between a left ventricular cardiac impulse and left ventricular preponderance in the electrocardiogram. Thus the electrocardiogram showed left ventricular preponderance in 48% of these cases and normal left ventricular dominance in 40%; in other words, it was left-sided in 88%. A right-sided electrocardiogram was found in 11% (only once in a case of pure mitral incompetence), and the electrocardiogram showed cardiac infarction in the case with coronary embolism.

A lift over the right ventricle, usually maximum in the third and fourth intercostal space in the left parasternal line, was appreciated in 79% of the surgical cases, in 45% of the medical, and in 36% of those with pure mitral in-



FIG. 6.—Four controls showing identical diastolic pressures in the right atrium and right ventricle.

competence, or in 61% of all cases. Since there has been a little uncertainty about the value and meaning of this sign, it was subjected to a searching cross analysis. Since the left atrium tends to be larger in cases with significant mitral incompetence than in those with pure stenosis, the figures themselves indicate that it is not the left atrium behind which is responsible for the parasternal lift in front. It was decided, therefore, to restrict the analysis to the surgical group, in which the evidence was more complete. The degree of right ventricular lift was recorded as a routine, and for the purpose of this particular analysis four groups were segregated, according to whether the lift was absent or grade 1, 2, or 3 in degree. There were 25 cases (chosen consecutively) in each group. In this way the degree of right ventricular lift was correlated with the degree of right ventricular preponderance in the electrocardiogram; the degree of dilatation of the left atrium, pulmonary artery, and right side of the heart as seen radiologically; the pulmonary vascular resistance; tricuspid incompetence; and congestive heart failure.

TABLE XI.—Right Ventricular Lift

R.V. Lift	R.V. Dominance (E.C.G.) Grade	Left Atrium Grade	Pulmonary Artery Grade	R. Atrium Ventricle Grade	Units of Resistance	T.I. %	C.F. %
0	0-35	1-5	1-0	0-6	2-6	0	0
Grade 1	0-8	1-4	1-5	1-1	4-4	12	12
" 2	1-8	1-6	2-1	1-6	6-8	12	28
" 3	2-5	1-5	2-9	2-2	12-0	32	48
" 3 or 4							

T.I. = Tricuspid incompetence. C.F. = Congestive heart failure.

The results are set out in Table XI. Each figure represents the average grade of the factor analysed as defined in the introduction. For example, the figure 2.9, at the bottom of the third column, represents the average grade of pulmonary artery dilatation in the 25 cases having a grade 3 (considerable) right ventricular lift. The table shows clearly that the right ventricular lift bears no relationship to the size of the left atrium, but is correlated closely with the degree of right ventricular preponderance in the electrocardiogram, with the degree of dilatation of the pulmonary artery and right side of the heart, and especially with the pulmonary vascular resistance; it was also related to the frequency of tricuspid incompetence and congestive heart failure. There can be no serious doubt that the fundamental factor which determines the degree of right ventricular thrust is the pulmonary vascular resistance.

AUSCULTATION

Presystolic Murmur

A presystolic murmur was heard in all but two of the surgical cases with normal rhythm, and there was a serious degree of mitral incompetence in the two exceptions. It was only just heard in one case in which there was an extremely high pulmonary vascular resistance. It was absent in one-third of the medical cases with normal rhythm; all but two of these had a serious degree of mitral incompetence, one had an extremely high pulmonary vascular resistance, and one was the mildest case of mitral valve disease in the whole series. It was absent in all cases classed as pure mitral incompetence. It is obvious from these figures that a presystolic murmur is excellent evidence against significant mitral incompetence. This conclusion was checked by analysing all cases of combined stenosis and incompetence in the surgical and medical groups. There were only 12 with normal rhythm, and of these only three had a presystolic murmur.

A presystolic murmur was heard in all of the six cases of mitral stenosis in which cardiac catheterization proved that the left atrial pressure (P.C.V.P.) did not exceed 10 mm. Hg with reference to the sternal angle; it was also present in all but one of the eight most trivial cases

of mitral stenosis in the medical group, the exception having already been referred to above. It follows that a presystolic murmur is a sign of mitral stenosis, but not of its degree.

Considerable interest is attached to the effect of mitral valvotomy on the presystolic murmur. When a presystolic murmur was present before operation it was still heard afterwards in 42% of the cases, but could not be heard in 58%. One-third of the cases in which the murmur was still present were classed as excellent results, whereas two-thirds of those in which the murmur disappeared were so classed. When those cases which lost their presystolic murmur as a result of a serious degree of mitral incompetence caused by the operation were excluded from this latter group as many as 90% were classed as excellent. The significance of this will be especially appreciated in the light of the previous finding that a presystolic murmur may occur with only a trivial degree of stenosis.

First Heart Sound

The first heart sound was loud (grade 3 or 4) in 90% of cases of uncomplicated pure mitral stenosis with normal rhythm in the surgical group (Table XII). Of the excep-

TABLE XII

	First Heart Sound		
	Normal	Accentuated	
		Grade 1-2	Grade 3-4
M.S. mild, L.A.P. < 10 mm. . .	0	42	58
" operated cases . . .	0	10	90
" M.I. . .	14	86	0
Pure M.I. . .	73	27	0

tions, only one case had but slight accentuation and this was the mildest in the series, the left atrial pressure measuring only 10 mm. Hg and the mitral orifice measuring 1.5 cm. in length at operation. In the medical group there were 26 cases classed as mild mitral stenosis with normal rhythm; the first heart sound was markedly accentuated in 15 of them, moderately so in 6, and only slightly so in 5. In this group there were nine instances in which a loud first sound was associated with a left atrial pressure proved to be less than 10 mm. Hg.

In the surgical group auricular fibrillation was present in only 14.5% of those with grade 3 accentuation of the first heart sound, but in 50% of those with grade 2 accentuation, indicating that auricular fibrillation tends to damp the intensity of the sound. In the majority of cases of auricular fibrillation the first heart sound was loud following a short diastolic period and soft after a pause, as described by Ravin and Bershof (1951). This is attributed to a tendency for the valve to close towards the end of diastole, when there is time for the ventricle to be properly filled. The absence of auricular systole favours such behaviour. In a limited number of cases, however, paradoxical accentuation of the first heart sound was noted—that is, it was softer after a short diastole and louder after a pause. No explanation for this phenomenon can yet be offered. In combined stenosis and incompetence there was usually little variation in the intensity of the first sound.

A high pulmonary vascular resistance also tended to damp the intensity of the first heart sound. Thus high or extremely high resistances were found in 25% of those with greatly accentuated first sounds, and in 41% of those with moderately accentuated first sounds. Nevertheless, extreme resistances never caused normal or soft first sounds.

Mitral incompetence was by far the most important factor modifying the first heart sound. Thus, of the surgical cases in which the degree of mitral incompetence was checked at operation, no case of significant incompetence had grade 3 accentuation of the first heart sound, 20% had grade 2 accentuation, and 66% grade 1. Again,

no case of significant mitral incompetence in the whole series had considerable accentuation of the first heart sound, 27% had grade 1 or 2 accentuation, and 73% had a normal or soft first sound. These figures were taken only from the cases without obvious calcification of the valve so that they would not be influenced by that factor. There were only three examples of marked calcification of the mitral valve without incompetence, and each of these had slight accentuation of the first heart sound. It follows that, although calcium alone may diminish the intensity of the sound, the soft first sound of mitral incompetence does not depend on its presence. As expected, there was a positive correlation between the intensity of the first heart sound and the presence and intensity of the opening snap.

It is believed that the first heart sound is loud in mitral stenosis because there is a sufficient pressure gradient across the mitral valve to billow the cusps deeply into the left ventricle right up to the moment when that chamber contracts. When there is no stenosis the left ventricle fills rapidly, so that towards the end of diastole, even when quite short, the mitral cusps tend to float into apposition, and therefore shut more quietly when the ventricle contracts (Dock, 1933). Normal rhythm favours accentuation of the first sound by increasing the pressure gradient across the valve at the end of ventricular diastole; a high pulmonary vascular resistance may damp the sound a little by encouraging the right ventricle to form the apex beat of the heart; mitral incompetence results in quicker left ventricular filling, and the rapid equalization of left atrial and left ventricular diastolic pressures may float mobile cusps into apposition before the ventricle contracts; moreover, mitral incompetence is often associated with rigid cusps, particularly in the presence of heavy calcification, and in these cases there may be little movement.

The effect of valvotomy on the intensity of the first heart sound was studied (Table XIII). When the first

TABLE XIII.—Post-operative First Heart Sound

First Heart Sound	Incidence	Functional Result		
		Excellent	Good	Fair or Poor
Intensity diminished by 2 or 3 grades. Now grade 1 or normal	30%	81.5%	18.5%	—
Intensity slightly diminished. Now grade 1 or 2	25%	30%	61%	9%
Unchanged	22%	20%	50%	30%
Now soft or normal due to mitral incompetence	23%	—	33.3%	66.6%

sound was greatly diminished after the operation 81.5% did excellently, whereas when it was unchanged or only slightly diminished only 20 to 30% did as well. When the first heart sound became soft as the result of mitral incompetence caused or increased by the valvotomy the result was poor or only fair in as many as two-thirds, and it was excellent in none. When it is remembered that the first heart sound is usually loud in trivial degrees of mitral stenosis the return to normal or near normal in about one-third of all cases operated on is remarkable.

It is concluded that a loud first heart sound is excellent evidence of mitral stenosis, but gives little indication of its degree; its presence is a talisman against serious mitral incompetence.

Mitral Systolic Murmur

A loud mitral systolic murmur (grade 3 or 4) was heard in all the cases of pure mitral incompetence except two in which the murmur was only moderate in degree; a thrill accompanied the murmur in 43%. A similar loud murmur was also heard in all the cases of combined mitral stenosis and incompetence in the medical group except two in which it was also only moderate in degree; a thrill accompanied this murmur in 14%. No case of significant mitral incompetence without a systolic murmur of at least moderate degree was encountered in the whole series. In

the surgical group there were naturally far fewer cases of significant mitral incompetence: here a loud mitral systolic murmur was heard in 11.4%, a moderate murmur in 9.3%, a faint murmur in 8.6%, and no mitral systolic murmur at all in 66.4%; in 4.3% of cases a tricuspid systolic murmur extending far out to the left was mistaken for a mitral murmur by some observers.

When the surgical cases were analysed in respect of the mitral systolic murmur there was close correlation between the incidence and grading of the murmur and the presence and degree of mitral incompetence recognized by the surgeon by direct palpation of the valve (Table XIV). For

TABLE XIV.—Mitral Systolic Murmur (Surgical Cases Only)

Mitral Systolic Murmur	Grade of Mitral Incompetence			
	0	1	2	3
Absent	98%	2%	—	—
Grade 1	42%	42%	16%	—
" 2	15%	70%	15%	—
" 3 or 4	12%	18%	12%	58%

example, when there was no mitral systolic murmur there was no incompetence at all in 98% of cases; on the other hand, when the murmur was loud mitral incompetence was found in 88%, considerable in 58%, and mild or moderate in 30%. It can no longer be seriously maintained that a mitral systolic murmur is of little value in determining the presence or absence of mitral incompetence.

The effect of valvotomy on the mitral systolic murmur was recorded in all the surgical cases and has been correlated with the functional results (Table XV). As would

TABLE XV.—Post-operative Mitral Systolic Murmur

Mitral Systolic Murmur	Incidence	Functional Result			
		Excellent	Good	Fair	Poor
Grade 3 or 4 before and after	9%	—	10%	30%	60%
Increased to Grade 3 or 4	22%	4%	29%	38%	29%
Increased slightly to Grade 1 or 2	21%	53%	39%	4%	—
No change Grade 0 to 2	41%	46.5%	38%	11%	4.5%
Diminished slightly	3.5%	50%	37.5%	12.5%	—
" greatly	3.5%	—	—	—	—

be expected, the development of a loud mitral systolic murmur (grade 3 or 4) was associated with an important degree of mitral incompetence in the great majority of cases in which it occurred (84%). The functional result was relatively poor in this group. Those cases with a loud systolic murmur before the operation nearly always had a loud murmur afterwards and did not do well, 90% of them being classed as fair or poor and none as excellent. Apart from these two groups the functional result was much the same whether a grade 1 or grade 2 mitral systolic murmur developed, whether such a murmur present before the operation diminished or even disappeared (which was rare), whether a grade 1 or grade 2 systolic murmur remained unchanged, or whether there was no murmur before or afterwards. As many as 41% of the whole surgical group had no mitral systolic murmur before or after the operation, and 55% of those without a pre-operative murmur did not develop one afterwards; since the functional result was excellent or good in 85% of such cases it is clear that mitral valvotomy is capable of restoring excellent valve function. Relatively few (14%) of those without a mitral systolic murmur before the operation developed a grade 3 or 4 murmur afterwards, and all but two of them then had other evidence of serious mitral incompetence.

The Pulmonary Second Sound

By the pulmonary second sound is meant the second or pulmonary element of the second heart sound; it is rarely heard beyond the pulmonary area. When the second sound seems single, splitting can nearly always be recognized

during rather deep inspiration. It was necessary to appreciate the split before the pulmonary element could be properly analysed. Table XVI shows the relationship between the intensity of this pulmonary second sound and the pulmonary vascular resistance. The correlation is not as close as might be expected, but cannot be ignored: thus

TABLE XVI.—Pulmonary Element of Second Sound

Pulmonary 2nd Sound		Resistance		
		< 6 Units	6-10 Units	> 10 Units
Normal	1	91%	8%	1%
Accentuated Grade 1	2	76%	16%	8%
"	3 or 4	42%	31%	26%
"	"	33%	33%	33%

when the pulmonary second sound was normal the resistance was relatively normal in 81%; on the other hand, when the pulmonary element was markedly accentuated (grade 3 or 4) the pulmonary vascular resistance was high in 66%. Further details may be studied in the table. Closer correlation might well have been obtained if the second sound had been auscultated while the pulmonary artery pressure was being recorded, but this was impracticable.

It is concluded that the pulmonary element of the second heart sound is an important but not infallible guide to the degree of pulmonary hypertension present in mitral stenosis.

Pulmonary incompetence was recognized in 10% of the surgical cases, but in only 1% of the medical and in none of the cases of pure mitral incompetence. It was associated with an extremely high pulmonary vascular resistance in 55%, and with a high resistance (6 to 9 units) in the other 45%; it was never encountered when the resistance was under six units. The pulmonary artery was conspicuously dilated in nearly all these cases, the average degree of enlargement working out at just over grade 3.

The Mitral Opening Snap

This occurred in none of the group with pure mitral incompetence, but this only means that if a snap was present pure mitral incompetence was never diagnosed. There was, however, ample collateral evidence supporting this attitude.

Of the surgical cases 16.5% did not have an opening snap, excluding four cases which were put up for surgical repair of mitral incompetence. The absence of a snap was attributed to the following factors: (1) associated significant mitral incompetence without calcification (four cases); (2) associated significant mitral incompetence with heavy calcification (9 cases); (3) heavy calcification with trivial mitral incompetence (4 cases); (4) an extremely high pulmonary vascular resistance over 10 units (5 cases); (5) massive left atrial thrombosis (1 case); and (6) moderate aortic valve disease (1 case).

It is uncertain whether the explanation in these last two instances is correct. Since the opening snap is certainly due to the abrupt backward billowing of the mitral cusps, particularly the aortic, when the pressure within the left ventricle sinks rapidly below that in the left atrium at the end of the period of isometric relaxation, it is suggested that aortic reflux may prevent the snap by interfering with the backward movement of the aortic cusp.

Mitral incompetence of sufficient degree prevents the snap because in these cases there is far more destruction and rigidity of the mitral cusps than in pure stenosis, so that the rigging is disorganized and, if one thinks of the cusps as sails, they are too matted down to flap back as the pressure gradient is reversed. It may also be true that with sufficient incompetence the lack of obstruction at the mitral orifice itself prevents the snap by allowing free filling of the ventricle as in normal hearts.

It has been suggested that mitral calcification may be responsible for the absence of a snap (Wynn, 1953), and the

findings here confirm this view. Conspicuous calcification is rare in the absence of incompetence, but it has occurred, and in addition to the four cases mentioned above two others have been seen recently both without a snap. Extreme rigidity of the cusps is assumed to be responsible. Of 13 additional surgical cases in which calcification was slight and in which there was no mitral incompetence, all had an opening snap.

An extremely high pulmonary vascular resistance obscured the snap in one-quarter of all such cases. Since the left atrial pressure was at a level which would certainly have been associated with a snap in uncomplicated cases of mitral stenosis, its relative lowering cannot be held responsible for the absence of the sign; moreover, the sign was in fact present in three-quarters of such cases, and was sometimes very loud. It is suggested that the snap may be masked by the very large pulmonary artery overlying the root of the aorta, so that sounds produced by the aortic cusp of the mitral valve are not readily heard at the base; also by a grossly distended right ventricle forming the apex of the heart, so that sounds transmitted through the left ventricle may be difficult to hear at the "mitral area." In one or two instances of extreme pulmonary hypertension the snap was recorded phonocardiographically when it could not be heard clinically; this was never so when a snap could not be heard in cases of mitral incompetence.

Amongst the 150 surgical cases there were only two instances of simple stenosis in which a snap was not recorded clinically. One of these had the largest mitral orifice in the series; in the other an error was suspected. Mitral valvotomy resulted in loss of the snap in 32% of the cases; half of these were associated with excellent results, the other half with the development of serious mitral incompetence.

In the medical cases an opening snap was not heard in 38%. The explanations were much as described for the surgical group, in that 16 had serious mitral incompetence without calcium, 10 had serious mitral incompetence with conspicuous calcification, one had conspicuous calcification without mitral incompetence, three had an extreme pulmonary vascular resistance, and one had moderate aortic valve disease. In addition, however, there were five cases in which the absence of a snap was attributed to the mildness of the lesion; in fact, 38% of really mild cases had no snap. It must be understood that in these the degree of stenosis approached the trivial. In relatively mild cases, in the sense that they were not severe enough to warrant valvotomy although otherwise quite well developed, a snap was always present. In the medical group also there was one case with predominant tricuspid stenosis in which a mitral opening snap could not be heard, and there was one instance in which failure to record a snap was believed to be a clinical error.

It is concluded that the opening snap is one of the most important signs of dominant mitral stenosis, and, like a loud first heart sound, is an excellent talisman against the presence of serious mitral incompetence. Although it signifies properly developed stenosis, being absent in many trivial cases, it does not necessarily mean that the stenosis is severe enough to warrant valvotomy.

The Third Heart Sound

This was never heard in cases of pure stenosis as noted by Bridgen and Leatham (1953). It was present in 85% of the cases of well-developed mitral incompetence (grades 2 to 4) and in 25% of cases of mild mitral incompetence. It was present in 74% of the medical cases in which a serious degree of incompetence complicated mitral stenosis, but in only 25% of the surgical cases of similar kind, probably because there was relatively more stenosis in this small group. Of the surgical cases with a third heart sound not one did excellently or even well; indeed, three-quarters of them died. A third sound was never heard when a trivial degree of incompetence complicated mitral stenosis.

The sound was closely correlated with a hyperdynamic left ventricle. Thus 78% of all cases having such a left ventricular action without aortic incompetence had a third heart sound; conversely, 95% of cases with a third heart sound had a hyperdynamic left ventricle. This could be recognized both clinically and radiologically. The third heart sound, of course, is attributed to rapid filling of the left ventricle. The third sound was very closely correlated with the presence of a loud mitral systolic murmur; indeed, it was never heard without such a murmur. In fact, it was closely correlated with all the other signs of mitral incompetence as discussed elsewhere.

The difference between an opening snap and a third sound is usually obvious when both are classical, the opening snap being closer to the second sound, shorter, sharper, and higher-pitched in quality, and being very well heard at the left sternal edge; whereas a third heart sound is later, longer in duration, dull, relatively low-pitched, and best heard over the left ventricle at the apex of the heart. Again, the snap is well heard on expiration, whereas the third heart sound usually comes out better on inspiration. Unfortunately, the character of the third sound may become much more like an opening snap in advanced mitral incompetence in the sense that it may be less delayed and much sharper and higher pitched in quality than usual. The classical description of the third sound is based on its occurrence in normal individuals, usually children, and in association with heart failure (left ventricular diastolic gallop). In mitral incompetence the left ventricle fills more rapidly than in these conditions, and this is probably responsible for the modification of the sound.

When present before the operation, the third sound never disappeared afterwards; on the contrary, it was always louder. In the cases with combined stenosis and incompetence without a third sound pre-operatively, 85% developed the sound after valvotomy. In other words, relief of stenosis accentuated the signs of incompetence. In cases operated on for mitral stenosis with a trivial degree of incompetence, as many as 60% developed a third heart sound after valvotomy, although these patients often did very well functionally, the incompetence being only of moderate degree. A third sound associated with mitral incompetence also developed after valvotomy in 7.5% of cases without previous incompetence at all.

It is concluded that the presence of a third heart sound is excellent evidence of at least moderate mitral incompetence. Its presence offers a strong reason for not recommending valvotomy even in those rare instances in which a clinical opening snap is heard in addition to the third sound.

Mitral Diastolic Murmur

Particular attention was paid to the length as well as to the intensity of a mitral diastolic murmur, and whether or not it was accompanied by a thrill; both length and intensity were graded. By grade 4 length is meant that no gap could be detected between the murmur and the first heart sound, or between a diastolic murmur and presystolic accentuation; a grade 3 murmur means that a gap could just be recognized; a grade 2 murmur was of moderate length, and grade 1 very short. When there was tachycardia the heart was slowed by means of carotid sinus compression in order to grade the length of a murmur. When there was auricular fibrillation the length of the bruit was gauged during the longer pauses; sometimes these had to be induced by carotid sinus pressure.

The mitral diastolic murmur was long (grade 3 or 4 in equal proportion) in 85% of the surgical cases. In 15% only was it relatively short; one-third of these had an extremely high pulmonary vascular resistance (abolishing the murmur altogether in one instance); one-third had significant mitral incompetence; no explanation could be found in the remainder (5% of the whole series). An extremely high pulmonary vascular resistance also abolished the murmur in one of the medical cases.

In the group with almost pure mitral incompetence the murmur was very short in 48% and only moderate in length (grade 2) in 24%. It was never long, and was absent altogether in 28%. Moreover, when a diastolic murmur was present in mitral incompetence a third heart sound could nearly always be heard.

A mitral diastolic thrill was appreciated in 38% of the surgical group, in 29% of the medical, and in 20% of the cases with mitral incompetence. An attempt was made to find some factor which might favour the development of a thrill, but with little success. In the cases with a thrill valve calcification was present in 29%, against 28% in the group as a whole; the left atrial pressure averaged 21.4 mm. Hg, the cardiac output 3.95 litres a minute, and the pulmonary vascular resistance 5.1 units, against respective control figures of 22.5, 3.8, and 6.5; the mitral orifice was less stenosed than usual in 22%, average in 46%, tighter than usual in 22%, and extremely stenosed in 10%, against control figures of 9%, 48%, 17%, and 26% respectively, omitting cases with significant mitral incompetence. As a rule, the cusps were mobile in cases with a thrill; a tough fibrous orifice was present in 27%; these anatomical findings were much the same in the series as a whole.

It will be discerned that the only points of difference between cases with a diastolic thrill and the surgical group as a whole were that the pulmonary vascular resistance was a little lower, and that the incidence of cases with extreme and relatively mild stenosis was reversed. On looking into the resistance more closely it was found that an extreme resistance was present less than half as frequently in those with thrills as in those without. This was confirmed by an analysis of the medical group, in which none of the few with an extreme resistance had a thrill. This damping effect probably explained the relatively few cases of an extremely stenosed orifice amongst the cases with thrill referred to above.

The intensity of the mitral diastolic murmur has not been analysed separately, for the loudest murmurs were usually associated with a thrill, soft murmurs never.

[Part II, with a list of references, will appear in our next issue.]

Scientific Film Review for March, 1954, includes descriptions of eight new medical films. "Analysis of the Effect of Vasoactive Substances on the Blood Vessels in the Mesorchium of the Rat" (Ciba Laboratories) is described as a superb example of cinemicrography. Although intended for pharmacologists and physiologists, it is also suitable for medical societies. "The Children's Vocabulary of the New Sign Language" (Department of Phonetics, University College, London) demonstrates some 330 moving signs in Sir Richard Paget's new sign language. It is intended for teachers of the deaf and otologists. "Cold Agglutination of Human Blood" (Ciba Laboratories), partly in colour, is for haematologists and physiologists. "The Cyto-diagnosis of Uterine Cancer" (Ciba) is a useful colour film dealing with the recovery of vaginal contents, the technique of Papanicolaou's staining procedure, and the appearance of cancerous cells. The first part is primarily of value to gynaecologists and the remainder to pathologists and laboratory technicians. "Lymph Vessel Movement Studies in the Mesentery of the Rat" (Ciba) is meant for pharmacologists and physiologists. "Nalorphine" (Wellcome Film Unit) demonstrates the antagonistic action of this drug to morphine, methadone, and thiambutene. "A New Approach to the Surgery of Peptic Ulcer" (Allen and Hanbury) is a demonstration in colour of the difference between Billroth partial gastrectomies and the jejunal replacement technique, with particular emphasis on the latter. It is likely to be of special interest to gastric surgeons and surgical societies. "Nydrazid in the Treatment of Tuberculosis" (E. R. Squibb and Sons) is a coloured film intended for chest physicians, tuberculosis officers, etc.

THE SURGICAL TREATMENT OF PECTUS EXCAVATUM (FUNNEL CHEST)

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Pectus excavatum is a depression deformity of the anterior chest wall that has been recognized under a number of names: funnel chest, trichterbrust, chondrocostosternon, koilosternia, and others. Despite the considerable literature on this well-known entity many differences exist concerning its development and management. A brief review of the current concepts and the results of surgical treatment used in this unit are presented.

Aetiology

The exact aetiology is still uncertain. Of the many theories advanced none could serve as a fit basis of treatment until Brown (1939) demonstrated that the deformity was due to a short central tendon of the diaphragm. Brodtkin (1951) observed a diminished inspiratory sternal retraction on the homolateral side following procaine injection of the phrenic nerve. We have noticed an almost complete disappearance of inspiratory sternal retraction when the diaphragm has been paralysed by curare. It does seem likely that some congenital abnormality of the diaphragm is primarily responsible for the condition.

The deformity is noticed shortly after birth, but in some individuals it may not become apparent until later years, and it may be observed by the parents for the first time in early adolescence. That there is a strong genetic factor is well shown by the commonly reported occurrence of multiple cases within a single family and in lineal descent through several generations (Sainsbury, 1947). This has been confirmed in our series. It is characterized by a progressive posterior sternal depression and distortion of the adjacent costal cartilages that begins near the sterno-manubrial junction and reaches its deepest point at the xiphoid. In infancy this retraction may be apparent only with deep inspiration and is best seen when the child is crying, a severe degree of deformity then being produced which immediately corrects itself after the inspiratory effort is over. Unfortunately it often tends to progress to a permanent bony deformity, and there is no way of knowing in which individual this will occur. In one of our cases it progressed from a mobile deformity seen only on deep inspiration to a fixed deformity in a period of six months. The deformity is often symmetrical but not always so. In time a characteristic posture develops. The ribs acquire a lateral flare and the chest becomes flattened and pulled down upon the abdomen, a dorsal kyphosis develops, and the head tends to protrude forward. The appearance is that of a thin round-shouldered, hollow-chested, pot-bellied individual. The costal cartilages dip into the sternum at a steep angle and the xiphoid is often impalpable from the overcrowding of the sixth and seventh cartilages. The depression, which is often extreme, usually deepens on inspiration.

The thoracic viscera may be affected by compression and distortion. Although there is interference with respiration this is seldom at a critical level, and in many instances the commonly used clinical tests of respiratory function may fail to show any serious alterations. There is adequate evidence in the literature to show that symptomatic cardiac disturbances are not uncommon. Electrocardiograms, angiocardigrams, and cardiac catheterization have pro-

vided convincing evidence of disturbed cardiac function. Symptoms of tachycardia, palpitation, arrhythmia, and dyspnoea can occur at an early age. A systolic murmur may be heard, and on the basis of this some of these children have been labelled "heart disease" and precluded from many activities at school.

The purpose of surgical treatment is to correct the sternal and costal cartilage deformity. This is of no value unless persistent post-operative supervision is carried out to see that the patient corrects the kyphosis, which is, of course, secondary to the diaphragmatic and sternal abnormality. The younger the patient the easier this is, and we are reluctant to operate on patients over 20 unless they have symptoms. There is no doubt that these symptoms will be relieved in this older age group, but the bad posture will probably persist.

Infants under the age of 6 months should not have treatment, as inspiratory sucking-in of the sternum may be present in the newborn and gradually disappear during the first few months of life. Delay in treatment is to be condemned, because in the early stage, when the chest wall is still mobile and deformity is produced only on deep inspiration, the operation is a relatively minor one. When the sternum has become detracted down and the costal cartilages are permanently deformed then a more extensive procedure is necessary. Excluding those who are too old and too young, we feel that all cases should have surgery.

It is striking how the patients' and their parents' concern over this disability is masked. When first seen in the out-patient department and accepted for operation their true feelings become more apparent, though restrained. It is only after operation that their real feelings are manifest. There is a reluctance on their part to believe that surgery can offer anything because they have been repeatedly told that nothing can be done. Many of them have had prolonged treatment in physiotherapy out-patient departments with little or no improvement, and an attitude of *laissez faire* exists. These children are often very conscious of their defect. They are shy of their complaint; boys frequently undergo teasing at school and girls feel handicapped, particularly as they reach adolescence. It has impressed us in their first follow-up how they volunteer a sense of well-being and an improved exercise tolerance. This latter is very constant. The patient often states that he can now do far more than he did before and that he can keep up with boys of his age effortlessly, whereas prior to the correction of his pectus he had found difficulty in keeping up. Thus surgery is undertaken: (1) for cosmetic reasons; the penalty for this is a scar which can be hidden, but it is impossible to hide the bad posture in a well-established case; and (2) to alleviate symptoms; these may be severe. It is true that the percentage of cases with symptoms in our series is not representative, as we are more inclined to see cases who have symptoms.

Brown (1939) and Ochsner and De Bakey (1939) put surgical treatment of pectus excavatum on a sound basis. Many modifications and variations have appeared since that time (Sweet, 1944, 1950; Ravitch, 1949; Wahren, 1950; Brodtkin, 1951; Woods *et al.*, 1952; Johnson and Kirby, 1952). Techniques involving the use of plaster casts, various forms of external traction and fixation, grafts of bone and cartilage internally to support the sternum, and plastic operations upon the deformed costal cartilages are in current practice. It is understandable that such a state of confusion should exist, since the exact aetiology of the condition is not completely settled and no one method of treatment has been 100% successful.

Most present-day operations are based upon the principles of Brown. It is mainly in the method of maintaining sternal elevation and in dealing with the deformed costal cartilages that the various techniques differ. We have been impressed with the modification described by Ravitch (1949), and our present technique is based essentially upon this method. It requires no traction or added supports externally or internally.

Technique of the Operation

The anaesthetic consists of nitrous oxide, thiopentone, curare, and oxygen with an endotracheal tube. A midline incision is made from above the upper limit of the deformity to the epigastrium. The pectoral muscles are dissected laterally to expose the full length of the deformed costal cartilages. Because of the crowding and depression, the lowermost two costal cartilages on each side usually need to be resected to expose the xiphisternal junction. After dividing this a tough fibrous band may be seen running from the posterior rectus sheath to the back of the sternum. This is not always present. When this so-called substernal ligament is divided the xiphoid and rectus retract, sometimes with an audible snap. It is now possible to palpate the entire posterior surface of the sternum and to free all adhesions and remaining diaphragmatic attachments.

If the costal cartilages are deformed they must be completely removed to the level where the posterior angulation of the sternum begins (Fig. 1). The remaining intercostal

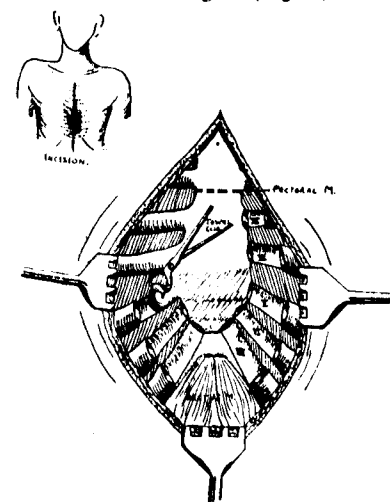


FIG. 1.—Diagram showing the third, fourth, fifth, sixth, and seventh cartilages removed on the left, and the fifth being enucleated on the right, leaving the posterior perichondrial layer intact. The xiphoid has been detached with the rectus after division of the substernal ligament. The upper line shows the usual site of the transverse osteotomy.

position of slight over-correction. The pectoral muscles are sutured to the periosteum of the anterior surface of the sternum near the midline and the wound is closed without drainage. A simple gauze dressing is used to cover the incision, and the patient is got up and dressed the following day. There has been no fixation in any case.

If the operation is done in infancy, before there is any fixed deformity of the sternum or the costal cartilages, only a small transverse incision is needed over the xiphisternum. The xiphisternum joint and the substernal ligament are divided and the sternum and the lowest costal cartilages are freed of any diaphragmatic attachments. We have abandoned subperichondrial resection of the costal cartilages, since it can be tedious and is felt to be unnecessary. A section of each side of the cartilage is freed from the intercostal insertions and a curved blunt periosteal elevator is inserted beneath the cartilage and elevated. This elevated cartilage is then easily divided with a knife and each end picked up in turn with a towel clip, stripped free, and removed. A narrow strip of posterior perichondrium is usually left. The chest becomes firm in two weeks.

In a case with fixed deformity it is essential to be radical. If the deformity of the third costal cartilage is present but not marked it is wrong to spare it. This mistake was made in Case 2; the cosmetic result has been spoilt by the overgrowth of this third cartilage and the patient has a mild degree of pectus carinatum.

The extent of the deformity in each individual must be carefully assessed clinically and at operation to ensure complete removal of all deformed costal cartilages. No harm follows accidental opening of the pleura with an endotracheal tube in place. The lung is kept inflated, the pleura is closed, and any small remaining pneumothorax is allowed to absorb. Occasionally fullness beneath the lower end of the incision will require aspiration, but routine drainage of this space has not been found to be necessary. Respiratory paradox of the anterior chest wall has not been a problem. It was seen in only one patient; she developed a lung infection two days after the operation and the paradox was rapidly brought under control by giving her four million units of penicillin a day. Diligent pre-operative and post-operative physiotherapy is most important in achieving a smooth convalescence and a good result.

The early results in this series of 10 patients is very satisfactory, the longest follow-up being 11 months. Concerning the question of later recurrence, we gain solace from the report of Ravitch (1951), whose patients, treated in this way, have been followed up for five and six years with no evidence of recurrence.

Case Reports

Full reports on all these cases are not given, as in many this would be repetitive; only cases with features of interest are discussed.

The age range of the patients was 2 to 17 years. There were seven males and three females.

Case 1.—A girl aged 15 had had severe symptoms for two years. She was afflicted by frequent attacks of giddiness, which were quite unrelated to any particular posture or

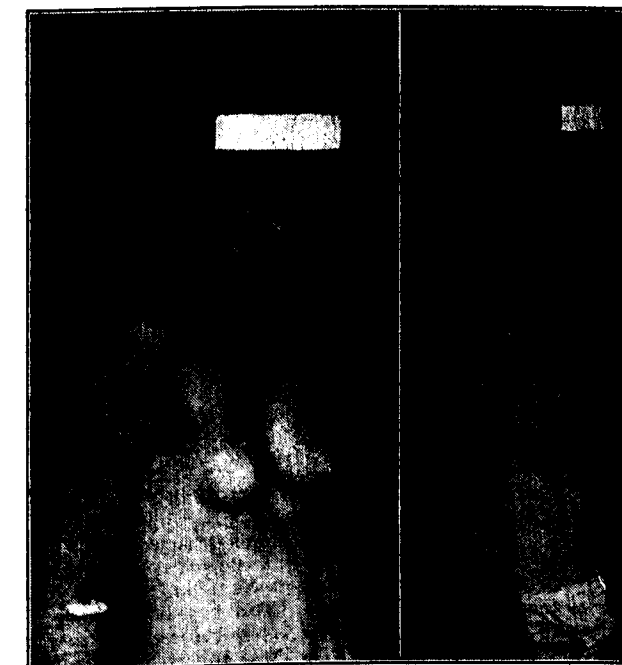


FIG. 2

FIG. 3

FIG. 2.—Case 1. This patient presented with symptoms of pain, dyspnoea, giddiness, and palpitation. Severe degree of deformity and paradoxical movement on inspiration. FIG. 3.—Case 1. Follow-up 11 months post-operatively. Correction maintained and symptoms alleviated.

movement. For 18 months she had noticed a persistent sense of constriction in the chest and on exercise experienced incapacitating discomfort along the subcostal margin, this being always associated with severe palpitations. At the end of a day at school her ankles were swollen. She had ceased all sporting activities because of pain and dyspnoea. On examination the typical deformity of a well-established funnel chest was seen (Fig. 2). Her kyphosis was not fixed,

and there was marked paradoxical movement of the sternum on inspiration. X-ray examination showed a rotation of the heart into the left chest. Angiocardiogram revealed no filling defect. E.C.G. was normal and the circulation time using dehydrocholic acid was seven seconds. In July, 1952, the deformity was repaired. The result is shown in Fig. 3. At her last follow-up, 10 months after operation, there was no recurrence of deformity, her posture was excellent, and she had no disability.

Case 2.—A boy aged 5 had been subject to "bronchitis" all his life. The deformity was first noticed when he was 2½, and it had progressed since. In all respects he seemed a healthy boy except for his recurrent chest infections. On examination a well-marked deformity was seen. On inspiration there was a severe degree of paradoxical movement of the sternum. Repair was carried out. He had a well-formed substernal ligament, and when this was divided the xiphoid and recti sprang away. The mistake was made of not being radical enough; the third costal cartilage should have been removed on either side. His follow-up from the cosmetic point of view was disappointing in that there was some overgrowth of the third costal cartilage. There was no paradox, and since his operation nine months previously he had had no further attacks of bronchitis; this was the longest period he had been free of chest infection.

Case 3.—A boy aged 10½ was completely symptomless. His parents requested the operation because they were a Service family and were anxious for the boy to go ultimately into the Services. Also, they lived in a families camp and

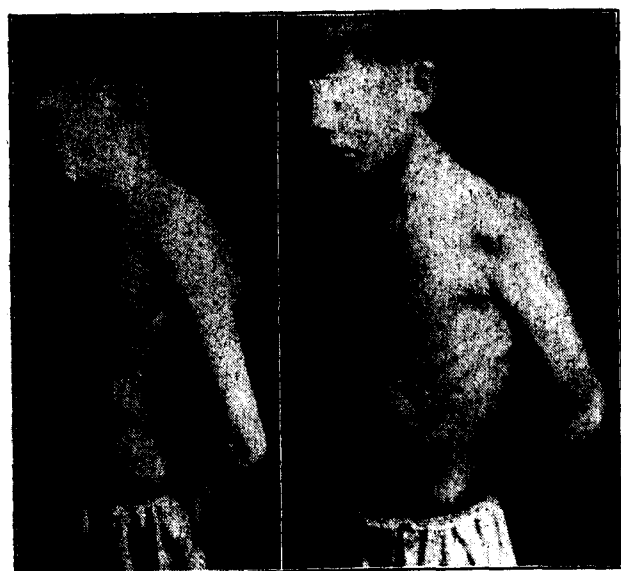


FIG. 4

FIG. 5

Fig. 4.—Case 3. This patient had no symptoms. Fig. 5.—Case 3. Photograph taken just before discharge.

had seen a previous case returned from the unit. Fig. 4 shows the degree of deformity. This boy had a marked paradox. Fig. 5 was taken immediately before his discharge and well illustrates the need for close supervision over the next three to five months.

Case 4.—A girl aged 13 complained of pain in the xiphisternal region associated with exercise. It was a sharp non-radiating pain. It had been present for one year. She became more breathless than her friends and at times found it difficult to keep up with them. Because of a murmur in her heart the school doctor had years previously told her that she had heart trouble. Examination showed typical funnel-chest deformity. There was a systolic murmur over the mitral area. The deformity was repaired; the murmur has now disappeared, and she indulges in full activities without any discomfort.

[Since this paper was submitted five additional cases have been repaired. They have all done well and no complications have arisen.]

Summary

The current concepts of pectus excavatum are briefly reviewed.

A prophylactic operation is advised at an early age to prevent a progressive and permanent deformity. The two main indications for surgery are cosmetic and symptomatic. The technique employed requires no external traction or added internal support. In infancy the dividing of the xiphisternal joint and freeing of the sternum from the diaphragm correct the deformity. Older subjects require the added resection of all deformed costal cartilages and a transverse wedge osteotomy of the sternum.

Ten patients treated by this method are presented. There were no deaths or complications. The early results are satisfactory and encouraging. It is necessary to be radical and to excise all the deformed cartilages.

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ANTIHISTAMINE THERAPY

WITH SPECIAL REFERENCE TO SKIN DISORDERS

BY

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During the past five years a separate out-patient clinic has been held twice a month for the purpose of studying the administration and overall value of the antihistamine group of drugs. Most of the patients attending the clinic have had urticaria. The main problems connected with the use of these drugs can be dealt with under headings of administration, ill-effects, and skin disorders affected.

The Drugs Available

The following drugs of the group are available for oral use in this country.

Official Name	Proprietary Name
Antazoline	Antistin (Ciba)
"	Histotab (Boots)
"	Ben-a-Hist (Bencard)
Bromazone	Ambodryl (Parke, Davis)
Chlorcyclizine hydrochloride	Histanin (Burroughs Wellcome)
"	Di-paralene (Abbott)
Diphenhydramine hydrochloride	Benadryl (Parke, Davis)
Mepyramine maleate	Anthisan (May & Baker)
Methaphenilene hydrochloride	Diatrin (Warner)
Phenindamine hydrogen tartrate	Theophorin (Roche)
Promethazine hydrochloride	Phenergan (May & Baker)
Tripeleannamine hydrochloride	Pyribenzamine (Ciba)
Meclozine dihydrochloride	Ancolan (B.D.H.)
None	Actidil (Burroughs Wellcome)
None	Synopen (Geigy)

"Dibistin" (Ciba) is a mixture of antazoline and tripeleannamine.

"Avomine" (M. & B.) and dimenhydrinate ("dramamine," Searle) contain antihistamines but are primarily used for travel sickness.

There is not much information available about the equieffective doses of the various drugs. In conjunction with Professor W. A. Bain, I carried out comparisons of various drugs in their effects on induced histamine weals in man. It was then found that for single doses 40 mg. of promethazine was equivalent to 275 mg. of mepyramine and 600 mg. of antazoline (Bain, 1949). With repeated doses the drugs with a long action, such as promethazine, will build up a greater effect; and after a week's therapy promethazine, 40 mg., was found to be equivalent to mepyramine, 560 mg., given in a 24-hour period.

The specific histamine antagonism is apparently the same with all the drugs, but the nature and degree of side-effects vary. It is the incidence of the latter, when equieffective doses of the drugs are compared, that usually determines which is the most suitable drug. In a clinical assessment (Bain, Hellier, and Warin, 1948) it was shown that the incidence of drowsiness was greater with diphenhydramine than with mepyramine. When promethazine given in a single dose at night was compared in this respect with mepyramine given three times a day, the side-effects were less, and most patients preferred promethazine (Bain, Broadbent, and Warin, 1949). Recently a similar comparison has been undertaken, using promethazine in a single dose at night and chlorcyclizine given twice a day. Forty-nine patients with persistent urticaria were treated with the drugs in turn, and the dose in each case was adjusted to a level giving approximately the same degree of reduction of the wealing. Nineteen patients had some side-effects with one or both drugs. In seven of these they were less or nil when on chlorcyclizine, in two they were less or nil on promethazine, and in 10 there was no difference. In this clinical comparison chlorcyclizine, 75 mg., gave approximately the same effect as promethazine, 25 mg.

From the preliminary tests it was shown that antazoline was a relatively weak antihistamine, and it has not been used in the clinical work. Tripeleannamine has a similar structure to mepyramine and its effects are about the same.

Meclozine, phenindamine, and methaphenilene do not appear to have any useful advantage over the others, but, together with the recent additions, bromazone, "actidil," and "synopen," my experience with these drugs has been limited, and no clear comparison seems to be available.

In the clinic the main drug used has been chlorcyclizine, but a few patients have had promethazine or mepyramine, and in some cases diphenhydramine has been used when the additional sedative action has been required.

Practical Points in Administration

The dose of the drugs required to suppress weals varies greatly. Apart from the question of body weight and age it has been shown that individual patients vary considerably in the degree of histamine antagonism given by the same dose of one of the drugs (Bain *et al.*, 1948). Thus the same degree of histamine antagonism given in one patient by, for example, 300 mg. of mepyramine a day may be given in another by 900 mg. If a patient shows a small antihistamine effect with one drug of the series, a small effect will generally be given by the other drugs. In the practical administration of the drugs the variation in response is usually overcome by giving the patient an average dose, and if the symptoms are not controlled the dose is raised until either the desired effect is brought about or side-effects become too great.

In addition to this variation in individual response to the drugs the strength of stimulus evoking the treated disorder will vary from patient to patient. If the tendency to urticaria is very great even in a patient relatively sensitive to the antihistamine, it may be impossible to reach a high enough dose of the drug to control the eruption. This is more often seen in the acute attacks of urticaria.

The strength of the stimulus may also fluctuate in the same patient. For example, urticarial weals satisfactorily

suppressed by certain doses of an antihistamine may suddenly reappear coincident with additional psychological stress, or other factor. In such a case higher doses of the drug may again suppress the weals (Warin, 1950a).

Judged by the response of the induced histamine weal, children are relatively insensitive to antihistamines, and consequently a larger amount than the usual proportional age reduction of the dose is necessary to get an effect on weal formation.

The frequency of administration will vary with the length of action of the drugs: promethazine has a long action, and if given in a single dose may control the urticaria throughout the 24 hours. However, in some patients on a single dose the weals return towards the end of the 24-hour period. This could, of course, be controlled by giving a second dose, but can also often be controlled by increasing the single nightly dose. Chlorcyclizine is relatively long-lasting and it seems satisfactory to give the drug twice a day. With mepyramine it is usually necessary to give the dose three or four times a day.

Chronic urticaria quite often fluctuates regularly throughout the 24-hour period, appearing or becoming worse in the evening or in the early hours of the morning. When this is so the drugs should obviously be given to allow the maximum antihistamine effect at this time. The time taken from ingestion to full effect is about two to four hours with most of the drugs. Therefore, for example, in a patient who has a persistent slight wealing but exacerbations in the late evening, the best method of administration might be to use chlorcyclizine, 50 mg. in the morning and 100 mg. at tea-time. In a patient requiring large doses of an antihistamine one may be able to avoid unpleasant side-effects at work or during the daytime by so adjusting the times of administration.

The antihistamine drugs vary in the rapidity of onset of action after ingestion. The new drug actidil apparently reaches its maximum effect more quickly than the others, and it may prove to be the drug of choice when a rapid effect is required.

Often the type of patient who suffers from a persistent urticaria does not sleep well, quite apart from any itching, and in these cases it may be worth while giving at night one of the antihistamine drugs, which usually produces a drowsy effect. Diphenhydramine and promethazine are perhaps the best for this purpose, and, indeed, recently they have been used deliberately as mild sedatives. The drugs can be mixed, and a quite useful combination is chlorcyclizine, 50 mg. twice daily, with diphenhydramine, 50 mg. at night.

The dose should always be gradually reduced before discontinuing treatment. Otherwise, if the tendency to urticaria remains unchanged, the patient may find a sudden and full return of the rash very distressing.

Sometimes the conditions treated are periodic, with intervals of a few weeks between attacks, and in these cases it may be as well to start off with a period of regular daily administration, but later on it is often satisfactory to give the patient a supply of the tablets to take for a few days as soon as the attack begins.

Ill-effects of Antihistamines

The main side-effect of the antihistamines is drowsiness. As has been discussed, this is commoner with some drugs, and is, of course, more often encountered when large doses are employed. It is very difficult to assess the overall incidence of drowsiness. On direct questioning practically all intelligent sensitive patients having average doses will have noticed a little drowsiness. The danger of drivers and workmen in hazardous occupations taking the drugs is of course present, but has probably been overemphasized. Under such circumstances the first dose should, if possible, be taken at a week-end or, if more urgent, in the evening after returning home. In the clinic a number of public transport drivers and a motor-cycle "speedway" rider have been treated for long periods.

Many other side-effects have been described; these include dryness of the mouth, headache, blurred vision, dysuria, nightmares, depression, and other mental changes.

A curious effect is that of a twitching sensation, which is usually felt more in the legs. The muscles ache and the patient is constantly moving and stretching the limbs. Restlessness and a desire to get up and walk about are often felt. This side-effect was first noticed with promethazine (Warin, 1950b), but during the past two years it has been noted with chlorcyclizine and also with diphenhydramine. The symptoms may not be described by the patient, but are not uncommon if specifically inquired about.

Mepyramine and tripeleminamine sometimes give rise to nausea, vomiting, abdominal colic, and diarrhoea. These side-effects are uncommon if it is remembered to give the drugs with or after meals. In potential epileptics the drugs occasionally produce fits (Churchill and Gammon, 1949).

Death associated with convulsions has been recorded in 14 cases when large overdoses have been swallowed accidentally by children. In only one of these children did the amount taken approach the therapeutic dose. This occurred in a child aged 14 months who died after accidentally taking mepyramine tablets, the dose of which was unknown, but assessed at 2-300 mg. (Prain, 1950).

Wyngaarden and SeEVERS (1951) mention reports of three cases of haemolytic anaemia and nine cases of agranulocytosis. In one of the latter the patient, who had mepyramine for three months, died (Glassmire, 1951). Bénard and others (1947) report the case of a patient who died with jaundice and anaemia, but this did not appear to be definitely related to the small dose of "anergan" administered.

Considering the vast amount of the drugs used throughout the world, these few cases have little significance, and it seems that in general these substances are relatively free from serious toxic effects in therapeutic doses, even when administered for prolonged periods. Some patients in the clinic have now received regular and continuous treatment for three to four years without any deleterious effects. There is no definite evidence that tolerance to the antihistamine effect of the drugs occurs. Certainly the drowsy side-effects often become less after a few days and patients may think that they are becoming tolerant to the drugs. It is also possible that the tendency to urticaria becomes greater and gives rise to an increase in weals in a patient in whom the rash was previously reduced, so creating an impression that tolerance was developing. However, the degree of reduction of the induced histamine weal after many months' treatment is unaltered (Warin, 1948).

Skin Disorders Affected

Acute chronic and papular urticaria, dermatographism, and the urticarial response from stings and bites can all be affected. The weals may be completely suppressed or they may just be reduced in number and size according to the level of antihistamine effect obtained. If the underlying stimulus to the urticarial reaction is considerable, as may occur with drug or food urticaria, or if the patient is relatively resistant to the drugs, as, for example, in children with papular urticaria, the weals may not be obviously affected by the doses commonly prescribed.

Although it is not intended here to discuss in detail the clinical value of suppressing or reducing the weals in urticaria, the main conclusions might be mentioned. When the attack is self-limited, as in acute or recurrent urticaria, symptomatic relief with the drugs will have an obvious place in treatment. In chronic urticaria the weals are reduced or suppressed only so long as the drugs are given, and treatment may have to be continued for many months. The period that the underlying tendency to wealing lasts is probably neither shortened nor prolonged by such treatment, but as in most cases considerable relief is obtained

it is thought that antihistamine treatment has an important place in the management of these cases.

It is very difficult to decide how much giant urticarial swellings are affected by antihistamines. In such giant urticaria (angioneurotic oedema or Quincke's oedema) the oedema is largely in the subcutaneous tissues. These swellings may or may not occur in association with chronic urticaria. Clearly they do not respond to antihistamines as well as the ordinary dermal weals, and when both conditions are present the dermal weals can often be completely suppressed while giant swellings may still occur. Fifty-two cases with recurrent giant swellings have been treated, and, although it is very difficult to institute adequate controls in a condition with such irregular manifestations, 40 patients have had a reduction in the number and size of swellings when on antihistamines. Furthermore, there was usually a reduction in the severity and length of time the swellings were present if the drugs were given only at the earliest possible stage in an attack. It therefore seems that, although not affected as much as dermal weals, subcutaneous swellings are reduced.

A type of wealing may occur in association with certain other eruptions, including dermatitis herpetiformis, erythema multiforme, and actinic prurigo. An attempt to assess the effect of antihistamines on these conditions has been made, the antihistamine effect being checked by noting the reduction of induced histamine weals and using a mild sedative in the control periods (Warin, 1950a). In 10 cases of dermatitis herpetiformis it was concluded that, although one or two patients appeared to be improved, in general no specific action on this condition could be demonstrated. Since then a number of cases have been treated, and it has appeared that the cases benefited have been those in which the weal element of the rash has been a prominent feature. Ten cases of actinic prurigo were also assessed in a similar manner; although conclusions were not definite there was apparently some effect from antihistamines. It has proved very difficult to decide whether or not erythema multiforme lesions are reduced.

The eczematous dermatitis reaction affects the epidermis chiefly, but in some cases the skin is raised and tense owing to an associated dermal oedema. In my experience it is only this latter type of the eczematous dermatitis reaction which is affected, and then only with regard to the dermal oedema. The drugs have been used to reduce pruritus from various causes, but it is only the type associated with wealing, as in urticaria, that can regularly be affected.

From time to time it has been claimed that certain other eruptions are affected by the drugs, but as experience becomes wider the number of conditions benefited becomes smaller and it may well be shown eventually that the only conditions affected are those in which wealing is part of the eruption. Halpern (1952) has suggested that the main effect of antihistaminic substances is on the neuromuscular mechanism of certain small vessels. As wealing is dependent on the dilatation of small vessels in the dermis, it would seem likely that the main action of the drugs is to antagonize the dilatatory action of histamine on the dermal vessels and to a less extent on the subcutaneous vessels.

Summary

The antihistamine drugs available in this country are listed and compared.

Certain practical points in administration of the drugs are mentioned.

Ill-effects of the drugs are discussed.

The skin disorders affected are discussed, and it would seem possible that the only conditions of the skin which are benefited by antihistamines are those in which wealing is part of the eruption.

I would like to express my thanks to Dr. C. D. Evans for so kindly referring many patients to me.

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INCIDENCE OF ALLERGIC DISEASES IN GENERAL PRACTICE

BY

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The symptoms of allergic disorders depend upon the antigen-antibody reaction in the shock organ. Von Pirquet defined allergy as an "acquired specific altered capacity to react." Even after 50 years of research in this field, Pepys (1953) points out that this statement is still valid.

The findings of a collagen lesion in serum sickness, periarteritis nodosa, lupus erythematosus, and rheumatic fever, and the improvement in these conditions after cortisone or A.C.T.H. therapy, suggest that allergic reactions might play some part in their aetiology. We decided to investigate the incidence of five of the common allergic diseases in our practice—namely, bronchial asthma, allergic rhinitis, urticaria, atopic eczema, and drug allergy.

The practice, an industrial one comprising about 4,000 patients, is carried on from two surgeries. Details of attendances and treatment are recorded daily in each surgery. The period of this investigation was from September 1, 1952, to September 1, 1953.

Diagnosis of the Allergic Diseases

Only a brief account of the diagnosis and differential diagnosis of allergic diseases is given.

The general practitioner has the best opportunity of diagnosing common allergic diseases. A careful history-taking is most important, and should include the main complaints, details relating to the cause of illness, past medical history, family and social history, environmental background, and history of previous treatment. History-taking has been emphasized by Tuft (1949), Herxheimer (1952), Sheldon *et al.* (1953), and other allergists. The therapeutic application of adrenaline and ephedrine in acute attacks of asthma and antihistamines in allergic rhinitis and urticaria is helpful in establishing the diagnosis.

We agree with Freeman (1950) that x-ray examination of the chest in asthma is not essential. Laboratory investigations, skin tests, and estimations of vital capacity are more useful for the management of the patients than for diagnosis. Cases of chronic bronchitis and emphysema were excluded.

In allergic rhinitis a history of recurrent attacks of rhinorrhoea, sneezing, itching in the eyes, nose, and pharynx, and a general feeling of fatigue are the complaints. Examination reveals bluish oedema of the nasal mucosa and sometimes polypi. Sheldon *et al.* point out that sore throat and enlargement of cervical lymph nodes are not common

in allergic rhinitis. The finding of large numbers of eosinophils in nasal smears helps in doubtful cases.

Urticaria may be acute or chronic: the acute type generally disappears within a few days or weeks; chronic urticaria may continue for months or years (Tuft, 1949; Sheldon *et al.*, 1953). The patient complains of an itching or burning sensation. The diagnosis is made on the finding of weals, which may vary in size and shape.

Atopic eczema was diagnosed by the finding of superficial cutaneous eruptions involving the flexural surfaces; adequate history is very important (Vickers, 1952; Sheldon *et al.*, 1953).

Drug allergy presents a great problem. A memorandum on the sensitivity of antibiotics (*Med. Offr.*, 1953) emphasizes the importance of this subject. Reports of deaths attributed to phenylbutazone have appeared in the medical and lay press. Penicillin may cause dangerous or even fatal reactions (Pick and Patterson, 1953; Siegal *et al.*, 1953). Drug allergy may develop after ingestion, parenteral injections, or contact with the offending agent, and it may manifest itself in the immediate or delayed type of reaction (Rackemann, 1953; Pepys, 1953; Sheldon *et al.*, 1953). The manifestations of drug allergy are various, the commonest being the skin lesions. The most serious, however, are agranulocytosis and thrombocytopenia, and thiouracil is the common cause of the former and "sedormid" (Grant, 1953) of the latter. Diagnosis depends on history, general examination, and cessation of symptoms on stopping the offending drug.

Differential Diagnosis

The diagnosis of straightforward cases of allergic disease, like many other medical or surgical conditions, is not difficult. The elderly hypertensive and arteriosclerotic patient with incipient cardiac failure gets attacks of dyspnoea; the child with recurrent attacks of bronchitis and bronchiolitis presents wheezing and cough. Periarteritis nodosa or Löfller's syndrome (Rubin, 1947) brings on asthma-like attacks. Here the eosinophil count is of great value. Bronchogenic carcinoma is getting common, and we encountered one patient suffering from it who self-diagnosed asthma.

Septal deflections, enlarged turbinates, enlarged tonsils and adenoids, infective sinusitis, and the common cold are the conditions mistaken for allergic rhinitis.

Children like to scratch the itchy urticaria weals; urticaria should then be differentiated from scabies or chickenpox.

In atopic eczema the secondary changes resulting from scratching and infection may lead to a variety of skin abnormalities: erythema, papules, wealing, scaling, pigmentation, and lichenification. Cases of seborrhoeic dermatitis and contact dermatitis were excluded.

Results of Observations

Table I shows the age and sex incidence of the five allergic diseases. Table II gives the percentage incidence of allergic diseases. Table III shows the duration of symptoms for each group. Drug allergy is of special interest

TABLE I.—Age and Sex Incidence of Allergic Diseases

Age	Asthma		Urticaria		Allergic Rhinitis		Atopic Eczema		Drug Allergy	
	M	F	M	F	M	F	M	F	M	F
0-1	1		9	8			1			
2-4	6		11	4	1		2			
5-9	4	2	5	5		1				
10-14	3	2	5	5	2					
15-19	4		2	2		1				1
20-29	3	2	1	2	2		1			
30-39	6	9	4	1	6	4	6	1	2	2
40-49	4	3	1	2	4	4	5	2		1
50-59	4	9		3	1	3	1	1	1	2
60-69		5		1	1		3			
70+	1			1						
Total	36	32	38	34	17	13	18	9	4	8
	68		72		30		27		12	

TABLE II.—Incidence of Allergic Diseases

	Asthma	Urticaria	Allergic Rhinitis	Atopic Eczema	Drug Allergy
Allergic cases	32.5%	34.5%	14.4%	12.9%	5.7%
Total practice of 4,000 patients	1.7%	1.8%	0.8%	0.7%	0.3%

TABLE III.—Duration of Symptoms in Allergic Patients

Duration	Asthma		Urticaria		Allergic Rhinitis		Atopic Eczema		Drug Allergy	
	M	F	M	F	M	F	M	F	M	F
<1 month	4	3	28	25			1	1	4	8
1-6 months	2	1	1	2	1		4	3	2	2
6-12 months	2	1	1	2			4	3	2	2
1-2 years	2	4	3	3	3	2	2	2	2	2
2-5 years	4	2	4	1			2	1	2	2
5-10 years	3	5			8	2	2	1		
10-15 years	4	6	1	1	4	2				
15-20 years	3	1			1					
20-30 years	1	1								
30+ years	2	2								

TABLE IV.—Details of Patients Suffering from Drug Allergy

No.	Sex	Age	Drug	Route of Administration	Manifestations
1	F	43	Phenylbutazone	Oral	Generalized urticaria
2	F	62	"Sulphatriad"	"	Skin rash, conjunctivitis
3	F	51	"Artane"	"	Generalized urticaria
4	M	35	A.T.S.	Intramuscular injection	Generalized urticaria, joint pains
5	F	67	Methylthiouracil	Oral	Agranulocytosis
6	M	28	Penicillin	Intramuscular injection	Generalized urticaria
7	F	57	"Acriflex"	Local application	Skin rash
8	F	18	Diphtheria immunization	Intramuscular injection	Generalized urticaria
9	F	35	Auristillae phenolis	Local application	Skin rash of face
10	M	56	Morphine hydrochloride	Subcutaneous injection	Circulatory collapse
11	F	38	Acetylsalicylic acid	Oral	Asthma
12	M	37	Streptomycin	Intramuscular injection	Generalized urticaria

TABLE V.—Patients with Collateral Allergy

No. of Patients	Sex	Main Complaint	Other Complaints
5	M	Asthma	Allergic rhinitis
12	F	"	"
1	F	"	Urticaria
2	F	"	Atopic eczema
2	F	Urticaria	Allergic rhinitis
1	M	"	"
1	M	Atopic eczema	Urticaria
1	M	Allergic rhinitis	Atopic eczema
1	F	"	"

from the therapeutic point of view, and details of the patients suffering from it are given in Table IV. Table V shows the patients with collateral allergy—that is, suffering from more than one form of allergic disease simultaneously. Such patients have been listed once only. They are included in the group which covers the most serious of their complaints—for example, a patient with severe recurrent attacks of asthma and also hay-fever is listed with the asthma cases. This is done to avoid duplicating the figures and to keep a true picture of the incidence.

Discussion

The figures given in the tables may not represent the actual incidence of the allergic conditions in this country, but they do give the true figures for this section of the population who come to the average surgery for these complaints.

Asthma.—Of 68 asthma cases, 45 fall within the working-age group (20 to 70 years), and 37 suffered from asthma for over five years. Although we are not discussing the management of asthmatics we would like to mention that our attitude towards these patients was similar to that which

the average practitioner takes with his epileptic patients. They were encouraged to stay at work, kept under constant supervision, and invited to pay frequent visits to the surgery, not only for treatment, but to report their progress. The results were good, and most of them are usefully employed.

Urticaria.—Out of 72 patients 32 were under 5 years of age. As is well known, "spots" usually compel most parents to attend the surgery promptly, hence the high proportion of small children in this group. Table III shows that 53 cases were of the acute variety, lasting less than four weeks. Some mothers could trace the offending allergen to foods. Sheldon *et al.* (1953) explain the greater incidence of food allergy in children by the fact that small children appear to absorb undigested food particles more readily than adults.

Allergic Rhinitis.—As stated before, these figures may not represent a true picture of this condition. The general public tend to neglect or ignore the usual allergy, and the children who undoubtedly suffer from it are labelled as "tonsils and adenoids." Doctors often make this mistaken diagnosis. There were only 30 cases, and only one had the condition for less than six months. The rest had suffered for two years or more. One child under 5 was diagnosed, and only four patients aged 5 to 19. There were 23 cases over the age of 30. Table V shows that 20 allergic patients had allergic rhinitis as collateral allergy and were therefore not included in these figures.

Atopic Eczema.—This condition tends to occur with acute exacerbations, and the figures support this clinical finding. Only five children were affected by it, and 22 patients were over 20. Seventeen patients had this condition for less than one year, and only six had it for more than two years.

Drug Allergy.—In this group 12 patients suffered from definite drug allergy. In each case the symptoms lasted less than a month; 11 of the patients were over 20 years of age. The list of offending drugs becomes longer every day, and the incidence of drug allergy must vary with the habits of individual doctors in drug prescribing. The unjustified use of well-recognized potential drug allergens without clear indication will greatly alter these figures—for example, penicillin ointments and creams for all types of skin blemishes or sulphonamide tablets for elevation of temperature. We tend to avoid antibiotics in local applications, and do not use heavy metals and other drugs recognized to give a high incidence of drug allergy, especially if alternative measures will suffice. In fairness to the drug manufacturers it should be stated that certain drugs are often blamed as allergens when some inactive ingredient in the pill or medicine is the actual allergen. Indeed, some useful drugs have been banished into oblivion because of slight reactions which may have been wrongly attributed to their use. Lastly, drug allergy may give rise to some very serious and sudden reactions, and this should be kept in mind when drugs are given parenterally.

Summary

Observations were made for a period of twelve months on the incidence of five allergic conditions: asthma, urticaria, allergic rhinitis, atopic eczema, and drug allergy in a general practice.

Tables give the details of these observations.

The findings and their significance are discussed.

Special note is made of drug allergy.

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EPIDEMIC OF INFECTIVE HEPATITIS IN AN OXFORD COLLEGE*

BY

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Infective hepatitis has long been recognized as a disease due to a specific micro-organism. This was Cockayne's opinion in 1912, and during the first world war and the next few years much work was carried out confirming this opinion, and distinguishing the disease from leptospiral infection and from other bacterial causes of jaundice (Willcox, 1919; Morgan and Brown, 1927; Gardner and Brown, 1928). In the years between the wars it became generally recognized that infection was usually spread by means of personal contact of some kind (Booth and Okell, 1928; Findlay *et al.*, 1931), and in 1939 Pickles emphasized the important part probably played by droplets from the respiratory tract.

During the second world war the aetiology of infective hepatitis again became an important problem owing to the high incidence of jaundice in the Forces. A number of epidemics in this country were studied with the greatest care (Newman, 1942; Ford, 1943; Lisney, 1944); and special efforts were made to correlate the observations made by Service medical officers, both British and American (Spooner, 1944; McFarlan, 1945; Gauld, 1946). Information collected in this way confirmed the importance of personal contact in the transmission of infection; but it was recognized that this contact was often of an indirect kind, and that the virus could be transferred as readily by fingers and feeding utensils contaminated with faeces or droplets as by direct droplet infection. Also during the war it was considered justifiable to carry out transmission experiments on human volunteers, and, by using material from patients in the early stages of the disease, it was found that infection could be transmitted by inoculation with serum and by oral and nasal administration of faecal suspensions (MacCallum and Bradley, 1944; Havens *et al.*, 1944; Neefe and Stokes, 1945).

As might be expected, from the discovery of the virus in faeces, food-, milk-, and water-borne outbreaks of infective hepatitis have occasionally been reported (Neefe and Stokes, 1945; Gauld, 1946; *Hlth Bull., Edinb.*, 1943; Read *et al.*, 1946). An epidemic of this kind occurred in an Oxford college towards the end of the Hilary Term, 1950, and, owing to a fortunate combination of circumstances, it was possible to be reasonably certain when infection took place and what article of food conveyed the virus to its victims.

History of the Epidemic

The Main Wave of Infection

The outbreak first came to light on May 31, 1950, when three cases of infective hepatitis were diagnosed among undergraduate members of the college in question. Next day eight more cases were found, and on the day following another 12. These cases and all subsequent ones were distributed at random among those living in college, in college annexes, and in lodgings.

Once it was realized that an epidemic was in progress, inquiries were made, aimed at discovering any patients who had fallen ill before May 31 and who might be under the care of other practitioners. There were three such patients,

including one who had begun his illness as far back as May 22, and this date has therefore been taken as marking the onset of the epidemic. From June 2, the day on which 12 cases were discovered, cases continued to appear with decreasing frequency for another week. The last patient in this wave of infection began his illness on June 10.

Incidence of Cases: May 22 to June 10.

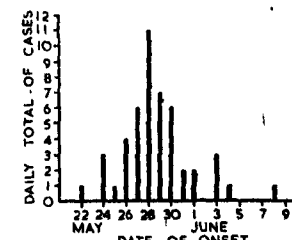
Date	Daily Total	Date	Daily Total	Date	Daily Total
May 22	1	May 29	7	June 5	0
" 23	0	" 30	6	" 6	0
" 24	3	" 31	2	" 7	0
" 25	1	June 1	2	" 8	1
" 26	4	" 2	0	" 9	0
" 27	6	" 3	3	" 10	1
" 28	11	" 4	1		

Between May 22 and this date—that is to say, during a period of 20 days—49 people had fallen ill with infective hepatitis, all connected in some way or other with the college, 47 of them being undergraduates. The table shows the number of cases occurring each day, and is accompanied by a histogram constructed from the figures.

Owing to its explosive nature the epidemic was regarded from the start as being due to a food- or milk-borne infection, and one of the first steps taken was to inquire among the kitchen and buttery staffs for any case of jaundice or "gastric flu" that had occurred four to five weeks previously. This inquiry proved fruitless, as did also all subsequent attempts to find an antecedent case that might have been the original source of infection.

Further light, however, was thrown on the problem on June 5 when a daughter of one of the college scouts and a patient of my practice attended surgery deeply jaundiced, having fallen ill seven days previously, on May 29—that is to say, at the height of the college infection. Next day I visited her in her home, and she admitted that she often had snacks of food in the college, and that about six weeks previously she had consumed a large plate of particularly delicious fruit salad and custard. She was quite sure that this was the only dish of food, apart from rolls and butter and pieces of cake, that she had eaten in the college during the previous few months. It seemed probable that she had acquired her infection from the same source as the undergraduate patients, and attention was therefore directed to the fruit salad and the custard as possible vehicles of the infective agent. On being questioned further, she remembered that she had eaten her helping of sweet on a Saturday evening, and that it had been left over from dinner on the previous day. Information was obtained from the college steward that fruit salad and custard had been served at dinner in hall on Friday, April 28.

At the suggestion of the medical officer of health, the problem of the date or dates of infection was next approached from a different angle. An attempt was made to discover a single meal or a small number of consecutive meals which had been eaten by all the undergraduate patients. It could be taken for granted that those living in college took their meals in hall regularly. So special attention was directed to the signing-in records of those patients who lived out of college, and who therefore lunched and dined in hall only occasionally. It was discovered that all patients in the living-out group either dined in hall on April 28 or lunched there on April 29. The menus showed that fruit salad and custard was served as a sweet on both occasions. These facts were consistent with the discoveries which had already been made about



Histogram of cases, showing distribution about a central peak.

*The Charles Oliver Hawthorne Clinical Prize essay for 1953.

the scout's daughter and her helping of sweet, and they contained the additional information that the custard was eaten on two consecutive days.

At this stage of the investigation the curious fact emerged that there were no cases of jaundice among the six members of High Table who dined in regularly, nor among the kitchen and butchery staffs, who were about 15 in number. No cases were in fact ever discovered among these groups, both of which included a proportion of young adults who, on the face of it, shared an equal risk with the undergraduates. Their escape was readily explained, however, when it was discovered that the dons had ice cream with their fruit salad, from a source outside the college; nor could there be much doubt that the kitchen and butchery staffs would have made the same choice also.

How the custard could have become contaminated was never discovered with any certainty. Presumably the virus might have gained access either to the milk from which the custard was made or to the custard itself at some stage while it was being prepared and handled. At any rate, contamination must have taken place inside the college, because had the milk been contaminated outside there would have been other outbreaks of infective hepatitis among those families and institutions which were supplied from the same source. From an inquiry carried out by the medical officer of health among general practitioners it was learnt that, although the incidence of infective hepatitis in the city was probably above the average, there was no widespread epidemic.

In order to account for the infection of those patients who missed dinner on April 28 and were presumably infected at lunch on April 29, it must be assumed that virus was carried over from one meal to the other. Custard was served at both, and it is probable that any left over from Friday's dinner would have been added to the fresh lot made for lunch on Saturday. Alternatively, receptacles which had been contaminated on the first day may still have contained sufficient virus, in spite of being washed up, to infect their contents on the second day. Although the washing-up arrangements in the college kitchen appeared to be very efficient, they may easily not have been thorough enough to destroy a relatively heat-stable virus.

A final piece of evidence in favour of the supposed dates of infection came to light later on, when it was discovered that an undergraduate guest from another college, who dined in hall on the suspected Friday night, fell ill with hepatitis on June 3—that is to say, near the peak of the college infection.

Secondary Cases

When infective hepatitis affects a closed community, a school for instance, it is common for a number of secondary cases to occur about a month after the primary wave of infection. The same thing often happens on a smaller scale in families. In the Oxford epidemic, however, probably owing to the fact that personal contact in a college is not very close, there were only three secondary cases, so far as could be discovered. One of these, the case of a patient who fell ill on June 30, came to light during the long vacation. The other two were reported during the following term after a notice asking for information on the subject had been displayed in the junior common-room. These latter were the cases of two friends who went on a hitch-hiking tour of France. One dated his illness from about June 20, and the other definitely from June 27, when he had an attack of "sunstroke," which was presumably the pre-icteric stage of infective hepatitis starting with acute febrile symptoms. Both these men were ambulant during most of the time they were jaundiced.

It could be argued that these three cases were a continuation of the main wave of the epidemic, and not due to secondary spread of infection. However, there was an interval of 10 days between the case already postulated as bringing the main wave of infection to a close and the first

case of this second group. In addition, all these later patients fell ill between 23 and 33 days after the peak of the main wave on May 28. They all admitted to having had plenty of contact with earlier patients during the term, and could easily have acquired their infection in this way.

Clinical Description

The 47 undergraduate members of the college who were affected by the main wave of infection form a conveniently homogeneous group of patients, and it seems worth while to comment briefly on the clinical aspect of their illness. The majority of them were under my own care, although some only to start with, because I had as many of them as possible transported home by car as soon as they were fit to travel. Of the remaining few who were not under my care, through the courtesy of colleagues I was able to interview and examine all but one, an undergraduate who fell ill while at home and wrote later to say that he became jaundiced on June 2.

Besides the 47 definite cases of infective hepatitis there were two others, which may have been examples of sub-icteric infection. Both patients were undergraduates who developed symptoms suggestive of the pre-icteric stage of infective hepatitis, but who never became jaundiced or passed bile-stained urine, so far as could be observed. It must be remembered that minor gastro-intestinal disturbances of a non-specific kind are always common among the undergraduate population of Oxford during the summer months.

The onset of the disease was abrupt in all the patients except two, who began their illness with an insidious malaise and a gradual loss of appetite. The great majority fell ill suddenly with shivering, sweating, and generalized aches, starting on a definite day and at a definite time which they could remember. These symptoms were usually accompanied by headaches, and in two cases the clinical picture at this stage raised a suspicion of early poliomyelitis. In neither, however, was the headache accompanied by neck stiffness or any other signs of involvement of the central nervous system, and it was not thought necessary to perform lumbar puncture. Two patients started their illness with diarrhoea and two by fainting. In one, the general constitutional symptoms were accompanied by a widespread urticarial rash. A single patient had nose-bleeds, and two complained of local joint stiffness, but neither had signs of effusion. Only two patients had symptoms of irritation of the upper respiratory tract.

Patients rarely complained of specific symptoms indicative of disturbed hepatic function at the onset of their illness. Nausea or vomiting, sometimes accompanied by abdominal discomfort, usually became their most prominent symptoms when they had already been ill for a day or two, and when fever and generalized aches and pains were beginning to subside. Shortly afterwards, darkening of the urine was usually noticed, and at this stage many patients began to feel much less ill in themselves; although in all but the very mildest cases gastric symptoms persisted and gradually became more severe. In two cases nausea improved temporarily with the subsidence of fever, but became more severe again when bile appeared in the urine. One patient denied that his appetite was ever affected, although at the onset of his illness he had a temperature of 103° F. (39.4° C.). It was often difficult to tell when bile first appeared in the urine because accuracy in this respect usually depended upon the patient's own powers of observation, or upon the stage in his illness at which he first happened to be seen by the college sister or myself. So far as could be determined, the urine became bile-stained some time between the second and eleventh day of the illness. Among four patients under close observation from the onset of their symptoms, three developed obvious bile staining when they had been ill for six days and the fourth when he had been ill for three days.

The clinical records of the icteric stage in a large number of cases are incomplete because, as already mentioned, as many patients as possible were taken home by their parents, once the nature of their illness had been established. The cardinal symptom of jaundice was present in all cases, and appeared between the fourth and the fourteenth day of the illness, with a mean about the seventh day. No cases were found in which there was bile-staining of the urine without some degree of jaundice. In 16 cases the urine, as tested by the salicyl-sulphonic acid method, gave a positive reaction for protein. In 21 cases the liver was palpable and usually tender as well. This unexpectedly low figure is probably accounted for by the fact that many of the patients were seen only in the early stages of their illness. In seven cases the spleen was palpable, and in one of these it was also noticeably tender. There seemed to be no correlation between the presence of an enlarged spleen in the early days of the illness and the subsequent development of a severe or prolonged attack. In no case was a generalized enlargement of the lymphatic glands detected. Three patients complained of generalized pruritus. Total white-cell counts were carried out on two patients early in the icteric stage, and gave figures of 5,000 and 8,000 with a film of normal appearance in each case. No other special investigations were carried out.

As a rule, by the time that jaundice had appeared the patient was afebrile and feeling better, but occasionally fever and other constitutional symptoms persisted during the first few days of the icteric stage. This occurred usually in the more severe cases, which in addition showed persistent vomiting, marked prostration, and rapid loss of flesh. In a few cases the illness was so mild that the patient experienced only a transient digestive disturbance, and had completely recovered in less than a fortnight. However, as judged by the standard of cases seen in the Middle East during the recent war, most patients had an illness of moderate severity. An attempt was made to follow up the course of each patient's illness by sending out a request for information on the following points: (1) date of return of urine to normal colour; (2) date of return of normal appetite; and (3) date when the patient considered himself perfectly fit again and/or had regained any weight lost. Thirty-nine patients sent in replies during the long vacation.

An inquiry of this sort has obvious limitations, but the results of this one were clear-cut and consistent with previous experience of epidemic infective hepatitis. In approximately a third of the cases return of appetite and the re-appearance of normal urine occurred after about two weeks' illness, and in another third after about three weeks. Among the remainder, a few took only a week to achieve normality, and the rest between four and six weeks. As was to be expected, convalescence was slow. About two-thirds of the patients took between three and five weeks to recover fully. Only three took a shorter time, and the rest between 14 and 16 weeks. Twenty-two patients reported loss of weight, two of them over a stone (10.9 kg.), and it was obvious that marked loss of weight was a feature of the disease in all but the mildest cases. The only notable symptoms reported as having occurred during convalescence were constipation and lassitude.

Two patients relapsed, one mildly and the other severely. The mild relapse was possibly precipitated by the consumption of alcohol. In the more severe case, relapse occurred four weeks after the onset of the initial attack, and while jaundice was still present. It began with an acute recrudescence of bilious symptoms. This patient took nine months to recover, but by the end of that time all tests of hepatic function were normal.

Discussion

Generally speaking, infective hepatitis is not a disease from which undergraduates suffer frequently. Apart from the victims of the epidemic described in this paper I have records of only six examples of the illness among rather

more than a thousand undergraduate cases of all kinds seen during the four years 1946-50. Not only was the occurrence of the epidemic itself an unusual event, but the features of the epidemic and the circumstances under which it occurred also raised a number of points of interest.

Mode of Infection

Although there is no doubt that infective hepatitis is usually spread by personal contact, the pattern of the Oxford epidemic was strikingly similar to that produced by other infections known to have been spread by food or drink. In particular, it was explosive, and the distribution of cases was that which would be expected if infection had taken place during a short period of time, such as one or two days; their wide "scatter" being related to the long incubation period of the disease. The circumstances of the epidemic make it improbable that all the cases could have acquired their infection by simultaneous contact, either with a patient already suffering from the disease or with a symptomless carrier of the virus. A considerable number of the victims visited the college only for the purpose of eating their meals in hall, and these occasions could hardly have provided the opportunity for sufficient personal contact to account for such widespread distribution of infection within such a short space of time.

In infective hepatitis it seems probable that infection can be transmitted either by personal contact or by the consumption of some article of food or drink containing the virus. In the epidemic under discussion all the evidence pointed to a food- or milk-borne infection, and to custard served at two meals as the particular vehicle concerned. It was never discovered how contamination might have taken place, and it is only possible to surmise that, among those handling the custard, there was a symptomless carrier of the virus, or a subclinical case of infection. Certainly, had there not been a special lookout for suggestive symptoms, some of the milder cases in the college epidemic might well have escaped detection.

Incubation Period

If it is accepted that all cases occurring between May 22 and June 10 resulted from infection that took place on April 28 and 29, the range of incubation period in this epidemic was between 23 and 42 days. These are exact figures, because fortunately both the first and last patients to fall ill consumed only one of the two crucial meals—namely, lunch on April 29. This range is consistent with the findings in other epidemics. Pickles (1939) for instance, in a batch of 40 cases, in which case-to-case spread could be accurately traced, calculated incubation periods varying between 26 and 35 days. Gauld (1946) found a rather wider range of 15 to 41 days in his small epidemic of 11 cases affecting a mountain infantry regiment drawing its water supply for a limited period from a contaminated well; while Neefe and Stokes (1945) found that incubation periods in their holiday camp epidemic varied between 14 and 39 days. Figures of the same order were found by MacCallum *et al.* (1951) to hold good for the epidemic in East Anglia studied by the Jaundice Committee of the Medical Research Council during the period 1943-7.

Attack Rate

The dean of the college kindly supplied the information that 103 graduates dined in hall on April 28, and 138 lunched on April 29. There would have been considerable overlapping between these two groups, and the dean estimated that the total number of men who consumed one or both meals would have been about 150. Out of this 150, 48 fell ill with jaundice—47 members of the college and one guest. Taking into account also the scout's daughter, this gives an attack rate of about one in three. The same figure can be obtained from the description given by Read *et al.* (1946) of their epidemic of 24 cases occurring among medical students living in a hostel.

Summary

During the summer of 1950 an explosive outbreak of infective hepatitis took place in one of the smaller Oxford colleges. The total number of cases was 52—49 occurred within a period of 20 days and comprised the main wave of the epidemic; and 3, occurring later, constituted a minor secondary wave.

Evidence was obtained from which it was reasonable to deduce that this was a food-borne epidemic, the vehicle of infection having been custard that was served at a dinner and a lunch on consecutive specified dates. No certain source of contamination of the custard was ever discovered.

The attack rate among those exposed to infection at the two meals was about 1 in 3; and the incubation period ranged between 23 and 42 days. A histogram constructed from the number of cases occurring each day shows an approximately symmetrical distribution about a single peak, and corresponds to a mean incubation period of 30½ days with a standard deviation of 3½ days.

The epidemic showed no unusual clinical features. In most cases the pre-icteric stage consisted of a well-marked febrile episode. No cases of hepatitis, without obvious bile-staining of the skin or urine, were detected with certainty. The icteric stage varied greatly in severity and duration. Convalescence was frequently prolonged. There was a relapse rate of 4%.

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"The precipitating cause of many malpractice actions is found in the unwise comments or criticism of physicians regarding treatment given to patients by other physicians. Commonly, it is criticism by a succeeding physician of the work of his predecessor on the case. Various authorities have estimated that 50 to 80% of all the suits for malpractice would be eliminated if such destructive criticism could be stopped. It is profitless to attempt to determine why physicians are so likely to criticize destructively and unethically, but the results of it are deplorable. Legitimate criticism can rest only on full knowledge of the facts as gathered from the physician who treated the patient, as well as from the patient."—Louis J. Regan, M.D., LL.B., *New Eng. J. Med.*, 1954, 250, 463.

MONDOR'S DISEASE (SUBCUTANEOUS PHLEBITIS OF THE BREAST REGION)

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We should like to draw attention to an unusual condition characterized by the development of a subcutaneous cord in the breast region, usually along a line from the epigastrium to the axilla. The nature of this cord has given rise to speculation, but it appears to be of vascular origin, and we believe it to be a phlebitis and more particularly a periphlebitis.

The condition seems to be uncommon in this country, but, since it is self-limiting, medical advice may not be sought. Perhaps it is seen more in general practice than in hospital; some experienced general surgeons whom we have questioned have never met with it. It seems to be more common in France, where it is known as "maladie de Mondor," after Henri Mondor, who described cases in 1939, and who referred to it as "string phlebitis of the chest wall." Subsequent papers by Leger (1947), Kapitanoff, Touzard, Darbon, and Sicard (1950), and Kapitanoff and Küss (1950), all refer to it eponymously. But, in fact, the same condition was described in France in 1922 by Fiessinger and Mathieu, in America by Williams (1931) and Daniels (1932), and in this country by Robinson (1935). Adair (1950), in an article on cancer of the breast, stated that he had seen about 26 such cases over a period of 30 years, although most of them appear to have developed the lesion after a breast operation. He referred to it as a condition "which I have not found heretofore described" and which "has been confused with cancer." It is to Hughes (1952) that we owe the most comprehensive account of the disease in English. He gave details of five patients, on four of whom a biopsy was performed.

We describe five cases.

Case 1

An unmarried woman aged 50 attended hospital in July, 1951, having noticed, three weeks before, a tender cord below the breast. Her general health was good and she had had no recent illness, nor had there been a discharge from the nipple.

She was found to have a subcutaneous cord, approximately ¼ in. (6 mm.) in diameter, passing from the lower inner quadrant of the left breast to the left side of the epigastrium. Elevation of the breast made the cord stand out like a bowstring. In the breast, at the upper end of the cord there was indefinite induration, but this was not present when she was admitted a week later. The other breast and the regional lymphatic areas were normal. The breasts were well developed. We wondered whether this was an instance of lymphatic permeation from an occult carcinoma. A small portion of the cord and overlying skin were removed for examination.

Pathology.—In the subcutaneous fat there was a fibrous cord near the centre of which was a ring of smooth muscle. Within this ring was organizing tissue containing a few red cells. Outside the muscle there was connective tissue composed of collagen and fibroblasts with scattered elastic fibrils. In this tissue and around its edge were numerous capillaries. There was no suggestion of an elastic lamina. The cord was a blood vessel, probably a vein, containing thrombus, with marked fibrosis of the adventitia. Serial sections were cut and the cord was seen to divide. No malignant cells were seen. One near-by vessel also showed fibrosis of the adventitia.

When the patient was seen five months later no trace of the cord could be found.

Case 2

A married woman aged 54 was admitted to hospital in February, 1950. For two years the left nipple had been retracted. There had been pain under the breast for two weeks, but no discharge from the nipple.

The left nipple was indrawn and a little blood-stained fluid could be expressed. Passing down from the lower outer quadrant towards the costal margin was a cord attached to the skin and in the shape of an inverted Y. The breast tissue itself felt normal. The other breast was granular and there was a small mobile node in the left axilla. The cord was excised.

Pathology.—In two blocks taken from the specimen, one contained two small thick-walled blood vessels and the other a single larger vessel of the same type. The former were radicles of the larger vessel, which in serial sections was seen to divide. All lay in the subcutis and had narrow blood-containing lumina surrounded by a layer of plain muscle which was enveloped by a thick zone of cellular fibrous tissue containing scattered elastic fibres. No elastic lamina was present. Midway between the divisions of the affected vessel was a dilated lymphatic vessel, about which there were active inflammatory changes. In the subjacent breast tissue there was sclerosing adenosis.

The patient has been seen at frequent intervals, the last occasion being in January, 1953; no further lesion has developed.

Case 3

Mrs. E. K. Dawson, of Edinburgh University, very kindly sent sections from a similar case, and added that, so far as she could recall, it was the only example she had seen. We



FIG. 1.—Case 3. Showing a thin muscle band surrounded by a wide zone of fibrous tissue. The lumen is almost occluded by granulation tissue.

are indebted to her and to Mr. T. McW. Millar for details of the patient and for permission to record the case. We should add that we are responsible for the following interpretation of the sections.

A married woman aged 53 was seen by Mr. Millar in June, 1951. In the right breast there was a centrally placed carcinoma, with *peau d'orange* over the lower half of the breast. A firm

cord-like band, slightly tender, extended from the lower and outer angle of the breast and ran down the chest wall to the costal margin. On lifting the breast the band stood out, and it was obviously close to, and possibly adherent

to, the skin. The lymph nodes in the right axilla and supraclavicular fossa were enlarged. A simple mastectomy was performed and a portion of the cord removed for examination. The patient subsequently received radiotherapy.

Pathology (Fig. 1).—The subcutaneous fat contained a single thick-walled blood vessel of similar type to those described in the other cases. Its lumen was reduced to a narrow crescentic slit by cellular and vascular granulation tissue which lay within a thin band of plain muscle. The main thickness of the vessel wall was, as in the other cases, due to a wide enveloping zone of compact cellular fibrous tissue in which there were irregularly scattered elastic fibres and a few capillary blood vessels.

Two months after operation the cord-like structure was very much less obvious.

Case 4

An unmarried woman aged 51 attended hospital in December, 1951. For two years she had had recurrent trouble from a small area in the left breast, which would come up like a boil and then subside without discharging. She felt unwell when the lesion was inflamed.

Examination showed a reddened indurated area about the size of a shilling in the skin and subcutaneous tissues over the lower inner quadrant of the left breast. A small bead of pus could be expressed. A thickening cord, thought to be a thrombosed vein, was felt running downwards and medially to the epigastrium. There were enlarged nodes in the axilla.

Subsequently the inflammatory area was excised. Histologically this was reported by Dr. R. H. Cowdell to be a subcutaneous giant-cell granuloma, probably of sebaceous origin. There was no biopsy of the cord in this case.

By the following month, the cord had subsided and there had been no recurrence when she was seen in July, 1953.

Case 5

One of us, through the kindness of Mr. Reginald C. B. Ledlie, was able to see this patient, a married woman of 57, who was found to have a tender subcutaneous cord which passed downwards and somewhat medially just lateral to the left breast. Five weeks later the cord was barely palpable, but she had developed a similar lesion in the right upper forearm. Some years ago she had had, in the left upper arm, a tender cord which resolved spontaneously.

Clinical Features

The essential lesion develops in the region of the breast, more commonly in the female. It is a subcutaneous cord which is often at first painful and tender, and which usually runs along a part or the whole of a line passing between the anterior axillary fold and the epigastrium. Usually, as in all these cases, it is below the nipple. Occasionally the cord divides into two or even three, and a case has been described in which a plexiform pattern existed. Earlier authors have described cases in which these cords were found elsewhere on the chest-wall, sometimes extending far down on to the abdomen. This is not surprising if the condition is to be regarded as a phlebitis, for the subcutaneous veins of the region (Fig. 2) have the same distribution as the cords.

Sometimes there is a history of recent local trauma or muscular strain, or of some pre-existing febrile episode or malaise, with or without an obvious local focus of infection, such as was present in Case 4. Case 3 was associated with a carcinoma of the breast, but there may be no symptoms or signs other than the presence of the cord.

The cord itself may be confused with cancer, as mentioned by Adair, and as happened in Case 1. It is possible for such a cord to be associated with an early carcinoma of the breast and for the patient for this reason mistakenly to be placed in an advanced stage and denied radical treatment.



FIG. 2.—The subcutaneous veins of the anterior body wall. (Modified from C. W. Braune by Spalteholz, 1896.)

Pathology

The earlier authors (Fiessinger and Mathieu, 1922; Williams, 1931; Daniels, 1932; Robinson, 1935) attributed the lesion to a superficial thrombophlebitis, although in none of their cases was a histological examination made. Mondor (1939) described the histology in one case and concluded that the cord was either a lymphatic vessel or a vein, and favoured the former as no red blood cells were seen. Sicard (Kapitanoff, Touzard, Darbon, and Sicard, 1950) found a thrombosed vein without phlebitis. Hughes (1952), however, prefers the term "angiitis," and considers the essential lesion to be gross sclerosis around the vessel.

In the present series the three specimens examined all contained red blood cells, so that a lymphatic origin can be discounted, although it is of interest to note that in Case 2 a neighbouring lymphatic vessel was affected by the inflammatory change.

The distinction between an arteritis and a phlebitis is difficult to make, and Hughes prefers the wider term of "angiitis." However, we consider that from the thinness of the muscle band and the paucity of elastic fibres it is much more likely to be of venous origin; furthermore, analogy with similar lesions elsewhere and the location of the cords (Fig. 2) support the view that it is a phlebitis. A striking feature of the lesion is the wide zone of fibrosis around the vessel, a point stressed by Hughes.

Moschowitz (1933) gave details of six patients who presented a similar picture of a subcutaneous cord in the breast region. He examined the cord in one case and found an epithelial structure surrounded by leucocytes. He attributed the lesion to inflammation of a persistent mammary line and termed the condition "vestigial mastitis." We agree with Hughes that photomicrographs of the condition are difficult to interpret. In none of the other reported cases has such an epithelial structure been found.

No wholly satisfactory name has been found for the condition; among those suggested have been "string

phlebitis" and "phlébite en cordon," both of which are concise and describe the clinical features: Hughes favours "sclerosing peri-angiitis of the lateral thoracic wall," a term which describes the pathological features, but which is clumsy and leaves doubt about the type of vessel affected. Although Mondor was not the first to describe the condition, he was the first to study it in detail, and, as we have an affection for the eponymous, we have used the short term "Mondor's disease."

Aetiology

In three of our cases there was no apparent cause. In Case 4 it is difficult not to incriminate the infected sebaceous cyst, which was situated at one end of the cord. In Case 3 the connexion between the thrombosed vein and the breast carcinoma is not clear. Robinson (1935) attributed the lesion to muscular strain: one of his patients had been digging in the garden and the other moving heavy furniture. He compared it with the axillary "phlébite par effort." (It should, however, be mentioned that it is often the exercising of the arm that stretches the thrombosed vein and draws attention to its presence.) The French authors have also noticed the traumatic factor, and a pre-existing influenza-like illness in some cases. Adair (1950), noting the condition in post-operative cases, believes that in the majority it is "unquestionably due to too tight an application of the adhesive over the dressings, blocking the return circulation of the superficial breast veins to the axillary and subclavian veins." It is similarly possible for the breast support worn to impede the venous flow, especially when the breasts are well developed. The reason for the marked periphlebitis is not easy to determine. It is difficult not to postulate an infective agent, as was in fact present in the region in Case 4, and as was suggested by the spread of the inflammation to a lymphatic in Case 2. Clearly, many factors may be concerned in the production of phlebitis here as elsewhere in the body, and none of these factors may be obvious in a given case.

Progress and Treatment.—The lesion itself is self-limiting, and the "idiopathic" variety will resolve without treatment in a few weeks. There is no record of any case proceeding to suppuration. Any associated condition will naturally require the appropriate treatment.

Summary

Attention is drawn to the apparently little-known condition of Mondor's disease (subcutaneous phlebitis of the breast region), five cases of which are recorded.

The clinical features are described and the pathology and aetiology of the malady discussed.

The disease is in itself benign and self-limiting, and may be commoner than is supposed.

We are grateful to Sir James Paterson Ross for his help and encouragement, and for permission to publish Case 1; to Mr. C. E. Shattock for Case 2; to Mr. A. Elliot Smith for Case 4; and to Mrs. Dawson for her help. We should also like to thank Dr. J. W. Whittick and Dr. R. J. R. Cureton for considerable help with the histology.

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PULMONARY OEDEMA DUE TO LATENT PHAEOCHROMOCYTOMA

BY

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The somewhat rare condition of phaeochromocytoma is occasionally diagnosed, but is all too often a necropsy diagnosis. Death is usually due to cerebral haemorrhage, pulmonary oedema, or ventricular fibrillation (Wood, 1950). In the case reported below an unsuspected phaeochromocytoma caused pulmonary oedema during a planned operation for repair of inguinal hernia.

Case History

A robust man of 60 complained of left sciatic pain, thought to be due to a truss he was wearing for a left inguinal hernia. He was admitted to hospital for repair of this hernia. He was robust and apparently in good health: his pulse rate in bed was 60 a minute and blood pressure 140/80 mm. Hg. For the operation he was given premedication morphine, 1/6 gr. (11 mg.), and atropine, 1/100 gr. (0.65 mg.), one hour before operation. Anaesthesia was induced with thiopentone, 0.4 g., and gallamine triethiodide, 80 mg., and maintained with cyclopropane, ether, and oxygen in a closed circuit. A No. 4 Waters airway was inserted. He was placed supine on a horizontal operating table. Respiration was almost adequate by the time he was on the table, and was assisted.

Some 20 minutes after the operation had begun the pulse became irregular at a rate of 80 and cyclopropane was discontinued. The pulse irregularity ceased almost at once, but the rate increased gradually to 120; in the course of a few minutes his skin colour changed from pink to blue and then to grey, the respiration rate increased and moist sounds were noticed, first in the trachea and then in the lungs. The face-mask was removed and mucus aspirated from nose and pharynx. When this had been done he was almost conscious and would not tolerate the airway. The operation had been completed, so he was returned to the ward. There he was conscious and reacted to questions, but cyanosis gradually increased, breathing became laboured, and he was distressed: his pulse rate was about 140 and irregular. It was realized that he had developed heart failure with pulmonary oedema of unknown cause. Oxygen was given by B.L.B. mask and from an Oxford inflator. Nikethamide was given intravenously, two doses of 2 ml.; aminophylline, 0.5 g. intravenously; morphine, 1/4 gr. (16 mg.) intravenously, with no improvement. Death occurred approximately three and a quarter hours after induction of anaesthesia.

At necropsy the lungs were congested and waterlogged, and blood-stained froth was present in all the passages. A haemorrhagic tumour, 2 in. (5 cm.) in diameter, was found in the left adrenal gland; this proved to be a phaeochromocytoma. The histological appearance was typical, the tumour consisting of sheets and columns of polygonal cells separated by a rich plexus of sinusoids with which the cells were in intimate contact. A weak chromaffin reaction was given by these cells when fixed in a solution containing potassium dichromate.

Comment

Macintosh and Mushin (1946) describe how pulmonary oedema may develop during anaesthesia in the presence of an obstructed airway. In this case there was no respiratory obstruction. Death was due to congestive heart failure and pulmonary oedema, which probably followed a sudden rise

in blood pressure and perhaps ventricular fibrillation due to outpouring of adrenaline or noradrenaline. It is uncertain why this developed during operation, but release of histamine at the site of operation may be concerned. Small injections of histamine lead to a fall in blood pressure, and following this there may be a rise in blood pressure above the normal, due to a compensatory secretion of adrenaline (Samson Wright, 1952). The mechanism in this compensation is probably the fall in blood pressure via the carotid sinus, thence via the nerve to the adrenal gland. During operation in normal subjects this complex would be unnoticed, there being no change in blood pressure, but in the presence of phaeochromocytoma it is possible that the secondary overaction of the adrenal glands may be exaggerated.

According to Graham (1951) a potentially fatal paroxysm may be induced by the anaesthesia or by the positioning of the patient. Ward, Riches, and Johnson (1952) discuss anaesthesia for removal of phaeochromocytoma. They advise against drugs which affect the myocardial irritability or cardiac rate, such as cyclopropane, trichlorethylene, and gallamine, and point out that high concentrations of ether may limit any rise in blood pressure. They recommend the use of benzodioxane to limit rise of blood pressure, and intravenous injection of procaine amide to control gross cardiac irregularity. Cobb *et al.* (1953) report the successful control of blood pressure by benzodioxane and L-noradrenaline during surgical removal of a phaeochromocytoma.

The tragedy in this case is that the patient's wife revealed after his death that for two years he had had attacks of palpitations, faintness, sweating, and pallor lasting a few minutes, followed by a sensation of exhaustion. These are very like the paroxysmal attacks described by Smithwick *et al.* (1950). The patient was ashamed of these attacks and did not mention them before operation.

Summary

A case is described in which death occurred due to pulmonary oedema which developed during a planned operation for inguinal hernia. Necropsy revealed a phaeochromocytoma of the left adrenal gland which caused the pulmonary oedema.

We would like to express our thanks to Mr. K. H. Taylor, under whose care the patient was admitted, for permission to publish the case; to Dr. L. E. Glynn for the necropsy report; and to Dr. H. J. Harris for assistance in the preparation of this article.

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The hygiene of seafarers has been receiving attention from a joint International Labour Organization and World Health Organization committee in Geneva. The chairman was the vice-president of the International Shipping Federation, Norway, and Dr. W. M. Frazer, emeritus professor of public health at Liverpool, was vice-chairman. The main recommendations concern the provision of medical advice by radio, the equipment of medicine chests, and the examination of all new entrants to the Merchant Navy for tuberculosis. In general the radio facilities are considered now to be satisfactory. The committee drew up a list of minimum requirements based on the *International Pharmacopoeia* for the medicine chests of ships not carrying a doctor. The drugs in the chest are intended for use by the master on his own initiative in the case of minor ailments and after wireless advice in serious illness.

Medical Memorandum

Uterine Abnormalities in Sisters with Associated Android Features

Since the introduction of hysterosalpingography, and its increasing use in the investigation of infertility, the discovery of congenital uterine abnormalities has become increasingly common. However, uterine malformation in sisters is extremely rare, and with android features is of special interest.

CASE REPORT

A married woman aged 29 first attended the gynaecological out-patient department with a history of amenorrhoea and morning sickness for four months. The menarche occurred at 18. The menstrual cycle was 10-12/50-60 days. She had been married five years. There was involuntary infertility.

On examination a thick-set muscular female with marked hirsutism of face, trunk, and limbs, and male distribution of pubic hair, was seen. Her height was 5 ft. 2 in. (157.5 cm.). Blood pressure was 140/90. Her breasts were well developed, with prominent Montgomery tubercles. Vaginal examination revealed the uterus enlarged, consistent with a ten-weeks pregnancy, and there was moderate hypertrophy of the clitoris. She was referred to the antenatal clinic, where arrangements were made for her confinement in hospital.

At subsequent visits the uterus was noted to be asymmetrical, with a diffuse swelling to the right which could not be felt apart from the body of the uterus. At the 35th week of pregnancy she was admitted to hospital with the signs of mild pre-eclamptic toxæmia and an unstable presentation. As there was no cephalo-pelvic disproportion a uterine malformation was suspected. The toxæmia worsened in spite of rest and sedation, and, because of this and the unstable presentation, delivery by caesarean section was decided upon. At operation a bicornuate uterus was found with the pregnancy contained in the left horn. The adrenal glands were not palpated, but both ovaries appeared to be normal. A male child weighing 6 lb. 2 oz. (2.8 kg.) was delivered, and the patient made an uninterrupted convalescence, being discharged from hospital on the 17th day of the puerperium with the child breast-fed.

Further investigation was undertaken three months after delivery. By this time the child was no longer breast-fed and menstruation had been re-established. A hysterosalpingogram confirmed the presence of a bicornuate uterus, and intravenous pyelography showed a normal urinary tract. Urinary 17-ketosteroids amounted to 14.5 mg. in 24 hours. X-ray examination of the skull showed a normal pituitary fossa.

FAMILY HISTORY

On being informed that she had a double womb, the patient volunteered the information that her elder sister had been investigated at another hospital for a similar abnormality. Information from this hospital stated that this sister had been admitted with a threatened miscarriage, which had completed itself shortly after admission. Examination under anaesthesia had revealed a septate bicornuate uterus, a sound having been passed 9 cm. into the left horn and 11 cm. into the right, but hysterosalpingography had not been performed.

The elder sister agreed to attend the gynaecological out-patient department. She was 31; the menarche had occurred at 17, and the menstrual cycle was 6-8/35-40 days. She had been married nine years, and had had two pregnancies, both having terminated spontaneously at the 10th week.

Examination revealed hirsutism, but to a less degree than in the above case, and hypertrophy of the clitoris. Urinary ketosteroids were 8 mg. in 24 hours. A hysterosalpingogram showed a bicornuate uterus with non-patency of the right Fallopian tube.

The third and youngest sister, aged 22, also agreed to examination. The menarche had occurred at 14, and the menstrual cycle was 5-7/28 days. She was unmarried and nulliparous. Examination showed normal female hair distribution with normal external genitalia. Vaginal examination and hysterosalpingography, performed under general anaesthesia, revealed a normal uterus.

The three sisters had been born and brought up in Ireland and had no brothers. The mother, who still lived in Ireland, apparently had hirsutism, but unfortunately no record could be obtained of the uterus; it had been removed some 15 years previously for menorrhagia.

COMMENT

It does not seem unreasonable, in these cases, to assume a relationship between the uterine abnormalities and the presence of minor degrees of female pseudohermaphroditism, represented by the hirsutism and hypertrophy of the clitoris—the two conditions being produced by the action of androgenic hormones of adrenal cortical origin, in early foetal life, inhibiting normal fusion of the Müllerian ducts, and producing the android features. Greene (1944) produced female hermaphroditism experimentally in animals by subjecting the female foetus to the influence of androgenic hormones, and in these cases various uterine abnormalities also were produced. An example of this occurring in animal life is the sterile freemartin; here the androgenic hormone reaches the female foetus via the placental circulation. However, in experimental cases of intersexuality the earlier the influence of the androgenic hormones in foetal life the greater the degree of sex reversal. Also, as normal fusion of the Müllerian ducts has occurred by the 14th week of intrauterine life, one would expect a much greater degree of sex reversal than in the present case. In Young's (1937) series of female pseudohermaphrodites the uterus appeared either to be normal or to be absent.

Heredity.—That this factor plays a part in the production of female pseudohermaphroditism is well known, especially in its lesser degrees (Browne, 1950). Biggs and Rose (1947) were able to collect nine families affected in this way: two sisters were pseudohermaphrodites, and in four of these families both males and females were affected. That uterine malformations arising from failure of fusion of the Müllerian ducts may also be hereditary has been shown by Way (1945, 1947). In his series there were four cases in which the mother and female child both had uterine abnormalities of this type, and in one of these cases two sisters were so affected. Hunter (1950) recorded 32 cases of uterine abnormalities and added one in which the mother had a fundal depression and the daughter a uterus bicornis bicornis unicollis.

Unfortunately, in our three cases it was not possible to obtain information about the mother's uterus, but the fact that she was hirsute is suggestive that she may have been similarly affected.

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Reviews

WAR SURGERY

Surgery of Trauma. Edited by Colonel Warner F. Bowers, M.C., U.S.A. With Forewords by Melvin A. Casberg, M.D., and Surgeons General of the Army, the Navy, and the Air Force. (Pp. 605; 284 illustrations. £6.) Philadelphia and London: J. B. Lippincott Company, 1953.

This book represents a considered review of war surgery based on the experiences of the medical officers of the armed forces of the United States in the second world war and the Korean war. It contains chapters written by 42 contributors, all but four of whom are officers or ex-officers of one of the fighting services.

As is inevitable in a composite work of this kind, the chapters vary considerably in their scope and their quality. The variation in scope is well seen in two adjacent chapters. Chapter 15 on vascular wounds occupies 34 pages, and, apart from a diatribe against tobacco, is chiefly concerned with peacetime technique. Chapter 16, on fractures occurring in war wounds, deals with the whole of this important subject in 17 pages, of which three and a half are devoted to reproductions of radiograms, yet succeeds in giving a lucid and admirable summary of the principles of treatment, illustrated by case reports.

There are four sections devoted respectively to the physiological aspects of the management of trauma, to regional wound surgery, to military considerations in wound management, and a short final one on research methods. Of these the second is by far the most successful. The writers on general principles know a good deal more about their subjects than about the art of clear writing, and they tend to dump down a mass of unsorted statements and unproved theories for the reader to sort out in his own time and in his own way.

Most of the chapters in the regional section are excellent; the best is Chapter 6, on cranio-cerebral trauma, by Donald Matson. He knows his stuff and knows how to write simply and clearly and to make every figure earn the space it occupies. Chapter 18 on amputations, by Leonard T. Peterson, makes a welcome retreat from the advocacy of guillotine amputations that was the official policy of the American army during the second world war. Dr. Peterson says, "The open amputation was known previously as the guillotine amputation." It was not. A war amputation, with or without flaps, should always be open, and no surgeon with any knowledge of warfare has ever advocated primary suture of an amputation stump. A guillotine amputation was one with no flaps. The fault of the guillotine amputation, and of many of those illustrated in this chapter, is that it involves needless sacrifice of tissue and usually two operations, and offers no additional safety. One of the most detailed, as well as one of the best, chapters is that on genito-urinary wounds, by Colonel James Kimbrough, who during Hitler's war made many friends in Britain. The pages on the management of the neurogenic bladder are admirable.

The book is well produced and contains an immense number of facts and figures. It is a work of reference rather than a guide for the young surgeon, but to the expert, knowing what he wants and where to look for it, it will prove a mine of factual information.

HENEAGE OGILVIE.

PREVENTIVE MEDICINE

Textbook of Preventive Medicine. By Professor Hugh R. Leavell, M.D., Dr.P.H., and Professor E. Gurney Clark, M.D., Dr.P.H. With the assistance of 19 collaborators. (Pp. 629; 28 figures. 68s.) London: McGraw-Hill Book Publishing Co., 1953.

This book is not a textbook according to the generally accepted meaning of the term in this country. Indeed, the authors specifically state that it should be used as a compendium, that it is not a textbook of epidemiology or of

biostatistics, and that it is not intended as a course in public health administration. The chief aim is to advance a philosophical concept and methods of approach to preventive medicine. It is designed mainly for the doctor entering private practice. Dr. Leavell is professor of public health practice at Harvard School of Public Health and Dr. Gurney Clark is professor of epidemiology at Columbia University. Those collaborating are drawn from many American universities and state and city health departments.

The authors wisely decline to attempt to distinguish between "public health" and "preventive medicine." They prefer to consider how the public health officer practises preventive medicine and how the family practitioner applies it—a neat, sound, and subtle distinction. The main sections of preventive medicine are all considered with great care—epidemiology, infectious diseases, nutrition, chronic illness, cancer, maternity and child welfare, mental health, and occupational health. There is an excellent chapter on biostatistics—a subject not too easily assimilated by most doctors, but this makes applied mathematics easier. The few pages on tests of significance provide a most useful and salutary restraint on enthusiasm in assessing ascertained facts.

There is much in this book about American agencies and services, and it is therefore naturally of more use to the American than to the European doctor, but even so a general knowledge of administrative arrangements in the States is useful to us for reference. But most of the chapters are of direct interest and will supply valuable stimulation in all countries where English is read or translated. The extensive references and indications for additional reading give guidance to the reader who may wish to pursue any of the extraordinary variety of special subjects referred to. The paper and binding are superlative. The printing is so unusually good that the middle-aged presbyope may enjoy the unusual experience of reading comfortably without spectacles subject to suitable remoteness of the volume. The British reader who can afford the price will be the fortunate possessor of a book which will be less useful for reference than the standard British textbooks on public health and than at least one American textbook. But it will certainly set him off on new lines of approach to preventive medicine.

C. METCALFE BROWN.

TEXTBOOK OF GYNAECOLOGY

Textbook of Gynecology. By John I. Brewer, B.S., M.D., Ph.D. (Pp. 532; 146 illustrations. 76s. 6d.) London: Baillière, Tindall and Cox, 1953.

Dr. Brewer's previous book was entitled *Gynecology* and presented the subject entirely from the standpoint of symptoms, thus reflecting the teaching plan of the gynaecological department in the medical school of the Northwestern University of Chicago. It now forms the basis of Part 2 of this new work, the first part having been added to supply the undergraduate with a more systematic account of disease to which he can refer when he leaves the bedside. Both sections are neat and compact, but the reasonable size of the book is mainly explained by the omission of embryology, anatomy, physiology, and operative treatment, and by the proper restriction of the place given to endocrine therapy. While expressing views on the pathology of certain diseases which differ from those held by most gynaecologists in Britain, the author impresses the reader by his simple common-sense advice on the handling and treatment of the patient and her complaint. The illustrations are nearly all photographs and do full justice to the art of modern photography.

The main criticism which might be levelled against the book is that the allocation of space fails to indicate or misrepresents the relative importance and frequency of various diseases. Thus Paget's disease and hydradenoma of the vulva receive as much, if not more, attention than does Bartholin cyst; and cervical pregnancy and amoebic vaginitis appear to be as important as adenomyoma of the uterus.

The dual approach to the same subject inevitably means some repetition, but this has its advantages. It is unfortunate, however, that the layout makes it necessary to consult four different chapters in order to get a composite picture of the treatment of fibroids and their complications. The selection and arrangement of subjects for an undergraduate textbook of gynaecology is extraordinarily difficult, and most of the problems can be solved only at the expense of creating others. No author can hope to do more than achieve a credit balance, and Dr. Brewer has certainly succeeded in doing this.

T. N. A. JEFFCOATE.

DIABETES AND ASTHMA

Zur Genese des Diabetes Mellitus und des Bronchialasthmas. By Professor M. Bauer. (Pp. 113. M. 9.60.) Stuttgart: Georg Thieme, 1953.

This is a difficult book to appraise and is concerned with the genesis and nature of diabetes and asthma. It appears to be the forty-ninth book produced in a series on "Work and Health," under the aegis of the German "Ministry of Work." One rather feels that this Ministry must have said to the appropriate authors, "Keep writing and we will publish."

The major part of this book is concerned with diabetes. First, the relation of trauma to the production of diabetes is discussed and no clear connexion found. The relation of the total endocrine system is then considered, and the well-known cycles of carbohydrate metabolism adequately described. Clear, but nothing new. Asthma is treated under two similar headings: is it of pure allergic origin, or does trauma (*schadigungsfolge*), including infections, and particularly bronchial ones, give the answer? The answer is elusive.

Only two sections have a reference section, fairly international. But when the writer of the introduction quotes seven German writers by name "as well as Banting and Best and others" as concerned in the discovery of the relation of the pancreas to diabetes, it leaves a blatantly Germanic and sour taste in my mouth.

R. D. LAWRENCE.

FORENSIC MEDICINE

Forensic Medicine: A Textbook for Students and a Guide for the Practitioner. By Douglas J. A. Kerr, M.D., D.P.H., F.R.C.P.(Ed.), F.R.S.(Ed.). Fifth edition. (Pp. 362; illustrated. 28s.) London: Adam and Charles Black, 1954.

This popular Scottish students' textbook appears in a fifth edition after an eight-year interval. It will be most welcome to a wide circle of both students and general practitioners who desire a concise practical guide to the subject, yet never intend to practise the art themselves. The author writes this time with the newly vested authority of the regius professorship at Edinburgh. Kerr's book has always been sound, lucid, and remarkably well illustrated: we find no change in the easy digestibility of any subject he sets out so succinctly, whether on the dry bones of legal procedure in case of death or on the more arresting subjects of wounds, asphyxia, or the sex offences: Kerr has obviously seen them—and taught on them.

This book, already distinctly fatter than its predecessors, must not grow larger. It is not a comprehensive guide to the subject, and to become voluminous would be to court disaster. It covers a remarkably large field, and Kerr has incorporated new legislature (Cremation Act, 1952, Coroners' Rules, 1953, and newer Poisons Regulations) in order to keep abreast of the times. An interesting short chapter on the history of the subject appears in this edition. A few minutiae are still dated—like the reference to "veronal" as "the most common soporific to cause poisoning," and "deaths from chloroform occur under surgical anaesthesia." We note, too, an anachronism on the wording of the English coroners' suicide verdict—which no longer uses the words "temporarily insane"—and uncertainty on the spelling of M'Naghten and even Romberg. The references for further reading must have attention next time,

for they do not appear to have taken adequate notice of the many contributions to the literature in the subject that the last 10 years have brought. But, by and large, Kerr has done a good job on the text, largely by leaving it well alone, modernizing only its law and statistics. It can be strongly recommended to the student and the general practitioner who wants everyday guidance.

KEITH SIMPSON.

HERNIA

Anatomy and Surgery of Hernia. By Leo M. Zimmerman, M.D., and Barry J. Anson, Ph.D.(Med.Sc.). (Pp. 374; 204 figures. 76s. 6d.) London: Baillière, Tindall and Cox, 1953.

This volume is the result of collaboration between a surgeon and an anatomist, both of the highest standing and wide experience. It is finely produced and superbly illustrated, and it may be taken as the last word in American experience. Naturally it deals for the most part with familiar material and with established methods, but these are well presented and illustrated with quite remarkable accuracy. Every class of hernia is described in elaborate detail, but we do not think that sufficient stress is laid on the importance of the neck of the sac. It is our own belief (we may be wrong) that when strangulation occurs it is invariably at the neck of the sac and physically due to abnormal thickening at this point. In the case of femoral hernia this is of vital importance, for if it is true the femoral ring itself is of quite secondary import. However this may be, the anatomical drawings here presented are of a very high order and worthy of close study.

The chapter by Bettman on diaphragmatic hernia deserves special mention. It gives a full and clear account of this difficult and important condition, and again the illustrative drawings are a pleasure to study and are of real value.

HENRY SOUTAR.

NEUROLOGY AND PSYCHIATRY

Progress in Neurology and Psychiatry: An Annual Review. Volume VII. Edited by Professor E. A. Spiegel, M.D. (Pp. 604. 75s.) London: George Allen and Unwin, 1953.

The association of neurology and psychiatry is closer in the United States than in Great Britain, where co-operation between the two disciplines is exceptional. Professor Spiegel, however, believes that "there is hardly a field of medicine in which the interrelationship between clinic and laboratory work is as obvious as in neurology and psychiatry."

This comprehensive book is the work of 73 contributors; the only non-American authors are Professor Sjögren and Dr. Hallgren (Stockholm), who write on genetics. The book is in four parts: the basic sciences (neuro-anatomy and neuro-physiology), neurology, neurosurgery, and psychiatry. Each contributor, an authority in his own sphere, surveys the abundant literature with a critical eye. The weekly, monthly, and quarterly spate of papers is so great that the postgraduate student finds it difficult to separate the wheat from the chaff. The chaff of this book is negligible, and although the wheat has a particular flavour it is nevertheless genuine wheat.

The psychological aspects of psychiatry receive less prominence in the volume than the physiological. While there are chapters on the neuroses, psycho-analysis, group psychotherapy, and rehabilitation, the book nevertheless gives the impression that the psyche as such is not of vital interest to the editor. The contribution on clinical psychiatry is particularly good, and there are notable chapters in Part I on general and regional physiology.

No one will read this book from cover to cover, for it is essentially a book of reference for the hospital or medical library. Few librarians—provided funds permit—would care to be without it. The general arrangement is clear and the index is good, although it omits the names of the writers mentioned in the host of references given with each chapter.

E. A. BENNET.

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SOCIAL INCIDENCE OF RHEUMATIC FEVER

For many years it has been recognized that the incidence of acute rheumatism is in some way related to poor social and environmental conditions, and attempts have been made to determine what are the important factors and how they operate. Traditionally, living in damp houses and the influence of damp climate were considered important, but there has been little consistent evidence in support of these suppositions. That overcrowding plays a part was suggested by the experience of Dudley¹ in training ships and of Bradley² in a residential school, and Perry and Roberts³ showed that the incidence of rheumatic heart disease in different wards of Bristol was highly and significantly correlated with overcrowding, as measured by the number of persons per room. Daniel,⁴ in a more detailed study in the same city, confirmed this, and in addition concluded that low family income was associated with high incidence. A study of children in Glasgow and London hospitals⁵ suggested that, although the disease was rare among the children of the well-to-do, the artisan class was subject to the greatest risk. Morris and Titmuss,⁶ on the other hand, showed that among males aged 20–35 years in England and Wales there was a steady increase in mortality from heart disease, assumed to be principally rheumatic at this age, on descending the social scale from the Registrar-General's Social Class I, the professional occupations, to Class V, the unskilled workers, and they considered that "the whole complex of poverty" was involved. They did not consider that urbanization or overcrowding as such were important influences. Knowelden,⁷ analysing mortality from heart disease at ages 15–34 years in thirty county boroughs, found a significant correlation with the proportions of the employed population in the lower social classes, but little association with overcrowding.

A major defect of many of these studies has been that they were concerned with morbidity and mortality from rheumatic heart disease and not with the incidence of the underlying condition, rheumatic fever. A factor which increases the prevalence of rheumatic heart disease might act either by increasing the frequency of attacks of rheumatic fever or by facilitating the development of heart disease in patients so attacked. Which of these two possible mechanisms is responsible cannot be determined from information on the end-result, heart disease, alone. Still further does this argument apply to studies based on heart disease mortality in which another variable, fatality from heart disease, is introduced. Since 1947, however, acute rheumatism has been notifiable in certain specified areas in England, making available for the first time routine information on the frequency of first attacks of rheumatic fever. In an analysis of these records received in the first three years of the scheme, Hewitt and Stewart⁸ conclude that, though children of unskilled workers are far more commonly affected than are children of professional and skilled workers, bad housing conditions or poverty are not the responsible factors. They emphasize the greater risk of infection in large families compared with small, and in children just attaining school age compared with children of pre-school age.

The approach to the epidemiology of rheumatic fever has changed with the wider acceptance of the fundamental part played by preceding streptococcal infections. Clinical observations of epidemics of rheumatic fever following epidemics of streptococcal infection have been supplemented by studies of anti-streptolysin titres in rheumatic children, and *Streptococcus pyogenes* has been obtained from a high proportion of throat swabs in children suffering from rheumatic fever. Some trials of prophylaxis by sulphonamide or penicillin in children who have had previous attacks of rheumatic fever have shown that a reduction in streptococcal carrier and infection rates has been associated with a reduction in the incidence of recurrences,^{9,10} but this has not always been confirmed.^{11,12} It is suggested, therefore, that the social incidence of rheumatic fever is the direct result of the social incidence of streptococcal infection.

A recent paper based on observations in Melbourne helps to clarify the picture. Holmes and Rubbo¹³ show that in the years 1938–48 the attack rate of rheumatic fever, based on hospital cases, in children living in low rental areas was three times that in high rental areas, the rate in medium rental areas occupying an intermediate position. Investigations carried out in certain schools in 1947 and 1948 revealed that the carrier rate for *Str. pyogenes* and the proportion of Dick-negative

¹ Spec. Rep. Ser. med. Res. Coun. (Lond.), No. 111, 1926.

² Quart. J. Med., 1932, 25, 79.

³ British Medical Journal Suppl., 1937, 2, 154.

⁴ J. roy. statist. Soc., 1942, 105, 197.

⁵ Spec. Rep. Ser. med. Res. Coun. (Lond.), No. 114, 1927.

⁶ Lancet, 1942, 2, 59.

⁷ Brit. J. soc. Med., 1949, 3, 29.

⁸ Ibid., 1952, 6, 161.

⁹ Massell, B. F., et al., J. Amer. med. Ass., 1948, 138, 1030.

¹⁰ Rubbo, S. D., et al., Lancet, 1949, 2, 311.

¹¹ Brick, M., et al., Canad. med. Ass. J., 1950, 63, 255.

¹² Gale, A. H., et al., Lancet, 1952, 2, 61.

¹³ J. Hyg. (Lond.), 1953, 51, 450.

¹⁴ Arch. Dis. Childh., 1948, 23, 1.

children were both greatest in the low rental areas and least in the high rental areas. They also observed a social pattern in tonsillectomy similar to that seen by Glover in England,¹⁴ with greatest tonsillectomy rates in the higher rental areas. Within each school the streptococcal carrier rate was considerably greater in children who still had their tonsils present than in those who had undergone tonsillectomy. The authors come to the conclusion that tonsillectomy protects against rheumatic fever by reducing the streptococcal carrier rate and also the infection rate.

Holmes and Rubbo propound an interesting theory to account for the social distribution of rheumatic fever, but they have far from proved their case. For example, to clinch their argument they observed that the tonsillectomy rate for rheumatic children, 26%, was even less than that for schoolchildren in the low rental area, 35%. However, this proportion is based on information on only 250 rheumatic children out of the total of 1,469 observed in the whole period, and the effect of this selection cannot be determined. Further, although a precise age distribution is not given, there is evidence to suggest that these rheumatic children may have been younger than the school groups investigated, and this would make any comparison of tonsillectomy rates invalid.

Epidemiology is the art of welding together evidence from many sources. The many investigations into the social incidence of rheumatic fever illustrate this by the contributions of clinical observation, of field studies, of vital statistics, and of laboratory investigation. The story, by its contradictions and uncertainties, also shows that epidemiology demands clear interpretation of precise data.

PENSIONS AND THE COMMUNITY

A great deal has been heard in recent years about the burden the growing numbers of old people will throw upon the community. For this reason an authoritative study showing that the burden can be shouldered without undue strain is reassuring. Such a study was recently undertaken by a research group of the Institute of Actuaries and the Faculty of Actuaries, whose report¹ was published last week. The problem the actuaries set themselves to examine was this. At any given period the country's national income has to maintain a certain number of people who for one reason or another are not contributing to that income—because they are too young or too old, unemployed, or sick and disabled. But in twenty-five years' time those who will have to be maintained because they

are old will have increased in numbers by 50%. Not only this: they will have acquired, in the shape of pensions of all kinds, rights to consume goods and services that will have to be honoured. But if the amount of goods and services produced remains stationary, the old people's rights can be honoured only by compelling, mainly through severe taxation, the earning members of the community to consume less. If this reduction in their standard of living does not take place, if everyone is allowed to try to consume as much as before of a constant amount of goods and services, then prices will be pushed upwards and the people to suffer will be those on fixed incomes and pensions.

The best answer to this problem is a steady rise in the national income—and thus in the amount of goods and services available—large enough for the pensioners' claims on it to be met without reducing the share of others. Before the war, productivity per head is thought to have increased at the rate of 1½% per annum, and since the war there have been years when the rate was as high as 3%. If merely the lower rate is maintained over the next thirty years it will bring about, the actuaries estimate, an increase in the national income of 56%. If, in the same period, pension rights continue to grow so that everyone eventually receives a total retirement pension (including the National Insurance pension) equal to two-thirds of his average earnings, pension payments, according to the actuaries' calculations, would absorb 11% of the national income—or 14% if widows are allowed half their husbands' pensions. The estimated rise in the national income will therefore easily provide for this and for a higher standard of living for other members of the community.

The actuaries' conclusion is reassuring. But is it over-optimistic? One comment that may spring to a professional man's mind is that, even if the national income has been steadily increasing since the war, it does not seem to have improved his standard of living. A bigger national income can always be redistributed according to the fancies of the Government in power, and the heavily taxed middle-classes may well feel that they have seen precious little of the rise since the war. Are they to bear more than their fair share of the amount to be raised by taxation to meet the growing cost of State pensions—as well as any claims on the higher national income that the other social services may stake? Secondly, although it is perfectly realistic to assume that productivity per head will increase at its pre-war rate, this cannot be taken as inevitable. Since there are

¹ *The Growth of Pension Rights and Their Impact on the National Economy* 1954. London.

now virtually no unemployed resources, as there were before the war, a rise in productivity depends on more capital investment and continued technological progress. The actuaries maintain that pension schemes, by enforcing savings, will help capital investment, but they agree that they only do so indirectly. It remains to be seen whether, with all the disincentive of heavy taxation, the country's economy is flexible enough to make the constant adjustments necessary if the national income is to expand indefinitely.

The actuaries were concerned only with the burden of pensions. But old people cannot be guaranteed a certain income and then allowed to get on with it. Their health is frailer, for one thing, and they need more medical care than the younger members of the community. There is no doubt that they will throw an ever bigger burden on the National Health Service, which means that it, in its turn, will have to demand a higher share of the national income. The burden of old people cannot indeed be measured solely in money terms. They raise all sorts of problems—of where and how they should live and who should be responsible for them. The burden will have to be accepted, and the actuaries have shown that, provided there is no national disaster, the next generation of old people need not fear real poverty. But that is only the beginning.

ANTHRAX PROTECTIVE ANTIGEN

The Pasteurian method of producing active immunity against anthrax by means of a living avirulent vaccine has hitherto not been superseded in the seventy years since it was introduced. Killed vaccines are ineffective. On the other hand it is also fifty years since Bail¹ showed that the anthrax bacillus liberates a substance in the body which has an immunizing action; filtrates of fluid from the lesion were shown to have this effect. The antigen responsible was first obtained from cultures by Gladstone,² the medium used containing serum or serum albumin. In order to concentrate or isolate the antigen it would be preferable to cultivate the organism in a protein-free medium, and such cultivation on an extensive scale has now been highly successful in the hands of Belton and Strange³ at the Microbiological Research Department, Porton. The medium used contained, apart from minerals and other basal constituents, certain amino-acids, a casein hydrolysate, yeast extract, and charcoal. The antigen was obtained from culture filtrates by lyophilization or alum precipitation. Satisfactory yields were given by cultures not only of a virulent but of the avirulent "Weybridge" strain.

¹ *Zbl. Bakt., 1904, I Abt., Orig.*, 38, 266.

² *Brit. J. exp. Path.*, 1946, 27, 394.

³ *Ibid.*, 1954, 35, 144.

⁴ *Ibid.*, 1954, 35, 153.

⁵ *Z. Immunforsch.*, 1938, 94, 436.

The material was non-toxic, and in small doses produced solid immunity in rabbits and monkeys against inoculation by injection and inhalation respectively with many times the minimum lethal dose of virulent organisms. Immunization of horses with the alum-precipitated antigen (length of course unstated) yielded a serum the protective power of which was at least equal to that obtained by the usual method of immunization with a living spore vaccine.

In a second paper Strange and Belton⁴ describe attempts to purify the antigen. It may be true to say that large amounts of this material can be produced "with normal laboratory equipment" if normal is understood in a qualitative but not quantitative sense: 1,000 litres of culture were used per week, and the filtration system dealt with 230 litres in five hours. Alum precipitates from this filtrate were the starting material for a process of fractionation which yielded a protein, apparently the protective antigen itself, and a polysaccharide resembling that described by Ivanovics.⁵ The sedimentation pattern and other properties of the protein were consistent with its being a single substance. A single dose of as little as 25µg. of a good batch gave 100% protection in rabbits against challenge with 250 average lethal doses of spores.

It is by methods of this kind, feasible only in an institution with lavish and large-scale equipment, that future progress in obtaining immunizing material of a high degree of activity is likely to be achieved. This antigen has an unexampled potency and may already have been obtained in a state approaching purity. If so, it is the first of its kind, and makes the materials used for most other forms of active immunization look very crude by comparison. There appears to be no reason why it should not replace avirulent living spore vaccines for all purposes for which they are used and for any others which may suggest themselves. The duration of the immunity produced will require further study. These workers mention only that tests on monkeys after one year showed no evidence of waning resistance.

A WIDER VIEW OF EPIDEMIOLOGY

Epidemiology is usually defined as the science of epidemics, and since the term epidemic has been largely confined to the communicable diseases the uninitiated might expect the "epidemiological method" to be the technique of studying the group prevalence and incidence of infections. The term has no such restriction for Dr. John Gordon, of Harvard, who addressed the Epidemiological Section of the Royal Society of Medicine on April 30 on "The Epidemiologic Method in Modern Perspective" and hardly mentioned communicable diseases. He maintains that the techniques developed for the investigation of epidemic diseases can profitably be employed in a far wider field. Although epidemiology still has its immediate practical use as the diagnostic method of public health—its analyses and tabulations are the clinical signs on which health

officers can base diagnosis and prognosis of the mass prevalence of disease—Dr. Gordon was more concerned with its fundamental contribution to knowledge of the diseases (and also of the health) of a population.

The cause of any disease can be sought by three approaches: the clinical investigation of particular patients; the study of possible aetiological factors in the microbiological, pathological, or physiological laboratory; and the epidemiological study of the disease as it affects a number of patients and as it occurs in different geographical or social groups. The three methods of study must continuously interact. The clinician and the laboratory worker can direct attention to possible aetiological agents; and the epidemiologists in investigating them may find correlations that have little real meaning until confirmed by direct experimental study. No wonder that, as Dr. A. M. McFarlan recalled at the R.S.M. meeting, Dr. Gordon's ideal epidemiologist is one who has clinical responsibility for his patients, carries out the field as well as the laboratory investigations, and finally performs the statistical analyses. No wonder too that such an ideal individual has usually to be replaced by a team of specialists.

Dr. Gordon said little about what really constitutes the epidemiological method, and Dr. Ian Taylor's suggestion that the chief characteristic of its practitioners is an attitude of mind that can see beyond the patient in the bed still does not offer very precise guidance to the newcomer. Professor R. Cruickshank¹ gave more helpful detail in his presidential address to the Epidemiological Section two years ago. It seems that what the epidemiologists consider their method (and it differs little from what the practitioners of "social medicine" or of "preventive medicine" regard as theirs) comprises the cumulation of experience from a number of cases, and the treatment of this material by statistical methods, with particular emphasis on possible correlations with environmental or social conditions. Although the early stages of an investigation may often be based on a series of patients suffering from the disease, it is rare for one to be concluded without study of "controls," or indeed of whole population groups.

Clinicians are sometimes scornful of statisticians because their method has to be selective, and because it is not possible to describe the whole of a patient's condition in numerical terms. The epidemiologist retorts² that it is only by abstracting the data in this way that it is possible, physically or psychologically, to arrive at an unbiased assessment in studying the aetiology of disease. The wise epidemiologist will rarely hope that his work will give a final answer to the problems of aetiology. Dr. Gordon's^{3,4} own studies on the causes of death from accidents in Massachusetts are the sort that could lead to immediate remedial methods. But more often—as with current epidemiological studies of cancer, diabetes, heart disease, congenital defects such

as mongolism, and with most nutritional problems—the hope is to restrict the field within which the clinician or pathologist has to seek.

ANTIHISTAMINE DRUGS IN DERMATOLOGY

In recent years there has been a striking increase of dermatitis venenata from the use of topical applications to which the patient is sensitive: it is perhaps the most important skin disease for the practitioner to be able to recognize. Many substances of complex chemical structure have been put on the market, and the suggestion of a rational scientific purpose behind their use has made them attractive to doctor and patient. The antihistamine drugs are an outstanding example and may be assumed to have been a great commercial success. Their use has, however, been much abused. Introduced to medicine by Bovet,¹ these drugs are not the least spectacular or important of the many remarkable chemical discoveries of the last two decades. The antihistamines are of importance in experimental pharmacology and have a wide range of application in general medicine. The antihistamine effect is one common to local anaesthetics, analgesics, and the quinidine type of drug, and the antihistamines themselves share the properties of all these drugs. The range of usefulness in clinical practice may not yet have been fully explored, and it would be foolish and harmful to condemn a drug of obvious importance because of the common fault of abuse.

Because of their local anaesthetic and general sedative effects the antihistamines tend to be used for any and every itching affection of the skin and are prescribed as general sedatives internally. To apply a local anaesthetic for a local disturbance of function is as reasonable or unreasonable as to give a general anaesthetic for a more general disturbance of function. Unfortunately the local anaesthetics, and with them the antihistamines, stand high in the list of sensitizing agents, and much suffering results from the application of antihistamine drugs to the skin for the relief of itching and of eczematous dermatitis. Having become sensitized by local application, the patient will have a relapse of the dermatitis after taking antihistamine drugs by mouth and sometimes also after taking drugs of related chemical structure through cross-sensitization. The American Council on Pharmacy and Chemistry—acting upon the opinion of experienced dermatologists—has recently agreed to discontinue the acceptance of dermatological preparations of all antihistamine drugs and to omit from *New and Nonofficial Remedies* all currently accepted products in that category.² This decision would seem to be a wise one, for dermatological practice would lose little if the antihistamine drugs were entirely withdrawn. Though their use is not essential, they have a specific therapeutic effect in allergic urticaria when taken by mouth. Elsewhere in this issue Dr. R. P. Warin discusses the treatment of skin disorders, particularly urticaria, with antihistamine drugs

administered by mouth, and he concludes that probably the only conditions of the skin which are benefited by them are those in which wealing is part of the eruption. These drugs have no other legitimate place in the treatment of skin disorders, and as local applications are better avoided altogether.

ALGAE AS FOOD

In the twentieth century man is faced by two contrasting perils. He may be burnt to cinders by a hydrogen bomb, or he may succumb to slow starvation through the overcrowding of the world by his ever-increasing progeny. It was the second of these that engaged the attention of the House of Lords last week, and several of the speakers showed their awareness of the urgent need to increase greatly the production of food. Much scope still remains for improving the production of crops and livestock in many parts of the world. Scientists have long been impressed, however, by the potentialities of the sea as a source of food. All denizens of the deep, from whales downwards, depend ultimately for their nutriment on the photosynthetic activities of microscopic algae or diatoms. Would it not be possible to forestall the whale, and to collect diatoms for direct use as human food? Viscount Samuel told their Lordships, for instance, that the blue whale, feeding on plankton alone, can in two years grow to a length of sixty feet and a weight of fifty tons. In the great extent of the oceans the whales are rather sparse, however, and it would be necessary to pass about thirty tons of sea water through a fine sieve in order to collect enough diatoms to weigh one ounce when dried.

According to H. W. Milner,¹ who has recently reviewed the subject, the artificial cultivation of diatoms seems a much more hopeful proposition. Extensive studies, which have already reached the pilot plant scale both in Britain and the U.S.A., have been made with the alga *Chlorella*. This unicellular organism is remarkable both for the rapidity of its growth and for the ease with which its chemical composition can be varied by modifications in the cultural conditions. Thus it may be made to contain 7 to 88% of its dry weight as protein, 6 to 38% as carbohydrate, and 1 to 75% as fat. Unlike most land plants it is entirely edible, without the necessity of discarding a husk or stalk. According to some accounts the taste is insipid, but others suggest a similarity to anchovy paste. Obviously the palatability will depend greatly on the methods of growth and preparation. Terrestrial plants cover the ground only for part of the year, and use only about 2% of the light falling on the area which they cover. *Chlorella* can be made to cover the ground for the whole year, and can use a much higher percentage of the available light. On the sun-lit roof of a factory at Cambridge, Mass., the organism is grown in a large polyethylene tube curved into an oval ring 160 ft. in circumference. The *Chlorella* is suspended in a culture medium containing nitrate, or some other form of combined nitrogen, and air mixed with a high proportion of carbon dioxide

is forced through the system. A pump keeps the *Chlorella* moving round, and a centrifuge removes the crop when the concentration exceeds the optimum for rapid growth. A cooling system is incorporated to prevent the development of excessive heat in the culture medium.

For the manufacture of one ton of dried *Chlorella* about two tons of carbon dioxide and 1.1 tons of potassium nitrate are needed. The degree of "supercharging" to which the organism is subjected may be judged from the inclusion of 5% of carbon dioxide in the circulating air, as compared with only 0.03% in the natural atmosphere. In one year an area of one acre could provide forty tons of dried material, which when cultivated at this rapid rate would contain 50% of protein and 7% of fat. According to current estimates the price under conditions of mass production would be 25–30 cents per lb. If the yield could be doubled and the cost cut in half *Chlorella* would immediately become highly competitive with farm produce in a free market. This might well come about by the selective breeding of new strains, a point made in the House of Lords debate by Lord Stamp, who is professor of bacteriology at the Postgraduate Medical School of London. It would appear that the artificial provision of food by unicellular algae may soon leave the realms of fantasy and become solid fact.

THE ANNUAL MEETING

If the programme of the Annual Meeting published in the *Supplement* this week describes the mingled fare, both grave and gay, offered to visitors, it must perforce omit from the list that unfailing ingredient of Annual Meetings—the hospitality of the hosts. As Dr. A. L. Goodall wrote last week,¹ "Perhaps the most pleasing of the commonly heard remarks of the visitor to Glasgow is that the people are amongst the kindest and most hospitable in the world," and a warm welcome awaits those many doctors who have made arrangements to attend the meeting. Those who have not yet done so would be well advised to make them soon. The plenary sessions, which have proved so popular in previous years, are to be on sleep, food and disease, and pulmonary tuberculosis, subjects of wide interest on which it is hoped many of the visitors will speak. A scientific exhibition is again to be a feature of the meeting, and here technical ingenuity comes into its own. At least one exhibit is to be so up to date that the exhibitors, who are illustrating their current research, are not sure yet what the scope of their exhibit will be. The Scientific Sections will range over clinical medicine, and many excursions have been arranged. Moreover, in the city of Glasgow and its 500-year-old university there is much to see of special interest to medical men. It was here that Lister devised his antiseptic system of surgery, and William Hunter's museum recalls to memory the genius of an earlier pioneer in our profession. The President-Elect is Sir John McNee, for seventeen years regius professor of practice of medicine at Glasgow until his retirement last October.

¹ *Proc. roy. Soc. Med.*, 1952, 45, 621.

² Greenwood, M., *Epidemics and Crowd Diseases*, 1935, London.

³ *Amer. J. med. Sci.*, 1949, 217, 325.

⁴ *Amer. J. publ. Hlth*, 1949, 39, 504.

¹ Bovet, D., *Ann. pharm. fran.*, 1944, Suppl. 4.

² *J. Amer. med. Ass.*, 1953, 153, 1447.

¹ *Scientific American*, 1953, 189, 31.

¹ *Supplement*, May 1, p. 20.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

PITUITARY FUNCTION

BY

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Developmentally the pituitary body can be divided into two parts: that which derives from Rathke's pouch in the buccal cavity and which in the fully developed gland forms the anterior and intermediate part of the gland, and that developing from nervous tissue, represented by the posterior part. The intermediate part is vestigial in man, and its function, if any, has not been satisfactorily elucidated; it is not considered in this article. The anterior pituitary has quite different functions from those of the posterior pituitary and no reason is apparent why the two parts should be joined to form one anatomical structure.

Laboratory tests alone are not always sufficient to diagnose abnormal pituitary function. They can usually only be interpreted by a simultaneous consideration of the clinical findings. In particular a search for evidence of a space-occupying lesion in the region of the pituitary should never be omitted.

Posterior Pituitary

The posterior pituitary is connected by nervous pathways to centres in the hypothalamus, notably the supraoptic and paraventricular nuclei. Its secretory activities seem to

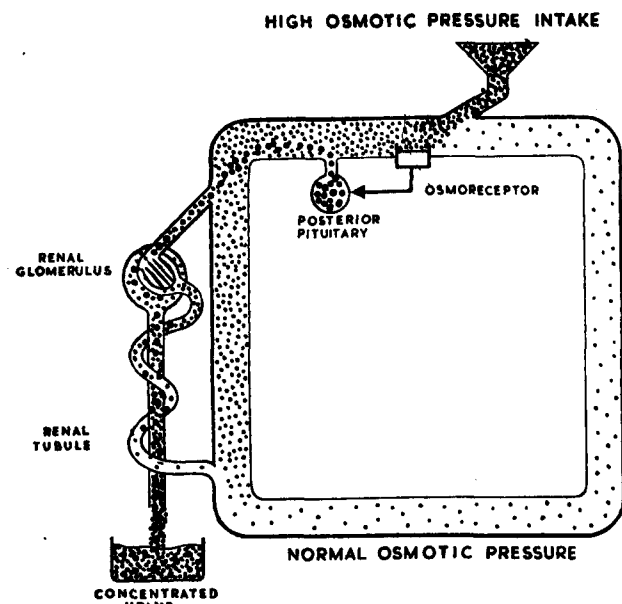


FIG. 1.—Diagrammatic illustration of the regulation of extracellular osmotic pressure by antidiuretic hormones.

depend upon the integrity of these pathways. Extracts of the gland have three main actions. In the first place, they cause a great diminution in urinary output, which has been shown to be due to increased reabsorption of water by the renal tubules; secondly, they cause generalized vasoconstriction and increased peristalsis of the intestine; and, thirdly, they produce contraction of the pregnant uterus. Only the antidiuretic activity is considered here.

It has been shown by Verney that there exist certain cells, called by him "osmoreceptors," which are probably situated in the supraoptic nucleus of the hypothalamus, and which are sensitive to changes in the osmotic pressure of extra-

cellular fluid—in other words, to the concentration of dissolved particles. Whenever this rises above normal, nervous impulses from the osmoreceptors to the posterior pituitary result in the secretion of increased amounts of "antidiuretic hormone" (A.D.H.). This causes an increase in the amount of water reabsorbed by the distal tubules of the kidney, with the consequent production of a more concentrated urine and a fall in the osmotic pressure of extracellular fluid. The system is represented diagrammatically in Fig. 1.

In contrast to the above, lack of secretion of the posterior pituitary will result in the passage of large quantities of very dilute urine and consequently in intense thirst. This is the syndrome of diabetes insipidus.

Diagnosis of Diabetes Insipidus

Clinically, deficiency of posterior pituitary secretion should be suspected whenever a patient complains of intense thirst and polyuria, and when it is found that the urinary specific gravity is never above 1005. Differentiation from diabetes mellitus should present no difficulty because of the presence of glycosuria and a high urinary specific gravity in this condition. In chronic nephritis there are proteinuria, a specific gravity of the urine fixed at about 1010, and a raised blood urea. There are, however, two conditions which can only be differentiated from posterior pituitary deficiency with more difficulty—namely, nephrogenic diabetes insipidus and polydipsia of psychological origin. The first of these two conditions is a rare familial disorder in which the renal tubules do not appear to respond to A.D.H. Differentiation can be made by the following test.

At some specified time—for example, 8 a.m.—the patient is instructed to empty his bladder and the urine obtained is discarded. Any urine passed during the next hour is placed in a bottle labelled "8 a.m. to 9 a.m." At 9 a.m. the bladder is again emptied and the urine placed in this first bottle. Another bottle labelled "9 a.m. to 10 a.m." is provided for urine passed during the second hour, and at 10 a.m. the bladder is emptied into this bottle. Pitressin, at a dosage level of 0.1 unit per 1 kg. body weight, is given subcutaneously at this time. Two further one-hourly samples of urine are obtained in the same manner as the others. The specific gravity and the volume of each of these samples is measured. There should be no restriction of water during this test unless a considerable fall in urinary output after the injection of pitressin is found; in this event, large quantities of water should not be taken until the urinary volume increases. In normal subjects who have not been on restricted fluids, in patients with true diabetes insipidus, and in those with psychological polydipsia the injection of pitressin will be followed by a considerable diminution in the rate of urinary secretion (to less than 1 ml. a minute) and by a marked increase in the specific gravity of the urine. No such change will be found in those with nephrogenic diabetes insipidus.

The following test will differentiate true diabetes insipidus from psychological polydipsia. It should only be carried out with the patient under carefully controlled conditions, otherwise the interpretation may not be satisfactory, and, furthermore, the patient may become seriously dehydrated.

Water is allowed freely, and, there being no evidence of dehydration, two one-hourly samples of urine are collected as in the above test. Water and food are then completely withheld for the next six hours and urine is collected during this period in one-hour samples. In normal subjects and in those with psychological polydipsia the specific gravity of the urine will increase considerably during the water deprivation (to above 1010) and its volume will fall. In those with true diabetes insipidus, however, and in those with nephrogenic diabetes insipidus there will be little change in the urinary specific gravity and volume.

A further test, proposed by Lewis and Chalmers, depends upon the observation that nicotine will stimulate the production of A.D.H.

Urine is collected at 10-minute intervals, and if the urinary flow does not exceed 10 ml. a minute the patient is instructed to drink more water until this level is reached during two consecutive intervals. Cigarettes are then smoked and the smoke inhaled until severe malaise or nausea and perhaps vomiting occurs (this may require up to three cigarettes), the urine being continuously collected at 10-minute intervals. In normal subjects and in those with polydipsia of psychological origin there will be a considerable diminution in urine flow and a rise in urinary specific gravity. There will be little or no effect in patients with true diabetes insipidus, nor presumably in those with nephrogenic diabetes insipidus.

Occasionally a patient with diabetes insipidus will have only a partial lesion of the A.D.H. mechanism, and in this event all these tests may have rather equivocal results.

Anterior Pituitary

On the basis of staining reactions there are three types of cells in the anterior pituitary—basophil cells, which stain with basic dyes; acidophil cells, which stain with acid dyes; and chromophobe cells, which do not stain readily at all. There is no definite evidence that the chromophobe cells secrete any hormone; it seems more likely that they are early forms of both acidophil and basophil cells.

The acidophil cells probably produce a hormone which has been called pituitary growth hormone or somatotrophic hormone (S.T.H.); and hyperplasia or a tumour of the eosinophil cells, producing excessive quantities of this hormone, gives rise to the clinical picture of gigantism or of acromegaly; conversely, lack of this hormone contributes to the picture of pituitary dwarfism. There is a considerable amount of evidence that S.T.H. is very closely allied to, if not identical with, the pituitary substance which will produce diabetes mellitus (diabetogenic hormone).

The basophil cells probably secrete many different hormones, and these seem mainly to control the activity of other endocrine glands. Because of the action of this group of hormones the pituitary has been called the "leader of the endocrine orchestra." They are (1) thyrotrophic or thyroid stimulating hormone (T.S.H.); (2) the hormone which stimulates the adrenal cortex (A.C.T.H.); (3) a substance which stimulates ovarian follicles in the female and the seminiferous tubules in the male (F.S.H.); (4) interstitial cell stimulating hormone (I.C.S.H.) or luteinizing hormone (L.H.); (5) lactogenic hormone—prolactin, which is probably identical with luteotrophic hormone (L.T.H.); Nos. 3, 4, and 5 are collectively termed the gonadotrophins. It seems certain that the

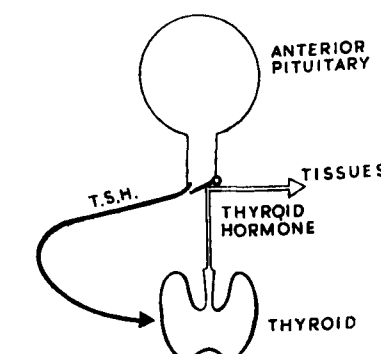


FIG. 2.—Diagram to illustrate the internal regulating arrangements of the pituitary-thyroid axis.

output of these hormones is controlled, possibly through chemical mediators, by centres in the hypothalamus. In addition, in the case of T.S.H. and A.C.T.H. the output of these substances is suppressed by thyroid hormone and by the steroids derived from the adrenal cortex, respectively. This system of control is very important and is represented by the pituitary-thyroid relationship (the so-called pituitary-thyroid axis) in Fig. 2.

It will be seen that externally administered thyroid hormone, provided the dosage is within the controlling limits of the system, will not result in any increase in thyroid hormone in the body, since there will be a suppression of

T.S.H. and a diminished output of endogenous thyroid hormone. Similarly, when cortisone is given there is a suppression of A.C.T.H. production, with consequent diminution in the activity of the adrenal cortex. This is very important, since, if cortisone which has been given therapeutically is suddenly discontinued, there is a period before the resumption of endogenous production of A.C.T.H. and consequent stimulation of increased adrenocortical activity when the patient may suffer from acute insufficiency of adrenocortical activity and may die as the result of what would normally be trivial trauma.

F.S.H. in the female stimulates the development of follicles in the ovaries, and, in conjunction with further stimulation by L.H., oestrogens are produced and maturation of the follicle with ovulation and the formation of a corpus luteum occurs. Further stimulation with prolactin or L.T.H. maintains the corpus luteum for about two weeks and results in progesterone formation. It seems probable that the oestrogens inhibit F.S.H. and stimulate L.H. production, and that, by contrast, progesterone stimulates F.S.H. and inhibits L.H. production. In addition to its action on the ovary L.T.H. will initiate lactation in mammary glands which have undergone the appropriate development associated with pregnancy.

In the male the relationship of these gonadotrophic hormones is by no means so clear, but it seems that F.S.H. stimulates the development of the seminiferous tubules, and that L.H. stimulates the Leydig cells, which, as a result, secrete androgens or masculinizing hormones.

Assessment of Anterior Pituitary Function

It can be seen from the foregoing that direct estimations of the hormones of the anterior pituitary would by themselves give no precise information about whether there was a primary pituitary disorder or not. There are, in any case, no methods of assay of these hormones available for general routine clinical use, though estimations of some are carried out in certain centres. Gonadotrophins are measured in the various tests for pregnancy, but these are derived from the placenta and are present in very much greater quantities than pituitary gonadotrophins.

Tumours of one type of anterior pituitary cell may either stimulate or depress the activity of the other cells. Thus chromophobe tumours, which in themselves have no secretory activity, usually cause a diminution in anterior pituitary function; on the other hand, eosinophil adenomas may be associated with evidence of increased or of decreased activity of the basophil cells.

Thus pituitary abnormalities must be assessed on clinical grounds and by tests of function of those peripheral endocrine glands which are under pituitary control.

On Clinical Grounds

1. By neurological and radiological evidence of a space-occupying lesion in the region of the pituitary. Such a lesion should always be looked for, although of course it is often absent.
2. By a preceding history of an obstetrical catastrophe or intense shock from haemorrhage, followed by symptoms and signs suggestive of deficient pituitary function resulting, as shown by Sheehan, from necrosis in the anterior pituitary.
3. By inference from a combination of clinical signs of various endocrine disturbances—for example, gain or loss of weight, failure of lactation, amenorrhoea, feeling of the cold, loss of libido, loss of axillary and body hair, and atrophic vaginal mucosa on the one hand, and acromegaly, masculinization, Cushing's syndrome, hirsutism, etc., on the other.
4. In childhood, by a consideration of the development of puberty, of growth rate, and of the appearance and union of epiphyses, all taken in conjunction with the patient's age.

By Tests of Function of Peripheral Endocrine Glands under Pituitary Control

The Adrenal Cortex*

(a) *Urinary 17-Ketosteroid Excretion.*—The most direct test of adrenocortical activity in common use is the estimation of the daily output of 17-ketosteroids in the urine. These substances, which stimulate the laying-down of body protein and which may also induce masculinization, are produced both by the adrenal cortex and by the interstitial cells of the testis. The whole of the urinary output in the female is thus derived from adrenal activity, whereas in the male about two-thirds of the total is derived from the adrenals and the remainder from the testes.

A quantitative 24-hour collection of urine is made and 10 ml. of concentrated hydrochloric acid is added as a preservative. This is assayed chemically for 17-ketosteroids; the normal output for 24 hours is roughly as follows, but the figures vary slightly in different laboratories: Adult males, 8 to 22 mg.; adult females, 5 to 14 mg.; children under 8 years, below 1 mg.; subjects between 8 and 20 years a gradual rise to the adult levels of the appropriate sex. In the female, values lower than the above indicate deficient secretion by the adrenal cortex. In the male, low values also usually indicate deficient function of the adrenal cortex (since this produces the major part of the 17-ketosteroids); deficient interstitial testicular secretion may result in somewhat low figures, though often they are in the normal range. If 17-ketosteroids are very low (absent or almost so) then it is probable that both the adrenal cortices and the testes are deficient and this will almost certainly result from anterior pituitary deficiency. Deficient secretion of adrenal 17-ketosteroids in both male and female may be due to a primary abnormality of the adrenal cortex or it may be secondary to anterior pituitary dysfunction. These can be differentiated by finding out whether 17-ketosteroid output varies after several days of treatment with A.C.T.H.—for example, 25 I.U. six-hourly (see below).

Increased amounts of 17-ketosteroids may result from increased stimulating activity of the anterior pituitary or from tumours of adrenal or testicular tissue.

(b) *Estimation of 11-Oxysteroids in the Plasma or Urine.*—These are the hormones secreted by the adrenal cortex, which are concerned in carbohydrate metabolism and in protecting the body against the non-specific effects of injury; cortisone and hydrocortisone are members of this group. Adequate routine methods for the estimation of these substances in plasma are not generally available, but when they do become so they will be extremely important and valuable. Routine methods for urine are in existence, the urine being collected quantitatively for 24 hours, as for the 17-ketosteroids. It will be appreciated, however, that these urinary substances are largely metabolic end-products and an exact interpretation of the findings is still not possible.

(c) *Adrenal Response to A.C.T.H.*—A final diagnosis between pituitary deficiency and adrenal cortex deficiency can be made by following the effect of injections of A.C.T.H. upon 17-ketosteroid output. Obviously, if there is no functioning adrenocortical tissue, there will be no increase in 17-ketosteroid output when A.C.T.H. is given. By contrast, when the lesion is one of the anterior pituitary, the injection of A.C.T.H. will, after an interval, result in an increased secretion of 17-ketosteroids. Details of this test vary in different centres; the one I use is as follows:

Twenty-four hour samples of urine are collected from 6 a.m. to 6 a.m. on each of two control days when no A.C.T.H. is given, and the 17-ketosteroid content of each is estimated. At 10 a.m. and 4 p.m. on each of these days blood is taken and the number of eosinophils per c.mm. is estimated. Starting at 6 a.m. 25 I.U. of A.C.T.H. is then given intramuscularly every six hours for four to seven days. On each of these days the 24-hour output of

17-ketosteroids is determined, and also at 10 a.m. and 4 p.m. blood is taken for enumeration of the eosinophils.

When there is insufficiency of the adrenal cortex—for example, in Addison's disease—there is no change in the urinary output of 17-ketosteroids and no change in circulating eosinophils. By contrast, when there is diminished function of the anterior pituitary, the output rises, usually on the second day of A.C.T.H., and even more on the third and fourth days; at the same time there is a fall in the number of circulating eosinophils and these are usually absent by the end of the third day. In cases of marked pituitary deficiency of long standing it may take five or six days before a significant response is obtained. The eosinophils are counted, because it has been found that the number of these cells per c.mm. of blood is decreased by 11-oxysteroids, and a decrease in their numbers forms a convenient index of increased secretion of these hormones.

(d) *Tests Associated with the Electrolyte- and Water-Regulating Effect of the Adrenal Cortex.*—The water diuresis test presupposes that there is no abnormality of renal function and no liver disease. The patient drinks 1.5 litres of water in the course of 15 minutes, and the excretion of urine hour by hour is recorded. Normally, over 1,000 ml. should be secreted within five hours. With decreased activity of the anterior pituitary and with primary lack of function of the adrenal cortex there is only a small diuresis or none at all during the five-hour period. If the test is repeated on the fifth or sixth day of A.C.T.H. therapy at a dosage of 25 I.U. intramuscularly six-hourly a normal response will be obtained if there is primary pituitary deficiency; in primary adrenal deficiency water diuresis will remain deficient.

(e) *Tests of Carbohydrate Metabolism.* A glucose-tolerance test carried out in the usual way shows a flatter curve than normal in hypopituitarism. In acromegaly and in other syndromes resulting from increased activity of the anterior pituitary the curve is often diabetic in type, in the former because of the diabetogenic effect of S.T.H. and in the latter because of associated overactivity of the adrenal cortex. An insulin-tolerance test carried out by following the change in blood sugar at 30-minute intervals following the intravenous injection of 0.1 unit of insulin per kg. body weight shows an abnormal degree and an abnormally prolonged period of hypoglycaemia in hypopituitarism, whereas in increased pituitary activity there may be no fall in the blood-glucose level. Care should be taken when this test is performed, since in hypopituitarism there is a risk of profound and possibly irreversible hypoglycaemia.

The Thyroid†

Thyroid function is estimated by the basal metabolic rate or by the uptake of radioactive iodine. These may show deficient function either in hypopituitarism or in primary lack of thyroid function. It is possible to stimulate thyroid activity by injections of T.S.H., and this can be used for differentiation. However, no test of this type is yet in general use.

The Gonads‡

In the female the lack of oestrogen production which accompanies hypopituitarism may be detected by the appearance of the cells in smears from the vaginal mucosa.

A small amount of vaginal secretion is aspirated into a glass tube by means of a rubber bulb. In hypopituitarism the vaginal mucosa is characteristically free from secretion and it may be very difficult to get material for a smear. However, if anything is obtained it is then spread thinly on to a clean microscope slide which is immediately plunged into a mixture of equal parts of ether and ethyl alcohol for fixing. It is of great importance that the smear should not dry before being plunged into the fixative, since this results in distortion of the cells and in alteration of their staining

*See also Dr. Russell Fraser's article on "Tests of Thyroid Function" (March 20, p. 696).

†See also Dr. G. I. M. Swyer's article on "The Assessment of Gonadal Function" (April 10, p. 866).

reactions. After fixation for at least two hours the slide can be posted, if necessary, to a suitable laboratory for staining and interpretation, but it is probably preferable to keep it in the fixing solution. It is stained with the special stain devised either by Papanicolaou or by Shorr. Interpretation should be attempted only by someone thoroughly conversant with the technique.

The chemical estimation of oestrogens in the urine is difficult and not usually necessary in the diagnosis of hypopituitarism.

In the male, testicular biopsy is sometimes used to differentiate diminution in function resulting from decreased activity of the anterior pituitary from that due to some primary testicular disorder. It is a very simple procedure and can be carried out under local analgesia. It is only occasionally necessary, and if F.S.H. estimation can be carried out will usually be unnecessary, since with primary pituitary deficiency F.S.H. output will be absent or low, whereas it will be abnormally high with primary testicular deficiency.

Conclusion

It can be seen that there is no simple test which can be applied to determine whether the anterior pituitary is functioning normally or not. Most of the tests are indirect and non-specific, pituitary function merely being inferred from their results. Such inferences cannot usually be made on the basis of one test alone, more information, either clinical or from other tests, being required. For this reason the diagnosis of anterior pituitary dysfunction can be made only by a consideration of the clinical data, taken in conjunction with the results of one or more of the tests outlined above.

Next article on Clinical Pathology.—"Interpretation of Electrolyte Changes in the Blood," by Dr. Paul Fourman.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) is available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

ROYAL SANITARY INSTITUTE CONGRESS THE IMPORTANCE OF PREVENTIVE MEDICINE

The annual congress of the Royal Sanitary Institute was held at Scarborough from April 27 to 30. The attendance was reckoned at about 2,000, and included representatives from more than a thousand local authorities. The EARL OF FEVERSHAM, in his inaugural address as president, acclaimed the achievements of the National Health Service, which, he said, had now silenced frivolous criticisms even among the most prejudiced. At the same time he drew attention to some perils. Centralization of the hospital services had brought about a separation between preventive and curative sections of the public service, and this, unless it was checked, might deteriorate into a divorce. The great service of voluntary effort which used to centre around the hospital was also in danger of being lost. He urged that there was a great opportunity at this stage to strengthen the links between the work of hospital boards and medical officers of health by a greater concentration on preventive medicine.

The Public Health Team

The Congress met in ten sections, and there were four special conferences for workers in the public health field. Presiding over the Section of Preventive Medicine, Sir ALLEN DALEY said that the preventive services must do all in their power to make the curative services redundant, as had already been largely done in those fields which were first subjected to direct attack. For example, fever hospitals were now largely available for other hospital pur-

poses, and tuberculosis of bones and joints had become a rare disease. But the burden of ill-health was still very heavy. Typhoid fever might appear again, as it did in Croydon some years ago; smallpox might slip through the barrier; apathy might develop about immunization against diphtheria, and new diseases might appear, or old ones, like poliomyelitis and hepatitis, might become more prevalent.

Dr. HENRY VAUGHAN, former Health Commissioner of Detroit, and now Dean of the School of Public Health, University of Michigan, described the steps taken in his country to train non-medical workers for the public health team, and pointed out the need for harmonious working on the part of all concerned, down to the least experienced technical assistant.

General Practitioners and Research

The relations between general practitioners and medical officers of local authorities were declared by Dr. HUGH PAUL, M.O.H., Smethwick, to be steadily growing more cordial. Much of the work of each was now dovetailed into the work of the other. The recent inauguration of the College of General Practitioners was noteworthy from the public health point of view, and even in its infancy the new College was showing a deep and intelligent interest in research. Could not medical officers of health harness its activity to their own, and by team-work find out much more of the real causes of disease? Many general practitioners were both eager and competent to carry out research work in this field, and could be enormously helped by the staff of the health departments. What about the study of diabetes? The medical officer of health might find out from the practitioners in his area a few who would co-operate in a study of the sociology of the disease.

"The family doctor is in a unique position to know the intimate family history of his patients, and a small committee of family doctors and public health medical officers, guided perhaps by a bio-statistician, could, in the course of time, bring together a mass of useful information which might well have a bearing on the causation, the course, and the prevention of the disease."

Again, the social pathology of peptic ulcer was another urgent problem, and here the team would include the hospital, with a health visitor to follow through her inquiries in the home and in the hospital and in the home again after discharge.

Spectacular successes, Dr. Paul added, must no longer be expected. "We no longer can hope to save hundreds of lives by removing the village pump handle." Future success would be hardly won, by lengthy processes and organized team-work.

Flaws in the Health Service

Dr. C. METCALFE BROWN, in presiding over the Conference of Medical Officers of Health, took as his main subject the administration and cost of the Health Service. Nearly all responsible people, he said, rightly supported the principle of a National Health Service, but forthright criticism was needed to secure necessary adjustments. It was no comfort to a patient to be assured that poverty was no bar to a hospital bed if he found, as many did, that no hospital bed was free for him within a reasonable time. In the future administration of hospitals there was a choice between the English voluntary hospital system of employing lay administrative officers and the local government and Scottish voluntary hospital system of relying on medical superintendent administration. Gradually, slowly at first but rapidly recently, it had become apparent to most people actively concerned with hospitals that the medical superintendent was indispensable, not only for smoothing inter-departmental relations but for the protection and assistance of the patient and his family.

Strong criticism had been levelled by many knowledgeable people at the regional hospital boards on the grounds that they are unwieldy, remote, soulless, inefficient, and uneconomical. It had to be faced that the hospital service

*See also Dr. F. T. G. Prunty's article on "The Assessment of Adrenal Cortical Activity" (March 27, p. 751).

was in general no better than it was before 1948 and the cost had increased fantastically. General practitioners and public health officers in many areas had to deal daily with patients needing hospital accommodation for whom beds were not available. A multiplicity of meetings of a variety of committees were nowadays necessary for action which formerly would have been taken simply and swiftly by a local government medical officer. Administrative dynamite was required to bring about what in bygone but recent years was achieved by friendly official letters or even telephone conversations. The only remedy was to entrust hospital administration to local health authorities. Regional arrangements for consultants would still be necessary, but that could be achieved, as it had been before in some areas, by means of Hospital Joint Advisory Boards.

Examining the rising cost of the Health Service, Dr. Metcalfe Brown said that the general-practitioner service was in the main well administered, and it was not the general practitioners' fault that far too many and far too expensive drugs were absorbed by their patients. "Some contributors to the National Insurance Scheme believe they were promised and entitled to the medical earth, and they intend to get it." The public health service offered no scope for economies, as it had always been conducted on the basis of obtaining the best value for money spent. The hospital service provided the only field for far-reaching economies. There appeared to be no limit to the huge cost of the hospital service, he said, and it was difficult to see what remedy could be applied so long as the extraordinary system persisted under which policy and costs were determined by people who had no direct responsibility to the taxpayer and ratepayer. There must be a balance struck between demands for treatment and its cost, and the local authorities in whose councils the voice of the local elector was heard were the best equipped for settling this delicate problem.

Dr. Metcalfe Brown concluded his address with some brief references to research and other activities in the public health field.

Epidemiological Aspects of Poliomyelitis

The discussion at the Conference of Medical Officers of Health was on poliomyelitis, Dr. W. H. BRADLEY discussing the epidemiological aspect and Dr. J. STEVENSON LOGAN the application of present epidemiological concepts to the management of outbreaks. The latter said that in his area (Southend-on-Sea), since the beginning of July, 1952, the incidence of confirmed disease had been 1 per 1,000 of population. A few years ago it could have been said with confidence that no path of infection had been traced and that multiple cases in the same household were unknown. In 1947 a tendency to some geographical grouping of cases was noticed, and it was considered worthy of comment that an adult should develop the disease eight days after its onset in a child living next door. From that time the distribution pattern seemed progressively to become a little clearer, but it was not until 1952 that school and district spread and multiple cases in the same households were seen.

As a result of his experience Dr. Logan said that an obvious first step in prevention was the exclusion from schools and nurseries of household contacts and other children who had been in close and regular association with a notified case of poliomyelitis. Three weeks' exclusion was probably the best general rule, a period which might with advantage be extended in specific cases where there had been vague illness in the immediate environment of a notified case. It was also reasonable to exclude from their occupations all those whose work brought them into regular and sustained contact with young children. These included school-teachers and other school employees and nursery nurses and nursery attendants. At one time he had taken less stringent action with adults in these employments, but the events of 1952 had led him to alter his views. In the infected school all unnecessary re-groupings of children were clearly to be avoided. Playtime recesses should be

"staggered" for different classes, and among younger children particularly the volume of organized physical activity ordinarily included in the curriculum should be reduced.

The Disabled Child

A symposium on the disabled child, in the Section of Maternal and Child Health, was preceded by an address by Professor A. G. WATKINS, the President of the Section, on the way in which the medical schools and hospitals of the country had entered the field of preventive paediatrics. During the last ten years the schools and hospitals had broadened their outlook a great deal and the study of the healthy child had been brought within their province. Infant mortality had fallen steadily, methods of immunization had improved, preventive measures had become almost routine, and the chronic illnesses of childhood had almost disappeared.

Dr. A. R. SOUTHWOOD, Director-General of Public Health, South Australia, gave an account of Australian ways with handicapped children. Much valuable work was being done by both official and voluntary bodies, but more could be achieved with better co-ordination, and it was in that direction that progress was being made. Dr. J. D. KERSHAW, M.O.H., Colchester, made some constructive criticism of the special schools for handicapped children. The special school took the child out of the social milieu in which he had been brought up and to which he would have to return. There should be no prejudice either in favour of the special school or against it, and the decision should be made in each case on its merits. Moreover, no school placement should be final. Dr. JEAN PARKER gave an account of what is being done in Sheffield for the disabled child, especially in occupation centres for mental defectives.

Prevention in the Mental Health Field

Three important addresses were given in a symposium on problems of prevention in the mental health field. Dr. J. A. FRASER, M.O.H., North Riding, speaking from the point of view of the medical officer of a local health authority, urged that such authorities should have restored to them the powers to house defectives in residential accommodation instead of having to rely on regional hospital boards to provide so-called "hospitals." These were, he said, in the main simply hostels for defectives where no real medical treatment was carried out. Professor T. FERGUSON RODGER dealt with the relationship between social change and the prevalence of mental illness and posed certain questions which might be taken into account in any survey:

Is the speed of social change a factor in explaining the increased prevalence of mental and nervous illness?

Is the increase in psychiatric illness related to the fact that people move about the country far more than formerly?

Is mental illness more common among those who have to live in an alien culture?

Is psychiatric disorder less frequent among those who have been brought up in and remained attached to religious belief?

What effect has the economic status of a family on the probability of one of its members succumbing to mental disorder?

Dr. J. A. HADFIELD discussed the principles of parenthood in relation to mental health and made the suggestion that homes should be established where children to the number of twelve to fifteen in separate houses could be placed under house mothers. In such homes the ordinary behaviour and disorders of children could be observed and studied by one or two whole-time trained psychiatrists who would work out the natural phases of maturation and reactions to varying types of treatment. These homes would not only be research stations but training schools, where medical officers, health visitors, and others could have experience in the handling of children.

A wide range of subjects was discussed in other sections of the Congress, including housing technique as affected by modern science, hospital planning, port health, rural

sewerage, health education, animal sources of food infection, polluted watercourses, food hygiene and preparation, and the problems of young people during the transition from schoolchild to adult worker.

IMPERIAL CANCER RESEARCH FUND

The annual general meeting of the governors of the Imperial Cancer Research Fund was held at the Royal College of Surgeons on April 29. Professor H. R. Dean, chairman of the council, said that two years had passed since the Fund celebrated its jubilee, and during those two years much had happened. The Fund was formed in 1902, when the first director of the laboratory, Dr. Bashford, formulated a scheme for an inquiry into the nature, cause, prevention, and treatment of cancer. The Fund's laboratory was one of the first to be established for the study of cancer, and during the years it had made many contributions to knowledge. In the last century the knowledge of cancer was almost limited to its appearance in human beings, but with the new century and the work of their laboratory it had been recognized that cancer occurred frequently among many varieties of animals, that it could be transmitted by grafting from one animal to another, and that cancer could actually be initiated by chemical substances, by ultra-microscopic viruses, and other means. Cancer thus became a branch of experimental biology.

New Laboratories in Lincoln's Inn Fields

It was for these long-term investigations that their laboratories at Mill Hill existed, and a report on the work above the name of Dr. James Craigie, F.R.S., director of the central laboratories, was before the governors. In 1951, Professor Dean continued, the council made a very important decision. At its request the Royal College of Surgeons provided two laboratories in Lincoln's Inn Fields, especially for the investigation of problems concerning cancer in human beings. These were under the general direction of Professor Geoffrey Hadfield. The council decided that larger premises were necessary, and once more a request had been made to the Royal College, which promptly helped them by giving them a ten years' lease of No. 48, Lincoln's Inn Fields. This house had been adapted as a laboratory for the clinico-pathological research unit, and here a number of new appointments had been made, including a senior and two junior biochemists and a junior research pathologist. A consultant service in diagnostic cytology would in the course of the year be set up at No. 47, Lincoln's Inn Fields, which had also been leased from the Royal College of Surgeons. Still other problems were coming forward for investigation, and it was hoped that it might be possible to increase the facilities for long-term investigation. It was essential that this work should be carried on in Central London, within easy reach of the great London hospitals; and here Professor Dean thanked the surgeons and pathologists of the London hospitals for their ready co-operation.

Current Research

Professor Dean went on to refer to certain investigations which are set out in more detail in the annual report.* Dr. Craigie had been concerned in an investigation to discover how tumour cells managed to survive freezing and thawing. A special refrigerating unit had been installed for the preservation of experimental tumours, and this had facilitated certain kinds of work for which transplantable tumours of animals were required. Tumour material kept in a frozen state for nearly five years had shown a remarkable degree of survival. The ability to survive in the frozen state was not, of course, peculiar to cancer, but was shared by various normal mammalian cells. Dr. A. M. Begg had started research on the induction of lung cancer in mice following the introduction of carcinogens by the

*Imperial Cancer Research Fund: Fifty-first Annual Report, 1953-4.

respiratory route, and Mr. H. G. Crabtree had extended his investigations, previously reported, on chemical carcinogens. Certain azo-compounds which yield sulphanilamide on metabolic breakdown were found to delay the development of butter-yellow liver tumours in rats by 6-7 weeks. Dr. L. M. Franks had carried out an inquiry into cancer of the prostate, especially from the point of view of two neglected factors, old age and the adrenal cortex, using hamsters, which aged rapidly, and guinea-pigs, which had an exceptionally large adrenal gland. Drs. G. Lumb and J. Stretton Young had been working on the morbid histology of established breast cancer. Much other work of a miscellaneous nature had gone forward.

Mr. A. Dickson Wright, Hon. Treasurer of the Fund, presented a financial statement, showing that the total receipts from investments, contributions, and other sources amounted to just over £60,000, a slight increase on the previous year's figure. This year, for the first time, legacies not exceeding £1,000 had been credited to revenue, bringing in a further sum of over £30,000. The Fund was in the happy position of being able to point to the very high proportion of expenditure incurred in its research work and the care of its laboratory buildings. Of the £91,000 income, only £4,517 was spent on administration and £6,739 on publicity.

Viscount Halifax was re-elected President and Mr. Dickson Wright treasurer.

PROBLEMS OF THE RHEUMATIC DISEASES

SEVENTEENTH MEETING OF EMPIRE COUNCIL

The 17th annual meeting of the Empire Rheumatism Council was held at the Royal College of Surgeons on April 28, Dr. W. S. C. COPEMAN, chairman of the Executive Committee, presiding. A message was read from H.R.H. the Duke of Gloucester, the President, in which he spoke of his pleasure on learning that the Council had initiated and was financing the first Chair of Rheumatology to be established in the Commonwealth, and that Dr. J. H. Kellgren, a member of the Council, had been appointed to the professorship.

First British Chair of Rheumatology

Dr. Copeman, presenting the annual report, said that this chair—perhaps the most important development in the whole orbit of rheumatology since the Council was formed in 1936—had been established in the University of Manchester. It was in fact only the third such chair in the world, the other two being in France and in Holland. It was an important and far-reaching accomplishment, and they all had the utmost confidence in Professor Kellgren. Another event of the year had been the invitation received by the Council to submit evidence to the committee of inquiry (the Piercy Committee) of the Ministry of Labour and National Service into the provision for the rehabilitation, training, and settlement of disabled persons. A person much overlooked and ignored in considering the problems of rehabilitation was the chronic arthritic, especially the arthritic housewife, whose return to a normal way of life was one of the most rewarding, though not one of the most dramatic, concerns of modern medicine. The securing of ministerial recognition of rheumatology as a specialty within general medicine and the institution of registrarships in rheumatology in its own right had been pursued, and it was hoped that the Minister would shortly receive another deputation on the subject, when final approval would be given to proposals on these lines.

Mr. W. R. C. HALPIN, chairman of the Finance Committee, presented a report which showed that the net income for the year (exclusive of legacies) was just over £10,000; the decrease of £3,434 on the previous year was accounted for almost wholly by a decrease in donations. Medical expenditure amounted to £8,127. The Finance Committee was very anxious to increase expenditure on research projects of merit, but could do no more than funds permitted.

Dr. Copeman was re-elected chairman, and Lord Webb-Johnson vice-chairman. The hon. medical secretary (Dr. Oswald Savage), his deputy (Dr. R. M. Mason), and the parliamentary representative (Sir Hugh Linstead, M.P.) were all re-elected, together with the various committees. The meeting closed with a vote of thanks to Dr. Copeman, proposed by Mr. C. G. Izard, seconded by Dr. Dudley Hart.

Clinical Research

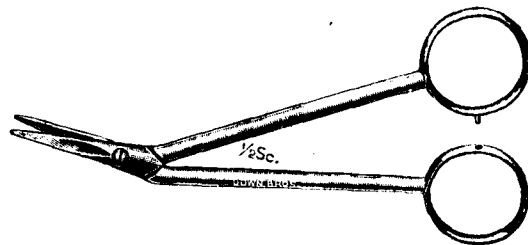
The annual report, which was adopted at the meeting, stated that certain work on steroid metabolism, including clinical trials of A.C.T.H., cortisone, and other steroid substances, at the Council's "Maclean" laboratory at the Hospital of St. John and St. Elizabeth, had terminated last year with the appointment of Dr. A. A. Henly to another position, but the Council's laboratory was not to be left without a successor and would continue to be used by an Empire Rheumatism Fellow for research work, for which new equipment and apparatus were now being obtained. Two clinical trials were in progress in which a number of hospitals were participating. One was to assess the value of cortisone and aspirin, and the other that of "hydrocortone." The report contained an account of completed and current researches under the Council's Fellowships. Two Fellowships had been recently instituted for specific research problems. Under one of these work had been undertaken at Sheffield on the oxidation of corticosteroids with sodium bismuthate, and had led to the development of an analytical method for the simultaneous determination of formaldehydogenic and 17-ketogenic steroids, and a routine procedure for the estimation of 17-ketogenic steroids in urine. Under the other, at St. Mary's Hospital, the examination of some enzymological aspects of connective-tissue metabolism was being conducted. Some basic research into the long-term treatment of rheumatoid arthritis, undertaken under the "Philip Gray" Fellowship, would shortly be published.

Preparations and Appliances

AN IMPROVED TYPE OF CORONARY SCISSORS

Dr. GEOFFREY SHERA, of Eastbourne, writes: The conventional type of coronary scissors has many faults: a clumsy, blunted tip unsuitable for very narrow coronary vessels and likely to disturb a small clot; the loops are too small for the average gloved hand; leverage is feeble; and the absence of any "angling" tends to tear a brittle vessel.

The new pattern illustrated here attempts to meet these defects. The tip is only just blunted, without increasing



its size. The loops are now adequate and eminently comfortable. Overriding is prevented by a "pin and socket" stop when strong pressure is required, and leverage is both powerful and effective. The "angling" allows the coronary vessels to be cut with the blade strictly in line with the lumen, and this ensures rapid and easy exposure thereof. One is much less likely to disturb a coronary clot with these scissors, and calcified vessels present no trouble owing to powerful leverage.

I am indebted to Messrs. Down Bros. and Mayer & Phelps, 32-34, New Cavendish Street, London, W.1, for their skill in executing the manufacture to my design.

Reports of Societies

Devon and Exeter Medico-Chirurgical Society

At a meeting on March 18 the president, Mr. Norman Capener, spoke of "The Hunterian Influence in Exeter," relating his talk to the development of a medical school there which had flourished during the first half of the nineteenth century. The school failed to survive the Medical Act of 1858, but while it lasted it had included amongst its teachers some outstanding figures. Dr. John Sheldon, F.R.S., had spent his last twenty years in Exeter, having retired owing to ill-health from the Westminster Hospital. He had gained notoriety through keeping the embalmed body of his mistress in his bedroom, as a pioneer of ballooning, and as an explorer for whales. But he deserved recognition for his early work on the lymphatic system. Nurtured in the Hunterian tradition was John Haddy James. He was a native of Exeter, and with Samuel Barnes was a leader in the development of the Exeter school. He joined the staff of the Devon and Exeter Hospital after serving with Wellington at Waterloo, and two years later won the Jacksonian prize for an essay on inflammation. He invented many interesting mechanical devices and was noteworthy for having introduced continuous traction in the treatment of fractures. He was one of those who assisted Charles Hastings, of Worcester, in the foundation of the Provincial Medical and Surgical Association, which later became the British Medical Association. James became its president in 1842, and the next year was one of the original Fellows of the Royal College of Surgeons of England under its new charter.

Liverpool Medical Institution

Sir Henry Cohen read a paper on "The Collagen Diseases and their Response to Cortisone and A.C.T.H.," at a meeting on March 26. Reviewing their pathology, Sir Henry discussed the ways in which fibrinoid degeneration was related to collagen. Damage to the collagen system led to disturbance in the lubrication of tissue and the transport of metabolites. He then described four collagen diseases: diffuse lupus erythematosus, periarteritis acuta nodosa, temporal arteritis, and dermatomyositis—and pointed out that similarities of pathological findings did not necessarily imply similar aetiology. He thought that periarteritis nodosa and temporal arteritis were different entities. The discovery of A.C.T.H. and cortisone had helped in the unification of collagen diseases, since it was in them that their greatest effect was found. Great, however, as had been their benefits in these diseases, they were toxic drugs, of great theoretical interest, but which would soon be superseded by newer forms of therapy. After Sir Henry's paper the annual meeting of members was held. Sir Henry Cohen was elected president for the ensuing year and was installed by the retiring president, Mr. J. B. Oldham.

Manchester Medical Society

Discussing cancer of the breast at an ordinary meeting on March 24, Mr. Hedley Atkins said that at the Guy's Hospital Breast Clinic they were searching for criteria that would enable them to predict whether the response to hormone therapy was likely to be favourable or not. Although this foreknowledge was not essential in treatment with endocrine preparations, it would be almost indispensable if the operations of adrenalectomy and hypophysectomy were shown to have definite value. An investigation to compare the results of adrenalectomy and hypophysectomy was now proceeding.

North of England Otolaryngological Society

On March 20 Mr. J. M. Wishart was installed as president at a meeting held at the Blackburn and East Lancashire Royal Infirmary. Afterwards clinical cases were shown and discussed.

Correspondence

A New Oral Diuretic

SIR,—I had the opportunity of reviewing the January 16 issue of the *Journal* and was impressed with the annotation entitled "A New Oral Diuretic" (p. 144). I was intrigued by the statements made on behalf of the new diuretic "mercloran" ("neohydrin"), which in my experience has proved to be almost as good as the parenteral diuretics. In fact, maintaining patients oedema-free with mercloran has been consummated with less difficulty than with the more potent parenteral mercurials. Therefore I was somewhat puzzled by your rather high incidence of reactions. I could not imagine that severe gastro-intestinal symptoms "develop in about two-thirds of patients after effective doses," as you report.

In my experience there have been fewer reactions with mercloran (about 10%) than with other diuretics. Moreover, the reactions when they occurred were usually mild. Considering the relationship between an effective diuretic dose and a dose large enough to provoke reaction, I have found that mercloran in nearly all instances will provide satisfactory diuresis in a dose far below the reaction level. This has been established in a report by Gold and his co-workers.¹ In addition to the high degree of tolerability which was observed in studies of over two years, I had also noted a psychological improvement in the patients. Apparently the lack of drastic response which the patients formerly experienced with the parenteral diuretic has improved the patient's attitude and nutritional status.

The Cornell University authorities, who have bioassayed this product and reported it to be unusually effective, had pointed out that in their tests the dose was necessarily administered *in toto*, even as high as nine tablets at once, and therefore some of the patients experienced gastro-intestinal reactions. The authorities also claimed that these reactions would certainly be less frequent if the doses were divided. This has been my experience and that of other investigators. It was more important to administer enough of the diuretic per day than per one dose. It is also well to point to the misconception clinicians have frequently entertained that mercurial diuretics give off metallic mercury. I believe that a review of the pharmacology texts will allay such fears. Organic mercurial diuretics do not give off free mercury. This also applies to mercloran.² According to this monograph,³ in the test for purity on this agent, the results indicated absence of ionizable mercury and other heavy metals.

Kidney function tests are being done on all of the patients attending the cardiac clinic who have been taking mercloran for a duration of from one to two and a half years. At the present time, we have not found a single patient who has presented any clinical or laboratory evidence of impairment of kidney function due to the oral mercurial mercloran. This study will be published in the near future. Through my own experience and that of other investigators in the United States, we have gained full confidence in the oral mercurial diuretic such as mercloran. I believe the British clinicians will experience similar favourable and unequivocal results.—I am, etc.,

Newark, 8, New Jersey, U.S.A.

WILLIAM A. LEFF.

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- ¹ *J. med. Soc. N.J.*, 1953, 50, 149.
- ² *J. Amer. med. Ass.*, 1953, 152, 1130.
- ³ *Ibid.*, 1953, 152, 331.

Congenital Tuberculosis after Pleural Effusion in the Mother

SIR,—The case described by Dr. Neil Mason (*Journal*, April 24, p. 970) is of great interest from the point of view of the pathogenesis of tuberculous infection generally, and of demonstrating a special need to distinguish primary from secondary tuberculous disease in pregnant women. The

pleural effusion in the mother when five months pregnant was obviously a perifocal reaction associated with the benign primary complex. This condition does not benefit by chemotherapy as a general rule unless there are evident bacillaemic metastases (meningitis, bone and joint disease, etc.), but it may give rise in pregnant women, as in this case, to the fatal malignant primary complex in the foetus. As this condition in the foetus cannot be diagnosed until delivery, it follows that all pregnant women contracting the benign primary complex should have chemotherapy as a preventive of foetal tuberculosis.

In Dr. Mason's case the mother did not have chemotherapy during pregnancy, and she recovered clinically without it. The lesions found in the infant at death, eight days after full-term delivery, included a large caseous mass of lymphatic nodes in the area of the porta hepatis, and acute miliary foci of two distinct sizes in the lungs, spleen, and liver. These are the lesions of the malignant primary complex, complicated by acute miliary dissemination, and are invariably fatal without chemotherapy. The conditions in this case were entirely different from that of the pregnant women with any form of secondary tuberculosis, such as advanced fibro-caseous disease, where acquired resistance is strong throughout the course of pregnancy and constitutes an effective protection to the foetus, which in these circumstances is usually born healthy.

An interpretation of the sequence of events in Dr. Mason's case, based on the known facts relating to natural and acquired resistance in tuberculosis, is as follows. The mass of caseous lymphatic nodes could hardly be other than the lymphatic component of a malignant primary complex of which the primary focus in the stomach or duodenum was no longer to be seen macroscopically. The upper mesenteric site of these nodes strongly suggests infection of the foetus by the alimentary route, probably by swallowing infected amniotic fluid. Since the duration of the disease appeared to be approximately the same in mother and child, the amniotic fluid was probably infected at a very early stage in the pregnancy, and most likely during the incubation period of the infection in the mother. At this stage, a preclinical bacillaemia regularly occurs in tuberculosis, as in so many other infectious diseases, and this is usually brought to an end by acquired resistance which rises only after the primary complex is established. Infection by means of the amniotic fluid is usually massive in contrast with that by inhalation, and this would account for the large caseous mass of lymph nodes (malignant primary disease) with two later invasions of the foetal circulation giving rise to the two sizes of acute miliary foci in lungs, spleen, and liver.

A case like this is rarely observed and it should become classical. Its lesions are most important: (1) the danger to the foetus not only from malignant primary tuberculosis (acute miliary) but from benign primary tuberculosis in pregnancy; (2) the necessity to distinguish primary tuberculosis from secondary in general, and particularly because of the need for preventive chemotherapy for the foetus in the former; and (3) the neat demonstration of the operation of two fundamental factors in pathogenesis, quantity of bacilli, and acquired resistance.—I am, etc.,

M. SEKULICH.

London, N.W.8.

Neomycin in Pyogenic Skin Diseases

SIR,—The reports by Dr. R. E. Church (*Journal*, February 6, p. 314) and by Dr. I. W. Caldwell (*Journal*, April 10, p. 871) suggest that neomycin may be the drug of first choice in the superficial pyoderms. But I would suggest that there may still be a place for other antibiotics. During the past 15 months, 304 cases of impetigo contagiosa all responded within a few days to treatment with 3% aureomycin cream. Of these cases 135 were sigilliform, and 169 were bullous and mostly widely generalized. It appears unlikely that insensitive organisms will develop in the course of rapid and successful treatment. Furthermore,

although it is generally agreed that neomycin may be applied topically with safety, it has been shown that systemic absorption may occur from topical application.¹ Although the serum concentration of neomycin was slight, this factor may have to be considered if local applications are adopted on a wide scale.

With regard to treatment of sycosis barbae, assessment is difficult but aureomycin and terramycin both appear to be of some value. Of 18 cases treated with 3% terramycin cream, 5 remained well when reviewed from 2 to 11 months after treatment had ceased, 4 cases cleared rapidly but did not report back, 3 cases continued to have occasional pustules, 1 case recurred 4 months after treatment had ceased, and 5 cases failed to improve. Six cases of seborrhoeic type showed temporary improvement. Of 28 cases treated with 3% aureomycin cream, 8 remained well when reviewed 2 to 18 months after treatment had ceased. Eight cases cleared rapidly but did not report back, 6 cases continued to have occasional pustules, 1 case recurred 11 months after treatment had ceased, and 5 cases failed to improve. Five cases of seborrhoeic type showed temporary improvement. As might be expected, duration of treatment was longer than in the cases of impetigo. In this connexion, the development of insensitive strains is of some moment also in treatment with neomycin, since neomycin may be required as an intestinal antiseptic and as a parenteral²⁻⁴ antibiotic in selected cases. It has also been shown that, *in vitro*, increase in resistance develops more regularly and rapidly to neomycin than to aureomycin, terramycin, and chloramphenicol,⁵ and that strains which have increased in resistance to neomycin also increase significantly in resistance to streptomycin.⁶—I am, etc.,

GLASGOW, W.2.

W. A. DEWAR.

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Appointment with Fear

SIR.—Dr. P. R. Saville's timely letter (*Journal*, April 17, p. 932) entitled "Appointment with Fear" deplores the increase of unhealthy, and often unfounded, fears among the British public in recent years. In a clinical lecture, the late C. B. Lockwood stated: "The human being fears death above all things; after death he fears pain, and after pain, parting with his possessions."¹ Had he been speaking to-day he might have added the fear of official infringement of his rights and liberties.

There is little doubt that most people fear the idea of pain, although they will usually bear it stoically enough when they actually have to endure it. They also fear the loss of their possessions or the ability to earn their living, but I would dispute the categorical statement that they fear "death above all things." In health, most of us dislike the contemplation of our own demise, but when people are faced with its inevitability they generally do not seem to be afraid. It has been stated that even condemned prisoners become philosophical enough once they come to realize that their fate is inevitable. It is certainly the general experience that the mortally sick and the aged generally face the end with little apprehension and sometimes even with a sense of relief. This may also be the case with those who retain their full faculties throughout.

I believe that what most people dread is a sense of uncertainty and the unknown. They fear "the shadow of uncertain ill." When they know exactly what to expect they generally cease to be fearful. Even in such a dreaded disease as cancer, I have generally found that patients are quieter in their minds once their doubts have been resolved and when they have been frankly told the truth, particularly where some method of treatment can hold out a reasonable prospect of cure or amelioration. I have never found it

advisable to attempt to delude patients into a sense of false security: they generally don't believe one if one does, and doubts as to the truthfulness of their medical adviser only tend to increase their general anxiety and augment their fears. On the other hand, no good purpose is served by proffering unasked-for information of an unpleasant character. A patient or his relatives should not generally be told bad news of this kind, unless the direct question is asked: exceptionally such information may become necessary in the patient's interests, particularly where there is hesitation to undergo some favourable line of treatment with a prospect of success.

We, as doctors, also have our especial fears, which have greatly increased in recent years: fear of the power of those authorities who now so largely control our professional lives; fear of irresponsible litigation, and, in view of some of the more recent decisions of the courts, a doubt that we may receive a full measure of justice; fear of the activities of other medical men who may be tempted to undermine our interests for their own advantage in the altered circumstances in which we now practise our profession. The most serious feature of these special medical fears is the unfavourable effect that they are having on the younger men and on entrants to the profession; this is evident from their increasing unwillingness to take appointments which carry any risk and their reluctance to undertake clinical responsibilities which should be well within their capabilities. Soon the most able types of men and women may cease to be willing to enter the profession at all. We may free our patients from unnecessary fears, to some extent, by clearing their minds of superstitions and by telling them the truth when we can, for ignorance is often the basis of fear; but neither we nor they can hope for freedom from fear unless we also regain some of those other freedoms which we seem to have lost. The public should remember that the doctor whose professional conduct is unduly influenced by the fear of personal consequences is lost, as may his patient be also.—I am, etc.,

LONDON, W.1.

JOHN NICHOLSON.

REFERENCE

- Clinical Lectures and Addresses on Surgery*, 1907, p. 4. London.

SIR.—The letter by Dr. Paul R. Saville (*Journal*, April 17, p. 932) sounds a welcome note of sanity. He has, however, omitted to point out that we should eat nothing but raw food to be entirely safe, for we have little, if any, notion of what happens to it during cooking. What thermal decomposition products, potentially lethal, has man been consuming for many thousands of years? We have no idea; nor have we a complete list of all the essential nutrients destroyed during cooking. Needless to say, this goes not only for cooking, but also for factory processing. How do we know, indeed, that many of the "thousand natural shocks that flesh is heir to" do not in fact come from producing slow poisons by simply cooking food or from the destruction in it of things we need?

Presumably the truly cautious should not eat anything cooked, processed, or manufactured before trying it on the dog—or at least on the laboratory rat. This, it seems, is the procedure being advocated in the field of food additives. Do we know what risks we run not just from preserving and sterilizing, but even from Mum's best kitchen practices? The answer is that we don't, any more than we know fully the hazards of crossing Piccadilly at mid-day; if we did, we should not get run over there, because we'd stay on our side.

There seems to be growing a pusillanimity that is a caricature of "safety first" in food, and the nation is, I submit, at present in serious danger of suffering from acute hyper-toxic consciousness—to coin a word. Scientists, whether medical or non-medical, surely have a responsibility for preventing the spread of this condition. Unfortunately, many of them seem to be doing exactly the opposite.—I am, etc.,

LONDON, N.W.3

A. L. BACHARACH.

Smoking and Lung Cancer

SIR.—The considerable suggestive evidence of a positive relationship between lung cancer, heavy cigarette-smoking, and urban residence may mean that (leaving out of account the possibility that city people smoke more than countrymen) excessive cigarette-smoking develops some abnormal mechanism which allows the ingestion not merely of possible carcinogens from the cigarettes themselves but, in addition, known potential carcinogens polluting the surrounding atmosphere. In short, two seemingly highly important factors—cigarette-smoking and urban residence—may operate synergistically. Heavy cigarette-smoking appears sufficient to irritate the mucosa of the respiratory tract to cause catarrh, bronchial wheezing, and reflex coughing, which continue for as long as the smoking habit persists. In industrial areas particularly, the discharge is impregnated with dark particles, including atmospheric soot. Pipe-smokers who do not inhale deeply through either mouth or nostrils appear generally to avoid this irritation and discharge.

The present writer found that a chronic "smoker's cough" which developed after heavy smoking (20 to 40 cigarettes per day) ceased immediately he gave up cigarettes. It did not reappear after pipe-smoking. Yet a mere ten cigarettes per day, even without deep inhalation through the mouth, was enough to start it off again together with a characteristic bronchial wheezing and discharge. It was believed that voluntary and involuntary inhalation of cigarette-tobacco fumes through the nostrils into the nasopharynx and bronchi might be the cause. When a cigarette-holder (with or without filter) was used, the cigarette end, as with the bowl of a pipe, was projected far enough from the nostrils to avoid nasal inhalation. Thereafter an abnormal experimental number of cigarettes (50 to 60 per day) was smoked for a week without the reappearance of the former symptoms.

It is probable, therefore, that nasally inhaled tobacco smoke caused nasopharyngeal and perhaps bronchial irritation, hypersensitivity of the mucosa, and a relatively copious watery discharge from neighbouring glands. It is not impossible that if a sufficient flow of fluid was generated by nasopharyngitis and bronchitis, this would cascade over the cilia of the respiratory trees, defeat their cleansing mechanism, and thus allow the carriage of tobacco soot and, in addition, inspired atmospheric soot into the bronchioles and alveoli. There is already experimental evidence^{1,2} that radio-opaque dusts mixed with fluids and introduced into the trachea of cats did penetrate right into the alveoli. The cilia were rendered inoperative by the fluid.

Although it is more reasonable to assume that a nasopharyngeal secretion would be blocked at the epiglottis and pass down the oesophagus, the wheezing and bubbling in the bronchi of habitual cigarette-smokers suggest that fluid (unless it is all produced by a local bronchitis) may indeed creep into the bronchi at night without operating a cough reflex. The matter was attacked experimentally by the introduction into the nasopharynx of "dionosil" in successive evening dosages of 6, 10, and 12 minims (0.3, 0.6, and 0.7 ml.) respectively after heavy cigarette-smoking without holder. Radiography showed a negative result—the material apparently went down the oesophagus, although rales and rhonchi could be detected with the stethoscope each morning. It is possible that the oily suspension used was insufficiently dilute to pass over the epiglottal bridge. A second attempt, involving the like ingestion of radio-active gold colloid, was projected, but this has not been made since there appears to be already available clinical evidence that a post-nasal drip does sometimes overcome the cough reflex and result in a mucous creep into the bronchi. Among children in particular lipid pneumonia can occur in healthy individuals after "the prolonged use of an oil spray or the instillation of oil in the upper respiratory passages."³

Even if the irritation induced by inhaled smoke is confined to the bronchi, the working hypothesis that inspired particles of atmospheric soot, as well as those of burnt tobacco, may be caught up in a mucus discharge and carried deep into the lungs is not invalidated. It matters little whether the abnormal flow of mucus is produced in the nasopharynx or in the bronchi so long as it is sufficiently copious to entrap inspired foreign particles, to overflow the cilia in such a way as to carry injurious substances into the bronchial terminations, and to prevent the cilia from expelling them.

The present contribution is made in the hope that the problem raised will be attacked experimentally by others directly interested in cancer research. It should be possible to achieve hypersensitivity and a chronic respiratory tract discharge in a series of experimental animals and to introduce, over a period, concentrates of tobacco soot, atmospheric soot, and mixtures of both. The writer of course makes no claim to the validity of the present hypothesis, but at the same time he now proposes to use a pipe, or a cigarette-holder at least three inches long, to avoid unnecessary future irritation of his respiratory tract epithelium.—I am, etc.,

LONDON, E.C.1.

A. J. MARSHALL.

REFERENCES

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- (1940). *Ibid.*, 13, 410.
- Holt, L. E., and MacIntosh, R. (1953). *Pediatrics*, 12th ed. New York.

Skin Cancer and Burns

SIR.—It is desired to correct a statement in your annotation "Skin Cancer and Burns" (*Journal*, January 23, p. 204). The paragraph, which could be misinterpreted, reads: "Cancer of the skin, after years of actinic rays, is common in such countries as Australia, where it is found that European settlers are most susceptible."

In our statistical survey¹ of patients with cancer of the skin, the following facts emerged: (1) The average age of patients with cancer of the skin, born in Australia, is 61. (2) The average age of patients with cancer of the skin who have migrated to Australia (of these 99% come from Great Britain and other European countries) is 71. (3) The average length of residence in Australia (of the non native-born) before the development of skin cancer is 44 years.

In our opinion, the development of skin cancer is far more common among people of British descent than people of any other race, including the Scandinavian and North German.—I am, etc.,

NEWCASTLE, AUSTRALIA.

W. H. WARD.
W. W. GUNTHER.

REFERENCE

- Ward, W. H. (1952). *Aust. J. Derm.*, 1, 157.

Cancer Resistance

SIR.—The article on neuropathies associated with carcinoma by Dr. P. L. de V. Hart (*Journal*, March 13, p. 606) makes fascinating reading. I have under investigation at present a patient with foot drop and radiological evidence of bronchial obstruction, who "feels well" yet nevertheless may be doomed; but it raises wider and perhaps fundamental issues of practical importance. The far-flung effects of cancer are not always due to metastases. Multiple venous thromboses in areas remote from the growth may appear and disappear after a short interval (Trousseau's syndrome). I have seen small, slightly tender thromboses in the elbow appear and pass in a week or so, followed by similar episodes in the leg and chest (transitory pleurisy), heralding the major symptoms of a carcinoma of the tail of the pancreas. The rare myoclonus of the palate is said to be a pointer to lung neoplasm, without actual bulb involvement. There is undoubtedly a biochemical factor in these cases, perhaps some change in the serum producing remote effects. Now all experienced practitioners have met the occasional case of carcinoma that surprisingly seems to come to terms with the neoplasm and lasts many years,

I recall a lady who had a carcinoma of the caecum removed, to be followed 12 years later by a carcinoma in the colon, also excised (both dealt with by the late Mr. B. J. Ward). She developed a large irregular liver years later and was alive over 26 years after the first operation, despite the hepatic enlargement. Of course, long-standing cases of breast carcinoma are much commoner, and are usually explained by "fibrosis," but I am by no means certain that either the scalpel or the scirrhus explains away these cases. In my view there is a resisting factor in the serum in certain favoured individuals, and I am sure there are sufficient cases up and down the country to warrant an investigation of the serum of these carcinoma-resistant people.

I wrote to the *B.M.J.* some years ago on this matter, but it raised no interest. The high incidence of certain types of carcinoma in the same family (I have seen uterine cancer in a mother, later followed by the same type of neoplasm in three daughters, all the latter in the early 40's), suggests that there might even be an association between particular types of carcinoma and blood groups (the latter, of course, in the widest sense).

The effects of the endocrines in the treatment of some forms of malignancy suggest that the body could produce some defensive response, albeit too weak to be effective unless considerably enhanced artificially, in parallel fashion to cortisone. The answer to smallpox and scurvy was found long before virus and ascorbic acid deficiency were associated as causal, and the answer to neoplastic disease could possibly be found on these lines long before the scientists give us chapter and verse.—I am, etc.,

London, S.W.2.

A. WISEMAN.

Cortisone and Infection

SIR,—Your leading article entitled "Cortisone in Infection" (*Journal*, February 13, p. 381) is of very real interest. I shall be most obliged, however, if you will publish this letter as, in a sense, rebuttal of one sentence—namely: "It seems that, whenever cortisone has been administered to a vertebrate host parasitized by an invertebrate, the course of events has been altered to the detriment of the host."

There is no question that administration of large amounts of corticoids (A.C.T.H., cortisone, or hydrocortisone) to patients or to experimental animals with a variety of infections will tend to cause a dissemination of such infection usually to the detriment of the host, unless suitable means are employed to counteract such detrimental effects. There is, however, a very real place for the use of these hormones in the clinical management of infectious disease. This use is limited, for the most part, to infections for which thoroughly adequate antibiotic agents are available. Specific indications for the addition of intensive hormonal therapy to appropriate antibiotics consist in an overwhelmingly severe infection, with particular reference to generalized peritonitis, unusually virulent forms of pyogenic meningitis, with or without obvious blood-stream infection. If one employs A.C.T.H. and cortisone in a suitable manner in such individuals, using the hormones for their "non-specific antitoxic and anti-shock effects" to tide the individual over until the antibiotics have a chance to take effect, significant improvement in mortality and morbidity will result. Such therapy was undertaken on an investigative basis almost four years ago in this institution, and has now become routine in infections of more than usual severity.

Incidentally, it is our feeling that there are very few of the untoward effects of the corticoids, in so far as infection in the human subject is concerned, which cannot be reasonably well explained on the basis of inhibition of the inflammatory reaction. On the other hand, such inhibition can be highly desirable in the case of inflammatory involvement of the central nervous system, assuming that one has available an antibiotic capable of destroying the organism. A paper giving a comprehensive review of our total experience to date appears in the current volume of the *Journal of Pediatrics*.—I am, etc.,

Oakland, 6, California

LAURANCE W. KINSELL.

Elderly Psychiatric Patients

SIR,—Why do psychiatrists (and psychologists) habitually misuse their own special language? In the *Journal* of April 10 (p. 876) there is a letter in which a psychiatrist discusses the case of "elderly psychiatric patients" (though you, Sir, or the Assistant Editor, are, I fear, responsible for the actual headline). What is an "elderly psychiatric patient"? The answer should be "an elderly patient practising psychiatry"—so odd a combination that, of course, we reject it as the writer's meaning.

One is constantly reading of "psychiatric disorders," "psychiatric disability," "psychiatric symptoms"; but the writers do not mean disorders affecting the treatment by a psychiatrist, or affecting the psychiatrist himself—or a disability affecting the psychiatrist or affecting his treatment—or symptoms affecting the psychiatrist. No, what the writer means by "elderly psychiatric patients" is "elderly patients with mental disease under treatment by a psychiatrist." The term "psychiatric" is transferred from its proper subject, the psychiatrist, to his patient. But if psychiatrists habitually misuse their own language one begins to question the soundness of their reasoning.

I do not venture to suppose that this protest will avail anything. The misuse of the word "psychiatric" constantly recurs even in textbooks on psychological medicine by authors of acknowledged authority. Medicine is full of terms habitually, though wrongfully, misused. To name only a few there are "the acute abdomen," "the acute ear," T.B. (for "tuberculous" or "tuberculosis"), etc., etc. Very many years ago the Editor of the *B.M.J.* published a short leading article on the last of these abuses above-mentioned following a letter from me pointing out that it was sometimes impossible to say whether "No T.B. found" in a report on a demobilized soldier (after War I) meant "No tubercle bacilli found" (on sputum examination), or "No tuberculosis found"—a difference of vital importance. Did the kindly intervention of the Editor result in any change for the better? No. "T.B." stands triumphant. I have, in the past, even been referred to—through ministerial channels—as "T.B. officer." What chance for "psychiatric"? Still, let the protest stand; it can, at least, do no harm.—I am, etc.,

Folkestone.

E. WEATHERHEAD.

Psychiatry and General Medicine

SIR,—Having read the excellent article by Sir David Henderson (*Journal*, April 17, p. 889) I feel sure that he will be the first to admit that much of the disrepute enjoyed by the psychiatrists is of their own manufacture. The acceptance of a form of therapy by the medical profession as a whole depends ultimately on the response of patients to treatment. It has always surprised me that psychiatrists never seem to discuss treatment. As a rule they can always find a cause for a symptom or a syndrome which satisfies them, even if no one else, but, in most cases, that is as far as it goes. They wish to be accepted by all as openly as general physicians and surgeons, yet their form of treatment is nebulous and shrouded in mystery. Even standard textbooks devote little space to the management of cases except for those ill-understood forms of therapy, such as insulin, which even Sir David Henderson states are too readily used.

I would willingly send more of my patients with anxiety neurosis (and all doctors see large numbers of them) to the psychiatrist were he more helpful to me. We certainly need help with these cases, but little real improvement seems forthcoming. We get numerous labels for their inadequacies and weird causal agents for their symptoms, but their future seems quite unpredictable, except in so far as it will be the same as their past. The psychoses seem to be largely incurable, though some change may take place as a result of an empirical form of therapy or destructive brain operation. Any improvement seems usually to be short-lived. The psychoneuroses seem even less amenable

to psychiatric treatment, and it is with this group in particular that I plead for more constructive help from the psychiatrists. There is certainly enough material for them to treat.

I have stated elsewhere¹ that in my opinion the child psychiatrist is not always as helpful as the paediatrician. As an example, one may take the favourite topic of enuresis. My own view, being that of a person who likes a convenient "organic" basis for disease, is that it is usually due to a disordered sleep mechanism in which control by the higher centres is so completely lost during too deep a sleep that the reflex emptying of the bladder occurs. Fundamentally, the process is similar to that occurring in incontinence in organic disease, for example paraplegia. Treatment of childhood enuresis with the amphetamine group of drugs produces remarkable results—far better than does the delving of the psychiatrist who searches for emotional factors. He does not seek such factors in the bed-wetting of paraplegics. Whilst doctors are investigating the fascinating field of psychosomatic medicine, it is becoming more evident that many so-called functional diseases have an organic basis. It may well be that the psychiatrist will be called on to become more of a physician than the converse.

Finally, to Sir David Henderson, I would tell him of the most recent instance when I asked the help of a psychiatrist. It was concerning an obsessional neurosis, and the patient would 'phone me repeatedly during the night to explain his fears. After being examined carefully by the psychiatrist and the cause of his symptoms being discovered, he came the question of treatment. I was advised that the only solution would be to remove the patient from my list and let him plague the life of some other unfortunate doctor. Is it surprising that we are not yet all endeared to the science of psychiatry?—I am, etc.,

London, S.E.24.

CYRIL JOSEPHS.

REFERENCE

¹ *British Medical Journal*, 1952, 2, 881.

SIR,—As one who has come into the field of psychotherapy from a fairly broad background of hospital medicine and general practice, I would like to make a few comments on Sir David Henderson's address (*Journal*, April 17, p. 889). Much of my work is at a clinic for the out-patient treatment of neurotic disorders, where analytical psychotherapy is used, and where lay therapists are employed under supervision by the medical staff. Even though there are other out-patient clinics staffed by doctors, between 700 and 800 new patients are referred to us each year, mainly by general practitioners. Over a number of years I have not come across a case of a patient refusing treatment from a lay therapist, or complaining at being allotted to one. Nor have there been any instances where a lay therapist's lack of medical knowledge has been a stumbling block to satisfactory treatment.

As a healer, the lay therapist seems to possess several advantages over many doctors in the treatment of the neuroses. His professional status does not act as a screen between himself and his patient. His understanding of the patient is not limited by the narrow, mechanistic training of the medical curriculum, with its emphasis on factual and textual knowledge. His vision of the whole person is not obscured by anxiety concerning disease that the patient may have. His treatment does not tend to be applied *secundum artem* after a diagnosis, but rather according to his understanding of the patient's needs. He has no professional overhead expenses, and therefore the amount of time he can give to each patient is not limited primarily by economic considerations. In general, patients referred to clinics would seem to require treatment over a period of a few or a great many months with an average of two sessions per week; and it is difficult to see how, under the conditions of general practice to-day, a doctor can give adequate treatment to his neurotic patients. Undoubtedly many physicians help and support their patients in their difficulties, but that is not the same as curing them and rendering them independent of their doctor's help.

In regard to the proper training of medical students "to deal intelligently and skilfully with patients as persons," I wonder whether lectures and scientific knowledge are the best means of achieving these aims. There is a danger in the over-development

of the intellectual function, so that the natural intuitive understanding becomes stultified. Probably one of the most important things of all is to be able to listen to patients—to the unspoken as well as the spoken word, and to the unconscious. The Chinese emphasize this in their proverb, "If you want good advice, go to a man with four ears." Many of our patients who have been under psychiatric care have had no opportunity to be listened to, and this often is their greatest need.

Surely the needs of our patients should be our primary consideration, and until the supply of physicians is sufficient to meet their needs, both in mental hospitals and in out-patient clinics, many patients will fail to get the help they require unless the lay therapists are valued for what they can do.—I am, etc.,

Edinburgh, 4.

PHILIP SCOTT.

Second Attack of Chicken-pox

SIR,—We were interested to read the extract from Dr. J. I. Lyons's letter (*Journal*, April 10, p. 878). We have in fact seen only two instances of second attacks of chicken-pox this year, but the history of one is, we feel, worthy of note.

The patient is a healthy girl, now aged 8, who developed chicken-pox on June 23, 1953. This ran a normal course and she quickly recovered. On January 27, 1954, one of us again saw her with a mild but again quite typical chicken-pox rash, ushered in by a mild systemic upset and a temperature of 99° F. (37.2° C.). Again she recovered quickly. We were therefore amazed and indeed not a little suspicious when in April 1 we were asked to see M., who "had another rash." Sure enough she had chicken-pox. On each occasion the rash has been preceded by a mild systemic disturbance; the elements of the rash are typical, the centripetal distribution, the intraoral vesicles, and the "cropping" have been present on each occasion, and indeed in the third attack she even showed a concentration of vesicles at the site of a recent abrasion on the left elbow.

We are at a loss to explain these three attacks in so short a space of time and can only postulate different strains of the virus, immunologically distinct, or alternatively a complete failure to develop immunity to the virus. This latter theory would explain individual cases, but would not account for Dr. Lyons's observation of second attacks.—We are, etc.,

London, E.11.

JOHN C. TURNER.
SIDNEY ABRAHAMS.

Herpes Zoster and Chicken-pox

SIR,—That there is a very close association between the viruses of herpes zoster and chicken-pox is well known, but the following case is, I think, something of a rarity and therefore merits recording.

On April 10 a woman aged 58 consulted me for an eruption which had appeared on the previous day. This was situated on the right hip, the right flank, and the upper and outer part of the right thigh, and consisted of typical papulo-vesicles of herpes zoster. She had had no pre-eruption pain and the rash was not troubling her much at the time, and so I prescribed a placebo mixture and an occlusive varnish. On April 15 I received a message asking me to call and see her as she was not so well. She told me that she had had little sleep during the previous two nights owing to pain having developed in the eruption. She also said that she had developed more of the eruption in various places. When I asked to be shown these fresh lesions she exhibited to me scattered papules and vesicles on the face, trunk, and limbs, more or less symmetrically arranged, and which were indistinguishable from the lesions of chicken-pox—there was no grouping about these fresh lesions such as was present in the earlier zoster eruption—and I have no doubt whatever that this patient had developed an outbreak of true chicken-pox within a week of the appearance of her zoster eruption.

I have not heard or read of a similar case and I certainly have never seen one like this previously, and I should be most interested to learn if any other of your readers has had any experience of this double eruption, which appears to me to be strong evidence in favour of the viruses of zoster and chicken-pox being identical.—I am, etc.,

Birmingham, 18.

C. SPENCER WHITEHOUSE.

Appendix in Hernial Sac

SIR,—I am not a little surprised to see from recent case reports in the *Journal* how uncommon it is to find an appendix in a hernial sac. I remember having removed two appendices whilst I was a senior registrar in the Royal Liverpool United Hospital. However, I observe that no one has reported an appendix in a left inguinal hernial sac. The patient, a Fijian aged 30, was admitted to Lautoka Hospital on September 21, 1953. He had developed acute pain in the left inguinal hernia, which he had had for three years. He was shocked, and he had a swelling in the left side of his scrotum "the size of a mature coconut." As soon as possible I operated and found in the left sac strangulated caecum, appendix, and 15 cm. of small bowel. He also had a hydrocele. Owing to the tenseness of the caecum it was not possible to exteriorize both ends of gut in the hernial sac and await recovery for a second operation: the gut was punctured by inserting a catheter fastened with a purse-string suture. After this collapse had been effected the neck of the sac was dilated and the whole mass was handed through to another incision in the right iliac fossa and exteriorized. After removal of the testis and hydrocele the hernia was closed with drainage. The gangrenous bowel was removed and the peritoneum was also drained. As might be expected, the patient died, but not until the fourth post-operative day.—I am, etc.,

Suva, Fiji.

ROBERT I. COHEN.

Fatal Bronchial Asthma

SIR,—The article by Drs. C. Kelman Robertson and Kenneth Sinclair (*Journal*, January 23, p. 187) interested me considerably, as, in 26 years in practice, I have seen only three deaths from asthmatic attacks, and they all occurred in the year 1947.

Without records available, I can only write from memory. Case 1 was a man of 50, Case 2 a man of 35 approximately. Both these men had had repeated injections of adrenaline over more than 24 hours without much relief, and were given morphine. What part the latter played in the deaths is uncertain, but I have never used it in this complaint since. Case 3 was a young woman, aged 17, slightly built, very intelligent, working as a newspaper reporter, who had had asthma since infancy. She had been in good health and free from asthma for several months. About 15 minutes after a normal meal she developed an attack of asthma, presumably no worse than her usual ones. When the attack had been in progress for half an hour she suddenly collapsed. I was sent for and arrived within five minutes to find her pallid, pulseless, and with only an occasional sighing respiration. Intracardiac adrenaline had no effect, and she was dead within five minutes more.

My impression at the time was that she died of right heart failure, brought on by the strain of the attack. The views of Drs. Robertson and Sinclair on the possible mode of death in this case would be appreciated.—I am, etc.,

Wellington, N.Z.

A. RYDER-LEWIS.

Clinical Aspects of Bronchial Obstruction

SIR,—On reading the article by Dr. Robert N. Johnston *et al.* (*Journal*, April 3, p. 799) I was reminded of a sign of bronchial obstruction which I have recently observed and which is not mentioned by these authors, probably because it is rare or even unrecognized. It is a sign of partial obstruction in the sense that while it is complete in full expiration the dilating bronchus during inspiration allows air to pass at a certain stage. On auscultation before this stage air entry is absent, but when it is reached there is an accelerated rush of air past the obstruction due to the increased negative pressure built up beyond it, so that a rather sudden, loud, but short, soufflé results towards the end of the inspiratory phase.

I have heard and demonstrated to my registrar this unmistakable finding in two children, in each case over

a lower lobe; the mechanism was demonstrated by bronchoscopy showing polypoid tuberculous granulations completely obstructing the bronchus in expiration, but incompletely in full inspiration. As mobility of the bronchus is so important in the production of this finding, it is evidently much less likely to occur when the obstruction is due to a carcinoma. I provisionally labelled the sign "delayed inspiration" and wondered what relation it might bear to the "veiled puff" described by Skoda in bronchiectasis. While such cases could well give a similar finding with a plug of sputum as the obstructing agent, forced coughing should easily differentiate this group by causing disappearance of the sign.—I am, etc.,

Bristol.

J. E. G. PEARSON.

Diabetes Insipidus Associated with Pulmonary Disease

SIR,—I was very interested in Dr. J. E. G. Pearson's description (*Journal*, March 20, p. 704) of the diagnostic use of the serum tuberculin-neutralizing factor in sarcoidosis. However, I note that in order to carry out the test he injected his patient's serum into five other (tuberculin-positive) patients. May I most strongly urge him, or anyone else intending to carry out the test in the future, to keep for the purpose a small stock of guinea-pigs rendered tuberculin-positive with B.C.G.? It seems to me unwise to submit other patients to the risk of the transmission by means of a test of this kind of the virus of "serum hepatitis"—or even of a hypothetical sarcoidosis-causing agent.—I am, etc.,

London, S.W.1.

G. R. F. HILSON.

Photic Convulsions

SIR,—I was interested in your annotation on "Photic Convulsions" (*Journal*, April 17, p. 925). I have found from a clinical point of view that glare and also the flicker from cinema screens will precipitate migraine in a number of cases, and I am hoping to be able to get more controlled evidence on this point in the near future. A main source of trouble is fluorescent tube lighting when the tube is parallel to the desk instead of at right-angles to it. It happens occasionally that glare is the predominant factor among other precipitating factors in a given case of migraine, and all that is required is to deal with this by the use of "polaroid" glasses, etc. It would appear that there are many industrial processes where the lighting conditions are such as to be excessive and to constitute a state of glare.

Certainly the visual experiences described by Dr. Grey Walter in *The Living Brain*¹ using flicker in phase with the alpha rhythms would seem to be similar to the scintillating scotomata of migraine. One of my patients, an industrial research physicist, volunteered the information to me that headaches were induced by the flicker of light through the trees by the wayside while motoring; which has features in common with a case mentioned by Dr. Grey Walter in the same book. The effect of glare and light on various forms of psychosomatic disease has been noticed in days gone by, and Liveing, in his book on "megrim,"² discusses it as a precipitating factor in asthma as well as migraine.—I am, etc.,

Birmingham, 27.

K. M. HAY.

REFERENCES

- ¹ *The Living Brain*, 1953. London.
- ² *On Megrim*, 1873. J. and A. Churchill, London.

Weight-lifting

SIR,—I have a practice within a few hundred yards of London and Katherine docks, and see many stevedores suffering from "sprung back" or prolapsed disk. Questioning those injured in lifting suggests: (a) Breathing is an important factor. If the lifter exhales during effort this decreases intra-abdominal tension and relaxes any "antagonist" muscles. This tip is well known to professional weight-lifters. (b) The centre of gravity must be as near

to and as far below the object to be raised as is possible. (c) If two people are lifting they must act as "mirror" images. The Safety Health and Welfare Museum in Horseferry Road, London, S.W.1, shows the posters Dr. J. H. Cyriax mentions (*Journal*, April 17, p. 933), and also some models.

Packing-case manufacturers could do some research into the placing and use of inset metal handles in their products of standard-size soft wood.—I am, etc.,

London, E.1.

N. D. WAYNE.

SIR,—Your recent correspondence under the heading, "Advice on Weight-lifting" (*Journal*, March 20, p. 703, and April 17, p. 933) prompts me to mention that, in collaboration with the Central Council for Physical Recreation, this Society has for two years been running courses in manual lifting and handling all over the country. The original point of contact—and this is typical of our work—was that the knowledge and experience behind the training of the weight-lifter in the field of sport might well be applied to weight-lifting at work. From this purely speculative idea developed a joint interest in human kinetics, the physiological details being medically approved. The basic lessons taught in these courses are summarized in a fully illustrated pocket book, *Manual Lifting and Handling*, which is bought by industrial firms in sufficient numbers to justify the belief, which we share with your correspondents, that the preventive approach is both necessary and appreciated.—I am, etc.,

London, W.1.

THOMAS FASSAM,
Controller,
Programmes and Publications,
Industrial Welfare Society.

Conjoined Twins

SIR,—I read with great pleasure Professor Ian Aird's account of the conjoined twins of Kano (*Journal*, April 10, p. 831), and I was interested in his statement that it has never been completely proved that conjoined twins are, in fact, invariably monovular. If conjoined twins were, on occasion, the result of fusion of binovular embryos would we not sometimes find that the twins were of opposite sexes? There is no mention of any such case in Professor Aird's paper, and I would be interested to know if conjoined twins of different sexes have ever been reported. It may, of course, be that the circulatory connexion between the two partners, with the resultant mixing of sex hormones, would render the development of normal sexual characteristics impossible, and some bizarre effects might result.

I understand from a veterinary colleague that authentic cases have been recorded of conjoined twins in other mammals where the partners are male and female, but I am afraid I can trace no written authority for this statement.—I am, etc.,

London, W.C.1

D. A. BAILEY.

Weber-Christian Disease

SIR,—The point of interest to me in Dr. H. R. F. Macdonald's medical memorandum on Weber-Christian disease (*Journal*, February 13, p. 377) was the admission of the patient to hospital as a case of coronary artery thrombosis. No evidence of myocardial infarction was found. Similar cardiac symptoms developed in a patient whom I saw recently with the same condition.

An obese woman aged 54 developed the typical lesions on her legs on January 10, 1954. She was seen by Dr. Alice Carleton on January 20, to whom I am indebted for the diagnosis. She was admitted to hospital for investigation and biopsy of one of the skin lesions, which confirmed the diagnosis. She showed a low grade pyrexia. This is her first attack, so that her condition cannot truly be termed "relapsing" nodular panniculitis. The skin lesions had resolved, when, on February 8, she suddenly "collapsed" and became breathless and cyanosed. She denied any pain. On examination auricular fibrillation with a ventricular rate of 150 per minute was found to be the cause of her symptoms. The blood pressure was 180/110. Treatment with digitalis was given, and the ventricular rate was reduced to 90

per minute. Sinus rhythm had returned when she was seen on February 15, and this has been maintained. An electrocardiogram could not be taken during the acute phase, but the tracing on March 12 was normal. A chest x-ray showed moderate generalized cardiac enlargement with unduly prominent pulmonary vascular shadows.

Lesions of the internal adipose tissue have been reported,¹ and it has been suggested that nodular panniculitis in the bone marrow can disturb normal haemopoiesis. Is it possible that similar lesions in the epicardial and pericardial fat may cause cardiac irregularities?—I am, etc.,

Wroughton, Wilts.

W. L. CALNAN.

REFERENCE

- ¹ Steinberg, B. (1953). *Amer. J. Path.*, 29, 1059.

Treatment of Threadworm Infestation

SIR,—When faced with cases of threadworm infestation many of us seem to be preoccupied with giving medicinal vermicides, necessary though they may be, and ignore the underlying causes. The literature is confused on the subject, and I would welcome the views of other practitioners on the following questions.

What are the conditions which favour the hatching of threadworms in the bowel? Donald Paterson¹ says: "It is the opinion of the author that most people are constantly ingesting the ova of worms. Those who are below par and run down have a low hydrochloric acid content and therefore fail to digest and kill off the swallowed ova." Has any work been done to prove or disprove this theory, or to establish what are the conditions in the digestive tract which favour the hatching and growth of the worms? Unless the problem is tackled at this level the tendency to infestation cannot be cured, however efficient the vermicide may be for each attack.

Is threadworm infestation detrimental apart from the anal irritation and the very rare blocking of the appendix? My own experience among well-cared-for children leads me to think that the appearance of threadworms is the result of debility rather than the cause of it. But what do others think? If, indeed, the condition is not detrimental there is no point in making the treatment more troublesome than the worms. Such fearsome and bothersome procedures are sometimes prescribed that mothers naturally get the impression that threadworms must be very dangerous, and become almost neurotic in their frantic efforts to eradicate the pests. I have recently heard of a mother who, when one of her family is infested, nightly gives enemas to her five children, including a baby, with goodness knows what psychological effects. She doses them and purges them and starves them, she daily boils their bed-linen and pants, and I am sure she would boil the children too if she could, so frantic and determined are her efforts to eradicate what she has been led to consider as a disgraceful and dangerous infestation. The tragic thing is that these efforts are largely in vain, because the worms appear again a few weeks later.—I am, etc.,

Shoreham-by-Sea.

GWYNETH M. COTTERELL.

REFERENCE

- ¹ *Sick Children*, 1938, p. 517. London.

Cricket

SIR,—A match between the B.M.A. and the Law Society Cricket Club has been arranged for Sunday, May 30, at 11.30 a.m., at Hurlingham, London, and I have been asked by Council to make the necessary arrangements on behalf of the B.M.A. Would any members who are active cricketers and who might wish to play please get in touch with me as soon as possible, so that an appropriate side may be chosen to represent the Association? Would members when writing please indicate their "potentialities"? Last year we were without a slow left-hand bowler, an omission which should be remedied this year.—I am, etc.,

R. PROSPER LISTON.

The Little House,
Broadwater Down,
Tunbridge Wells.

Obituary

Dr. H. U. GOULD died very suddenly on April 14 in the grounds of his home at Walton-on-Thames, where he had been living in retirement, at the age of 78. Harold Utterton Gould was born at Worcester Park, Surrey, on February 18, 1876, the son of Charles Gould, Q.C., and was educated at Winchester, Trinity College, Cambridge, and St. Bartholomew's Hospital. He qualified in 1902 and graduated M.B., B.Chir. in the following year. After holding the appointment of assistant house-surgeon at the Gloucestershire Royal Infirmary and Eye Institution, he returned to St. Bartholomew's as resident midwifery assistant and house-physician. In 1906 he settled in practice at Shaftesbury, in Dorset, where he became medical officer to the Westminster Memorial Cottage Hospital and medical officer of health to the Shaftesbury Rural District Council. He took a prominent part in local affairs and was elected mayor of Shaftesbury. Dr. Gould returned to Surrey in 1926, living first at Surbiton and then in the adjoining Royal Borough of Kingston-upon-Thames, where he designed and had built a central surgery for the use of himself and his two partners. For many years a member of the honorary medical staff of the Kingston Victoria Hospital, he was much concerned about the closing of the hospital three years ago. He was also on the honorary staff of the Surbiton Hospital. A tall man, with the physique of an athlete—he rowed for the Leander Club and won the Colquhoun sculls while at Cambridge—he was remarkably gentle in treating his patients, who quickly found that his seemingly off-hand manner masked a keen interest in their welfare. Dr. Gould retired from practice two years ago, but made many return visits to the Kingston district to call on former patients who had become his friends. A widower, he is survived by two sons and a daughter.

Dr. MABEL G. BRODIE died suddenly on April 21 at Port Dickson, Malaya, at the age of 64. Mabel Garland Cowper was born on May 28, 1889, and was educated at the Universities of Aberdeen and St. Andrews, graduating M.B., Ch.B. from St. Andrews in 1914. After graduation she was resident for a short time in 1914 at the Birmingham General Dispensary, whence she went to the Brownlow Hill Infirmary, under the Select Vestry, at Liverpool. In this post she proved herself an able clinician, but her chief interests were in maternity and child welfare and in ophthalmology. She took the D.P.H. at Liverpool in 1917. After about two years she was appointed to one of the Liverpool fever hospitals, where her work and ability attracted the attention of the then medical officer of health, the late Dr. E. W. Hope, and he asked that she be appointed as first medical officer in charge of maternity and child welfare work for the city of Liverpool. Her broad view of the duties of such a post, along with her advanced outlook and ability, soon showed how far-sighted had been the choice of the Liverpool City Council. Her next appointment was to the staff of the Ministry of Health, but on her marriage to Dr. William Hugh Brodie she resigned from the Ministry. Shortly afterwards she became senior medical officer to the maternity and child welfare department of the Durham County Council. Later both she and her husband joined the Colonial Medical Service in Malaya. In 1933 she took the D.T.M.&H. of the English Royal Colleges. Dr. Mabel Brodie had very deeply at heart the interests of mothers and children, both in England and Malaya. She returned to England soon after the outbreak of the last war and was employed as a medical officer in an ordnance factory in Yorkshire, and later undertook public health work in Willesden and Islington. After the war she went back to Malaya, and her sudden death has deprived the Colonial Medical Service of a very capable and conscientious practitioner and administrator. She was a most generous and sympathetic person

and will be missed by many of her colleagues and by those who worked under her and to whom she gave of her best. All who knew her will wish to extend their sympathy to her husband and their daughter and to her mother and sister.—W. M. G.

Medical Notes in Parliament

WORLD POPULATION AND FOOD SUPPLIES

Viscount SAMUEL invited the House of Lords on April 28 to consider the continuing and rapid increase in world population and the consequent need for increasing production of food and raw materials if living standards were to be maintained and improved.

He said that in 1850 the world population was rather over 1,000 million; to-day it was 2,500 million; and, if present trends were continued, by the early part of next century it would be 5,000 million. These figures had given rise to great anxiety, and the question was asked whether the human race was heading to sheer disaster. Dr. A. V. Hill said, in his presidential address to the British Association the year before last, that the rapid lowering of death rates all over the world meant that unless there was a deliberate restriction of birth rates in many countries there would be an inevitable fall in living standards.

The proposition that Lord Samuel put was that science, which had brought about the danger, brought also the means for preventing it, and that it was a fallacy to suppose that a mere increase of population must be a sheer liability. There were enormous opportunities for extending the areas of cultivation and vastly increasing the yields. Long-range possibilities included the development of nuclear energy, which might bring economic salvation to countries short of other sources of power; and the reaping of a greater harvest from the sea, including plankton, which for the next generation might be familiar as a main source of human food supply—it was only a question of the mode of preparation and availability. Plankton could be had for the asking; it contained millions of tons of proteins and quantities of vitamins. If the human race had been clever enough to grasp nitrogen out of the air and convert it by means of artificial fertilizers into bread and milk, surely it would be clever enough to take plankton from the sea and make it available in one form or another for human sustenance.

Lord BOYD-ORR said it was easy enough in theory to increase food, but not so easy in practice. In the Eastern countries—the food-deficit countries—there were social, religious, and economic difficulties. The food and economic problems might cancel each other out, because if food production was to be doubled an enormous increase in industrial equipment would be needed, and increased purchasing power and markets result from it.

The ARCHBISHOP OF YORK said that in asking the medical staffs of tropical hospitals what were the chief illnesses with which they had to deal, he had been struck that so often the answer had been, "With the exception of malaria, there is no particular tropical illness that causes us trouble, but the ordinary illnesses which you have at home are intensified and made more serious through malnutrition." He mentioned that one of the results of the eradication of malaria in British Guiana had been a decrease in infant mortality from 250 a thousand to 67 in a year, and the birth rate had also gone up. Birth control must be discussed and considered, but first things must be taken first, and he had found in the West Indies the opinion that the immediate need was to raise the standard of living, and that when that had been done people would have a greater appreciation of the necessity for parental responsibility.

Birth and Death Control

Lord BEVERIDGE said that what had been called "death control," the saving of lives through the development of science, had become one of the major factors in the world

population problem. It was clear that it automatically required birth control in some form or other.

Lord SIMON of Wythenshawe said that when this country started death control nearly 200 years ago medical and sanitary science was in its infancy. It took us nearly 200 years to get the death rate down to 40 a thousand. But recent inventions like penicillin and D.D.T. had produced remarkable results. If India, for example, applied Western health measures with comparable efficiency she would have an increase in population not of five million a year but ten million, and would not have time to get birth control going or industry developed. The Indian Government's five-year plan included, for the first time in history, he thought, the initiation of a campaign to limit the increase of population and as early as possible to stabilize it.

Lord HADEN-GUEST said that a world survey in much greater detail was required before any conclusions were drawn, and the necessity for control of the birth rate must be faced.

Lord STAMP said that as a medical microbiologist he was particularly interested in the contribution that research in the biological sciences might make. Further research was needed into the nutritive value of yeast for man and animals, and the methods of improving its palatability. Another group of organisms which appeared to have considerable potentialities as food was the algae, in particular the chlor-ella or green algae often seen as a green scum on the surface of ponds. These plants had high yields of fats and protein of nutritive value. There were many others which might prove of equal or greater value, and there was also the possibility of utilizing further the photosynthetic action of sunlight in building up proteins of nutritive value by devising methods for the extraction of proteins from leaves of plants that were at present largely wasted.

Earl DE LA WARR, for the Government, said the real problem was that agriculture must keep pace with medicine. It could do so only with a great effort. Birth control was primarily a matter for the countries concerned, and interference of that sort from this country would not be welcomed. He recounted the aid which was being given to the Food and Agriculture Organization and the United Nations technical assistance programme and through the Colombo plan. He agreed that the subject was one of great importance, and assured the House that the Government saw it as such and was prepared to do something as well as talk about it.

INQUIRY INTO HOMOSEXUALITY AND PROSTITUTION

It was announced in the House of Commons on April 29 that the Home Secretary, having given careful and anxious consideration to various representations that had been made on homosexual offences, and also close attention to the parallel problem of the law relating to prostitution and solicitation generally, had decided—in conjunction with the Secretary of State for Scotland—to appoint a committee to study both these questions.

Sir HUGH LUCAS-TOOTH, Under Secretary at the Home Office, added that he was anxious to secure the services of able and experienced men and women to serve on the committee, and therefore it might be some little time before he was able to announce the membership and terms of reference. The Home Secretary believed that a thorough investigation by a well-qualified body would throw useful light on the scope and nature of these difficult and controversial matters, and would make a valuable contribution to the problem of how the criminal law should deal with them.

Mr. DESMOND DONNELLY (Pembroke, Lab.) proposed the appointment of a Royal Commission to investigate the law relating to and the medical treatment of homosexuality, on the motion for the adjournment of the House. He said it was important that if such a commission was appointed it should look into the matter with a view to seeing what medical treatment could be provided. He was advised

that this was not mainly a glandular problem; it was a psychiatric problem, and the answer could often be found in psychiatric treatment where this was possible, or more particularly in studying the treatment of young people in their nursery years, because that was the crux of the whole matter. A Royal Commission should go into the matter and see that there was widespread public knowledge of how this sort of thing could be avoided.

Sir ROBERT BOOTHBY (Aberdeenshire, East, Con.) said that all the laws relating to this subject were enacted before any of the discoveries of modern psychology, and in any event were out-moded. The duty of the State was to protect youth from corruption and the public from indecency and nuisance. What consenting adults did in privacy might be a moral issue between them and their Maker, but it was not a legal issue between them and the State. What were called infanto-homosexuals should be segregated unless and until they were cured—as indeed must all those who committed offences against children and young people of either sex. But to send confirmed adult homosexuals to prison for long sentences was not only dangerous but madness. The prisons in their present overcrowded condition were factories for the manufacture of homosexuality. Recent cases established the need for an authoritative inquiry to furnish Parliament with the necessary expert knowledge and guidance for appropriate legislative and administrative action.

Sir HUGH LUCAS-TOOTH, replying, said that three main questions had emerged: What was the prevalence of homosexual activities? What was the impact of the law on such activities, and was any amendment of the law desirable? And what could be done by way of curative treatment, apart from punishment, for those who offended? There were no reliable means for assessing the prevalence of homosexual practices, but it was right to say that there had been a serious increase. Between 1938 and 1952 indictable offences known to the police had increased between four- and five-fold. He thought it could be said with complete truth that the reasons for the increase were simply not known. There would be general agreement that the criminal law ought to provide effectively for the protection of the young and the preservation of public order and decency. The question was whether the law should confine itself to securing those two objects, or whether it should be amended to permit unnatural relations between consenting adults in private. Such activities were no crime in many countries.

What medical science could do for those prisoners who were willing and able to be helped by psychological treatment was done to-day. Visiting psychotherapists had been appointed at certain prisons. Elsewhere prison medical officers submitted to the Prison Commissioners the names of any prisoners serving substantial sentences whom they thought were likely to benefit by treatment from psychotherapists with a view to their transfer. There was a scheme for prisoners serving shorter sentences to be seen by visiting psychiatrists from regional hospital boards with a view to continued treatment after release. The Prison Commissioners proposed to build a special establishment for mentally abnormal prisoners, and sexual and homosexual cases would be included. But those who could benefit were in a minority.

Cancer Registration

Mr. S. AWBERY (Bristol, Central, Lab.) asked if the Minister of Health, as a means of combating cancer, would give powers to local authorities to register all persons suffering from this disease; and if he would promote schemes to educate patients through general practitioners and other means on the best form of treatment. Miss PAT HORNSBY-SMITH replied that hospital boards were encouraged to arrange for the registration of all cases treated in hospital, and to provide information about incidence and results of treatment. The Minister had already invited local authorities to promote educational schemes, in co-operation with hospital authorities and general practitioners.

Mr. AWBURY said that many people who suffered from the disease were afraid to go to their doctors in the initial stages, and asked if the Minister would carry on a campaign through medical officers of health to encourage people to see their doctors at a stage when they could be helped. Miss HORNSBY-SMITH said that she shared his concern. They were working on the advice of the standing advisory committee on cancer and radiotherapy, and carrying out a scheme recommended by them.

Emphysema Research

Sir JOCELYN LUCAS (Portsmouth, South, Con.) asked the Minister of Health on April 29 if he would set up a special centre for research into the cause and cure of emphysema, and if he would give an estimate of the number of sufferers affected. Miss PAT HORNSBY-SMITH said that research into the lung conditions with which emphysema was usually associated was in progress in a number of centres. There was not information available to form an estimate of the number of sufferers.

Sir J. LUCAS urged that, as neither the cause nor the proper cure of this complaint had yet been discovered, the Minister should do all he could to step up research, with a view to relieving sufferers. Miss HORNSBY-SMITH said that research into diseases of the lung was already carried out at such centres as Hammersmith, the Brompton Hospital, and Sheffield, which covered research into emphysema.

World Health Organization

Sir RICHARD ACLAND (Gravesend, Lab.) asked the Minister of Health on April 29 whether he would instruct the British Government to press for a substantial increase in the regular budget of the World Health Organization, and to pledge this country to pay its fair share in the increase. Miss PAT HORNSBY-SMITH stated that the proposed regular budget of the Organization for 1955 showed a substantial increase over that approved for 1954, but the Minister was not satisfied that this increase was justified. The matter would be further considered at the next World Health Assembly. The United Kingdom contributed to the budget on a scale approved by the Assembly.

Sir RICHARD ACLAND asked that Britain should press for an increase in the budget so that the Organization could overcome its many problems. Miss HORNSBY-SMITH: "Not unless we are satisfied that the increase is justified."

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked for an assurance that there would be a long-term guarantee of funds to the Organization so that it could recruit the technical and qualified staff urgently needed for long-term contract work. Miss HORNSBY-SMITH said that was a much wider question, which she could not possibly answer.

Hospital Private Beds

Mr. A. MOYLE (Oldbury and Halesowen, Lab.) asked the Minister of Health on April 29 what steps were taken to ensure that private beds were not reserved for the use of fee-paying patients when there were urgent or chronic cases on the general waiting-list. Miss PAT HORNSBY-SMITH replied that the National Health Service Act specifically provided for patients in urgent medical need of treatment to be admitted to a pay-bed without charge if no alternative accommodation was available. The Minister had brought this to the notice of hospital authorities, and had also asked them to ensure that pay-beds not in full use for private patients were used for other patients, whether urgent cases or not.

Mr. MOYLE asked what view the Minister took of the heavy fees paid by private patients for minor operations, like the removal of tonsils, for which they were able to get attention within a week, whereas children had to wait as long as six months. Miss HORNSBY-SMITH said she hoped he would not exaggerate these claims. In the hospitals in which he was interested the Minister had assured him that whereas 25 tonsillectomies were done in a week under the Health Service there were only four in a year on private fee-

paying patients. If M.P.s had any evidence the Ministry would be glad to go into it to ensure that there was no abuse. It was not fair to suggest there was widespread abuse.

Medically Unfit for Service

Mr. IAN HARVEY (Harrow, East, Con.) was informed by Mr. HAROLD WATKINSON, Parliamentary Secretary, Ministry of Labour, on April 27, that it was estimated that 20% of the men medically examined on registering for national service in the first quarter of this year were not fit for service, on medical grounds. Mr. HARVEY said there was some concern about evasion of national service through men obtaining doctors' certificates, which were then honoured by the board, and asked that the matter should be looked into. Mr. WATKINSON said he did not think so. The medical boards did as the House had asked and were careful to see that they did not call up men who were medically unfit for military service. That sometimes meant delay in conferring with consultants, and so on, but he did not think many people evaded service for medical reasons. Mr. GEORGE THOMAS (Cardiff, West, Lab.) asked if the percentage was rising or falling, as 20% seemed a high figure for people unfit, and Mr. WATKINSON replied that it had been about the same over the past 12 months.

Antidotes to Poison

Lieutenant-Colonel W. SCHOFIELD (Rochdale, Con.) asked the Home Secretary if, where the law provided that any poisonous fluid or substance must be marked and labelled "poison," he would make it compulsory that the antidote to the poison should also be clearly stated. Sir DAVID MAXWELL FYFE replied on April 29 "No." The Poisons Board had advised against the introduction of such legislation. There were great dangers, because undue emphasis on antidotes might result in the loss of valuable time in obtaining medical help.

Contaminated Oranges.—Miss PAT HORNSBY-SMITH informed Mr. R. W. SORENSSEN (Leyton, Lab.) on April 29 that the Ministry of Health had received no reports from medical officers of health or any general practitioner of intestinal or other ill effects suspected to be due to the contamination of oranges by thiourea.

Sanitary Inspectors.—The Minister of Health stated on April 29 that he and other Ministers concerned had considered the report of the working party on the recruitment, training, and qualification of sanitary inspectors, and he proposed to discuss it with the interested bodies with a view to implementing the working party's proposals. It should not be inferred that he necessarily accepted all the detailed recommendations of the working party.

Medico-Legal

AN UNCERTAIN WILL

[FROM A SPECIAL CORRESPONDENT]

A recent decision in the courts has been of great moment to the two principal medical charities, and is therefore of importance to the whole profession. A Miss X, daughter of a long-deceased doctor, made a will in which, after various bequests, including annuities to be paid by her executors to four female friends, she left the residue to be divided (not quite equally) between the Royal Medical Foundation of Epsom College and the Royal Medical Benevolent Fund. One of the legacies was a bequest of £250 to her usual medical attendant.

So far all was plain sailing, but shortly before her death she executed a codicil in which she empowered her executors at their discretion to allow her doctor to buy her house, should he want to do so, "not necessarily at its full probate value but for such an amount as he can afford." The house was valued for probate at £700 at the time when Miss X died, about two years ago. The doctor then offered the

executors £100 for the house. Both the charities, naturally enough, protested emphatically against the acceptance of this offer. Various attempts to arrive at a compromise solution of the dilemma broke down, so finally the executors sought the direction of the court on the course they should follow. The clause was declared to be void for uncertainty. For once the strict letter of the law and natural justice seem to have coincided, which, to laymen, does not appear always necessarily to be the case.

HYPNOTIST LECTURER ACQUITTED

Believed to be the first person to be prosecuted under the Hypnotism Act of 1952, Mr. D. T. Watson, aged 46, was acquitted at Northampton on April 28 on a summons brought under the Act. Watson was a lecturer at a meeting arranged by the International Friendship League at a Northampton café, and he was accused of giving a public demonstration of hypnotism on a young man, a journalist, at a place which was not licensed for it. The Act says that "no person shall give an exhibition, demonstration, or performance of hypnotism on any living person at or in connexion with an entertainment to which the public are admitted," unless authorization has been given. The defence claimed that the lecture was not an entertainment, and that the purpose of the Act was to prevent the prostitution of hypnotism by people who wanted to make money from it in theatres. The magistrates were satisfied that the demonstration was not an entertainment.

Manchester Guardian, April 29.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on January 21 the degree of B.M. was conferred on J. G. Bateman and B. C. Morson.

The Board of the Faculty of Medicine has re-co-opted Dr. A. M. Cooke and co-opted Dr. E. M. Buzzard for the statutory period of two years from the first day of Hilary Term, 1954.

UNIVERSITY OF ST. ANDREWS

The degree of M.D. has been conferred on Norman Levinson. The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—W. Chaplain, I. M. Sutherland, Mary E. Woods.

UNIVERSITY OF GLASGOW

The following degrees were conferred on January 16:

M.D.—J. Bruce (with commendation), Helen I. W. Kerr-Taylor, R. Lamb (with commendation), J. M. McBride (with high commendation), H. Thompson, R. M. L. Weir.

M.B., CH.B.—Florence M. D. McC. Adams, D. MacF. R. Adamson, W. G. Aitchison, J. A. H. Aitken, Elizabeth H. Arklie, W. G. Barbour, J. Bolland, Evelyn M. Borland, R. H. Boyd, Elizabeth J. B. Buchanan, J. M. Cameron, W. S. Campbell, J. A. Chapman, W. H. Cochrane, J. A. Dand, W. A. Dawson, Marion R. H. Donald, R. G. Dryden, D. Duncan, Stella E. G. Gibson, Katherine M. Girdwood, A. I. M. Glen, I. B. Hall, Margaret A. Hart, G. S. Henderson, M. Holmes, G. M. Jesner, J. H. Lawrie, Myra Leatham, W. J. Leishman, E. S. Livingstone, Isobel McClung, G. T. MacCulloch, A. McCutcheon, A. J. McDonald, I. G. MacFarlane, J. A. McCarry, W. G. MacIntosh, J. C. MacIntyre, A. Mackintosh, Marion T. McKissock, J. S. MacLean, J. H. McLean, J. D. Mabon, W. Mitchell, R. S. Moir, J. B. Morris, J. M. Neilson, J. M. Newton, R. A. H. Newton, W. A. Nicol, G. H. Parker, A. Patrick, Flora K. Prentice, Euphemia Quigley, Helen A. Ritchie, A. Robertson, J. T. Robertson, A. W. B. Russell, I. D. Sanderson, R. W. Sharp, I. R. Sherret, C. E. Simpson, N. J. Skelton, W. D. Smith, W. McA. Speirs, D. A. Stalker, Doreen Steel, Anne M. Stewart, Jean O. Struthers, Margaret A. Timmins, P. G. M. G. Walker, Margaret Wallace, A. S. Wilson, W. Young.

UNIVERSITY OF LONDON

D. P. Walther, M.R.C.S., L.R.C.P., L.D.S.R.C.S., senior hospital dental officer, orthodontist in charge of the orthodontic clinic department at the Eastman Dental Hospital, and senior hospital dental officer at the Hospital for Sick Children, has

been appointed to the University Readership in Orthodontics, tenable at the Royal Dental Hospital of London School of Dental Surgery.

UNIVERSITY OF SHEFFIELD

Dr. J. Wilkie has been appointed part-time Lecturer in Radio-diagnosis.

UNIVERSITY OF BRISTOL

The following candidates have been approved at the examinations indicated:

M.D.—J. D. Sheward.

FINAL M.B., CH.B.—P. B. Bailey, M. J. Betty, G. A. Bond, M. L. Cox, R. W. Digby, R. D. Doyle, R. I. Eastwood, Monica M. Gurnhill, K. W. Moulding, A. E. Nesling, T. F. J. Parker, W. E. Smith, D. G. Trott (with distinction in public health), R. Winstone. In Group I completing the examination: J. P. Bishop, Christine F. Boulter, Margaret V. Brown, J. Royle, Catherine M. Stephen. In Group II only: K. G. Collins, Janet H. Keevil, E. C. Skeens.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Part II: L. W. Bowen, D. E. Jarman, S. Prus.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on December 10, 1953, with Sir Reginald Watson-Jones, Vice-President, in the chair, Dr. Fred W. Rankin, President of the American College of Surgeons, was awarded an Honorary Fellowship.

Hunterian Professorships were awarded to Mr. R. C. Evans, and Dr. Michael Ward for a lecture on "The Ascent of Mount Everest—Medical Studies."

The Begley Prize was presented to Margaret M. Heley (Royal Free).

It was decided to proceed at once with the building of the Nuffield College of Surgical Sciences.

Diplomas of Fellowship were granted to the following candidates: J. A. James, K. L. Barnes, C. M. Phillips, R. B. McGrigor, D. B. Moffat, R. M. Harvey, G. F. Hird, J. S. J. Morley, J. E. Oliver, L. G. Fison, K. Till, A. S. Falconer, A. E. Platt, R. A. Daws, J. A. G. Holt, Betty M. L. Underhill, J. Bihari, P. B. Foxwell, S. Panikkar, B. G. Reynolds, Agnes R. D. Bartels, J. A. Snyder, K. S. E. MacRae, Margery Scott-Young, C. J. S. Sergel, M. Shaffi, G. C. Pritchard, K. G. Malcomson, J. M. Ellis, I. M. Grant, H. D. W. Powell, F. H. Gamali, J. D. Glanville, W. Grundill, P. A. P. Joseph, A. M. Akram, A. Benjamin, R. F. Burton, J. K. Craig, W. S. Foulds, P. E. Ohadi, B. Goldman, R. J. Hart, K. W. Hinrichsen, G. S. Karai, J. S. Lekias, Elaine Lister, E. A. McVerry, K. D. J. Vowles, K. H. Abdel-Ghaffar, A. K. Das, I. Sober, J. B. R. Wells, C. G. Wilson, W. S. Wilson, F. J. Hall, H. C. Jones, J. Klely, B. V. Kyle, E. D. McIntyre, S. A. Mellick, D. J. Retief, J. E. S. Scott, N. J. Way, R. F. Zacharin, A. F. G. Anderson, R. R. Barnett, J. G. Brice, A. F. Ferguson, H. R. McCoy, M. K. Mehra, A. G. Morgan, P. J. Mortensen, G. T. Smedley, T. K. Thorlakson, M. Wynyard, J. Chalmers, D. Davies, L. R. De Jode, E. S. P. Ferguson, R. S. Gupta, C. H. MacLaurin, B. Shandling, K. K. Sinha.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The following were admitted to the Membership of the College on February 5: K. H. Anderson, E. E. Doyle, K. C. Finkel, L. G. McElearney, M. F. McParland, J. B. O'Dullivan.

SOCIETY OF APOTHECARIES OF LONDON

The diploma of L.M.S.S.A. has been granted by examination to the following successful candidates: J. M. Goyder, T. J. Gallivan, I. Dollond, T. J. Taylor, T. G. Wadsworth, E. Dayan, J. Curtis, J. K. Anderson, J. G. Robertson, M. W. L. Davis, B. Clarke.

The following candidates have been awarded the Diploma in Industrial Health: W. R. Brown, S. Chakravorti, K. P. Duncan, B. K. Ghose, R. Makin, P. B. Nicol, J. D. Pickford, M. K. Qureshi-Ul-Hashmi, A. W. W. Robinson, T. Simpson, H. Stott.

APOTHECARIES' HALL OF IRELAND

At recent examinations the following candidates received the diploma of L.A.H. Dublin: S. M. Abba, E. Allan, A. Azike, J. F. L. Barry, Evelyn Blake, E. W. Burke, D. R. Chiney, G. G. Dibue, P. P. Gallagher, W. H. Hamilton-Deane, P. J. A. Horan, J. M. Langan, Chew Seng Lau, J. M. Mangan, Erminie Marazzi, D. Martin, Bridget Moylan, P. D. Moylan, H. McCarthy, O. L. McGuinness, D. C. O'Sullivan, Maire Quigley, J. A. Quigley, T. F. Regan, Constance Strickland, J. D. Steele, T. E. Winckworth, R. Whyte.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 17 (No. 15) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	14	1	3	1	0	18	2	8	0	0
Dysentery	919	121	273	4	3	282	33	88	6	0
Encephalitis, acute	2	0	0	0	0	3	0	0	0	0
Enteric fever:										
Typhoid	1	1	0	0	0	2	0	0	0	0
Paratyphoid	3	0	0	0	0	7	0	1(A)	0	0
Food-poisoning	88	9		6		56	9		0	
Infective enteritis or diarrhoea under 2 years				12	14				21	19
Measles*	1,912	67	144	92	281	18,861	835	550	269	284
Meningococcal infection	24	1	18	1	2	54	6	11	1	4
Ophthalmia neonatorum	35	4	12	0		48	1	4	0	
Pneumonia†	451	17	185	10	0	796	57	473	14	8
Poliomyelitis, acute:										
Paralytic	10	0	3	0	3	26	1	0	1	0
Non-paralytic	7	1				8	0			2
Puerperal fever‡	185	24	14	0		208	30	23	1	
Scarlet fever	994	60	137	38	29	994	67	151	35	51
Tuberculosis:										
Respiratory	751	95	168	32					147	27
Non-respiratory	111	9	20	2					16	6
Whooping-cough	1,980	69	248	37	19	2,847	181	374	40	152

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0	0	0	0	0	0	0	0	0
Encephalitis, acute	0	0	0	0	0	0	0	0	0	0
Enteric fever	0	0	0	0	0	0	0	0	0	0
Infective enteritis or diarrhoea under 2 years	7	0	0	2	3	8	1	1	3	0
Influenza	6	1	1	1	0	37	1	1	2	3
Measles	0	0	0	1		0	0		2	
Meningococcal infection	0	0	2			0	0			
Pneumonia	189	26	22	8	4	300	33	26	19	11
Poliomyelitis, acute	0	0		0		8	1		0	
Scarlet fever	0	0	0	0	0	0	0	0	0	0
Tuberculosis:										
Respiratory	90	10	10	0	6	119	19	14	4	6
Non-respiratory									3	3
Whooping-cough	2	0	0	0	1	3	0	1	0	1
Deaths 0-1 year	218	29	42	8	10	229	30	34	14	22
Deaths (excluding stillbirths)	5,092	703	577	129	178	5,428	731	623	126	209
LIVE BIRTHS	6,339	955	769	261	311	8,068	1,175	923	235	409
STILLBIRTHS	206	21	24			196	25	20		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Vital Statistics

Hospital In-patient Statistics

A further contribution to the study of morbidity statistics published this week includes figures of cases admitted to certain hospitals in England and Wales in 1949 analysed by sex, age, disease, length of stay, and social class. The volume also includes some figures from wartime E.M.S. hospital records. The significance of many of the figures tabulated is not easy to interpret, because the population at risk is problematical. Hospital administrators, however, may find useful guidance on the proportions in which groups of beds should be set aside for different diseases. Some of the sex ratios of disease incidence obtainable may usefully be compared with those obtained from mortality statistics. Table H2 shows that the average stay in hospital is lower in the provincial teaching hospitals than in either the London teaching hospitals or the regional board hospitals. The figures for the last-named are influenced by the relatively high proportion of old people admitted.

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in March, 1954, was 118, compared with 114 in the previous month and 122 (revised figure) in March, 1953.

The number of cases of industrial diseases in the United Kingdom reported during March was as follows: lead poisoning 2, other poisoning 0, anthrax 4, epitheliomatous ulceration 12, and chrome ulceration 27; total 45. There was 1 death from epitheliomatous ulceration. *Ministry of Labour Gazette*, April, 1954.

Venereal Diseases

In England and Wales during the quarter ending December 31, 1953, 1,557 new cases of syphilis were reported as attending the clinics. Of these, 276 were classified as primary, secondary, or latent in the first year of infection. 24 cases of congenital syphilis in children aged under 1 year were reported, and 213 cases in persons over that age. New cases of gonorrhoea numbered 4,697, of chancroid 83, and of non-gonococcal urethritis (males only) 3,253. *Monthly Bulletin of the Ministry of Health*, April, 1954.

Infectious Diseases

The incidence of infectious diseases fell in England and Wales during the week ending April 17. The largest declines in the number of notifications were 635 for dysentery, from 1,554 to 919, 482 for whooping-cough, from 2,462 to 1,980, 381 for measles, from 2,293 to 1,912, and 380 for scarlet fever, from 1,374 to 994.

A decrease in the incidence of scarlet fever was recorded in most areas; the largest falls were Lancashire 30, from 166 to 136, Durham 24, from 44 to 20, and Derbyshire 21, from 31 to 10. The largest declines in the number of notifications of whooping-cough were 92 in Yorkshire West Riding, from 259 to 167, 54 in Norfolk, from 83 to 29, and 47 in Lancashire, from 237 to 190, while the only rise of any size was 36 in Gloucestershire, from 39 to 75. 14 cases of diphtheria were notified, being 2 more than in the preceding week. The largest falls in the notifications of measles were 119 in Staffordshire, from 334 to 215, 92 in Lancashire, from 499 to 407, and 45 in Cheshire, from 132 to 87, and the largest rise was 43 in Durham, from 65 to 108. 3 of the 5 cases of paratyphoid fever were notified in Anglesey, Beaumaris M.B.

17 cases of acute poliomyelitis were notified. These were 3 more for paralytic and 4 more for non-paralytic cases. *Registrar-General's Statistical Review of England and Wales for the Year 1949: Supplement on the Hospital In-patient Statistics*. H.M.S.O., 15s.

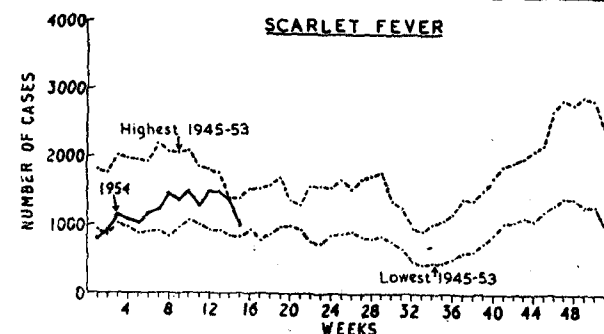
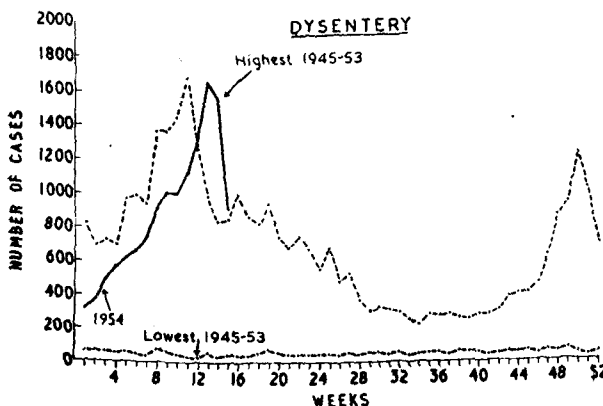
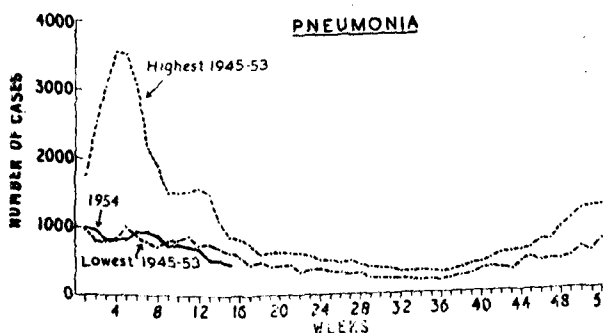
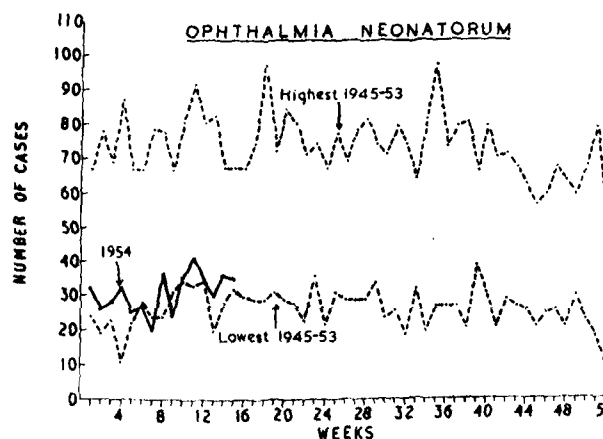
than in the preceding week. 3 cases were notified in Somersetshire and 2 in each of the counties of Devon, Warwick, Lancashire, and Yorkshire East Riding.

The largest returns of dysentery were Yorkshire West Riding 148 (Sheffield C.B. 42, Dewsbury C.B. 18, Leeds C.B. 17, Bradford C.B. 10, Wortley R.D. 10), Lancashire 133 (Salford C.B. 22, Liverpool C.B. 15, Bolton C.B. 11), London 121 (Islington 42, Lewisham 17, Wandsworth 15), Leicestershire 88 (Leicester C.B. 83), Middlesex 48 (Edmonton M.B. 12, Willesden M.B. 11), Nottinghamshire 40 (Nottingham C.B. 32), Essex 31, Norfolk 28 (Norwich C.B. 26), Gloucestershire 27 (Bristol C.B. 24), Warwickshire 26 (Birmingham C.B. 23), Kent 25, Staffordshire 23 (Cannock U.D. 15), and Surrey 22 (Croydon C.B. 17).

In Scotland the largest returns of dysentery were 147 in Glasgow, 40 in Lanark county, and 39 in Edinburgh.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending April 24

The notifications of infectious diseases in England and Wales during the week included pneumonia 478, scarlet fever 789, whooping-cough 2,133, diphtheria 12, measles 2,196, dysentery 711, acute poliomyelitis 10, paratyphoid fever 3, and typhoid fever 1.

Not Smallpox

A Briton who returned by air from Spain on April 24 developed a rash which was reported to have aroused suspicion of smallpox, but further observation has excluded this diagnosis.

Medical News

World Health Assembly.—The seventh World Health Assembly opened in Geneva on May 4.

Clinical Science Institute at Belfast.—The most ambitious extension to Queen's University, Belfast, since its foundation in 1845 is the Institute of Clinical Science which was opened on May 7. It comprises two buildings on the hospitals site at Grosvenor Road, Belfast, which are directly linked with each other and with the adjacent Institute of Pathology and the Royal Victoria Hospital. Other hospitals in the vicinity are the Royal Maternity Hospital, the Royal Belfast Hospital for Sick Children, and the Musgrave Clinic. The new Institute will house the departments of medicine, surgery, therapeutics, obstetrics and gynaecology, child health, and social and preventive medicine, and one for research. In addition there are a medical library, lecture and reading rooms, operating rooms, laboratories, a photographic studio, and workshops. The design of the research department has been based on that at the Mayo Clinic in America. It is expected that the Institute will provide magnificent facilities for both undergraduate teaching and postgraduate research.

Nuffield Scottish Committee.—The first meeting of the Scottish Advisory Committee of the Nuffield Provincial Hospitals Trust was held in St. Andrew's House, Edinburgh, on April 28, with Sir George H. Henderson in the chair. The new committee will advise the trust on applications for grants towards projects in which either the Trust or the Nuffield Foundation may be interested. The medical members of the committee are Dr. May D. Baird, Mr. P. Martin Brodie, Professor Thomas Ferguson, Professor Ian G. W. Hill, and Professor C. F. W. Illingworth.

Eugenics Quarterly.—The American Eugenics Society has commenced publication of *Eugenics Quarterly*, which replaces *Eugenical News* as the official organ of the Society. Subscription to *Eugenics Quarterly* is \$3 per annum.

British Association of Physical Medicine.—The annual meeting was held on April 30 and May 1 at King's College Hospital Medical School, London, by kind permission of the Dean. The opening session was devoted to a discussion on "The Scientific Approach to Physical Medicine," the

principal speakers being Dr. A. C. Boyle, Dr. A. J. Richardson, and Dr. Richard Doll. Each of them emphasized the vital necessity of applying rigid statistical criteria before any new form of physical treatment was accepted. Failure to "control" clinical impressions in the past had led to much empirical therapy, the scientific basis of which was now being challenged. Subsequent speakers stressed some of the ethical and technical difficulties in carrying out an impeccable clinical trial. The second morning session took the form of a conference on industrial and social rehabilitation, organized by Dr. F. Cooksey, in which twelve illustrative cases were discussed by medical staff, almoner, occupational therapist, local disablement resettlement officer, and other interested officials. On one of the afternoons a clinical meeting was held, and on the other short papers were read. The annual dinner was held at the Grosvenor House, with Lord Horder presiding. The toasts were given by the Minister of Health (Mr. Iain Macleod), Lord Horder, Dr. A. C. Boyle, and Sir Cecil Wakeley, P.R.C.S.

Medical Women's Federation.—Dr. Annis Gillie has been elected president of the Medical Women's Federation. Her induction by the retiring president, Dr. Mary Esslemont, was announced as the final ceremony at the annual general meeting held on May 6 at Sheffield. The title of Dr. Gillie's presidential address was "Motive and Momentum."

Hunterian Society.—Dr. W. S. C. Copeman has been elected president of the Hunterian Society of Great Britain in succession to Sir Heneage Ogilvie.

Smokeless Zone for Bolton.—The Minister of Housing and Local Government has approved an Order creating the first smokeless zone in Bolton. The zone is an area of 86 acres in the centre of the city. The Order will come into force on November 1.

Professor Otto Loewi, the distinguished German pharmacologist, who now lives in New York, has been made a Foreign Member of the Royal Society. In 1936 Professor Loewi shared a Nobel Prize with Sir Henry Dale for their work on the transmission of nerve impulses.

Sir Landsborough Thomson, second secretary of the Medical Research Council, has been elected president of the Zoological Society of London.

Dr. J. W. Landells has been appointed to the University readership in morbid anatomy tenable at the London Hospital Medical College.

COMING EVENTS

Cavendish Lecture.—Lieutenant-General Sir William MacArthur will speak on "Pepys and the Plague" on May 10 at 8.30 p.m. at the Royal Society of Medicine, 1, Wimpole Street, London, W.1.

Medical Association for the Prevention of War.—A public conference will be held on May 15 from 2.30 to 5.45 p.m. at 45, Russell Square, London, W.C.1. The theme of the meeting is "The Concept of Race," and the speakers will include Professor Lionel Penrose, F.R.S., Dr. N. A. Barnicot, Mr. E. S. Sachs, and Dr. Duncan Leys.

William Blair-Bell Memorial Lecture.—Dr. Ian Donald will lecture on "Atelectasis Neonatorum" on May 21 at 5 p.m. at the Royal College of Obstetricians and Gynaecologists, 58, Queen Anne Street, London, W.1. Admission is by ticket only, obtainable from the secretary of the College.

Bristol Medical Exhibition.—The exhibition will be held at the Victoria Rooms, Bristol, from May 17 to 21 from 11 a.m. to 6.30 p.m. daily (7.30 p.m. on May 19). It will be officially opened at 11.30 on May 17 by Professor C. Bruce Perry. It is expected that the film of the Siamese twins operation will be shown in each day's programme. Further information may be obtained from the organizer of the exhibition, Victoria Rooms, Bristol.

Meeting of American College of Surgeons in London.—The American College of Surgeons is holding a three-day sectional meeting at the Royal College of Surgeons, Lincoln's Inn Fields, on May 17, 18, and 19. The programme for the meeting has been prepared by the American College on the lines of one of their typical sectional meetings, while the local arrangements are in the hands of the Royal College. The American College of Surgeons has issued invitations to all Fellows of the Royal College of Surgeons and to all members of the Association of Surgeons of Great Britain and Ireland. The programme is as follows:

Monday, May 17

9.00-12 noon.

The Great Hall, Royal College of Surgeons: Film and Lectures.

12.15-2.15 p.m.

Luncheon and Panel Discussion on: "Intestinal Obstruction," at the Connaught Rooms, Great Queen Street.

2.30 p.m.-6.00 p.m.

The Great Hall, Royal College of Surgeons: 2.30 p.m., Symposium on Gynaecology. 3.20 p.m., Panel Discussion on: "Pre- and Post-operative Care." 5.00 p.m., Presentation of Honorary Fellowship. 5.05 p.m., Hunterian Lecture on: "Progressive Exophthalmos."

6.30 p.m.-7.30 p.m.

Various Receptions. Reception by President and Council at Royal College of Surgeons.

9.30 p.m.

Tuesday, May 18

9.00 a.m.-12 noon

The Great Hall, Royal College of Surgeons: Symposium on: "Cardio-vascular Surgery." Room 1, Royal College of Surgeons. Symposium on: "Cancer."

2.00 p.m.-6.00 p.m.

Visits to London Hospitals.

7.30 p.m. for 8.00 p.m.

Banquet at the Dorchester Hotel, Park Lane.

Wednesday, May 19

9.00 a.m.-12.20 p.m.

The Great Hall, Royal College of Surgeons: Film and Lectures.

9.00 a.m.-12.15 p.m.

Special Programmes for otolaryngologists and urologists at the Royal College of Surgeons, and for ophthalmologists at the Institute of Ophthalmology, Judd Street, W.C.1, and Moorfields Westminster and Central Eye Hospital.

12.35 p.m.-2.30 p.m.

Luncheon and Panel Discussion on: "Massive Gastrointestinal Tract Haemorrhage," at the Connaught Rooms, Great Queen Street.

2.45 p.m.-5.30 p.m.

The Great Hall, Royal College of Surgeons: 2.45 p.m., Moynihan Lecture on: "Pancreatitis, Fundamental and Clinical Aspects." 3.45 p.m., Expression of Appreciation. 3.55 p.m., Panel Discussion on: "Hand Surgery."

Newsholme Lectures.—Professor W. M. Frazer will deliver three lectures on "State Medicine in the Nineteenth Century" at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1, on May 24, 25, and 26 at 5.15 p.m.

Demonstrations for Consultants on Modern Aspects of Thyroid Disease.—A week's course will be held at the Postgraduate Medical School, Ducane Road, London, W.12, from September 20 to 24. Further details are given in our advertisement columns at page 40. Applications for places, which are limited to 40, should be made to the Dean before September 1.

American Geriatrics Society.—The eleventh annual meeting will be held at the Hotel Fairmont, in San Francisco, from June 17 to 19. Dr. Laurence W. Kinsell, Highland Alameda County Hospital, 2701, Fourteenth Avenue, Oakland 6, California, is in charge of arrangements for the meeting.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, May 10

MEDICAL SOCIETY OF LONDON.—8.30 p.m., second general meeting. Annual Oration by Mr. G. L. Keynes: Second (and Third) Thoughts on the Surgery of the Thyroid Gland.
WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Royal Society of Medicine, 8.30 p.m., Cavendish Lecture by Lieutenant-General Sir William MacArthur: Pepys and the Plague.

Tuesday, May 11

CHELSEA CLINICAL SOCIETY.—At South Kensington Hotel, annual dinner.
EDINBURGH UNIVERSITY.—At Surgery Lecture Theatre, University New Buildings, 5 p.m., Second Sir John Fraser Memorial Lecture by Dr. Ewart A. Graham (American College of Surgeons): Cancer of the Lung, with Special Emphasis on the Aetiology.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Antibiotics.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Croonian Lecture by Dr. J. F. Smith: Nutrition and Child Health.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Imperial Cancer Research Fund Lecture by Dr. L. M. Franks: Latent Carcinoma.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Almoth Wright Lecture by Professor P. B. Medawar, F.R.S.: Wound Healing, with Special Reference to the Skin.

Wednesday, May 12

DUBLIN UNIVERSITY.—At Physiology Theatre, 4.30 p.m., John Mallet Purser Lecture by Professor E. B. Verney, F.R.S.: Water Diuresis.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Virus Diseases.
INSTITUTE OF ORTHOPAEDICS.—At Brockley Hill, Stanmore, 8 p.m., senior clinical pathological conference.
OXFORD UNIVERSITY.—At Physiology Theatre, 12 noon, Professor Z. M. Bacq (Liege): Actions of Cystamine and Cystamine.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. G. W. B. James: lecture demonstration in psychiatry.

Thursday, May 13

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. Franklin Bicknell: Diet and Behaviour.
FACULTY OF HOMOEOPATHY.—5 p.m., Dr. Pierre Schmidt (Geneva): Hidden Treasures of the Last Organon.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Virus Diseases.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor M. L. Rosenheim: Treatment of Nephritis.
ROYAL EYE HOSPITAL.—5 p.m., Mr. H. B. Jacobs: Relation of Nasal and Ocular Diseases.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. R. W. G. Wyckoff: Use of the Electron Microscope in Biology and Medicine.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Dr. M. A. Partridge.
SURREY INTER-HOSPITAL PSYCHIATRIC ASSOCIATION.—At Roffey Park Rehabilitation Centre, Horsham, Sussex, 5.30 p.m., clinical meeting. Papers by Dr. V. W. Wilson, Dr. L. S. Davies, and Dr. T. M. Ling.

Friday, May 14

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. P. F. Borrie: Vascular Anomalies.
LEEDS UNIVERSITY.—At Riley Smith Hall, University Union, 3.30 p.m., Moynihan Lecture by Dr. A. Blalock (Baltimore, U.S.A.): Expanding Scope of Cardiovascular Surgery.
LONDON UNIVERSITY.—At Anatomy Lecture Theatre, University College, 5.30 p.m., special university lecture in psychology by Dr. M. Ray Denny (Michigan): Learning Theory and Experimental Extinction.
PAPWORTH VILLAGE SETTLEMENT.—At 26, Portland Place, London, W., 5 p.m., Fourth Varric-Jones Memorial Lecture by Dr. H. G. Trimble (California, U.S.A.): Current Therapy in Pulmonary Tuberculosis.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. E. P. Brockman: Disabilities of the Foot: 4 p.m., Professor R. B. Hunter: Control of Anticoagulant Therapy in Myocardial Infarction.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Mr. L. H. W. Williams: Obstetric/Gynaecological Conference.
SOCIETY OF MEDICAL OFFICERS OF HEALTH: WELSH BRANCH.—At B.M.A. House, 195, Newport Road, Cardiff, 6.30 p.m., annual meeting.

Saturday, May 15

ASHTON, HYDE, AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE.—At Physiotherapy Department, Lake Section, Ashton-under-Lyne General Hospital, 2.30 p.m., clinical meeting.
BIOCHEMICAL SOCIETY.—At Department of Physiology, The University, Bristol, 11 a.m., 329th meeting, scientific papers.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Heyland.—On April 2, 1954, at the London Hospital, London, E., to Joanna (formerly Poynton), and Dr. Ralph Heyland, of Hermon House, Faversham, Kent, a son.
Mather.—On April 15, 1954, at Ashmount, Lonsborough, York, to Dr. Maud (formerly Buchanan), wife of Dr. John S. Mather, a daughter.
O'Brien.—On April 27, 1954, at Leeds, to Elizabeth (formerly Craig), M.B., B.Chir., wife of Richard O'Brien, Wakefield, a brother for Alison—David Charles.

MARRIAGES

Fleischl-Quinton.—On May 1, 1954, at St. Paul's, Portman Square, London, W., Peter Fleischl, M.B., Ch.B., of Wellington, New Zealand, to Charmian Quinton, M.B., B.S., of London, W.

DEATHS

Fitter.—On April 1, 1954, Clara Ann Shipley Fitter, M.D., late of Streatham, London, S.W., and Hindhead, Surrey, aged 93.
Starforth.—On March 31, 1954, in hospital, William Percy Starforth, M.B., Ch.B., of London, S.E., formerly of Durham.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Vaccine Trial in General Practice

Q.—I am aware of the recent Medical Research Council trials of whooping-cough vaccines, but I want to test for myself over a period of years the efficiency in general practice of a combined diphtheria-pertussis prophylactic. My difficulty is to find a suitable control group with which to compare my results. What control group would you advise?

A.—It is difficult to see how a satisfactory trial of such a vaccine could be conducted in a general practice nowadays, it being presumed that the doctor is bound to vaccinate any child whose parents request it. The vaccinated children will form a "volunteer" group, and their home background, the size of family they come from, and other factors may make their risk of exposure to infection different from any "non-volunteer" control group. It might be of interest, however, to keep careful records of every occasion in which pertussis occurs in the vaccinated child's own family. An unvaccinated child of pre-school age without a known history of pertussis infection probably runs an 80% risk of himself becoming infected in such circumstances. With efficient vaccines this secondary attack rate is reduced to about 10%.

I am not optimistic that within the bounds of one practice the questioner will be able to collect sufficient data to calculate these secondary attack rates. Only children will rarely be of use to him, and even if efficient vaccines have not been widely used in his area the brothers and sisters of children offered for vaccination will often have been vaccinated already.

Infection from the Chalice

Q.—In certain churches the chalice at Holy Communion is passed from person to person. What are the risks of infectious diseases being spread by this means?

A.—Scattered observations dating back to the last century have been made on this subject, although none of them are fully conclusive by modern standards, and authors who condemn the use of the chalice as insanitary do not appear to have been free from bias against the practice itself. Burrows and Hemmens,¹ who review this evidence and describe what appears to be the only recent study of the subject, begin by emphasizing that they "are concerned with neither the theory of the sacrament nor the relative ecclesiastical merits of the various methods of its administration."

A superficial resemblance between this problem and that of "sanitizing" drinking utensils in general leads them to point out that "ordained clergymen are highly educated persons whose administration of the sacrament would appear hardly comparable to the activities of the usual soda fountain employee, restaurant dish washer, or bar keeper." The hygienic precautions taken are described as "rotation of the chalice so that successive persons do not drink from the same place, and the wiping of the chalice both inside and out before the same place is used again, with a purifier or a series of purifiers which are freshly laundered and ironed prior to use." It is also pointed out that in the Book of Common Prayer the directions for Communion of the Sick read "... the Minister shall first receive the Communion himself, and after minister unto those who are appointed to communicate with the sick, and last of all to the sick person."

These authors' actual experiments consisted in contaminating the rim of a silver chalice either with sterilized saliva to which pure cultures of various bacteria had been added or by drinking from it with or without an indicator organism

(*Chr. prodigiosum*) in the mouth, and studying the fate of the bacteria so deposited by subsequent quantitative culture. Silver is itself bactericidal, and a rapid fall in the numbers of bacteria recoverable was observed in comparison with their behaviour when similarly deposited on a glass slide. Moreover, the wiping of a smooth surface with a fine linen fabric mechanically removes anything deposited on it with a high degree of efficiency, and reductions in bacterial counts of 90% were observed to result from this process alone. From these and other experiments the authors were satisfied that the risk involved is very small, and it is said that in fact no instance of the transmission of infection by this means has ever been substantiated. Their least satisfactory evidence concerns *Myc. tuberculosis*. Experiments with this species were not quantitative, and were concerned only with survival on the surface of the chalice without wiping, but all guinea-pig tests up to 40 minutes after contamination were positive.

REFERENCE

¹ *J. Infect. Dis.*, 1943, 73, 180

Idiosyncrasy to Procaine

Q.—Following a subcutaneous injection of 5 ml. 2% procaine, a pregnant woman had a severe reaction which came on within 10 minutes and lasted for half an hour. It consisted in tachycardia and collapse. No adrenaline was given with the procaine. What is the nature of this reaction, and can the diagnosis be confirmed by patch test or other means? If the diagnosis is confirmed, can the patient be desensitized to procaine, or are there other local analgesics that may safely be used?

A.—True allergic reactions to procaine usually manifest themselves as a local dermatitis to direct contact with the drug or urticaria and angioneurotic oedema from injections. The present reaction is due to the toxicity of the drug—that is, it is an idiosyncrasy rather than an allergy. The diagnosis cannot be confirmed by patch tests, but the reaction could be reproduced on further injections. Desensitization is thus not to be expected and I have not seen it reported. It is quite possible that a patient may show toxic reactions to procaine and have no reactions to such drugs as stovaine or supercaine which do not contain a para group. Buff¹ has found that a subcutaneous or intravenous dose of 0.5 to 1 mg. neostigmine methylsulphate will prevent collapse and dramatically reduce the cardiac rate to normal in cases with a toxic procaine tachycardia.

REFERENCE

¹ *Amer. Practit.*, 1950, 1, 347.

Sodium Glutamate in Food

Q.—Sodium glutamate seems to be a frequent constituent of the prepared foodstuffs being imported into this country, and recently in an American method of cooking rice it was recommended as an addition. It is said to be used as a condiment in the East, but I wonder if it has any other value in the cooking of rice and if it is entirely innocuous?

A.—Sodium glutamate is usually made from wheat gluten by acid hydrolysis followed by neutralization with soda, but it can also be obtained as a by-product in the sugar beet industry. It is favoured as a means of obtaining a strong meaty flavour from cheap vegetable sources. Under the name "aginomoto" it is used extensively in Japan and China. It is very effective in reinforcing the taste of chicken in dishes consisting mainly of rice. Food manufacturers use it to improve the taste in canned and dehydrated meats. There is no evidence that it is harmful, and it is presumably metabolized in the same way as glutamic acid eaten in combined form in ordinary foods.

Stability of Antibiotics

Q.—How stable are the commoner antibiotics in the refrigerator and at room temperature?

A.—A full answer to this question occupies 12 pages and constitutes Chapter 4 of *Antibiotics: A Survey of their*

Properties and Uses. London: Pharmaceutical Press, 1952, to which the inquirer is referred for details. The question presumably refers to solutions, and the stability of these depends not only on the temperature at which they are held, but on other factors such as pH. For example, penicillin is most stable at pH 6.0, and, if the trouble is taken to buffer the solution at this pH, it will last longer.

The only antibiotic so unstable as to cause serious difficulty is aureomycin: solutions of this for laboratory purposes should be made daily. Streptomycin, chloramphenicol, and terramycin are more stable than penicillin, and any of these four will suffer no significant loss of potency in one month or more if the solution is frozen, or in one week at about 4° C. These times may be extended if a loss of potency of the order of 10% is of no consequence.

NOTES AND COMMENTS

Drugs for Hypertension in Pregnancy. Mr. JOHN SOPHIAN (London, W.1) writes: In the answer to "Any Questions?" of February 13, regarding the place hypotensive drugs have in the treatment of hypertension in pregnancy, you touch on the merits of (1) hexamethonium and tetraethylammonium compounds and on (2) hydrazinophthalazine, thiopranium, and veratrine. In connexion with the neurogenic factor in hypertension Mendlowitz has classified the site of therapeutic action of hypotensive drugs at four levels: (a) The cortical, where barbiturates and rauwolfia serpentina act; (b) the hypothalamic, affected by protoveratrine and 1-hydrazinophthalazine corresponding to group (2) above; (c) the ganglionic level which reacts to the hexamethonium compounds, equivalent to the classification (1) above; and finally (d) the sympathetic nerve endings themselves. Rothlin¹ has shown that some portion of the pharmacological activity of the ergot derivatives is directed to the peripheral blocking of sympathico-adrenergic vasoconstrictor stimuli and that they have proved most useful for this purpose. The value of hypotensive drugs essentially needs to be considered along with the electrolyte NaCl, whose depletion appears to affect the non-neurogenic or intrinsic factor in hypertension, helping to reduce the blood pressure. The therapeutic agents in group (b) and (d) have a noticeable effect on the kidney. According to Moyer et al.,² 1-hydrazinophthalazine increases the renal blood flow in anaesthetized dogs. Simultaneous exhibition of adrenaline or noradrenaline showed that this was a preferential decrease in peripheral resistance in the kidney to that in the extremities, in which there was no change in blood flow; while Willson and Smith³ found that intravenous veratrine in the vagotomized animal heightened the perfusion rate of the isolated kidney. It is not improbable that the effectiveness of these therapeutic agents in toxæmia lies in the relief of an underlying renal ischaemia. Work on the ergot derivatives supports this view, as I mentioned recently in a letter in the *Lancet*.⁴ I therefore feel that the barbiturates and the ergot derivatives should find inclusion in the reply and that the corollary of salt restriction needs emphasis.

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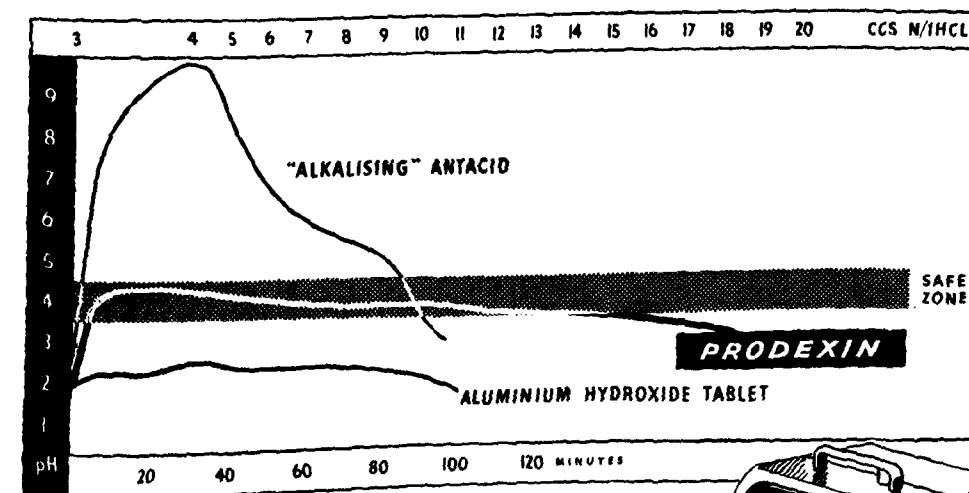
- ¹ Mendlowitz, M. (1953). *Ann. Intern. Med.* 39, 999.
- ² Rothlin, E. (1944). *Helv. physiol. acta*, 2, C48.
- ³ Moyer, J. H., Handley, C. A., and Higgins, R. A. (1951). *J. Pharmacol.* 103, No. 4, 368.
- ⁴ Willson, J. R., and Smith, R. G. (1943). *Ibid.*, 79, 208.
- ⁵ Sophian, J. (1954). *Lancet*, 1, 107.

Correction.—In the obituary notice of Major-General W. H. S. Nickerson, V.C. (April 24, p. 989), we stated that he left Portsmouth Grammar School to become a medical student. This was a mistake, for it was from the Manchester Grammar School that he went on to Owens College.

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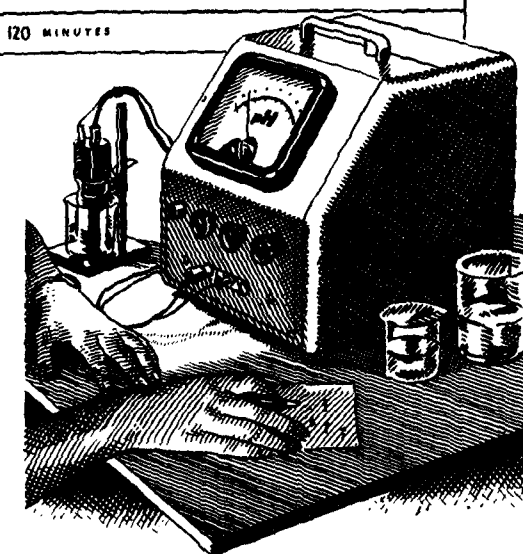
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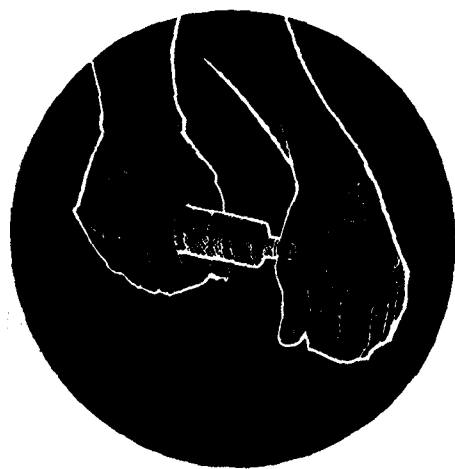
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 15 1954

MANAGEMENT OF RHEUMATOID ARTHRITIS WITH PROLONGED CORTISONE ADMINISTRATION*

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After three years' experience at the West London Hospital in the treatment of a series of cases of rheumatoid arthritis with cortisone, we feel that it may be of interest to summarize our results to date. In a previous publication (Copeman *et al.*, 1950) we reported a short study of the effect of cortisone and other steroids in rheumatoid arthritis, and described certain methods for clinical assessment. We later published a longer study of the effects of continuous cortisone administration in the same disease (Copeman *et al.*, 1952). The present paper is a continuation of those studies.

This report is on 20 cases of rheumatoid arthritis, 14 of which have received cortisone for more than two years, and all for at least a year continuously (Table I).

TABLE I.—Duration of Cortisone Treatment

Months:	36	35	34	33	32	31	30	29	25	22	18	17	16	Total
No. of cases	2	3	1	2	1	1	2	1	1	1	2	1	2	20

All the patients selected had previously suffered from active rheumatoid arthritis for at least two and a half years, and the majority for much longer, the average duration of the disease before cortisone treatment being 6.8 years. None of them were able to carry out their normal occupations, and all were regarded as severe cases. They had lost their independence, and described themselves as "crippled." These patients had been under observation and treatment for some time, and the more standard methods, such as adequate rest, salicylates, and gold salt injections, had failed to suppress the progress of their disease.

From this series of 20 cases 17 have now been returned to a working life in their various spheres, although, as the analysis in this report will show, the actual degree of functional improvement varies from case to case.

*This work has been aided by grants from the Dan Mason Research Foundation of the West London Hospital Medical School, the Empire Rheumatism Council, and the Medical Research Council.

Realizing that a real cure in any case was unlikely, we decided to assess our results on a practical functional basis. Accordingly, if the disease was suppressed sufficiently to enable normal work to be resumed and maintained we regarded the result as satisfactory; if the patient was able to return to work but still complained of considerable pain we termed the result moderate; and if the patient could not resume work it was held to be unsatisfactory.

Analysis of Results

Any opinion concerning the value of a particular form of treatment must depend on whether the emphasis is placed

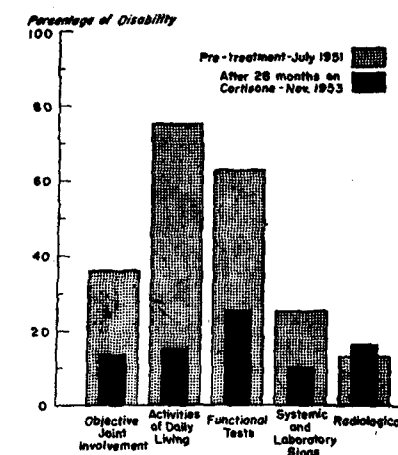


Chart showing the effect of long-term cortisone administration on the different components of rheumatoid arthritis (Case 7). Note the marked improvement in functional capacity, moderate improvement in signs of activity of the disease, and deterioration in radiological involvement.

The practical value of such improvement obtained through cortisone must, however, be weighed against the possible dangers resulting from long-term treatment with this drug.

TABLE II.—Results

Case No.	Description	Condition Before Treatment	Present Condition	Time on Cortisone	Daily Maintenance Dose of Cortisone	Results as Assessed by Functional Improvement
1	Housewife aged 48. R.A. 8 years	Doing only very light housework	Working. Cooking and housework	36 months	100 mg.; or 60 mg. hydrocortisone	Satisfactory
2	Army officer aged 33. R.A. 5½ years	Partly bedridden; could walk 30 yards	Full-time clerical work. Drives invalid chair. Considerable pain from secondary osteoarthritis of hips	36 "	100 mg.	Moderate. Walks with difficulty
3	Housewife aged 40. R.A. 4½ years	Unable to dress herself or do housework	Working, and leading a normal life	35 "	50 "	Satisfactory
4	Housewife aged 36. R.A. 12½ years	Unable to dress herself or run her home	Working. Can do housework with difficulty. Only partial suppression	35 "	62.5 "	Moderate. Oedema and some pain
5	Housewife aged 43. R.A. 5 years	Unable to do housework, lift anything, do her hair, or get out of a bath	Working. Leading a busy social life entertaining for her husband; much hampered by her knees	35 "	100 "	Moderate. Much pain
6	Superintendent water inspector aged 45. R.A. 14 years	Unable to work	Working full-time with much travelling	34 "	62.5 "	Satisfactory
7	Treasury official aged 35. R.A. 7 years	Just managing to work with long periods of sick leave. Unable to dress himself	Working full-time without difficulty	33 "	37.5 "	"
8	Clerk aged 34. R.A. 8 years	Unable to work or do housework	Working. Has completed training as a dressmaker. Arthrodiesis of left wrist	33 "	75 "	"
9	Housewife aged 36. R.A. 5½ years	Able to do light cooking only	Working. Able to do much more in her home, but hampered by her knees from walking any distance	32 "	50 mg., plus fortnightly injections of 50 mg. hydrocortisone into both knees	"
10	Housewife aged 31. R.A. 11 years	Unable to do housework or look after children. Walked with a stick	Working and leading a normal life, hindered only by deformed feet	31 "	62.5 mg.	"
11	Typist aged 21. R.A. 3½ years	Unable to work	Working full-time and leading a normal life	30 "	62.5 "	"
12	Chiropodist aged 54. R.A. 10½ years	Unable to work and permanently in hospital	Full-time clerical work in spite of much permanent damage	30 "	87.5 "	"
13	Railway maintenance worker aged 44. R.A. 4½ years	Bedridden. Much muscle-wasting and joint effusion	Not working, though mobile and independent and capable of light employment	29 "	75 "	"
14	Housewife aged 51. R.A. 4½ years	Unable to do housework or shopping	Working and leading a normal life. Some tenderness and swelling of right wrist and left knee	25 "	75 "	"
15	Gold blocker aged 50. R.A. 2½ years	Unable to work	Working full-time	22 "	37.5 "	"
16	Housewife aged 49. R.A. 8 years	Unable to look after herself	Not working. Can do only light housework. Marked depression on a higher dose	19 "	75 "	Unsatisfactory
17	Schoolteacher aged 41. R.A. 5 years	Unable to work	Working, but has much stiffness in ankles and knees	19 "	62.5 "	Moderate. Acne and moonface on higher dose
18	Housewife aged 52. R.A. 4½ years	Unable to run her home or carry anything	Working. Leading a normal life, but has some pain in hands and feet	17 "	62.5 "	Satisfactory
19	Children's nurse aged 52. R.A. 5 years	Unable to look after herself	Not working. Unsatisfactory response with hypertension	16 "	75 "	Unsatisfactory
20	Housewife aged 23. R.A. 5 years	Unable to do housework or look after child	Working and leading a normal life	16 "	75 "	Satisfactory

In order, therefore, to assess the true value of this therapy we have analysed in each case the effect of cortisone on various important components of the disease process, such as the objective joint changes, the patient's functional capacity, clinical and laboratory evidence of activity, and the radiological changes. Table II shows the results of this analysis in the whole series, and the Chart gives a graphic representation of the changes in a particular case.

These cases have been examined in detail every few weeks since the start of treatment, and the various components of the disease process assessed according to the following categories (Table III).

TABLE III

	Joint Involvement	Activities of Daily Life	Functional Tests	Systemic Signs and Lab. Tests	Radiological
Marked improvement	—	7	8	—	—
Moderate improvement	14	11	7	15	—
Unchanged	1	1	3	3	12
Deterioration	5	1	2	2	8
Total No. of cases	20	20	20	20	20

Objective Joint Involvement.—This was measured by examination of the joints for swelling, tenderness, and range of movement; the recordings were charted each month.

Activities of Daily Life (Functional Capacity).—At the outset of this trial a set of test questions was drawn up to estimate the patients' chief limitations in the conduct of their everyday life—for example, ability to dress, speed of dressing, ability to shave or do hair, ability to bath themselves, ability to walk, speed of walking, ability to climb stairs, ability to work, number of analgesics needed daily, how often awakened by pain.

Functional Tests.—Ten functional tests were adapted for each patient, depending on the joints involved. Among these were the power of grip, using a baumanometer cuff, starting at 30 mm. Hg (normal 260 mm. Hg +). Certain common functions, such as taking off a jacket, jumping, or standing on the toes, were also timed. These tests can be arranged to give a composite picture of the patient's functional abilities and can be carried out in a few minutes.

Systemic Signs and Laboratory Tests.—The clinical signs of activity apart from joint changes are fever, loss of weight, and muscle-wasting. The laboratory tests we have used consistently are the sedimentation rate (Westergren) and estimation of the haemoglobin level.

Radiological.—X-ray films taken before treatment included all the main joints involved at that time. The points particularly observed for change subsequently were soft-tissue swelling, osteoporosis, cartilage and joint erosions, and loss of joint space. A number of our cases have shown evidence of radiological progression in spite of the fact that their functional ability has none the less improved with cortisone.

Dosage Schedule

To find the optimum maintenance dose it is necessary to employ some method of assessing the clinical activity of the disease, and we have found that by measuring joint tenderness and function, together with the patient's own account of his pain and mobility, at regular intervals this can be achieved with reasonable accuracy. The patients in this series were seen and assessed weekly or fortnightly in the early stages, and once there was evidence that the symptoms and signs were being adequately suppressed the maintenance dose was found by reducing the initial dose by small amounts at intervals of not less than five days. A maintenance dose of 50 mg. a day or less was aimed at, but could by no means always be achieved. When the maintenance dose had been established the patients reported as out-patients every four or six weeks for observation.

In some cases a low maintenance dose will successfully suppress the inflammatory signs in all but one or two joints, often knees. We have found that by the use of hydrocortisone (compound F) as an intra-articular injection every few weeks, or occasionally at longer intervals, we can suppress this residual inflammation, and we have in addition sometimes been able to lower the patient's oral dose of cortisone.

In our early cases we adopted the scheme of dosage originally suggested by Hench *et al.* (1949), in which on successive days 300, 200, 100 mg. were used. We soon found, however, that the response provoked in this way tended to be too dramatic, and so led to subsequent disappointment on the part of the patient if this rate of progress did not continue. We therefore adopted a routine initial dose of 100 mg. daily, and with this it proved possible to measure the patient's response after about five days. In more recent cases in this series we have lowered the initial dose still further to 75 mg. daily; a level which has proved to be equally satisfactory in most cases.

Variation of Maintenance Dosage

The maintenance dose may have to be increased temporarily when conditions of extra stress occur, but should be lowered again as soon as possible. The average maintenance dose by the oral route in this series has been 69 mg. a day, which is the same as that reported by Fischer and Brøchner-Mortensen (1953) in Denmark.

Fourteen of our patients have received cortisone continuously for over two years, and during this period their dose requirements have not altered to any large extent, although in two cases the dose had to be increased somewhat. In Cases 6 and 8 the dose was progressively reduced during the first few months of treatment to 25 mg. cortisone a day, and was maintained satisfactorily at that level for some months. It was then thought probable that patients who need such a low dose might be able to dispense altogether with the drug, so it was stopped, with the unfortunate result that the disease relapsed at once. In neither of these cases were we ever able to lower the maintenance dose down to 25 mg. a day again.

We believe that the dose of cortisone should never be altered on account of surgery. Healing has proceeded normally after all operative procedures undertaken on our patients, notably in emergencies such as strangulated hernia (Case 12) and evacuation of a haematoma (Case 1), and in planned surgery such as an arthrodesis (Case 8). In the three cases of peptic ulceration which occurred (Cases 4, 7, and 12) the dose of cortisone was lowered slightly, but in each instance the lesion healed normally with ordinary medical treatment.

Side-effects

It is important to try to estimate the likelihood of the occurrence of side-effects in each case. Such an assessment often fails because the maintenance dose required cannot be accurately foretold. Experience has shown that in general men can tolerate a higher dose than women with-

out developing side-effects, and that obesity and "moon-face" are particularly apt to occur in women near the menopause. Most of the side-effects we have encountered were mild and could be controlled by merely lowering the dosage and supervising the diet, or adjusting the sodium or potassium intake; but over a long period they may sometimes become troublesome enough to offset the functional improvement gained.

We have divided the side-effects observed in this series into two groups: (1) those which were serious in the sense that they might endanger the patient's life; and (2) those which were merely inconvenient, aesthetically displeasing, or transitory.

Group 1. Side-effects Dangerous to Life

Depression.—The most serious reported complication of hormone treatment is psychosis. We have taken particular trouble in our series to exclude patients with psychological incidents in their history, and we have not encountered this complication. We have, however, one patient (Case 16) who suffers such severe depression on the minimal dose needed to control her arthritis that, although she has no family or previous history of psychological disturbances, we have decided to withdraw the drug.

Hypertension.—In all but three of our cases the blood pressure remained unaffected by treatment; in one (Case 19), however, hypertension became evident early in treatment and the blood pressure rose from 120/80 to 200/105 on the eighteenth day. The condition was symptomless, but, as it has so far proved impossible to find a dose which will control arthritis without further increasing the hypertension, cortisone is being withdrawn. In the other two cases the blood pressure rose slightly at the onset of treatment, but has not increased during the past year. Both these patients are working full time, and we have not felt it necessary to withdraw the hormone (Cases 2 and 15).

Gastric Complications.—There have been three gastric complications in the present series. Case 7 developed a duodenal ulcer after thirteen months on cortisone. This healed normally on medical treatment with slight reduction of the cortisone dosage whilst in hospital, and he has now been symptom-free for fifteen months. Case 4, who had a previous history of gastric ulcer, complained of retrosternal pain referred to the back. On investigation this was found to be due to an oesophagitis associated with a hiatus hernia, which responded to ordinary medical treatment with slight reduction in cortisone dosage. Continued medical treatment keeps her free from oesophageal pain. Case 12, after two years' continuous cortisone, complained of exhaustion, which was found to be due to anaemia secondary to melaena. On admission to hospital the haemoglobin had fallen to 4.23 g. Without alteration in the dose of cortisone she became symptom-free after transfusion and medical treatment. There was no x-ray evidence of peptic ulcer three weeks after the melaena stopped, but she has continued on an ulcer dietary regime.

Miscellaneous.—In the earlier cases, before the drug could be given by mouth, we encountered a great deal of trouble with injection abscesses. We have not encountered any intestinal intolerance to administration by the oral route. One case (No. 2), which has been reported fully elsewhere (Bishop and Glyn, 1952), has concurrent diabetes. He has been satisfactorily maintained on continuous cortisone therapy, however, whilst his diabetes has been controlled by insulin. We have already reported (Copeman *et al.*, 1952) the death from cerebral haemorrhage of one of our long-term patients. This was not, however, thought to be attributable to cortisone, and as she received the drug for only nine months her case is not included in the present series.

Group 2. Less Important Side-effects

Obesity.—The most common side-effect in female patients on cortisone has been a tendency to accumulate fat, both local and general. In nine cases there has been some rounding of the face; in two the development of localized

deposits of fat over the lower cervical vertebrae ("buffalo hump"), and in six cases some weight increase, due partly to fluid retention as evidenced by peripheral oedema, and partly to the voracious appetite which such patients occasionally develop. These effects were controlled with difficulty in some cases, by reduction of dosage, a salt-free diet, and fluid restriction.

Miscellaneous.—Minor skin abnormalities have occurred on high dosage: acne in three cases, excess sweating and hypertrichosis in two, and pigmentation in a single case. All these have disappeared on dose reduction. Minor psychiatric symptoms were occasionally noted, and were fairly evenly divided between those who showed apathy and exhaustion and those who complained of tension and irritation. In no case were they severe or disabling, and it seems that in such cases the drug merely tends to accentuate the normal personality trends.

Discussion

It is universally agreed that cortisone in adequate dosage will suppress the symptoms and signs of rheumatoid arthritis in a relatively short period, and it is recognized that when the drug is withdrawn a rapid relapse generally follows. It is, however, argued by some that because of this necessity for prolonged or even indefinite administration cortisone does not constitute practical therapy, and that owing to the danger of side-effects its use is not justified in practice.

Published reports of long-term treatment with cortisone and A.C.T.H. have now appeared from various parts of the world. Holbrook (1953), reporting on a group of 36 patients with rheumatoid arthritis treated with cortisone, found that at the end of twenty-four months only 10 of these were still getting worth-while improvement, and that all showed some clinical and x-ray advance in their disease. West and Newns (1953) reported a study of 27 patients with rheumatoid arthritis treated for an average of nineteen months with a maintenance dose between 50 and 75 mg. a day. They compared their series with other patients who had not received cortisone, and concluded that this drug does not have a favourable effect on the course of rheumatoid arthritis, and because of the danger of complications do not recommend its administration on a long-term basis.

In New York Freyberg *et al.* (1951) studied 44 patients who received cortisone uninterruptedly for more than a hundred days. In many patients a good partial remission could be maintained with 50–75 mg. daily. These authors note the less point out that prolonged use of cortisone is not practical treatment for all patients with rheumatoid arthritis. They advocate its use mainly for definite purposes, such as to check rapidly worsening disease or to facilitate certain stages in physical therapy or rehabilitation.

In Copenhagen Fischer and Brøchner-Mortensen (1953, 1954) have treated 50 patients suffering from rheumatoid arthritis with both cortisone and A.C.T.H. In their first report on 24 patients these authors were unwilling to commit themselves on the practicability of this form of treatment. In their second paper they report the study of 50 cases. In five cases treatment was abandoned because of an unsatisfactory response, whilst in another five cases complications necessitated stopping these drugs. In four cases treatment was stopped after five to twelve months because remission had occurred. The remaining 36 were maintained with an average dose of 69 mg. of cortisone a day from five to thirty-three months. Measurement of the joint-movement index and the general functional ability showed an improvement in 84% of the group when compared with the pretreatment values. Of the group in remission or continuing treatment only two had been capable of work before treatment started, compared with 31 during therapy; whilst the number of totally disabled subjects in this series was reduced from nine to one. Those authors now conclude, therefore, that this form of treatment is of practical value in the therapeutic management of selected cases of rheumatoid arthritis.

From Paris, Coste *et al.* (1953) reported 20 cases of rheumatoid arthritis treated continuously for many months. In three cases remissions occurred and they were able to stop treatment without relapse; in a further three cases the results were poor and cortisone was discontinued; whilst in the remaining 14 patients the results were satisfactory enough to make continued therapy worth while. Like most recent workers they preferred continuous to intermittent courses of treatment, and they believe that this method can be used as a practical therapeutic measure in this disease, save perhaps in early cases which might anyhow be expected to go into remission spontaneously. They estimated the risk of psychotic side-effects at 1% in their series.

Clark *et al.* (1953) reported on 35 patients with this disease treated with cortisone for from three to twenty-four months. Major subjective improvement was obtained in 74% and major objective improvement in 38%, although minor complications were common. They did not consider that hormone therapy should be employed until maximum benefit from conservative measures has been established, and that it should always be combined with such measures.

A study of long-term cortisone treatment was reported by Ward *et al.* (1953) in which 65 patients were treated. In 57 (88%) of these cortisone controlled the symptoms adequately, and in 8 (12%) the drug was stopped because the dose required for significant relief of symptoms also produced side-effects. In 46 patients the drug was given continuously for from eight to twenty-four months. In 44 of these patients there was moderate to great improvement; in the remaining two cases the relief was only mild. Nine cases showed mild side-effects. These authors concluded that long-term cortisone is a practical and useful method of treatment in rheumatoid arthritis, and is the treatment of choice in certain phases.

Conclusion

As the result of our experience with a well-observed group of 20 cases of rheumatoid arthritis, we consider that cortisone therapy is a practical addition to treatment in selected cases.

As cortisone is not actually curative, and since we have seen radiological progression of joint damage in patients in whom the symptoms were being suppressed, we consider that more conservative methods of treatment, such as adequate rest, salicylates, gold salts, and physiotherapy, should generally be tried first, as these will themselves in some cases produce adequate remission of the disease.

Absolute contraindications to cortisone therapy are recent or active tuberculosis, present or past psychosis or psycho-neurosis, diabetes, hypertension, and severe osteoporosis; while long-standing cases with much permanent irreversible deformity and joint damage are also unsuitable for cortisone therapy.

Evidence is adduced to show that the functional improvement of the patient under cortisone treatment is greater than the actual degree of suppression of the activity of the disease. The most suitable cases are therefore those in which the functional disability exceeds the anatomical joint damage.

It is our experience that, although previously incapacitated, a number of patients can be restored to and maintained in relatively normal activity by long-term cortisone treatment. Such patients, however, require careful and constant supervision if this result is to be achieved.

Summary

Twenty cases of rheumatoid arthritis have been treated with cortisone; 14 of them received this drug for over two years.

All were previously incapacitated, but 17 have been able to return to their occupations with the help of this treatment, as the result of varying degrees of functional improvement, the extent and nature of which have been analysed.

The dosage and management of these cases, and the side-effects seen in the course of their treatment, are discussed.

The cortisone used in this study was partly provided from a generous gift made jointly to the Medical Research Council and the Nuffield Foundation by Messrs. Merck & Co. Inc., and partly from the Ministry of Health. We wish to acknowledge the valuable assistance given to us by Dr. B. Gottlieb, consultant physician, St. Mary Abbots Hospital, and his assistants, and by the following pathologists and biochemists and their assistants: Dr. H. E. Archer, Dr. J. D. Robertson, and Dr. R. G. L. Waller, West London Hospital; Dr. A. G. Signy, St. Mary Abbots Hospital; and Dr. A. E. Kellie, Middlesex Hospital.

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AN APPRECIATION OF MITRAL STENOSIS*

PART II. INVESTIGATIONS AND RESULTS

BY

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THE ELECTROCARDIOGRAM P Mitrale

The P mitrale may be defined as a widened P wave of normal or only slightly increased voltage, usually notched, bifid, or flat-topped. It was present in all but four of the surgical cases with normal rhythm. The exceptions included three instances of the P pulmonale (due to extreme pulmonary hypertension in two and to tricuspid stenosis in one); there was only one instance in which the P wave was normal, and this was the mildest in the series. In 10 cases the auricular complex was a mixture of the P mitrale and the P pulmonale: the pulmonary vascular resistance was in the extreme grade in two of these, between 6 and 9 units in three of them, and relatively normal in three; tricuspid stenosis was responsible in the other two. The P mitrale was at least 0.12 second wide in 79% of the whole surgical group.

In the medical series with normal rhythm, the P mitrale was absent in three-quarters of the trivial cases of mitral stenosis and in 10% of the relatively mild cases in the sense that they were not severe enough to warrant valvotomy. It was present in all

the cases in which mitral incompetence was associated with stenosis, although usually of only moderate degree; there was no presystolic murmur in 80% of these cases. A P pulmonale was present in the most extreme example of pulmonary hypertension and in two cases of tricuspid stenosis, but in only one other. Excluding the trivial cases, a well-developed P mitrale, at least 0.12 second in duration, occurred in half of all the medical cases with normal rhythm.

In the group with almost pure mitral incompetence the P wave was normal in all trivial and mild cases; it was present in relatively mild degree (0.10 to 0.11 second) in half of those of moderate grade. It was seen, also in relatively mild degree, in 80% of the severe cases (grade 3 or 4).

A conspicuous P mitrale (grade 3 or 4) could not be correlated with a dominant a wave in the left atrial pressure tracing: thus only one-third of the cases showing such a waves had a grade 3 or 4 P mitrale; conversely, only a similar proportion of cases having a conspicuous P mitrale had an a wave higher than v in the left atrial tracing. The grade of the P mitrale could not be correlated with the size of the left atrium, this fact being best illustrated by the relatively mild grades found in mitral incompetence, which favours left atrial dilatation. Nor could it be correlated closely with the size of the mitral orifice found at operation, the great majority of those with conspicuous P mitrales having an orifice either in the average grade (1 by 0.5 cm.) or in the slightly tighter grade (0.75 by 0.4 cm.); in only one was the stenosis extreme (0.5 by 0.3 cm.).

It is concluded that the P mitrale is a good sign of well-developed mitral valve disease, and that if it is well marked (grade 3 or 4) it strongly favours stenosis rather than incompetence; also that it should be present in all cases of stenosis that are severe enough to warrant valvotomy.

Right Ventricular Preponderance

The degree of right ventricular preponderance in mitral stenosis based on a conventional interpretation of the six routine V chest leads was closely related to the pulmonary vascular resistance (Fig. 7). An important practical fact noticed in the analysis was that any degree of right ventricular preponderance in mitral stenosis meant that the case was severe enough to warrant valvotomy: the converse, of course, was not true.

Left Ventricular Preponderance

Left ventricular preponderance was very rare in pure mitral stenosis, and when present was only of slight degree. In the mitral incompetent group, on the other hand, it occurred in 82%, excluding trivial cases, and in degree averaged slightly over grade 2. Grade 3 left ventricular preponderance always meant severe mitral incompetence in the absence of aortic valve disease. In the medical group with significant mitral incompetence, left ventricular preponderance, averaging a little under grade 2, occurred in one-third, ventricular balance being normal in half and

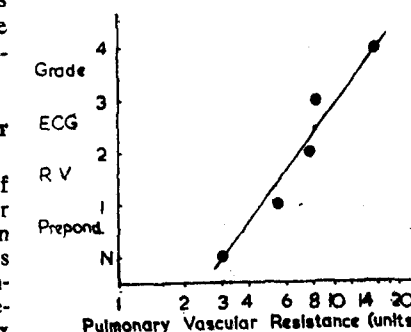


FIG. 7.—Relationship between right ventricular preponderance and pulmonary vascular resistance.

*The second part of a lecture delivered before the San Francisco Heart Association on October 29, 1953, and modified for the Strickland Goodall lecture of the Society of Apothecaries of London, March 24, 1954. Part I appeared in last week's issue (p. 1051).

the right ventricle predominating in the remainder. Amongst the surgical cases with combined mitral stenosis and incompetence, slight left ventricular preponderance (averaging grade 1) occurred in one-third, the ventricular balance being normal in one-third and the right ventricle preponderating in one-third.

It is concluded that left ventricular preponderance is excellent evidence of mitral incompetence in the absence of aortic valve disease. In the whole surgical series there was only one patient with more than slight left ventricular preponderance, and she did not do at all well. Since the results of valvotomy were poor in half the cases of mitral stenosis complicated by more than trivial incompetence, and only fair in another quarter, and since only one-third of this group had left ventricular preponderance at all, and that of only grade 1, it follows that higher grades of left ventricular preponderance are a direct contraindication to mitral valvotomy.

X-RAY APPEARANCES

Small Aorta

Diminution in the size of the aortic knuckle, often to the extent of its being invisible in the antero-posterior view, was noticed in two-thirds of the surgical cases. A normal aorta was attributed to concomitant aortic valve disease, to atherosclerosis associated with age (over 45), to a relatively mild degree of stenosis, or to the maintenance of a normal rather than a low cardiac output at rest (4.5 to 6 litres a minute), each of these factors occurring in 30%, sometimes in varying combination. Their respective incidences in the surgical cases with a small aorta were 7%, 12%, 19%, and 20%, so that aortic valve disease and age were more likely to have been responsible than the degree of stenosis and the measured cardiac output; few of the cases were mild enough for the last two factors to be important. In addition, 6% of those with a normal aorta had a slightly raised blood pressure (about 160/110) against 1% in those with a small aorta. No obvious cause for a normal-sized aorta could be found in 15%.

In the mitral incompetence group, omitting trivial cases and those of grade 1 severity, 50% had a normal aortic shadow, but of these 58% were between 45 and 69 years old. In the cases with a small aorta only 17% were in this age group. If these relatively old patients are also omitted from the analysis, two-thirds of the mitral incompetence group had a small aorta, which is more comparable to the findings in mitral stenosis.

In the medical series two-thirds of those with significant mitral incompetence had a normal aortic shadow. This was attributed to associated aortic valve disease in half of them. On the whole the findings did not implicate mitral incompetence as one of the factors which tend to preserve a normal aortic shadow.

Left Ventricular Enlargement

Radiological evidence of left ventricular enlargement in cases of mitral valve disease proved less reliable than either clinical or electrocardiographic evidence, and deserves no further comment.

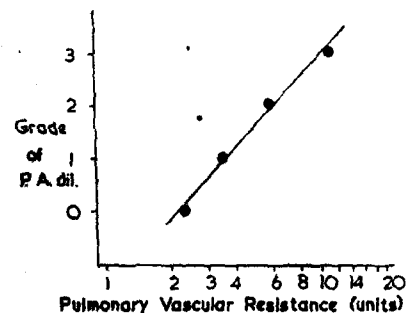


FIG. 8.—Relationship between size of pulmonary artery and pulmonary vascular resistance.

Dilatation of the Pulmonary Artery

There was a close relationship between the size of the pulmonary artery and the pulmonary vascular resistance (Fig. 8). The figures were compiled from the

medical and surgical groups, omitting cases of pure mitral incompetence. When the pulmonary artery was normal or only slightly dilated the pulmonary vascular resistance was normal or only slightly increased in 95%, being high in only 5%; on the other hand, when the pulmonary artery was considerably or grossly dilated the resistance was normal or only slightly increased in 17%, whereas it was high or extreme in 83%. No doubt the correlation would have been closer still if there were not so much variation in the radiological appearances of the pulmonary artery in normal individuals.

In the group with pure mitral incompetence considerable dilatation of the pulmonary artery was seen in only one instance; the vessel was normal in 73%, slightly dilated in 21%, and moderately so in 4%. The lack of enlargement was attributed to the relatively low pulmonary vascular resistance found in this group (see below).

Dilatation of the Right Atrium and Ventricle

It was rarely possible to decide which of these chambers was chiefly affected radiologically, either in the antero-posterior or in the oblique positions, and they have therefore been taken together. The clinical and electrocardiographic findings usually make it clear whether or not the ventricle is involved. In any case, isolated dilatation of the right atrium is seen only in tricuspid stenosis.

The presence and degree of right-sided cardiac enlargement was closely related to the size of the pulmonary artery (and therefore to the pulmonary vascular resistance). Thus in the whole series the grading of the two was the same in 55% and within one grade of each other in 35%, being out of harmony in only 10%. In the surgical group, when there was any discrepancy it was usually the pulmonary artery that was relatively larger than the right side of the heart. In the medical group it was the other way round. When the pulmonary artery was conspicuously dilated and the right heart only slightly so, a high pulmonary vascular resistance was present in half the cases; no explanation could be found in the other half. When the shadow of the right side of the heart was conspicuously enlarged and the pulmonary artery normal or only slightly dilated, tricuspid stenosis was present in 44%, pericardial effusion in 12.5%, and "congestive heart failure" without an unduly high pulmonary vascular resistance in 25%; no explanation other than auricular fibrillation could be found for the remainder.

Left Atrial Dilatation

The size of the left atrium was graded so far as possible from the x-ray appearances in the antero-posterior view. When it could not be seen at all in this view, but deflected the oesophagus backwards in the first oblique position, enlargement was considered to be slight (grade 1); a similar grading was applied when the right border of the left atrium could be seen through the shadow of the right atrium but did not overlap it in the antero-posterior view. Grade 2 enlargement meant that the left border of the atrium or the appendage itself formed a separate arc between the shadows of the pulmonary artery and left ventricle, or that the right border of the left atrium formed the upper part of the right border of the heart, but did not extend further laterally than the right atrium; in grade 3 dilatation the left atrium bulged conspicuously on both sides of the heart, and extended beyond the shadow of the right atrium on that side; gross enlargement was reserved for aneurysmal dilatation.

The average size of the left atrium in the surgical group worked out at grade 1.62, for the medical 1.92, and for mitral incompetence 2.35; for the whole series it was grade 1.8. These figures confirm the fact that mitral incompetence is a more important cause of left atrial dilatation than mitral stenosis.

In the surgical group no correlation could be found between the size of the left atrium and the degree of stenosis. Omitting the cases complicated by significant

Incompetence, grade 1 dilatation was found in 42%, grade 2 in 52%, and grade 3 in 6%; aneurysmal dilatation was not seen. The incidence of each grade of dilatation was much the same in each grade of stenosis. Similarly there was no correlation between the size of the left atrium and the left atrial pressure, provided that a critical degree of stenosis had been reached—as in the surgical group; those with grade 1 dilatation had an average left atrial pressure of 22.9 mm. Hg; those with grade 2 dilatation 21.8 mm. Hg.

In the medical group the size of the left atrium worked out at less than grade 1 for trivial cases, at grade 1.5 for the average case of stenosis not yet severe enough to warrant valvotomy or so severe that death supervened before operation could be undertaken, and grade 2.5 for combined stenosis and incompetence. This confirms the conclusion already drawn.

In the cases in which the pulmonary vascular resistance was extreme (10 units or above) the average size of the left atrium was a little under grade 1.5.

The relationship of the size of the left atrium both to auricular fibrillation and to systemic embolism has been discussed under those headings.

Pulmonary Venous Congestion

Pulmonary venous congestion is of course closely related to dyspnoea, but from time to time intense congestion may be noted radiologically in a patient who is hardly breathless at all, and vice versa. In these unusual cases individual idiosyncrasy in respect of the nervous reflex involved in the mechanism of this type of dyspnoea is incriminated.

As expected, the degree of pulmonary venous congestion judged radiologically was proportional to the left atrial pressure (Fig. 9). This chart shows that the vast majority of cases with radiological signs of pulmonary venous congestion had left atrial pressures between 10 and 30 mm. Hg.

Pulmonary venous congestion was also proportional to the degree of stenosis, provided the pulmonary vascular resistance was not too high. This is shown in Fig. 10, a to d, which have been compiled from the surgical cases without significant incompetence. When the mitral orifice was less

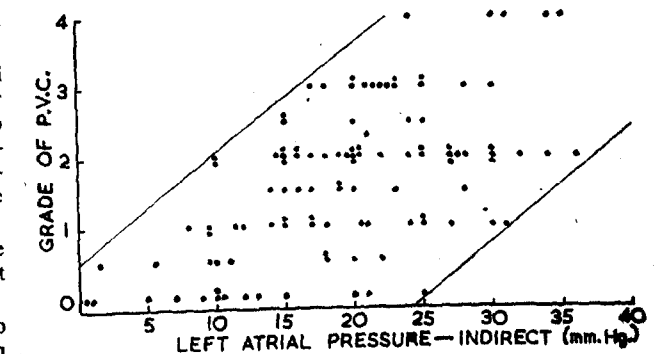


FIG. 9.—Relationship between the radiological signs of pulmonary venous congestion and the left atrial pressure.

stenosed than usual, venous congestion was slight or moderate in degree and was never modified by the pulmonary vascular resistance, for the latter was never raised; in the most common type of case, with an orifice of about 1 by 0.5 cm., congestion was usually moderate or considerable, provided the resistance was not above six units, but fell off sharply when the resistance was higher; when the mitral orifice was tighter than usual, around 0.75 by 0.4 cm., but not yet extreme, the findings were similar; in extreme cases in which the orifice did not exceed 0.5 by 0.3 cm., congestion tended to be considerable or gross and, although modified by resistances between 6 and 10 units, usually required a greater degree of vasoconstriction for its efficient

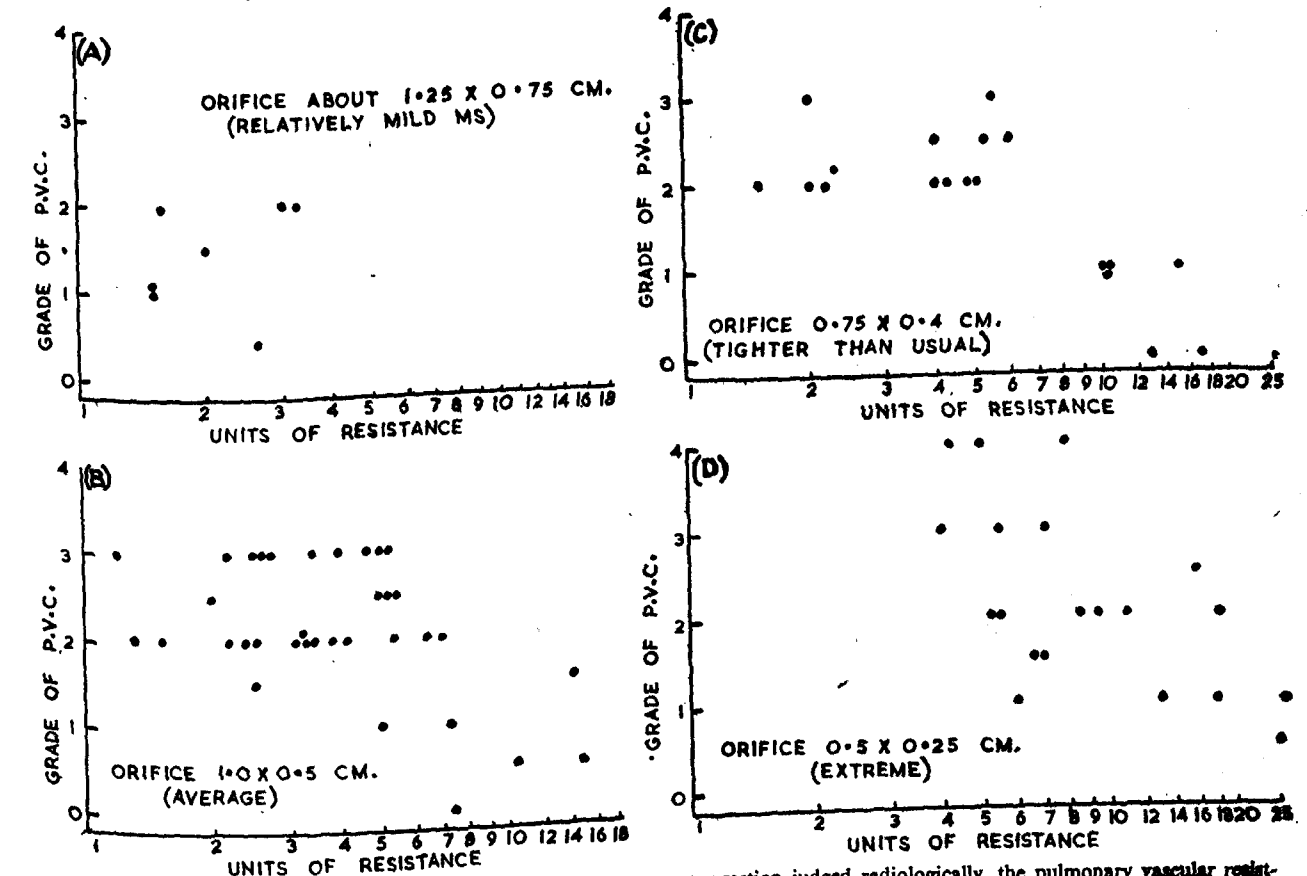


FIG. 10.—Relationship between the intensity of pulmonary venous congestion judged radiologically, the pulmonary vascular resistance, and size of the mitral orifice. In A the orifice was larger than usual, in B it was average, in C it was tighter than usual, and in D it was extreme. In B, C, and D the damping effect of a high resistance is seen.

relief. It may also be noticed from Fig. 10 that there was a higher incidence of cases with a high resistance in the group with extreme stenosis than in the other groups; life may well have depended on it.

Good objective evidence of a functionally successful valvotomy was afforded by relief of pulmonary venous congestion judged by radiological standards.

Haemosiderosis

Incontrovertible haemosiderosis, distinct from pulmonary venous and lymphatic congestion, was observed in 10% of the surgical cases and in 6% of the medical; it did not occur in a single instance of pure mitral incompetence. In the few examples in which serial skiagrams had been taken over a prolonged period haemosiderosis had been present for many years; indeed, the time of its onset was never detected, for it was always present in the first film obtained and did not change subsequently either before or after operation.

Orthopnoea or paroxysmal cardiac dyspnoea occurred in 60% of the cases with haemosiderosis, which is about the same as its incidence in the combined surgical and medical groups as a whole, so that pulmonary venous congestion cannot be the only factor concerned. Normal rhythm and a normal pulmonary vascular resistance were each present in 80% of the cases with haemosiderosis, which is a little higher than in those without. But by far the most important factor correlated with haemosiderosis was *pulmonary apoplexy*, as previously defined, for this had occurred in 55%, which is four to five times higher than its incidence in cases without haemosiderosis (12%). Since haemosiderosis is believed to be due to multiple recurrent haemorrhages from the broncho-pulmonary anastomoses in the mucosa of the terminal bronchioles the relationship was expected (Laubry *et al.*, 1948; Lendrum, 1950).

No correlation could be established between haemosiderosis and mitral incompetence, the left atrial pressure, or the size of the mitral orifice; nor, of course, had it anything to do with pulmonary hypertension.

Calcification of the Mitral Valve

The association between heavy calcification of the mitral valve and a serious degree of mitral incompetence has been emphasized repeatedly, and the point is strongly confirmed in the present series. Thus, 40% of the group with relatively pure well-developed mitral incompetence, 52% of the medical cases of mitral stenosis complicated by serious incompetence, and 62% of similar surgical cases had heavy calcification; in fact, 50% of all cases with a significant degree of mitral incompetence had heavy calcification.

In the surgical group 28% of all cases had some degree of mitral calcification, but it was trivial and in no way influenced the findings, operative technique, or results in over half of them; only 12% of the surgical cases had heavy or moderate mitral calcification, and significant incompetence was present in all but three of them.

Valvotomy was undertaken in these cases because the patients' symptoms were attributed to stenosis despite the leak, or in the hope that the valve could be repaired. The results in this small series were never excellent; they were good in 41%, fair in 12%, and poor in 47%. The chief cause of the bad results was the development of an even greater degree of mitral incompetence. Of three cases in which the pre-operative mitral leak was trivial, two did badly in this way.

In the medical group as a whole 87.5% of those with mitral calcification had moderate or considerable mitral incompetence.

It is concluded that heavy mitral calcification is a serious drawback to valvotomy, not only because it favours too great a degree of mitral incompetence, but because it is likely to result in such incompetence if not already present. It is not merely the calcium which causes the trouble, but the severe destruction of the valve mechanism which leads to its deposition.

Cardio-Thoracic Ratio

Although this was measured and recorded in most cases, it has not been analysed separately, for an increased cardio-thoracic ratio meant little unless the dilated chambers causing the enlargement of the heart shadow were identified. When there appeared to be true general enlargement without a mechanical cause, pericardial effusion proved a more likely explanation than active rheumatic carditis.

CATHETER STUDIES

Cardiac catheterization was carried out in 125 of the surgical cases, 42 of the medical, 17 of those with mitral incompetence, and in 23 awaiting valvotomy—a total of 207 cases. No serious technical difficulty was encountered in any of them; there was no mortality, and no complications other than the occurrence of pulmonary infarction when diiodone was injected through a catheter wedged in a distal branch of the pulmonary artery, so that that method of studying the anatomy of the pulmonary circulation had to be abandoned.

Right Atrial Pressure

Tracings obtained from the right atrium confirmed clinical observations on the jugular venous pressure and pulse described under that heading. Little further information was gained by analysing the central tracings themselves. When there was normal rhythm *a* and *v* were usually about equal in amplitude in uncomplicated cases. The *a* wave was usually dominant, measuring 3 to 5 mm. Hg above *v*, in cases with severe pulmonary hypertension, and was occasionally of giant proportions. Giant *a* waves were also recorded in tricuspid stenosis. In advanced heart failure the *v* wave became more prominent and was followed by a steep *y* descent. In tricuspid incompetence the *x* descent was minimal, and in auricular fibrillation it was never seen.

Right Ventricular Pressure

The systolic pressure was of course always the same as the pulmonary artery systolic pressure; this is discussed in the next section. The right ventricular pressure at the end of diastole was raised in 50% of patients with congestive heart failure, lying between 4 and 14 mm. Hg above the sternal angle; that the other 50% with failure did not show high readings was attributed to the fact that patients with heart failure were commonly treated by means of rest, digitalis, a low-sodium diet, and mercurial diuretics, and were not catheterized until they had improved. For this reason few of the figures represent the situation in severe failure.

The right ventricular end diastolic pressure was not raised in tricuspid stenosis. The diagnostic pressure gradient across the tricuspid valve in this condition has already been described and illustrated (Fig. 5, in Part I).

Pulmonary Artery Pressure

In the surgical group the pulmonary artery pressure averaged 64/33, with a mean of 45 mm. Hg. It will be noted that the diastolic level averaged about half the systolic, and that the mean pressure averaged the diastolic plus two-fifths of the pulse pressure. The pulmonary systolic pressure was 100 to 130 mm. Hg in 13%, between 60 and 95 mm. Hg in 40%, between 50 and 59 mm. Hg in 22%, and below 55 mm. Hg in 27%.

The relationship between the pulmonary systolic pressure and the pulmonary vascular resistance in the combined surgical and medical series is shown in Fig. 11. The critical systolic levels were 100 mm. Hg, above which the resistance was always raised, and 50 mm. Hg, below which the resistance was very rarely raised. The resistance varied considerably, however, when the pulmonary systolic pressure lay between 50 and 100 mm. Hg. Nearly all patients with pressures below 100 mm. Hg and an extreme pulmonary vascular resistance had congestive heart failure.

The relationship between the pulmonary pressure gradient (mean P.A.P. - mean L.A.P.) and the pulmonary vascular resistance is shown in Fig. 12. The critical gradient was about 25 mm. Hg, above which practically all cases had a resistance over 6 units. The majority of patients with

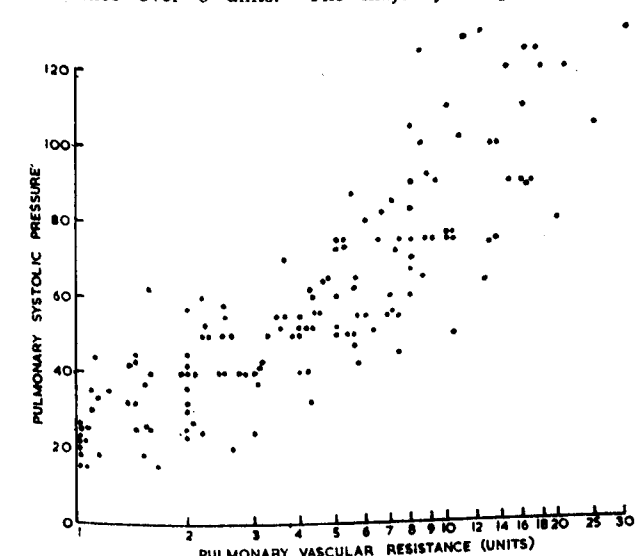


FIG. 11.—Relationship between the pulmonary systolic pressure and the pulmonary vascular resistance.

resistances between 6 and 10 units had gradients between 20 and 30. Practically all cases with an extreme resistance (10 to 30 units) had pressure gradients between 30 and 70 mm. Hg.

The pulmonary artery pressure always rose during effort, often very considerably. When the resistance was relatively normal the rise in pressure tended to run parallel with a normal rise in left atrial pressure, and in some instances the latter reached unexpectedly high levels, well above 35 mm. Hg. Clinical pulmonary oedema did not develop in these cases, but the effort was maintained for only three minutes. When the resistance was high the pulmonary artery pressure tended to rise disproportionately, often to an extreme degree. Precise figures cannot be given, because neither the work done nor the cardiac output during effort was measured, and unless these factors are known the findings can do no more than indicate the general trend. Since Dexter and his group (Gorlin *et al.*, 1951) showed that the resistance did not in fact change during effort, we have abandoned the test as a

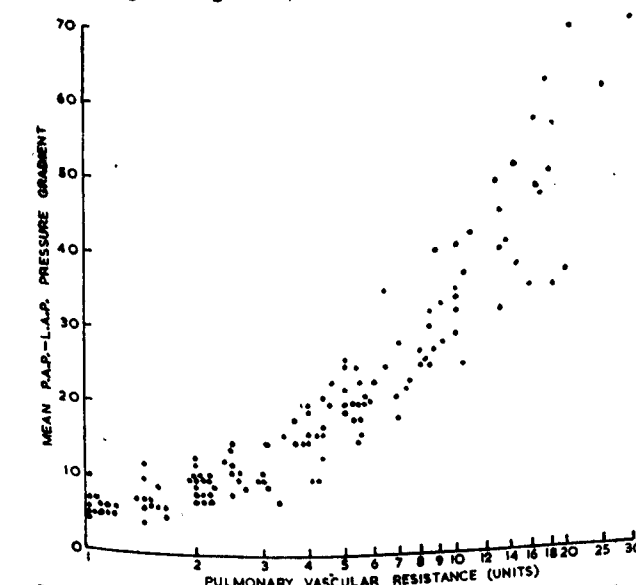


FIG. 12.—Relationship between the pulmonary pressure gradient and the pulmonary vascular resistance.

diagnostic procedure, for it did not seem to provide any information beyond that already obtained in other ways.

Left Atrial Pressure

This was measured indirectly by wedging the catheter in a distal pulmonary artery as described in the introduction under "Method" in Part I. Tracings were considered valid only when venous in form.

The left atrial pressure ranged between 0 and 10 mm. Hg in all the trivial and several of the mild cases in the medical group, but was under 10 mm. Hg in only one of the surgical cases. This man had no effort intolerance, but was operated on for recurrent systemic embolism. The valve orifice was found to be less stenosed than usual.

The average left atrial pressure in the surgical group was 22.5 mm. Hg above the sternal angle, and, as previously mentioned, tended to be only slightly if at all higher in patients with orthopnoea or paroxysmal cardiac dyspnoea than in those without such symptoms; this also applied to patients giving a history of pulmonary oedema (Table IV). The relationship between the left atrial pressure and pulmonary venous congestion judged radiologically has already been discussed and illustrated in Fig. 9.

Pulmonary oedema was a rare complication of cardiac catheterization, and no physiological observations were made during an attack. On two occasions it occurred before the catheter was introduced into the vein. It is clear, however, that left atrial pressures up to 35 mm. Hg with reference to the sternal angle might be tolerated without pulmonary oedema, and that much higher pressures, even up to 50 mm. Hg, were maintained for short periods during the effort test without distress. On the other hand, pulmonary oedema never occurred with a left atrial pressure below 30 mm. Hg at the time, which agrees with the observations of Dexter's group (Gorlin *et al.*, 1951), and with current theory.

The relationship between the left atrial pressure and the pulmonary vascular resistance is shown in Table XVII. It

TABLE XVII.—Left Atrial Pressure and Resistance

	Pulmonary Vascular Resistance Units				
	Mild Medical Under 4	Surgical Series			
		Under 4	4-5.9	6-9.9	10-30
Average left atrial pressure (mm. Hg)	9.2	19.6	22.2	23.2	22.4

may be seen that there was some correlation between these two factors up to resistances in the critical range of 6 to 9.9 units, but when the resistance was in the extreme range (10 to 30 units) the left atrial pressure tended to fall off.

The left atrial pressure, as expected, was related both to the size of the mitral orifice and to the cardiac output, as shown in Fig. 13. The ratio C.O./L.A.P. offered a useful index of the degree of mitral stenosis, averaging 45% (range 33 to 66%) when the stenosis was less tight than average, 20% (range 12.5 to 50%) when the stenosis was average or a little tighter than average, and 12.5% (range 10 to 15%) when the stenosis was extreme, as previously defined. Gorlin's formula (Lewis *et al.*, 1952) could not be utilized, because the heart rate was omitted from the analyses.

FIG. 13.—Relationship between left atrial pressure, cardiac output, and size of mitral orifice.

Form of the Left Atrial Pressure Tracing

The form of the pulmonary venous pulse has already been discussed in relation to the P mitrale of the electrocardiogram. Only 32% of all cases with reliable indirect left atrial pressure tracings showed a waves higher than v; a and v were about equal in amplitude in 39%, and v was taller than a in 29%.

Giant a waves towering more than 5 mm. Hg above v were uncommon. In this respect left atrial behaviour is different from right atrial behaviour in tricuspid stenosis. This rather unexpected finding requires further study.

Although v was taller than a in nearly one-third of the cases of pure mitral stenosis, the difference was usually only a matter of 2 to 4 mm. Hg. In mitral incompetence with normal rhythm, on the other hand, v towered above a, the average difference in well-developed cases being as much as 14 mm. Hg, the range being 5 to 25. The expression giant v wave would not be out of place in these cases. When there was auricular fibrillation the amplitude of the v wave in mitral stenosis infrequently exceeded 10 mm. Hg and averaged nearer 5 mm. Hg; in well-developed mitral incompetence, on the other hand, it ranged between 5 and 30 mm. Hg. Thus, although there was considerable overlapping, it is fair to say that a v wave over 15 mm. Hg in amplitude nearly always means mitral incompetence, and a v wave under 5 mm. Hg nearly always excludes it.

Arterial Oxygen Saturation

The arterial oxygen saturation averaged 91.5% for the whole surgical series, being within the normal range (92 to 96%) for our laboratories in 52%, slightly reduced (88 to 91%) in 34%, and moderately reduced (83 to 87%) in 14%.

An attempt was made to find some factor common to the cases with the lowest range of arterial oxygen saturation. Pulmonary venous congestion could not be inculcated when patients with paroxysmal cardiac dyspnoea were compared with patients without orthopnoea, but appeared to be a significant factor in the group with orthopnoea only (Table XVIII). This suggests that patients with orthopnoea only

TABLE XVIII.—Relationship Between Arterial O₂ Saturation and Symptoms of Pulmonary Venous Congestion

	Arterial Oxygen Saturation		
	92-96%	88-91%	83-87%
No orthopnoea or P.C.D.	58%	31%	11%
Paroxysmal cardiac dyspnoea	52%	36%	12%
Orthopnoea only	38%	35%	27%

may be more advanced than patients with paroxysmal cardiac dyspnoea (a hypothesis which is not as improbable as it might seem), or that the factor chiefly responsible for a low arterial oxygen saturation tends to prevent paroxysmal cardiac dyspnoea: such a factor might well be the pulmonary vascular resistance.

In the small group of cases in which the arterial oxygen saturation ranged between 83 and 87% the pulmonary vascular resistance was extreme in 46%, between 8 and 9 units in 39%, and normal in 15%; in these last instances pulmonary oedema was present at the time. Conversely, 35% of all cases with an extreme resistance had an arterial oxygen saturation under 88%.

In the group with the lowest arterial oxygen saturation the left atrial pressure averaged 22.5 mm. Hg, which is the same as in the rest of the series. The cardiac output averaged 3.3 litres a minute and was below 4 litres a minute in all but one instance. The low cardiac output was probably the result of the high resistance.

Coincidental cor pulmonale, due to emphysema, the result of repeated attacks of winter bronchitis, was a very rare complication of mitral stenosis, as previously mentioned, and certainly played no part in lowering the arterial oxygen

saturation in the cases analysed; in the most florid instance, in which independent bronchial asthma was believed to be at least partly responsible for the symptoms, the arterial oxygen saturation was 94%.

Just why a high pulmonary vascular resistance should reduce the arterial oxygen saturation is unknown. The same phenomenon occurs in the later stages of primary pulmonary hypertension. That frank pulmonary oedema lowers the arterial oxygen saturation is well known and requires no explanation; pulmonary venous congestion alone is exonerated.

Arteriovenous Oxygen Difference and Cardiac Output

The relationship between the arteriovenous oxygen difference and the cardiac output in the present series is

TABLE XIX.—Arteriovenous Oxygen Difference

A-V Difference (ml./litre)	Incidence	Average Cardiac Output (l./min.)	Range (l./min.)
21-30	1.5%	9.3	7.3-11.3
31-40	6.5%	6.2	4.5-7.8
41-50	18%	4.8	3.7-5.7
51-60	30%	4.0	2.7-5.5
61-70	15%	3.4	2.5-5.25
71-80	17%	3.2	2.4-5.0
81-90	5.3%	3.0	2.2-4.0
91-100	3.3%	2.9	2.5-3.7
101-110	3%	2.3	2.0-3.1

shown in Table XIX and is illustrated in the shape of a curve in Fig. 14. If for any reason the oxygen consumption cannot be measured at the time the samples are obtained, it may be as accurate or more accurate to estimate the output from the arteriovenous oxygen difference by reference to such a curve than to measure the oxygen consumption subsequently.

The cardiac output averaged 3.8 litres a minute in the surgical cases, being higher in those with normal rhythm (4.1) than in those with auricular fibrillation (3.6), and higher in those with paroxysmal cardiac dyspnoea (4.0) and pulmonary oedema (4.6) than in those without (3.5 in the group also without orthopnoea); it was especially low (3.3) in cases with the typical mitral facies, and was above average (4.2) when there was no peripheral cyanosis at all.

The relationship between the cardiac output and the pulmonary vascular resistance is shown in Fig. 15. The pulmonary resistance is perhaps the most important of all the factors limiting the cardiac output. Certainly the output is restricted by the mitral stenosis itself, but if the resistance did not rise there would be little to prevent the output being maintained at the expense of an extremely high left atrial pressure, which would result in death from pulmonary oedema. This state of affairs has in fact been observed, although death was prevented by prompt treatment. Surges of output in pregnancy, during effort, on excitement, and as the result of other factors in patients with normal resistance may cause paroxysmal cardiac dyspnoea or pulmonary oedema in this way. Such patients may have no orthopnoea under basal conditions; indeed, one of these dramatic attacks may be the first symptom of mitral valve disease in certain circumstances.

The cardiac output was of course low in patients with congestive failure, but this group also had a high pulmonary vascular resistance; nevertheless, it was probably lower in those with failure than in those without, but precise figures are not available because catheterization was usually deferred until congestive failure had responded to treatment.

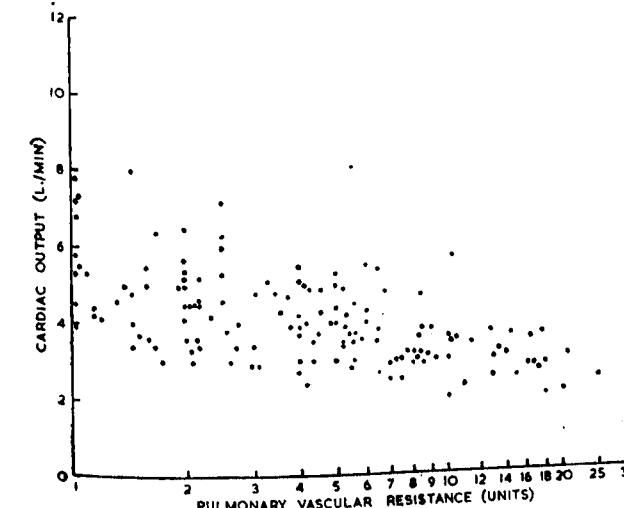


FIG. 15.—Relationship between the cardiac output and the pulmonary vascular resistance.

Pulmonary Vascular Resistance

Adapting the Poiseuille equation—

Resistance (R)=

mean P.A. pressure—mean L.A. pressure (mm. Hg)
pulmonary blood flow (cardiac output in l./min.)

the result may be expressed in units as in this paper. If it is desired to express resistance in fundamental units of force, as described by Gorlin and Gorlin (1951), pressures in mm. Hg must be converted into dynes/cm.², and flows expressed in litres a minute must be converted into cm.³/sec. The equation thus becomes—

$$R = U \times \frac{0.1 \times 13.59 \times 981.17 \text{ dynes/cm.}^2}{1,000 \text{ cm.}^3/60 \text{ sec.}}$$

where U stands for the simple unit already described. The figure 13.59 is the specific gravity of mercury, and 981.17 cm. per second per second is the g factor—that is, the acceleration force of gravity. The dividend thus becomes 1,333.4 dynes/cm.². The equation may now be rewritten—

$$R = U \times \frac{1,333.4 \text{ dynes} \times 60 \text{ sec.}}{1,000 \text{ cm.}^3}$$

$$= U \times 80.004 \text{ dynes sec./cm.}^3$$

Thus it is only necessary to multiply the unit by 80 to express the resistance in dynes sec./cm.³.

In the 200 cases in which it was measured the pulmonary vascular resistance averaged 6 units for the surgical group, 4.2 units for the medical, and 3.5 for those with mitral incompetence, or 5.4 for the whole series. Further details are given in Tables XX and XXI. The estimates for the

TABLE XX.—Pulmonary Vascular Resistance

	Average Resistance (Units)	Incidence of Each Grade of Resistance			
		Normal 1-3.9 Units	Transitional 4-5.9 Units	High 6-9.9 Units	Extreme 10-30 Units
Surgical	6.0	38.4%	26%	23%	12.6%
Medical	4.2	63%	15%	12%	10%
Mitral incompetence	3.5	56%	31%	6.5%	6.5%
Total catheterized	5.4	45%	24%	19.5%	11.5%
Estimate for whole series	4.2	60%	20%	12%	8%

TABLE XXI

	Pulmonary Resistance		
	"Normal" 1-5.9 Units	High 6-9.9 Units	Extreme 10-30 Units
M.S. serious	64%	19%	17%
" all cases	73%	14%	13%
M.I. serious	74%	26%	—
" all cases	79%	21%	—
M.I. serious	84%	13%	3%
" all cases	90%	8%	2%

whole series were contrived by including the 100 cases that were not catheterized, arbitrarily giving to each the average resistance of the group to which it belonged on clinical and other grounds. This was desirable because high-resistance cases were more likely to have been selected for physiological investigation than the others.

It may be added that predictions concerning resistances were rarely far wrong once the principles outlined in this paper were understood.

Although high resistances were rare in pure mitral incompetence they were not uncommon in combined lesions; extreme resistances, however, were very rare in anything but pure stenosis (Table XXI).

The behaviour of the pulmonary vascular resistance is perhaps the most important physiological event in mitral stenosis, and to a large extent determines the course and pattern of the disease. Thus a high resistance puts a considerable strain on the right ventricle and causes that chamber to enlarge with or without functional tricuspid incompetence; it prevents the pulmonary venous system and left atrium from developing unduly high pressures, and so diminishes orthopnoea and abolishes paroxysmal cardiac dyspnoea and pulmonary oedema; it limits the cardiac output directly and also indirectly by tending to reduce the pressure gradient across the mitral orifice. In other words, a high pulmonary vascular resistance saves the patient from drowning at the expense of a low cardiac output; a high venous pressure, hepatic distension, oedema, and fatigue replace haemoptysis, severe breathlessness, paroxysmal cardiac dyspnoea, and pulmonary oedema. Most of the evidence upon which these conclusions are based has already been presented in previous sections. It remains to be shown that congestive heart failure itself occurs only as a result of a high pulmonary resistance. That this was so in mitral stenosis is clear from Fig. 16. This omits



FIG. 16.—Relationship between congestive heart failure and the pulmonary vascular resistance. ●=Mitral valve disease without failure. ○=Congestive failure in mitral stenosis. ○=Congestive failure in mitral incompetence. * = Failure due to thyrotoxicosis.

transient congestive failure provoked by auricular fibrillation with uncontrolled ventricular tachycardia. There was no single instance in which a primary myocardial fault was responsible for failure. In mitral incompetence, on the other hand, there were as many cases of heart failure with relatively normal resistances as with high, and either a myocardial fault or some other factor must have operated. This question needs further study.

It might be thought that a high resistance developed in mitral stenosis gradually over the years in all well-established cases and that it depended on structural changes in the pulmonary arteries resulting from passive pulmonary hypertension secondary to a rise in left atrial pressure; that it was an inevitable end-result which must occur sooner or later if the patient did not die prematurely from pulmonary oedema, systemic embolism, or other complication of mitral stenosis. This hypothesis was not supported

by the facts. On the contrary, the average age of the group with an extremely high pulmonary vascular resistance was the same as in the rest of the series, as already mentioned; indeed, in the whole series the three most florid examples of extreme pulmonary hypertension were aged 27, 23, and 27. Again, no case of irreversible pulmonary hypertension has yet been encountered, and there is good reason to believe that the pulmonary vascular resistance falls after technically successful mitral valvotomy in practically all these cases, even if the operation is undertaken only in the very last stages and in the presence of gross heart failure. Finally, only 20% of the really high-resistance cases gave a previous history of pulmonary congestive symptoms, the great majority presenting the clinical picture of active pulmonary hypertension from the start. Just what determines this vasoconstrictive response is unknown. Much the same problem is encountered in cor pulmonale and the Eisenmenger syndrome (Wood, 1952).

Operative Findings

These have already been correlated with the pre-operative findings, and will therefore be reviewed here only briefly.

1. Atrial Thrombosis.—A clot was found in the left atrial appendage or sometimes in the left atrium itself in 23% of cases, as described in the section on systemic embolism, to which its relationship has been fully discussed. Brock has stressed the importance of allowing blood to gush momentarily from the incised auricle when a clot is detected or suspected, with the object of washing it out, and this manoeuvre has been successful in a number of cases (Baker *et al.*, 1952). Even so, systemic embolism complicated valvotomy in 10%.

2. Mitral Incompetence.—A regurgitant jet was appreciated by the surgeon in 24%, being slight in just over half of them, moderate in nearly a quarter, and considerable in nearly a quarter. Some degree of incompetence was predicted in 90% of these cases, as a rule with reasonable accuracy in respect of degree. Thus the prediction was correct in all but one of those with considerable regurgitation; in fact, half of them had been put up for surgical repair rather than valvotomy. Some were put up for valvotomy at a time when an attempt was being made to see what could be done for combined stenosis and incompetence, usually at the repeated request of the patient. The results were uniformly poor or fair; the degree of mitral incompetence was never less after the operation, and as a rule it was worse. Nevertheless, one-third of these patients improved enough to have made valvotomy worth while, and from being totally incapacitated they were comfortable and able to get about, though scarcely well enough to work.

Of the cases in which a moderate regurgitant jet was found, one had been predicted to have considerable incompetence and two mild incompetence—the rest were accurately assessed. Of those with a small jet, a trivial degree of incompetence had been predicted in 72%, the leak had been overlooked in 17%, and a moderate leak had been diagnosed in 11%.

Mitral incompetence of trivial degree was diagnosed clinically in 9% of the series, apparently in error. In one-third of this small group—that is, in 3% of the whole series—it was expected to be moderate in degree; but no instance of serious mitral incompetence was predicted erroneously. The final results in those with trivial or moderate leaks were not quite as good as in the rest of the series, there being fewer graded as excellent, and in over one-third of them mitral incompetence became considerable in degree.

Calcium.—Mitral-valve calcification has already been discussed in the radiological section. Only trivial calcification was sometimes overlooked on screening, important calcification practically never.

Size of Orifice

The orifice was commonly described as a small oval 1 by 0.5 cm. (Brock, 1952); it was about this size in 46% of the surgical cases, but was tighter (0.75 by 0.4 cm. approxi-

mately) in 18%, and extremely stenosed (0.5 by 0.3 cm. approximately) in 21%; in only 5% was the orifice a little larger, and it never exceeded 1.5 cm. in length in cases of simple stenosis. When there was a serious degree of associated mitral incompetence the orifice usually measured from 1.25 to 2 cm. by 0.75 to 1 cm. in length. In these cases the valve was severely disorganized and commonly heavily calcified, as described by Brock (1952). There were too few cases of pure incompetence examined to form any opinion about those.

The relationship between the size of the orifice and the symptoms, physical signs, and physiological findings has been discussed in other sections. It need only be said here that extreme stenosis tended to have more dire consequences than an average-sized opening, and that the grade of stricture should not be considered less important than the physiological reaction to the obstruction. Certainly pulmonary oedema was just as likely to occur in a patient with an average or relatively large orifice (provided it was within the critical range) as with extreme stenosis; auricular fibrillation, haemoptysis, and systemic embolism were also indifferent to the size of the orifice; but the pulmonary vascular resistance was undoubtedly influenced by the degree of stenosis, never being raised with a relatively large orifice, and never being normal with extreme stenosis (Fig. 10, a-d); angina pectoris, the left atrial pressure, the degree of pulmonary venous congestion, and the cardiac output all bore an inverse relationship to the size of the orifice. The matter may be summed up by stating that the degree of stenosis was the fundamental factor which determined the severity of the disease, and pulmonary vasoconstriction was the most important physiological reaction which modified its course and behaviour; auricular fibrillation and embolism were in the nature of accidents.

Post-operative Course

Shock from the operation, intrathoracic haemorrhage, pleural effusion, collapse of the lung, and left chest pain, having no bearing on the present thesis and being purely surgical matters, are not discussed.

Post-operative Auricular Fibrillation. Auricular fibrillation occurred post-operatively in 24% of the surgical cases, usually during the first week. It tended to last about ten days in those cases in which normal rhythm was resumed spontaneously, but if left to nature it was often permanent. At first we attempted to prevent the rhythm change by means of quinidine, but this failed; it was found much better to prepare the patient with digitalis, so that the ventricular rate was controlled when auricular fibrillation developed. We also learned that it was a mistake to try to restore normal rhythm too soon, the reversion being more easily accomplished towards the end of the second week. Since it is now believed that only fresh clots are responsible for embolism, anticoagulants are begun on the seventh day, so that no clot is likely to form in the left atrium during the five days before quinidine is given. Normal rhythm was restored in this manner and without embolic complications in 95% of the cases in which quinidine was used (Table XXII). Post-operative auricular fibrillation was left alone when the surgeon had found clots in

TABLE XXII

	Incidence (%)		Functional Results (%)			
	Total	In Each Group	Excellent	Good	Fair	Poor
Normal rhythm throughout	31.3		56	33	9	2
Post-op. A. Fib.	24					
Spontaneous reversion		21	100	0	0	0
Quinidine		39	40	55	0	5
Quinidine failed		3	100	0	0	0
Permanent A.F., no quinidine		17	50			50
Pre-op. A. Fib.	38					
Spontaneous reversion		0				0
Quinidine		10	80		20	0
Quinidine failed		10	80		20	0
Permanent A.F., no quinidine		10				18
Died	6.6		12	37	33	

the left atrium, or when valvotomy was not technically satisfactory. Quinidine was also given to a limited number of patients whose auricular fibrillation had been present before the operation if conditions for restoring normal rhythm seemed favourable. The results in this small group were far less satisfactory, however; for normal rhythm was restored in only half of them, and of these two-fifths relapsed.

Fever and Left Chest Pain.—Recurrent attacks of fever, usually associated with pain in the left chest, lasting about one week and with intervals up to a month, occurred in 10%. For a long time the cause of these attacks was by no means clear. The course of each was uninfluenced by antibiotics and salicylates, and it was soon realized that both fever and pain abated just as quickly when no special treatment was given. No rheumatic manifestations accompanied the fever. Reference of pain to the left neck and flank, occasional pericardial friction or effusion, and certain electrocardiographic changes suggested pericarditis, and it is now believed that this is the usual explanation. The attacks closely resembled those seen in association with pericardial foreign body (Wood, 1950). No serious consequences have ever been observed, and in the end they have always subsided permanently.

TABLE XXIII.—Chief Groups

	Pure M.S.			M.S. Trivial M.I.			M.S. Serious M.I.			Pure M.I.			High Pul. Resistance		Gross Pul. Resistance		Mitral and Aortic	Mitral and Tri-cuspid		
	Trivial	Rel. Mild	Serious	Trivial	Rel. Mild	Serious	Trivial	Rel. Mild	Serious	Trivial	Rel. Mild	Serious	Dom. M.S.	Dom. M.I.	Dom. M.S.	Dom. M.I.				
Surgical	—	—	70	—	—	10	—	—	12	—	—	2	22	6	18	—	5			
Medical	6	27	2	2	8	—	2	7	16	—	—	—	2	4	4	—	12			
Mitral incompetence	—	—	—	—	—	—	—	—	—	7	14	24	—	—	—	1	—			
Total	6	27	72	2	8	10	2	7	28	7	14	26	24	14	22	1	17			
Incidence %	2	9	24	0.6	2.6	3.3	0.6	2.3	9.3	2.3	4.6	8.6	8	4.6	7.3	0.3	5.6			
Incidence % discounting severity	35			6.6			12.3			15.6			12.6		7.6		5.6			
Chief groups	41.6						28						20.3						Others 10	

Psychosis.—Confusional psychiatric states, usually with delusions, during the immediate post-operative course occurred in 5% of cases. The disturbance was always temporary, however, and normal mental function was restored within a matter of weeks. There was no evidence of cerebral embolism in these cases, but the exact mechanism is unknown.

Results

Results were assessed in terms of function and were excellent in 30%, good in 40%, fair in 15%, poor in 9%, and fatal in 6%. Excellent meant that effort intolerance became normal or improved by three grades. For example, the result was classed as excellent if a patient who was totally incapacitated before the operation had only slight effort intolerance three months afterwards. A good result meant that effort intolerance improved by two grades and a fair result by one grade. Good results were also characterized by abolition of paroxysmal dyspnoea, orthopnoea, haemoptysis, angina pectoris, peripheral embolism, and serious winter bronchitis in all cases.

The chief causes of indifferent or bad results were inadequate splitting of the commissures or mitral incompetence (either pre-operative or as a direct consequence of the valvotomy). The chief surgical complication which sometimes spoiled an otherwise good result was systemic embolism.

During the three-year period under review 5% of the cases have re-stenosed, including 3 out of the first 20. Since mitral stenosis takes from three to fifteen years to develop after active rheumatic valvulitis, a similar time interval must elapse before the true incidence of re-stenosis is known.

SUMMARY

All cases of mitral valve disease may be grouped according to the anatomical lesion or the physiological state; in certain circumstances the former is more useful, in others the latter. In practice, a combination of the two has been found best. In respect of anatomy one is concerned whether mitral stenosis or mitral incompetence is dominant and with the degree of obstruction or leak; also with the presence and degree of associated aortic valve disease or tricuspid stenosis. Physiologically, the most important factor is the pulmonary vascular resistance. In the present series the cases have been grouped according to the anatomical lesion and its severity when the resistance was normal or borderline; but when the resistance was high or extreme the cases were grouped separately and subdivided into those with dominant stenosis and those with dominant incompetence, for the degree of valve damage was never trivial or mild in these cases. The incidence of each group and subgroup is set out in Table XXIII.

1. Pure Mitral Stenosis (35%)

The clinical features of pure mitral stenosis may now be described as follows.

The patient is usually a woman in the mid-thirties. The chief symptom is breathlessness rapidly progressing to paroxysmal cardiac dyspnoea, orthopnoea, and sometimes death from acute pulmonary oedema. Blood-spitting is frequently associated with congestive attacks, and these are often complicated by winter bronchitis. Pulmonary apoplexy may be an early symptom. Pregnancy aggravates the symptoms and usually causes some permanent deterioration.

On examination she looks well, and although the hands may be cold there is little peripheral cyanosis and the mitral facies is commonly absent. The peripheral pulse is small and firm, the jugular venous pressure and pulse are normal. The left ventricle cannot be felt at the apex of the heart; there is only a slight lift, if any, over the right ventricle in the left parasternal line, and none over the pulmonary artery. In the mildest cases a presystolic murmur and an accentuated first heart sound are the only auscultatory signs, but an opening snap soon develops. In better-developed cases which are still free from symptoms all the classical auscultatory signs are invariably present. At the apex of the heart these consist of a presystolic murmur, a loud slapping first sound, no systolic murmur, a soft aortic second sound, a loud opening snap, no third heart sound, and a long mitral diastolic murmur of moderate intensity, often accompanied by a thrill. The tap imparted to the palpating hand represents the first heart sound. At the base the second heart sound is normally split, and the second or pulmonary element is only slightly if at all accentuated. There is no pulmonary incompetence. In the third left space it is often possible to hear the pulmonary component of the

second sound separating out on inspiration, and the opening snap increasing in intensity during expiration.

The electrocardiogram shows a normal P wave in trivial cases and a P mitrale in better-developed cases, certainly in all those requiring valvotomy. The QRS-T complexes are normal.

X-ray films show a small aorta, a normal or only slightly dilated pulmonary artery, slight or sometimes moderate dilatation of the left atrium, normal ventricles and right atrium, and a varying degree of pulmonary venous congestion, according to the severity of the case, being absent in mild cases and gross in the most severe. Haemosiderosis may be present in cases giving a history of pulmonary apoplexy. No calcification can be seen in the mitral valve, or if present it is only slight. The cardiothoracic ratio is under 50%.

On cardiac catheterization the right atrial pressure and wave form are normal. The right ventricular diastolic pressure is normal. The mean pulmonary artery pressure is commonly 10 to 15 mm. Hg above the left atrial pressure, which is normal in trivial cases, still under 10 in mild cases, and between 15 and 30 in the great majority requiring valvotomy. On exertion the left atrial pressure rises considerably, sometimes well above 35 mm. Hg, and the pulmonary artery pressure rises passively. Whether or not pulmonary vasoconstriction develops during an attack of pulmonary oedema is still uncertain. Such a reflex would certainly be expected as a result of the anoxia and would be a physiological life-saving event. The arterial oxygen saturation is normal unless there is pulmonary oedema. The arteriovenous oxygen difference is well below 50 ml. per litre in mild cases and commonly between 50 and 60 in those requiring valvotomy. The cardiac output is normal or only slightly reduced at rest; it rises normally in mild cases, but is strictly limited in the more severe; nevertheless, it is by no means fixed. The pulmonary vascular resistance is normal or near normal. At operation in cases severe enough to warrant it, the left atrium is usually free from clot, there is no calcium in the mitral valve and there is no mitral incompetence. The mitral orifice commonly measures 10 by 5 mm., but may be a little tighter (8 by 4 mm.) or even extreme (5 by 3 mm.); it is occasionally less stenosed, but is never more than 15 by 5 mm. as estimated by R. C. Brock (1952). Necropsy figures are usually higher. The cusps themselves are usually mobile, but the margins of the orifice may be fibrous and tough.

Mitral valvotomy is advised in all cases of pure stenosis with grade 2B to grade 4 effort intolerance, the results of a technically successful operation being excellent. Premature valvotomy should be avoided in view of the operative risks and the chance of re-stenosis (probably greater than at present envisaged).

2. Mitral Stenosis with Trivial Incompetence (6.6%)

This small group differs in no way from that just described except for the presence of a slight-to-moderate mitral systolic murmur, and a small regurgitant jet appreciated at operation.

3. Mitral Stenosis with Serious Incompetence (12.3%)

The patient is as likely to be a man as a woman. The symptoms are similar to those described for group 1, but pulmonary apoplexy is more likely to have occurred. The physical signs are very different. The peripheral pulse is small, but slightly water-hammer in quality. Auricular fibrillation is highly probable. The cardiac impulse is left ventricular in type and hyperdynamic. On auscultation there is no presystolic murmur even in those with normal rhythm, the first heart sound is soft, normal, or only slightly accentuated, there is a loud mitral systolic murmur usually associated with a thrill, no opening snap, a loud third heart sound, and a mitral diastolic murmur of moderate intensity and duration. The electrocardiogram usually shows left ventricular preponderance. The x-ray appearances are char-

acterized by considerable or gross dilatation of the left atrium, enlargement of the left ventricle, and conspicuous calcification of the mitral valve; haemosiderosis may be seen in cases giving a past history of pulmonary apoplexy. The cardio-thoracic ratio is usually much increased owing to the dilated left heart.

The physiological findings are similar to those of pure stenosis except that the left atrial pressure tends to swing more and the arterial tracing may show systolic collapse.

At operation a powerful regurgitant jet can nearly always be felt. The valve is heavily calcified and disorganized, and usually measures about 15 to 20 by 5 to 10 mm. If it is sufficiently stenosed to encourage the surgeon to undertake simple valvotomy the degree of incompetence usually increases, and, although the patient is occasionally improved, he is usually no better off. Partial valvotomy may be more rewarding than a radical bilateral split. Combined stenosis and incompetence really requires a repair operation, but the techniques employed to date are none too satisfactory, and the results are indifferent. At the time of writing, therefore, it is wise to defer such cases, if not too advanced, in the belief that surgical techniques will continue to improve. If life is already threatened, however, conservative or partial valvotomy may be the best solution.

4. Pure Mitral Incompetence (15.6%)

The patient is usually a man. The symptoms are similar to those of pure mitral stenosis except that the downhill course is more rapid once breathlessness has developed. There is often, however, a longer latent interval which may compensate for the more rapid course. On examination the physical signs are similar to those of the combined lesion described in group 3, except that the mitral diastolic murmur is very short or absent altogether, and the gap between the systolic murmur and the third sound may be partly closed. The electrocardiographic and x-ray appearances are also similar to those in the combined lesion, but occasionally the left ventricle dominates the whole picture in a manner never seen when stenosis is present. Conspicuous systolic expansion of the left atrium, particularly in the antero-posterior view, is a valuable sign of organic mitral incompetence. The physiological findings are similar to those of the combined lesion, and in some the swing of the v wave in the left atrial pressure pulse is gross.

A repair operation is required. This may be undertaken at the present time if it is too dangerous to wait (Logan and Turner, 1952), but should be deferred in the majority of cases until the surgical technique is more satisfactory.

5. Mitral Valve Disease Complicated by a High Pulmonary Vascular Resistance (12.6%)

In this group the symptoms are much the same as in simple stenosis, the degree of pulmonary vasoconstriction being insufficient to prevent the development of high pulmonary venous pressures, but in some of the cases the symptoms of pulmonary venous congestion are damped. In a sense it is a transitional group between those with relatively normal resistances and those in the extreme grade.

There is more obvious peripheral cyanosis and the mitral facies may be present. The peripheral pulse is very small, and the jugular venous pressure may be a little raised; in some cases there is frank congestive heart failure or functional tricuspid incompetence, which are not seen in cases of stenosis with normal resistance. The left ventricle cannot be felt at the apex of the heart unless there is marked mitral incompetence as well; but there is nearly always a strong lift over the right ventricle. The auscultatory signs may be slightly damped, but as a rule are scarcely changed, except that the pulmonary element of the second sound is clearly accentuated. The electrocardiogram shows right ventricular preponderance, but the P wave is still mitrale in type. X-ray films show enlargement of the pulmonary artery and right side of the heart in addition to the appearances already described in the other groups.

Cardiac catheterization reveals a higher mean pulmonary artery pressure and a pressure gradient between 20 and 30 mm. Hg; the cardiac output tends to be lower and more fixed, the arterio-venous difference between 60 and 70 ml. per litre, and the pulmonary vascular resistance between 6 and 10 units. At operation the pulmonary artery is seen to be bulging and tense and the right-sided enlargement is confirmed. After technically successful valvotomy there is nothing to prevent an excellent result, and the pulmonary resistance is expected to return to normal.

6. Mitral Stenosis Complicated by an Extreme Pulmonary Vascular Resistance (7.6%)

It is very unusual for gross resistance to develop in cases of mitral incompetence or combined stenosis and incompetence. The patient is more likely to be a woman than in any other group. Although there is still breathlessness on exertion, and even slight orthopnoea in some cases, paroxysmal cardiac dyspnoea and pulmonary oedema do not occur and breathlessness is overshadowed by fatigue and oedema; ascites and angina pectoris are relatively common. Symptoms from pulmonary venous congestion are replaced by those related to a low cardiac output. It is this group, above all, that develops functional tricuspid incompetence and congestive heart failure. Haemoptysis due to pulmonary infarction occurs late in the course; indeed, death from pulmonary embolism secondary to phlebotrombosis in the legs is a constant danger.

The patient has either a conspicuous mitral facies and intense peripheral vasoconstriction, or, rarely, the palmar flush and vasodilatation of hepatic dysfunction. The peripheral pulse is exceptionally small. The jugular venous pressure is usually raised and the venous pulse may show a giant a wave in cases with normal rhythm. The left ventricle is always palpable, but the heaving thrust over the right ventricle may extend as far across as the anterior axillary line. There may be pulsation over the pulmonary artery, but it is uncommon. The auscultatory signs are thoroughly damped. A presystolic murmur, if present, is difficult to hear. The first heart sound, however, is still accentuated. A loud systolic murmur may sometimes be heard at the apex of the heart, but it is tricuspid in origin and can be heard equally well at the left sternal edge. The opening snap may be inaudible, but in such cases may sometimes be demonstrated by means of phonocardiography. There may be a right ventricular third heart sound, which in association with the systolic murmur already mentioned may encourage a mistaken diagnosis of mitral incompetence. The mitral diastolic murmur may be abolished altogether or it may be heard only very occasionally and then only with great difficulty. In other cases the auscultatory signs of mitral stenosis are still obvious, but they are never florid. At the left sternal edge in addition to the tricuspid systolic murmur there may be a loud pulmonary systolic click synchronous with the opening of the pulmonary valve, as described by Leatham (1954). At the base the pulmonary component of the second sound is short, sharp, high-pitched, and loud, but may be difficult to separate from the aortic element even on inspiration. When there is pulmonary incompetence, which is common, the pulmonary second sound loses its characteristic quality.

The electrocardiogram shows either a P pulmonale or a combination of this and the P mitrale. There is usually gross right ventricular preponderance, high-voltage R waves and inverted T waves extending across from V₁ to V₃ or V₄, and no Q waves can be seen in V₆ for the right ventricle usually forms the apex beat.

X-ray films reveal a very small aortic knuckle, considerable or gross dilatation of the pulmonary artery, and marked enlargement of the right ventricle and atrium. The left atrium may not be obviously dilated in the antero-posterior view, but can usually be distinguished in the first oblique position. Pulmonary venous congestion may be absent altogether, the pulmonary vascular markings being chiefly arterial proximally, and very light distally, as described by

Goodwin *et al.* (1952). The cardio-thoracic ratio is much increased owing to the right-sided enlargement.

The physiological findings are characterized by a prominent a wave in the right atrial tracing when there is normal rhythm, a raised right atrial and right ventricular end diastolic pressure, a pulmonary artery pressure in the region of 100/50 mm. Hg or above, a pulmonary pressure gradient well over 30 mm. Hg, and only an average rise in left atrial pressure. The arterial oxygen saturation is a little reduced in about one-third of the cases, the arteriovenous oxygen difference very high, and the cardiac output low and fixed. The pulmonary vascular resistance is between 10 and 30 units.

After a technically successful valvotomy the right ventricle may remain in difficulties for many weeks or months, and convalescence must be slow. There is good reason to believe, however, that the resistance falls gradually over the months and the whole situation may be very much improved a year afterwards.

7. Associated Aortic Valve Disease (5.6%)

When this is trivial it does not alter any of the clinical syndromes described. When it is severe it dominates the picture and need not be considered here. The cases which make up the group under discussion are those in which it is often difficult to decide whether the aortic or the mitral lesion is the more important.

The symptomatology and course are like that of mitral valve disease. The physical signs are thoroughly complicated, particularly when there is both aortic and mitral stenosis and incompetence, which is as likely as not. The mitral lesion tends to damp the signs of the aortic. When the pulmonary vascular resistance is raised in addition, the confusion is even greater and it becomes almost impossible to know which lesion is mainly responsible for the physiological changes in the circulation. It must suffice here to say that if aortic valve disease is not obviously the chief lesion, either it is of no importance or mitral disease is more advanced than suspected.

When aortic valvotomy or aortic valve repair can be more successfully undertaken these cases will have to be worked out with greater precision. At the moment the results of mitral valvotomy and attempted aortic valvotomy are indifferent, although sometimes good enough to have made the operation worth while.

8. Tricuspid Stenosis (3.3%)

Just as mitral stenosis damps the features of aortic valve disease, so does tricuspid stenosis damp those of mitral valve disease. These cases present with clinical features resembling those of the extreme pulmonary hypertensive group, but on examination, although the giant a is present in the neck, there is no lift over the right ventricle and no accentuation of the pulmonary second sound; similarly, the electrocardiogram reveals a tall P pulmonale, but little right ventricular preponderance, and radiologically, although the right side of the heart is distended, the pulmonary artery is not. Careful auscultation usually reveals separate tricuspid murmurs which are louder during inspiration. The diagnosis is made with certainty by demonstrating a pressure gradient of several mm. Hg across the tricuspid valve during diastole.

When tricuspid stenosis is severe mitral valvotomy cannot be recommended. But in relatively mild cases, in which the symptoms are due to mitral stenosis, the operation has been very successful. Tricuspid valvotomy is in its infancy.

Conclusion

Three hundred cases of mitral valve disease have been studied in detail. It is hoped that the facts revealed may be of some value to those interested in this fascinating subject.

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HORMONE TREATMENT OF DISSEMINATED BREAST CANCER

BY

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In the endeavour to control malignant disease, clinical and experimental work is being carried out to find substances which will inactivate cancer or reverse the cancerous changes back to normal. There is evidence that by alterations brought about in the hormonal status of the body by various methods the cancerous process in certain patients can be checked, thus enabling them to live on for a number of years in excellent health. By this means a form of treatment is being developed which may enable us to attain our object, and ultimately it seems likely that hormone therapy will play an important part in those cancers which are hormonal-dependent. At present new methods are required for biological assays of hormones to provide us with scientific measurements of the changes which are brought about by various stages of cancer and the effects of hormonal treatment. We could thus measure the hormonal balance of the body and abnormal amounts of particular hormones, and determine the constitution of abnormal hormones which may be present. Treatment to-day is largely empirical, based upon clinical observations, and further advances will be made in our search for the truth when the laboratory comes to our aid in this way.

The presence of disseminated breast cancer creates a serious situation for the patient and a difficult problem for the surgeon. Until recent years the prospect was gloomy, but now a little gleam of light is showing. A number of workers have demonstrated that some of these patients are sensitive to variations of their sex

hormones; for regression in the disease has occurred with oophorectomy, adrenalectomy, and the administration of either androgens or oestrogens. This important therapeutic progress is not reviewed here; the object of this paper is to record the effects in a group of patients and especially to call attention to those patients who are living in excellent health more than four years later. The case record of the first patient has already been published (Raven, 1950); her subsequent history is now reported.

Case 1

A married woman aged 50 was seen on April 13, 1948, with disseminated carcinoma of the left breast. She stated that the various lumps became bigger just before her menstrual periods. A carcinoma 3.5 cm. in diameter was present in the upper inner quadrant of the left breast, with enlarged cervical and left axillary lymph nodes, the latter being fixed. Numerous skin deposits were present in the region of the left shoulder, left arm, chest wall, and right loin. A nodular lump 3.4 by 2.2 cm. was present in the right pre-auricular region. Histological examination of a cervical lymph node and a skin nodule showed spheroidal-cell carcinoma.

I performed a bilateral oophorectomy on July 7, 1948. The disease gradually disappeared, and on February 22, 1949, I found no evidence of cancer. The 17-ketosteroids in the urine were normal in January, 1950. In January, 1951, I excised a group of enlarged right axillary lymph nodes. Histological examination showed nodes replaced by sheets and cords of closely packed anaplastic polyhedral carcinoma cells. On January 8, 1952, an enlarged right supraclavicular lymph node and two small skin nodules in the posterior aspect of the chest were found; the patient was given methyltestosterone, 50 mg. daily, and these lumps regressed. The testosterone was withdrawn on July 28, 1953. Radiological examination of the chest and cervical, dorsal, and lumbar parts of the spine and pelvis was always negative for metastases. On December 22 I found a cyst 4 cm. in diameter in the left breast, and there was no clinical evidence of cancer anywhere. The patient is well, lives a normal life, and I think she looks younger than before, with colour in her cheeks; she volunteered the information that the latter was new for her, as she was always pale before the treatment. The amount of hair on her face has now decreased markedly, but her voice remains at a lower pitch than normal.

Case 2

A married woman aged 42, without children, noticed a lump in the right breast in November, 1946. This was removed elsewhere in February, 1948, and histological examination showed a carcinoma. A week later I performed a right radical mastectomy. In May, 1949, radiological examination showed metastases in the ribs, pelvic bones, right femur, and probably in the neck of the left femur. Palliative high-voltage x-irradiation was given to relieve the pain they were causing, and she was also given methyltestosterone, 50 mg. daily, until September, 1950. There was marked reduction in the pain in the right hip and improvement in the pain in her back. In March, 1951, she looked and felt very well; hot flushes occurred after the testosterone was withdrawn. Flexion was slightly limited at the right hip, otherwise movements in both hips were full. Testosterone therapy was recommenced and the dose increased to 75 mg. daily by April, 1952; it was withdrawn in May, 1952. At this time palliative x-irradiation was given to the right hip. In June, 1952, pain occurred in the right shoulder and there was radiological evidence of a metastasis in the upper part of the shaft of the right humerus; palliative x-irradiation was given to this region.

On October 20, 1953, methyltestosterone, 25 mg. daily, was given because radiological examination of the pelvic bones showed that the affected areas were bigger and an increase had occurred in the area of rarefaction in the right

humerus. I examined the patient on December 22 and found her in excellent health and living a normal life; there was no evidence of soft-tissue metastases; the radiological appearances of the osseous metastases persist. There is very little hair on the face; her voice has a lower pitch than normal.

Case 3

A married woman aged 60, with one child, noticed a lump in the left breast in November, 1951, and in February, 1952, a left radical mastectomy was performed elsewhere for a carcinoma, and followed by a course of high-voltage x-irradiation.

She was brought to hospital by ambulance on December 16, 1952. On examination she looked ill, cyanosed, and dyspnoeic. There were no clinical signs of local recurrence; metastases in the chest were suspected. Radiological examination of the chest showed some elevation of the left diaphragm, the trachea was displaced to the left, and there were enlarged hilar shadows on both sides and an opacity in the left upper zone of the lung which resembled lymphogenous spread of carcinoma. The patient was treated with testosterone phenylpropionate, 50 mg. twice weekly. Examination on March 24, 1953, showed that she had improved and was gaining weight. The testosterone injections were increased to 100 mg. twice a week. On June 23, the improvement was maintained; her voice was lower in pitch, and the testosterone injections were decreased to 50 mg. twice weekly. On November 24 the patient stated that she felt well; the testosterone injections were continued, and thyroid extract, $\frac{1}{2}$ gr. (32 mg.) twice daily, was prescribed. A radiological examination of the chest showed that the opacity in the left mid-zone was more clearly defined. When examined on December 22 she looked well, no dyspnoea or cough was present, her general condition was good, and there was no evidence of soft-tissue metastases.

Case 4

A married woman aged 56 first attended hospital on August 14, 1941, with a rodent ulcer involving the external canthus of the right eye, which was treated with low-voltage x-irradiation. On October 21, 1952, she complained of a lump in the left breast, and on examination it was found that the nipple was retracted and a carcinoma was present in the upper and inner quadrant, attached to the skin and deep fascia. The left axillary nodes were palpable. Radiological examination showed metastases in several right lower ribs, in the bodies of the eleventh and twelfth dorsal and the lumbar vertebrae, and also in the neck of the left femur. Injections of testosterone phenylpropionate, 50 mg. weekly, were given for four months. In March, 1953, she complained of pain in the lumbar spine; the injections of testosterone were stopped and ethinyl oestradiol, 0.05 mg., was given twice daily. In May a palliative course of high-voltage x-irradiation to the lumbar spine was given and the ethinyl oestradiol was continued.

On October 13 the patient was examined; she had no pain in her back and only a small area of residual thickening remained in the left breast; no lymph nodes were palpable in the left axilla. Radiological examination showed extensive osseous metastases in the spine, pelvis, and neck of the left femur. A follow-up letter dated December 18 stated that her condition remained the same.

Case 5

A married woman aged 49, with two children, attended hospital in August, 1953, with multiple skin nodules of carcinoma; the first of these had appeared six months previously. Thirteen years ago a hysterectomy for a fibroid uterus and excision of the right ovary for a cystadenoma had been performed elsewhere. In 1947 a left radical mastectomy was performed elsewhere for a carcinoma of the breast, proved by microscopical examination, and in 1952 a right radical mastectomy was done elsewhere for a car-

cinoma of the breast, proved by microscopical examination. A course of x-irradiation was given after each operation.

On examination irradiation changes were seen in the left supraclavicular region; there were multiple skin nodules over a wide area, including the right chest wall, left hypochondrium, left iliac fossa, and the right arm. Radiological examination of the dorsal spine showed no evidence of metastases. Injections of testosterone phenylpropionate, 50 mg. twice weekly, were given. Examination on October 27, 1953, showed considerable regression in the skin nodules.

Case 6

A married woman aged 80, without children, attended hospital in April, 1949, with a lump in the left breast which had been present for nine years. It had been increasing in size slowly and had bled during the past two months. Three months after the lump appeared in the breast another lump developed in the left axilla. On examination an ulcerating carcinoma 7.5 by 6 cm. occupied the inner half of the left breast attached to the chest wall, and the nipple was destroyed. A hard lymph node 1.5 cm. in diameter was present in the left axilla attached to the skin. Radiological examination of the chest showed no metastases. A course of high-voltage x-irradiation was given to the left breast, left axilla, and left supraclavicular regions. On September 16, 1952, the ulcerating carcinoma and axillary lymph node was still present and the patient was treated with stilboestrol (5 mg., thrice daily) until November 20, when vaginal bleeding occurred and the stilboestrol was withdrawn. By December 20 the ulcerating carcinoma had almost healed. On October 13, 1953, it was seen that the lesion had regressed considerably, was dry and practically healed, and no abnormality was present in the left axilla. From April 21 she has had ethinyl oestradiol, 0.05 mg. twice daily. On January 12, 1954, the lesion was flat and healed.

A summary of results in the above cases is given in the accompanying Table.

Results of Hormone Treatment in Disseminated Breast Cancer

Case	Variety of Disease	Treatment	Survival Period after First Treatment Given	Survival Period after Start of Hormone Treatment
1	Carcinoma breast; cervical and bilateral axillary lymph node metastases; multiple skin nodules	Oophorectomy; excision right axillary lymph node. Methyltestosterone	5½ years	5½ years
2	Carcinoma breast; multiple osseous metastases	Radical mastectomy. H.V.T. (palliative). Methyltestosterone	6 "	4½ "
3	Carcinoma breast; pulmonary metastases	Radical mastectomy. Post-op. H.V.T. Testosterone phenylpropionate	2 "	1 year
4	Carcinoma breast; multiple osseous metastases	Testosterone phenylpropionate. Ethinyl oestradiol. H.V.T. (palliative)	1½ "	1½ years
5	Carcinoma breasts rt. and lt.; multiple skin nodules	Radical mastectomy rt. and lt. Post-op. H.V.T. Testosterone phenylpropionate	7 "	2 months
6	Ulcerating carcinoma breast; axillary metastases	H.V.T. Stilboestrol	4½ "	1½ years

Discussion

Each patient received benefit from hormone therapy with androgens or oestrogens, and Cases 1 and 2 are of special interest because they are in excellent health 5½ and 4½ years respectively later. In the first patient there is no evidence of carcinoma; in the second there is radiological evidence of bone metastases, but this is not adversely affecting the

patient's health. The voices of both patients are lower in pitch, but there is no other evidence of masculinization. The amount of hair on the face in Case 1 has diminished considerably and she has a much more youthful appearance than before the oophorectomy. The other patients will be followed up for a longer period to assess the results. If patients are enabled to live on in comfort for several years in spite of persistent cancer the value of this treatment will be established, and it is likely that some method will be found to counteract any unpleasant side-effects which may occur.

Since Loeser (1940) suggested testosterone therapy for advanced breast carcinoma several reports have described the effects in soft and osseous tissue dissemination. Additional information is now required on survival periods after this treatment is begun. More than 50 years have gone since Beatson (1896, 1902) wrote of the beneficial effect of oophorectomy in some of these patients, and it has received sporadic attention to the present time. This operation is also being performed in the younger pre-menopausal group of patients after radical mastectomy, and it is necessary to evaluate the end-results after the lapse of an adequate follow-up period.

Regarding the dosage of testosterone, I usually give a big dose during the first course of treatment, which in one patient has extended for 18 months. A careful check is kept on the patient's general condition, including examinations of the blood urea and serum calcium. An important observation is the improvement which occurs after the cessation of hormone treatment, and it is suggested that these interruptions play an important part. When they have obtained the maximum benefit from oophorectomy and androgen therapy there are certain patients with severe pain from osseous metastases who may be helped further by adrenalectomy. The selection of patients for this final form of treatment must be done carefully, and at present it seems that the number suitable for it is small.

Summary

The results of hormone therapy in a group of patients with disseminated breast cancer are described and attention is called to two patients who are in excellent health 5½ and 4½ years later.

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The Minister of Health is to be asked to receive a deputation from the London County Council on the question of the extension of chiropody services provided by the Council under the National Health Service. In the county of London facilities are provided at the rate of 1.38 chiropodist sessions per 10,000 population, but there is no provision in the City of London and in 13 other metropolitan boroughs. The Health Committee of the Council states that the inadequate and unbalanced service is due to the diversity of the arrangements taken over in 1948. They regard chiropody as essentially a preventive service, which could do much to prevent the ill-health resulting from foot trouble, and urge that an extension of the service is a logical development of the functions of the local health authority under the N.H.S. Act. The approval of the Minister was sought for a long-term scheme of extension of the service as a whole by 34%, and a short-term scheme for an immediate extension of the service in those boroughs without any service at all at present. All the clinics would be in existing or projected health service premises. The Minister replied that while appreciating the Council's concern in the matter he did not feel able to approve either of the schemes. Accordingly he is to be asked to receive a deputation.

ACUTE POST-OPERATIVE LARYNGEAL OBSTRUCTION

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Though large series of post-anaesthetic conditions have been reported from time to time, we have found little reference to lesions of the upper respiratory tract. Obstructions of various bronchi by mucus plugs giving rise to segmental and sometimes massive collapse of the lung are well known, but the more serious obstruction at the larynx is notably absent from the literature. Four cases of this grave complication occurring after grafting operations in children are presented.

Case 1

A girl aged 3 years was admitted to the burns unit with a history of having fallen into boiling water six weeks previously. Her general condition was poor and she had obviously lost weight. On examination an extensive granulating area involving her abdomen, back, and both lower limbs was found.

On the afternoon of the third day a grafting operation was performed under general anaesthesia induced with cyclopropane and oxygen and maintained with methyl *n*-propyl ether ("neothyl") and oxygen. A No. 1 "flexometallic" endotracheal tube was passed without difficulty and the operation was uneventful, though the defect was not fully grafted owing to its extent.

Shortly before midnight on the same night very slight stridor was noted, but was not regarded as significant. Next morning the stridor was more pronounced and was accompanied by a moist cough, but there was no other evidence of laryngeal obstruction. Treatment consisted of steam tent, postural drainage, and systemic penicillin. At midday she vomited after a bout of coughing and the larynx went into spasm, but this subsided on careful toilet of the pharynx by suction. Some time after this episode her breathing became more laboured and there was indrawing of the suprasternal notch. This became more pronounced during bouts of coughing in her effort to clear the air passages of a tenacious sputum. At 4.45 p.m. an acute airway obstruction developed, followed by cyanosis, coma, and convulsions. The latter was localized to the right side of the face and the left side of the body.

An emergency tracheotomy was performed and aspiration of the air passage carried out, with considerable improvement in her colour. On cutting down the dressings on her abdomen to ensure unrestricted respirations an acute dilatation of the stomach was uncovered. This was thought to be due to sucking air into the oesophagus during the airway obstruction, and was deflated with a stomach tube.

Her general condition was still very poor and severe convulsions continued. An intravenous drip was set up and the convulsions were controlled with gallamine triethiodide ("flaxedil"). An initial dosage of 12.5 mg. of gallamine followed by 7.5 mg. within a few minutes sufficed to control this attack. A dosage of 2.5 mg. half-hourly was maintained, but convulsions recurred eight hours later. These subsided only after the administration of 50 mg. of gallamine in divided doses, and 12.5 mg. was given on any

further evidence of twitching. From then on a steady recovery was maintained and a pyrexia of 102° F. (38.9° C.) subsided in a few days.

The tracheotomy tube was removed on the sixth day and grafting was subsequently completed. Her second operation, which was carried out without endotracheal anaesthesia, was uneventful.

Case 2

A girl aged 3 years was admitted with deep burns of the left side of the chest, abdomen, and left arm, which were sustained when her clothes caught fire. She was in good general condition.

Two weeks after admission a grafting operation was done. General anaesthesia was induced with cyclopropane and maintained with neothyl, nitrous oxide, and oxygen. A No. 1 flexometallic endotracheal tube was passed without difficulty. Operation was uneventful and the grafting completed. In the immediate post-operative period she was described as being "chesty," but there was no evidence of any airway obstruction.

Six hours later a mild degree of stridor was noted, and during the night it increased. It continued during the first post-operative day, and was accompanied by very moist chest sounds. Bouts of heavy coughing were productive of a very little tenacious sputum and caused a severe stridor and indrawing of the suprasternal notch. Temperature rose to 103° F. (39.4° C.), pulse 122, and respirations 35.

Treatment consisted of steam tent, postural drainage, and systemic penicillin, with careful observation. Under this regime her breathing became less laboured and the cough more productive. The temperature began to subside on the second day and the stridor had settled by the fourth day. She has made an uneventful recovery, and subsequent examination of the larynx has revealed no abnormality.

Case 3

A girl aged 6 years was admitted with a history of flame burns which occurred during an attack of epilepsy six weeks previously. Her general condition was reasonably good.

Grafting operations were carried out on the sixth and twentieth days after admission. Anaesthesia for these was induced and maintained with nitrous oxide and oxygen and trichlorethylene, and rubber endotracheal tubes were introduced without any difficulty. Six hours after the second operation some stridor was noted, and thought to be due to oedema of the larynx. The usual routine of steam tent and penicillin treatment was adopted, but the stridor showed no signs of subsiding. Twelve hours later she developed an acute respiratory obstruction with deep cyanosis, and an emergency tracheotomy had to be performed with toilet of the air passages by suction catheter. Very moist sounds, especially at both bases, were heard in the chest, and bronchopneumonia was diagnosed.

Twenty-four hours after tracheotomy the tube slipped out of the trachea and into the tissues of the neck, giving rise to surgical emphysema and a left pneumothorax. The tube was reintroduced and the chest aspirated by underwater suction.

Her general condition remained poor for some days, but a final recovery was made. Subsequent chest x-ray films showed a resolving pneumothorax and patchy areas of lung collapse.

Case 4

A child aged 4 years was admitted two years after a flame-burn accident for correction of scar contractures and grafting of the defects. Operation was carried out under nitrous oxide and oxygen and ether anaesthesia, and a rubber endotracheal tube was introduced without any difficulty. Operation was uneventful.

Twenty-four hours later she was very chesty and had some stridor and pyrexia. Treatment with steam tent and systemic penicillin was carried out. For a time she seemed to settle down on this regime, though there were occasional

bouts of distress with expectoration of a thick mucous material. On the fourth day, however, she developed severe respiratory embarrassment with deep cyanosis and coma. An emergency tracheotomy was then performed, followed by the usual routine of careful aspiration and the maintenance of a clear airway. A pyrexia of 100 to 101° F. (37.8 to 38.3° C.) subsided in a few days and her general condition was very much better. The tracheotomy tube was removed five days later.

Discussion

Four cases have been described of an acute post-operative condition of the air passages of such severity as to cause a respiratory obstruction, and it is the purpose of this discussion to consider certain factors which may have given rise to this grave disaster.

All four patients were female children undergoing grafting operations as the result of burns, and all were carried out under endotracheal anaesthesia. No difficulty was experienced in the intubation of any of these cases, and this was carried out by a different specialist anaesthetist in each instance, in two different hospitals, and the operations performed by three different surgeons. Flexometallic tubes were used in Cases 1 and 2 and rubber tubes in Cases 3 and 4.

Grafting operations in children may require many changes in position for the removal of dressings, cleansing, grafting, and redressing. During these procedures the head may undergo many alterations in position in relation to the body, and this may cause the endotracheal tube to rub and produce friction on the lining walls of the airway. When intubation is used in children great care should be taken to avoid this form of trauma.

Cinchocaine ("nupercaine") ointment 10% was used as a lubricant for the tube in all cases. Systemic intoxication due to cinchocaine is well known, but adverse local effects have not been reported to our knowledge.

A search through the literature has revealed very little on the subject of acute post-operative airway obstructions of this nature. Gittins (1942) included allergy and trauma as aetiological factors in acute non-specific laryngeal obstruction, and yet we cannot find reports of this following the use of the large variety of endotracheal tubes and their various lubricants. Emery (1952) suggests that abacterial agents, by interfering with the growth of bacteria, may upset the liquefaction of sputum and thus give rise to a thick tenacious glue-like material which cannot easily be expectorated, and which is found obstructing the already narrowed airway. It is evident that the post-anaesthetic condition we have observed is, in fact, a form of laryngo-tracheo-bronchitis (Briggs and Heseltine, 1952) which has followed the irritation of endotracheal anaesthesia, and the use of antibiotics may well have aggravated the course of the lesion. It is also suggested that pre-operative atropine may be a factor in the production of thick viscid mucus.

Treatment is a very controversial question, and requires clear thinking in this alarming emergency. In a mild case such as Case 3, steam tent, postural drainage, and penicillin may be sufficient to allow the condition to subside, but careful observation must be kept for worsening of symptoms. If the airway becomes so obstructed by narrowing and tenacious secretions that there is indrawing of the suprasternal notch, cyanosis, or acute restlessness, then there is no doubt that other means of relief must be resorted to. Reintubation and tracheo-bronchial suction may be a life-saving measure, and if easily performed will allow an immediate tracheotomy to be carried out as a set procedure. Continued intubation is entirely illogical in that the added trauma must further offend the already inflamed airway and may produce chronic arytenoid oedema with subglottic swelling and ulceration. Early low tracheotomy with careful and frequent suction toilet of the air passages is the treatment of choice. "We always preach early tracheotomy, but practically always do it late; dangerously late" (Chevalier Jackson, 1921a, 1921b).

Careful aftercare is as important as the tracheotomy in maintaining a clear airway, and this must be the whole-time job of a nurse who is trained in performing suction toilet and in care of the tube.

Summary

Acute laryngeal obstruction occurring as a post-operative condition is described in four cases. Its aetiology and treatment are discussed. It is considered that, though there may be no difficulty on intubation, the trauma of an endotracheal tube is an aetiological factor and that cinchocaine used as a lubricant may be contributory. In the treatment of a severe case tracheotomy is preferred to reintubation.

We acknowledge with thanks the co-operation and helpful criticisms of Mr. Emlyn Lewis, consultant plastic surgeon to the Welsh Regional Hospital Board, and Mr. A. H. R. Champion and Mr. A. McDowell, consultant plastic surgeons to the Manchester Regional Hospital Board, under whose care these patients were admitted.

[We wish to mention that since this paper was written Dr. J. R. Rook has published an article in which three similar cases are cited (*Lancet*, 1953, 1, 1214).]

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INDIFFERENCE TO PAIN IN LOW-GRADE MENTAL DEFECTIVES

BY

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In the normal course of acute conditions, whether surgical or medical, the symptom of pain is an important factor in diagnosis. In mental defectives, however, this important symptom does not always present. Seven cases are listed below, all occurring in one unit over a period of six months.

Case Reports

Case 1.—A male mental defective (imbecile grade), aged 14, confined to bed, had a series of severe epileptic fits. On recovery he was somewhat confused and irritable. Next day the irritability persisted and he showed some resistance to being moved about at meal-times. Temperatures, pulse, and respirations remained normal. On examination he showed some resentment on movement of the lower limbs, particularly the left, and unnatural mobility was present at the left hip. He could sit up, however, and turn himself in bed. On being referred for x-ray examination a fracture of the neck of the left femur was found.

Case 2.—A male mental defective of low feeble-minded grade, aged 42, suddenly collapsed. He was pale, the skin cold and clammy, the pulse rapid and weak, and the respiratory movements were curtailed. Marked upper abdominal rigidity, but little complaint of pain except on deep palpation. A perforated duodenal ulcer was suspected, and he was admitted to hospital, where a large duodenal diverticulum with ulceration at its base was found.

Case 3.—A male mongol of imbecile grade, aged 24, had an attack of what appeared to be catarrhal jaundice. Recovery initially was uneventful, but his condition rapidly deteriorated with gross liver enlargement and lower

abdominal rigidity. Temperature, pulse, and respirations were normal. He continued to eat normally and did not complain of pain. His condition rapidly became worse in spite of continued apparent "well-being," and he was admitted to hospital, where he died two days later. Post-mortem examination revealed a tuberculous enteritis.

Case 4.—A female mental defective of idiot grade, aged 12, suddenly vomited clear fluid for no apparent reason, and a short time afterwards passed approximately 1½ pints (1,750 ml.) of dark-red offensive-smelling partially clotted blood per rectum. There was marked abdominal rigidity, and she was deeply shocked but maintained a completely detached and uninterested view of her condition, no mention being made of pain, and no signs of pain were noted. She was admitted to hospital, where a diagnosis of Meckel's diverticulum was made.

Case 5.—A male mentally defective macrocephalic, aged 14 (imbecile grade), fell during a grand mal attack and received a severe lacerated wound of the forehead. He showed no evidence of pain, and the wound was cleansed and sutured without administration of an anaesthetic. His attitude throughout the procedure was one of detached annoyance.

Case 6.—A male mental defective of imbecile grade (congenital word deafness), aged 14, suddenly developed a gross swelling of the left testicle. This swelling attained a size of approximately 3 by 2 in. (7.5 by 5 cm.) but did not appear to inconvenience him in any way. It was decided to admit him to hospital, where a biopsy could be carried out to determine the cause of the swelling. A torsion of the left testicle was found.

Case 7.—A female mental defective of imbecile grade, aged 40, was noticed to have a severe herpes zoster affecting the left fifth and sixth thoracic dermatomes. There was no complaint of discomfort, far less of pain. On the condition clearing she presented no symptoms of post-herpetic pain.

Discussion

These seven cases all show absence of pain where pain would normally be expected. Even allowing for individual variation to painful stimuli it is difficult to understand the absence of pain in these cases.

The only similar examples of indifference to pain as exemplified in this series occur in the condition known as congenital universal indifference to pain or asymbolia for pain. This rare condition is generally diagnosed in childhood, when a child is noticed to have a stoical indifference to episodes causing bodily injury. Several cases have been noted during the past few years, and so far no anatomical basis has been found to explain the condition. There appear to be no post-mortem reports in the literature on the examination of brain tissue from any cases. The outstanding feature in this condition is that the patient can name correctly any painful stimulus applied, but at the same time shows no obvious sign of pain and makes no effort to withdraw from the stimulus. It will be seen that in this condition there is no analgesia or thermæsthesia. So far there are no reports of mental deficiency associated with this condition.

It will be appreciated that the interpretation of painful stimuli presents a major neurological problem. In this series the problem lies in fixing the level at which the normal reaction to a painful stimulus takes place.

A lesion producing indifference to pain probably appears to interrupt the frontothalamic projection fibres.

It has already been determined that lesions involving the thalamus may affect the sensations of pain and sensibility. The thalamic syndrome of Dejerine and Roussy is produced, being characterized by spontaneous pain and hyperreaction to disagreeable stimuli such as heat and cold.

If the lesion occurs in the associated cortical or sub-cortical areas the opposite side of the body is then affected. Position sense is lost and two-point discrimination becomes

faulty—astereognosis. Tactile discrimination and weight sense are lost. Crude sense of pain touch and thermal sensitivity are retained, but the degree of recognition may become inconstant. This is the condition of cortical anaesthesia. In discussing lesions affecting the frontothalamic projection fibres the thalamus itself must be considered.

The thalamic nuclei may be divided into three main groups: the cortical relay nuclei, association nuclei, and nuclei with subcortical connexions. None of these nuclei receive ascending fibres. It seems that the area under discussion involves either the association nuclei (dorsomedial, lateral, and pulvinar) or their associated connecting fibres. These nuclei are connected to the following cortical areas: dorsomedial, areas 9, 10, and 12 (Brodmann); lateral, areas 5 and 7; pulvinar, areas 18 and 22.

In the modern technique of frontal leucotomy of the partial combined intervention type (leucopectomy) the object of the operation is the severance of three main groups of fibres passing from the frontal cortex to the thalamus. These groups are: (1) from cortical areas 9, 10, and 45 (Brodmann); (2) from cortical areas 11, 12, 13; (3) from cortical areas 24 and 32.

A recent application of leucotomy has been the relief of intractable pain, generally in terminal neoplastic conditions where normal drugs have become useless and the object of operation is to make the closing stages of life pain-free for the unfortunate patient.

Such an operation does not sever any known pain pathways, but the end-result is that the division of the frontothalamic projection fibres completely alters the patient's reaction to pain. It now appears quite certain that the sensation of pain is in no way altered or abolished, but that the patient ceases to worry about the pain and thus relief is obtained.

It will now be seen that this state closely resembles that found in congenital universal indifference to pain.

It therefore appears that the frontothalamic projection fibres involved in the interpretation of pain and the imposition of pain on consciousness derive from cortical areas 9, 10, and 12, and pass into the dorsomedial nucleus of the thalamus. It can be presumed from anatomical and embryological evidence that connexions exist between the thalamus and that integration of interpretation from left and right cortical areas will occur.

In low-grade mental defectives the psychological, intellectual, and personality states in many cases can be compared to the changes found after leucotomy in mental patients. This may point to defective development either in frontal cortical areas or in the fronto-thalamic projection fibres. If this is the case, this hypothesis gives an explanation for the indifference to pain found in low-grade mental defectives accompanying acute surgical and medical conditions.

Summary

Seven cases of surgical and medical conditions occurring in low-grade mentally defective patients are reported. In the normal patient these conditions are associated with pain of severe degree. In these mentally defective patients there was a marked indifference to pain, although some discomfort was felt in a few cases.

An explanation has been advanced for this indifference to pain on the theory of frontothalamic projection fibres associated with cortical areas 9, 10, and 12 being defectively developed or in defective development of these cortical areas themselves.

A comparison has been drawn between the condition of congenital universal indifference to pain and the cases in the above series.

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INTRAVENOUS ERGOMETRINE AND THE UNDIAGNOSED SECOND TWIN

BY

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Our purpose in writing this paper is to draw attention to a complication associated with the use of intravenous ergometrine in the control of the third stage of labour. During the past two years, on four occasions in the Princess Mary Maternity Hospital, an undiagnosed second twin has been discovered after the administration of intravenous ergometrine; three of the cases occurred within the space of a fortnight, and this brought the problem to our notice.

Case Reports

Case 1.—The patient, a gravida-3 aged 39, was admitted to hospital as an emergency case of ante-partum haemorrhage four weeks before term. Three hours after admission she delivered spontaneously a live male child weighing 4 lb. 10½ oz. (2.1 kg.). Intravenous ergometrine, 0.5 mg., was given with the birth of the anterior shoulder, but as soon as the child was born it was realized that a twin pregnancy was present. The second twin was presenting as a vertex, and within a few minutes a female child weighing 3 lb. 15½ oz. (1.8 kg.) was delivered spontaneously. The placenta was expressed quite easily after the delivery of the second baby. The twins were in good condition at birth and made satisfactory progress.

Case 2.—The patient, a gravida-2 aged 24, was booked for hospital delivery, and was admitted in premature labour at 30 weeks. The uterus was noted to be slightly larger than for the gestation period, but a twin pregnancy was not suspected. Twenty-five minutes after admission an outlet forceps delivery was performed under local analgesia; the baby, a male, weighed 3 lb. 6 oz. (1.5 kg.). Intravenous ergometrine, 0.5 mg., was given with the delivery of the anterior shoulder. A twin pregnancy was diagnosed as soon as this child had been delivered. A vaginal examination showed the presentation to be a footling, and the membranes were ruptured by the operator. Strong uterine contractions began at once, but no progress was made, and after an interval of 8 to 10 minutes a general anaesthetic was started. Vaginal examination revealed a constriction ring in the lower part of the uterus. The anaesthesia was deepened, and with some difficulty a breech extraction was carried out. The child, a male, weighed 3 lb. 10 oz. (1.6 kg.) and was limp and blue at birth; respirations were never satisfactorily established, and the infant died at 55 minutes. A post-mortem examination was not obtained, but the cause of death was presumed to be anoxia and possibly traumatic cerebral damage. The first twin made satisfactory progress.

Case 3.—This patient, a gravida-3 aged 25, was booked for delivery in hospital and was admitted in labour two weeks before term. After a labour lasting three hours she delivered spontaneously a male child weighing 6 lb. 14 oz. (3.1 kg.). Ergometrine, 0.5 mg. was given intravenously with the delivery of the anterior shoulder, but only with the delivery of this child was a twin pregnancy diagnosed. Vaginal examination showed that the second twin was

presenting by the breech. The membranes were not ruptured on this occasion, and the operator, with his hand, kept the presenting part high in the pelvis until a general anaesthetic had been administered. The membranes were then ruptured and a breech extraction was easily performed 25 minutes after the delivery of the first child. The second twin, a male, weighed 6 lb. 2 oz. (2.8 kg.). The placenta had to be removed manually. Both babies made satisfactory progress.

Case 4.—The patient, a gravida-4 aged 36, was admitted to hospital as an emergency case four weeks before term. After a labour lasting two and a half hours a male child weighing 3 lb. 7 oz. (1.56 kg.) was born. Intravenous ergometrine, 0.5 mg., was given with the birth of the anterior shoulder; a twin pregnancy was diagnosed as soon as this child had been delivered. Vaginal examination showed the second twin to be presenting as a vertex, and the operator kept the presenting part high in the pelvis whilst a general anaesthetic was administered. The membranes were then ruptured and a male child weighing 3 lb. 12 oz. (1.7 kg.) was delivered by forceps; the placenta was expressed quite easily. The first child made satisfactory progress, but the second suffered from repeated cyanotic attacks for several days; the appearance of the second twin strongly suggested mongolism, but this diagnosis has yet to be established.

Discussion

There is convincing evidence that intravenous ergometrine, provided it is given with the crowning of the foetal head or birth of the anterior shoulder, will reduce the risk of post-partum haemorrhage and shorten the duration of the third stage of labour (Martin and Dumoulin, 1953). Certain drawbacks to its use have been noted. Grimes *et al.* (1948) and Priver *et al.* (1949) have reported side-effects such as nausea, headaches, and vomiting, while Martin and Dumoulin noted a significant increase in the incidence of manual removal of the placenta. For the past two years, in our hospital, intravenous ergometrine has been used widely but not routinely in the control of the third stage of labour. During this time there have been 74 cases of twin pregnancy, and nine of these have been undiagnosed. Four out of the nine patients were given intravenous ergometrine as the first baby was being delivered, and details of these cases have been given. One of the eight babies born to these women died, and, although we cannot be sure, we suspect that the death was at least in part caused by the strong uterine contractions which followed the administration of ergometrine; this drug is known to cause tonic contraction of the uterus and is therefore liable to interfere with placental circulation and so lead to foetal anoxia. As a result of the difficulty experienced in the delivery of the second twin in Case 2, we made a point, in the later cases, of not rupturing the second sac of membranes until we were in a position to carry out immediate delivery of the second twin. By conserving the sac of membranes there is less likelihood of the uterus contracting firmly down on the second twin.

So far we have been fortunate in that none of the undiagnosed second twins has been lying transversely. Were this to happen, then the operator might well be faced with a difficult intrauterine manipulation where the uterus had contracted down firmly on the foetus. There might then be a risk to mother as well as to child.

A number of authors have now reported the use of intravenous ergometrine in large series of cases, but, so far as we are aware, no one has acknowledged the complication to which we draw attention in this paper. In our experience the hazard is a real one and must be taken into account when an assessment is made of the advantages and disadvantages of the use of intravenous ergometrine in the control of the third stage of labour.

Summary

Attention is drawn to the complication of the undiagnosed second twin when intravenous ergometrine has

been given in the control of the third stage of labour. This complication occurred four times in two years at the Princess Mary Maternity Hospital, and one baby died. Details of the four cases are given.

It is suggested that when this complication occurs every effort should be made to avoid rupture of the second sac of membranes until the patient is under an anaesthetic and immediate delivery of the second twin can be undertaken. With an intact sac of membranes there is less likelihood of the uterus contracting down on the second twin and interfering with placental circulation.

We are indebted to Professor Harvey Evers for permission to publish details of cases which were under his care.

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RENAL CLEARANCE OF CREATININE AND UREA IN THE WEST AFRICAN

BY

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We have previously reported from this laboratory the low levels of plasma urea (Phillips and Kenney, 1952) and the low output of urea following the ingestion of 30 g. of this substance (Kenney, 1953) encountered in the West African subject. The clearance data reported in this paper were obtained in order to provide a further standard of comparison with the European subject. Precise investigation of the renal partial functions, glomerular filtration rate, and the rate of renal plasma flow (Kenney, 1954) had demonstrated the identity of these values in the African and European subjects.

Methods

Ten African subjects were used. All were familiar with the procedure of venepuncture and were trained to empty their bladders completely and spontaneously at frequent fixed intervals. The subjects were typical members of the local labour force, in regular employment and enjoying a good standard of nutrition by African reckoning—that is, a diet containing about 70 g. of protein a day, about one-third of which was meat.

The subjects reported to the laboratory at 8 a.m., after their normal morning meal, and rested in bed for a period of two hours. During this time their water intake was adjusted so as to provide a low urine flow of less than 1 ml. a minute at the start of the experimental period. At the end of this time the bladder was emptied and urine collection started. Urine samples were obtained every 15 minutes for a period of 90 minutes. During this time two or three blood samples were taken by venepuncture with the minimum of stasis. The blood was stored in a heparinized vessel and the plasma separated off by centrifugation for subsequent analysis. During the period of urine collection water was given by mouth in volumes sufficient to raise the urine flow from its original low level to about 5 to 6 ml. a minute. In this way a series of urine samples were obtained over the wide range of urine flows.

Urine and plasma samples were analysed for creatinine and urea by the following methods.

Urea.—The method of Karr (1924) was applied to both urine and tungstate filtrates of plasma in appropriate dilution. The final colorimetric estimation was carried out in a Coleman junior spectrophotometer set at a wavelength of 5,000 Å.

Creatinine.—Diluted urine samples and tungstate filtrates of plasma were treated by an alkaline picrate method (W. S. S. Ladell, 1951, personal communication), the final estimation being carried out in the Coleman junior spectrophotometer set at a wavelength of 5,200 Å.

Results

From the values for plasma concentration, urine concentration, and urine flow were calculated the clearance values for the two substances by the usual formula. The results obtained are set out in the Table, together with the mean values and the standard deviations of the observations. The table also records the mean values obtained on a group of European subjects examined under the same conditions. The values for urea clearance have been divided into two groups—those obtained at urine flows less than 2 ml. a minute and those obtained at higher rates of flow. In both cases the true clearance value is recorded; the empirical standardization of the values obtained at low flows has not been employed.

Urea and Creatinine Clearance Values

Subject	Creatinine Clearance ml./min.	Urea Plasma Concentration mg./100 ml.	Urea Clearance ml./min. flows 2 ml./min.	Urea Clearance ml./min. flows 2 ml./min.	Urea Clearance/Creatinine Clearance
Os	121	15.0	44	52	0.43
Wm	117	13.5	44	43	0.37
Sa	141	12.7	36	50	0.31
Jo	145	10.6	36	37	0.25
Co	85	10.2	42	21	0.41
Pa	168	10.7	35	46	0.15
Ma	102	11.9	35	31	0.43
Ge	129	16.7	34	54	0.22
La	141	18.8	60	46	0.44
An	120	19.6	63	46	0.44
Mean	127	13.9	45	42	0.345
s.d.	23	3.4	16	11	
European values:					
Mean	122	26.7	70	54	0.48
s.d.	12	4.7	8	9	

Discussion

The value obtained for the creatinine clearance is in very good agreement with the values commonly observed in the European subject. It appears that creatinine is as adequate a method of determining the rate of glomerular filtration rate as is the more popular inulin or mannitol clearance, and if this be accepted the glomerular filtration rate in these subjects agrees well with the "world average" for this function quoted by Smith (1951). The creatinine clearance was completely unaffected by the rate of urine flow.

It will be observed that the values of urea clearance are nearly identical whether observed at high or low rates of urine flow. The African subject, therefore, fails to show the "augmentation" phenomenon which is characteristic of urea excretion in the European subject (this is supported by the values recorded in the table).

The absolute values of the urea clearance are low, being only about two-thirds of the normal standard. The average ratio of urea clearance to glomerular filtration rate at random urine flows in 37 normal subjects observed by Raaschou (1948) was 0.65 (range 0.458–0.776). Shannon and Smith (1935) obtained a value of 0.64 (range 0.59–0.67), and Blegen, Haugen, and Aas (1949) reported a mean value of 0.59. The ratio observed in this laboratory for the European subject lies at the lower extreme of the range reported by the Danish workers. This may, however, merely be a reflection of a preponderance of low rates of urine flow in the present European data. In the African

subject, even at high rates of urine flow, the clearance value is less than that observed at flows below the augmentation limit in the European subject.

It is well known that the level of dietary protein affects the rate of urea elimination, and for this reason the comparison of African with European data may not be valid. The European subjects investigated had a daily protein intake of about 100 g. (half of which was of animal origin) compared with an intake of 70 g. for the African (about one-third of which was meat). The plasma concentration of urea will, however, be conditioned by the same factor, and, since it is the clearance value which is here being considered, the effect of the lower elimination may be to some extent compensated. Although Jolliffe and Smith (1931) and Shannon, Jolliffe, and Smith (1932) have demonstrated a fall in urea clearance on low-protein diets, this fall has been accompanied by a fall in the filtration rate; in the present series there was no indication of reduced filtration rate.

The possibility that there is a real difference between the mode of urea elimination in the African and the European is the subject for further investigation, with particular reference to the secretory phase of urea elimination which has been demonstrated in the European subject (Barclay, Cooke, and Kenney 1947; Kenney *et al.*, 1950).

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FAT UTILIZATION IN ADULTS ON A DIET OF COWS' MILK

BY

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AND

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Although extensive investigations into the absorption and excretion of fat in infants, both breast-fed and on cows' milk, have been carried out by Holt *et al.* (1919a, 1919b, 1919c), we have found no reference to fat absorption by adults on a milk diet. During the course of another experiment we were required to live on a diet of cows' milk for one month, and below we record our fat absorption and excretion taken over three days of the fourth week.

The fat content of a milk diet is much higher than that of a normal mixed diet. Wollaeger *et al.* (1946) found that on normal mixed diets the amount of fat ingested by adults may be increased to 208 g. a day without gross change in the percentage absorbed, an average of 9% only of the ingested fat being excreted. Annegers *et al.* (1948) studied the effect of varying quantities of fat added to a mixed diet, and found that, within normal limits, neither the quantity nor the type of ingested fat influenced the amount of excreted fat in any individual subject. A normal fat

absorption on a milk diet is therefore to be expected. On the other hand, Holt *et al.* (1919a, 1919b) found that normal infants fed on cows' milk passed more than twice as much fat as infants who were breast-fed, and that the average utilization of dietary fat was 88.6% for cows' milk and 95.8% for breast milk. They also found that the percentage of the total fat excreted as soap was much higher in infants taking cows' milk. We therefore believe that our results are worth recording.

Methods.—The collection of faeces was carried out between carmine markers over a period of three days. The diet consisted of nothing but pasteurized cows' milk, and the intake was kept constant before and during the period of collection of faeces. Five millilitre samples of milk from all bottles drunk were collected, and the fat content of the mixed samples was estimated. The faeces were collected in screw-capped glass jars containing a small amount of formalin, and were dried over a water-bath, ground, and mixed carefully. The estimations of soap, neutral fat, and free fatty acids were carried out in duplicate, using Soxhlet apparatus by the method described by Harrison (1947).

The results are shown in Table I.

TABLE I

	W.H.H.A.	R.H.
Daily milk intake	12 pints	10 pints
Fat content of milk	3.3 g.% (w/v)	3.3 g.% (w/v)
Daily fat intake	225 g.	187.5 g.
Weight of dried faeces (3 days)	147 g.	131 g.
Total fat in dried faeces	28.6%	26.4%
Percentage fat as (1) Soaps	74.5%	72%
(2) Free fatty acids	13.5%	14%
(3) Neutral fat	12%	14%
Total daily weight of excreted fat	14 g.	11.5 g.
Fat intake absorbed	93.8%	93.9%
Total body weight. Gain or loss over one month period on milk in brackets	195 lb. (+5)	155 lb. (nil)
Daily calorie intake approximately	4,450	3,700

Discussion

Although a diet of cows' milk becomes monotonous no difficulty was experienced in continuing it for a period of one month. At times we observed minor degrees of flatulence, but general health was apparently unaffected. One of us, in fact, played competitive tennis throughout the whole period and even travelled to London for the Coronation, having to sit all day in Hyde Park drinking milk. The motions seemed to be increased in bulk, rather constipated, and of uniform consistency and colour (pale) throughout. The calorie intake was obviously adequate, and one of us (W.H.H.A.) gained 5 lb. in weight over a total period of one month on milk.

The most striking feature of the results is that fat utilization is 94% (Table II), a figure well within the usually accepted, roughly defined normal range for adults, in which the amount of fat in the stool should not exceed 10% of the ingested fat. The other feature of interest is the high percentage of the total fat excreted which appears as soap. This bears a close relation to the figures which Holt *et al.* obtained for infants fed on cows' milk. The percentage of

TABLE II

	Total Fat in Dried Faeces	Percentage as Soap	Percentage as Free Fatty Acid	Percentage as Neutral Fat	Utilization of Fat Intake
W.H.H.A.	28.6%	74.5%	13.5%	12%	94%
R.H.	26.4%	72%	14%	14%	94%
Average for normal breast-fed infants (Holt <i>et al.</i>)	34.5%	43.1%	36.7%	20.2%	95.8%
Average for infants fed on cows' milk (Holt <i>et al.</i>)	34.1%	60.5%	18.6%	12.1%	88.6%
Average for children on milk with bread and cereal (Holt <i>et al.</i>)	30.7%	60.9%	25.1%	14.0%	90.6%
Average for normal adults on a mixed diet containing 208 g. fat (Wollaeger <i>et al.</i>)	33.7%	—	—	—	96%

total fat in the dried faeces is just above that which is usually regarded as being within normal limits for a mixed diet of average fat content, but below the figure obtained by Wollaeger *et al.* on a mixed diet containing 208 g. of fat.

Conclusions

An investigation was made into the fat absorption and excretion in adults on a milk diet.

It was found that adults living on a high fat diet consisting of cows' milk absorb a normal proportion of their fat intake.

As in infants on cows' milk and normal children on a milk diet, a considerable proportion of the excreted fat is in the form of soap.

A milk diet for one month has no adverse influence on health.

The work of one of us (R.H.) was carried out during the tenure of a John Holt Research Fellowship and with the aid of a grant from the Royal Australasian College of Physicians. The milk fat estimations were kindly carried out by Mr. N. Heron, of the City Analyst's Department, Liverpool, and the faecal fat estimations by Mrs. E. Smith, of the Department of Tropical Medicine, Liverpool School of Tropical Medicine.

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Medical Memoranda

Intestinal Polyposis associated with Pigmentation of the Oral Mucosa

This syndrome was described by Peutz (1921) and again by Jeghers (1944), who later collected a further 22 cases from the world's literature. Of the 30 patients so far reported few proved cases have been described in the British Isles.

In view of the apparent rarity of the condition, which may yet prove to be more common than is at present supposed, two further cases are considered worth recording. The first patient, in whom the polyposis is confined to the small intestine, is exceptional in that he has been admitted to hospital on eight occasions with an intussusception and has undergone five operations for this complication. In the second patient the polyposis occurred predominantly in the large intestine, and radical surgery was possible.

CASE 1

A man aged 28 attended in March, 1948, with symptoms of recurrent partial intestinal obstruction. In 1943, when in the Forces, he had been operated on for intussusception. His son, aged 8, has pigmented lips but as yet no symptoms. He was a dark, tall, thin man with typical pigmentation of the lips and buccal mucosa. Barium enema revealed a chronic ileo-colic intussusception.

At laparotomy on March 15 chronic jejuno-jejunal, ileo-ileal, and ileo-colic intussusceptions were found. All three were reduced. Nine large polyps were present at intervals throughout the small intestine. No resection was carried out. He was subsequently readmitted in six attacks of acute intestinal obstruction.

At laparotomy on May 5 an ileo-colic intussusception was partially reduced. A few inches of ileum and the contained polyp required resection. Pathological examination showed a benign adenomatous polyp.

MAY 15, 1954

At laparotomy on May 30, 1949, an ileo-ileal intussusception was reduced; no resection. On April 20, 1950, laparotomy revealed an irreducible ileo-ileal intussusception; 12 in. (30 cm.) of ileum was resected.

In November, 1950, and January and July, 1951, he was admitted with intestinal obstruction and intussusceptions were palpated, but spontaneous reduction occurred shortly after admission. He often suffers from both mild and severe attacks of colic, but so far has required no further admission to hospital.

CASE 2

A boy aged 12 attended in February, 1951, with a rectal polyp. He had had an operation for intussusception in 1939. There was no relevant family history. He was a tall, thin child with typical pigmentation of the lips and oral mucosa. A polyp was removed from the rectum. Barium enema and sigmoidoscopy revealed no further polyps at that time. A second polyp was removed in July 1951, and in May, 1952, examination revealed a third rectal polyp and mass in the ascending colon.

An exploratory laparotomy on July 9, 1952, revealed a polyp in the jejunum, 12 in. (30 cm.) from the duodeno-jejunal flexure, a polypoid mass in the caecum, a polyp in the appendix, a polypoid mass in the descending colon, where a chronic intussusception was present, and a polyp in the sigmoid colon; the mucosa of the terminal ileum was nodular, but no true polyps were present. Resection of 6 in. (15 cm.) of upper jejunum and total colectomy, anastomosing the lower ileum to the rectum, were carried out. The pathological report stated "benign adenomatous polyps."

Post-operative progress was complicated in October, 1952, by intestinal obstruction due to adhesions, which were divided. No further polyps have developed in the 4 in. (10 cm.) of rectum remaining.

I wish to thank Mr. Ridley Thomas and Mr. Norman Townsley for permission to publish the histories of these patients, who are under their care, and for their help and advice.

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Intestinal Polyposis associated with Pigmentation and Intussusception in Triplets

Hunter and Wilson (1953) define two types of true adenomatous polyps of the small intestine: (1) those associated with pigmentation of the lips and buccal mucosa and with familial tendencies; and (2) those not associated with pigmentation and no obvious hereditary factor.

In view of the rarity of this condition the following cases of type 1 occurring in triplets are considered worthy of note. All three presented initially with abdominal colic and all showed marked pigmentation of the lips and buccal mucosa, including the gums; all were of tall, thin complexion and had dark hair.

CASE 1

The patient was first seen on November 17, 1944, when aged 8. For three years, on and off, she had complained of colicky abdominal pain associated with diarrhoea and vomiting. Marked circumoral and buccal pigmentation was noted along with a patchy brown pigmentation of the abdominal wall. A tentative diagnosis of Addison's disease was made, and she was admitted for further investigation. Full blood examination showed only very slight anisocytosis; blood sodium 307 mg. per 100 ml.; and blood potassium 24 mg. per 100 ml. X-ray examination showed no supracolic calcification and the Kepler water test was normal.

A diagnosis of mild Addison's disease was made, and she was discharged on January 15, 1945.

She was readmitted on February 10 with symptoms of acute intestinal obstruction. At laparotomy (A. L. L.) 4 feet (122 cm.) of gangrenous ileum was seen and was thought to be due to volvulus. Resection with end-to-end anastomosis was performed. Some calcified tuberculous glands in the mesentery were included in the resection. She was seen again on April 9, complaining of intermittent abdominal pain, but full x-ray examination showed no abnormality.

On March 10, 1953, she was readmitted with very severe abdominal pain and symptoms of intestinal obstruction. Examination revealed a large sausage-shaped swelling in the lower and right abdomen. A diagnosis of small-bowel obstruction was made and laparotomy was performed (W. P. C.). An ileo-ileal intussusception extending through the ileo-caecal valve was found. Reduction was impossible, and a right hemicolectomy was performed. A large, simple adenomatous polyp was found to have initiated the intussusception. Convalescence was uneventful, and since discharge she has been seen several times and has remained perfectly well.

CASE 2

This sister was first seen on April 22, 1948, when aged 12, with symptoms of acute small-bowel obstruction. Circumoral and buccal pigmentation was noted. Laparotomy (A. L. L.) revealed an ileo-ileal intussusception 4 in. (10 cm.) in length. This was reduced and an intestinal polyp $\frac{1}{2}$ in. (1.9 cm.) in diameter was palpated through the bowel wall. The polyp was excised and the bowel sutured transversely. Histological examination showed inflammation of an adenomatous polyp. She was readmitted on May 26, complaining of left lower abdominal pain, but sigmoidoscopy and barium examination revealed no abnormality.

On March 28, 1949, she was again admitted with severe lower left abdominal pain associated with vomiting. At laparotomy a colo-colic intussusception of the sigmoid loop was demonstrated. This was easily reduced, and was found to be initiated by a polyp palpable through the bowel wall. Several other polyps were palpable further up the large bowel as far as the transverse colon. A Paul-Mikulicz resection of the sigmoid colon containing the intussuscepting polyp was performed. The double-barrel colostomy was later successfully closed.

CASE 3

This girl is the only one of the triplets who has not required laparotomy. Nevertheless she was seen on April 9, 1951, aged 15, complaining of colicky abdominal pain. At examination she, too, had marked circumoral and buccal pigmentation. In view of her sisters' history full barium x-ray examination and sigmoidoscopy were performed, but no evidence of polyposis could be demonstrated.

COMMENT

The association of circumoral and buccal pigmentation with polyposis of the small intestine and intussusception, though rare, is by now a well-recognized syndrome. The familial tendency of the condition is well demonstrated in these triplets, but no history of similar pigmentation or intussusception could be elicited from the parents or other members of the family.

Hutchinson (1896) first described pigmentation of the lips and buccal cavity in twins, and Parkes Weber (1919) recorded that one had died of intussusception. Jeghers (1944) and Jeghers *et al.* (1949) described the syndrome more fully and recorded 10 further cases. Tanner (1951) added a further case, and Wolff (1952) reviewed the literature and recorded a case of his own. Kaplan and Feuchtwanger (1953) and Kitchin (1953) added three further cases. Hunter and Wilson (1953) recorded yet another case of adenomatous polyp of the small intestine associated with pigmentation and intussusception, and suggested a classification of intestinal polyps. So far as can be ascertained 31 cases have been recorded.

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A GUIDE TO THE LANGUAGE OF MEDICINE

CHARLES SINGER.

CLINICAL CYTOLOGY

More than 20 years have passed since Dudgeon and his co-workers published the first of several papers on the use of the cytological method in the diagnosis of tumours and in the systematic examination of sputa for malignant cells. Exfoliative cytology was subsequently employed by Papanicolaou and his colleagues in the U.S.A. in the examination of the vaginal smear, and has since been adopted for the diagnosis of malignancy in other pathological fluids such as urine, prostatic secretion, and pleural effusions. In the United States the cytological diagnosis of cancer is almost universally regarded as reliable and scientific. British pathologists, however, remain unconvinced and are for the most part unwilling to submit this technique to a fair and rigorous trial. The appearance of this volume is most opportune, for it has the unusual advantage in books on this subject of treating the subject in a commendably broad and comprehensive manner. Two valuable chapters, devoted to general cytology, contain detailed descriptions of the morphological appearances of normal cells and of the many alterations of structure which accompany general pathological processes, including the various types and

J. BAMFORTH.

In this sort of book, as usual, one finds that in most of the case histories there has been a fairly abnormal environment.

The reader is left wondering what psychotherapy would be applied should the therapist be faced with the problem of the child of normal parents who was nevertheless finding life difficult. In the end an illustrative case history is given, and an examination of this shows two interesting facts. It would appear that no analysis is done, in the sense of the interpretation of the unconscious, as it becomes ready for interpretation in the transference neurosis samples. On the other hand, toleration and unexpressed understanding enable the child to find therapeutic gain through a regression in the relationship to the therapist, and to make subsequent progress in emotional development on a firmer basis. The value of regression is not, however, specifically pointed out in the discussion.

We find here valuable intuitive clinical work put forward, but without the psychological formulations which give the work a firm basis. Certainly in certain cases it is better to allow a child to regress and to make new progression, rather than to do the alternative of interpreting without understanding the need for regression. On the other hand, it is very important for psychology that the regressive techniques should be developed by those who are able and can show that they are able to do ordinary psycho-analytic work.

D. W. WINNICOTT.

ELECTROCARDIOGRAPHY

Études Electrocardiographiques. By Jean Laham. Tome 1. (Pp. 285. No price given.) Paris: Librairie Maloine. 1954.

In the first volume of this work on electrocardiographic studies the author discusses myocardial infarction, coronary insufficiency, and pericarditis. Unfortunately, as so often with French books, there is no index, so it is difficult to find what one wants. Discussing infarction, the author claims that in 95% of recent cases characteristic cardiograms can be found, and that the size of an infarct as shown by the cardiogram has a bearing on prognosis; such information as this is easy to find. But there are a number of serious disadvantages to this sort of book. Certainly only the most hard-bitten cardiologist will try to read it, for there is not a single illustration, and the effort of mentally visualizing the curves, the technical description of which appears in the text, is by no means small, even to the initiated.

There are many abbreviations, where capitals stand for words—not easy again for the foreigner to translate. The references are profuse; sometimes ten or twelve lines of them, all in small capitals with the dates in brackets; this makes the text almost unreadable. How much better it would be to collect them all in appropriate herds and refer to them in the text by little numbers. The style is intensely tabular, broken up into short didactic paragraphs, numbered and classified into many headings and subheadings. This seems to be the fashion in some of the French medical publications of to-day. Gone is the elegant fluency of the older writers. Tiring to the eye also are the many statistics, whole series of percentages, and so forth, which may or may not mean much. But if any reader can get over all these difficulties he will find here an enormous amount of information, and the book can well be of great use to the cardiologist for reference, to be taken in very small doses. After all this electrocardiography one might easily forget all about the patient.

TERENCE EAST.

OBSTETRIC STATISTICS

Das Geburtshilfliche Gutachten im Vaterschaftsprozess. By Professor Kurt Podleschka. (Pp. 237; 64 illustrations. M. 33.) Stuttgart: Georg Thieme. 1954.

German scientific literature is replete with compendial monographs which, while contributing little or nothing in the way of original thought or research, emerge mainly as extremely well presented reviews of all the available knowledge to date on their particular subject. The present work, the cumbersome title of which may be translated as "obstetrical aids in the assessment of paternity claims," is

characteristic of the genus. The author discusses the problem of disputed paternity from a strictly statistical viewpoint, marshalling the relevant facts with enviable precision and efficiency. He thoroughly dissects the vexed questions of time of conception, date of ovulation, duration of pregnancy, and post-maturity, and reduces them to tabular or graphic form, and he leaves the reader with the impression that the determination of these distressing legal claims is merely a matter of turning up and quoting the appropriate authority. The matter is in practice by no means so simple, for natural variation in these factors is so great that the average court will accept a width of application sometimes amounting to discrepancy. The medical witness, however, will find the concentration into one handy volume of all the scientific data concerning a difficult subject of value in replying to precise legal questioning, and the book should be in the possession of those likely to be so involved.

ALBERT DAVIS.

BROADMOOR

Broadmoor: A History of Criminal Lunacy and Its Problems. By Ralph Partridge. (Pp. 278; illustrated. 21s.) London: Chatto and Windus. 1953.

"On May 15, 1800, a man named James Hadfield was arrested after firing a pistol at King George III in the Royal Box at Drury Lane Theatre. The bullet narrowly missed its mark, as the King happened to be bowing his head at the time to the audience." At his trial it was revealed that the prisoner thought he was acting on the direct instructions of God, who had commanded him to save the world by sacrificing his own life. Suicide being too wicked, he hoped to be executed, but his wish to be hanged, drawn, and quartered was not to be gratified. Within a month of his trial the Criminal Lunatics Act of 1800 was passed, under which persons acquitted on grounds of insanity or found insane on arraignment could be ordered to be detained "until His Majesty's Pleasure be known."

So begins Mr. Partridge's fascinating story. After discussions in the first chapters on insanity from the legal and the medical point of view, Chapter III begins the history of Broadmoor from its founding in 1856 down to a full account of its organization at the present day. The history of the institution is to a large extent a history of its successive medical superintendents, with their varying inclinations to liberalism or rigour. At the beginning, as the author remarks, greater reliance was placed on the science of engineering than on the science of medicine; if one could not try to cure the patients, one could try to keep them inside. Nevertheless, escapes were quite frequent in the earlier days, and have continued on rare occasions until now. The commonest means of leaving the hospital—as it became in 1941—had, up to that date, been by transfer to other mental institutions and by death. However, it is noteworthy that about a quarter of the patients admitted either have been discharged recovered or have recovered and been sent back to prison. One must hope that the next 5,000 patients dealt with will show a considerable improvement on these figures.

Some of the improvements made in the organization during the superintendency of Dr. Hopwood, who retired in 1952, are of interest. He succeeded in introducing parole, despite the misgivings not only of authorities but even of his own staff; needless to say, the parole system has amply justified itself. Doors within the hospital also began to be flung open, so that trusted patients could pass freely from one part to another. Social occasions were begun, at which the sexes were allowed to mix: women number about a quarter of the total, which must be a higher figure than in sane prisoners. Other amenities have been added, bowling greens, away matches for the cricket team, and the famous dramatic society of patients, "The Broadmoorists." It was owing to Hopwood that Broadmoor came to be recognized as a mental hospital, that turnkeys passed away and even attendants became nurses, that patients wear sports coats and flannel trousers and clean-shaven faces. The era of wise humanitarianism had done its best.

ELIOT SLATER.

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HORMONE TREATMENT OF BREAST CANCER

In 1829 Astley Cooper¹ suggested that a functional relationship existed between the ovary and the mammary gland. It was soon recognized that this relationship might be of major importance in the genesis of breast cancer, but it was not until 1896 that oophorectomy was first advocated and performed by Beatson² as a means of treating this disease. The operation fell into disuse partly because complete regression of tumour growth was rarely obtained.

Much of our present-day knowledge of breast cancer is based on animal experiments. The carcinogenic potency of the ovaries was first demonstrated in mice by Loeb³ and his co-workers in 1919, who found that removal of both ovaries from young mice of various strains with a high susceptibility to cancer considerably reduced, though it did not entirely prevent, the incidence of mammary cancer. Then Murray⁴ in 1928 found that mammary cancer could be produced in castrated male mice of a highly susceptible strain by grafting into them the ovaries of their sister litter mates. But it was not until Lacassagne⁵ announced in 1932 the results of his classic experiment that the relationship between the ovarian factor and breast cancer became firmly established. By repeated administration of oestrogen Lacassagne was able to induce mammary carcinoma in male mice which normally never develop it. This was a very important discovery, not only because oestrogens proved to be the first substances originating in the body which could cause cancer, but also because oestrogens came to be used in the hormonal treatment of certain types of neoplasia which arise in organs under endocrine control.

The next important advance was made by Murray,⁶ who discovered that in certain of their

biological activities oestrogens and androgens are antagonistic to each other. He found that when male and female mice of a high cancer strain are joined in parabiosis the female partners, which normally develop mammary carcinoma, failed to do so under these experimental conditions. Since then Lacassagne and others have shown that hormonal antagonism, while preventing spontaneous breast cancer in mice, has considerably less influence on growths which are already established and in which malignancy has appeared.

In the clinical field Loeser⁷ was one of the first to use testosterone therapy on advanced breast carcinoma in women. Later Adair and Herrmann⁸ reported regression of breast cancer with bone metastases following large doses of testosterone propionate, and Mr. R. W. Raven in an article at page 1124 of this issue of the *Journal* describes several cases of breast cancer with metastases which he treated with methyl-testosterone. In two instances the survival periods after treatment was begun were six and seven years. Other clinicians, relying on the depression of pituitary function and hence inhibition of ovarian secretions, have used massive doses of oestrogen for the treatment of breast cancer. Haddow and his co-workers⁹ in Britain and Nathanson¹⁰ in the U.S.A. have obtained partial regression of advanced breast carcinoma in women with this form of therapy. More recently Stoll and Ellis¹¹ have published interesting clinical data on the treatment by oestrogens of pulmonary metastases from breast cancer. In the treated group 31% of cases survived over 12 months, as compared with 7.5% in the untreated group. In the treated group 26% showed regression of pulmonary lesions, whereas in the untreated group there was no regression at all.

Since the time of Beatson many workers have re-introduced bilateral ovariectomy for the treatment of mammary cancer, while others have preferred irradiation with x rays as a substitute for ovariectomy. The reports of both these forms of treatment are in many instances conflicting. A notable case is now reported by Mr. Raven in which ovariectomy was performed on a woman with breast carcinoma accompanied by cervical and axillary lymph node metastases. The operation was done five and a half years ago, and the patient to-day shows no clinical evidence of cancer and leads a normal life.

Recent work in endocrinology has demonstrated conclusively that the ovaries are largely but not entirely responsible for the induction of breast cancer because of their share in the production of oestrogen. But it must be remembered that under certain conditions the ovaries are capable of secreting andro-

¹ *Illustration of the Diseases of the Breast*, Chapter IX. London: 1829.

² *Lancet*, 1896, 2, 104.

³ *J. med. Res.*, 1919, 40, 477.

⁴ *J. Cancer Res.*, 1928, 12, 18.

⁵ *C.R. Acad. Sci. (Paris)*, 1932, 195, 630.

⁶ *Amer. J. Cancer*, 1937, 30, 517.

⁷ *British Medical Journal*, 1940, 1, 479.

⁸ *Ann. Surg.*, 1946, 123, 1023.

⁹ *British Medical Journal*, 1944, 2, 393.

¹⁰ "Endocrine Aspects of Human Cancer," in *Recent Progress in Hormone Research*, 1947, 1, 261.

¹¹ *British Medical Journal*, 1953, 2, 796.

¹² *Proc. Internat. Congress of Genetics*, Bellagio, 1953.

¹³ *J. Urol.*, 1952, 68, 875.

¹⁴ *Ann. Surg.*, 1952, 136, 595.

¹⁵ *J. Amer. med. Ass.*, 1954, 164, 234.

gens, the Sertoli cells of the testis secrete oestrogens, and the adrenal cortex elaborates both oestrogens and androgens. It has become clear, for instance, that cancer in the male breast can now be attributed with some confidence to the secretion of oestrogens by the testis. New light has recently been shed on the hormonal genesis of breast cancer in mice by Muhlbock¹² in Amsterdam. He has discovered that frequent implantations of fresh hypophyses induce mammary neoplasia in the absence of both the milk factor and extraneous oestrogen. This finding is important because it suggests that a pituitary gonadotrophin plays a part in the development of this disease.

There are many encouraging examples by which the growth of a neoplasm arising in a gland under endocrine influence can be temporarily held in check over considerable periods by administration of hormones, but reports of complete recovery from the disease are rare. Reactivation of the tumours almost invariably occurs, and it would seem that, in many instances when a hormone imbalance is created after surgical removal of an endocrine gland or by administration of a hormone, a compensatory mechanism develops in which the anterior pituitary gland stimulates other endocrine organs to make up for the deflection caused by a particular form of treatment.

The work of Huggins strongly suggests that this happens. He has frequently observed that breast cancer in either the male or the female at first shows a favourable response to gonadectomy, but that recurrence of the growth occurs later. Working on the assumption that elaboration of steroid hormones from the adrenal cortex was responsible for the renewed growth of these tumours, he obtained a further regression after bilateral adrenalectomy and the administration of cortisone acetate. Thus he contends¹³ that breast cancers may be either ovary- or adrenal-dependent. Occasionally in women they are entirely dependent on the ovary for sustained growth, and this probably accounts for the occasional success which follows treatment by ovariectomy alone. As most breast tumours appear to be adrenal-dependent, Ling-Yuan Dao and Huggins¹⁴ recommend ovariectomy to be carried out before adrenalectomy or both operations simultaneously, since they found it impossible to determine by distinctive morphological characters whether a breast cancer will prove to be adrenal-dependent or not. Pearson *et al.*,¹⁵ using calcium excretion as a measure of the growth rate of mammary tumours with bone metastases, prefer to classify mammary cancer in relation to oestrogen rather than with the organs producing it. One type depends on oestrogen for maintenance of growth and the other

type does not depend on oestrogen. Patients with non-oestrogen-dependent tumours fail to respond to ovariectomy and probably also are not helped by adrenalectomy. It is claimed that cortisone induces remission in non-oestrogen-dependent mammary cancer, but this work is too recent to allow a forecast yet on whether improvement can be maintained over long periods.

Endocrine therapy is one of the most interesting and promising fields in cancer research, but until more is known of steroid metabolism it will be impossible to improve much on the sort of result which is being obtained at the present time. We do not know why some patients respond favourably, neither do we know why so many growths prove ultimately to be refractory.

MITRAL STENOSIS

The value of mitral valvotomy for the relief of mitral stenosis is now well established, and the operation is being carried out in many centres in this country and abroad with excellent results in the majority of cases. The success of the operation depends to a large extent on the selection of suitable cases, and this has led to intensive study of the clinical, radiological, and haemodynamic changes in mitral stenosis in the hope of increasing the accuracy of diagnosis. For this reason Dr. Paul Wood's paper on mitral stenosis, published in this and last week's issues, is timely, particularly as he shows that, by applying the results of methods of investigation which can be carried out only in special centres, an accurate clinical diagnosis of the nature and effects of the mitral valve lesion can be made. In the patient with pure mitral stenosis, with steadily and often rapidly progressing disability, the clinical picture is clear cut: there is a right ventricular lift on the left of the sternum, the mitral first sound and the opening snap are loud, there is no third heart sound, and the mitral diastolic murmur is long. A major difficulty in the pre-operative study of patients with mitral stenosis has always been the assessment of the degree of mitral incompetence which may be present, since if this is significant the results of surgical treatment are poor. Serious mitral incompetence will be recognized if Dr. Wood's criteria are followed. The small water-hammer pulse, the hyperdynamic left ventricular apical thrust with electrocardiographic evidence of left ventricular

¹ *Amer. Heart J.*, 1951, 41, 1.
² Gorlin, R., and Gorlin, S. G., *ibid.*, 1951, 41, 30.
³ *Amer. J. Path.*, 1936, 12, 573.
⁴ Curtin, P. C., *et al.*, *Circulation (N.Y.)*, 1953, 8, 893.
⁵ *J. clin. Invest.*, 1950, 29, 602.
⁶ Araujo, J., and Lukas, D. S., *ibid.*, 1952, 31, 1082.
⁷ Lukas, D. S., and Dotter, C. T., *Amer. J. Med.*, 1952, 12, 639.
⁸ Editorial in *Circulation Res.*, 1953, 1, 371.
⁹ Rodrigo, F. A., *Amer. Heart J.*, 1953, 46, 1.
¹⁰ Gorlin, R., *et al.*, *ibid.*, 1951, 41, 834.
¹¹ Grant, R. T., *Heart*, 1933, 9, 275.

hypertrophy, the soft mitral first sound followed by a systolic murmur, the presence of a third heart sound and the absence of the opening snap, and the radiological appearances of dense calcification of the mitral valve, are all definite signs of mitral incompetence and therefore indicate that operation should be avoided.

Most investigators agree on the general pattern of the haemodynamic changes in mitral stenosis, although they differ in their interpretation of the significance of these changes. The cardiac output in severe mitral stenosis is low at rest, and on exercise often fails to increase and may sometimes fall, the additional oxygen necessary during muscular activity being obtained by increasing the oxygen extraction from the blood. With slight or moderate valve-narrowing the resting pulmonary capillary pressure is normal or slightly increased, and the pulmonary-artery-pulmonary-capillary pressure gradient is unchanged, so that there is passive pulmonary hypertension. With more severe stenosis, either calculated by the Gorlin formula¹ or estimated at mitral valvotomy, the resting pulmonary capillary pressure is raised to about 30 mm. Hg, this being approximately the same as the plasma osmotic pressure. With this marked narrowing of the mitral valve orifice the pulmonary artery pressure rises sometimes to the level of the systemic pressure, the pulmonary-artery-pulmonary-capillary pressure gradient is greatly increased, and the pulmonary arteriolar resistance, calculated by the Poiseuille equation, is correspondingly raised.²

The cause of this increased pulmonary resistance, which raises the pulmonary artery pressure and adds to the work of the right ventricle, is probably active vasoconstriction rather than the structural changes in the vessels described by Parker and Weiss,³ since there is no correlation between the calculated resistance and the appearance of the pulmonary vessels studied by lung biopsy at operation.⁴ Dexter and his colleagues⁵ introduced the concept that the raised pulmonary arteriolar resistance protected the pulmonary capillaries against sudden increases in pressure—possibly resulting from sudden changes in cardiac output—which could cause pulmonary oedema. It has also been suggested that the raised resistance is responsible for the low cardiac output, either directly or indirectly by increasing the pressure gradient across the mitral valve.

Dr. Wood attaches particular importance to the pulmonary arteriolar resistance in relation to the production of both symptoms and signs of mitral stenosis and supports Dexter's view that a high resistance protects the patient against pulmonary

oedema. Other investigators, however, have questioned the conception of "protective pulmonary hypertension,"^{6,7} and the measurement of pulmonary resistance itself has been criticized, either because of the difficulties in making accurately the measurements necessary for its calculation⁸ or because of doubt about the validity of the Poiseuille formula in the presence of turbulence at the mitral valves and varying rates of blood flow.⁹ The pulmonary capillary pressure often rises on exercise to 50 or 60 mm. Hg, which is well above the plasma osmotic pressure level, and these patients may develop pulmonary oedema. The pulmonary arteriolar resistance, whether initially high or low, is unchanged on exercise despite the increase in pulmonary capillary pressure, and in these circumstances no protection of the pulmonary capillaries has occurred.⁶ It seems that only under resting conditions may the high resistance help to maintain the capillary pressure at a safe level, and this protective mechanism may break down under conditions of stress. The effect of tachycardia in raising the pulmonary capillary pressure may well be the cause of pulmonary oedema in some patients. Tachycardia, whatever its cause, shortens the diastolic ventricular filling period, and a raised left auricular pressure is necessary to increase the pressure gradient across the mitral valve and to maintain the cardiac output.¹⁰

Rheumatism is one of the commonest causes of heart disease in this country, and if Dr. Wood's estimation of the number of cases of mitral stenosis is correct it is clear that a large number of mitral valvotomies will need to be carried out annually. His series is composed largely of more seriously incapacitated patients, and it should not be forgotten that the disease is not necessarily progressive and that only a minority of those with little or no cardiac enlargement ever develop serious symptoms.¹¹ A healthy myocardium may be able to sustain for long periods the additional work imposed by the mechanical obstruction at the mitral valve. The operative mortality of 6%, and the 10% incidence of embolism at operation, should discourage operation in symptomless patients or in those with only minimal disability.

REMUNERATION OF CONSULTANTS AND HOSPITAL MEDICAL STAFFS

The discussions on remuneration of consultants and hospital medical staff in the Council last week and the Central Consultants and Specialists Committee a fortnight ago unfortunately only serve to deepen the disquiet many feel about the fate of the Consultant Spens Report and—if that is now in jeopardy—of the

General Practitioner Spens Report, two documents accepted by both Government and medical profession six years ago and deciding factors in persuading a reluctant profession to enter the National Health Service. When Mr. Marquand, as Minister of Health, offered general practitioners £2m. in 1951, they rejected it and determined to press their claim in the terms of the G.P. Spens Report. This was the first overt sign of the Government's—and the Ministry of Health's—wish to undermine the basis on which doctors had agreed to work in the N.H.S. This effort failed. In his able exposition last week in Council of the events that have unfolded since the days of the Negotiating Committee Dr. T. Rowland Hill concluded that the recent agreement was on an "immediate, noncommittal *ad hoc* increase," and that there was no finality in it. He went on to say that the implementation of the Consultant Spens recommendations would be vigorously pursued, and supported the amendment to his report that: "The Council of the Association reaffirms its policy to adhere to the basis of remuneration enunciated in the Spens Reports."

The Staff Side of Whitley Committee "B" believes that "Spens remains the yardstick of consultant remuneration," and no one questions the sincerity of this belief. But do the Government and the Ministry of Health hold the same belief, even without the same fervour? There are, unfortunately, strong grounds for doubting this. Dr. Hill, reading from an agreed minute in last week's Council, referred to the importance attached by the Minister to the Spens Report, and urged that this should be fully reported. The Minister's reply to a question put to him by Sir Russell Brain, as minuted, was as follows:

"The Minister said that the *only point he was now dealing with was the actual level of remuneration. On other matters he agreed fully with the importance attached to the Spens Report*, which must continue to occupy the same place as before in any discussions the Government had with the profession about the consultant and specialist service." (Our italics.)

The Minister of Health is far too experienced a politician to be so naive as this statement makes him out to be. The whole purpose of the Consultant Spens Report was to determine levels of remuneration of consultants and hospital medical staff in a public service. If words mean what they are supposed to mean, the above statement implies explicitly that the Minister no longer attaches much if any importance to levels of remuneration recommended in a report on remuneration. If any doubts remain they are dis-

pelled by the reply, published in this week's *Supplement*, of the Permanent Secretary to the Ministry, Sir John Hawton, to questions put to him by Dr. Angus Macrae, Secretary of the B.M.A. Sir John Hawton states, quite bluntly, that the remuneration of consultants and hospital medical staff is no longer to be determined "by a mere reference back to the contents of Reports which were produced years ago and before there had been any experience of the working of the Service under modern conditions."

The profession is urged to study with the greatest care the words of the Minister and the Ministry's Permanent Secretary, because they were not thrown off carelessly in the heat of a debate, but represent the carefully considered policy of the Government. And if anyone is unaware of their import a careful examination of the recent agreement should show how little regard has been had to the Spens recommendations. We are told that the Management Side—and the Minister—refused to take "betterment" into consideration—one of the twin pillars of the Spens recommendations. When faced with this completely untenable position the Staff Side would have been wise to go back to their constituents for fresh instructions. Having yielded, and in the face of the Minister's and the Ministry's statements referred to, they face their future course with an uncharted map. The actual amount of additional money for consultants and hospital medical staff is in some ways the least significant aspect of the recent agreement between the Staff and Management Sides of Whitley Committee "B": some consultants even hold the view that no claim should have been made. But few can feel happy about the way in which the negotiations have been conducted: secrecy apart, no evidence appears to have been presented on which a proper claim could be pressed. What stands out is that the first time the consultants have sought to have the Spens recommendations implemented—six years after publication of the Report—they have met with a refusal by the Management Side to discuss betterment. In the face of this it is difficult to maintain that "Spens remains the yardstick."

It is possible to interpret the fate of the Consultant Spens Report on the assumption that in relation to the corresponding report on the remuneration of general practitioners it was too generous. This would indeed seem to have been in Sir Russell Brain's mind when he told the Central Consultants and Specialists Committee on April 28 (*Supplement*, May 8) that the new terms for consultants "had restored the balance between the income of the general practitioner and that of the consultant and specialist." And he added: "Moreover, this agreement was not likely

to be thrown over within a short period of years." But if consultants, as has been asserted, intend to press on with their claims, regarding the recent agreement as only interim and noncommittal, this balance will then be upset, and further claims for the general practitioner will presumably be made—a course often described these days as spiral. The danger of all this is that a kind of "pull devil, pull baker" attitude will arise between the two most important sections of the profession. There is more than ever a need for the closest harmony between the two, and for the co-ordination of effort in all aspects of their work. It will be noted that the Council's first amendment to Dr. Hill's report referred to its continued adherence to the Spens Reports—in the plural. The second amendment deplored the secrecy surrounding the recent agreement. Joint consultation on remuneration between consultants and those they represent and general practitioners would seem to be desirable, indeed imperative, if unity of effort and aim is to be maintained in the interests not only of those now working in the N.H.S. but more especially in the interests of future generations. But neither section of the profession should let the guile of the politician wheedle them out of the standard of living promised by the two Reports drawn up on the basis of carefully ascertained statistics by responsible committees presided over by Sir Will Spens.

THE FUTURE OF NEUROLOGY

In an interim report¹ which has just been issued the Committee on Neurology of the Royal College of Physicians advises the avoidance of a rigid plan for training neurologists, but in general suggests that training should consist of two years' experience of general medicine and surgery followed by five years' hospital work in neurology. As in previous reports,² the committee is opposed to a neurology diploma. The report states that, unlike other specialties, there has been practically no expansion of the neurological services under the National Health Service, and that in many parts of the country a neurological opinion is still not easily available. Indeed, there are only 50 to 60 practising neurologists in England and Wales, more than two-thirds of whom are in the London and the metropolitan regions. Finally, the committee points out that the prospects are so poor that promising graduates are becoming increasingly reluctant to enter a branch of medicine in which this country is still pre-eminent.

This report betrays an unsatisfactory state of affairs, for neurology should be contributing to the developments in many growing fields of research, such as the study of cerebral vascular disease and neurotropic virus diseases, the rehabilitation of the paralysed, and the relief of pain. Perhaps the failure of neurology to

develop with the Health Service is due partly to a certain lack of political sense in the neurological associations, and partly to the fact that the few neurologists in the country are all so busy with purely diagnostic work that there is little time for them to apply their special knowledge to modern therapeutic possibilities. Many of the smaller specialties form what might be called political pressure groups to develop the specialty in all regions, and it is a sad reflection on modern times that neurologists may have to become more politically minded in order to co-ordinate their national effort more closely and to improve their contribution to modern medicine.

British neurologists must always look to the National Hospital, Queen Square, to take the lead in all such matters, and to maintain a close and helpful interest in the work of her disciples in provincial centres.

PREVENTION OF CARIES

The prevention of dental caries rather than the expensive treatment of already diseased teeth is the theme of a memorandum¹ drawn up by the British Dental Association's Child Dental Health Committee. The committee has wisely refrained from abstruse discussions on the theory of dental caries aetiology and has confined itself to known facts of practical significance. The report makes clear the overwhelming evidence that dental caries is associated with the stagnation of food, particularly refined carbohydrates, around the teeth. An increase in the consumption of this type of food is accompanied by a corresponding increase in the incidence of dental caries, and conversely less of it results in less caries. This is well illustrated by the lower dental caries incidence in those countries where sugar and sweets were rationed during the two world wars. It is not only the total consumption of these refined carbohydrates that is significant but also the spreading of it throughout the day. The studies in dental caries recently carried out in Sweden have shown that the greatest damage to the dental structures results from eating sweets and other snacks between meals, while a similar total quantity of this type of food taken at mealtimes is not so detrimental.

It is difficult, in the absence of national economic crises, to alter a nation's eating habits, but much can be done by public education in these matters. There is no doubt that dental caries can be reduced by limiting the consumption of sticky carbohydrates, particularly between meals. If the general public is made aware of this by the combined efforts of the medical, dental, and nursing professions, it should be possible to convince people, particularly parents, that dental decay is largely under the control of the individual.

The report also considers other methods of reducing the incidence of dental caries. Toothbrushing, to be effective, must be carried out immediately after eating, and the method of brushing must be one that removes food debris not only from the exposed surfaces of the teeth but also from the relatively inaccessible areas. The

¹ Interim Report of the Committee on Neurology, 1954, London.
² See *British Medical Journal*, 1945, 2, 292.

¹ *Brit. dent. J.*, 1954, 98, 199-220.

cursory toothbrushing that most people carry out does little to prevent decay, and it is clearly the responsibility of the dental surgeon and the dental hygienist to instruct the public in the correct technique. The practice of rinsing the mouth with water after eating is beneficial and presents fewer social difficulties than might be expected. Water is usually available at the table, and the operation of rinsing can be carried out unobtrusively and the mouthful subsequently swallowed. Chemical treatment of the teeth as a preventive measure has been tried for many years, with disappointing results. Topical application of silver nitrate has been shown to be ineffective. The application of silver nitrate appears to slow down an established carious process, as the committee states, but this procedure does not eliminate the risk of a cavity providing a shelter in which food debris can accumulate, allowing caries-producing micro-organisms to multiply there undisturbed and in time affect the contiguous surface of the adjacent tooth. Topical applications of sodium fluoride may not be as successful as was originally hoped, but the results of the large-scale investigation of the Fluoride Working Party of the Ministry of Education are expected to indicate the value of this measure. Various toothpastes have been manufactured containing what are alleged to be caries-inhibiting constituents, but the committee regards these with considerable reserve and some, such as pastes containing penicillin, with disfavour. Further research on enzymes may result in the introduction of certain anti-enzyme substances into toothpastes or mouthwashes, with favourable results.

Apart from dietary control, the most hopeful means of preventing caries is the introduction of one part per million of sodium fluoride into the public water supply. This practice, widely adopted in the United States since 1945, has been observed to reduce the caries rate. An investigation on these lines is proposed for Britain. Here as elsewhere people living in districts with a natural fluoride content of this concentration in their water have been found to have better teeth than people living where the water is relatively lacking in fluoride.

The problem of caries control at present centres chiefly on education of the public: education in what to eat and when to eat it, and what to avoid eating; education in oral hygiene, education to prevent mothers (or grandmothers) from ruining babies' teeth by giving them rubber dummies dipped in sugar or honey; and education to accept or even demand public health measures designed to reduce their children's caries susceptibility. Parents should be encouraged to take their children for routine dental examination at an early age. Neglected teeth result in apical sepsis and pain, and the improvement in a child's health after the extraction of infected teeth is notable. Premature loss of the deciduous teeth, however, usually has a deleterious effect on the occlusion of the permanent dentition, and mal-occlusion in turn leads to an increased susceptibility to dental caries and predisposition to periodontal diseases. The medical and dental professions can help too by co-operating in devising diets to maintain the general health of the child and ensure not only sound, well-developed teeth but also teeth which are not constantly exposed

to a harmful oral environment. The report should be read by everybody concerned with the health and well-being of children.

ELECTRONIC TRANSLATION

The enormous speed at which electrons travel—or so it seems to humans more accustomed to the London-Brighton road—has tempted scientists in many branches of learning to think of new ways in which these wave-particles can be pressed into service. We have become familiar now with electronic "brains" performing elaborate calculations which in certain respects are far beyond the capacity of human brains, and with the paradox that the human brains must yet devise every move made by their electronic servants. Composing the instructions to be given to the machine can be an intricate operation, and a new profession of programmers to do this is no doubt growing apace. One of the tasks they may in years to come be setting their machines is to translate a scientific paper from one language into another. The need for some such aid to the understanding of medical literature is evident to all but natural linguists. Abstracts from the world's literature offer some help, and in fact *Abstracts of World Medicine*, published monthly by the B.M.A., covers nearly 2,000 journals in over a dozen languages. But if machines could be programmed to turn out comprehensible translations of papers and books in a matter of minutes, or an hour or so, the reader's problems would seem to be much simplified.

Discussing the still formidable obstacles to the design of such machines, Bar-Hillel,¹ of the Massachusetts Institute of Technology, begins by drawing a distinction between the kind of writing seen in novels and that seen in technical papers. What he calls the correlating of certain words in the source language with certain words or phrases in the target language can be complicated if the words to be translated bear such connotations as they often do in works of fiction. The phrase "Came the dawn," for instance, would be easier for a machine to translate correctly in a meteorological than a melodramatic context. Nor are scientific papers often wholly free from the kind of linguistic puzzle that Bar-Hillel himself would present to an electronic translator in the following words: "One method involves adding an additional piece of mechanical equipment of a somewhat more involved nature. . . ." Idioms and synonyms would tax the resources of the machines, or at least of their designers, and at first likely alternative meanings might have to be incorporated in the translation and all but the correct one struck out by a human editor. Even so, as Bar-Hillel points out, sometimes this functionary, whom he calls the post-editor, would be presented with literal renderings of idiomatic phrases to which no amount of shuffling of the translated words will give meaning—despite, too, the post-editor's own programme: "The post-editor will be warned that any preposition might have to be replaced by almost any other preposition. . . ."

Probably a more important task for the post-editor—and one on which Bar-Hillel touches—is to act as what

¹ *American Scientist*, 1954, 42, 248.

we might call a pre-editor. That is to say, he would have to prepare the original paper, by eliminating idioms and so on, so as to present the machine with a verbally unambiguous programme. But as any ordinary editor, neither pre- nor post-, knows, to translate into good English a paper written in bad English is apt to be an almost baffling task even when knowledgeable readers are assumed to be the audience. How much more difficult when the translation is for an unsympathetic electrical circuit. Perhaps the need to write clearly for a human rather than an electronic eye is the more pressing at the moment. At any rate, it seems that some years will elapse before an electronic translator gives any reader the sense of wonder that Keats felt on first looking into Chapman's Homer.

A GREAT RUNNER

Last week at Oxford, Mr. R. G. Bannister, a medical student at St. Mary's Hospital, won the plaudits of the world in being the first athlete to run the mile in under four minutes. His actual time was 3 minutes 59.4 seconds. Since it is only twenty-three years since Jules Ladoumegue was the first to beat 4 minutes 10 seconds, it is natural to ask whether there are any fixed limits to athletic performance and physical endurance. History—including the climbing of Everest last year—suggests that there are not. For many years a record may not be broken, and often it is a round figure which provides the sticking point. But surprisingly, when this point is eventually passed, it is passed by a fair margin. The present discussion of a high jump of 7 ft. will quickly turn to talk of 7 ft. 6 in. once the round figure has been beaten. Only four years ago the weightlifters wondered if a 1,000-lb. total could be reached on the three Olympic lifts. This figure was first exceeded in 1951 by lifts totalling 1,062 lb., and 1,200 lb. is confidently expected soon.

The limits to man's physical performance are imposed by anatomical, physiological, and psychological factors. Many world champions possess certain natural physical advantages, perhaps most noticeably the long limbs and large vital capacities of so many track athletes, and specialized training can improve even natural anatomical advantages. Exercises of endurance induce capillarization of muscle, the number of capillaries being as much as 45% more in trained than in control animals¹; and the haemoglobin content of the muscles of trained dogs is more than twice that in untrained dogs.² It has been said that a gain in endurance may be mainly a problem of improving transport of the blood in the muscles.³ Certainly training has to be regular, intense, and rational, and Bannister's training fulfilled all these conditions. His medical education and research into the physiology of exercise have doubtless influenced the actual technique of his training, which included special strengthening exercises.

Athletes cannot hope to better the performances of their predecessors if training is hindered by inadequate

¹ Petré, T., Sjöstrand, T., and Sylvén, B., *Arbetsfysiologi*, 1936, 9, 376.
² Whipple, G. H., *Amer. J. Physiol.*, 1926, 78, 693.
³ Schneider, E. C., and Karpovich, P. V., *Physiology of Muscular Activity*, 1948, Philadelphia.

facilities or failure to incorporate new and more scientific methods, but psychological factors probably provide, in the form of the challenge and inspiration of new records to be broken, the deciding stimulus which urges men on to ever greater physical endeavour. The effect of intense rivalry on the track is shown by the frequency with which athletes achieve in competition results they have never achieved in training. Athletic records, in fact, are advanced not only by improved training and technique but also by the simple will of man.

WOMEN IN MEDICINE

There are now 7,600 women doctors' names on the *Medical Register*, of whom some 6,000 or more are in active work. This is an impressive number and lends force to the fact that women are now established in medicine and are accepted as a matter of course alike by their male colleagues and the public. Medical women, therefore, might well be excused if they assumed that their major professional difficulties had been overcome. A recent P.E.P. publication,¹ however, and the correspondence in *The Times* which followed, has shown that the path of the married woman graduate to-day wishing to follow her vocation can still be far from smooth: and Dr. Annis Gillie, who last week succeeded another popular figure, Dr. Mary Esslemont, as president of the Medical Women's Federation, thought fit in her presidential address to sound a note of special warning to women medical graduates. None would wish or expect women who have chosen to embark on a professional career to exclude all else from their lives, but marriage continues to remove from the ranks of medical women many who have careers of promise before them, and is likely to go on doing so. A lesser but none the less important effect of early marriage is that it reduces the number of women going on to take higher degrees and thence to a specialty. It is possible for a young woman of determination and character to overcome the impediments to her professional career which marriage entails, but she needs considerable devotion to her work if she is to bear with equanimity the burden of a dual responsibility. Nor is she encouraged to do this by the disheartening cost of paying heavily for her substitute in the home and by the effect of taxation upon a combined income. There is no short answer to these and other particular problems of medical women to-day. Dr. Gillie sees them as a challenge which calls for action by women themselves. A position won must be fortified and held. This is true, but the matter is more than a domestic one and will attract the sympathy of all who would wish to see their women colleagues' contribution to the practice of medicine continue undiminished.

The next session of the General Medical Council will open on Tuesday, May 25, at 2 p.m., when the President, Sir David Campbell, will take the chair and deliver an address.

¹ *Graduate Wives. Planning*, No. 361, 1954, London.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

INTERPRETATION OF ELECTROLYTE CHANGES IN THE BLOOD

BY

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The general practitioner does not very often have to ask the laboratory for estimations of electrolytes; the results of such tests do come to him, however, in the letters about patients who have left hospital; and he himself may want to follow the electrolyte changes in some of the more chronic diseases he meets. This article sets out to recall the meaning of some of the chemical data that may be encountered and to indicate when the determinations may be useful. The treatment of acute disturbances of water and electrolyte balance was fully discussed by Dr. D. A. K. Black* in another Refresher Course. Disturbances in calcium and phosphorus metabolism, which are not closely related to water balance, are not discussed here.

The Body Fluids

The constituents of the body, other than those of the bones and fat, are held in solution in water. This water accounts for 50-60% of the weight of a man, depending on how fat he may be. One-third of this water is outside the cells in the tissues and in the blood; this is the extracellular fluid (E.C.F.). The remaining water, two-thirds of the total, is intracellular fluid (I.C.F.). The electrolyte content of the two fluids is quite different. In the extracellular fluid, sodium (Na^+) is the main cation; chloride (Cl^-) and bicarbonate (HCO_3^-) are the main anions. In the intracellular fluid of muscle, which accounts for most of the intracellular fluid, potassium (K^+) and magnesium (Mg^{++}) are the main cations; organic compounds of phosphorus are among the main anions. In both extracellular and intracellular fluid protein also acts as an anion, and this may be more important in the intracellular fluid, which contains the greater amount of protein.

The following principles govern the composition of the body fluids. The number of anions equals the number of cations. The reaction, or pH, depends on the concentration of hydrogen ions (H^+), but this concentration is very small compared with the concentrations of the other cations. The total concentrations of ions (cations+anions) largely determines the osmotic pressure of the solution. Changes in the reaction or in the osmotic pressure of the body fluids are usually rapidly compensated; for instance, a loss of base is likely to be accompanied by a loss of acid, and a loss of salt is accompanied by a loss of water.

Only the extracellular fluid can be sampled clinically. This is done when we collect and analyse the plasma or serum of the blood, although these do differ from the extracellular fluid outside the blood vessels in having a higher concentration of protein. Our knowledge of changes in the intracellular fluid is usually only inferred from changes in the serum. The sodium, chloride, bicarbonate, and potassium are the ions commonly measured.

Sampling

Blood is drawn from a vein with a clean, dry, sterile syringe, with a minimum of venous stasis; a wide-bore needle is better than a very fine one. The syringe may be lubricated with liquid paraffin. Instead of a syringe

many prefer a needle with a short length of rubber tubing attached to it through which the blood is allowed to flow. The blood is collected into a centrifuge tube or a screw-capped bottle. If the tube or bottle contains an anticoagulant the blood can be centrifuged and the plasma taken off without delay; this may take up less time than waiting for a clot to form and retract so that the serum separates. Oxalate is a convenient and cheap anticoagulant, but potassium and ammonium oxalates interfere with the determination of potassium and urea. Heparin (2 drops of 1:1,000 solution) does not interfere with these determinations, but it is more expensive. Plasma is needed for the determination of bicarbonate and chloride. Ideally it should be separated from blood which has been collected under a thin layer of liquid paraffin; this is to prevent contact with air and loss of CO_2 by diffusion. Plasma can also be used for determining sodium and potassium, but some laboratories prefer serum separated from blood without an anticoagulant. Serum or plasma for the determination of potassium must be separated as soon as possible because potassium leaves the red cells and gives a falsely high reading in the serum. For the same reason there must also be no haemolysis. The following contribute to haemolysis: traces of water, alcohol, or ether; vigorous expulsion of the blood into the tube, especially through a fine needle; excessive shaking and frothing. Haemolysed blood will not do for measuring the potassium or, incidentally, the phosphate.

The Units of Measurement

Concentrations of electrolytes may be expressed in milligrams per 100 ml. or in milli-equivalents per litre. The latter expression is the more natural, for analytical methods depend upon chemical equivalence, but some laboratories calculate their results in milligrams per cent. For example, they give the sodium and the chloride in the plasma as so many milligrams per 100 ml., and the CO_2 as so many volumes or millilitres per 100 ml. But concentrations of sodium and chloride cannot be exactly compared if they are expressed like this, because a milligram of sodium is not chemically equivalent to a millilitre of CO_2 or to a milligram of chloride. If we wish to make a sum of the anions to compare with the cations, we cannot add milligrams of chloride to millilitres of CO_2 . Many people now prefer to use units based on chemical equivalents. For example, equivalent weights of sodium, chloride, and hydrogen are 23 g., 35.5 g., and 1 g. These are also the atomic weights, in grammes, of these elements. Each one of these weights is 1 unit, which is defined as the weight which will combine with—or displace—1 g. of hydrogen. In hydrochloric acid, 35.5 g. of Cl is combined with 1 g. of H to produce the equivalent weight of HCl—namely, 36.5 g. Similarly, in sodium chloride (NaCl), 23 g. of Na combines with 35.5 g. of Cl to give the equivalent weight of the salt of 58.5 g. The equivalent weight of a substance dissolved in a litre of water makes a normal solution.

The unit usually employed in clinical work is one-thousandth of an equivalent weight, or a milli-equivalent (cf. milligram, millilitre). A milli-equivalent of any substance is the amount contained in 1 ml. of its normal solution. For monovalent elements a milli-equivalent is the atomic weight in milligrams, but the atomic weight of a divalent compound makes two equivalents, so that a milli-equivalent of, say, calcium is the atomic weight in

milligrams divided by 2. In practice, however, only Na, Cl, O_2 , and K are usually measured in milli-equivalents. A milli-equivalent of CO_2 is the molecular weight in milligrams; the volume occupied by this amount under standard conditions of temperature and pressure is 22.4 ml., so divide 22.4 to convert millilitres of CO_2 to milli-equivalents. The figure for CO_2 in milli-equivalents is also the amount of bicarbonate, HCO_3^- , that it can form. Note that:

$$1 \text{ mEq Na}^+ + 1 \text{ mEq Cl}^- = 1 \text{ mEq NaCl} \\ (23 \text{ mg.}) + (35.5 \text{ mg.}) = (58.5 \text{ mg.})$$

The following Table shows the relation between cations and anions in normal plasma.

Base	mEq/litre	Acid	mEq/litre
Na ⁺	142	Cl ⁻	103
K ⁺	5	HCO ₃ ⁻	28
Ca ⁺⁺	5	Protein	16
Mg ⁺⁺	3	Organic acids	5
		HPO ₄ ⁻	2
		SO ₄ ⁻	1
Total 155		Total 155	

Isotonic saline (0.9%) contains 154 mEq per litre of NaCl. Although it is often called, physiologically, "normal saline," it is one-sixth the strength of a normal solution in chemical terms.

Changes in total base are accompanied by changes in total acid. Any major change in total base can only come from a change in Na^+ ; and changes in total acid are largely changes in Cl^- and HCO_3^- . The sum of cations and anions can remain equal in spite of rapid changes in either, because there is an unlimited supply of HCO_3^- from the CO_2 of metabolic processes to make up the balance when required, and any excess is promptly excreted by the lungs as CO_2 . The amount of the bicarbonate depends simply on the excess of cations over the other, fixed, anions.

Normal values in milligrams and volumes per 100 ml. are shown for convenience:

Sodium	325-350 mg.
Chloride (as NaCl)	560-620 mg.
(as Cl)	340-370 mg.
CO_2 combining power	55-75 ml.
Potassium	16-20 mg.

The following discussion assumes, however, that all values are expressed so that their chemical equivalence is obvious—that is, in milli-equivalents.

Changes in Na^+ and Cl^- and the Accompanying Changes in HCO_3^-

In conjunction with the clinical history, the levels of Na^+ and Cl^- in the blood give information on the body stores of these ions. The changes in HCO_3^- (bicarbonate) which depend on these levels are also discussed here. Changes in acid-base balance are then described, followed by the changes in potassium (K), which is primarily an intracellular cation.

The serum sodium concentration can nowadays be estimated quickly and easily if a reliable flame photometer is available. In general, the concentration of sodium in the serum depends on two things at least: the amount of sodium and the amount of water in the extracellular compartment of the body fluids. A gain or loss in the amount of sodium leads at first to a proportionate gain or loss of water, so that a normal concentration of sodium, and hence a normal osmotic pressure, is maintained. It is only with the more severe disturbances that the serum values become abnormal.

Sodium depletion is the commonest electrolyte disturbance. Abnormal losses are usually from the gastro-intestinal tract, by diarrhoea and vomiting, and through the aspiration or the fistulous discharge of intestinal secretions. Abnormal renal losses of sodium occur in rarer conditions like Addison's disease and salt-losing nephritis, in which a low serum sodium is accompanied by the continued loss of sodium in the urine. In addition, low values for the serum sodium are quite often found in patients with oedema or

ascites who have taken a diet low in salt for a long time. Mercurial diuretics, often essential to the treatment, are partly responsible for this complication. They act by increasing the renal excretion of sodium and chloride, and if this does not lead to the desired mobilizing of oedema fluid the concentration of sodium in the body falls. The resulting deficit of sodium may, itself, make the patient ill, and if the serum sodium is low the proper treatment is to restore salt in spite of the risk that oedema may then be aggravated. Occasionally low values for the serum sodium concentration are the result not of a fall in the amount of sodium but of an increase in the amount of water in the extracellular compartment of the body fluids. Low values from dilution with water are observed when the osmotic pressure outside the cells is high compared with that within them; this may happen, for instance, with the hyperglycaemia of diabetes.

A high serum sodium nearly always means a lack of water, and the conscious patient will complain of thirst.

Changes in the plasma chloride are not always the result of abnormal gains or losses of chloride. Usually they depend on the changes in the sodium stores of the body or on changes in the acid-base balance. The plasma chloride may rise if an excess of chloride is given, as in ammonium chloride acidosis, or if the renal excretion of chloride is impaired. It may fall if chloride is lost by vomiting. In general, however, the chloride ion in the plasma is but a partner to the sodium; and the bicarbonate ion a passive make-weight in the anion column. The sum of the chloride and bicarbonate (in milli-equivalents) is a guide to the level of the sodium, which is normally some 15 mEq more than these two together. Organic acids in the plasma account for part of the difference between the values for Na^+ and $\text{Cl}^- + \text{HCO}_3^-$. When, for example, in diabetic ketosis the organic acids accumulate in abnormal amounts, the Cl^- and the HCO_3^- fall and the difference between the determined anions and cations is much increased. The mechanism of the acidosis that accompanies these changes is now considered.

Disturbances in Acid-Base Balance

An explanation of the relation between the CO_2 and the pH of the plasma necessitates a physiological digression. The reaction of the blood is maintained near a pH of 7.4, just on the alkaline side of neutrality. Two types of disturbance may upset it. One is respiratory, the other "metabolic." Both change the plasma CO_2 , but for a given change in the pH they change the plasma CO_2 in opposite directions. This has sometimes led to confusion, but it is easily explained.

The CO_2 in the plasma is mostly that which is combined by base as bicarbonate. A small amount in solution forms the carbonic acid. The reaction, or pH, of the plasma depends on the ratio of the concentration of bicarbonate to carbonic acid:

$$\text{pH} = 6.1 + \log \frac{[\text{NaHCO}_3]}{[\text{H}_2\text{CO}_3]}$$

(The square brackets mean "concentration of.") The bicarbonate is normally 20 times the carbonic acid:

$$\text{pH} = 6.1 + \log 20 = 6.1 + 1.3 = 7.4$$

Now it is clear that the pH may vary because of a change in $[\text{NaHCO}_3]$ or because of a change in $[\text{H}_2\text{CO}_3]$, but the effects of these changes will be opposite. Moreover, changes in the one can be compensated by changes in the other. The amount of H_2CO_3 in the plasma depends on the rate at which the lungs get rid of the CO_2 which the body produces. The amount of NaHCO_3 depends on the amount of sodium ions, Na^+ , not combined with other anions and free to bind bicarbonate.

Respiratory Disturbances

These disturbances depend on changes in the elimination of CO_2 from the lungs and hence on the concentration of carbonic acid in the plasma.

*British Medical Journal, 1950, 1, 893. Ibid., 1951, 2, 1207.

Alkalosis.—This results from the washing out of CO_2 from the blood—for example, in hysterical hyperventilation. The denominator of the fraction $\frac{[\text{NaHCO}_3]}{[\text{H}_2\text{CO}_3]}$ is diminished and the pH rises. To compensate for this the kidneys excrete sodium as bicarbonate and so restore the pH towards normal. The urine is therefore *alkaline*. The total plasma CO_2 is *low*.

Acidosis.—This results from a failure to eliminate CO_2 as may happen in advanced emphysema, in narcotic poisoning, and with laryngeal obstruction. The $[\text{H}_2\text{CO}_3]$ increases and the pH falls. In compensating, the kidneys conserve sodium bicarbonate and the urine is *acid*. The total plasma CO_2 is *high*.

"Metabolic" Disturbances

These disturbances depend on the amount of sodium that is free to combine with bicarbonate in the plasma.

Alkalosis.—This is the result of an increase in NaHCO_3 . An excessive intake of alkali can produce it, but a more usual cause is the loss of Cl^- from the stomach by prolonged vomiting as in pyloric stenosis. An excessive renal loss of Cl^- may be produced by treatment with mercurial diuretics. The resulting fall in plasma Cl^- frees Na^+ to combine with more CO_3 as bicarbonate. The rise in NaHCO_3 , leading to a rise in the pH of the plasma, depresses the respiratory centre and there is a rise in H_2CO_3 —that is, the metabolic alkalosis is so far as possible compensated by a respiratory acidosis. The kidneys excrete bicarbonate, and the urine is *alkaline*, unless there is also a deficit of Na^+ so severe that this compensation cannot take place. The total plasma CO_2 is *high*.

Acidosis.—This is a result of a fall in NaHCO_3 . This happens when acids stronger than carbonic acid accumulate in the blood and displace HCO_3^- from combination with Na^+ . Such acids are produced in diabetic ketosis. When an acidosis is produced therapeutically with NH_4Cl as an adjunct to mercurial therapy, the Cl^- ion accumulates and depresses the level of HCO_3^- . The fall in $[\text{NaHCO}_3]$ may also result from the direct loss of it. This is what happens in the acidosis of chronic diarrhoea. But, however caused, a metabolic acidosis is accompanied by an increased elimination of CO_2 from the lungs because a fall in the pH of the plasma stimulates the respiratory centre. The resulting fall in $[\text{H}_2\text{CO}_3]$ in the plasma compensates for the fall in $[\text{NaHCO}_3]$. The kidneys conserve base and excrete chloride, and the urine is *acid*. The total plasma CO_2 is *low*. In "renal acidosis" the kidneys are unable to excrete acid in the normal way and the urine remains alkaline, while acids accumulate in the body and produce an acidosis, with a low plasma CO_2 . This is an exception to the rule that with an acidosis the urine is acid and with an alkalosis it is alkaline. In general this rule does enable one correctly to interpret the changes in the plasma CO_2 which are opposite for respiratory and metabolic disturbances.

I may summarize by showing in tabular form the meaning of a rise or a fall in the plasma CO_2 .

Plasma CO_2	Reaction of Urine	Abnormality
High	Acid	Respiratory acidosis
	Alkaline	Metabolic alkalosis
Low	Alkaline	Respiratory alkalosis
	Acid*	Metabolic acidosis

* Except in "renal acidosis."

The metabolic disturbances in acid-base balance are more commonly observed than the respiratory; but either type of change compensates the other. For instance, a metabolic acidosis is compensated by over-breathing, which by itself would produce a respiratory alkalosis. The respiratory compensation is an emergency stop-gap: the metabolic disturbance is, in the end, corrected by the renal adjustments, and this requires that the stores and supplies of sodium and water be normal, so that the kidneys may function normally.

Changes in the Serum Potassium

The changes in the composition of the plasma considered up till now have concerned changes in the extracellular compartment of the body fluids. Potassium is the only intracellular ion to be discussed.

It is only in the last six years or so that it has become widely recognized that deficits of potassium at least as large as those of sodium are quite common; they mostly arise, as do the sodium deficits, from gastro-intestinal losses. It is occasionally necessary to follow the level of the serum potassium in renal disease and during treatment with adrenal hormones which produce an increased urinary excretion of potassium. The level of the serum potassium depends on three major factors: (1) the stores of potassium in the body, so that, on the whole, a low serum potassium (less than 3.5 mEq per litre) means that the stores are low; (2) the acid-base balance, for in the presence of an acidosis the serum potassium is often maintained at the normal level in spite of a cellular deficit of the ion; and (3) the function of the kidney; the renal excretion of potassium is not so delicately adjusted to the needs of the body as the excretion of sodium. The excretion may fail in nephritis and in oliguria, although there is an excess of potassium in the body, and the excretion of potassium may persist in the face of a deficit.

The finding of a low level of potassium in the serum means that there is a deficit of the ion, but the extent of the deficit cannot be ascertained, since it falls almost entirely upon the intracellular compartment of the body fluids. Only severe deficits seem to produce any symptoms.

Conclusion

Problems of electrolyte metabolism often obtrude themselves after therapy with artificial fluids, after operations and during acute illnesses. But they may also arise insidiously in more chronic diseases, and, although their recognition may be a signal for the patient to enter hospital, in many instances these disturbances can be prevented from becoming serious by attention to the diet and to the intake of water and of salts. But the diagnosis must precede treatment, and for this some chemical determinations and their proper interpretation may be unavoidable. The subject is a large one and this article has attempted no more than to point the way.

Next article on Clinical Pathology. "Laboratory Control of Chemotherapy," by Professor Robert Knox.

THE MEDICAL CURRICULUM

REPORT OF THE UNDERGRADUATE EDUCATION COMMITTEE OF THE FIRST COUNCIL OF THE COLLEGE OF GENERAL PRACTITIONERS

"The hardest conviction to get into the mind of a beginner is that the education upon which he is engaged is not a college course, not a medical course, but a life course, ending only with death, for which the work of a few years under teachers is but a preparation."

WILLIAM OSLER, *The Student Life*.

The medical curriculum was discussed at the First World Conference on Medical Education organized by the World Medical Association in 1953, at which many original views were expressed and new experiments in medical education described.¹ The British Medical Association has devoted considerable attention to this subject^{2,3}; and the creation of the College of General Practitioners is in some part due to a revived interest in, and growing dissatisfaction with, the undergraduate and postgraduate training of family doctors.⁴ In the

spring of this year, when 15 of the 22 regional faculties of the College in the British Isles had been formed, it was felt that some of these groups of members and associates, through their faculty boards, might usefully survey the medical curriculum in the light of their own professional experience.

Until then many individual opinions had been expressed, but there had been no means of assessing how widely these were held. The object of this survey has been to put forward certain controversial points, and to bring to light opinions about the medical curriculum held by a number of keen general practitioners. It is hoped that the results may stimulate study, both within the College and by the profession as a whole, and that they may contribute something of value to the work of those responsible for the future teaching policy in medical schools.

In the analysis of the replies to a questionnaire prepared by the Council of the College, and in this report, we have tried to examine the curriculum in the light of modern requirements—the need to turn out newly qualified doctors with a sound basic knowledge and broad understanding not only of more than 20 specialties but also of general practice and family doctoring. Every medical student must have a sufficiently broad general education to look at the world from a humanitarian rather than a materialistic point of view. He must be intellectually humble and resilient enough to be able to alter his ideas, because time inevitably changes old beliefs. He must develop a self-discipline in his way of thinking to protect himself from specious advertisements, from unscientific publications, and journalistic enthusiasm. He must be the severest critic of his own work.

These are the basic attributes needed by all medical graduates in whatever branch of the profession they eventually elect to serve. To develop these qualities with economy of time and maximum concentration of effort is, in our view, the purpose of the curriculum. It is no easy target, and to attain it every item in the medical student's training should be scrutinized and ruthlessly discarded if it does not contribute something essential to these ends.

School Education

When young men or women decide that they would like to become doctors, what is the best way in which they should spend their last one or two years at school?

There is a choice between early specialization in scientific subjects—chemistry, physics, botany, zoology—or continuation of a broad general education, including the classical way of thought, until the time of leaving school. This question is at present exercising the university authorities, some of whom already insist that the young student shall have passed the first medical examination before joining them.

In the discussions which have taken place at meetings of some of the regional faculties of the College, or their boards, only a few doctors have favoured early scientific specialization. The great majority preferred the idea of a liberal education for a liberal profession. One faculty quoted Sir Richard Livingstone in his *Education for a World Adrift*: "The knowledge necessary to living must be imparted. People must be taught to use their brains. . . . Knowledge is important, still more so is the power to use it; but most important of all is what a man believes, what he thinks good and bad, whether he has clear values and standards and is prepared to live by them. . . . As Plato said, the noblest of all studies is the study of what man should be and how he should live. . . . If Greek thought and Christianity created the soul of

Western civilization . . . then these are the philosophies for which we are looking, and before his education is completed everyone should have an idea of what they are."

A number of general practitioners were in favour of combining evenly, during the last one or two years at school, a general education with an approach to scientific subjects, but without stretching the latter to the full extent of the syllabus for the first medical examination. Many expressed doubts regarding the necessity of taking chemistry, physics, botany, and zoology to the high level now demanded in the first medical examination; and there was an appreciable feeling that the curriculum could well be shortened in these subjects.

Selection of Medical Students

Are we satisfied with the present method of selection of medical students?

Only one faculty thought that selection now was altogether satisfactory. The others felt that there could be improvement in some way. It is remarkable how great a change has occurred since the 1920's, when almost anyone of reasonable intelligence was welcomed in a medical school. At that time an appreciable number of those who started did not finish the course, because they or their teachers decided that medicine was not for them. It was an automatic method of selection and rejection. Nowadays there are many more applicants than vacancies, so that medical schools have had to adopt some form of selection. This early selection is of great importance; but it is not a simple matter, and we are not satisfied that present methods always admit those candidates who will make the best doctors. Academic achievement in scientific subjects, though important, should not be rated too high at this stage; character, home background, heredity, and school record are probably of equal importance in the long run.

Every study group considered that a wise and experienced general practitioner could usefully assist a dean in the selection of students. Whether or not it is essential for him to be still in active practice is debatable, because this helping in the selection of medical students might be a useful role for men or women who have retired, after a sufficiently long time in general practice, provided that they are not too old. In the selection of all our future doctors, about half of whom will become general practitioners, it seems logical that there should be at least one person on the selection board with first-hand knowledge of the life for which so many of these young people are being chosen.

A Balanced Curriculum

(1) Does the Curriculum Give a Satisfactory Basic Education in All Branches of Medicine?

Each doctor looks back on his own training and treats such a question from his own point of view. Some faculties thought that too much time was spent with the specialties, such as advanced surgery. In the old curriculum it was considered necessary for every medical student, whatever his future, to have a detailed knowledge of anatomy and of the surgery for which this prepared him, so that when he left hospital he would be able to undertake operations which nowadays he would never attempt. Surgery then was taught by general surgeons; nowadays few of these exist, and the student in hospital may have to spend long hours watching complicated, highly specialized techniques which he may never need again.

Some felt that too much time also was spent on the differential diagnosis of obscure conditions, and that there was too little teaching of the simpler variations in health and disease. Nearly all believed that at present the basic curriculum did not, in all schools, include a sufficient insight into general practice. This was discussed in detail last year in the report of this committee on "The Teaching of General Practice by General Practitioners."⁵ The aim of the general medical curriculum is, surely, to produce broad-minded doctors rather than medical scientists or skilled technicians.

(2) Is There a Case for Shortening the Basic Curriculum by Omitting Detailed Studies of Certain Subjects?

If students are to be taught more about the commoner diseases and are to be given more insight into general practice, the curriculum will need pruning. There is much dead wood, and also many overgrown branches, which can well be lopped off the present curriculum. The introduction of the pre-registration year and the two years of national service have made this pruning all the more essential.

One faculty quoted Lord Horder: "The anatomy, the physiology, the chemistry, and the physics of the pre-clinical studies of the medical student should be directed towards the actual examination of the patient. I think we took a step backwards when we put the academic anatomist, physiologist, and chemist in charge of preclinical studies. These men staked out large claims in their respective spheres as though medical students were in training for professorships in these subjects rather than being doctors in embryo. This view led me to plead for spending less time over the intimate structure of the organ of Corti and the theories of colour vision, and more time over . . . simple instruments by which the structure and functions of the normal body are studied. . . . I still meet doctors who have never seen the optic disk clearly, nor the vocal cords at all."

(3) Should More Detailed Attention be Given to Certain Branches of Medicine, and to Common Diseases?

Faculties were unanimous in declaring that this was necessary. Provided the rarer diseases are included to some extent, it should be the hall-mark of a good teacher to illustrate sound medical principles on a disease which is common, as often as possible, rather than on something which is obscure. It is not unusual now to find that the commoner conditions are mentioned only by name and that it is the rarity which is presented for demonstration. The dispensary system of teaching general practice, as at Edinburgh, has given the student a good picture of the commoner diseases.

Dermatology, orthopaedics, psychiatry, allergy, rheumatic disorders, and diseases of the ear, nose, and throat are not always taught as fully as their importance in general practice demands. Paediatrics is not so much a specialty as a grouping together of all branches of medicine and surgery in a particular age group. Family doctors treat many children, and there can be no better training for many branches of medicine, and for general practice in particular, than a spell among children. At the opposite end of life there is the study of the effects of stress and of degeneration on the body and mind. Geriatrics is a subject which has been closely observed by generations of general practitioners; but only recently has it begun to receive in medical schools the attention it deserves.

(4) Should More Attention be Given to the Management of the Individual Patient?

In the Nuffield Trust Survey on General Practice, Dr. Stephen Taylor distinguishes the work of the general practitioner by the one main characteristic of *continuity*. No other doctor has a continuing responsibility for his patient from year to year and from illness to illness, from the cradle to the grave. Any young man who is worth his salt will accept this responsibility as soon as he realizes what is required of him; but it is unlikely that he will appreciate this in hospital, because the patients whom he sees there appear to have been cut off from their family doctors, who rarely enter teaching hospitals. Both general practitioners and consultants are equally to blame for this. Doctors who send their patients to hospital with a scrappy note or a visiting-card advertise themselves as travesties of good family doctors, and are directly responsible for giving both students and their teachers a poor opinion of general practice and the men in it. When we, as general practitioners, write about our patients to consultants we should be on our mettle to show them, and any students whom they may be teaching, that we always take a proud interest

in our patients both as individuals and as medical problems. It must be remembered that a derogatory remark about general practice would probably not be made if it were undeserved.

On the other hand, consultants might do a great deal more in teaching this continuity of care to their students if they knew a little more about it themselves from personal experience. Admittedly it is difficult to teach this continuing responsibility in hospital; but there are several ways in which it can be done. One is practised by a consultant in a London teaching hospital, who uses the domiciliary visit as a teaching experience: he always takes a student with him, and we believe that attendance at such a consultation between the specialist and the general practitioner at the bedside is one of the most useful practical experiences for the student that can be devised. Another is in the writing of letters: the student will sometimes see those from the general practitioner to the hospital, but he rarely hears the advice which is sent back from the consultant to the family doctor, or realizes that the patient's visit to the hospital is but a brief episode in a much longer story. A third method is attendance at health centres or at a general practice teaching unit attached to the medical school, as at Edinburgh. The fourth is attendance of students on general practitioners themselves.

(5) Can More be Done to Teach Students the Relationship Between Family Doctors and Consultants?

Closely bound up with this problem of continuing responsibility is the student's assessment of the relative roles of family doctor and consultant. His experience in hospital may give him the idea that all medical roads lead to the hospital, and that general practitioners are merely signposts to the proper out-patient department. Until he goes out himself, he knows little of the great mass of good medical work done by family doctors without reference to hospital or specialists at all, and is unaware that both patients and general practitioners regard the specialist as someone who, by virtue of a particular training and knowledge, can help the general practitioner to care for his patient.

All doctors are members of a team, and the student must be taught that, for the patient's benefit, the co-ordination of all the different functions of this team is the responsibility of the family doctor. The student should learn from the very start how this can be done; he should not have to find it out slowly for himself later on, rather to his surprise. Probably the best ways for this co-ordination to be taught are for students to meet general practitioners from time to time throughout their clinical studies, both outside hospitals—by attending domiciliary consultations and by visits to general practices, health centres, or dispensaries—and inside hospitals by the presence of general practitioners as lecturers, and as spectators or commentators on teaching rounds. This contact of students with general practitioners will be as valuable to those who remain on in hospitals as specialists as it is to those who go out into the world as family doctors.

(6) Can the Student be Taught to Realize Better the Wide Field Covered by General Practice?

Most of the faculties felt that the student, whatever his future is to be, should be taught to recognize how much of medicine lies within the realm of the general practitioner. When he starts in practice he will then be less bewildered at the wide field he has to cover; and consultants, specialists, and students at hospital will be less mystified by the range of work a general practitioner has of necessity to do himself. The student must learn to appreciate clearly the great volume and variety of service that it is desirable for a family doctor to undertake, and what should be referred to a specialist if there is one within reach. To learn all this will help the student also to discover more easily his own aptitudes and limitations, so that he may decide wisely on his future career.

Conclusions

A questionnaire on the medical curriculum has been discussed by some of the regional faculties and faculty boards of the College. It is hoped that the results will stimulate further study and a continuing review of medical education. In this interim report it is suggested that:

1. The last two years at school should be evenly divided between receiving a broad education and an introduction to the scientific method.
2. The present method of selecting medical students could be improved by co-opting a general practitioner on to each selection board.
3. The medical curriculum requires revision so as to give students a broader introduction to all branches of medicine, including general practice.
4. The present division between preclinical and clinical subjects is too sharp.
5. There is a tendency for too much time to be spent at present on obscure subjects and highly technical procedures, to the exclusion of a study of common disorders.
6. Medical students should be given more insight into medicine as it is practised *outside* hospitals.

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RICHARD SCOTT (Edinburgh).

The Undergraduate Education Committee of the First
Council of the College of General Practitioners.

April 28, 1954.

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Reports of Societies**CHRONIC PYELONEPHRITIS**

On April 27 at the Royal Society of Medicine the Section of Medicine held a discussion on chronic pyelonephritis. The president, Sir HENRY COHEN, was in the chair.

Professor MAX ROSENHEIM said that it was difficult for a clinician to open a discussion on a condition which only a pathologist could clearly define or diagnose. Chronic pyelonephritis was characterized by scarring of the kidneys with corresponding decrease in their size. The changes could be widespread or localized; histologically the scarred areas showed hyaline degeneration of the glomeruli, dilatation of the tubules, and interstitial cellular infiltration. It was now believed that acute pyelonephritis arose as a blood-stream infection; even in the so-called "ascending pyelonephritis" the infection probably often spread to the kidneys through the blood. The invading organisms were most commonly coliform bacilli. Most acute infections could be rapidly cured; in the absence of an underlying abnormality of the renal tract it was doubtful whether a simple urinary infection ever resulted in chronic pyelonephritis. The disease could be unilateral or bilateral; an underlying cause

might or might not be obvious. How often chronic pyelonephritis occurred it was difficult to estimate.

Diagnosis was not always easy, but radiological examination sometimes showed kidneys which were either small or unequal in size. It was often difficult to distinguish the contracted kidney of pyelonephritis from congenital renal aplasia. Clinically, chronic pyelonephritis might present as a case of recurrent urinary infection, raised blood pressure, or of insidious renal failure. Although it was possible for urinary infection to persist for many years without leading to chronic pyelonephritis, it was nevertheless important to cure or control any urinary infection as a safeguard.

A Cause of Hypertension

Chronic pyelonephritis, often bilateral, was a not uncommon cause of malignant hypertension. In many cases of hypertension which had been cured by unilateral nephrectomy the underlying lesion was pyelonephritis. Even though the affected kidney might appear to have useful function, its removal could relieve hypertension. It was not understood why some patients with pyelonephritis developed hypertension while others did not. When renal failure was the presenting feature, pyelonephritis was apt to be confused with chronic nephritis. The absence of hypertension was more suggestive of pyelonephritis, as was a difference in the size of the kidneys. Marked variation in the degree of failure from month to month was also characteristic. In the absence of complicating hypertension, renal failure in chronic pyelonephritis was a slow process and often produced bizarre metabolic disturbances such as the renal bony disorders and the syndromes of sodium or potassium depletion. In the diagnosis of pyelonephritis a history of past or recurrent urinary infection, the recognition of recent severe hypertension, and insidious kidney failure were invaluable guides. Urinary examination was often unhelpful, since the urine might be normal or contain merely a trace of albumin. Pyelonephritis was a disease which could only be diagnosed if its presence was constantly suspected.

Dr. S. J. DE NAVASQUEZ discussed the pathological aspects of pyelonephritis. There was full agreement, he said, on the histological appearances. Microscopically there was replacement fibrosis, often in triangular areas with their apices pointing to the renal pelvis. The renal tubules were atrophic and underwent cystic dilatation. There was a chronic inflammatory exudate, but bacteria were seldom demonstrable. The final stage of contracted granular kidneys was merely the end result of a process which had begun as a simple bacterial infection of the kidney.

Pathogenesis of Pyelonephritis

Experimental methods had solved some of the problems of pyelonephritis where simple anatomical studies had failed. When rabbits were given an intravenous injection of staphylococci, many of them developed renal infection; some rabbits survived the initial infection to succumb later to renal failure. The lesions in such animals resembled those in the human disease. Animal experiments had shown that transient renal infections could give rise to scarring and renal failure. Once the kidneys had become scarred there was, however, a great liability to repeated infection because of the slow blood flow through the granulation tissue. Recurrent infections were usually transient and often passed unnoticed. In the pathogenesis of chronic pyelonephritis it seemed likely that the first stage was a haematogenous renal infection producing acute pyelonephritis. As this disease healed, organization and replacement fibrosis led to intrarenal hydronephrosis. The kidneys were then prone to recurrent attacks of infection, and finally a state of chronic pyelonephritis was produced.

A Difficult Diagnosis in Infancy and Childhood

Dr. J. M. STANSFELD discussed some features of pyelonephritis in childhood. The incidence was difficult to assess, but pyelonephritis was about as common as pyogenic meningitis or intussusception, and, if E.N.T. cases were excluded,

accounted for some 14 of every 1,000 children admitted to hospital. The majority of patients were under the age of 1 year, and at this age the sexes were about equally affected, whereas in older children girls suffered from pyelonephritis much more commonly than boys. In infants the disease was often unrecognized by the family doctor or at welfare clinics. Yet early diagnosis was important if smouldering infections were to be avoided.

The disease was usually overlooked because the clinical features were not well known, because physical signs were sparse, and because pyuria was often difficult to demonstrate. Analysis of the clinical symptoms in a series of cases had shown that gastro-intestinal symptoms, such as anorexia, vomiting, failure to thrive, and constipation, predominated. Symptoms referable to the renal tract were not obvious; rigors and convulsions were rare. Ultimately the diagnosis rested on demonstrating pyuria, and this was sometimes difficult because pyuria was intermittent and modest in amount. Many specimens of urine might need to be examined.

One difficulty had been to establish agreement on how many pus cells could be found in a normal urine. This had been overcome by doing accurate cell counts of urine in a haematological counting chamber. Such cubic-millimetre cell counts had been found a great advantage in revealing pyuria which would otherwise have been overlooked. A cell count of more than 50 pus cells per cubic millimetre in boys and more than 500 per cubic millimetre in girls indicated renal tract disease.

Treatment of chronic pyelonephritis in children was never easy and was a long and hazardous affair. The aim was not merely to sterilize the urine but to eradicate infection from the kidney, and chemotherapy had to be given in full dosage and continued for long enough for this to be achieved.

The Discussion

In the discussion which followed Dr. W. W. PAYNE said he thought there were two distinct groups of children with pyelonephritis. In the first group were placed children with recurrent urinary infections who were completely healthy in the intervals. In the second group the children failed to thrive and often had gastro-intestinal symptoms between the attacks of obvious urinary infection. In this group the histology often showed areas of renal dysplasia; the children had probably started life with some abnormality of the kidneys.

Professor W. C. W. NIXON said that obstetricians in the past had failed to treat urinary infection thoroughly enough, but the tendency nowadays was to treat pyelitis of pregnancy more energetically.

Many other members and visitors took part in the discussion, and it was clear that the current problems of pyelonephritis were attracting the attention of not only physicians but surgeons, pathologists, and radiologists as well.

LOCAL MEDICAL SOCIETIES

Manchester Medical Society

The results of a blind trial of oral cortisone in severe chronic asthma was described to the Section of Medicine by Dr. William Brockbank (with Dr. R. S. Savidge) on April 7. Twenty-four patients were included in the trial, ranging in age from 17 to 70. Thirteen received regular maintenance doses of cortisone and 14 an indistinguishable control. Three who were failures on the control were given cortisone. Of the 13 cortisone cases, six improved greatly in their ability to work and play; four more improved, but mostly subjectively; one was not improved and died eight months after cortisone was discontinued; two died while still taking the drug. In the 14 controls there was no improvement in eight patients and one died. Side-effects were few, increasing weight being the most important. The longest remission after withdrawal of the cortisone was 11 weeks. Most cases tended to relapse within a few days. It was concluded that cortisone could not cure asthma, but

some cases of long-standing chronic asthma could be effectively controlled by moderate doses of oral cortisone, provided the dosage was maintained. But in some undefined types of asthma cortisone treatment was dangerous to life.

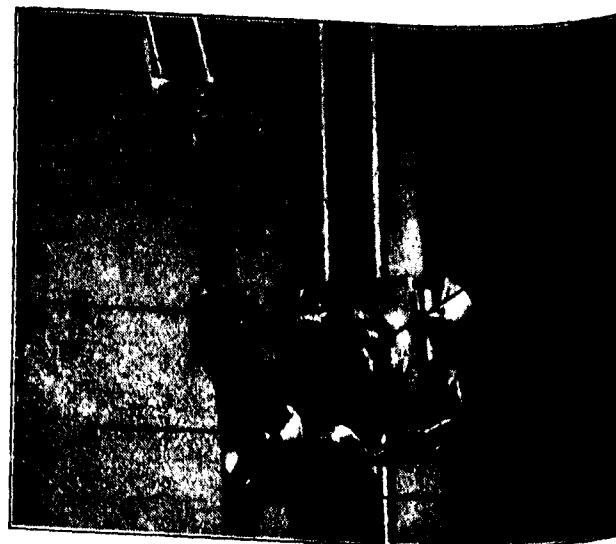
In a recent presidential address to the Section of Pathology, Dr. T. Blench spoke on the Law and Medicine. While the Law sought for certainty, Medicine dealt with clinical probabilities. Yet lawyers chided doctors for differing and also for not being willing to differ. Doctors could be sued as a result of their calling, but actions against counsel were banned by statute. Lawyers loved words and documents; but Medicine did not, in contradistinction to Advocacy, lend itself to verbal analysis and verbal agility.

Preparations and Appliances

AN IMPROVED DRIP CONTROL

Dr. G. HERINGTON, consultant anaesthetist, Wanstead Hospital, writes: The increasing use of succinylcholine chloride and other relaxants and anaesthetic agents by intravenous drip calls for a more accurate method of control than the gate clip provided with the standard giving set. The gate clip has two disadvantages: it requires two hands for manipulation, and it is often difficult to adjust the flow rate exactly to the desired level, particularly when a low rate is required. The former difficulty is overcome by clamping the apparatus direct to the upright of the drip stand, while the greater accuracy is obtained by the use of both coarse and fine adjustment controls.

The apparatus illustrated here was designed and made by Mr. E. L. Powell, of Buckhurst Hill, to fulfil the above requirements. The coarse adjustment (A) is provided by



a cam (B) which turns through 180 degrees from a full-open to a full-closed position. The final setting is obtained by a fine-adjustment screw (C) acting on the face of the cam, which affects the compression of the tubing at the pressure pad (D) through a lever (E). A spring is fitted to the pressure pad to ensure that it returns to the full-open position, so that the drip tubing can be readily inserted or removed. A hinged clip (F) is fitted to the back of the apparatus, so that it can be clamped easily to the upright of the stand.

In practice the cam is put to the full-open position, the tube is inserted, and the cam turned to the approximate position required; an accurate setting can then be made by means of the fine-adjustment screw. If desired, a flow rate of as little as one to five drops a minute can readily be obtained.

Correspondence

Preservation of Blood Samples

SIR,—The preservation of blood samples sent by post to the chemical laboratory presents special difficulties. Frequently haemolysis occurs, and is attributed to bacterial infection despite careful collection of the sample. In samples submitted for estimation of blood sugar, fluoride is often added to prevent glycolysis, and recently formaldehyde was recommended for the preservation of samples submitted for determination of the urea content.¹ It has been brought to our attention that formaldehyde may interfere with the estimation of urea by a urease-Nessler method, and this we have confirmed. However, samples for haemoglobin estimation have been sent as far as from London to Australia without deterioration when streptomycin and glucose were added as preservative, and we have found that streptomycin does not influence the estimation of urea by the Nessler method of King.² The streptomycin is dissolved in distilled water and added to the containers, which are then dried in a warm oven, stoppered, and kept until required. We have used a concentration of 1 mg. of streptomycin base to 10 ml. blood. Although this preservative has only been tested for haemoglobin and urea estimation, it seems likely that it has a much wider application. This point is under examination here.—We are, etc.,

R. I. S. BAYLISS.
I. D. P. WOOTTON.

Postgraduate Medical School,
London, W.12.

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- Bayliss, R. I. S. (1953). *British Medical Journal*, 2, 1318.
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Undescended Testicles

SIR,—Since no one will question Mr. Denis Browne's skill as an anatomist, diagnostician, or operator, it is obvious that only with great reluctance can I bring myself to comment upon some of the points he makes in his letter (*Journal*, April 24, p. 987). Indeed, bowing to his great experience, I will not attempt to deal with each and every one of them; but there are some on which I fear I do find myself in disagreement.

Like Mr. Browne, I too find the majority of boys referred to me as "cryptorchid" have testicles which can be made to descend into the scrotum—all the way—and are clearly in need of no treatment. Only their parents need reassuring. But there are others in whom I am quite honestly unable to say whether the apparent non-descent is due to ectopia or to retractability. Perhaps Mr. Browne never encounters this uncertainty. My experience, admittedly much inferior to his, has been that the response to gonadotrophin has proved of value in distinguishing the two types. In the course of running a fertility clinic, I see, from time to time, infertile men with histories of cryptorchidism. Some of these have had operative treatment close to or after puberty; others may have had spontaneous descent at the time of puberty. Now, while it is possible that congenital testicular deficiency may have coexisted with the cryptorchidism, it is difficult to reject the view that some at least of these men would have been fertile had testicular descent been achieved—by any means—at an earlier age. Perhaps Mr. Browne never has made a mistake—but has none of the many boys he has considered could safely be left alone let him down, in that spontaneous descent failed to occur before puberty? And if there have in fact been some such mistakes, are these boys now fertile men? Surely this is the crux of the whole matter: unless infallible predictions can be made, some avoidable infertility will result, which, with all due respect, is not likely to come to the knowledge of Mr. Browne.

I will gladly concede Mr. Browne his little joke on the twenty-minute record for descent after hormone injection. By "there and then" I naturally meant within the period of a course of injections of something like 1,000 I.U. of

chorionic gonadotrophin given twice weekly for ten weeks. I have never seen the "serious physical and psychological side effects" mentioned by Professor C. Wells (*Journal*, April 17, p. 932) resulting from such a course of treatment. As for continuing hormone treatment for three or four years, quite obviously no one who has the least idea about the matter would countenance such an absurdity. Rare though worry about non-descent may be, the fact is that some boys and more parents are prone to it. I have, moreover, seen instances where it arose quite early in development. I cannot see why no attempt should be made to deal with it by hormone treatment—if that treatment is likely to succeed.—I am, etc.,

London, N.W.1.

G. I. M. SWYER.

Early Recurrent Acute Intussusception in Children

SIR,—In their interesting article, Mr. David A. Macfarlane and Mr. L. P. Thomas (*Journal*, March 6, p. 559) draw attention to the rare complication of early recurrent acute intussusception in children and report four personal cases. Among 26 proved cases of intussusception admitted to a Danish general surgical hospital in the period 1944–53 we have seen two similar cases.

Case 1.—A male child aged 5 months was admitted to Surgical Department A of Frederiksberg Hospital on January 3, 1947, with a seven hours' history of attacks of abdominal colic, and before admission blood-stained stools had been passed. On examination the child was pale and looked ill, but there was no gross dehydration. Between the colicky attacks a sausage-shaped tumour was felt in the left hypochondrium. A barium enema revealed an ileo-caecal intussusception, and reduction beyond the hepatic flexure was accomplished, but, as a complete reduction was not obtained by this method, laparotomy was decided upon. First operation. Under general anaesthesia the abdomen was opened through a lower right para-rectus incision. A small amount of serous fluid was encountered, and the intussusception in the ascending colon and caecum was reduced without difficulty. Its apex in the ileum was 3 cm. from the ileo-caecal junction, and here the intestinal wall showed cyanosis and oedema. For the first three days after the operation the post-operative course was uneventful, and stools were passed on the second post-operative day.

On the morning of January 6 attacks of abdominal colic started again, and the patient vomited several times. He became worse, with signs of dehydration, and the abdomen was tympanitic; on auscultation metallic bowel sounds were heard. A straight x-ray examination of the abdomen showed a dilated small bowel loop, and a barium enema showed normal filling of the colon, with the barium entering the ileum. Thus no radiological signs of intussusception were found, but signs of obstruction of the lower ileum were present. After the administration of 250 ml. of normal saline his symptoms subsided, and he spent a quiet night. The next morning his condition was again worse, with vomiting and abdominal colic. Laparotomy was decided upon. Second operation. Under general anaesthesia the previous wound was reopened, and moderately distended coils of small bowel presented themselves. About 180 cm. from the ileo-caecal valve an ileo-ileal intussusception was found and reduced. The post-operative course was uneventful, and the child was discharged on January 24, 1947.

Case 2.—A female child aged 6 months was admitted to our department on April 13, 1953, with a history of repeated attacks of vomiting and abdominal pain for the past 24 hours. There had been no bowel action since the previous day. On examination the child was seen to be in a good general condition and showed no signs of dehydration. A sausage-shaped tumour was felt in the right hypochondrium. Rectal examination gave no further information. A barium enema showed an ileo-colic intussusception that could not be reduced, and operation was decided upon. First operation. Under general anaesthesia the abdomen was opened through a lower right paramedian incision. There was a considerable quantity of clear fluid in the peritoneal cavity, and the ileo-colic intussusception was found with its apex 10 cm. up in the ascending colon. Its reduction was easy, and it had originated as an ileo-ileal intussusception 15 cm. from the ileo-caecal valve. Numerous enlarged mesenteric glands were noted. The post-operative course was uneventful, and the child left hospital on April 22, 1953.

The same evening there was again vomiting, and blood-stained mucus was passed. She was again admitted to our department. A lump was felt above and to the left of the umbilicus, but an hour later it had disappeared. The next morning the lump

was again there, and there were attacks of abdominal colic. X-ray examination of the abdomen showed a dilated coil of small bowel, and a barium enema showed normal filling of the colon with no barium entering the ileum. A diagnosis of recurrent small bowel intussusception was made, and laparotomy undertaken. *Second operation.* Under general anaesthesia the abdomen was opened through the previous wound. Distended coils of ileum presented themselves in the wound, and a 20-cm. long ileo-ileal intussusception was found, with collapsed ileum distal to it. The origin of this intussusception was proximal to the previous one, and it was easily reduced. After an uneventful post-operative course the child was discharged on May 5, 1953.

The number of published cases of early recurrent acute intussusception in children given by Macfarlane and Thomas as 81 is thus increased to 83.—I am, etc.,

Copenhagen, F., Denmark

ERIK CHRISTENSEN.

Toxaemia of Pregnancy in Identical Twins

SIR.—Identical twin sisters, aged 24 years, have recently been delivered at two different hospitals within six months of each other by caesarean section, the indications being pre-eclamptic toxæmia not responding to treatment. An almost identical sequence of events took place in the twins, and the salient points are presented in table form below.

	Case 1	Case 2
Blood pressure at first visit to antenatal clinic (12 weeks) ..	154/80	110/60
Blood pressure on admission ..	170/110	170/110
Maturity on admission ..	34 weeks	34 weeks
Oedema on admission ..	Trace	Absent
Proteinuria on admission ..	+	+
Treatment ..	Sedation Caesarean section after 3 days	Sedation Caesarean section after 13 days
Liquor drained at A.R.M. ..	30 oz. (0.8 l.)	30 oz. (0.8 l.)
Blood pressure at operation ..	152/114	165/110
Birth weight and sex at operation	5 lb. 6 oz. (2.4 kg.) male (live)	5 lb. 14 oz. (2.7 kg.) female (live)

Two sisters of these twins, not themselves twins, are under our care, one having recently had an abortion after several pregnancies without toxæmia, the other having had hyperemesis gravidarum but no toxæmia in her first pregnancy. The mother of the twins has hypertension and last year suffered a cerebral haemorrhage.—I am, etc.,

Greenford, Middlesex.

L. A. PIKE.

"Edwardian" Adolescents

SIR.—It is characteristic of many social problems that interest in them is periodic. This is especially true if the problem concerns youth, sex, or crime, and Dr. Margaret Lowenfeld's letter (*Journal*, May 1, p. 1040) touches upon all three. The letter is paralleled by newspaper headlines such as "Girl Attacked by Edwardian Youth Gang." This renewed interest in an old problem has perhaps been precipitated by the recent change from excessively padded, "finger-length," drape suits, startling tie, with thick-soled crepe rubber shoes (called "creepers") to the present Edwardian-like style. Foreign students assure me that an exactly comparable sort of youth exists in many other parts of the world. A book such as F. M. Thrasher's *The Gang* (1927, University of Chicago Press) shows that comparable groups existed in Chicago at least as far back as the 'twenties. As a contribution to a book to be published shortly by Messrs. Butterworth, edited by the late Sir Norwood East, I have outlined the psychology of these youths, who, it would seem, are basically handicapped by strong unadmitted feelings of inferiority. Their exhibitionistic, bombastic, restless ways express their need of reassurance that they can be masculine, tough, command attention, and that they can exist independently from their mothers. They feel easier when banded together with equally handicapped individuals. Their vast majority is content with parading a well-lit street, meeting in "caffs," fighting rival "mobs," and feeling their way towards more mature behaviour. Their dancing, since Dr. Lowenfeld raises the

matter, is of two main sorts; in one the boy progresses monotonously, *back first*—that is, in the girl's position—round and round the floor; the other is the jive in which the boy shuffles *inactively* without moving forward, while the girl performs a highly active series of pirouettes before him.

The family background of these youths commonly shows factors which, acting over the years, have tended to keep the individual in a passive, over-dependent position. Most typical is an imbalance of parental influence; this may mean a possessive mother who holds the family reins and belittles the males of the family, a father who, either because of physical absence or of personal qualities, does not help the boy to cut the apron-strings; the imbalance may be *between* the parents or in the inconsistency of *one* parent. In general the family setting resembles that of homosexuality and the perversions, but differences of degree and perhaps of heredity impel or enable these youths to struggle successfully against that biologically less satisfactory solution to their problem. Seriously antisocial youths, those who actually use their weapons and who assault others, are (in spite of publicity) relatively uncommon. Most of the dangerous types are not of this Edwardian type, but if they do happen to be so then one finds either a coexisting psychiatric condition (perhaps demonstrable by electro-encephalography) or a history of frank hostility from the parents, or domination by a much more pathological companion.

While further investigation into this problem is much needed, I make a plea that these youths should not be regarded as a new phenomenon and that, in this group too, there are more sheep than goats.—I am, etc.,

London, S.E.5.

PETER SCOTT.

Adolescence

SIR.—I note that in your leading article (*Journal*, March 27, p. 748) somebody decries the fact that no one has ever investigated the effect of National Service upon the character of the youth of the country. As I am employed in the psychiatric unit in the Royal Air Force, I am most interested in the project. Perhaps the writer of the leading article could advise me how to embark upon such a study. The easiest manner to decide the beneficial or other effect of National Service would be to compare the work record of young men who have done their National Service with those who are not subject to it, and here the first difficulty of lack of suitable controls becomes apparent. I am most interested in the subject and I would be greatly obliged for any advice as to how such an investigation could be undertaken. I am, etc.,

Halton, Bucks.

P. J. O'CONNOR.

Doctors and Technicians

SIR.—Every doctor should read the letters of A. E. Brown and F. Mather (*Journal*, April 24, p. 983), since they give a clear indication of the direction of medicine. These two technicians are emphatic in their demands for recognition. A. E. Brown states: "The days when the medical laboratory technologist [lab. assistant as he was called in my days] was merely an assistant are long gone—except perhaps in certain university laboratories. The work performed by the technologist nowadays is nearly always done without direction, and the subsequent reports are sent out on his responsibility." While F. Mather states that "the interpretation of findings have passed, or are passing, from the domain of the pathologist to that of the technician. It will be found, particularly in the field of blood transfusion serology, that some of the greatest authorities in the country are not medical men but technologists. . . . It would seem, therefore, to be more justifiable to state that in many respects the technologist has, or should have, equal status to the pathologist." I have heard these claims made by doctors who demanded such assistance, and I know that the claims are not without foundation, for men acquire knowledge and skill worthy of recognition only by doing

the jobs. As Ruskin stated: "There is no furniture of a man's mind which he has a right to exalt in, but that he has hewn and fashioned for himself."

Animal technicians, laboratory technologists, radiographers, photographers, chemists, physicists, therapists, midwives, nurses, dietitians, and a score of others, are being trained to do the work which formerly doctors did for themselves, and as these aids are all provided free in the Welfare State, together with abundant elaborate equipment, the doctor is concomitantly losing his ability to do these things, and, more important still, the ability to assess their value or accuracy, and has to trust to the words and works of others who have not had a basic medical training and do not have the personal responsibility to the patient. Such doctors still seek to be judged for recognition on the works of others by demands for greater elaboration, more ostentatious buildings and furniture, expensive spectacular apparatus, abundant white-coated staff and secretaries. How long can they hope to keep their highly paid, jargon supplying, supervisory posts, when they themselves appear to be losing their power of writing even their signature to reports? Even the Welfare State may think it is paying a great deal for the use of a rubber stamp when all these workers demand equal status to the doctor. The discipline of the pre-N.H.S. days, which forced men to do their own jobs, was good for medicine; but when the demands for the total abolition of private practice are acceded to, and the doctors are left at the mercy of administrators and planners, God help the patients, medicine—yes, and the doctors.—I am, etc.,

Birmingham, 15.

JAMES F. BRILSFORD.

Bovine Tuberculosis

SIR.—May we be permitted to reply to the letter of Drs. R. W. Kind and M. C. Brough (*Journal*, April 17, p. 936) on the subject of bovine tuberculosis? Many parents and a number of schools give children unboiled, specially designated "tuberculin-tested (T.T.) milk" believing it is most unlikely to contain tubercle bacilli. We would repeat our previous statement (*Journal*, March 13, p. 646), that it offers the consumer no guarantee, and we submit the time is long overdue for explaining to the public the true facts about T.T. milk. We do not assume, as Drs. Kind and Brough have implied, that all parents could or always should be persuaded to give boiled milk to children. We appreciate some consider it unnecessary, others too much bother, and that many children will not drink it, but these are not valid reasons for withholding the advice generally. Obviously when milk is universally pasteurized a reasonably good safeguard will be provided for all.

We apologize for having inadvertently used the word "accredited" *per se* in our previous letter. The herd to which we referred was attested tuberculin-tested (the highest Ministry grading). All its members were reported non-reactors in July, 1953. One cow developed a sore on the udder in September, 1953, milking continuing for a further fortnight. The beast was slaughtered in October, found to be heavily infected with tuberculosis, and thereafter all milk was pasteurized. A further two months elapsed before the herd was retested, when eight cows, five being young animals, reacted. To date fourteen children have been notified with clinical tuberculosis which we believe has resulted from drinking unboiled milk from this herd. The figure includes one case of intussusception associated with a tuberculous mesenteric adenitis. Most of the children drank the unboiled T.T. milk at home and at school, but two received it only at school, one of these having always had pasteurized milk and the other boiled T.T. milk in the home. Lest it be thought this incident is the unfortunate exception that proves the rule, may we mention that we know of others. Milk which can bring about these results cannot be described as "representing a reasonable universal level of safety."—We are, etc.,

Marlborough,
Oxford.T. R. MAURICE.
HUGH ELLIS.

Elderly Psychiatric Patients

SIR.—I feel Dr. F. Houston (*Journal*, May 1, p. 1036) misunderstood my letter (*Journal*, April 10, p. 876). My plea was for the abolition of the term "arteriosclerotic dementia" in favour of "post-apoplectic dementia." The large majority of patients who suffer from strokes were not demented prior to the stroke, or are so after they have recovered from the initial effect. In a small number of cases following a second or third stroke there may be intellectual loss and the patient may more easily be provoked to tears. The intellectual level then remains static unless a further stroke occurs.

All the above have presumably suffered from cerebral arteriosclerosis for a number of years, yet the dementia, if it occurs, is related to the apoplexy and not the arterial lesion. The term arteriosclerotic dementia suggests a progressive intellectual loss, and this gives the wrong impression. I am quite sure that necropsy evidence of cerebral infarction does not correlate with arteriosclerotic dementia, as the large majority of cases are not demented. The discrepancy between clinical and pathological lesions has been noted many times, notably by the careful work of Rothschild.^{1,2} I feel Dr. Houston should publish fully his knowledge of deaths following modified E.C.T., as this may be a very serious criticism.—I am, etc.,

G. I. TEWFIK.

Sheffield

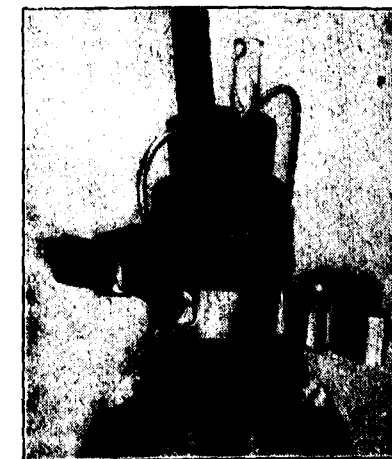
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- ¹ *Dis. nerv. Syst.*, 1947, 8, 123.
- ² *Geriatrics*, 1947, 2, 155.
- ³ *Amer. J. Psychiat.*, 1947, 100, 501.

A Bung-holder

SIR.—A simple device to prevent ejection of the rubber bung of the giving set during a positive-pressure transfusion can quickly be made as follows.

The band of a standard M.R.C. type bottle-holder is bent, as shown in the photograph, to fit closely round the neck of the transfusion bottle. The "wings" thus formed are secured by artery forceps or drip-regulating screw clips. The hanger loop is bent into an "M" shape so as to press firmly upon the bung when the device is in place.



I am indebted to Male Charge-Nurse J. Atkinson, of the Royal Victoria Infirmary, Newcastle-upon-Tyne, for this suggestion.—I am, etc.,

Newcastle-upon-Tyne, 1.

J. A. G. HORTON.

Injection into Artery

SIR.—It would seem that the warrant for Dr. O. H. Belam's statement made in court and reported in the *British Medical Journal* of March 27 (p. 766) is in fact that so far he has not had the misfortune to inject thiopentone into an artery.

In the letter published on April 10 (p. 875), in which he attempted to mollify his dogmatism, Dr. Belam appears to be equally dogmatic. What does he mean by "an experienced person"? Would a thousand intravenous injections enable one to claim experience? I had certainly performed several times this number before I had the misfortune to inject thiopentone into an artery. I was well aware of this hazard, and had several times inadvertently punctured an

artery and recognized the fact before I had the misfortune to do so without eliciting the usual signs of this mishap. Almost 2 ml. containing 0.1 g. of thiopentone was injected before pain drew attention to my error. This was followed by blanching and then coldness of the affected limb segment. I shall continue to believe that I exercised "reasonable" skill and care and that intra-arterial injection of thiopentone cannot be entirely avoided.—I am, etc.,

Guernsey.

BRIAN WEBBER.

The Winter Vomiting Disease

SIR,—Similar outbreaks of the winter vomiting disease occur in Australia and are known by various names in different localities—"gastric flu," "three-day sickness" (after the bovine complaint), and so on. Winter vomiting is not a very good name here, as the attacks are often in summer, but goldfish spawn in November here as in England, without reference to the season, so perhaps we could call it "February vomiting" or "after Christmas vomiting." The mention by Dr. J. H. Whittles (*Journal*, February 6, p. 333) of infective hepatitis prompts me to remark that the incubation period of our disease is three days, whereas hepatitis is four to six weeks.—I am, etc.,

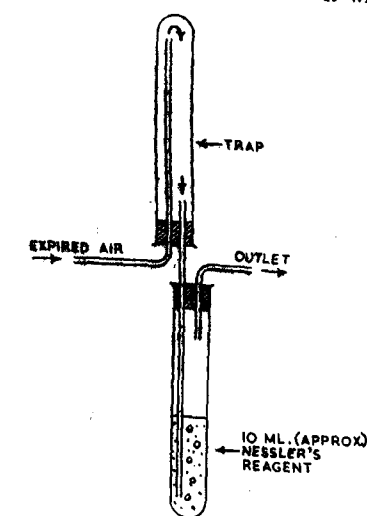
Wollongong, N.S.W.

M. C. MCKINNON.

Acetone Tests in Diabetic Coma

SIR,—The tests for acetone using 2,4-dinitrophenylhydrazine, described by Drs. Ole Sylvest and René Dybkaer (*Journal*, April 3, p. 816), may be a useful method of detecting acetone in the breath.

In Dr. R. D. Lawrence's clinic we have been using a similar sort of test for some time, in which the patient breathes into Nessler's reagent. If acetone is present a heavy milky white precipitate forms within 20 seconds when there is heavy ketosis, or after 40 to 60 seconds in milder cases. In order to minimize the risk of inhaling this mercury-containing solution, we think it wise to use a simple piece of apparatus made from two boiling tubes in which there is a fluid trap, as shown in the accompanying diagram. The rapidity at which the precipitate forms will of course depend on the volume of air expired, varying with the rate and depth of respiration and the degree of co-operation by the patient. The precipitate is presumably not specific for acetone, being due to a chelation compound with mercury. A high concentration of tobacco smoke also gives a faint white discoloration, but only after several minutes of hard blowing, and alcohol gives a very slight haziness, neither of which are likely to be confusing. With 2,4-dinitrophenylhydrazine a similar cloudiness also forms with tobacco smoke.



We have already carried out both these tests in a few patients, clear positive reactions being obtained in three patients after 35, 70, and 80 seconds with Nessler's reagent, though no visible colour change or crystal formation had occurred after 120, 120, and 300 seconds respectively with 2,4-dinitrophenylhydrazine. For those physicians with a poor sense of smell, tests for acetone in the breath may be of help, but they are far less important than examination of the urine by the old-established methods.—We are, etc.,

London, S.E.5.

K. J. GURLING.
H. R. MILLAR.

Food-poisoning Due to *Cl. welchii*

SIR,—Having been printed in the same issue of the *Journal* as Dr. A. Beck, Dr. A. W. H. Foxell, and Dr. W. C. Turner (March 20, p. 686)—and bearing in mind Professor T. N. A. Jeffcoate's views on public correspondence—I have hesitated to endorse in print the findings of your contributors who reported an outbreak of food-poisoning due to heat-resistant *Cl. welchii*. In the last year I have observed two such outbreaks and intend to publish the reports of these in the *Journal of the Royal Army Medical Corps*. The following data, I think, are consistent with the findings of Drs. Beck, Foxell, and Turner, and I am indebted to the Editor of the *Journal of the Royal Army Medical Corps* for permission to publish them here.

	Day	No. Examined (with Symptoms)	No. Positive for Heat-resistant <i>Cl. welchii</i>
Outbreak 1 (men at risk 138; men with symptoms 48; total number of patients examined 30)	2 15 26 36	30 20 (repeat) 7 3	30 7 3 2
Outbreak 2 (men at risk 300; men with symptoms 25; total number of patients examined 18)	2 4 12	2 2 12	1 2 6

Service conditions facilitate the follow-up of such cases, and, following the second outbreak, investigation of the food-handlers revealed two men who had had no symptoms but who persisted to excrete the organism intermittently for at least four months. One of these men, who was involved in handling meat, appears to have been the source of this outbreak.

The second outbreak was traced as a result of experience gained during the first and consequent reference to the work of Dr. Hobbs *et al.* I am sure that the second outbreak would otherwise have escaped detection, and I agree that a heat-resistant variant of *Cl. welchii* may well be a commonly undetected cause of this type of food-poisoning. I am, etc.,

Newcastle-upon-Tyne.

J. GERALD COLLEE.

REFERENCE

J. Hyg., Lond., 1953, 51, 75.

SIR,—I was interested to read the account of an outbreak of food-poisoning due to *Clostridium welchii* (*Journal*, March 20, p. 686) reported by Drs. A. Beck, A. W. H. Foxell, and W. C. Turner. In one of the schools in the Nashoba Health District, Massachusetts, in May, 1953, we had a similar food-poisoning outbreak with more than 100 children, teachers, and staff upset. In following up the causation it was noted that the only article of diet which was suspect was turkey meat. A specimen of this turkey meat was recovered from the garbage can by the sanitation officer. This was the day after the food had been eaten. This specimen smelt very badly. Cultures of the specimen, however, revealed no staphylococci, no salmonella, but a Gram stain of a direct smear of the meat revealed large Gram-positive rods abundantly throughout the meat. The meat was inoculated into litmus milk in two tubes and a stormy fermentation arose in 24 hours. In thioglycollate broth a cloudy growth with cottony clumps deep in the tube and gas resulted. The organisms also grew on thioglycollate agar, in Brewer plate, with a good growth of white colonies spreading in wet places. A large Gram-positive rod with the morphology of a clostridium was revealed microscopically, but no spores were seen. The biochemical reactions showed acid in lactose, sucrose, dextrose, and maltose. Spores were never seen from the organisms, although the latter were kept in the laboratory for about six weeks on the milk thioglycollate broth and a thioglycollate agar.

The turkeys which were eaten for this school lunch had been brought from a storage freezer in a neighbouring town in the frozen state. However, on the way from the storage refrigerator

unit the carrier truck was allowed to stand out in the open for several hours. The turkeys were then taken to the school and on the following day were prepared for cooking, that is on the afternoon before consumption. During the preparation one of the workers noted that one of the three turkeys had a peculiar red colour—but did not smell bad, nor did she notice any bad smell at all. The turkeys were cooked in the normal manner, and, because they were very hot and it was relatively cool weather, the cook left the turkeys out on the kitchen table at room temperature until the next morning, when the meat was shredded and divided up, a sauce being poured over the shredded meat. No pupil or teacher complained of anything objectionable about the dinner at the time of eating, although practically without exception the children and teachers who partook of the dinner had a sharp turn of diarrhoea, nausea, and general upset within 24 hours, mostly within eight to ten hours of eating the turkey. The normal reports were made to the State Health Department but no conclusions were come to as to the possibility of the toxic properties caused by the clostridium being responsible for the upset. This staff felt, however, that the large anaerobic Gram-positive rod (resembling a clostridium) was in fact responsible for the illness. Later the bacteriologist in the unit, Mrs. Marjorie Dunlap, experimented with turkeys, and she noticed that the turkey meat cooked promptly after defrosting remained sweet and firm for six days although kept at room temperature. Organisms from the turkey which had been recovered from the garbage can were inoculated into this meat and they stayed alive at room temperature but did not cause any particular decomposition. But she felt that possibly decomposition would have occurred if moisture had been added. On the other hand, turkey meat allowed to defrost and kept raw for five days at room temperature was found on examination to have Gram-positive rods in the meat taken from the shoulder or from the skin. These organisms were not seen in the abdominal cavity. It was unfortunate that in this outbreak very few stool specimens were obtained and in those no special organisms were found. In conclusion it was felt that (although not proved) turkey meat properly cooked but carelessly handled was in fact responsible for the outbreak.

In this department it is felt that the advice offered by Drs. Beck, Foxell, and Turner regarding the risk involved in preparing meat dishes prepared the day before their consumption is worth noting, and we in Nashoba have advised our own school systems to make certain that food cooked the day before consumption is properly refrigerated before being used. As a result of this outbreak in one of our schools we have prepared a standard school luncheon series of regulations.—I am, etc.,

Ayer, Massachusetts.

KENNETH I. E. MACLEOD.

Carcinoma and Neuropathy

SIR,—Within recent years much interest has centred upon the association of neurological disorders (polyneuropathy, cerebellar degeneration, etc.) with malignant disease, particularly carcinoma of the lung. In this connexion the report by Dr. P. L. de V. Hart (*Journal*, March 13, p. 606) is of considerable interest. It is, however, important to realize that all cases of proximal muscular weakness developing in patients with malignant disease are not due to a neuropathy. Indeed, an association between dermatomyositis or polymyositis and malignant disease has been recognized for some years, and has been discussed recently by Curtis and his associates.¹ In the case descriptions given by Dr. Hart one looks in vain for any absolutely convincing evidence that his patients were suffering from a neuropathy. The clinical picture which he describes is equally compatible with, if not more suggestive of, polymyositis. The pattern of muscular involvement in both cases was typical of this disease; the first patient had a skin rash and in the second the electromyogram showed that some motor units were "broken up as is seen in neurogenic lesions." Disintegration of motor unit potentials occurs to a much greater extent in primary muscle disease than in a neuropathy.

Dr. Hart refers in an addendum to an account by Dr. R. A. Henson² of eight cases of proximal motor neuropathy in association with carcinoma of the bronchus. At least one of Dr. Henson's patients was believed to be suffering from polymyositis, and from his descriptions, in the absence of pathological evidence, it is impossible to be sure that this was not true of other cases in his series. The remittent

course of several of them makes this a very real possibility. Dr. Henson mentioned that certain of his cases showed fatigability of muscles like that seen in myasthenia gravis, and two showed temporary improvement after prostigmine. In this connexion it is interesting to recall the recent reports of myasthenia in cases of bronchogenic carcinoma.^{3,4} In one of these reports⁵ a battery of diagnostic tests suggested that the patient was suffering from true myasthenia gravis, but in the other two cases the diagnosis was less certain. I have recently observed considerable and sustained improvement in muscular weakness on prostigmine therapy in two cases of polymyositis, though the response was certainly not as good as that seen in true myasthenia gravis.

I make these points in order to stress the fact that many patients with carcinoma who develop proximal muscle wasting and weakness, with involvement of neck and pharyngeal muscles, are suffering from polymyositis and not a neuropathy. The correct diagnosis can generally be made by muscle biopsy. It is a common experience to observe spontaneous remission in cases of polymyositis; the relationship of the improvement which occurred in Dr. Hart's cases to therapy with vitamin B was tenuous in the extreme. To adduce a specific deficiency of pyridoxine or of pantothenic acid or riboflavin as the cause of the patient's muscular weakness is presumptuous on the evidence which is presented to us. To go even further and to propose that the tumour cells compete for these vitamins seems quite unjustified. Much work remains to be done before the pathogenesis of the neurological and muscular disorders complicating malignant disease can be elucidated. The first essential, however, is accurate diagnosis of the lesion or lesions responsible for muscular weakness in each case. Once this has been achieved by biochemical and pathological means it may be possible to make some progress in identifying pathogenic mechanisms.—I am, etc.,

Boston, Mass.

JOHN N. WALTON.

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2. *Proc. roy. Soc. Med.*, 1953, 46, 859.
3. Anderson, H. J., *et al.* (1953). *Lancet*, 2, 1291.
4. Mackenzie, I. (1954). *Ibid.*, 1, 108.
5. Shafar, J. (1954). *Ibid.*, 1, 109.

Infectious Mononucleosis

SIR,—Dr. S. Shubert, Captain J. G. Collee and Dr. B. J. Smith's interesting article (*Journal*, March 20, p. 671) offers a good opportunity for re-emphasizing that the haematological picture, and not the agglutination test, is the mainstay of diagnosis in either the epidemic or the "sporadic" form of infectious mononucleosis. This is a fact that requires to be repeated again and again when statements such as "the laboratory let us down" are made, referring to the Paul-Bunnell test.

Regardless of whether one adopts the theory of one causal virus or of different closely related ones, the histological change in the lymphopoietic tissues, and the resulting peripheral blood count, are probably identical in all cases. Tidy,¹ in his remarkable exposé of glandular fever, reviewed the various clinical forms, to which one may add the very rare laryngeal form,² which I have also observed. Both his article and Whitby and Britton's classical textbook³ contain comprehensive information on the value of blood changes and of serological findings in this disease. It has been variously estimated that roughly 10% of cases have a negative Paul-Bunnell test. This figure will undoubtedly be increased by observations of epidemics like the one described by Drs. Shubert, Collee, and Smith.

The differential white blood count appears to be the most constantly positive laboratory test in infectious mononucleosis, even before, or in the absence of, any glandular enlargement, the only exception being the prolonged febrile type of the disease. In this latter form of infectious mononucleosis, the laboratory tests will become diagnostic later on, at the time of the enlargement of the glands.⁴ To be distinguished from infectious mononucleosis is a condition clinically simulating glandular fever with its enlargement of lymph glands, and sometimes recurring at intervals of

several weeks or months. The negative blood findings and negative lymph gland cytology (puncture!) will differentiate this condition of as yet unknown aetiology from infectious mononucleosis.

To summarize, I would like to make the following points: (1) the blood count is the most important test of infectious mononucleosis and is the most likely to reveal the diagnosis at an early stage and during the whole active phase of the disease; (2) the agglutination test (Paul-Bunnell test), if positive, is additional evidence; (3) a negative Paul-Bunnell test does not exclude this diagnosis; (4) a positive Paul-Bunnell test can sometimes be found after convalescence when the blood count might have become normal; and (5) negative haematological findings in the presence of glandular enlargement (especially if repeated) exclude the diagnosis of infectious mononucleosis.

In conclusion, I would like to say that it should be kept in mind that while the Paul-Bunnell test is a purely "technical" test the opinion on the blood film in difficult cases belongs in the domain of the expert.—I am, etc.,

Sheffield.

S. VARADI.

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- ¹ *British Medical Journal*, 1952, 2, 436.
- ² Ravenna, P., and Snyder, J. (1948). *Ann. intern. Med.*, 28, 861.
- ³ *Disorders of the Blood*, 1953, p. 607. London.

Pethidine for Pain and Insomnia

SIR,—We have noticed that even the most up-to-date textbooks advocate morphine in cases of pain and insomnia associated with pneumonia. However, it has been our experience that when we have given even small doses of morphine, especially in people over the age of 40, the condition has deteriorated rapidly, with death in a very high percentage of cases.

On the other hand, since we have started using pethidine in similar cases the response has been noticeably better and the death rate has been very low. In our opinion, morphine is contraindicated in all cases of pneumonia, especially nowadays, as we have other drugs to relieve pain and help sleeplessness which are not so depressant on the respiratory centre.—I am, etc.,

R. G. B. WIGODER.
H. JEFFS.

London, S.E.6.

Single Incision for Bilateral Orchidectomy

SIR,—Like Mr. C. J. Cellan-Jones (*Journal*, May 1, p. 1039), my own memories go back to 25 years ago, when I learnt from Mr. Kenneth Walker to approach the testes directly through the scrotum. I have been doing so ever since without any of the complications he describes. So I must admit that, for my part, I took quite seriously Sir Heneage Ogilvie's plea for this approach (*Journal*, April 17, p. 934).—I am, etc.,

London, W.1.

REYNOLD BOYD.

Chronic Vasomotor Rhinitis

SIR,—The two syndromes described by Mr. P. Reading and Mr. K. Malcomson and Dr. D. O'Neill and Mr. K. Malcomson (*Journal*, March 6, pp. 552 and 554) as "non-specific paroxysmal sneezing and rhinorrhoea" and "persistent nasal blockage" respectively are believed by the authors to respond differently to treatment. In the case of the former the symptoms are controlled by antihistamine drugs and sustained improvement follows psychotherapy, whereas the latter requires surgical intervention or zinc ionization. In my experience the two conditions frequently merge and the characteristic symptoms of the two states may alternate in a single individual. I am myself an example of such a "mixed" syndrome, all symptoms being promptly relieved by antazoline hydrochloride, 0.1 g.

The authors might find it of value to investigate how many of their cases had used the "pocket inhaler" in the past. The recent survey carried out by the City Analyst of Birmingham (*Journal*, March 13, p. 616) shows that while some of the inhalers examined were deficient in amphet-

amine others contained an excess of up to 30%. I attribute my own condition to the excessive use of such inhalers to relieve "catarrh," and the amount of amphetamine absorbed in this way was sufficient to cause sleeplessness, abolition of fatigue, and restlessness. A friend of mine in Calcutta, who was incapacitated for days by rhinorrhoea until he took antihistamine drugs, also blames the condition on to the excessive use of inhalers.—I am, etc.,

Udayagiri, India.

D. STEWART McLEARN.

Bacterial Endocarditis Due to *Chromobacterium Prodigiosum*

SIR,—Drs. A. J. Hawe and M. H. Hughes (*Journal*, April 24, p. 968) point out that Wilson and Miles were, in 1946, unable to quote any indubitable report contradicting the view that *Chromobacterium prodigiosum* was non-pathogenic for man. A patient died of septicaemia due to *Bacillus prodigiosus* in 1934 in a London teaching hospital, and the death certificate was lying on the desk of the local registrar of births and deaths when I went in to register the birth of a child. The registrar showed me the certificate (having found out that I was a doctor) and remarked that he had never heard of the condition. I told him that he was probably in the unique position of being the first to register a death from this cause, and I eagerly searched medical journals for some months in the hope that the case would be published. It apparently never was, which is a pity, as it would presumably have been the first of its kind.—I am, etc.,

London, W.1.

J. C. HAWKESLEY.

SIR,—It may be of interest to Drs. A. J. Hawe and M. H. Hughes (*Journal*, April 24, p. 968) to draw their attention to a case of acute fatal septicaemia due to *Chromobacterium prodigiosum* which I published in the *Lancet* in 1935.¹ This was probably the first case of fatal infection with this organism ever published. The point of interest is that it was associated with agranulocytosis, and it seems possible that their case may have had chloramphenicol-induced agranulocytosis and developed endocarditis due to this organism only in the later stages of the illness. I am, etc.,

Guildford.

C. RICKWORD LANE.

REFERENCE

- ¹ *Lancet*, 1935, 2, 20.

Racial and Religious Tolerance

SIR,—It is a sad reflection on the ability of the medical profession to think rationally that out of the fourteen advertisements for assistants in the *Journal* of April 10 seven implied preference for a particular race or religion. What does this imply? Does it imply that each of these doctors believes that a particular race or religion is more likely to supply a compatible colleague, or that it is easier to work with a person of one's own (or possibly not one's own) nation or creed? If this be so, have those concerned bothered to consider if their beliefs are founded on any rational judgment, or merely on emotionally toned prejudice? Do a significantly higher proportion of Scotsmen than Englishmen or Argentinians, for example, make better assistants even to other Scotsmen: do more Catholics than Jews? I have no figures available so am unable to formulate any conclusions lest they be based on prejudice. I think it is true to say that many beliefs of racial superiority or inferiority have been shown not to be founded on fact, and it would be reasonable to suggest that this may be so in this present case.

In any case I feel that a liberal-minded profession should be capable of putting aside emotionally toned judgments and accepting a colleague on his merits as "a good man to work with," irrespective of his race, colour, or creed. It should set an example in this disturbed world, where polls are necessary to decide on the allowable quantity of skin pigment in bus conductors, and abhor the discriminatory techniques so prevalent to-day.—I am, etc.,

Bristol.

C. P. SEAGER.

Obituary

F. L. HOPWOOD, D.Sc.

Professor F. L. Hopwood, who died at Sidmouth, Devon, on May 2, had worked for many years in close association with the medical staff at St. Bartholomew's Hospital, as physicist, as professor of physics, and as vice-dean of the medical college.

Frank Lloyd Hopwood was born in 1884, and was educated at Hawarden Grammar School and at the University College of North Wales, Bangor. He then came to London, where he continued his studies at the Royal College of Science and at University College, taking the London degree of D.Sc. in 1919. Before graduating he worked during the first world war on the improvement of instruments for submarine detection and for underwater signalling, of which he invented a system. He became physicist at St. Bartholomew's Hospital in 1920, and was appointed professor of physics at the medical college there in 1924. He retired in 1949. London University then conferred on him the title of emeritus professor. He was also vice-dean of the medical college from 1939 to 1945.

Hopwood's contribution to radiotherapy was a most important one, for his hospital was one of the most progressive in this field. He published numerous papers in the *British Journal of Radiology*, the *Proceedings of the Royal Society*, and other journals, and he was a member of the Nuclear Physics Committee of the Medical Research Council. For many years also he served the British Empire Cancer Campaign as a member of its grand council and on many of its committees and subcommittees, and latterly as its honorary secretary. He was a past president and Silvanus Thompson Medallist and Memorial Lecturer of the British Institute of Radiology, an honorary member of the Faculty of Radiologists, and from 1925 to 1950 honorary secretary of the British Committee for Radiological Units. At the seventh International Congress of Radiology he was vice-president emeritus, having attended the previous Congress as a British delegate. The University of Cambridge conferred on him the honorary degree of M.A. in 1940, and in the same year he was elected an honorary Fellow of Queens' College, Cambridge.

He married Miss Helen Sproston in 1909, and she survives him. There was one son of the marriage.

We are indebted to Professor A. WORMALL for the following appreciation: Frank Lloyd Hopwood retired in 1949 after 44 years of service happily and fruitfully devoted to the Medical College and Hospital of St. Bartholomew. Even in his retirement, however, there was no cessation of the work he loved so well, and right up to the end he continued to serve Bart's, the British Empire Cancer Campaign, and many other organizations in which he had a special personal interest.

The thousands of medical students who passed through his hands are not likely to forget him as a teacher and, above all, as a man who set a standard of personal and professional integrity which might be equalled but could not be surpassed. Many will for ever be grateful to him for his never-failing kind-heartedness and for the fatherly advice which he so readily gave them when they were in trouble. Those well acquainted with him knew that his opinion and advice were invariably sound, unbiased, and worthy of careful consideration, whatever the topic or the problem under discussion. A committee which had Hopwood as a member was unlikely to take any action which was either unwise or unfair.

Many will remember the prominent part he took in helping to establish the million-volt x-ray unit at Bart's in 1936; others will recall his direct and always helpful interest in the Strangeways Institute at Cambridge, his submarine detection work in the 1914-18 war, or his early fundamental work on ultrasonics. Few people know that it was in his laboratory in 1934 that Szilard and Chalmers carried out the first chemical separation of an artificially produced radioactive isotope. His teaching and administrative duties were heavy, and frequent calls were made on his services for college and university committee meetings. There appeared, therefore, to be little time for him to carry out systematic research. It was characteristic of his real aptitude for research that during his retirement he published several important papers describing investigations which arose from observations he had made when using the kitchen tap and an ordinary household sieve. What an excellent director of a research institute he would have made, for rarely if ever did any researcher consult him without obtaining sound advice; and often he received real inspiration.

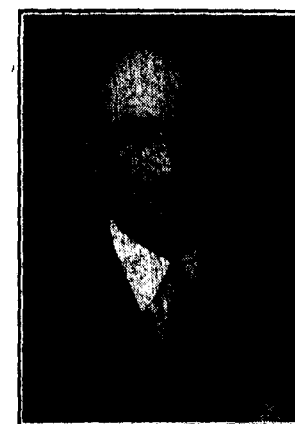
As a leader and as a man of wisdom and wide vision Hopwood was outstanding. These attributes received wide recognition when in September, 1939, he became vice-dean of our Medical College, with the task of looking after the preclinical departments during their wartime stay in Cambridge. How splendidly he performed this special duty is well known to his many friends at Bart's, Queens' College, and the Universities of Cambridge and London. I shall remember him particularly as a man of absolute integrity, a staunch colleague, a loyal and generous friend, and a delightful companion for a round of golf or a country walk, or at the lunch table. It was truly a privilege to have known him and to be blessed with his friendship.

J. L. LOVIBOND, T.D., M.D., F.R.C.P.

Dr. J. L. Lovibond, assistant physician at the Westminster Hospital, died suddenly on May 4, his 47th birthday.

John Locke Lovibond was born on May 4, 1907, and was educated at Oundle School, Christ's College, Cambridge, and the Middlesex Hospital, where, after qualification in 1932, he became casualty officer and house-surgeon to Mr. W. Sampson Handley. He then went to the Westminster Hospital as house-physician to the late Dr. Hildred Carill and to Dr. W. E. Lloyd. In 1935 he took the M.R.C.P.

and graduated M.B., B.Chir. at Cambridge, proceeding to the M.D. two years later, the subject of his thesis being hydrothorax in cardiovascular disease. After holding the post of house-physician at the Brompton Hospital, he returned to the Middlesex Hospital to work in the cardiographic department, and later became medical registrar to Dr. Cockayne. In 1938 he was appointed physician to the King George Hospital, Ilford, but had hardly taken up this appointment when war broke out in the following year. As a keen Territorial he was one of the first to leave. He served with the British Expeditionary Force in France, being one of the last to come through Dunkirk, and later in Iraq, Ceylon, and Burma. From officer in charge of a medical division, he became officer commanding the 35th British General Hospital



(Lafayette, Ltd.)

in 1943 and, later, officer commanding the 38th British General Hospital in Burma, holding the rank of colonel. It was while serving in the R.A.M.C. that he was elected F.R.C.P. Towards the end of the war he became consulting physician to the 12th Army, South-east Asia Command. On return to civilian life in December, 1945, he added to his previous appointments by becoming assistant cardiologist at the London Chest Hospital, Victoria Park, and, in 1948, assistant physician to Westminster Hospital.

We are indebted to Dr. F. DUDLEY HART for the following appreciation: "Jock" Lovibond had apparently been in perfect health and on the evening before his death had attended a medical committee meeting, where he showed his usual alertness and vigour. On the following day, although usually scrupulously punctual, he did not turn up for his teaching round at 2 o'clock, and the tragic news was heard a few minutes later. His death came therefore as a sudden and prostrating shock to all of us who had so recently seen his cheerful, alert figure.

Lovibond was a delightful man and his friends were not confined to one profession or school. Although keenly interested in cardiology, he was an excellent all-round general physician with a wide interest in all branches of medicine, as is shown by his varied publications dealing with diseases of the blood, of the colon, of the heart and lungs, and many other subjects. In 1938 he was the first to describe the "profile sign" as an early sign of clubbing of the fingers. Perhaps his most important publication was "Hydrothorax in Heart Failure," published in the *British Heart Journal* in 1941 and written in conjunction with Dr. D. Evan Bedford.

He had wide interests outside medicine. At the Middlesex Hospital he was captain of the first fifteen, and for many years he was a keen horseman, riding in many hunter trials, point-to-points, and following the hounds. He was a keen amateur painter and an able cartoonist, his caricatures adorning the pages of the *Granta* and the walls of the Westminster students' refectory. Some years ago, with a colleague, he built brick by brick his own country cottage. He retained his keen interest in the Army and was attached to the 1st Regiment, Honourable Artillery Company (R.H.A.). Indeed, two days before his death he had been on manoeuvres on Salisbury Plain. As a colleague he was unfailingly kind, co-operative, and cheerful; we never saw him depressed or irritable. The deep sympathy of all his friends and colleagues goes out to his widow and mother in their tragic and sudden loss.

S. SPENCE MEIGHAN, M.B., F.R.F.P.S.

By the sudden death on April 20 of Dr. S. Spence Meighan Glasgow has lost one of her best-known ophthalmologists and the British Medical Association a member who was to have served as a vice-president of the Section of Ophthalmology at the Association's Annual Meeting to be held at Glasgow next July.

Stuart Spence Meighan was born at Glasgow on June 19, 1888, the son of the late Dr. T. Spence Meighan, and was educated there at the High School and at the University, where he graduated M.B., Ch.B., with honours, in 1912, having previously obtained the B.Sc. in 1909. He was elected F.R.F.P.S. in 1920. After qualifying he held resident appointments in Glasgow at the Western Infirmary, the Royal Hospital for Sick Children, and the Eye Infirmary, where his father had been a surgeon. Soon after the outbreak of war in 1914 he entered the R.A.M.C. and served in France with the Highland Field Ambulance in the 51st Division from 1916 until March, 1918, when he was taken prisoner. He was twice mentioned in dispatches.

After the war Dr. Spence Meighan returned to a junior staff post at the Glasgow Eye Infirmary, and soon afterwards became ophthalmic surgeon to Stobhill Hospital, then a Poor Law institution. He was promoted surgeon to the Eye Infirmary in 1926, and in the same year was appointed to the chair of ophthalmology at the Anderson College of Medicine, where he worked until 1943, when ill-health obliged him to resign. Later he became an honorary lecturer in ophthalmology in the University. At Stobhill, and at the Clydebank Eye Dispensary, he did much to extend the ophthalmic services available to the locality.

A member of the council and a vice-president of the Ophthalmological Society of the United Kingdom and a past-president of the Scottish Ophthalmological Club, he was keenly interested in all matters affecting his specialty. He was a member of the British Medical Association's committee on the diagnosis and certification of miners' nystagmus, the report of which was published in 1936. When the National Health Service began he was appointed a member of the Glasgow Northern Hospitals board of management and became chairman of its medical committee, a responsibility for which he was well suited. Dr. Spence Meighan had planned to read a paper before the Section of Ophthalmology at the Annual Meeting in July on trachoma in Glasgow, a subject on which he was an acknowledged expert. He was also particularly interested in the medico-legal problems of ophthalmic practice, and was often called to give evidence in courts of law.

Dr. Spence Meighan will long be remembered for his kindness both to his patients and to his colleagues, and for his readiness to help those who came to him for advice. His innate diffidence could not disguise his sound clinical knowledge and surgical skill. He regarded all his fellow men with an air of benevolence, and his sense of humour found an outlet in mimicry without malice, a gift which his friends enjoyed to the full. He is survived by a widow and two sons.

Dr. HARRISON STANFORD MARTLAND, the American pathologist, died in New York on May 1 at the age of 70. He was born in New York in 1883 and received his medical education at the College of Physicians and Surgeons, Columbia University, where he graduated in 1904. For the next four years he served as pathologist at the Russell Sage Foundation. In 1908 he was appointed city pathologist of Newark, New Jersey, a position which he held for 46 years. He was also chief medical examiner of Essex County. For many years he was professor of forensic medicine at the Postgraduate Medical School of New York University. Martland was a pioneer in the study of diseases due to radioactive substances. In 1925 he investigated the deaths of several girls who had been employed in painting luminous watch-dials and who had developed necrosis of the jaw and severe anaemia. He showed that these deaths were attributable to the habit the girls had of putting a point on the paint-brushes by wetting them on the lips and to the absorption of radioactive material in this way. His papers on this and related subjects were recently republished in book form by the U.S. Atomic Energy Commission, where Martland was employed for a time in designing protective devices against exposure to radioactivity. A proof of the regard in which Martland was held was forthcoming last January, when the thirteen-million dollar municipal hospital under construction at Newark was named the "Harrison S. Martland Medical Center." He was a member of the editorial board of the *American Journal of Surgery* from 1935 to 1946, when he was appointed associate editor.

Medico-Legal

ALLEGATIONS WITHDRAWN

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

An action for negligence against the North-east Metropolitan Regional Hospital Board and Mr. Eric Edmund O'Malley, M.S., F.R.C.S., who had been surgical registrar of the Prince of Wales Hospital, Tottenham, came to an unusual end last week.

The action was brought by Mrs. Storie in respect of the death of her husband, Mr. Lawrence Rodney Storie, a week after an operation for a varicose vein. In 1951 Mr. Storie had been successfully treated by Mr. O'Malley at the Prince of Wales Hospital for varicose ulcers, and doctor and patient had become friends. It was decided to operate for a varicose vein. The operation was performed on February 11, 1952, not by Mr. O'Malley but by the senior house-surgeon, and Mr. Storie was allowed to go home. On February 15 he was examined at hospital by Mr. O'Malley, and again allowed to go home and told to report on February 18. On February 18 he did so, but collapsed and died outside the hospital from a clot of blood 4 in. (10 cm.) long, which was found at necropsy in his heart.

The plaintiff's case was that on February 15 there was already gross sepsis at the site of the operation in the right groin, with enlarged glands which would have been palpable on examination, and that the clot had formed in the ligated vein, been dislodged by the sepsis, and travelled to the heart. It was alleged that Mr. O'Malley had made his examination so carelessly that he had failed to observe the signs of sepsis, and consequently failed to immobilize the patient to reduce the risk of dislodging a clot.

Mr. O'Malley's case was that he made a thorough examination during which he tested for the presence of a blood clot but found no sign of one, and found no sign of sepsis. From his examination he considered that Mr. Storie was going on absolutely as would be expected, and it would have been a bad thing to put him to bed.

The hospital board were joined as defendants on the ground that they were in law vicariously responsible for Mr. O'Malley's alleged negligence. No separate allegation of negligence was made against them.

The action was tried before Mr. Justice Stable and a jury, and at the end of a three-day hearing the jury, after an absence of over an hour, stated that they could not agree upon a verdict, and regretted putting the court to such inconvenience. Mr. Justice Stable, observing that it was not the court but the parties who would suffer, thereupon discharged the jury. On May 6, however, on the application of Mrs. Storie's counsel, the action was withdrawn.

In making the application to Mr. Justice Stable counsel said that, while he had been waiting outside court for the jury's verdict at the hearing, Mrs. Storie had told him that having heard the evidence she was satisfied that there was no ground for complaint against Mr. O'Malley. Mrs. Storie had instructed him so to inform Mr. O'Malley and to repeat it in public so as to clear him so far as she could. The action had not been brought irresponsibly at Mrs. Storie's instance, but on the strength of the medical evidence laid before her which turned out to have been founded on one or more false premises for which she was not to blame.

In allowing the application for the action to be withdrawn Mr. Justice Stable said that in the course of a fairly long legal experience he had not come across an example of such magnanimity as Mrs. Storie had shown in acknowledging that Mr. O'Malley did all and more that a really competent surgeon should have done. Mr. O'Malley emerged from the case with his professional reputation not only not impaired but enhanced. Not only was he a thoroughly competent surgeon, but a most kindly and friendly man.

The Medical Protection Society instructed Messrs. Le Brasseur and Oakley to act for Mr. O'Malley.

The Times, May 7, 1954.

Medical Notes in Parliament

HEALTH SERVICE FINANCE

The Minister of Health, Mr. IAIN MACLEOD, speaking in a House of Commons debate on the Health Service on May 10, ranged over many aspects of the Service from the apportionment of capital expenditure for hospital needs to the cost of drugs and the standard of the general practitioner's surgery. He told the House that the Guillebaud Committee—engaged in a review of the finance of the Service—would begin the preparation of their report towards the end of June.

He commented that for the first time the true gross of the Health Service, at £505m., had exceeded £500m. The conclusion he ultimately reached was that, if one took medical need alone as the criterion, one could justify much greater expenditure—more, indeed, than any Chancellor could sanction or the country could stand. In his judgment the sum provided in the Estimates was enough. This was going to be a difficult year for hospital maintenance, but the sum allocated was £12,500,000 more than the out-turn last year, and that amount should enable them to hold the line, meet major needs, and make some modest advance. The capital outlook was a good deal more encouraging than it had been for some time. In the wider setting of national expenditure he was satisfied this year with the Estimates.

Less for Teaching Hospitals

Mr. Macleod said that he had deliberately allocated less in proportion to the teaching hospitals than to the regional hospital boards, since he felt there was more scope for economy in the teaching hospitals, and that it was right, within the limits of what was available, to be more generous to the regional boards. An analysis of the types of scheme that had been undertaken since the Service began until the end of last year showed that 20% of the money had been spent on ward accommodation, 17% on staff accommodation, 21% on special departments, 6% on out-patient departments; 4% on laundries and kitchens; 19% on engineering services, and 13% on others. It had been the consistent policy of successive Ministers to give high priority to special departments. If central allocations for capital expenditure were to be continued it would take away much of the autonomy and discretion of regional boards in the matter; and if the impression was given that funds would be made available for a particular service it would tend to make the boards think that as the matter was being taken care of centrally they need not bother to finance part of it out of their own budgets.

He had come to be regarded as the apostle of charges for the Health Service, but he was the only one of the four Ministers since its inception who had not introduced a Bill to impose those charges. Before the charges were made the cost of providing dentures had been running at about £2,750,000. It dropped almost at once to less than £1,500,000, and had remained fairly constant at that figure since.

It was immensely difficult to make a comparison between the numbers of prescriptions in different years, because so much depended on the prevalence of sickness. The figures for the first year of the Health Service charges were distorted by the London fog, the East Coast floods, and an influenza epidemic. The prescriptions dispensed now numbered about 213 million, compared with a peak of 225 million. The cost per prescription had turned down from a peak of 49d. to about 47½d. The cost to the Exchequer was £40m., against a peak of £45.5m., and the patients were paying £6.5m. If a Socialist Government should be returned to power he hoped they would think carefully indeed about some of these figures, and reflect that there might well be higher priorities on which to spend money than free laxatives and free vitamin pills.

Delivery dates of artificial limbs had considerably improved, and delays in repairs had also been reduced.

Some Drugs too Dear

Investigations had been made into the cost of basic drugs in four categories—antibiotics, vitamins, hormones, and insulin—and proprietary preparations. During the investigation the prices of penicillin and hormones had been reduced by the manufacturers. In the basic drugs he was conscious of the danger of interfering with valuable research, and also of the importance of the export trade, because there was no question that risks had to be taken by the manufacturers.

Without prejudice to final action the Ministry decided last year to make a number of investigations into the cost of manufacturing certain proprietaries which would seem at first sight to be especially expensive. In categories 2, 3, and 4 there were 6,000 preparations of which they were investigating 91, which accounted for 30% of the total cost of proprietaries to the Health Service and 18% of the total drug bill. In one group investigations were complete. They had not been able to reach agreement with the manufacturers on what they considered a reasonable profit level, and proposed soon to advise doctors that satisfactory price arrangements had not been made and to ask them not to prescribe these preparations.

More Partnerships

In the 12 months ending July, 1953, the number of doctors in partnership increased by more than 1,000, or 3.6%. Of the doctors newly admitted to established partnerships, 555 were known to have been assistants in the practices in which they became partners, which was a welcome development. A substantial proportion of the doctors entering the Service in 1952-3 went into under-doctored urban areas, with the result that the proportion of the urban population in under-doctored areas fell from 60% in October, 1952, to 46% in July, 1953.

Speaking of accommodation and surgeries, he said that as part of a doctor's terms of service he was required to provide proper and sufficient surgery and waiting-room accommodation for his patients. There could be no justification whatever, now that the Danckwerts award had been promulgated, for that not being done up to a reasonable standard. Last October the chairman of the General Medical Services Committee of the B.M.A. drew the attention of all general practitioners to this matter in a letter, and urged the highest possible standard.

On health centres and group practice, he said the report of Sir Henry Cohen's committee was in his hands and would be published soon. People held very different views about the future of the health centres. Another matter which they must seek to develop in the general-practitioner service was that they should have as much help as possible from x-ray and "path" examinations in the hospitals. A good deal of opportunity was being given, and he was certain that it provided a genuine incentive to the keen practitioner. In spite of the difficulties of providing such a direct service, he was told that about half the hospitals with these facilities had made them generally available to the general practitioners.

It was not right that they should look for spectacular changes in the structure of general practice, but they could draw encouragement from the figures he had given and the beginnings of the implementation of the Working Party report. There was great interest in this, and some interesting studies—by Dr. Hadfield,¹ of the B.M.A., and by Dr. Stephen Taylor—helped to encourage that interest. A quotation from Dr. Taylor's book summed up what he had to say about general practitioners and the provision of accommodation: "There is no impossibility about raising the standards of practice of the less good doctors to those of the best, providing that what happens in the best practices is made known to all." That was an accurate reflection of the position.

¹British Medical Journal, September 26, 1953, p. 683.

Opposition's Views

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.), who opened the debate, said that many people had feared that the Guillebaud Committee would be used for the introduction of spot interim recommendations which might have a seriously detrimental effect on the work of the Service. Since then it had become clear that the committee was being given opportunities and time to study the subject carefully and fully. The Opposition welcomed this. They were certain that, the more fully the committee investigated, the more they would be convinced that true economy would demand increased rather than reduced expenditure. (Opposition cheers.)

Recently medical officers of health in speeches at congresses had given a misleading account of the hospital service. One well-known officer had said that no progress had been made since 1948. That was demonstrably false. Great advances had been made, although in some cities, which were particularly fortunate in the past, the same rate of progress had not been maintained as in other areas. It was misleading for men in responsible public positions to attempt to give the impression to the public that because they had lost some contact with hospital development this had meant a complete setback in development generally.

This year the Estimates provided for an increase in the capital allocation to hospitals of 25% over the allocation for last year, but what a miserable total was disguised by the percentage! (Opposition cheers.) It was an increase of only £2m. over the £8m. allocation of last year, and it only brought the allocation nearly back to what it was in the Estimates for 1951-2. It only partly redressed the severe cuts made a year ago, and would in no way meet the needs of the hospital service.

The majority of doctors' practices were good, but a serious proportion were bad. It was a tragedy that those doctors were getting the advantage of payments to which they had no right. Nobody could make him believe that in those shocking practices anything like 38.7% was being spent on expenses. The Service was being swindled and contumely brought on other doctors who maintained a good standard of provision. Premises should be inspected, and some of the worst offenders warned that unless there was some improvement they could no longer be regarded as practising in the Health Service.

Improvements in Hospital Service

Mr. SOMERVILLE HASTINGS (Barking, Lab.) said there had been a great improvement in the hospital service, which had been most marked in the medical treatment in the small ex-Poor-Law hospitals in country districts. The general-practitioner service had provided great benefits for the families of the employed, but there had been complaints. Certain people who were accustomed to "send for the doctor" for almost anything, in the same way that they sent for the plumber or the sweep, had found that they were not getting the same attention—for the very good reason that the practitioners were busy dealing with more important cases. The Minister's action in allocating a percentage of beds in general hospitals for tuberculosis cases had shown the advantage of the unity of control bestowed by the Health Service Act, and the result had been that the waiting-lists had become much smaller. He doubted whether preventive medicine had improved to the same degree as curative medicine, and for that the doctors were largely to blame. He also said that consultants should no longer be paid travelling time and expenses. It encouraged them to dissipate their energies by going to too many hospitals.

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) said that if we had to face an atomic war large stocks of antibiotics, blood, and dried plasma should be available.

General practitioners, he said, should be the first line of attack against disease. More use should be made of them than had been in the past. For them to work in isolation was wrong, particularly in the cities, where group practice

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was the best. There were sufficient general practitioners and consultants if they were properly distributed.

Colonel M. STODDARD-SCOTT (Ripon, Con.) said that the time had come to consider whether the regional hospital boards in England were the best organization for the Health Service. The first form of organization was not necessarily the best, and it should now be decided either to abolish them completely or to reduce their power and influence, at the same time raising the standard of the management committees.

Mr. R. FORT (Clitheroe, Con.) referred to the importance of the general practitioner, and said that this had been brought out by two remarkable publications—the book by Dr. Stephen Taylor and the issue of the *British Medical Journal* last September which included Dr. Hadfield's survey of several hundred general practitioners and the results of his postal inquiry. One difficulty was the increasing specialization which was required, but there was a need for the various branches of the medical profession to work closer together. It was disappointing to find that, according to the article in the *British Medical Journal*, consultants were failing to have general practitioners present at consultations as much as was the case before the Health Service started. It would be well to bring to the notice of specialists how important it was to keep their general practitioner colleagues working side by side with them.

Commander T. GALBRAITH, Under-Secretary, Scottish Office, replying to the debate, said that any practitioners who wished to incur capital expenditure on the provision of premises for group practice were invited to apply for interest-free loans from the £100,000 which had been set aside from the national pool for the development of group practice. Decisions on applications—which were only now coming in—would be taken by a joint committee, one in England and Wales and the other in Scotland, composed of representatives of the general body of practitioners on the one hand and of the appropriate health department on the other. The Government had no rigid preconceived notions on what, for this purpose, constituted group practice, but the committee would endeavour to select those which held out most promise of improving the standard of service which the group of doctors would be able to offer their patients. These loans would be repayable normally over 10 years and the money repaid would become available for further loans. The health centres which had been set up were for experimental purposes, and it would be best to await developments and see how they were serving their purpose. A great deal could be done by group practice and by the doctors themselves.

Hospital Waiting-lists

Dr. BARNET STROSS (Stoke-on-Trent Central, Lab.) asked the Minister of Health whether he had noted the variation in the average waiting time, after inclusion in the waiting-list, for patients who required major surgery for tuberculosis, cancer of lung and bronchus, or bronchiectasis, and what he proposed to shorten the waiting time, particularly in Wales. Mr. IAIN MACLEOD replied on May 6 that the length of waiting time was due primarily to the rapid increase in demand for thoracic surgery and the comparative shortage of thoracic surgeons and trained theatre staff. The number of surgeons had increased by 50% over the past three years, and was likely to increase further, and the annual number of patients dealt with by thoracic surgery departments rose by over 18% in 1953 and had nearly doubled since 1949.

Dr. STROSS said that in Wales the waiting period for tuberculosis before treatment was offered was up to two years, and for bronchiectasis up to five years. Would the Minister increase the number of consultants for this specialty? Mr. MACLEOD said they were doing all they could to iron out the serious discrepancies between the regions. One method was by consultation between senior assistant medical officers to see whether one region could help another. Mr. SOMERVILLE HASTINGS (Barking, Lab.) sug-

gested the concentration of cases in need of chest surgery in a relatively large hospital, so that so much time was not wasted by surgeons travelling from one hospital to another, and better work could be done because of the treatment that trained staff could give. Mr. MACLEOD observed that that was a far-reaching proposal and he would like to consider its implications.

Use of Pay-beds

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked the Minister of Health on May 6 what percentage of Section V pay-beds were unoccupied in the hospitals under his direction during each of the last three years. Mr. IAIN MACLEOD replied that no figures were available before July, 1952. For the periods July to December, 1952, January to June, 1953, and July to December, 1953, the figures for non-mental hospitals were 34.5, 30.4, and 34.5 respectively. Mr. HASTINGS commented that the figures showed a terrible waste of beds. Large numbers of non-paying patients could use those beds if the Minister would so instruct. Mr. MACLEOD said that he did that last August, and the results of that were not apparent in these figures. He hoped that it would substantially reduce the percentage of non-occupied beds.

Hospital Out-patients

Mr. GEORGE JEGE (Goole, Lab.) asked the Minister of Health whether he had given consideration to the question of reducing waiting time in hospital out-patients' departments, and what action he had taken. Mr. IAIN MACLEOD stated on May 6 that, as he had previously said, he regarded this as a matter which was primarily one for local action by the hospital authorities themselves. He was, however, proposing to ask them to review their present arrangements. He was not convinced that they could do very much by circular; a great deal more could be done by the pressure of public opinion in the different areas. He would consider a suggestion that the Central Health Services Council should be asked to make a survey of the out-patient problem.

Hospital Board Appointments

The MINISTER OF HEALTH was asked on May 6 why he had not reappointed Dr. Stark Murray to the South-West Metropolitan Hospital Board. He replied that in making this and other changes he had followed the example of his predecessors in introducing new members at regular intervals, so as to widen the opportunities for service on the boards.

Mr. H. KING (Southampton, Test, Lab.) said this doctor had been one of the most able and conscientious members of a very good board. It was a bad thing to terminate the appointments of excellent men merely because they had been six years on a board. Above all, could the Minister assure the House that political considerations did not enter this matter, as Dr. Stark Murray was a leading Socialist doctor and his successor was a leading anti-Socialist doctor? Mr. IAIN MACLEOD said that if Mr. King would look at the appointments to this and other boards he would know that there was no foundation for his suggestion.

Colonel M. STODDARD-SCOTT (Ripon, Con.) asked about the appointments of M.P.s to the boards, and the parties to which they belonged. Mr. MACLEOD said the original appointments included six M.P.s, a number subsequently increased to nine, and by a strange coincidence all nine were Socialists.

Dr. EDITH SUMMERSKILL (Fulham West, Lab.) asked whether the Minister knew that this very able doctor was a founder-member of the Socialist Medical Association. Mr. MACLEOD: "I appoint people for medical and not political considerations." Mr. PETER SMITHERS (Winchester, Con.) asked by whom Dr. Stark Murray had been succeeded, and Mr. MACLEOD said it was Mr. Lawrence Abel, one of the finest surgeons in the country.

Tuberculous Immigrants

Mr. KENNETH ROBINSON (St. Pancras North, Lab.) asked the Minister of Health on May 6 if he had any statement

to make concerning the problem of persons from abroad taking up residence in this country while suffering from active tuberculosis. Mr. IAIN MACLEOD stated that the Central Health Services Council had recommended that appropriate action be taken to ensure that those seeking work in this country from abroad should be free from infectious tuberculosis. The Standing Tuberculosis Advisory Committee, on the other hand, had expressed the view that the position did not indicate a serious menace to the health of the country. Special inquiries that had been made suggested that the number of those entering with active tuberculosis was very small indeed.

Mental Nursing Recruitment

Miss PAT HORNSBY-SMITH, Parliamentary Secretary to the Ministry of Health, replying to an adjournment debate on May 3 about the shortage of mental nurses and the action taken to encourage recruiting, told the House of Commons of the improved wages rates that had been recommended after arbitration and were now before the Whitley Council. The Ministry had launched a series of 36 publicity campaigns. It was too early to assess results. The Minister regarded this subject as of top priority, and no effort in aid and encouragement within their power would be spared to get open non-staffed beds and thereafter to provide the staff for new beds.

Scottish Hospital Board.—During the past two years, according to a reply given on May 3 by the Secretary of State for Scotland, 13 persons had ceased to be members of the South-East Scotland Regional Hospital Board and five new appointments had been made. Those who have left the board include Dr. E. A. Cormack (Edinburgh), Dr. A. Simpson (Hawick), and Sir Henry Wade (Edinburgh). The new members include Dr. J. C. G. Mercer (North Berwick), Professor G. H. Percival (Edinburgh), and Dr. G. J. Summers (Edinburgh).

Welfare Milk.—The Minister of Food stated on May 3 that on October 31 a new system of welfare milk based on weekly tokens would be introduced.

Vital Statistics

Occupational Mortality

The deaths in England and Wales in 1950 have been analysed in relation to the 1% sample already tabulated from the 1951 census to provide some preliminary figures on occupational mortality.¹ Only broad groups of occupation are listed; the medical profession is not among them. As a basis of comparison standardized mortality ratios are given in Tables I and II below, extracted from the Registrar-General's tables. These S.M.R. figures are to be compared with the figure of 100 for the total population analysed in each Table, and they illustrate relative, not absolute, differences.

Table I below, concerned with men aged 20-64, shows that there are well-marked gradients upwards in social classes I to V for deaths from chronic rheumatic heart

TABLE I

Causes	Social Class				
	I	II	III	IV	V
Malignant neoplasms, all sites	96	84	105	94	110
Stomach	57	67	100	114	132
Intestines	123	100	105	85	94
Lung, bronchus, trachea	80	79	108	89	116
Chronic rheumatic heart disease	61	87	103	102	114
Arteriosclerotic (coronary) heart disease	150	110	104	79	89
Pneumonia	43	63	97	106	157
Ulcer of stomach	56	81	97	99	144
Ulcer of duodenum	104	78	106	82	126

In Tables I and II figures in italics are based on fewer than 50 deaths, figures in parentheses on fewer than 10 deaths.

¹Registrar-General's Decennial Supplement: England and Wales, 1951. Occupational Mortality, Part I. H.M.S.O. 7s. 6d.

disease, pneumonia, and ulcer of stomach, whereas a reverse gradient is shown for cancer of the intestine and coronary heart disease.

Figures for married women aged 20-64, analysed by the same causes of death and the social class of their husbands, are given in Table II below.

TABLE II

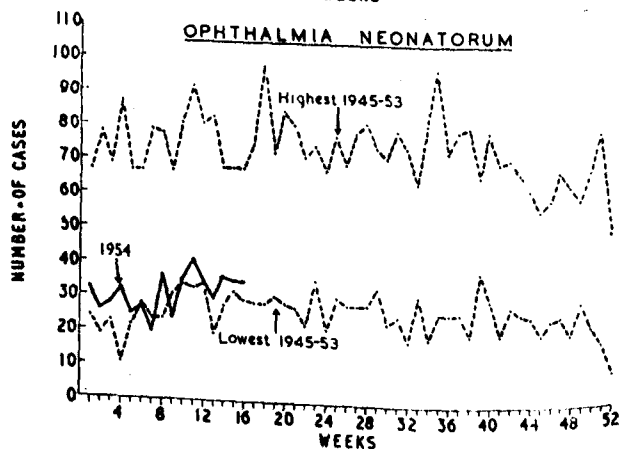
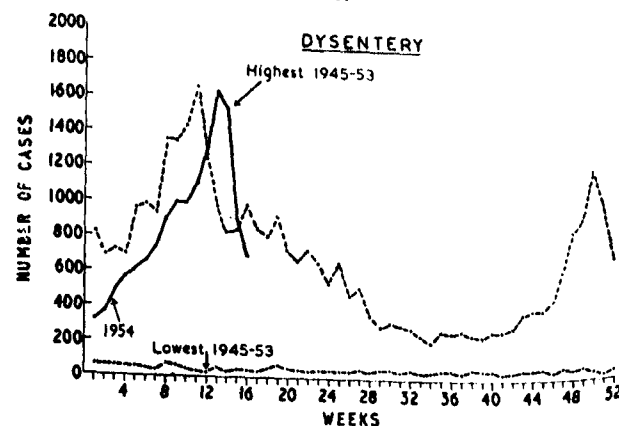
Causes	Social Class				
	I	II	III	IV	V
Malignant neoplasms, all sites	115	90	103	95	107
Stomach	57	72	101	106	138
Intestines	103	100	97	104	106
Lung, bronchus, trachea	120	94	104	96	91
Chronic rheumatic heart disease	63	62	102	118	135
Arteriosclerotic (coronary) heart disease	92	93	101	100	108
Pneumonia	69	75	98	110	138
Ulcer of stomach	(60)	93	96	124	100
Ulcer of duodenum	(100)	68	91	133	131

The infant mortality rate, being the number of deaths in infants aged under 1 year per 1,000 live births, increased through social classes I to V. In 1950 the rate was 17.9 for social class I, 22.5 for II, 28.4 for III, 34.5 for IV, and 41.1 for V; for all classes it was 29.9. The maternal mortality rate also increased by social class, figures for 1950 per 1,000 legitimate live and stillbirths being as follows: 0.77 for social class I, 0.82 for II, 0.80 for III, 0.90 for IV, and 0.93 for V; for all classes it was 0.83.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus ———, the figures for 1954 thus ———.

Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 24 (No. 16) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1954					1953				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	12	0	3	1	0	25	0	5	0	
Dysentery	711	91	351	2	1	419	53	67	8	
Encephalitis, acute	3	1	0	0		6	0	0	0	
Enteric fever: Typhoid	1	0	0	0	0	2	0	2	0	1
Paratyphoid	3	0	1	0	0	8	1	(B)	0	
Food-poisoning	85	8		0		88	12		0	
Infective enteritis or diarrhoea under 2 years				8	15				13	18
Measles*	2,196	93	184	115	405	13,731	629	568	243	168
Meningococcal infection	34	2	11	3	4	44	5	25	5	1
Ophthalmia neonatorum	35	3	7	0		30	1	4	1	1
Pneumonia†	478	32	204	9	5	681	35	223	20	8
Poliomyelitis, acute: Paralytic	6	0	3	0	0	34	8	2	0	1
Non-paralytic	4	0				7	0			
Puerperal fever‡	232	36	14	3		220	33	21	1	
Scarlet fever	789	58	122	32	35	1,047	63	165	35	83
Tuberculosis: Respiratory	706	81	148	30				163	27	
Non-respiratory	113	7	31	3				28	7	
Whooping-cough	2,133	63	314	31	25	3,206	237	429	41	149

Infectious Diseases

The largest variations in the returns of infectious diseases in England and Wales during the week ending April 24 were decreases of 208 for dysentery, from 919 to 711, and 205 for scarlet fever, from 994 to 789, and increases of 284 for measles, from 1,912 to 2,196, and 153 for whooping-cough, from 1,980 to 2,133.

Small falls in the incidence of scarlet fever were recorded in every region; the largest decline was 31 in Yorkshire West Riding, from 107 to 76. The largest increases in the number of notifications of measles were 104 in Cheshire, from 87 to 191, 64 in Norfolk, from 308 to 372, and 36 in Yorkshire West Riding, from 185 to 221, and the largest decrease was 30 in Staffordshire, from 215 to 185. 12 cases of diphtheria were notified, being 2 fewer than in the preceding week. The chief feature of the returns of diphtheria was a rise from 2 to 7 in Lancashire, where 4 cases were notified in Liverpool C.B. The largest variations in the trends of whooping-cough were rises of 33 in Sussex, from 45 to 78, 31 in Lancashire, from 190 to 221, and a fall of 35 in Kent, from 161 to 126.

10 cases of acute poliomyelitis were notified. These were 4 fewer for paralytic and 3 fewer for non-paralytic cases than in the preceding week. The only counties with 2 cases were Somerset and Yorkshire West Riding.

For the third consecutive week the number of notifications of dysentery has fallen and the total is now less than half of that of three weeks earlier. The largest centres of infection were Lancashire 138 (Denton U.D. 47, Manchester C.B. 13, Salford C.B. 12, Bolton C.B. 10), London 91 (Islington 26, Lewisham 20), Yorkshire West Riding 81 (Sheffield C.B. 19, Bradford C.B. 16, Dewsbury C.B. 16), Leicestershire 42 (Leicester C.B. 35), Middlesex 37 (Edmonton M.B. 16), Glamorganshire 34 (Llchwyr U.D. 16), Gloucestershire 31 (Bristol C.B. 25), Kent 27, Essex 24, and Warwickshire 20 (Birmingham C.B. 19).

In Scotland the number of notifications of dysentery increased by 78, from 273 to 351. The largest returns were 196 in Glasgow, 65 in Lanark county, 21 in Edinburgh, and 21 in Dundee.

Week Ending May 1

The notifications of infectious diseases in England and Wales during the week included pneumonia 521, scarlet fever 623, whooping-cough 2,233, diphtheria 12, measles 1,970, dysentery 759, acute poliomyelitis 20, paratyphoid fever 3, and typhoid fever 3.

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	1	0		0		0	0			
Encephalitis, acute		0					0			0
Enteric fever	1	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	6	1	2	1	2	11	0	1	3	0
Influenza	12	3	3	1	1	23	2	2	0	2
Measles			0	0	1		0	1		0
Meningococcal infection		0	0				1	1		
Pneumonia	197	23	22	20	7	213	38	22	12	6
Poliomyelitis, acute	1	0			0	2	1			0
Scarlet fever		0	0	0	0		0	0		0
Tuberculosis: Respiratory	96	16	10	6	6	113	17	14	0	11
Non-respiratory							3	2	0	3
Whooping-cough	1	0	0	0	0	1	0	0	0	0
Deaths 0-1 year	218	32	26	10	28	239	30	30	10	20
Deaths (excluding stillbirths)	5,218	768	612	155	171	5,273	758	606	132	201
LIVE BIRTHS	7,552	1111	1101	228	441	7,874	1172	971	272	407
STILLBIRTHS	185	26	24			217	30	25		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Royal College of Physicians of London.—The following were elected Fellows of the College on April 29: M. K. Gray, M.B. (New Zealand), I. G. Davies, M.D. (Leeds), E. T. D. Fletcher, M.D. (London), O. E. J. Murphy, M.B. (Australia), C. L. Stote, M.D. (Shrewsbury), L. G. Bell, M.D. (Canada), H. M. Rennie, M.B. (Australia), R. Whishaw, M.B. (Tasmania), A. C. E. Cole, M.D. (Tanganyika), E. C. Allibone, M.D. (Leeds), H. B. May, M.D. (London), E. M. Darmady, M.D. (Havant), H. A. Dewar, M.D. (Newcastle-upon-Tyne), J. M. Holford, M.B. (Royal Navy), A. P. Dick, M.D. (Cambridge), D. H. G. MacQuaide, M.D. (Northampton), J. Carson, M.B. (Bamford in the Peak), Raymond Greene, D.M. (London), R. J. G. Morrison, M.D. (Royal Army Medical Corps), Georgiana M. Bonser, M.D. (Leeds), C. E. Dent, M.D. (London), J. M. Naish, M.D. (Iron Acton, near Bristol), T. N. Morgan, M.D. (Aberdeen), K. S. MacLean, M.D. (London), J. Lowe, M.D. (London), A. P. Norman, M.D. (London), J. H. Paterson, M.D. (Sidcup), G. MacG. Bull, M.D. (Belfast), L. G. Blair, L.R.C.P. (London), R. Kirk, M.D. (Sudan), D. V. Hubble, M.D. (Derby), A. P. Murphy, M.D., P.R.A.C.P. (Australia), Sir Eric D. Priddle, M.B. (London), H. E. Sigerist, M.D. (Switzerland).

Seventh World Health Assembly.—Dr. M. G. Candau, Director-General of W.H.O., said when he addressed the Assembly on May 3 that the policy of decentralizing W.H.O.'s work had proved to be fully justified. In determining priorities for requests for aid, they took account first of whether the project would raise the general health standards of the country concerned. They had also to be certain that the work would be carried on and completed by the government of the country. Member countries, he said, could depend more and more on W.H.O. for assistance in improving their epidemiological services and their health statistics. They could also rely on W.H.O. to keep them informed of progress made in the scientific aspects of medicine.

Dr. J. N. Togba, of Liberia, has been elected president of the W.H.O. in succession to Dr. M. Khater, of Syria.

Professor G. Macdonald, of the London School of Hygiene and Tropical Medicine, has been awarded the W.H.O.'s Darling foundation prize jointly with Dr. G. R. Coatney, of the U.S.A. The prize consists of a medal and 1,000 Swiss francs.

Board of Registration of Medical Auxiliaries.—The first dinner of the Board was held at Apothecaries' Hall on May 4, with the president, Mr. A. M. A. Moore, in the chair. In proposing the health of the Board Sir Russell Brain, P.R.C.P., said that medical auxiliaries were an integral part of medicine and should not be looked on just as additions to medicine. The existence of the Board showed that the auxiliaries, being part of medicine, shared its ideals and sought to maintain the same high standards of skill, ethics, and professional pride. There must be co-operation not only with the profession, but among themselves. In reply Mr. Moore traced the history and development of the Board. The first move was begun in 1928, when the Representative Body of the B.M.A. resolved that, in view of the risk to the public from the use of electricity and radiation in treatment by untrained and unqualified persons, suitable courses of training should be organized under medical direction, and that those who had satisfactorily followed such a course should be entitled to have their names on an approved scroll. In 1929 the Council of the B.M.A. decided that the only method of carrying out the wishes of the Representative Body was by means of voluntary action, the most satisfactory solution being the institution of a voluntary register. This register came into being in 1930. In 1933 the Representative Body approved the establishment of a register of auxiliary medical services, and in 1936 the Board was incorporated under the presi-

dency of Sir Henry Souttar, the founder members being the B.M.A., the Society of Apothecaries, the Chartered Society of Physiotherapy, and the Society of Radiographers. Subsequently recognition was given to orthoptists, speech therapists, dietitians, and more recently to operating theatre technicians. Recognition was given only after the fullest investigation of the standards of education, training, and examination of the body concerned. The main function of the Board was to publish sectional registers of each of the qualifying bodies registered with it, and it was hoped before long that a comprehensive register would be brought out. One of the main objects of the Board was to promote legislation for the establishment of a statutory register. The Cope Report, which was published in 1951, recommended a degree of statutory registration for medical auxiliaries employed in the N.H.S. and for the registration of others not so employed if they desired it. In 1953 the Minister of Health stated in the House of Commons that there was insufficient agreement on fundamental matters to proceed with statutory registration on the lines proposed by the Cope committees. The Minister had now appointed a working party with a view to evolving a scheme acceptable both to the Minister and to the auxiliaries. Mr. Moore paid a tribute to the many persons who had played an important part in the development of the Board's work. The health of the guests was proposed by Mr. John Hanby, President of the Society of Chiropodists, and responded to in a delightful speech by Sir Heneage Ogilvie.

Availability of Cortisone.—The Board of Trade will issue import licences for cortisone or A.C.T.H. in response to applications made by or on behalf of patients who need these drugs for their personal use. The application must be accompanied by a medical certificate stating the condition from which the patient is suffering and the quantity and form of cortisone or A.C.T.H. required for treatment. The patient should send the medical certificate with a request for form ILB/A (Revised) to the Import Licensing Branch, Romney House, Marsham Street, London, S.W.1.

Rehabilitation Inquiry.—Anyone wishing to give evidence to the Committee of Inquiry on the Rehabilitation of Disabled Persons should submit it as soon as possible, and before June 30, to the joint secretaries of the committee at the Ministry of Labour and National Service, 32, St. James's Square, London, S.W.1.

Drummond Memorial Fellowship.—A fund has now been raised in memory of the late Sir Jack Drummond, and though donations are still coming in the trustees want to appoint a Fellow on October 1. The intention is to award a fellowship to "a young scientist of proved ability to engage in research on nutrition, with special emphasis on human nutrition." Appointment would be for one year at first with a stipend at the rate of £900 per annum. The trustees would consider extending it. The trustees have sent a letter to the heads of departments of appropriate institutions seeking help in the appointment of a Fellow.

The Medical World for April is a special issue devoted to smoking and cancer of the lung, containing a symposium of professional opinion on this subject.

COMING EVENTS

British Association of Sport and Medicine.—The next meeting, a symposium on athletic injuries and their treatment, will be held on May 24 in the Meyerstein Theatre of the Westminster Hospital Medical School, Horseferry Road, London, S.W.1. Details from the honorary secretary, 95, Mount Street, London, W.1.

Sir Howard Florey, F.R.S., will deliver the Croonian Lecture to the Royal Society on May 27 at 4.30 p.m. His subject will be "Mucins and the Protection of the Body."

Friends of Vellore.—A public meeting will be held at Caxton Hall, London, S.W.1, on May 27 at 7.30 p.m. The speakers will be Dr. Hilda M. Lazarus, Sir Samuel Runganathan, and Dr. Howard Somervell. Further information may be obtained from the secretary, Mr. R. Chamberlain, Annandale, North End Road, London, N.W.11.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, May 17

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.
LONDON UNIVERSITY.—At Guy's Hospital Medical School, 5.30 p.m., first of two lectures by Dr. Bernard B. Brodie (National Heart Institute, Bethesda, U.S.A.): Biochemical and Clinical Implications of Studies in Drug Metabolism.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. N. F. Coghill: Sigmoidoscopy in Medicine.

Tuesday, May 18

ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., annual general meeting. Dr. H. N. Rose: Medical Administration.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. L. Forman: Lupus Erythematosus.
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bellingbroke Hospital, Wandsworth Common, S.W.1, 8.30 p.m., Dr. Paul Wood: The Physician's Approach to Cardiac Surgery.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Almroth Wright Lecture by Dr. W. Hayes: Nature of Genetic Recombination in *Bacterium coli*.

Wednesday, May 19

ASSOCIATION OF OPTICAL PRACTITIONERS.—At London School of Economics and Political Science, 8 p.m., 26th Ethics Memorial Lecture by Mr. S. M. Wells, F.S.M.C., D.O.Rth.: Visual Problems of the Older Worker in Industry (Illustrated).
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Histology of Some Skin Conditions in Children.
INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—5.30 p.m., Dr. I. Friedmann: Malignant Granuloma of the Nose.
INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Dr. Mary Barber: Investigation of Sepsis in a Maternity Unit.
LONDON UNIVERSITY.—At Guy's Hospital Medical School, 5.30 p.m., second and last lecture by Dr. Bernard B. Brodie (National Heart Institute, Bethesda, U.S.A.): Biochemical and Clinical Implications of Studies in Drug Metabolism.
MIDDLESEX COUNTY MEDICAL SOCIETY.—At Clare Hall Hospital, 3 p.m., clinical meeting. Papers by Dr. J. S. Crowther: Spontaneous Pneumothorax, Review of 60 Cases; Dr. R. E. D. Harvey-Samuel: Marital Tuberculosis.
OXFORD UNIVERSITY.—At University Museum, 5 p.m., Litchfield Lecture by Professor W. T. Astbury, F.R.S.: Some Observations and Thoughts on the Structure and Mobility of Flagella.
ROYAL EYE HOSPITAL.—5.30 p.m., Mr. L. H. Savin: Ophthalmic Neurology (5).
WILLESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—8.45 p.m., discussion: Medical and Surgical Aspects of Diseases of the Gall-bladder and Liver. Speakers, Dr. R. B. Terry and Mr. F. W. M. Pratt.

Thursday, May 20

● GUY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Carbutt Memorial Lecture by Dr. Michael De Bakey (Baylor, U.S.A.): Surgical Considerations of Diseases of the Aorta.
INSTITUTE OF CARDIOLOGY.—9.30 a.m., Dr. J. H. Wright: Unilateral Renal Hypertension.
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Symposium: Abortion. Speakers, Mr. A. W. Bourne, Mr. L. Courtin, L.I.M., and Dr. H. J. Shorvon.
OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Mr. C. D. Read: Post-menopausal Haemorrhage.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. J. F. Goodwin: Pulmonary Hypertension.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnold Demonstration by Dr. F. Stansfield: Maxillary Air Sinus; 5 p.m., Hunterian Lecture by Professor V. E. Neagus: Comparative Anatomy of the Nose and Paranasal Sinuses.
ROYAL EYE HOSPITAL.—5.45 p.m., Miss J. M. Dollar: Films on Operative Surgery (1).
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., paper to be read by Dr. J. Donald Ball (Uganda): Endomyocardial Fibrosis in Africa (by Drs. A. W. Williams, J. N. P. Davies, and J. D. Ball). A discussion will follow.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor Lawson Wilkins (Baltimore, U.S.A.): Diagnosis and Treatment of the Adrenogenital Syndrome.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. J. H. Paterson.

Friday, May 21

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 2 p.m., general meeting. Group Captain D. A. Wilson, A.F.C.: Radiological Experiences of the Atomic Explosion at Woomera. A cine-film will follow. 3.15 p.m., Skinner Lecture by Dr. F. Baclesse (Paris): Radiotherapy in Cancer of the Breast.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. T. Brain: Skin Diseases in Children.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. D. A. K. Black: Disturbed Electrolyte Metabolism in Pyloric Stenosis.
● ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS.—5 p.m., William Blair-Bell Memorial Lecture by Dr. Ian Donald: Anteclastis Neonatorum.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Webb-Johnson Lecture by Professor H. F. Humphreys: Value of the Teeth as Evidence—Scientific, Clinical, and Forensic.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Professor G. W. Pickering: Obstetric/Gynaecological Conference.

Saturday, May 22

INSTITUTE OF ORTHOPAEDICS.—At 234, Great Portland Street, W., 10 a.m., clinical demonstration by Mr. P. H. Newman: Clinical Aspects of Lumbar Instability and its Complications.
LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—2.45 p.m., visit to Royal Horticultural Society Gardens at Wisley.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Vision for the Navy

Q.—What visual standards are required of entrants to the Royal Navy? I am sometimes asked this by the parents of boys who are considering a career in that Service.

A.—The visual standards for entry into the Royal Navy vary according to the branch of the Service. Acute form-vision in both eyes without glasses is required for those employed on look-out duties. Other branches accept men with moderate defects of form-vision which can be corrected by glasses, the wearing of which is permitted in some branches. In addition, colour perception must be within certain standards, and examination of the refraction and ocular muscle balance is required for certain categories. Broadly speaking, a candidate would be acceptable for some type of Naval Service, in so far as form-vision is concerned, if his unaided vision in each eye is not less than 6/60 and can be corrected with glasses to 6/12:6/12 or alternatively to 6/6:6/24.

Doctors who are consulted by prospective candidates for entry into the Royal Navy are advised to communicate with the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W.1, indicating which particular branch of the Navy the candidate wishes to enter. Exact details of the visual standard required for the branch in question will then be provided.

Risks of Late Child-bearing

Q.—A couple have married rather late in life. The husband is 45, the wife a nullipara of 42. They are anxious to have a child. How grave are the dangers to the mother at this age? Ought I to advise them against child-bearing?

A.—Provided that the woman's general health is good, that the blood pressure and urine are normal, and that lesions of the pelvic organs—for example, fibroids—are excluded, child-bearing at the age of 42 or later does not carry any great risk. There is a slightly increased chance of hyperemesis, abortion, toxæmia of pregnancy, placenta praevia, faulty uterine action in labour, foetal malposition, soft tissue dystocia, and stillbirth, but the dangers tend to be exaggerated, and many women having their first baby at a comparatively late age have a surprisingly smooth pregnancy and labour. In a case such as this, where the deferment of pregnancy is the result of lack of opportunity rather than of infertility, the occurrence of conception would itself be evidence of good reproductive function, and would augur well for the pregnancy and labour. Even if complications do arise they can nowadays usually be easily treated or circumvented if the delivery is conducted in a well-equipped hospital—which it should be.

Another aspect to be considered is the increased risk of foetal malformation which is present in women more than 40 years of age. This applies mainly, if not entirely, to mongolism, and, again, the chance is not so great that it should deter a couple who are anxious for a family.

Yellow Fever Vaccine for Children

Q.—What modification of dosage is required for children receiving yellow fever vaccine? Is a reaction to the vaccine likely?

A.—Children of all ages receive the same dosage of yellow fever vaccine as adults. Neither local nor general reactions occur in the vast majority of cases.

perimental animals. This implies that, even if diseases are caused by an excess of such hormones, the corticoid concentration in the blood and urine may have returned to normal by the time the patient consults a physician (Green, 1953). It remains to be demonstrated, however, that natural adrenal hormones, secreted during stress, could also exert such delayed pathogenic actions.

(5) Some investigators consider it paradoxical to assume that the same factor, stress, can both inhibit and produce disease manifestations (Rosenberg, Woodbury, and Sayers, 1952).

We have now devised an experimental model on which these points can be tested by quantitatively measurable objective indicators. To permit generalizations a simple pathogen was used which produces such fundamental disease manifestations as inflammation and necrosis—that is, lesions commonly encountered in clinical medicine. As outlined below, the basic elements of this model are: the “pathogen” or topical stressor (the principal immediate cause of disease), the direct effect of the topical stressor (the local disease manifestations, such as inflammation and necrosis), the systemic stressor (which influences the local disease manifestations), and the adrenals (upon which the actions of the systemic stressor could depend) (Selye, 1954).

The purpose of this communication is to report upon three series of animal experiments, performed with a technique of this type.

Materials and Techniques

Experimental Animals and Their Maintenance

In all these investigations we used female Sprague-Dawley rats, weighing 120–150 g. at the beginning of the experiment. They were fed on “Purina Fox Chow,” and, since some of them were adrenalectomized, for uniformity's sake all received 1% NaCl as drinking fluid.

Topical Stress

The “granuloma-pouch” technique, which has been described in detail elsewhere (Selye, 1953a, 1953b), was used to produce and assess topical stress. In essence, the test is performed by injecting 25 ml. of air under the shaved dorsal skin of the rat, this being immediately followed by the injection of some irritant, the “local pathogen,” into the regularly shaped, ellipsoid connective-tissue chamber thus formed. In the present experimental series various dilutions of croton oil (in corn oil) have been used as examples of mild and severe local stressors, respectively.

The resulting amount of a haemorrhagic inflammatory exudate can be assessed approximately, day by day, by transillumination of the pouch with an electric flashlight; it can subsequently be measured accurately by withdrawing the fluid into a graduated syringe. This serves as an indicator of inflammation.

If the granuloma is weak, and the croton-oil solution comparatively strong, then the skin which covers the granuloma pouch undergoes manifest discoloration and necrosis. This serves as an indicator of local tissue death. As will be seen below, usually there is an inverse relationship between the intensity of inflammation and of necrosis.

Systemic Stress

In the first experiment, systemic stress was produced by fasting on the third, fourth, sixth, and seventh days after the granuloma pouches were prepared. However, the animals were allowed drinking fluid *ad libitum* at all times.

In the second and third experiments, forced restraint of the animals' free movements was used as a systemic stressor. The advantage of this procedure is that it does not necessitate the introduction into the body of any foreign materials or the infliction of traumatic tissue injuries. In principle, this technique (also described in more detail elsewhere—Selye, 1954) consists in temporarily restraining free loco-

motion by fastening the animal to a wooden board with adhesive tape. Since the procedure is irritating and provokes a certain amount of struggling, the condition of the rat is not unlike that occasioned by physical and mental fatigue in man.

Earlier experiments had shown that inflammation in the granuloma-pouch can most readily be inhibited by corticoids or systemic stress during a “critical period,” at about the third and fourth days in the development of a granuloma pouch (Selye, 1953c, 1954). Hence we applied the stress of forced restraint between the 72nd and the 96th hour of the experiment, both in the second and in the third experimental series. It should be added that, although during immobilization the animals received no food, many earlier control experiments had shown that a single day of fasting has no measurable effect upon the development of the granuloma pouch.

Assessment of the Adrenal Factor

All adrenalectomies were performed through the lumbar approach—in the first experiment 24 hours before, in the second and third experiments on, the day the granuloma pouch was prepared.

Some form of corticoid therapy was given in all three experimental series. In the first experiment, in which all animals were adrenalectomized, the rats of Groups I and II received cortisone acetate, those of Groups III and IV desoxycorticosterone acetate (D.C.A.), in the form of aqueous microcrystal suspensions, as distributed by Merck and Co., Inc. Both steroids were administered subcutaneously, twice a day, at the dose of 500 gamma in 0.2 ml. of suspending agent, between the 48th and the 168th hour of the experiment—that is, during the “critical period.”

In the second and third experiments, only some of the rats (Groups III and IV) were adrenalectomized, and hence in need of corticoid substitution therapy. Yet for uniformity's sake all animals were given 1 mg. of cortisol acetate microcrystals subcutaneously in 0.2 ml. of suspending agent twice daily. Unlike in the first experiment, this slowly absorbable cortisol ester was given throughout the period of observation (instead of the rapidly absorbed cortisone acetate during the “critical period”), to ensure a more constant blood-corticoid level. Numerous preliminary tests had shown that at this threshold level both corticoids increase the systemic resistance of adrenalectomized rats sufficiently to permit survival under considerable stress, and yet in themselves they do not greatly alter such reactions to local stress as exudation or tissue necrosis in the granuloma-pouch test.

Experimental Observations

First Experiment: The Effect of Fasting Upon the Topical Actions of Croton Oil in Adrenalectomized Rats Maintained with Cortisone or D.C.A.

This experiment was performed in order to establish whether the well-known anti-inflammatory effect of starvation is due exclusively to a stimulation of antiphlogistic corticoid (A-C) production by the adrenals, or whether it can also manifest itself in adrenalectomized animals if they receive maintenance therapy with such a corticoid.

Four groups, each consisting of ten adrenalectomized rats, were treated as outlined in Table I. The amount of exudate was measured, after aspiration into a graduated syringe, on the tenth day following the preparation of the granuloma pouch. In the table the mean volume of exudate is given with the standard error.

TABLE I.—Effect of Fasting Upon Exudation Due to Croton Oil in Adrenalectomized Rats (Maintained with Cortisone and D.C.A. Respectively)

Group	Treatment	Exudate (ml.)
I	Cortisone	5.5 ± 0.5
II	Cortisone and fasting	0.5 ± 0.16
III	D.C.A.	7.7 ± 0.36
IV	D.C.A. and fasting	5.5 ± 0.34

It will be noted that, in itself, the small dose of cortisone given to these animals failed to suppress exudation (Group I). Yet it caused almost complete inhibition of inflammatory fluid formation in the fasted animals (Group II). On the other hand, the rats maintained with D.C.A. developed considerable amounts of exudate, whether they were otherwise untreated (Group III) or exposed to starvation (Group IV).

It may be concluded that, although fasting has little or no effect upon exudation in adrenalectomized animals maintained with D.C.A., it considerably augments the antiphlogistic effect of cortisone. This augmentation is manifest in the absence of adrenal tissue—that is, under conditions when the stress of starvation could not act by stimulating the production of endogenous corticoids.

Second Experiment: The Effect of Restraint (Neuromuscular Stress) Upon the Topical Actions of Croton Oil in Intact and in Adrenalectomized Rats

The second experiment was performed on two groups of ten intact and two groups of ten adrenalectomized rats. Their treatment is summarized in Table II. A compar-

TABLE II.—Effect of Systemic Stress (Immobilization), in Intact and in Adrenalectomized Rats, Upon Topical Actions of Croton Oil

Day	Group I	Group II	Group III	Group IV
1	0.5% Croton oil	0.5% Croton oil	Adrenalectomy 0.5% Croton oil	Adrenalectomy 0.5% Croton oil
4	Exudate: ++	Exudate: 0	Exudate: ++	Exudate: ++
7	Exudate: ++	Exudate: 0	Exudate: ++	Exudate: ++
8	Exudate: ++	Exudate: 0	Exudate: ++	Exudate: ++
15	Necrosis: 10%	Necrosis: 100%	Necrosis: 10%	Necrosis: 90%

tively dilute croton-oil solution was introduced into the cavity of each granuloma pouch at the beginning of the experiment. On the fourth day one of the intact and one of the adrenalectomized groups were exposed to the neuro-muscular stress, occasioned by forced immobilization (as outlined in the introductory section of this paper). On the 15th day the exudate content of the pouches was measured after aspiration into a graduated syringe, and the mean value so obtained is shown in the Table.

Perusal of Table II indicates that a large amount of exudate was formed in the non-stressed intact (Group I) and adrenalectomized (Group III) rats, while no trace of exudate could be demonstrated in the intact stressed animals (Group II). In the adrenalectomized stressed rats (Group IV), exudation was reduced by about 50% as compared with the adrenalectomized non-stressed controls.

Evidently, under these circumstances, stress proved to be a very effective antiphlogistic factor in intact animals. In the adrenalectomized rats the inhibitory effect of stress was still very obvious, but not as marked as in intact rats. This was so despite the fact that threshold amounts of cortisol were administered to all groups. Previous experiments had shown that, in adrenalectomized rats maintained with D.C.A. (which has no antiphlogistic properties), systemic stress of this kind causes virtually no inhibition of inflammation (Selye, 1954); hence it was postulated that two factors may be involved in this effect: (1) an increased discharge of endogenous antiphlogistic corticoids (which can occur only in the intact stressed rats); and (2) a peripheral synergism between the corticoids so liberated and some non-adrenal-mediated effect of stress.

It was then decided to perform a third experiment, with a still more dilute croton-oil solution, to see whether its exudate-forming action could be completely inhibited by systemic stress even in adrenalectomized rats if they are maintained on threshold doses of cortisol. At the same time, in this last experiment we wanted to test the resistance of the granuloma-pouch wall to the necrotizing action of more concentrated croton oil, given at a time when the non-stressed rats had already developed a strong granulomatous barrier. Such an experimental arrangement would permit the assessment of the functional value of

granuloma tissue as a barrier against the production of necrosis in adjacent tissues (in this case the skin).

Third Experiment: The Effect of Restraint (Neuromuscular Stress), in Intact and in Adrenalectomized Rats, Upon the Topical Actions of Weak and Strong Croton-oil Solutions Respectively

In this experiment we used two groups of ten intact and two groups of 20 adrenalectomized rats. They were treated as outlined in Table III. A weak croton-oil solution was introduced into the cavity of each granuloma pouch on the first day of the experiment. Then one of the intact and one of the adrenalectomized groups was exposed to the stress of immobilization during the “critical period.” The degree of inflammation was first estimated on the seventh day by transillumination of the pouches. Subsequently, on the eighth day, a strong (normally necrotizing) croton-oil solution was injected into the pouch cavity, and the incidence of skin necrosis was noted on the 15th day.

TABLE III.—Effect of Systemic Stress (Immobilization), in Intact and in Adrenalectomized Rats, Upon Topical Actions of Weak and Strong Croton-oil Solutions Respectively

Day	Group I	Group II	Group III	Group IV
1	0.25% croton oil	0.25% croton oil	Adrenalectomy 0.25% croton oil	Adrenalectomy 0.25% croton oil
4	Exudate: ++	Exudate: 0	Exudate: ++	Exudate: ++
7	Exudate: ++	Exudate: 0	Exudate: ++	Exudate: ++
8	Exudate: ++	Exudate: 0	Exudate: ++	Exudate: ++
15	Necrosis: 10%	Necrosis: 100%	Necrosis: 10%	Necrosis: 90%

It will be noted that, under these conditions, stress prevented inflammatory exudate formation not only in intact rats (Group II), but also in those adrenalectomized and maintained with comparatively small doses of cortisol (Groups II and IV). On the other hand, large amounts of exudate had formed both in the intact (Group I) and in the adrenalectomized (Group III) non-stressed rats, although they received the same amount of cortisol as the others. Thus the findings on the seventh day confirmed the observations of the first and second experimental series, under slightly modified circumstances.

Interestingly, the subsequent injection of strong croton oil caused necrosis of the skin in all the intact stressed (Group II) and in 90% of the adrenalectomized stressed (Group IV) rats, while all but 10% of the intact (Group I) and of the adrenalectomized (Group III) non-stressed rats resisted this necrotizing action of the strong topical irritant.

It may be concluded that, here, the same stressor, which protected against the local disease-manifestations (exudation) usually produced by a weak topical irritant, actually sensitized the tissues to the more severe damage (necrosis) normally elicited by higher concentrations of the same local pathogen. It is also evident that a transitory exposure to systemic stress on the fourth day considerably altered tissue-reactivity to local irritants introduced into the pouch, either before or after this time.

Discussion

Let us now consider the information which these experiments have furnished concerning the much-debated points enumerated in the introduction.

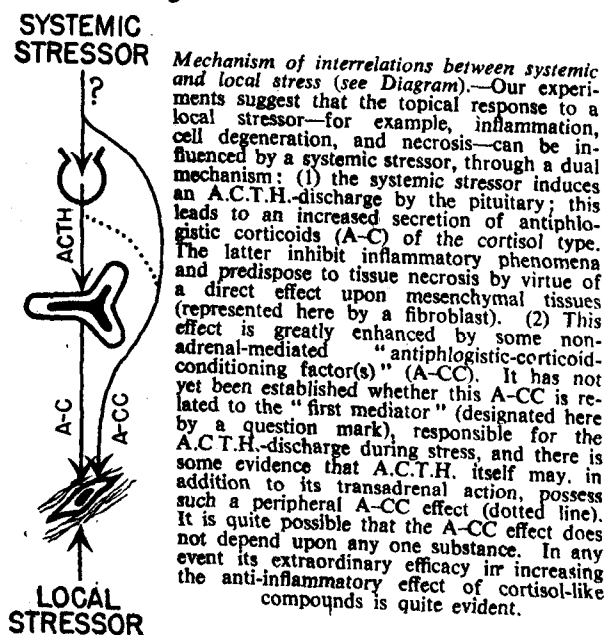
The first experiment gives objective evidence in support of what I have called the “antiphlogistic-corticoid-conditioning effect (A-CC)” (Selye, 1953b; Selye and Horava, 1953). Adrenalectomized rats maintained with small doses of cortisone are still capable of responding to topical injury by intense inflammatory exudation. If these animals are exposed to the stress of fasting they lose this ability. Here starvation obviously could not have acted by increasing endogenous corticoid secretion, since the rats had no adrenals, yet the animals, by the withdrawal of food, were conditioned for the antiphlogistic effect of exogenous antiphlogistic corticoids.

On the other hand, under similar circumstances, adrenalectomized animals maintained with D.C.A. (a steroid

devoid of antiphlogistic properties) retained their ability to produce inflammatory exudate even during prolonged starvation. Hence the inhibition of inflammation by food withdrawal cannot be the unconditional direct effect of inanition as such.

The adrenalectomized rats of the second and third experimental series showed that this antiphlogistic conditioning potency is not a specific characteristic of starvation, because it can be duplicated by an entirely different kind of stressor—namely, the neuromuscular exhaustion resulting from forced immobilization. These same animals also demonstrate that cortisone is not the only antiphlogistic hormone whose activity can thus be augmented by stress, since they were maintained on cortisol.*

The probable mechanism of these responses to systemic and topical stress is illustrated by the accompanying schematic drawing.



Another point illustrated by the second and third experiments is that tissue reactivity to topical damage can be altered not only during, but even several days after, exposure to a transitory period of systemic stress. The delayed susceptibility (predisposition for necrosis) or refractoriness (resistance to inflammation) to disease, which is thus produced by stress, depends upon endogenous corticoids, since it is not seen in the absence of the adrenals unless suitable substitution therapy is given.

Finally, the third experiment demonstrates that the same factor, stress, can both inhibit and facilitate the production of local disease manifestations, since it inhibits the phenomena of inflammation and aggravates those of necrosis.

These observations also help to understand the mechanism through which the biological reactions of systemic and local stress are integrated. The so-called “local adaptation syndrome” (L.A.S.), the characteristic triphasic adaptive response to topical injury, comprises both necrosis and

*It should be mentioned in this connexion that, in additional unpublished experiments, adrenalectomized rats were maintained on threshold doses of cortisone and injected with lyophilized thymic, lymphatic, and splenic tissue, or subjected to complete ligation of their main bile duct. These animals likewise showed complete inhibition of exudate formation in the granuloma-pouch test. Here, again, the inhibition could not have been due to the direct unconditional effect of the extracts or of biliary retention, since it was not manifest in adrenalectomized rats maintained with threshold doses of D.C.A. A variety of purified A.C.T.H. preparations (including “corticotropin-B,” kindly furnished by Merck and Co., Inc.) also proved highly effective in augmenting the antiphlogistic effect of cortisone in adrenalectomized animals. The question arises whether the various “A-CC agents” act through different mechanisms or through the intermediary of their ability to stimulate the A.C.T.H.-production of the animals’ pituitary. This point is now under investigation.

inflammation. It has been demonstrated and discussed at some length by several participants of the International Symposium on the Mechanism of Inflammation (Jasmin and Robert, 1953). The experiments reported in this paper furnish additional evidence in support of the view expressed at that Convention, that a close relationship exists between the general adaptation syndrome, as a systemic manifestation of stress, and the local adaptation syndrome, as its topical counterpart. In particular, local stress can cause systemic stress, and the latter can, in turn, greatly modify the course of the former. Indeed, various combinations of these two responses represent integral parts of many among the common maladies of man.

Our experimental model is directly concerned only with the role of the adrenals in determining the production of inflammation and tissue necrosis by a topical irritant, during systemic stress. However, inflammation, necrosis, topical irritants, and systemic stress are fundamental elements of most, if not all, maladies. Actually, there is no evidence to prove that any tissue damage (no matter where and no matter by what agent it be produced) would fail to be similarly regulated through the adrenals during the systemic stress of disease.

Summary

Using the granuloma-pouch technique, it was shown that, depending upon circumstances, systemic stress can either inhibit or aggravate the topical damage caused by exposure of a limited tissue area to a pathogen—for example, a chemical irritant, such as croton oil.

The antiphlogistic effect of stress is not merely due to increased secretion of cortisol-like hormones, since it is also observed in adrenalectomized animals maintained on (in themselves inactive) threshold doses of injected cortisol.

The aggravation of topical tissue injury by systemic stress also depends only in part upon endogenously produced adrenal hormones; it is abolished by complete adrenalectomy, but not if suitable substitution therapy with antiphlogistic corticoids (cortisone, cortisol) is given.

Both these effects of systemic stress upon topical tissue reactions can be delayed, becoming manifest only after the systemic stressor has ceased to act.

The interrelation between systemic and local manifestations of disease in general are discussed in the light of these findings.

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EXPERIENCES WITH A.C.T.H. AND CORTISONE

A NOTE ON LONG-TERM THERAPY

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A.C.T.H. and cortisone have now assumed a most important place in the treatment of a number of diseases for which we could previously do little. The prognosis of the generalized collagen diseases, certain severe skin diseases, particularly pemphigus and acute exfoliative conditions, and several eye disorders has been improved at least from black to grey. To achieve success, however, treatment must usually be continued for indefinite periods, and with the limited supplies so far available this has presented a most difficult problem. Our results in the long-term steroid therapy of these patients at Guy's Hospital are briefly presented.

The first supplies, received in December, 1950, were only sufficient to treat five patients simultaneously. It was therefore essential that a central authority should arbitrate between the requests received from the various members of the hospital staff so that the best use might be made of the amount available. The department of medicine was asked to assume this duty. As soon as a request is received the patient is visited by a member of the department and the dose and method of administration are suggested according to the needs of the case and the current level of supply. While receiving treatment the patient is visited at least once a week, and further therapy is decided in consultation with the member of the staff in charge of the case. Clinical responsibility for the patient remains entirely with the consultant under whose care he had been admitted, and the consultant's wishes regarding dosage are followed as closely as the level of supply allows. If it is impossible to meet a request the circumstances are discussed personally with the consultant concerned.

At first it was decided that patients should receive a set course of approximately three weeks, during which time they were in hospital and under constant observation. Treatment consisted of cortisone, 100 mg. daily by intramuscular injection, or of A.C.T.H., by four intramuscular injections to a total daily dose of about 60 mg. Second courses were given only in exceptional circumstances. It soon became apparent that these drugs were life-saving in certain cases, that bigger initial doses were often necessary, and that maintenance therapy would have to be arranged. Thus a greater proportion of the slowly increasing supplies had to be allotted to long-term cases which required treatment after discharge from hospital.

In mid-1951, following the results of the clinical trial reported by Renold *et al.* (1951), we began to administer A.C.T.H. by the slow intravenous drip method. We found this most satisfactory, an adequate response usually being produced with a daily dose of 20 mg. or less. Thus our supply of A.C.T.H. was enough to treat

three or four times as many patients as when it was given intramuscularly in divided doses. Late in 1951 we received the first supply of oral cortisone tablets, and at the beginning of 1953 A.C.T.H. gel became available. These new preparations were used mainly for maintenance therapy.

Method

Our present practice is to treat patients receiving these drugs for the first time according to one of the following schemes: (1) 20 to 40 mg. of A.C.T.H. daily by intravenous drip for a minimum of eight and occasionally up to sixteen hours (McIntosh and Holmes, 1951); (2) 20 to 40 mg. of A.C.T.H. gel daily, given in a single intramuscular dose; (3) 100 to 200 mg. of oral cortisone daily in four divided doses; (4) 100 to 150 mg. of cortisone intramuscularly in a single daily dose. When it becomes apparent that the disease has been controlled—usually after seven to fourteen days—the daily dose of cortisone is reduced, or the A.C.T.H. is administered on alternate days.

Initially all patients had a chart showing output and intake of fluid, and eosinophil chamber counts were performed thrice weekly. Estimations of the serum sodium and potassium, the urinary 17-ketosteroid excretion, and the erythrocyte sedimentation rate were carried out weekly. We soon found that such detailed laboratory control was unnecessary, and our practice now is to do an initial serum sodium and potassium estimation, which is repeated only if intensive therapy is continued for more than two weeks or if the patient's clinical condition warrants. If the drugs are being given daily we restrict fluid intake to about 50 to 60 oz. (1.4 to 1.7 litres) in apyrexial patients. No added salt is allowed. The patient is weighed every second day and his blood pressure is recorded daily. Drinks with a high potassium content, such as Horlick's or “ovaltine,” are given, or capsules of potassium chloride to a total of 4 g. daily may be taken.

The diagnoses of 185 patients treated between December, 1950, and June, 1953, are given in Table I.

TABLE I

Endocrine Disorders	General Medical Disorders	
Addison's disease .. 13	Ankylosing spondylitis .. 2	
Adrenalectomy (Cushing's syndrome) .. 8	Asthma .. 8	
Congenital adrenal hyperplasia .. 1	Dermatomyositis .. 2	
Hypopituitarism .. 4	Disseminated lupus erythematosus .. 5	
	Myopathy .. 3	
Dermatological Disorders	Nephritis (inc. nephrotic syndrome) .. 3	
Dermatitis of hands .. 2	Polyarteritis nodosa .. 7	
Keloid (post-operative) .. 2	Rheumatic fever .. 6	
Pemphigus .. 9	Rheumatoid arthritis .. 50	
Pruritus ani .. 2	Sarcoidosis .. 4	
Psoriasis .. 4	Scleroderma .. 11	
	Ulcerative colitis .. 3	
Haematological Disorders	Miscellaneous disorders .. 17	
Leukaemia .. 4		
Thrombocytopenia .. 3		
Ophthalmological Disorders		
Choroiditis .. 2		
Iridocyclitis .. 10		185

With the exception of those suffering from endocrinological disorders, all received intensive therapy as inpatients in the first instance. The response of these patients accorded well with that to be expected from a study of the literature, which has been well summarized by Thorn *et al.* (1953). We do not propose, therefore, to analyse these results further, but the complications encountered seem worthy of mention. Three patients on A.C.T.H. had gastro-intestinal perforations (one ulcerative colitis, one polyarteritis, and one unsuspected peptic ulcer in a patient receiving treatment for rheumatoid arthritis). Two of these patients died, and we wish to emphasize the way in which A.C.T.H. or cortisone may mask the classical early symptoms of an abdominal emergency. Three patients developed acute psychosis necessitating removal to a psychiatric unit; two of these gave a history of previous mental illness. Two patients (one nephritic, one terminal polyarteritis nodosa) died in uraemia, but death seemed inevitable before steroid treatment. One patient with polyarteritis nodosa developed

steroid diabetes. Further reference is made to this case. Minor complications included abscess at an injection site (four cases), A.C.T.H. sensitivity (one case), hypokalaemia with asthenia (one case), and occasional mild depression. Purulent bronchitis, sinusitis, and minor hand infections seemed to occur much more often than in the rest of the hospital population, and called for immediate antibiotic treatment. Special complications developing during long-term maintenance therapy are discussed under the appropriate sections.

Maintenance Therapy

Table II gives a list of 44 patients whose condition appeared to merit long-term out-patient therapy.

TABLE II

Endocrine Disorders	
Addison's disease	13
Hypopituitarism	4
Congenital adrenal hyperplasia	1
Collagen Diseases	
Polyarteritis nodosa	3
Disseminated lupus erythematosus	2
Subacute collagen disease	1
Scleroderma	5
Rheumatoid arthritis	1
Skin Diseases	
Pemphigus	6
Psoriasis (exfoliative)	2
Eye Diseases	
Choroiditis	2
Iridocyclitis, chronic	4

Note.—Discrepancies between the members in this group and those in Table I are due to numerous factors—death, distance from hospital, continued care under private physician, etc.

Endocrine Disorders

The patients in the endocrinological group have been maintained on oral cortisone under the supervision of Dr. P. M. F. Bishop and have been seen regularly at the endocrinological out-patient department.

Since October, 1952, the patients with Addison's disease have been maintained on 12.5 mg. of cortisone by mouth daily and periodic D.C.A. implants. In addition to the daily dose of cortisone, each patient is supplied with an emergency ration of 100 mg. of cortisone and 3 g. of oxytetracycline ("terramycin") which is for immediate consumption in case of sudden appearance of untoward signs—severe infection of any kind, vomiting, fever. Patients are instructed to report to hospital as soon as possible for further care on these occasions. So far the general health of these patients has been better than when they were maintained on D.C.A. implants alone. Their cases will be reported in full at a later date.

Four patients with hypopituitarism have been given cortisone as daily maintenance treatment, with good response to 12.5 mg. a day in two. A poor result has been obtained in the other two; one of these failed to respond to as much as 50 mg. a day.

The single case of congenital adrenal hyperplasia has responded well to daily doses of 25 mg. of cortisone as reported by Wilkins *et al.* (1951). Her 17-ketosteroid output has decreased and there was commencing breast development.

Non-endocrine Conditions

The remaining cases have been followed at a regularly scheduled out-patient session. This permits regular examination and laboratory follow-up when necessary. Patients who are on treatment are seen weekly or fortnightly; others slightly less often.

Maintenance therapy, in order of frequency of use, has consisted of: (a) 20–35 mg. of A.C.T.H. administered intravenously over an eight-hour period twice or three times weekly. (b) Combinations of one or two intravenous infusions as above and one or two intramuscular injections of 20 mg. of A.C.T.H. gel, so that patients received the equivalent of two or three days' prolonged adrenal cortical stimulation. (c) Combinations of intravenous A.C.T.H.

drips two or three times a week and 50–100 mg. of cortisone, in divided oral doses, on one, two, or three of the off days. (d) Oral cortisone tablets in divided doses.

Our findings are in line with those of Thorn and others in that 20–40 mg. of A.C.T.H. gel is as effective as an eight- to ten-hour drip of 20–40 mg. of lyophilized A.C.T.H. Only small supplies of gel were available during the period of this review.

If intravenous therapy is ordered, the patients arrive about 9 a.m., weigh, urinate, and then sit in comfortable armchairs to receive the drip, which usually finishes between 5 and 6 p.m. This is more convenient for reading, eating, and chatting with fellow "drips," and makes it possible to bring these patients into a busy hospital ward without overcrowding or disrupting the usual order of business. No patient has registered dissatisfaction at the use of armchairs; in fact, most of them have expressed a definite preference for the chair versus the bed.

During this long-term out-patient therapy we have used the clinical laboratory rather sparingly, not attempting any extensive metabolic follow-up. Serum sodium and potassium levels have been carried out weekly or fortnightly. Occasional blood counts, urinalyses, blood sugars, chest films, sedimentation rates, serum protein determinations, etc., have been performed as necessary. Antibiotics (particularly depot penicillin or oxytetracycline tablets) have been prescribed freely whenever there has been evidence of infection. Potassium chloride has been taken by all long-term patients in 3- or 4-g. amounts depending upon their serum levels. The decision to terminate steroid treatment has been reached arbitrarily in discussions with the original consultant. Criteria have varied with the different diseases, but, in general, the key point has been that the patient's condition must have been static for four to eight weeks. Treatment was restarted at the first conclusive evidence of relapse, and has usually produced a response adequate enough to obviate admission to hospital.

Results

Polyarteritis Nodosa

Three patients were referred to the follow-up clinic; reports on them are given below.

Case A.—A woman of 35 was desperately ill when cortisone therapy was begun. She had been asthmatic for some years and was admitted in congestive heart failure with pulmonary infection and intense bronchospasm. There was a scaly rash on forehead and cheeks, her urine contained albumin and red cells, and there was a 25% blood eosinophilia. One month earlier she had had an acute pneumonic episode which had responded to penicillin. Intramuscular cortisone (100 mg. twice on the first day and subsequently once daily) was given together with chloramphenicol. Improvement was rapid, although the oedema persisted in spite of mersalyl injections. Cortisone was stopped after three weeks in order to produce a diuresis. She relapsed almost at once and developed a mononeuritis multiplex. Cortisone was reinstituted, and the daily dose was then gradually reduced to 37 mg. orally; she then again began to go downhill and was given intravenous A.C.T.H. therapy. She has had continuous steroid therapy for 16 months and is at present well and able to perform the normal duties of a housewife. She is subject to occasional asthmatic attacks and still has a mild tachycardia. She continues to receive A.C.T.H., 20 mg. either as gel or by intravenous drip on three days a week and 100 mg. of oral cortisone at week-ends. Any attempt to reduce this dosage is almost immediately followed by a recrudescence of her disease.

Case B.—A man of 52 had a history of a pyrexial illness with marked loss of weight for eight months. He had had a haemoptysis, and serial x-ray films showed patchy transient consolidations in various parts of the lung fields. There were raised purpuric plaques over the hands and legs. He was hypertensive, and the urine contained albumin and casts. Occasional specimens showed glycosuria, but glucose-tolerance tests before and during steroid therapy were normal. Intravenous A.C.T.H. (20–30 mg. daily) was started, and after six weeks this was reduced to 10 mg. three times a week, with 25 mg. of oral cortisone on other days. Within three weeks he developed severe conjunctivitis, and purpura returned on the legs. Increasing the intravenous dose of A.C.T.H. to 25 mg., and then to

40 mg., two or three times a week did not prevent a slow deterioration, and he was readmitted for a month's intensive therapy with daily A.C.T.H. (20–25 mg. by intravenous drip or as gel). He improved greatly and after a further month in hospital, during which he received similar treatment on alternate days, he was discharged in complete remission. He has had out-patient A.C.T.H. treatment three times a week since and also continuous cortisone (100 mg. daily) but his purpura has again returned and the sedimentation rate, normal on discharge, has risen to 74 mm. in one hour (Westergren). He has, however, had little constitutional disturbance. Improved supplies of gel have enabled us to give him A.C.T.H. daily as an out-patient and he is again improving. Ten months after steroid therapy was started it was certain that neither 100 mg. of cortisone daily nor 20 mg. of A.C.T.H. three times a week (by intravenous drip or gel) would keep his disease fully controlled. This case has already been reported in full (Baker, 1953).

No spontaneous remission has therefore been produced in either Case 1 or Case 2 over sixteen and ten months respectively.

Case C.—A man of 45 had had a pyrexial illness for three months with polyarteritis, hypertension, and mild renal involvement. He then developed a patchy peripheral neuritis and his blood showed a mild eosinophilia. He was treated with intravenous A.C.T.H., 20–30 mg. daily, for two weeks and then on alternate days for a similar period. He made a complete recovery apart from slight residual paraesthesia and has been followed for a further five months without any sign of relapse.

Special Complication.—During the four weeks the third patient received A.C.T.H. he developed diabetes. This is said to be rare (Jenkins, 1953). Glycosuria had been found on several occasions before treatment, and two glucose-tolerance tests showed curves of the "lag" type. During treatment he lost 5 lb. (2.3 kg.) in weight in spite of obvious clinical improvement. All specimens of urine showed a brick-red reduction of Benedict's solution at this time. A third glucose-tolerance test, a week after treatment had finished, showed a severe diabetic response, but a further test a week later was almost normal. No glycosuria has been found at out-patient attendances since. At no time did he receive insulin. Results of the glucose-tolerance tests are shown in Table III.

TABLE III.—Results of Glucose-tolerance Tests in Case C

Date	Blood Sugars (mg./100 ml.)					
	Fasting	½ hr.	1 hr.	1½ hr.	2 hr.	2½ hr.
28/1/53	121	225	230	160	128	100
4/2/53	110	207	223	164	113	—
17/3/53	466	530	611	—	500	424
23/3/53	161	194	182	127	127	119

A.C.T.H. therapy was given from February 5 to March 6.

Disseminated Lupus Erythematosus

Two patients in whom the diagnosis has been confirmed by the demonstration of L.E. cells have been followed.

Case D.—A girl of 19 was admitted in May, 1951, severely ill with high pyrexia, polyarthritides, and the typical butterfly rash. She had had two previous acute episodes—the first in 1947, when she was in hospital for eight months with joint involvement and pericardial and pleural effusions, and the second in 1949, polyarthritides being the predominant symptom. She received intramuscular A.C.T.H. (50–80 mg. daily in four divided injections) for three weeks in June, 1951, but this was only partially successful in limiting the disease. Five weeks later a second course was started, the total daily dose being increased to 150 mg. At first she responded well, but in the third week an injection abscess caused her temperature to rise again. A.C.T.H. was stopped after 24 days and treatment by surgical incision and antibiotics was started. She improved steadily after this, and was discharged in September feeling well, although she still had a low-grade pyrexia and a high E.S.R.

A satisfactory remission continued for nine months, when high fever, anaemia, and arthritis returned and she was readmitted again severely ill. A.C.T.H. intravenous drips (45 mg. reduced gradually to 20 mg.) were given daily for three weeks and then oral cortisone, 75 mg. a day, was substituted. Her response to the A.C.T.H. had been excellent, but she lost ground during the

six weeks she received oral cortisone, low-grade pyrexia and joint swelling returning. A.C.T.H. drips twice a week (50 mg.) were started, with cortisone, 25 mg., on the other days. This completely controlled her symptoms and she was discharged on out-patient treatment. The cortisone was omitted after two more months, and she received two intravenous A.C.T.H. drips (25–40 mg.) a week with a third injection of A.C.T.H. gel (20 mg.) on an intermediate day. On this regime she has felt better than at any time since 1947 and is completely afebrile. The E.S.R., however, remains moderately raised. Steroid therapy was stopped at the beginning of July, 1953, and she remained completely well, although there has been a further increase in the E.S.R. (from 40 to 77 mm. in one hour). It is of interest that in February, 1953, while in remission on maintenance steroid therapy, she developed vertigo. Without alteration of treatment the vertigo disappeared in three weeks, while the nystagmus has persisted in diminishing intensity since. Electroencephalograms were performed during the vertiginous period and for four months afterwards. The former showed long periods of slow and fast activity, with spikes and waves on overbreathing and photic stimulation which were interpreted by Dr. D. A. Pond as being somewhat similar to those seen in epilepsy. Epileptiform seizures are now well recognized in disseminated lupus erythematosus (Sedgwick and Von Hagen, 1948; Russell *et al.*, 1951). The latter tracing was regarded as approximately normal. This patient noticed some menstrual irregularity during her prolonged course of maintenance therapy.

Case E.—A woman of 35 had had several previous attacks of joint swellings associated with lesions of the fingers originally diagnosed as chilblains. These occurred when she was 13, 21, 23, 27, and 34 years of age. They seemed to respond to gold therapy, and she was well in between the attacks. Six months before her admission to Guy's in May, 1951, she experienced severe generalized joint involvement and the rash appeared on the arms and face for the first time. She rapidly became very ill, with a high pyrexia. Intramuscular A.C.T.H. therapy (50–100 mg. in four divided doses) was given daily for four weeks and then it was changed to a daily dose of 100 mg. of intramuscular cortisone for a further three weeks. A complete remission was produced, although a low-grade pyrexia returned two weeks after stopping treatment. For the next 18 months she remained in partial remission, but her skin never completely cleared and she had bouts of low-grade pyrexia and joint involvement. In the spring of 1953 she began to relapse rapidly and was readmitted. She received A.C.T.H. gel daily for one week, followed by a similar dose on alternate days for a fortnight. Complete remission occurred, and she was discharged on out-patient treatment at the end of May. For two months she received cortisone (75–100 mg. orally) daily for two weeks each month. She lives too far away to make drip therapy practicable. She is moderately well, but relapses during the weeks off treatment.

While the spontaneous remissions and exacerbations in these two patients make it difficult to assess the value of maintenance therapy, it seems that their disease has reached a stage when steady deterioration is to be expected in the absence of steroid therapy, and that they will be able to lead active lives only if this is continued indefinitely. It has certainly proved dramatic in combating the acute stages of the disease.

Subacute Collagen Disease

A woman of 47 was admitted in November, 1952, with pyrexia, polyarthritides, and pericarditis of one week's duration. There was no previous history of rheumatic fever. The E.S.R. was 130 mm. in one hour, the blood showed an eosinopenia and the serum albumin was reduced. She had no rash, however, and marrow study failed to reveal Hargreaves cells. The diagnosis is still uncertain. Salicylates produced no improvement, but she rapidly responded to a daily intramuscular injection of cortisone (100 mg.). This was gradually reduced until after six weeks she was receiving 25 mg. orally when she relapsed. Intravenous A.C.T.H. produced immediate response, and she was discharged to out-patient treatment on three drips a week, which was later changed to cortisone, 75 mg. orally daily. She was so well that after five months all steroid therapy was stopped. Within a week the E.S.R. had risen from 15 to 84 mm. in one hour, and a few days later symptoms of pericarditis returned. These immediately disappeared when drip A.C.T.H. therapy was restarted, and she was then well and about to return to out-patient maintenance treatment. It appears that she will require continuous treatment for an indefinite period.

Scleroderma

We found A.C.T.H. or cortisone of little value in the far-advanced cases with visceral involvement and marked contractures, so that in such patients no attempt at prolonged maintenance therapy was made. Five patients with early to moderate sclerodermatous changes have been followed up for from five to fourteen months. Each has obtained a good response to intensive courses of A.C.T.H. but have relapsed between courses, slipping further downhill with each relapse. Three have now received continuous out-patient treatment with A.C.T.H. for three, two, and two months, with encouraging results. Another has improved on oral cortisone intermittently for six months. The fifth patient, who lived too far away for regular maintenance treatment has benefited from frequent periods in hospital for monthly courses of treatment during the past year.

Scleroderma in its early stages would appear to demand the highest priority for A.C.T.H. or cortisone, and it seems likely that a programme of almost continuous treatment will be necessary. It is now our practice to give each new case an intensive course of A.C.T.H. therapy (20-30 mg. daily by drip or gel) for one month and then decide whether the improvement seen makes long-term treatment worth while.

Rheumatoid Arthritis

The shortage of supplies has enabled us to undertake long-term treatment on only one patient with rheumatoid arthritis, and no conclusions can be drawn from this single case.

Pemphigus

Of the nine patients with pemphigus who received steroid therapy, six were subsequently referred for long-term treatment. Details of these cases are given in Table IV.

(Cases 3 and 4) occurred while the patients were receiving 50 mg. of oral cortisone a day. These patients have at all times responded to A.C.T.H. gel or intravenous drip, a daily dose of 20 mg. usually being adequate, although it has been necessary to give as much as 40 mg. for the first few days. Once the disease has been brought under control no relapse has occurred while the patients have been receiving three injections of 20 mg. of A.C.T.H. a week either as gel or by intravenous drip.

If cortisone is to be used in the treatment of pemphigus, therefore, a daily dose of 300 or 400 mg. may be necessary, and we consider that A.C.T.H., given either as gel or an intravenous drip, is the most economical method of treatment.

The longest remission so far obtained without treatment is nine months (Case 1), while two patients (Cases 2 and 6) are still well six and three months after the cessation of steroid treatment.

Special Complications.—As might be expected when treatment with high doses has to be continued for long periods, two of these patients developed many "Cushingoid" features, but these regressed slowly when treatment was interrupted.

Exfoliative Psoriasis

Two cases which had been treated with most of the widely used remedies were thought severe enough to warrant steroid therapy. Both responded remarkably to daily intravenous A.C.T.H. over periods of three to six weeks. After that, one was just barely maintained for two and a half months with a few skin plaques on three prolonged drips a week; when treatment was stopped he relapsed completely in three weeks, and required another intensive course for two weeks before reaching a point where out-patient main-

TABLE IV

Case No.	Sex	Age	Diagnosis	Condition before Treatment	Months since Initial Therapy	Longest Remission (Months)	Condition on July 31, 1953
1	F	53	<i>P. vulgaris</i>	Generalized pemphigus of mouth and body. Dangerously ill	25	9	On treatment. Very well. Occasional oral blisters
2	F	61	" "	Oral blisters; conjunctivitis. General condition fair	21	6	No treatment. Very well. Occasional oral blisters
3	F	55	" "	Oral blisters. General condition fair	18	3	On treatment. Well and working. Occasional blisters
4	F	52	" <i>ollicus</i>	Generalized pemphigus; heart failure. Dangerously ill	12	4	Well but lesions relapsing on face (retreated 10.8.53)
5	F	75	" <i>vegetans</i>	Oral blisters; crops starting on body. Moderately ill	9	0	On treatment. Vegetans lesions still present on face. Constitutionally well
6	F	69	" "	Generalized pemphigus; vegetans lesions on neck. Dangerously ill	8	3*	Very well. Occasional blister. No treatment

* Remission continuing.

Three of these six were critically ill when treatment was started, while the remainder, although having less constitutional disturbance, had extensive oral lesions which seriously affected nutrition. Skin lesions were present in all cases. They have been followed up for periods varying from eight to twenty-five months, and five of the six are leading full active lives with no more disability than an occasional blister. The sixth (Case 5) developed crusted "vegetans" lesions over most of the face which harboured *Staph. aureus* infection. These have so far resisted all attempts at steroid and antibiotic therapy. She is, however, constitutionally well, and new blister formation has been prevented. Since without steroid therapy all these patients would almost certainly be dead, pemphigus is obviously an absolute indication for prolonged treatment with A.C.T.H. or cortisone.

Two cases (1 and 4) were initially controlled by daily intramuscular doses of 200-300 mg. of cortisone for three days followed by 100 mg. Case 2, however, showed no improvement on 100 mg. of intramuscular cortisone daily for ten days, while a relapse of Case 3 failed to respond to 200 mg. of cortisone daily. Furthermore, two relapses

tenance was again feasible. As two more months of high doses of A.C.T.H. three times weekly plus cortisone tablets at the week-end failed to prevent slow deterioration, all steroid therapy was abandoned for a trial period.

The other patient was admitted with widespread psoriasis and pneumonia. Treatment with antibiotics preceded the use of A.C.T.H. by about a week. Response was excellent while in the ward, but out-patient maintenance was hampered by her requirement of large quantities of A.C.T.H. and by irregular attendance due to personal affairs. Eventually her steroid treatment was discontinued.

Complications.—After receiving pig A.C.T.H. for a period of three and a half months, the first patient with psoriasis began to suffer with widespread angioneurotic oedema following and/or during intravenous administration. This was the only drug he was receiving at the time. Skin tests were negative. Treatment was stopped until ox A.C.T.H. could be obtained; during his two months' treatment with this he encountered no difficulty. From our experience with these two patients we do not consider that steroid therapy is indicated in the long-term treatment of exfoliative psoriasis, although it may be of great value in tiding over

the acute exacerbations which occur from time to time. These patients required greater quantities of A.C.T.H. to suppress their disease adequately and continuously than did any other group treated. The maintenance dose of cortisone required was never determined, but it seems certain that it exceeded 100 mg. a day.

Chronic Non-granulomatous Uveitis

These cases usually are well controlled for long periods on small (25 mg.) daily doses of cortisone by mouth. All four patients have responded to steroids administered in various methods, including cortisone by subconjunctival instillation or drops. Relapses, occurring while patients were receiving local applications, have responded to systematic administration. An occasional seven- to ten-day period of intensive A.C.T.H. therapy has been followed by relatively long symptom-free periods. One patient was maintained completely symptom-free for three and a half months with two A.C.T.H. drips a week. Following cessation of treatment she went two months before misty vision and ocular discomfort returned. She then responded to small doses of oral cortisone.

Choroiditis, Non-specific

Two patients have been given intensive courses of A.C.T.H. and a two-months follow-up on out-patient steroid treatment. Most of the improvement took place during the first three weeks of treatment. There has been no evidence of relapse in five months since treatment was stopped in one; after three months the other patient noted some return of visual symptoms which responded to oral cortisone (25-50 mg. daily).

Discussion

The continued satisfactory response to A.C.T.H. and/or cortisone two or three times a week of these patients with disseminated lupus erythematosus, polyarteritis, scleroderma, choroiditis, and chronic non-granulomatous uveitis deserves emphasis. Similarly, in accordance with Lever's (1953) findings, five of our patients with pemphigus have shown excellent response to prolonged therapy; when relapse has occurred two weeks to nine months after cessation of steroid treatment, reinstitution of treatment has quickly produced regression of lesions. The least satisfactory results have been achieved in the two patients with exfoliative psoriasis who required larger doses of drug more frequently. This was mentioned by Lever (1951). In addition, each of these patients had some associated emotional factors which have been found to be so important in severe psoriasis.

This method of out-patient management offers several worthy features: maintenance of the patient's self-confidence, outside contacts, and home life; continued, rather close, observation by the physician; a tendency to lessen the prolonged stimulatory effects (Ingle, 1950; Gordon *et al.*, 1951) of A.C.T.H. and A.C.T.H. gel (Frazier, 1953) and the adrenal hypoplasia resulting from prolonged cortisone administration (Forsham *et al.*, 1950; Sprague *et al.*, 1950); and it diminishes the cost of the drugs per patient and makes more hospital beds available.

The outstanding lament sounded repeatedly in articles describing the remarkable results obtained with A.C.T.H. and cortisone in diseases of the type mentioned here is their temporary nature, due to the cost of the drug used, the accumulating untoward side-effects, and problems of administration in the case of A.C.T.H. Intermittent dosage as used by Lever and described above seems to be a partial answer to these difficulties and seems worthy of general trial. Russell *et al.* (1951) mentioned intermittent treatment with lyophilized A.C.T.H. intramuscularly on a follow-up basis in some of their patients with disseminated lupus. However, they did not elaborate on the details of treatment or their results. Slow intravenous drip therapy can be offered to out-patients effectively on an intermittent

schedule with little inconvenience to any of the parties concerned—patients, ward nurses, or physicians. A.C.T.H. gel has likewise been used satisfactorily on intermittent-dosage schedule in amounts equivalent to that (lyophilized) used for one intravenous drip. The advantages of a single intramuscular injection which can be given by the patient's own doctor are obvious. Recently the supplies of gel have increased substantially, and it seems that this will be the ideal method for continuous steroid therapy. Patients need attend hospital only for assessment and regulation of dosage at weekly or biweekly intervals, so that many will be enabled to return to work, which was impossible while the necessity for regular intravenous drip therapy continued.

Summary

A brief review of cortisone and A.C.T.H. therapy at Guy's Hospital from December, 1950, to July, 1953, is presented. In the early stages, set courses, generally of three weeks' duration, were given, the various dosage schemes of which are described. The diagnoses of the 185 patients who received treatment are tabulated.

Complications encountered included three cases of gastro-intestinal perforation with two deaths, three psychotic episodes, and one case of steroid diabetes. Four abscesses occurred at an injection site.

It soon became apparent that maintenance therapy was going to be essential in many cases, and the long-term treatment of 44 patients is discussed. Eighteen of these were suffering from Addison's disease or pituitary dysfunction, and these were supervised at the endocrine clinic by Dr. P. M. F. Bishop. The remaining 26 cases were diagnosed as follows: polyarteritis nodosa (3); disseminated lupus erythematosus (2); subacute collagen disease (1); scleroderma (5); rheumatoid arthritis (1); pemphigus (6); exfoliative psoriasis (2); eye conditions (6). The manner in which these patients were treated as out-patients and their subsequent progress are described in detail. The results obtained proved highly satisfactory. Many patients entered a phase of remission enabling treatment to be stopped, at any rate for a time. The two patients with exfoliative psoriasis responded poorly, although the acute phase of the condition was greatly helped temporarily.

The manner in which limited supplies of A.C.T.H. may be conserved by the use of slow intravenous drip therapy is stressed.

We should like to thank the physicians under whose care the patients were admitted for the help and co-operation we received from them. In particular we should like to thank Dr. E. J. Moynahan under whose care four of the pemphigus cases were admitted. He proposes to publish these in greater detail at a later date.

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NYSTAGMUS IN OTHERWISE NORMAL COAL-MINERS

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For years the popular opinion of coal-miners' nystagmus has been that it is a psychological disease and that the men are hysterical, anxious, obsessional, pathologically truculent, or, indeed, doubtfully genuine (Culpin, 1932). Moreover, Halliday (1948) has implied that the disease is "psychosocial." On the other hand, a previous study (Browne *et al.*, 1950) suggested that miners who develop the disease are very much like those who do not. In the first comparison the men were certified in 1942, and in the second, which is described in this paper, in 1950, so that any reproducibility of the main results after a period of eight years and in different groups of men may lend some weight to the original conclusions.

The problem in this disease is to apportion the cause between the physical conditions of the miner's work and the psychological and social setting of his life.

The Method

Fifty consecutive cases from County Durham were studied. In each case a certificate of disablement for the disease had been granted by the same certifying medical practitioner. They were matched with 50 normal men who were the controls, and who were chosen from the same 29 different collieries at which the men with nystagmus had been working when they were certified. These collieries were visited, and the names were selected at random from their office records to match, by age (so far as possible to the nearest decade) and occupation, the men with nystagmus who had worked there. All but three of the controls attended for examination; one of them developed nystagmus after his name had been selected, and the other two refused to come. One had "never been able to pull himself together" since his son was killed seven years before, and the mere thought of attending hospital upset him. The other was a man with a suspicious turn of mind who could not understand the method of selection.

A special clinic was instituted for this work, where the men were seen throughout by the same clinician, who took their medical and occupational histories and made a simple physical examination. They were also seen by an almoner, who inquired into their social background.

Results of Medical Study

Table 1 shows the number of miners in each decade and also the mean ages of the two groups. This was 52 years 8 months for the men with nystagmus, and 51 years 2

TABLE I.—*Number of Miners in Each Decade and Mean Ages of the Two Groups*

Age	No. of Miners	
	Nystagmus	Control
25-34 years	1	0
35-44 " " " "	9	12
45-54 " " " "	19	17
55-64 " " " "	16	15
65-74 " " " "	5	3
Mean age	52 8/12	51 2/12

months for the control group. The usual age of onset given in the literature is 45, and it therefore seems that the age of onset is tending to rise.

The previous illnesses of the two groups were almost identical (Table II). The term "nervous illness" includes psychological as well as neurological conditions, but only

TABLE II.—*Previous Illnesses*

Illness	Nystagmus	Control
Infections	2	2
Nervous	3	1
Respiratory	9	8
Circulatory	0	0
Digestive	7	8
Peptic ulcer	4	2
Skin	4	7
Bones	5	4
Endocrine	1	0
Total	35	32

two more of the men with nystagmus than of the controls complained of them. The pattern of complaints for digestive diseases, peptic ulcer separately, and skin disease is also about the same in both groups of men. However, the pulse rate (Table III) of the men with nystagmus tends

TABLE III. Summary of the Physical Findings

Average	Nystagmus	Control	Statistical Significance P
Pulse rate	79	71	< 0.005
Respiration rate	19	18	0.04
Blood pressure:			
Systolic (mm. Hg)	147	136	0.04
Diastolic (mm. Hg)	87	80	0.01
Height	66 in. (168 cm.)	67 in. (170 cm.)	
Weight	146 lb. (66.2 kg.)	150 lb. (68 kg.)	

to be a little higher than that of the controls, and the same tendency is shown by the respiration rate and the blood pressure. These are unlikely to be chance findings, but the values, even for the men with nystagmus, can hardly be regarded as abnormal. The heights and weights of the two groups are, however, much the same.

Results of Occupational Study

The number of years the two groups of men spent in various kinds of mining occupation is given in Table IV. It shows that the men who broke down with nystagmus had, on the whole, graduated to face-work earlier than had the controls. They had also served in the responsible position of deputy (or underground foreman) to a greater extent than the others. In the decade 15 to 24 the nystagmus men spent 3.3 years on face-work, but the controls only 2.2, and the next two decades show a similar trend. For the job of deputy in the decade 35 to 44 the men with nystagmus spent 0.7 year and the controls 0.5, and the figures for the next two decades (0.8, 0.7; 0.3, 0.1) are similar. Fewer absolute man-years were worked by the control group, but this is largely because there are three fewer men in it.

The type of lamp used by the two classes of men was not appreciably different (Table V), since both spent about 60% of their working lives in oil light, about 27% in hand electric, about 6% in a naked light, and about 6% with the modern type of electric lamp which fits on to the protective hat.

From the time of Snell (1892) it has always been thought that nystagmus was found more often among men who worked in low seams. It is not easy to find figures to support this, but it is indeed a reasonable supposition on clinical grounds, because oscillations of the eyes are elicited most easily either when a man is stooping or when he is looking up—both of which he has to do when the roof is not high enough for him to stand up straight, or low enough to force him to be on his face, side, or back. Table VI shows the heights in which the men worked.

TABLE IV.—Relative Number of Years Spent in Each Mining Job

Age:	15-24		25-34		35-44		45-54		55-64		Total	
Occupation	Nys.	Cont.	Nys.	Cont.	Nys.	Cont.	Nys.	Cont.	Nys.	Cont.	Nys.	Cont.
Surface ..	1.0	0.8	0.5	0.9	0.2	0.2	0.6	0.2	1.3	1.3	3.6	3.4
Haulage ..	2.7	3.0	0.4	0.7	0.1	0.4	0.4	0.8	2.0	2.0	5.6	6.9
Putting ..	3.0	4.0	0.4	0.4	0.0	0.1	0.0	0.0	0.0	0.0	3.4	4.5
Face-work ..	3.3	2.2	8.6	8.0	9.0	8.8	8.2	8.4	6.4	6.6	35.5	34.0
Deputy ..	0.0	0.0	0.0	0.0	0.7	0.5	0.8	0.7	0.3	0.1	1.8	1.3
Total ..	10.0	10.0	9.9	10.0	10.0	10.0	10.0	10.1	10.0	10.0	49.9	50.1
Absolute man-years worked	500	470	499	470	460	423	325	259	122	91	1,906	1,713

TABLE V.—*Types of Lighting Used*

Lighting	Nystagmus		Control	
	Years		Years	
	No.	%	No.	%
Naked light ..	104	6.1	112	6.9
Oil safety ..	1,057	62.4	951	58.5
Electric, hand ..	442	26.1	461	28.4
" cap ..	90	5.3	102	6.3
Total ..	1,693	99.9	1,626	100.1

TABLE VI.—*Heights in Which the Men Worked*

Height of Seam	Nystagmus		Control	
	Years		Years	
	No.	%	No.	%
Under 3 ft. (91 cm.)	257	22.8	337	31.8
3 ft.—4 ft. 11 in. (91–150 cm.)	519	46.0	332	31.3
Over 5 ft. (152 cm.)	352	31.2	391	36.9
Total	1,128	100.0	1,060	100.0

The nystagmus group spent about 15% more time in seams of 3 ft. to 4 ft. 11 in. (91 to 150 cm.), and consequently the less of its time in seams higher or lower than this. The odds against this connexion between nystagmus and working in this seam height being due to chance are less than one in a thousand ($\chi^2 = 37.0$. $P < 0.001$). There is therefore statistical support for Snell's original idea that nystagmus is found more often among the men who work in low seams. However, it is not the lowest seams that do the damage, but those of intermediate height, which cause the men to bend forward and look up at the same time.

Results of Social Study

Results of Social Study

Fourteen of the men with nystagmus and 17 of the controls were born and bred in the village in which they were living. Twenty-eight in each group came from elsewhere in County Durham, and only eight with nystagmus and two controls came from outside it, while all the men started their working lives within the area of the Durham coalfield (Table VII).

TABLE VII.—*Number of Men by Birthplace, Father's Job, and Their Own Preference for Work*

	Birthplace			Father's Job			Own Job Preference		
	Present Village	Other Village Same County	Elsewhere	Coal-miner	Other	Unknown	Coal-mining	Indifferent	Other
Nystagmus Control	14 17	28 28	8 2	41 42	8 4	1 1	21 15	19 20	10 12

Seven men with nystagmus and six controls had their early home life upset by the death of one or both parents, and one in each group had an acutely disturbed childhood deprived of normal parental care. But only one man in

each group spoke of childhood as an unhappy period; the man with nystagmus had finally run away to live with a sister; the control said that "drink was his father's downfall." All the other men in both groups appeared to have had normal home backgrounds. Varying degrees of poverty had been endured, but even when it had been "scrub and go" it did not seem to have blighted the home. Many of these men had gone short of clothes as children, but they had seldom gone short of food.

Most of them had taken it for granted that they would go into the pits as soon as they left school. Even those who had the offer of different work often chose the pits in order to remain with their schoolmates, and a few went into mining in spite of strong opposition from their parents. The range of youthful ambitions among those who would have preferred some other work was much the same in both groups. None seemed to have been strenuously opposed to the idea of mining.

Two of the men with nystagmus were under 20 when they married, and one was over 35. Five of them were single. Seventeen of the controls were under 24 when they married, 4 were over 35, and 2 were single, which represents only an insignificant difference between the two groups (Table VIII).

TABLE VIII.—*Number of Men by Age at Marriage and Type of House*

	Age at Marriage (Years)							Housing		
	— 20	21 — 24	25 — 29	30 — 34	35 +	Single	Unknown	Colliery	Council	Other Rented
Nystagmus... ..	2	21	15	6	1	5	0	19	19	7
Control	0	17	18	5	4	2	1	20	16	6

After marriage, most of them moved into a house of their own after a few months spent in rooms or with in-laws, and a waiting period of longer than a year was uncommon. Three in each group had to wait over five years before they could set up as a separate household, and one control had lived apart from his wife for six years until a house became available.

Two men with nystagmus and two controls were widowers. Two other men with nystagmus and one control had lost their first wives and married again later in life. One of the widowers with nystagmus had remarried, but had lost his second wife as well. One man with nystagmus and three controls mentioned other serious domestic tragedies. What was probably by far the heaviest emotional load had been carried by one of the controls whose wife had never fully recovered from a mental illness following the loss of her baby. One man with nystagmus whose wife "suffered with her nerves" may have had a rather difficult home background, and one other had a wife who was diabetic and probably had low social standards as well. There was no indication of severe matrimonial difficulties except in the case of one control who was separated from his wife.

Five men with nystagmus and two controls remained unmarried. One in each group lived in lodgings. The single man with nystagmus had been in the same lodgings for over 40 years. The control had changed lodgings twice in the past 27 years. One man with nystagmus was living by himself in his own bungalow. The other single men lived with relatives.

The homes were not visited, but only two men with nystagmus and one control said that their houses were in poor condition and overcrowded. There were no complaints from any of the others.

The men were asked what they liked doing in their spare time, and Table IX shows what they put first in their spontaneous answer, as well as the other activities which they

TABLE IX.—Leisure Activities

	Nystagmus		Control	
	Main Interest	Other Activities	Main Interest	Other Activities
Garden, greenhouse, or poultry...	13	8	11	8
Joinery, cobbling, and similar hobbies	2	2	—	4
Taking part in sports or games, and walking	11	7	7	10
Choir or band	2	—	1	—
Work for union, chapel, or other group	2	2	1	2
Family outings, and travel	2	—	1	1
Watching football and other sports	9	12	12	9
Club and pub	3	4	5	7
Pictures	2	3	—	4
Reading	—	2	1	1
Doing nothing	4	—	8	—

mentioned. Twenty-one men with nystagmus and 19 controls liked gardening, though some of the nystagmus group had been forced to give it up because it meant stooping. Twenty-one in each group enjoyed watching football or other sports. These were the most popular spare-time occupations, but a variety of others, both active and passive, were mentioned. One man in each group spent most of his leisure time on trade union work. Twelve men with nystagmus and ten controls had three or more separate spare-time activities apiece. At the other end of the scale, nine men with nystagmus and twelve controls had scarcely any outside interests at all.

Two men with nystagmus and three controls seemed well below the average in intelligence. At the upper end of the scale there were some highly intelligent men in both groups, but the gradation to these from the rank and file was in small stages, and the differences could not fairly be judged subjectively. The general impression was that there was not much to choose between the two groups.

One man in each group combined high intelligence with an unusually strong and stable personality and an active interest in outside affairs. Among the other memorable characters was a man with nystagmus who summed himself up by saying that "the three best things in life are singing, dancing, and rearing flowers." One of the elderly controls, an original and enterprising man, was keen to discuss the history of wood-carving in various countries.

Two in each group were excitable and voluble men who seemed a good deal less stable than the rest. Four men with nystagmus and two controls were very negative in temperament, backward in social contacts, and lacking in drive. These include the two men who had spent most of their childhood in institutions; they both seemed also of limited intelligence and both had remained unmarried. Another of the single men with nystagmus is included here, and a married control whose wife managed all his affairs for him. But in both groups the majority of men were solid ordinary miners with no outstanding characteristics.

Discussion

To select a group of conditions with well-marked but relatively inexplicable signs and symptoms, and to call them

psychosomatic—as has happened in the case of coal-miners' nystagmus—is apt to have a number of results which are not always beneficial to the patients. Research into the physical aspects and prevention of the disease are impeded. Sooner or later it gets around among the people suffering from it that they are "neurotic" or "no good," and the same attitude is apt to infect both their employers and their doctors, with the result that once they are labelled or certified they are apt to drift without adequate medical management. The past history of coal-miners' nystagmus illustrates all these points. The pulse and respiration rates and blood pressures of men with this disease are higher than normal, and the reason for this is not immediately obvious. The previous study (Browne *et al.*, 1950) showed that five years after removal from the conditions which caused the disease their systolic blood pressures were normal, but their diastolic pressures were still significantly higher than those of the controls. On the other hand, as workmen and as family men they are not worse but, if anything, rather better than other coal-miners. Both investigations suggest that men who eventually contract the disease are, until this, rather better workmen than the others. This tends to support an opinion among mine managers that the disease attacks the more conscientious men. They live in the same sort of homes as other miners and have the same sort of interests. There is, however, a connexion between working in seams of intermediate height and the onset of the disease in susceptible men which appears to be unlikely to be due to chance.

It may perhaps be objected that the number of men seen is too small or the methods used are too coarse to display any differences between the groups. But if the test of life itself, so far as it can be simply measured, fails to reveal a difference between two groups of 50 men, they are surely, for practical purposes, identical. Workers (Ohm, 1916; Riesen, 1950; Browne, 1951) widely separated by both time and space have shown that nystagmus can be produced in animals, whose visual apparatus is analogous to that of man, by simply keeping them in the dark, and that they recover when replaced in the light. This finding, together with the repeated demonstration that men with and without nystagmus are alike in other respects, suggests the conclusion that the cause of the disease is somatic rather than psychological.

Summary

Fifty consecutive men with coal-miners' nystagmus, who were given certificates of disablement by the same certifying medical practitioner, are compared with 47 randomly chosen miners without the disease, matched in respect of age, detailed job, and colliery.

The medical histories, heights, and weights of the two groups were similar, but the men with nystagmus had slightly higher pulse and respiration rates and blood pressures. The nystagmus group did not suffer more psychological disease than the controls.

The men with nystagmus climbed their professional ladder a little more quickly and spent slightly more time at higher positions. They spent the same times in the different kinds of mine lighting, but had worked more in seams of medium height.

The men with nystagmus marry at the same ages, live in the same types of house, and have the same work preference and interests outside work as do men without the disease.

The results of this study confirm those of one made of men certified with the disease eight years before, and, when related to the experimental production of the condition, lend no support to the opinion that coal-miners' nystagmus is primarily a psychological rather than a somatic condition.

There is a relation between the development of the disease in susceptible men and working in coal seams of intermediate height—3 ft. to 4 ft. 11 in. (91 to 150 cm.).

Acknowledgments are due to the National Coal Board for an expenses grant, to the National Union of Mineworkers for help in the organization of the work, and especially to the miners who acted as the control group, many of whom made long journeys to come for examination.

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TREATMENT OF PERNICIOUS ANAEMIA WITH ORAL VITAMIN B₁₂ WITHOUT KNOWN SOURCE OF INTRINSIC FACTOR

BY

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Several groups of workers have investigated the effect of orally administered vitamin B₁₂ in the megaloblastic anaemias. The majority of the reports have come from America, and include those by Berk *et al.* (1948), Spies *et al.* (1949), Hall (1950), Meyer *et al.* (1950), Conley *et al.* (1951, 1952), Glass *et al.* (1952, 1953), and Unglaub *et al.* (1954). British publications are those of Ungley (1950, 1951-2), and Girdwood (1953).

It appears from these reports that single oral doses of vitamin B₁₂ of less than 1,000 µg. have, in general, little effect, and that, while repeated daily doses of 50-100 µg. may cause some haematological response, the degree and length of improvement have been very variable. In some instances no responses were obtained. Spies and his colleagues concluded that a daily oral dose some 30 to 60 times that of a single intramuscular injection is necessary to obtain similar effect.

Ungley (1950) first showed that a single massive oral dose of 3,000 µg. of vitamin B₁₂ without any intrinsic factor was therapeutically effective in cases of pernicious anaemia

in relapse, and this was confirmed by Conley *et al.* (1951) and Chalmers *et al.* (1951). The haemopoietic effect of smaller doses of oral vitamin B₁₂ has been shown to be enhanced by giving it with normal gastric juice and other sources of intrinsic factor (see Ungley, 1950; Glass and Boyd, 1953; Latner *et al.*, 1953). Haematological responses have also been reported in cases of pernicious anaemia treated with oral aureomycin (Lichtman *et al.*, 1950), and oral and parenteral penicillin were found to be effective in the megaloblastic anaemias described by Foy *et al.* (1952). If the intrinsic factor present in normal gastric juice acts by protecting vitamin B₁₂ from utilization by intestinal bacteria, as was indirectly suggested by the work of Ternberg and Eakin (1949), these antibiotics may have increased absorption of the vitamin by alteration of the bacterial flora. Ungley (1950) tried to prove this by introducing vitamin B₁₂ into a washed portion and a partially sterilized portion of the intestines of patients with pernicious anaemia in relapse, but no responses were obtained.

In Ungley's investigations the patients were given oral doses of vitamin B₁₂ when fasting, and this condition was strictly observed in the following experiments, in which oral vitamin B₁₂, in amounts ranging from 9,000 µg. in a single dose to repeated daily doses of 50 µg., was administered without known source of intrinsic factor to cases of megaloblastic anaemia in relapse.

Material and Methods

Twelve of the patients studied were suffering from pernicious anaemia in relapse, with typical blood values, megaloblastic marrows, and histamine-fast achlorhydria. Three others had undergone gastrectomy, but resembled cases of pernicious anaemia in other respects, including their ultimate complete response to treatment with vitamin B₁₂. No free hydrochloric acid was found when test meals were attempted on these patients, and there were no symptoms or signs of steatorrhoea. Fat-balance studies were not made. Oral vitamin B₁₂ was given after different periods of observation to ensure that there was a maintained fall in pre-treatment blood-count values; Case 11, who was known to have suffered from pernicious anaemia previously and to have responded to parenteral liver extract, did not want treatment restarted "until it was necessary," and provided for us a prolonged period of control observation.

When in hospital, the patients were placed on a diet from which offal was excluded, with restriction of eggs, meat, milk, and cheese. Patients receiving single amounts of oral vitamin B₁₂ were given the dose when fasting at 9 a.m., and no food or drink was permitted for four hours afterwards. When daily doses were employed it was found convenient to give the vitamin at midnight, no food or drink being taken between the hours of 6 p.m. and 6 a.m.

TABLE 1.—Cases of Pernicious Anaemia and Post-gastrectomy Megaloblastic Anaemia treated with Single Oral Doses of Vitamin B₁₂

Case	Age and Sex	Single Dose Oral Vitamin B ₁₂	Initial Blood Values (Pre-Treatment)			Values on 15th Day after Single Dose of Oral Vitamin B ₁₂			Reticulocyte Response			Marrow after Treatment. Day of Test in Parentheses
			Hb G. %	R.B.C. Mills. per c.mm.	P.C.V. %	Hb G. %	R.B.C. Mills. per c.mm.	P.C.V. %	Max. %	Day of Maximum	Type of Response	
1	53 F	9,000 µg.	9.9	2.30	29	12.7	3.44	40	11.4	5	Sharp	—
2	70 F	6,000 "	5.2	1.14	15	8.9	2.80	31	22.5	5		—
3	38 M	3,000 "	11.1	2.35	30	13.9	3.80	40	13.0	5		—
4	65 M	3,000 "	8.1	1.95	23.5	10.7	2.80	32	32.0	5		—
5*	56 F	3,000 "	7.4	1.55	23	11.1	2.95	38	32.0	6		—
6*	40 M	2,000 "	11.5	2.80	34	13.3	3.70	39.5	9.5	5	Low flat	—
7*	47 M	1,000 "	6.8	1.42	19	7.1	1.50 (9th day)	21	8.6	6		—

* Megaloblastic anaemia occurring in patients who had undergone gastrectomy.

Normoblastic (6)
 Marked increase of normoblasts.
 Megaloblasts disappearing (2)
 Some increase of normoblasts, but still many megaloblasts (3)

TABLE II.—Cases of Pernicious Anaemia Treated with Daily Doses of 50 µg. Oral Vitamin B₁₂

Daily Dose of Oral Vitamin B ₁₂	Case	Age and Sex	Initial Blood Values (Pre-Treatment)			Values on 15th Day of Oral Vitamin B ₁₂ Therapy			Reticulocyte Response			Marrow after Treatment. Day of Test in Parentheses
			Hb G.%	R.B.C. Mills. per c.mm.	P.C.V. %	Hb G.%	R.B.C. Mills. per c.mm.	P.C.V. %	Max. %	Day of Maximum	Type of Response	
50 µg. with 0.5 g. "tween twenty" when fasting	8	59 F	6.2	1.80	18.5	9.5	2.48	28	29.0	9	Usually prolonged and of "plateau" type	Normoblastic with some transitional forms (11)
	9	44 M	9.2	2.10	26	11.8	3.02	33	13.0	10		Mainly normoblastic, but transitional forms present (11)
50 µg. in saline when fasting	10	53 F	5.9	1.50	17	8.6	2.20	27	17.0	8		Normoblastic (12)
	11	58 F	10.4	2.60	33	12.3	4.20	39	8.0	9		" (12)
	12	67 F	12.1	2.36	33	13.2	3.60	36.5	6.2	8		" (15)
	13	62 F	8.0	1.80	25	10.2	2.66	31	9.5	8		" (8)
50 µg. in saline after midday meal	14	70 F	4.9	0.97	14	7.7	1.82	23	15.6	9		Normoblast increase. Still some megaloblasts and transitional forms (15)
	15	72 M	10.4	2.34	31	11.8	2.60	33	7.3	10		

Technical methods were the same as described previously (Chalmers, 1951), except that a photoelectric colorimeter with Thompson's grey standard, calibrated so that a recording of 100% was equivalent to 14.8 g. Hb per 100 ml., was used throughout.

Results

Effect of Large Single Doses of Oral Vitamin B₁₂

Haematological responses of Cases 1 to 7 are shown in Table I. Single doses of oral vitamin B₁₂ in saline given to the fasting patients resulted in prompt haematological improvement in six of them when the dose administered was 2,000 µg. or more. Sharp reticulocyte peaks on the fifth or sixth day compared well with the results obtained by us with single intramuscular doses of 20–100 µg. of the vitamin. With the exception of Cases 4 and 7, all satisfied the formula of Della Vida and Dyke (1942) in their average weekly red-cell gain.

While Case 4 almost reached this arbitrary standard, Case 7 showed only a slight increase in red cells and reticulocytes after an oral dose of 1,000 µg., and subsequently had a secondary reticulocyte response of 26.5% after a single intramuscular

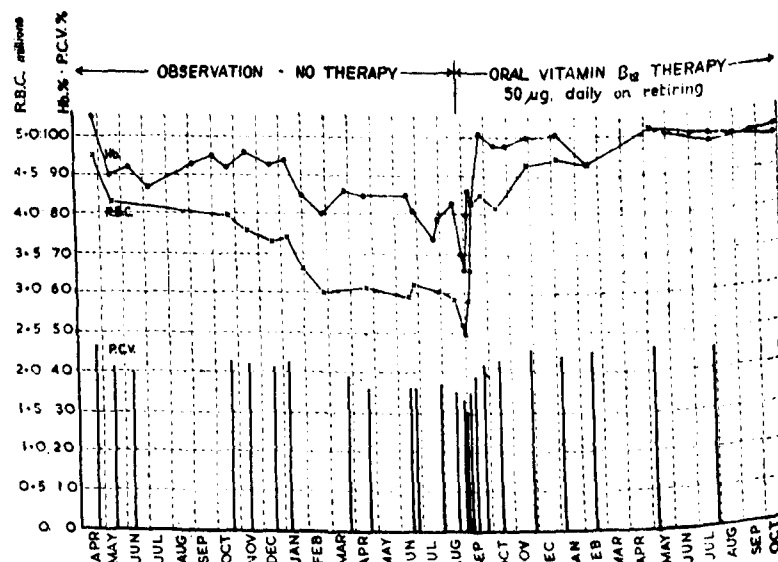


FIG. 2.—Case 11. Results of treatment with oral vitamin B₁₂ alone over a period of 18 months.

injection of 200 µg. vitamin B₁₂ given on the tenth day of the experiment.

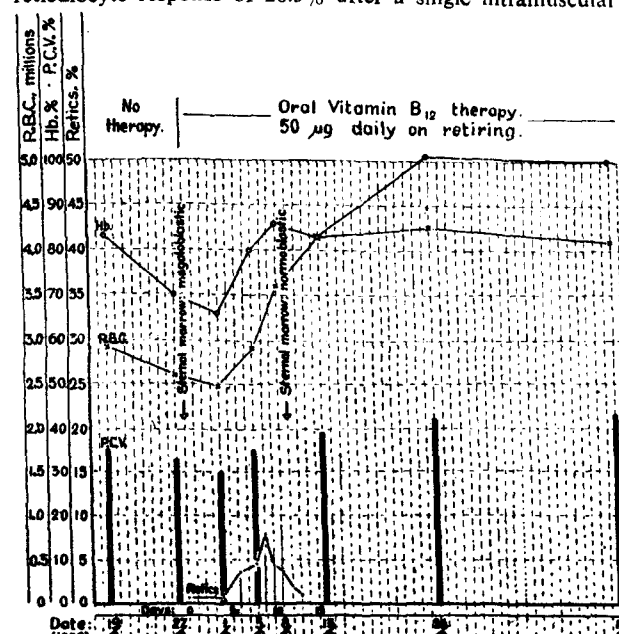


FIG. 1.—Case 11. Initial response following oral vitamin B₁₂ therapy.

Effect of Smaller Daily Doses of Oral Vitamin B₁₂
At the suggestion of Dr. W. F. J. Cuthbertson two patients suffering from pernicious anaemia in relapse were treated with oral vitamin B₁₂ in daily doses of 50 µg. combined with 0.2 g. of the surface agent polyoxyethylene sorbitan monolaurate ("tween twenty"), to see if this substance could act as an aid to absorption of the vitamin. No food or drink was taken for six hours before or after the dose was given, and the experiment was continued for 14 days. Significant clinical and haematological improvement occurred in both cases (Table II, Cases 8 and 9). Reticulocyte responses usually of a prolonged or "plateau" type were observed, the maximum levels being on the ninth and tenth days after the starting of treatment. The marrows became essentially normoblastic by the eleventh day.

Control experiments were then carried out on five further cases of pernicious anaemia in relapse, giving 50 µg. of oral vitamin B₁₂ without the surface agent for 14 days under the same test conditions. Equally good clinical and haematological improvement was obtained.

In one patient (Case 15) the same dose of the vitamin taken immediately after the midday meal showed much less clinical effect, although a small increase in red cells, reticulocytes, and packed cell volume occurred, together with some increase of normoblasts in the marrow.

Though facilities did not exist for following up most of the cases, it was possible to arrange for Case 11, who

had already accommodated us with a very adequate control period before treatment, to be maintained on doses of 50 µg. of oral vitamin B₁₂. Details of this case, showing haematological values for over a period of two and a half years, are shown in Figs. 1 and 2. She had a primary response that satisfied Della Vida's formula and has kept in haematological remission for 18 months, during which time she has received no other treatment than 50 µg. of oral vitamin B₁₂ taken every night before retiring.

Discussion

The experiments show that, under the conditions of the clinical trials described, oral vitamin B₁₂ without added source of intrinsic factor is haemopoietically active when given either in large single doses of 2,000 µg. or more or in repeated daily doses of 50 µg. The results of the experiments in which the vitamin was given in saline do not suggest that tween twenty increased absorption of the vitamin to any significant extent. The uniformly good results obtained with oral daily doses of 50 µg. could be related to the strict precautions taken to ensure that the patients took the dose when fasting and had no food for six hours afterwards.

There are several possible reasons for this. (1) In the fasting state there is greater opportunity for the vitamin to come into contact with the intestinal mucosa than when it is mixed with food. Close contact between the intestinal mucosa and vitamin B₁₂ in adequate concentration may be the necessary condition for the absorption of the vitamin without intrinsic factor. Castle and his colleagues have now suggested that the role of intrinsic factor is merely to increase assimilation of vitamin B₁₂, and that its effect may be on the intestinal wall rather than directly on the vitamin (see Berk *et al.*, 1948; Wallerstein *et al.*, 1953). (2) Vitamin B₁₂ may be destroyed by digestive secretions unless protected by intrinsic factor (Hall, 1950) and, if so, the small amount of secretions in the fasting state may not destroy all of the 50 µg. dose. (3) If intrinsic factor prevents utilization of vitamin B₁₂ by bacteria, some temporary alteration in bacterial flora when the patient is fasting may allow the vitamin to be absorbed.

Another possible reason for the responses obtained could be that the patients with histamine-fast achlorhydria were still secreting a small amount of intrinsic factor. It has been suggested that lack of intrinsic factor is not absolute in all cases of pernicious anaemia (Goldhamer, 1936; Campbell *et al.*, 1949), and, while it might seem unlikely that we would encounter this condition in a series of consecutive cases, the possibility cannot be excluded. To prove that the fasting state was important in allowing absorption of the vitamin, it would be necessary to use each patient as his own "control," giving the vitamin first with food and, later, in similar dosage when fasting. It was unfortunately not possible to carry out such studies on the present series of cases or to draw conclusions when smaller doses were given under the same conditions.

While the reason is not yet understood, it would seem that oral vitamin B₁₂—now accepted as "extrinsic factor"—can cause haematological response in cases of pernicious anaemia in the absence of any known source of intrinsic factor. We do not advocate this method of oral therapy for routine management of cases of pernicious anaemia, but our results demonstrate again that extraneous sources of intrinsic factor are not essential for utilization of vitamin B₁₂ and that oral therapy with the vitamin alone may be most effective when given to fasting patients.

Summary

Cases of megaloblastic anaemia in relapse given single oral doses of 2,000–9,000 µg. of vitamin B₁₂ showed initial haematological responses similar to those obtained by a single intramuscular injection of 20–100 µg. of the vitamin.

Daily doses of 50 µg. of oral vitamin B₁₂ taken when fasting caused significant haematological responses in cases of pernicious anaemia in relapse. A less satisfactory response was obtained when the same dose was taken with food.

The surface agent "tween twenty" did not appear to be of value in aiding absorption of vitamin B₁₂.

A case of pernicious anaemia in relapse has been initially treated and maintained in remission for over 18 months on a dose of 50 µg. of oral vitamin B₁₂ taken daily on retiring at night.

While intramuscular preparations are preferable and more convenient for routine management, it is concluded that, without intrinsic factor, oral vitamin B₁₂ can be utilized when taken fasting by patients suffering from pernicious anaemia and that clinical and haematological remission can be obtained with oral vitamin B₁₂ alone.

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Pharmaceutical exports declined slightly in 1953 to £30.7m. from £31.7m. in 1952. According to the *Annual Report for 1953-4* of the Association of British Pharmaceutical Industry the main reasons were the fall in world prices and the export of bulk instead of finished goods. The principal market was India, which took £3m. worth; British West Africa and Australia came next with over £2m. Exports to the Union of South Africa, New Zealand, Malaya, Hong Kong, and Eire each exceeded £1m. Difficulties were experienced in trade with Pakistan and Egypt. In 1952 Pakistan was Britain's second best customer with £2m., but, owing to the reduction in her own exports, imports of drugs were curtailed and fell to £823,000. Exports to Brazil, formerly about £500,000, almost entirely disappeared. Countries poorly developed industrially are beginning to manufacture drugs or at least finish the later stages. Consequently material is being exported in bulk for local finishing and profits are lower. The Chinese government is said to be embarking on a manufacturing programme which will make it independent of all outside supplies of drugs.

DIAGNOSIS OF ACUTE PORPHYRIA

BY

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Although the pattern of symptomatology in acute intermittent porphyria is recognizable with ease in retrospect or in frankly paralytic cases, it is well known that striking simulation of abdominal or neuropsychiatric disease may deceive the practitioner with no personal experience of the condition.

The disease may be described as uncommon but not rare. In Australia it is possible to arrive at an approximate estimation of its incidence. Ten cases have already been reported (Derrick, 1946, two cases; Hetzel, 1949, two cases; Saint *et al.*, 1952, six cases). Fifteen new cases were diagnosed in one year (1952-3) in Western Australia, South Australia, Victoria, and part of New South Wales, giving an approximate "standardized" incidence of 1.5 per 100,000 in adult females. Other mild cases undoubtedly pass unrecognized; but the incidence is low enough to preclude the majority of family doctors and many general physicians attending a case in the course of their professional life. Since there is evidence that the indiscriminate use of some drugs, notably barbiturates and sulphonamides, may materially worsen prognosis, it is felt that attention should be paid to early clinical recognition. Three further cases of acute porphyria are presented from this point of view.

In each case diagnosis was eventually established by the identification of porphobilinogen in the urine by means of the modified Ehrlich reaction of Watson and Schwartz (1941). Total uroporphyrin and so-called "uroporphyrin III" in 24-hour urine specimens was estimated quantitatively by methods described by Sveinsson *et al.* (1949). Urinary coproporphyrin was estimated by the method of Schwartz *et al.* (1951), using Soret absorption and corrections described by Rimington and Sveinsson (1950). The three cases were investigated in the Royal Perth Hospital between December, 1952, and May, 1953.

Case 1

Classical Acute Porphyria with Pain, Psychosis, and Neuropathy, with Death from Respiratory Paralysis

A 27-year-old married woman of Scots ancestry complained quite suddenly, in November, 1952, of nondescript pains in the legs and back, and was treated by her family doctor for "influenza." Sulphonamides and barbiturates were freely prescribed. After several weeks improvement had not occurred. She became extremely depressed and was admitted to a mental hospital, where a short course of electric convulsion treatment was given without material benefit: in fact, her condition worsened, and she was admitted to the Royal Perth Hospital in January, 1953, complaining of generalized abdominal pain of great intensity, constipation, and weakness of all limbs. For several weeks she had been vomiting intermittently, and it was clear that her nutritional status had greatly deteriorated.

Examination revealed a dehydrated woman, weeping and grimacing in consequence of severe pain, and greatly con-

fused with respect to time and space. Her temperature was 99.4° F. (37.4° C.); pulse 140; blood pressure 110/90 mm. Hg. No abnormality was detected in the heart or lungs; the abdomen, despite some pain, was lax and not tender. The cranial nerves were normal. There was profound weakness of all the muscle groups of both arms and legs and the trunk. Diaphragmatic movements appeared impaired (confirmed fluoroscopically). Her confusional state prevented a full examination of sensory function—at least, pain sensibility did not seem impaired. Loss of deep reflexes was patchy: the biceps, knee, and ankle-jerks could not be elicited on either side, but supinator and triceps jerks were present. Plantar reflexes were flexor. Freshly collected urine was a deep burgundy colour, darkening on standing in light.

For a day or two she appeared to improve, taking food and drinks by mouth satisfactorily. Pain was controlled with pethidine. In view of her inability to cough, penicillin and streptomycin were given to prevent respiratory infection. Five days after admission she became more confused than ever. Weakness of intercostal muscles appeared suddenly, and she was transferred to a Both respirator, in which she was fed by means of an intragastric drip. However, both temperature and pulse rose, weakness and confusion increased, and she died two days after the initiation of artificial respiration, seven days after admission to hospital, and two months after the onset of her illness.

The only abnormal finding from a variety of biochemical investigations was a fasting blood urea of 56 mg. per 100 ml. The Watson and Schwartz test on fresh urine was strongly positive.

Porphyrin Excretion.—Quantitative studies on urinary porphyrins are shown in Table I.

TABLE I.—Quantitative Studies on Urinary Porphyrin Excretion in Case 1. Significant Worsening of Symptoms Occurred on D+5 and D+6. Death Occurred on D+7

Day after Admission	Total vol. of Urine (ml.)	Total Uroporphyrin Excreted (mg./24 hrs.)	"Uroporphyrin III" Excreted		Total Coproporphyrin Excreted (mg./24 hrs.)
			Total (mg./24 hrs.)	% of Total Uroporphyrin	
+1	500	13.7	11.5	84	0.368
+5	475	9.7	8.7	90	0.667
+6	785	25.2	20.2	84	2.375

Necropsy.—Marked congestive changes were seen in both lungs. No macroscopic abnormality was seen in the adrenals, kidneys, spleen, alimentary tract, brain, or spinal cord. The liver showed on its surface, and on section, numerous irregularly distributed foci of yellow discoloration of inconstant shape, measuring up to 5 mm. in diameter. Microscopically, moderate patchy fat infiltration was seen. Microscopical sections of the myocardium showed marked disintegration of muscle fibres with loss of nuclei and striation. Patchy demyelination was seen in peripheral nerves.

Familial Studies.—There was no evidence of consanguinity in the marriages of the parents or grandparents of the patient. Urine from the majority of her close relatives—both parents, four siblings, and four children—was examined both qualitatively for porphobilinogen and quantitatively for uroporphyrin, with negative results.

Comment.—Although the significance of the tetrad of pain, polyneuritis, psychosis, and port-wine urine was apparent late in the course of her illness, it is not difficult to see how the vague onset must have seemed like an influenza illness to her family doctor, and how the association of depression with ill-localized pain later suggested hysteria. During this phase large doses of sulphonamides and barbiturates were administered empirically, and E.C.T. given; it is reasonable to suppose that they did not aid recovery.

Case 2

Acute Porphyria in an Elderly Patient with Associated Hypertension and Diabetes Mellitus

A 61-year-old married Scotswoman was admitted to the surgical wards in December, 1952, with severe epigastric pain. At 23 she had a caesarean section, and in 1944 spent a week in hospital with acute vomiting, dyspnoea, and signs of pulmonary oedema, attributed to hypertensive and coronary heart disease. For ten years she was known to have moderate hypertension (200/100) and mild diabetes well controlled by diet.

The abdominal pain was of sudden onset. It was accompanied by vomiting, was unremitting, and was felt in the upper abdomen, radiating to the back. She had not been taking drugs.

She was extremely obese. Her temperature was 98.4° F. (36.9° C.), pulse 130, blood pressure 200/130 mm. Hg. The heart was not apparently enlarged. There were no abnormal signs in the central nervous system. Some tenderness was noted in the upper left abdominal quadrant. The urine was straw-coloured; sugar and acetone were not detected at first examination.

During the ensuing week she continued to complain of abdominal pain. The urge to explore was resisted in the face of a lax abdomen, a normal plain x-ray film of the abdomen, a normal cholecystogram, and normal urinary findings. At least 4 gr. (0.26 g.) of phenobarbitone was given daily, along with pethidine.

When a specimen of urine was noticed to be of a reddish colour the Watson and Schwartz test was found to be positive. Thereafter she became confused and occasionally delirious. During the next two weeks her condition rapidly deteriorated: her limbs became paralysed; she had difficulty in swallowing, necessitating intragastric feeding; she developed a right facial paresis and paralysis of the limbs; all deep reflexes were absent; she became incontinent of both urine and faeces; her diastolic blood pressure remained persistently high (130-140 mm. Hg). Only a minimal degree of narrowing of vessels was seen in the optic fundi.

She died in a coma three and a half weeks after admission. Of the many investigations, significant positive findings included a fasting blood urea of 72 mg. per 100 ml., and a fasting blood sugar of 172 mg. per 100 ml. Electrocardiographic tracings showed a pattern of left ventricular strain.

Porphyrin Excretion.—Only one specimen was examined quantitatively. It fluoresced strongly in ultra-violet light. The total porphyrin content of native urine was 10.3 mg. per litre (of which 0.4 mg. per litre was ether-soluble—coproporphyrin); after heating with N/2 HCl this increased to 21.9 mg. per litre.

Necropsy.—Congestion and signs of early bronchopneumonia were present in both lungs. The heart was not enlarged and the coronary vessels showed minimal atherosclerotic changes. The pancreas was atrophic and contained areas of recent necrosis. Fat infiltration was present in the liver. Macroscopically and microscopically the kidneys appeared to be normal.

Comment.—Manifestations of porphyria begin as a rule in the third or fourth decade of life; the late onset in this patient is worthy of comment. The 64-year-old patient of Kench *et al.* (1953) is possibly the oldest on record, but symptoms were mild in their case and had been present for many years. The localization of abdominal pain was highly suggestive of pancreatitis. This was confirmed at necropsy by the appearances of recent focal necrosis in the pancreas. The association of long-standing hypertension with porphyria inevitably gives rise to speculation. Macleod and Grant (1953) describe a case with attacks of left ventricular failure: at necropsy chronic pyelonephritis was present. Our patient probably had "essential" hypertension, which by the usual clinical and pathological

criteria seems to have been relatively benign. It is not inconceivable that the attack of pulmonary oedema she is said to have had in 1944 was due to sudden rise in blood pressure, beyond an elevated baseline, due to an episode of porphyria.

Case 3

Mild Acute Porphyria with Evidence of Pancreatitis

A 27-year-old woman of Scots ancestry was admitted in April, 1953, with a short history of generalized pain and vomiting. Six months previously she had had a similar illness diagnosed as "influenza"—but, unlike a virus infection, muscle pain had persisted three weeks. On the present occasion she complained of occipital headache, pain in the back and legs, and nausea. The urine was noted to be "dark": her family doctor was inclined to diagnose subicteric infectious hepatitis, which was endemic in the neighbourhood.

Although she looked ill the only abnormal sign was an unexplained tachycardia of 130 a minute. The liver was not enlarged and the abdomen was lax. Her blood pressure was 130/72 mm. Hg. There were no abnormal signs in the central nervous system. The urine was amber-coloured.

For a week after admission her chief complaint was of pain in the epigastrium radiating to the back, with intermittent vomiting. The Watson and Schwartz test proved to be positive. The site and radiation of pain suggested pancreatitis, which was confirmed by the finding of raised levels of serum amylase (see Table II). She was discharged, free of pain, three weeks after admission.

TABLE II.—Quantitative Studies on Porphyrin Excretion in Case 3. Related to Severity of Abdominal Pain and Serial Estimations of Serum Amylase

Day after Admission	Vol. of Urine 24 hours (ml.)	Total Uroporphyrin mg./24 hr.	Uroporphyrin III		Abdominal and Back Pain	Serum Amylase (units) (N=70-200)
			mg./24 hr.	% of Total Uroporphyrin		
+7	—	—	—	—	±	20
+8	—	—	—	—	++	—
+9	—	—	—	—	+++	228
+10	—	—	—	—	++	—
+11	990	5.76	4.30	75	—	—
+12	—	—	—	—	±	—
+13	—	—	—	—	—	359
+14	—	—	—	—	—	—
+15	910	3.39	2.95	87	—	384
+17	1,410	6.60	5.80	88	—	—
+18 & 19	1,530	2.26	2.00	87	—	—
+20 & 21	3,020	2.67	2.12	79	—	—
+22	880	1.65	1.20	73	—	285
+23	2,010	2.83	2.42	85	—	50
+25	—	—	—	—	—	—

The majority of investigations were negative, apart from the bromsulphthalein test, which showed 12% retention of dye at 30 minutes; other tests of liver function were normal.

Porphyrin Excretion.—Porphobilinogen was present in all specimens examined. The daily output of total uroporphyrin varied between 1.65 and 6.60 mg., between 73 and 88% being present as uroporphyrin III (see Table II).

Comment.—This was a comparatively mild episode, probably only the second the patient had ever had. As in Case 1, the initial diffuseness of pain led to a provisional diagnosis of virus infection. Happily, sulphonamides and barbiturates were not prescribed. As in Case 2, the site of pain was compatible with a clinical diagnosis of pancreatitis, proved biochemically.

Discussion

These case records indicate how vague and misleading are the early symptoms of acute porphyria. The simulation of abdominal emergencies (Case 2) is well known; but pain may not always be confined to the abdomen (Cases 1 and 3)—"virus infection," "rheumatism," "fibrositis," and "hysteria" were the diagnostic dustbins into

which our patients had been relegated at an early stage in their illness. Too great a reliance cannot be placed on the colour of the patient's urine; early in the course of the illness of Case 3 the urine was of normal appearance. In diagnosis the Watson and Schwartz test for porphobilinogen is an extremely simple and valuable one which can be performed in any side-room; moreover, it is wholly reliable (Hammond and Welcker, 1948). It is possible that the more widespread use of this diagnostic test might bring to light many more mild cases of porphyria.

This question of early diagnosis and the diagnosis of mild cases is of more than purely academic interest. At present the disease defies comprehension, and treatment is for the most part supportive, attention being paid to nutrition, prevention of respiratory complications, and the control of pain. The supervention of profound and widespread paresis should not engender complete despair: Saint *et al.* (1952) described a case with paralysis of the diaphragm and intercostal muscles in which full recovery occurred after two weeks in a respirator. If we can do patients little positive good, there is certainly evidence that we can do positive harm. The unfavourable influence of sulphonamides and barbiturates on the natural history of the disease has been recorded too often to be ignored. Unfortunately the very symptoms with which the disease is announced—pain and psychotic behaviour—are those which often call for the empirical use of these drugs. The answer to the problem must lie in awareness of the diagnosis.

Like the understanding of the underlying metabolic anomaly, the origin of symptoms in porphyria remains obscure. There is much to support the contention of Denny-Brown and Sciarra (1945) that many of its manifestations are explicable on the basis of spasm of smooth muscle, particularly of the circular muscle of small arteries. The diffuse pathological changes seen in the central nervous system and elsewhere are highly suggestive of focal ischaemia. In this respect the variety of systemic manifestations—renal (hypertension), abdominal, neurological, myocardial—calls to mind that other disease of focal ischaemia, *periarteritis nodosa*. To the long list of organs involved in porphyria the pancreas must now be added, for the clinical, biochemical, and pathological evidence of mild pancreatitis in Cases 2 and 3 was wholly convincing. It is interesting in this connexion to note that pancreatic involvement sufficient to cause abnormality in the sugar-tolerance curve in *periarteritis nodosa* has been recorded by Middleton and McCarter (1935) and by Baker (1953).

Summary and Conclusions

A survey of the reported cases of acute porphyria in Australia indicates an approximate incidence of 1.5 per 100,000 females over the age of 15 years.

Three cases with classical biochemical findings are described in which the earliest symptoms bore little relation to the "classical" picture of the disease.

In two cases pain was entirely peripheral in distribution, and was attributed to mild infective illness. The unfolding of neuropsychiatric symptoms and signs followed the administration of barbiturates.

In two cases the abdominal pain was due to pancreatitis, proved biochemically and at necropsy.

The importance of early recognition is stressed so that the harmful influences of sulphonamides, barbiturates, electric convulsion therapy, and unnecessary surgery may be avoided. The more widespread use of the simple Watson and Schwartz test in the diagnosis of obscure abdominal and peripheral pain, hysteria, unexplained depressive states, and neuropathy is urged.

We are grateful to Dr. J. Ord Poynton, of the Institute of Veterinary Science, Adelaide, Mr. Ian Parsons, of the Department of Biochemistry, University of Melbourne, and Dr. C. R. B.

Blackburn, of the Royal Prince Alfred Hospital, Sydney, for information regarding the incidence of porphyria in Australia; and to Drs. Ian Thorburn and John Calder and Mr. N. Robinson for permission to quote the cases under their care.

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ACUTE PANCREATIC NECROSIS AS A CAUSE OF SUDDEN DEATH

BY

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Acute pancreatic necrosis has long been recognized as an acute and frequently fatal abdominal catastrophe, but it does not usually figure as a cause of sudden death. Roberts *et al.* (1950), however, mentioned the possibility, and Gaskell (1942) described 10 cases of sudden death from this condition.

During the past two years five cases have been encountered in the course of post-mortem examinations carried out at the Royal Victoria Infirmary, Newcastle-upon-Tyne, all of them investigated at the request of H.M. Coroner. In the following account a short summary of the clinical history of each case is given together with descriptions limited to the state of the pancreas and adjacent organs and any other positive findings.

Case Histories

Case 1.—A public works contractor aged 48 (weight 112 kg.), an obese subject enjoying good health, was suddenly seized with acute abdominal pain. He became breathless at work, collapsed, and died instantly. A month previously he had suffered an attack of "food poisoning," with subsequent recovery. **Post-mortem Examination:**—The pancreas (weight 200 g.) was soft and swollen, and the cut surface showed diffuse areas of haemorrhage with a limited amount of fat necrosis. Histology confirmed a severe necrosis of the pancreas with abundant haemorrhage. Stomach and duodenum contained a recent meal; the mucosal surface appeared congested. The liver showed severe fatty change. The lungs were congested and very oedematous.

Case 2.—A brewer's cooper aged 62, well nourished and of good physique (weight 70 kg.), who normally enjoyed good health, suddenly complained of abdominal pain whilst at work. His colleagues saw him collapse. He lost consciousness and died instantly. **Post-mortem Examination:**—The pancreas (weight 160 g.) was dark plum-coloured and flecked with yellowish necrotic material. Histology showed a haemorrhagic necrosis of pancreatic tissue with limited fat necrosis. The stomach, duodenum, gall-bladder, and bile ducts appeared normal. The lungs were severely congested and oedematous.

Case 3.—An obese elderly woman aged 73 (weight 65 kg.), living at home, had been under the care of her doctor for several years on account of thrombophlebitis in her right leg. She developed symptoms suggesting pulmonary embolus a few weeks before death, but subsequently recovered. On September 10, 1952, she got out of bed at 10 a.m., suddenly collapsed, and died. **Post-mortem Examination:**—The pancreas (weight 140 g.) was swollen, soft, and oedematous, with numerous subcapsular haemorrhages. On section one major haemorrhage was seen in the head of the pancreas with numerous smaller ones throughout the gland. There was a minimum amount of fat out the gland. Histology showed a complete necrosis of the parenchyma with perivascular haemorrhages. The stomach and duodenum contained a recently ingested meal. The gall-bladder contained numerous pigment stones, but the mucosa was normal in appearance. The bile ducts were healthy. The splenic vein contained a recent ante-mortem thrombus. The main pulmonary arteries contained ante-mortem thrombi, which were firmly adherent to the vessel walls and were shown histologically to be in varying stages of organization. There was moderate atheroma of the coronary arteries but no recent thrombus. Two large simple cortical cysts were present in the left kidney. There was an extensive organized thrombus in the right femoral vein.

Case 4.—A well-nourished woman aged 69 (weight 58 kg.), living at home, had been in failing health for some months. She complained of sudden pain in the chest and brought up a small quantity of blood. The pain subsided, but the following morning she had a further severe attack of upper abdominal pain, collapsed, and died before her doctor arrived. **Post-mortem Examination:**—The entire pancreas (weight 145 g.) was found to be swollen and congested. Sectioning showed an extensive haemorrhagic necrosis of the head of the pancreas with smaller haemorrhages throughout the gland. Histology confirmed extensive necrosis of glandular tissue with diffuse haemorrhage and slight fat necrosis. The stomach contained altered blood and mucus, with congestion of the mucosa and scattered submucosal haemorrhages. The duodenum was moderately congested. The gall-bladder and bile ducts appeared healthy. The lungs showed oedema.

Case 5.—A general labourer aged 28, well developed and in good nutrition (weight 68 kg.), had been in normal health. On November 11, 1951, he ate a good lunch and shortly afterwards ran some distance and boarded a bus. On reaching his seat he was seen to slump forward, and by the time help arrived he was dead. He had been treated at the age of 16 for meningitis. In 1945 he had been wounded in the leg while serving with H.M. Forces in Germany. **Post-mortem Examination** showed a haemorrhagic necrosis of the head of the pancreas, which was confirmed histologically. The stomach contained a large quantity of recently ingested food; the mucosal surface was healthy. The duodenum was congested. The gall-bladder and bile ducts were healthy.

One further case deserves mention. A man aged 65, who had been in previous good health, was found by the police unconscious in his bedroom. In hospital he revived slightly with nikethamide, but relapsed into coma and died the following day. Subsequent necropsy revealed an acute haemorrhagic pancreatitis, which was confirmed by histological examination. In view of the delay between discovery and death, this case cannot be accepted as one of sudden death, but nevertheless it bears certain similarities to the series being described.

Comment.—The main necropsy findings in all cases were acute haemorrhagic pancreatitis with necrosis of the parenchyma. Fat necrosis was present in variable amounts but was not a prominent feature. The susceptibility of the pancreas to post-mortem autolysis was borne in mind in assessing the lesions, but in all cases the cellular activity and haemorrhagic infiltration indicated a genuine necrotic process. Sudden death was common to all cases. In Case 4

the history suggested two separate attacks, the second one being instantly fatal. In Case 3 the issue was obscured by a concurrent pulmonary embolism, but it was felt that the extent of the pancreatic lesions together with considerable organization of the majority of the pulmonary thrombi warranted the pancreatic condition being cited as the cause of death. In none of the cases was there evidence of coronary arterial thrombosis.

Discussion

The aetiology of this condition remains obscure. Certain authors regard the lesion as the result of auto-digestion by activated pancreatic enzymes, resulting from acinar rupture taking place at the height of enzyme secretion. The fact that the lesion may occur in the wake of a recently ingested meal would tend to support this idea. Lium and Maddock (1948) reinforce this interpretation by animal experiments in which they produced pancreatic necrosis in starving rats by ligating the ducts and then stimulating the gland by artificial means. The most extensive inflammatory changes followed ligation of the ducts at the height of digestion, approximately two hours after the animal had eaten. Paxton and Payne (1948) stressed the role of alcoholism as an aetiological agent. In two of the cases described above there was a history of alcoholic tendencies.

The possibility of the lesion being primarily the result of vascular disease must also be considered. In two of the above cases ante-mortem thrombi were located in pancreatic arterioles not immediately related to necrotic tissue. This would tend to suggest that in the more acute forms of the disease there may well be a primary arteriolar thrombotic process giving rise to acute haemorrhagic infarction of the pancreas, with subsequent liberation and activation of gland enzymes. At any rate, the arteriolar lesions probably succeed in promoting extension of the lesion if not in initiating it, and may well be a main factor in rendering this type of pancreatic necrosis an irreversible and frequently fatal disease.

Summary

Acute pancreatic necrosis can cause sudden death. Five such cases are described. The aetiology of the condition is briefly discussed.

Attention is drawn to the significance of arterial thrombosis as a factor in the pathogenesis of the disease.

I wish to thank Professor J. B. Duguid for his helpful criticism and advice.

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The need for a home where severely handicapped children can stay for short periods during holidays and family crises has so impressed the Invalid Children's Aid Association that it has turned over its John Horniman Home at Worthing to this purpose. The home, which is in the charge of a married couple with nursing and domestic assistance, can take 24 children (boys 7 to 13 and girls 7 to 15 years, inclusive). Physiotherapy is available at the local hospital. The maximum length of stay is eight weeks, and the fee £5 10s. a week. Children with the following disabilities are considered suitable: spina bifida, poliomyelitis, congenital deformities, haemophilia, muscular dystrophy, cerebral palsy (I.Q. not below 65), fragilitas ossium, congenital or quiescent rheumatic heart disease. Children are not accepted who have been ascertained as mentally defective, or who suffer from epilepsy, pulmonary tuberculosis, or blindness. Application forms for admission and further details may be obtained from Miss Rattenbury, 4, Palace Gate, London, W.8.

BACK TO BILLROTH I

A COMPARISON OF RESULTS OF BILLROTH I
AND II OPERATIONS

BY

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More than a million people in these islands are denied the pleasure of the table for weeks or months or years at a time owing to peptic ulcer. The most frequent sufferer is the breadwinner of the family, and as the pit of his stomach grows heavy his purse grows light, his face long, and his temper short, until in time the whole family comes to feel the strain of father's ulcer. This miserable "pre-gastrectomy syndrome" can be exchanged for a life of domestic and epicurean bliss, up to the levels permitted by political expediency, for most of these medical sufferers by well-planned, old-established, and adequately performed surgery. This happy "post-gastrectomy syndrome," which can be at times for the "ninety and nine," is too often forgotten in the quest of the unfortunate "one."

Much attention has been given to features arising after gastrectomy and labelled "post-gastrectomy syndrome," as if they were a customary expectation following partial gastrectomy. Perhaps a better description of what is implied would be "post-Polya-gastrectomy syndrome."

A great volume of work has been published on the late results of gastrectomy for benign ulcer, and, as fresh complications after the Polya procedure have been brought to light, loops have been passed for a time from right to left then back again, made antecolic then retrocolic, made long then short, then long again. "Valves" also have had an equally unsettled existence. In the past decade attempts were made to clarify these issues by accurate measurement of long-term results, "dumping" was born, and later came the after-birth of "early and late syndromes." Most of the analyses have been on the results of some modification of the Billroth II operation, whether it be the Polya or a "valve" with a disputed, unpronounceable title. This state of affairs is largely due to the Polya operation having been made fashionable, partly because of the comparative ease with which it can be performed, and partly by the untested faith of those early zealots who first gave it to us. There have been few reports on post-operative studies of series of Billroth I gastrectomies, and still fewer on a comparison of results of the various methods.

Capper and Butler (1951), in assessing 102 patients treated by the Billroth I method, compared these with several groups of about the same number treated by varieties of the Polya-type gastrectomy, and they found no patients with early post-gastrectomy syndrome in the Billroth I group as against 12-15% in each Polya-type group.

Wells and Brewer (1948) say they found no dumping in 363 cases, mostly of the Polya type, but Wells and Welbourn (1951), in what is mostly an excellent review, claim enough experience to be able to write about it. They state that the Billroth I operation is technically difficult in duodenal ulcer and that ulcers are apt to recur. They referred to Wells and Brewer (1948) for

evidence, but Wells and Brewer claim only 24 patients treated by the Billroth I technique. Further, they say it is likely that their deductions are false, as in most of the examples of the Billroth I operation which they quote the resection of the stomach was inadequate. There is no sound evidence here.

On the other hand, Schoemaker (1947), in 129 patients with peptic ulcer (40 gastric and 89 duodenal), used his own modification of Billroth I in 111 patients without any instances of dumping in the follow-up.

Custer, Butt, and Waugh (1946), at the Mayo Clinic, say that they did not find dumping in the cases treated by the Schoemaker modification of the Billroth I, but they had a high incidence of dumping in those who had undergone the posterior Polya anastomosis. They say it follows gastric resection of the latter type in 5-12% of cases and is apt to be permanent.

In a comparison of results there is no sound evidence against the Billroth I procedure, but there is some solid evidence for it. There is much sound evidence against the Polya types of anastomosis.

Mortality

My personal experience of Billroth I and Polya operations for benign ulcer to the end of 1952 is: Billroth I, 193 operations (gastric 93, duodenal 100); Polya, 89 operations (gastric 16, duodenal 73). The proportion of Polya operations is much higher than I would now advise or find necessary. The mortality of these operations is as follows:

Billroth I Series (193).—(a) Elective operations (162)—1 died. Post-mortem examination: a wasted man of 69 explored on the suspicion of carcinoma and dying of bronchopneumonia. (b) Emergency operations for bleeding (31)—3 died. Post-mortem examination: (i) coronary thrombosis; (ii) massive pulmonary embolism; (iii) leakage of suture line.

Polya Series (89).—(a) Elective operations (82)—3 died. Post-mortem examination: (i) a man of 73 operated on for pyloric stenosis died of bilateral suprarenal haemorrhage; (ii) a man of 45 operated on for duodenal ulcer died of inhalation pneumonia; (iii) a man of 57 operated on for duodenal ulcer died from leakage at the duodenal stump. (b) Emergency operations (7)—1 died. Post-mortem examination: a woman of 57 operated on for a huge duodenal ulcer with uncontrolled bleeding died from rupture of a posterior perigastric abscess with no good evidence of leakage.

The mortality for all elective operations was 4 deaths in 244 resections, and for all emergency operations for acute bleeding 4 deaths in 38 resections.

The safety of the Billroth I operation has been questioned at times on the grounds of a high incidence of leakage at the so-called "danger angle," where the reconstituted lesser curve meets the gastro-duodenal suture line. In this series there was no evidence of leakage in 162 elective operations, and in 31 emergency operations the only instance occurred in a woman of 84 with acute haematemesis who developed the signs of a leak on the sixth day after operation following removal of the aspiration tube on the fifth day. The post-mortem examination showed poor healing reaction and a leakage at the danger angle. Fluid had accumulated in the stomach and the resulting drag had caused the sutures to cut through the tissues in the absence of support by natural healing. The debilitated 84-year-old patient often heals poorly.

On this evidence it would be fair to say that the results of the Billroth I operation from the surgical aspect of the resection and anastomosis are almost devoid of mortality.

In the Polya series there was one instance of leakage at the Achilles heel, the duodenal stump. This operation is equally safe in accustomed hands, as shown by Hosford (1949), who had 1 death in 200 elective operations, com-

pared with 1 death in 162 elective operations by Billroth I technique in my series. So there is no evidence of any significant difference in the relative safety of either operation when properly performed, and the relative merits must be judged by the degree of sequelae.

Morbidity

It was my impression that the patients on whom I had performed a Billroth I gastrectomy were not showing the dumping syndrome, nor were a proportion wasting as were some of those patients who had had a Polya gastrectomy. It was to confirm this impression that this analysis was made.

The patients in this study total 154, and were those on whom I had performed a partial gastrectomy for benign ulcer in the public ward of the Radcliffe Infirmary or the Churchill Hospital before the end of 1951. Private operations and those done elsewhere were not included, nor were patients on whom vagotomy was added to partial gastrectomy. The review was 94% complete. The interviews were made in the out-patient department by my medical colleague, Dr. E. M. Buzzard, and by myself. Both the type of ulcer and of operation were unknown to Dr. Buzzard, and many I could not recall. All results were assessed and tabulated before examining the case notes for the nature of the ulcer and of the operation. The analysis was done under the headings of weight, various symptomatic complaints, and assessment of the result, which was made independently by both of us; and, further, I asked every patient to give his frank opinion of what he thought about the result of the operation. These broad assessments have been classified individually. We have not drawn a distinction between the effects that came on early or late after meals, a simple tally being made of all the symptoms. The worst picture has been painted, as all symptoms have been totalled whether recorded by one or both of us. For ease of reading the discussion of symptoms is done under each separate heading.

General Features

Total patients examined—154 (19 female, 135 male). Ages—the usual large group between 40 and 60 years, 9 below 30, 8 over 70, and 4 over 80.

Varieties of ulcer—62 gastric, 86 duodenal, and 5 stomal, 1 in which no ulcer was found at operation. Multiple ulcers were found in 10% of patients, the more severe ulcer being the one used for subsequent classification.

Operations—Billroth I, 98 (49 for gastric and 49 for duodenal ulcer); Polya, 56 (13 for gastric, 37 for duodenal, and 5 for stomal ulcer).

TABLE I.—Weights

Years:	0-1		1-2		2-3		3+		Total for All Years	
	BI	P	BI	P	BI	P	BI	P	BI	P
Same	29	—	19	2	10	6	9	13	67	21
+7 lb. 3.2 kg.	3	—	4	1	—	2	2	4	9	7
+14 " 6.4 kg.	—	—	—	—	—	—	—	—	—	—
+21 " 9.5 kg.	3	1	4	—	—	—	1	1	8	2
-7 " "	3	—	4	5	1	6	1	4	9	15
-14 " "	—	—	1	1	—	4	—	4	1	9
-21 " "	—	—	—	—	—	1	—	1	—	2
Total	38	1	36	9	11	19	13	27	98	56

BI=Billroth I. P=Polya.

Weights were assessed as nearly as possible by taking the patient's opinion of the usual weight, and weight a year pre-operative and immediately pre-operative. These were all checked so far as possible against information taken from notes. An assessment was made from these data of the likely normal weight in the past year or two, and the weight found at interview was compared with it. A return of weight to normal following a loss during operative treatment was not accepted as a gain in weight for the present purpose,

nor was it regarded as a loss when there was reduction of fatty tissue after operation in a patient made overweight by a recent milky diet. Gains or losses up to 6 lb. were classed as "same," 7 to 13 lb. were classed as + or -7 lb., 14 to 20 lb. were + or -14 lb. A fair amount of latitude must be allowed in consideration of weight owing to difference of clothes and the slight seasonal alterations, and it was thought that one must allow 6 lb. for such changes.

It will be seen from Table I that in the Polya series quite a high proportion of patients showed a weight loss. The Billroth I series shows only nine patients with a loss of 7 lb., which is not a very significant loss when such factors as clothes, seasonal changes, and change of work are concerned.

The Billroth I series shows only a 1% loss of 7 lb. or more, whereas the Polya series shows a 20% loss of 7 lb. or more.

Others have noticed this weight loss with the Polya type. Muir (1949) showed that of 86 patients submitted to Polya gastrectomy and examined at intervals of six months to six years after operation, over 40% had lost 7 lb. or more and over 20% had lost over 14 lb. or more. Only 10% of patients had gained weight. This led Muir to comment, "Further investigation of this important abnormality in gastrectomized patients is obviously required." Among my cases 16% of the Polya series, in contrast to 22% of the Billroth I series, showed a gain in weight. Ward-McQuaid (1949) showed that of 49 patients operated on by Mr. Elliot Smith, 24 (50%) were 7 lb or more below normal weight one to two and a half years after the Polya operation, 15 (32%) had lost 14 lb. or more, and only 4 had gained weight.

These findings support the general impression I had formed when seeing patients after operation, that the Billroth I series had not lost weight to the degree seen in the Polya series. The loss or gain of weight is not obviously associated with any functional upset, but it is often a nuisance or an embarrassment to patients, who complain of being too thin or having to buy new suits of clothes. The maintenance of weight in the Billroth I series may be due to better mixing of food, bile, and pancreatic juices as the food passes into the duodenum, and the loss in the Polya series may be due to imperfect mixing, with perhaps a loss of bile from bilious vomiting, which is often a feature in the Polya-type case. But those who have lost weight after a Polya-type operation are not always those who have bilious vomiting. The maintenance of weight in the Billroth-I-type case is not in this series due to inadequate resection of the stomach, as is shown by the large number of Billroth-I-type patients with a reduced capacity for food in the first two years (Table IV). This finding of maintenance of weight in Billroth-I-type patients has not been brought to light before to my knowledge, and will need investigation in series by other surgeons before it can be adequately substantiated.

Symptomatic Complaints

Flatulence is a difficult symptom to assess from a patient, and must depend partly on how much air he swallows. There is no evidence in Table II of any essential difference between the Billroth I and the Polya series.

TABLE II.—Flatulence

	Billroth I				Polya			
	No.	+	++	+++	No.	+	++	+++
Gastric	49	4	1	0	13	2	0	0
Duodenal	49	2	2	0	43	2	7	1
Total	98	6	3	0	56	4	7	1

Analysis of these symptoms in years after operation: Billroth I, 0-2 years, 4 (74); 2+ years, 5 (24). Polya, 0-2 years, 2 (10); 2+ years, 10 (46).

Regurgitation of bile occurred in the Billroth I cases in the early post-operative period, but not in those operated on two or more years before. In the Polya series, however,

the proportion is high in those operated on two or more years before (Table III). The demonstration of this feature is not new, the tendency for the patient with the Polya type of operation to bring up bile even years after operation has been well shown in various papers. There has been much talk of "afferent loops."

TABLE III.—Regurgitation of Bile

	Billroth I				Polya			
	No.	+	++	+++	No.	+	++	+++
Gastric	49	3	—	—	13	—	—	—
Duodenal	49	2	1	—	43	3	—	—
Total	98	5	1	—	56	3	—	—

Analysis of these symptoms in years after operation: Billroth I, 0-2 years, 6 (74); 2+ years, 0 (24). Polya, 0-2 years, 1 (10); 2+ years, 10 (46).

All complaints of a reduced capacity to take food or liquids, especially with the main meal, are included in Table IV. These tend to lessen in the Billroth I series, but nearly half of those in the Polya series show real difficulty with food and liquids after two years.

TABLE IV.—Reduced Capacity

	Billroth I				Polya			
	No.	+	++	+++	No.	+	++	+++
Gastric	49	16	—	—	13	3	1	—
Duodenal	49	12	2	—	43	9	3	2
Total	98	28	2	—	56	12	4	2

Analysis of these symptoms in years after operation: Billroth I, 0-2 years, 25 (74); 2+ years, 5 (24). Polya, 0-2 years, 2 (10); 2+ years, 16 (46).

Table V shows a clear preponderance of persistent trouble with the Polya series and an entire absence of symptoms with the Billroth I patients after two years.

TABLE V.—Puddings Produce Unpleasant Symptoms

	Billroth I				Polya			
	No.	+	++	+++	No.	+	++	+++
Gastric	49	2	—	—	13	3	—	—
Duodenal	49	—	—	—	43	6	2	3
Total	98	2	—	—	56	9	2	3

Analysis of these symptoms in years after operation: Billroth I, 0-2 years, 2 (74); 2+ years, 0 (24). Polya, 0-2 years, 2 (10); 2+ years, 12 (46).

TABLE VIII.—Personal Assessment of Results

Years	Gastric Ulcer					Duodenal Ulcer					Totals for G.U. and D.U.	Percentage Distribution	Grand Total		
	0-1	1-2	2-3	3+	Total	0-1	1-2	2-3	3+	Total					
	BI P	BI P	BI P	BI P	BI P	BI P	BI P	BI P	BI P	BI P					
By G. E. Moloney															
VG	6	8	8	5	27	10	14	6	4	28	55	56	83		
G	5	3	1	2	12	8	3	5	5	11	23	23	38		
NI	—	—	—	—	7	4	—	—	—	7	16	16	24		
RU	—	—	—	—	1	—	—	—	—	1	2	2	5		
	—	—	—	—	2	—	—	—	—	1	—	0	1		
By Dr. E. M. Buzzard															
VG	6	8	8	6	28	5	13	9	3	21	49	50	80		
G	5	2	—	—	10	13	2	4	3	17	27	28	37		
NI	—	—	—	—	7	3	—	—	—	8	16	16	25		
RU	—	—	—	—	2	—	—	—	—	2	4	4	9		
	—	—	—	—	—	—	—	—	—	2	—	0	—		
By the Patients															
VG	7	12	8	6	33	15	15	12	4	34	67	68	106		
G	5	2	—	—	7	4	2	—	—	8	17	17	25		
NI	4	—	—	—	2	1	—	—	—	6	11	11	14		
RU	—	—	—	—	4	3	—	—	—	7	11	5	14		
	—	—	—	—	1	—	—	—	—	1	1	1	2		
	—	—	—	—	2	—	—	—	—	1	2	0	2		
B=Excellent. VG=Very good. G=Good. NI=Not Indicated. RU=Rejected.															

E=Excellent. VG=Very good. G=Good. I=Improved. NI=Not improved. RU=Recurrent ulcer.

Table VI reveals nothing significant except a low incidence of sweating.

TABLE VI.—Sweating

	Billroth I				Polya			
	No.	+	++	+++	No.	+	++	+++
Gastric	49	1	—	—	13	1	—	—
Duodenal	49	1	—	—	43	1	—	—
Total	98	2	—	—	56	2	—	—

Analysis of these symptoms in years after operation: Billroth I, 0-2 years, 2 (74); 2+ years, 0 (24). Polya, 0-2 years, 0 (10); 2+ years, 2 (46).

Table VII suggests a remission of dizziness and sleepiness in the Billroth I series, but a strong persistence and high incidence in the Polya series.

There were two instances of anaemia, both in women who had had Billroth I operations for gastric ulcer. There was one instance of stomatitis and glossitis, in a man who had had a Polya operation for duodenal ulcer. The comparison of patients with gastric and duodenal ulcers shows no significant difference in either series.

TABLE VII.—Dizziness and Sleepiness

	Billroth I				Polya			
	No.	+	++	+++	No.	+	++	+++
Gastric	49	2	—	—	13	3	—	—
Duodenal	49	2	—	—	43	6	—	—
Total	98	4	—	—	56	9	—	—

Analysis of these symptoms in years after operation: Billroth I, 0-2 years, 4 (74); 2+ years, 0 (24). Polya, 0-2 years, 2 (10); 2+ years, 9 (46).

The Billroth I series had mild effects from a small stomach for a variable time, but after one to two years most patients develop a satisfactory capacity with few, if any, side-effects. The Polya series, on the other hand, show a proportion with persistence of bile regurgitation, unpleasant symptoms with puddings, reduced capacity for food and liquids, and dizziness and sleepiness after meals.

Perhaps there were not the same troubles when protein was plentiful, and a beefsteak with Yorkshire pudding in the afferent loop may not have been as productive of rising bile or sleepiness as is Yorkshire pudding without the beefsteak. But as we cannot forecast certain dietary problems it would seem best to let the jejunum keep the natural 12 in. (30 cm.) or so from the stomach as often as is possible.

Personal Assessment of Results

An assessment was made separately by Dr. E. M. Buzzard, myself, and the patients (Table VIII). The results were grouped into six categories—excellent, very good, good, improved, not improved, and recurrent ulceration.

Personal judgments vary, but it will be seen that the physician and the surgeon largely agree in essentials. It will also be seen that the "customer" was the most satisfied of all, and the contrast between his reckoning and ours shows that in many cases in which we see some defect the patient thinks nothing of it in his happiness at being able to eat when and what he likes, and at having no subsequent pain. With the exclusion of two patients with recurrent ulcers there was only one patient in the Billroth I group (98 patients) who classed herself as "improved," and none considered they were "not improved." In the Polya group (56 patients), three patients classified themselves as "improved," and two as "not improved."

Recurrent Ulceration

There were two patients with recurrent ulceration in the Billroth I series, both being after operations for gastric ulcer. One came on 51 months and the other 22 months after the original operation. Both these patients have been reoperated on, the procedure being excision of the ulcer, further reduction in the size of the stomach, vagotomy, and then reconstitution by Billroth I anastomosis. The second operations were done less than a year ago and the patients have had no further digestive upsets. There was one recurrent ulcer following a Polya operation for a duodenal ulcer.

Much has been written of the recurrence rate following the Polya operation, but the literature is surprisingly quiet on the recurrence rate for the Billroth I operation. The only reliable statistics are those of Schoemaker (1947), who reviewed 94 patients, all at an interval of more than three years after operation, and found two instances of recurrent ulceration. This compares with my recurrence rate of 2%. There is certainly no real evidence to show that the Billroth I operation is more productive of recurrent ulceration than is the Polya operation.

It would be a pity if in zeal to produce no instance of recurrent ulceration the philosophy of the late Hedley Visick (1948) was generally adopted. He claimed that by removing the greater part of the stomach, more than three-quarters, and anastomosing the jejunum to the remnant, he found no subsequent recurrent ulceration. With the whole stomach removed it would also be likely that there would be no recurrent ulceration, but after the very radical type of operation which Visick recommended one must expect to see in high numbers such sequelae as bilious vomiting, reduced capacity for food, weight loss, and other unpleasant features. It is better, I submit, to treat 100 cases by less radical measures, such as the Billroth I operation, and to secure a good functional result for 98. If two should later prove themselves by re-ulceration to be the black sheep, only those need be given a near-total clipping of the offending organ to be rid of pain at the price of possible unpleasant sequelae.

Discussion

The main inference from these results is that the Billroth I operation should be used wherever possible for the surgical treatment of gastric and duodenal ulcers. There is a strong swing back to the Billroth I operation for treating gastric ulcer, but, owing to what may be unhappiness in the dissection of the difficult duodenal ulcer, the Polya operation is so often considered to be more suitable for dealing with a duodenal ulcer, and the devil take the post-operative consequences.

I find that most duodenal ulcers can be dissected out with patience and care, though it is not advisable if they are far distal in the second part of the duodenum near the opening

of the bile duct. I use the Billroth I operation for duodenal ulcers as often as I can, as I believe there is a better post-operative result. One must expect a proportion of difficult dissections, but once the duodenum is freed beyond the ulcer it is well to remember that if there is enough to close there is enough to anastomose, and one might as well do a Billroth I. In the past two years I performed the Billroth I operation for 50 gastric ulcers and 78 duodenal ulcers, while the Polya operation was done for 3 patients only, all with distal duodenal ulcers.

In the past 18 months I have been endeavouring to overcome the reduced capacity, especially for the main meal, owing to the small stomach remnant. This is seen in the early months after the operation, but greatly improves later. Men under 50 are usually more vigorous, needing a bigger food intake, and in these I have been leaving nearly half the stomach, adding vagotomy in those with duodenal ulcer. This is not done in order to achieve an anastomosis, for high resection with gastro-duodenal anastomosis can be achieved after resection of a duodenal ulcer. My theory is that a Billroth I procedure gives more than the equivalent of a pyloroplasty, for it means a fresh start without the ulcer. The removal of the lower half of the stomach takes away that great stimulator of gastric juice, the mucosa of the pyloric antrum, and the vagotomy reduces the secretory capacity of the remaining mucosa; thus humoral and nervous mechanisms of secretion are both eliminated. As half the stomach is removed the incomplete emptying found with vagotomy alone is unlikely to occur. So much for the theory. In practice it has been working well, judging by impressions, but the results have not yet been subjected to time or detailed analysis, nor have the numbers been sufficient. This must therefore remain an interim investigation.

Summary

The results of a series of 154 operations for varieties of peptic ulcer by Billroth-I-type and Polya-type techniques are contrasted.

The main findings are that the patients after a Billroth I gastrectomy do not lose weight in an abnormal way like some of those who have had a Polya gastrectomy.

After Billroth-I-type gastrectomy patients showed few distressing symptoms after meals, and such unpleasant features as there were tended to wear off with the passage of time, in contrast to a persistence of those following Polya-type gastrectomies.

The incidence of recurrent ulcer is the same in both series (2%), and it is claimed that there is no real evidence of a difference in recurrence rate between the two methods.

A plea is made for avoiding too radical resection of the stomach, which may eliminate recurrent ulcer but cause unpleasant post-operative sequelae.

Mention is made of a method on trial for improving the reduced stomach capacity found at times in the early months after operation.

I thank Dr. E. M. Buzzard for giving so much time and effort as an independent judge in this assessment.

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INFANTILE ECZEMA TREATED WITH ORAL CORTISONE A CLINICAL REPORT

BY

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The dramatic but unfortunately temporary improvement which occurs in infantile eczema when cortisone is administered has already been reported by Glaser *et al.* (1951). The purpose of the present trial was to observe the clinical transformation which they found.

Some cases urgently call for temporary improvement because of the severity of the skin lesions and the distressingly poor general condition of the infant. For these, short courses of cortisone may be considered, but, bearing in mind the potential dangers of the drug and the relative harmlessness of infantile eczema, it should be administered only to carefully chosen cases.

All the 15 cases in this series were severe and, except for the two with hay-fever, had had a good deal of treatment. The routine management of the condition, which was carried out before it was thought necessary to administer cortisone, consisted in a carefully taken history, general examination, skin-testing, local and general forms of treatment, as well as a period in hospital. Each patient was also regularly weighed, and regular eosinophil counts and routine blood pressure estimations were made. There were 10 males and 5 females. Five were between 6 and 12 months old; two were between 1 and 2 years, and seven were between 2 and 3 years.

The most difficult point to arrive at in these cases was to determine upon a dose unlikely to produce toxic effects, and it was thought wisest not to exceed 75 mg. a day. This was adhered to except in three cases, in which 87.5 mg. daily was given for a short time. No other treatment was given, except when weeping lesions were present and local applications were essential.

In the following three groups of cases only observations referable to the clinical response of the eczema have been noted. The first group describes a number of infants whose response to cortisone was slow, unconvincing, and not maintained. In none of these was an exacerbation seen after treatment. The third case produced toxic symptoms.

Group 1

Case 1.—A 7-months-old boy had had weeping lesions on the face and flexures of the elbows for four months. His mother and sister had asthma. On June 3, 1952, 50 mg. of cortisone daily was started. As there was little change two weeks later, 75 mg. was given daily. A slight improvement resulted, and after six weeks, although the lesions were drier, cortisone was gradually discontinued. When she was seen two months later exudative lesions were again present.

Case 2.—A boy aged 8 months had had eczema of the face, flexures, and trunk for the previous three months. From April 2, 1952, he was given 75 mg. of cortisone a day. There was no improvement after fourteen days, and the dose was increased to 87.5 mg. daily. After another fortnight the condition was much the same, and the drug was gradually discontinued.

Case 3.—A 2-year-old boy had suffered from eczema of the face, neck, and flexures of arms and legs for twenty

months. There was a lot of crusting and scaling. He had a moderate degree of ichthyosis. From March 12, 1952, he was given 75 mg. of cortisone daily. A month later the skin was much improved, but, alarmingly enough, there was a rounding of the face, with increase of the scalp and eyebrow hair. He gained 2½ lb. (1.1 kg.) in seven days. The cortisone was discontinued within a week. The eczema relapsed within ten days. At the end of a month his weight was the same. By the beginning of August his face was normal, and the excess hair had markedly diminished.

Case 4.—A boy aged 2 had had severe atopic dermatitis of the face, flexures of elbows, and forearms for eighteen months. His father had eczema and asthma. On January 6, 1953, 75 mg. of cortisone daily was started. At the end of a week he was much better, and the dose was reduced to 50 mg. daily. Three days later exuding lesions were again present. The dose was raised to 75 mg. daily, but as this did not control the rash, at the end of a week it was increased to 87.5 mg. daily. After 16 days with no improvement the drug was gradually discontinued.

Case 5.—A 3-year-old girl had had severe generalized atopic dermatitis since the age of 18 months; her arms and legs were very excoriated, and itching had been extreme. Her mother has severe asthma. From November 7, 1952, the patient was given 75 mg. of cortisone daily. A fortnight later the itching had diminished, but the rash had not quite cleared from the legs. The dose was dropped to 62.5 mg. daily, but within five days the skin condition was worse. Again 75 mg. daily was administered, but, as it produced scarcely any improvement after a fortnight, 87.5 mg. daily was given for 14 days. Little improvement occurred, and the drug was gradually discontinued.

Case 6.—A 3-year-old girl had had severe chronic atopic dermatitis of the arms and legs, and slightly on the cheeks, for one year, with a flare-up causing oozing lesions. She was allergic to all types of fish, and had had severe attacks of angioneurotic oedema involving the face, mainly lips and tongue. She was given 75 mg. of cortisone daily from August 24, 1952. A week later there was little change, and the dose was increased to 87.5 mg. daily. Three weeks later the condition was much the same, so cortisone was gradually withdrawn. Her skin condition is now much the same as when first seen.

Group 2

These cases illustrate a moderately good response to cortisone. Exudation was abolished for considerable periods, and itching was always remarkably reduced.

Case 7.—A 10-months-old girl had had a severe dermatitis of the face, flexures of arms, and backs of knees for three months. From April 8, 1952, 50 mg. of cortisone was given daily. Within a week all the lesions were dry, and five days later the dose was cut to 37.5 mg. daily. On May 10 there was a sudden flare-up of the facial lesions, but a return to 50 mg. daily rapidly improved it. This dose was maintained for eight weeks. It was gradually reduced to 25 mg. daily and stopped on August 2. During the past 10 months she has had two mild recurrences, relieved by local treatment.

Case 8.—A girl aged 15 months had had moderately severe atopic dermatitis involving the cheeks, backs of forearms, legs, and thighs for four months. From May 28, 1952, she was given 75 mg. of cortisone daily. Ten days later there was a great improvement and the dose was cut to 50 mg. a day. Two weeks later she got worse and moist lesions appeared. The skin responded well again to 75 mg. daily, and 14 days later it was reduced to 62.5 mg. During the next three months the dose varied between this and 37.5 mg. daily. It was discontinued at the end of October. When seen in April, 1953, there was some redness and scaling, but there had been no exudation, and itching was negligible.

Case 9.—A boy aged 2½ had had diffuse papular lesions on the trunk, limbs, and face for ten months. His sister had had eczema as an infant. On September 4, 1952, 75 mg. of cortisone daily was started. Ten days later

owing to marked response, it was reduced to 62.5 mg. and a week later it was possible to cut it to 50 mg. daily. At the middle of October the dose was further reduced to 37.5 mg. daily and, as no new lesions appeared, a month later cortisone was gradually discontinued. When last seen in May, 1953, there had been no fresh acute attacks. There was a little redness of the flexures of the arms, and occasional papules appeared on the trunk.

Case 10.—An 11-months-old girl had had itchy papular lesions of the face, neck, and interscapular regions for five months. Her scalp was covered with a good deal of greasy scales. On November 6, 1952, 50 mg. daily of cortisone was started. In ten days there was considerable improvement of the facial and interscapular lesions. The scalp also improved, but never to the degree of the other areas. At the beginning of January, 1953, there were no lesions below the scalp, and the cortisone, which had been maintained at the original dose, was gradually discontinued. When last seen in April, 1953, nothing abnormal was noticed except slight scaling on the scalp.

Case 11.—A 15-months-old boy had a sudden exacerbation of eczema, from which he had suffered since the age of 10 months. Weeping lesions developed on the cheeks, arms, and forearms. The attack may have been due to wool, to which he was extremely allergic. From October 6, 1952, cortisone was given in doses of 50 mg. daily. By the end of a week the lesions were dry, and ten days later the dose was cut to 37.5 mg. daily. A month later only redness and a few papular lesions were present in the original areas, and cortisone was discontinued. Up to May, 1953, there had been no further acute attacks, although the rash was more pronounced and itchy.

Case 12.—A 2-year-old boy had had a diffuse papular rash involving the face, arms, trunk, and backs of knees for seven months. From March 22, 1952, 75 mg. of cortisone was given daily. Ten days later, as he was much improved, the dose was reduced to 50 mg. The rash began to recur within a week. He was again given 75 mg. daily, and this was maintained for six weeks. It was very gradually reduced to 25 mg. daily over a period of seven weeks, and successfully discontinued in July. In March, 1953, he developed weeping lesions for the first time, and 75 mg. daily for a month was necessary to dry them up. Gradual withdrawal over a period of six weeks resulted in no relapse, and when seen in May there was a slight papular rash involving the cheeks and the backs of the knees.

Group 3

This group showed a very satisfying response, reacting rapidly to cortisone, without return of symptoms.

Case 13.—A boy aged 9 months had had dry papular lesions on the face, scalp, shoulders, and flexures of elbows, and slightly on the wrists, for two months. On June 11, 1952, cortisone, 50 mg. daily, was started. A week later the rash had cleared except for very slight scaling and redness of the face. Up to September it was kept in good control by 37.5 mg. or 25 mg. daily. It was slowly discontinued in October, and there had been no exacerbation up to March, 1953.

Case 14.—An orphan boy aged 2½ had a papular and scaly dermatitis of the face, arms, legs, feet, and interscapular and lumbosacral areas, associated with hay-fever. It was his second attack, the first one having occurred a year before. On May 7, 1952, cortisone, 50 mg. daily, was started. Ten days later he was practically well. By the middle of June, as pollination was over and the signs of eczema were limited to slightly scaly areas on the back of the left leg, cortisone was gradually discontinued. There was no recurrence up to January, 1953, soon after which he went to America.

Case 15.—A girl aged 3 had a severe diffuse papular dermatitis associated with severe hay-fever. It was her first attack of eczema. On May 10, 1953, cortisone, 75 mg. daily, was started. There was an immediate improvement in the hay-fever and skin lesions. Five days later the dose

was reduced to 50 mg. daily. A week later the rash had disappeared except for residual erythema. She was maintained on 37.5 mg. daily until the middle of June, when the drug was discontinued. A month later there had been no recurrence of the rash.

Comment

Owing to the dangers already mentioned, there seems to be little justification at present for administering cortisone to infants with eczema, unless the lesions are severe, the infant's general health is definitely deteriorating, and scratching has become a ceaseless habit. Then cortisone is often of great value for temporary improvement. Sometimes there is a temptation to give it in moderate cases when there is pressure from anxious parents, but it is better to explain to them that the benefits of cortisone in infantile eczema are only temporary, and indicate that exacerbations may occur after withdrawal of the drug.

One of Lever's (1951) contentions regarding the disadvantages of cortisone in atopic dermatitis is that the rebound of the disease after discontinuation of the drug is worse than in most of the other diseases. My patients, however, did not have this experience following treatment, although lesions assumed their former character in many. Unfortunately, toxic effects give no warning of their appearance. The 2-year-old boy (Case 3) developed excessive growth of hair four weeks after a relatively low dosage of cortisone. Other patients who had larger doses had no toxic symptoms. One of the infants in Glaser's (1952) series developed transient hypertension.

Generally speaking, when the patient responds to cortisone it should not be continued for a protracted period. But in very exceptional cases Baer and Leider (1951) consider it warranted so long as a maintenance dose of 25 mg. is used. Glaser (1952) has also done this when asthma was a feature of the case, and W. R. F. Collis (1953, personal communication) reports a case of infantile eczema, complicated by asthma, which has been treated with A.C.T.H. and cortisone for one year without ill effects and with much benefit. Glaser (1952) suggests that in long-term therapy alternation between courses of A.C.T.H., which causes hypertrophy of the adrenal glands, and cortisone, which causes atrophy, should be used to maintain a reasonable balance.

The euphoria which is usually so pronounced in adults taking this drug is also obviously present in infants. Also, their appetite increases and sleep is prolonged, and all these features are usually evident within two or three days of taking cortisone. When the eczema responds to cortisone the effect is so dramatic and satisfying that the underlying complex, and perhaps allergic, nature of the condition is frequently forgotten. It often requires a little reflection on the part of the administrator to realize that, unfortunately, the treatment is symptomatic only.

As will be seen from the description of these cases, there were few results which could be classified as good. Two cases which responded well were associated with severe hay-fever, and Reicher *et al.* (1952) have already shown that the latter condition frequently benefits from the judicious use of cortisone. In most of the other cases, all of which had severe skin lesions, the temporary benefits these unfortunate infants obtained appeared to justify the administration of short courses of cortisone.

The question yet to be answered is: What will be the effects produced by this early administration of cortisone as the infants grow? On account of immediate and unknown late risks, therefore, it is felt at the moment that until every other form of treatment has been tried, and except for the severe distressing generalized cases, cortisone should be withheld in infantile eczema.

Summary

Fifteen cases of infantile eczema were treated with oral cortisone. Temporary benefit usually resulted.

One case showed toxic effects by growing an excess of hair on the face.

Infections which are easily masked by cortisone should be carefully watched for.

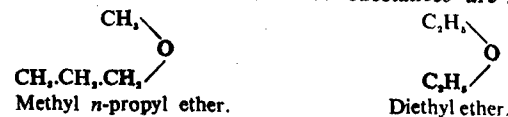
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Medical Memorandum

Use of Methyl *N*-Propyl Ether as an Anaesthetic for Children

The use of methyl *n*-propyl ether in anaesthesia dates from its inclusion in a series of ethers investigated by Krantz *et al.* (1946). The physical and chemical properties are not dissimilar to those of diethyl ether, of which it is an isomer, and similar precautions against explosion risk must be observed. Its safety margin is close to that of diethyl ether, the arbitrary standard (Krantz *et al.*, 1947), and it is excreted from the body without having undergone metabolism. The chemical formulae of the two substances are:



In the present series of 378 cases in which methyl *n*-propyl ether was used as a maintenance agent all the patients were subjected to plastic surgical procedures, and the group selected for study includes ages from birth to the fifth birthday, distributed as follows: 1st year, 108; 2nd year, 87; 3rd year, 71; 4th year, 50; 5th year, 62.

By the age of 3 most of the surgery for hare-lip and cleft-palate has been completed, and the liability to burns and trauma causes the increase in surgery in the fifth year and subsequently. The duration of administration of anaesthesia varied from 10 minutes to 180 minutes, the average being 76 minutes. With the exception of eight cases, administration was carried out by means of an intratracheal tube, using the method described by Picken (1950), the vaporizing agent being oxygen or a 2:2/3 oxygen and nitrous oxide mixture at a flow rate of 4 to 5 litres a minute.

In this series 209 patients were operated upon for repair of hare-lip and/or cleft-palate, among them an Abbé repair of primary hare-lip at 5 months, in which the administration lasted 145 minutes; 80 underwent excision and/or grafting of burns; and the remaining 89 were submitted to a large variety of procedures, including a repair of spina bifida lasting 105 minutes, eleven hours after birth, and a colostomy at 26 hours.

Premedication.—Atropine alone, 1/200 to 1/100 gr. (0.3 to 0.6 mg.), was used in the smallest children. Pentobarbitone sodium ("nembutal") at the rate of 0.7 gr. per stone (7 mg per kg.) body weight, with atropine, was given orally to some; morphine sulphate, 1/40 gr. per stone (0.25 mg. per kg.), with atropine was given to others; while a few of the older children received papaveretum and scopolamine. All these drugs, with the exception of pentobarbitone, were given by the intramuscular route.

Induction.—Cyclopropane and oxygen 50:50 was used as the inducing agent in 200 cases, and ethyl chloride followed by methyl *n*-propyl ether on the open mask in most of the other 178. In a very few cases induction and maintenance were carried out with methyl *n*-propyl ether alone. Cyclopropane is preferred by one of us (H. G. M.) because it gives a very rapid induction, free from coughing or excitement. Its vapour density (21) is greater than that of air (14.3), and most of the children were anaesthetized without

the use of a mask by "pouring" the gas from a tube concealed within the hand. Intubation was carried out, using either the Magill or the Macintosh laryngoscope, as soon as the jaw was relaxed. Induction with ethyl chloride and methyl *n*-propyl ether appeared to be more rapid than induction under similar circumstances with ethyl chloride and diethyl ether. The relatively non-irritating vapour of methyl *n*-propyl ether causes less coughing and breath-holding and allows induction to proceed more smoothly.

Course.—After intubation anaesthesia was maintained with either pure oxygen or a mixture of nitrous oxide and oxygen as a vaporizing agent for the methyl *n*-propyl ether. The vapour is carried by pressure tubing to a Cardiff connector attached to the end of the intratracheal tube so that there is no resistance to breathing in the circuit. Because this ether is relatively non-irritating we have found that anaesthesia may be deepened very rapidly when required, and therefore a very light plane may be maintained when relaxation is not needed. The respiratory rate is not apparently increased to the same extent by methyl *n*-propyl ether as by diethyl ether, nor is there any apparent increase in capillary oozing in the presence of an unimpaired airway. We have observed no cardiac irregularities in the series. The response of the pupil to methyl *n*-propyl ether shows a time lag when compared with the sequence for diethyl ether (Guedel, 1937), and consciousness may be reached during withdrawal of anaesthesia from depth before the pupil contracts (Shane, 1947). Recovery from anaesthesia is rapid, and the cough reflex is quickly restored. Excitement and struggling are very uncommon. It has been found possible to begin feeds in all cases very soon after withdrawal of anaesthesia, thus minimizing nutritional loss. In the concentrations used there have been no complaints of headaches or disagreeable feelings in the surgical teams (Fisher and Whitacre, 1947).

Sequelae.—We have found no significant alteration in the incidence of post-operative nausea and vomiting when compared with diethyl ether. No vomiting persisted beyond the first post-operative 24 hours. The type of surgery undertaken in this series has necessitated the acceptance for operation of a higher than normal proportion of patients with chest infections. It is our impression that complications are few, since coughing is restored rapidly and co-operation in physiotherapy soon follows. There were no deaths immediately or remotely attributable to the anaesthesia.

We are indebted to Mr. Emyln Lewis, consultant plastic surgeon to the United Cardiff Hospitals and the Welsh Regional Hospital Board, under whose care these patients were admitted, for his co-operation.

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The United States Food and Drug Administration has directed that drug products containing more than 5% of oil of wintergreen must bear on their labels a warning that they should be kept out of reach of children, and that use contrary to directions may be dangerous. The methyl salicylate in the oil of wintergreen attracts young children by its smell, and a considerable number of deaths have occurred in the U.S.A., as in Britain, from young children drinking such preparations as liniments containing oil of wintergreen. Parents are not often aware of how dangerous these preparations are to children.

Reviews

STRESSES AND STRAINS

Stress and Disease. By Professor Harold G. Wolff, M.D. (Pp. 199; 38 figures. 40s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

Psychosomatic disorders are in the forefront of medical attention at the present time, but they are difficult to investigate by the methods of inductive science. It is therefore valuable to have a general statement of the views of Wolff, who has been remarkably successful in devising objective methods for their study. Wolff uses "stress" in a slightly different sense from Selye, and more correctly in terms of mechanics. Stress is the internal or resisting force brought into action by the external force or load; the result is called strain or deformation. Wolff has been particularly concerned with the detection and measurement of these strains as revealed by disturbed function of organs, circulatory changes, contraction of smooth muscle, and similar effects in man. Selye has written more about the common and non-specific effects of illness seen in experimental animals, whose relevance to human disease has not yet been completely demonstrated.

Wolff gives a fascinating account of the experimentally observed effects of stress in man. He shows that much of the human equipment has to do with meeting emergencies and overcoming crises, and that in certain circumstances the responses may be qualitatively as well as quantitatively inappropriate and may result in disease. When he goes further and says that the social impact of man on man may be as seriously traumatic as the assaults of 'micro-organisms or physical forces, some of us will find it difficult to follow him. The actual proof that social or emotional upsets can produce peptic ulcers, ulcerative colitis, or exophthalmic goitre still seems to be lacking. Certainly these disorders have not been produced experimentally—as hysterical paralysis or anxiety neurosis has been so produced.

If it is argued that these diseases are multifactorial in aetiology, then surely the approach to them should be statistical and not anecdotal. The English reader will not find the interpretation of symptoms in terms of organ jargon convincing, particularly in American patients who appear to be well read in *Life*, *Time*, and the *Reader's Digest*, and anxious to volunteer what the doctor expects them to say. The epidemiological approach is likewise marred by special pleading. For example, on page 111 we are told that there was a striking rise in hyperthyroidism in Norway, Denmark, and Holland in the recent war, but not in neutral Sweden; and we are not told that there was no rise in England. Nor are we told that there was a striking fall in thrombosis and embolism in Norway during the war, though on page 89 we are told that one of the important effects of painful experiences or periods of alarm and anxiety is an increased clotting proclivity.

In conclusion, then, this monograph is most stimulating as a record of experimental work, but less convincing when the author is theorizing from his data. Indeed, one can say about Wolff what he himself says about Selye, that his generalizations, "important though they may be in illuminating aspects of many reactions to stress, cannot be construed as a universal formulation."

L. J. WITTS.

PHILOSOPHY OF VISION

Introduction to Physiological Optics. By Armin von Tschermak-Seysenegg. Translated by Paul Boeder, Ph.D. (Pp. 299; 111 figures. 75s.) Oxford: Blackwell Scientific Publications. Springfield, Illinois: Charles C. Thomas. 1952.

The American Committee on Optics and Visual Physiology, a joint committee of the American Ophthalmological

Society, the Academy of Ophthalmology and Otolaryngology, and the American Medical Association, has done a service by translating the second edition of Tschermak-Seysenegg's book into English. The German original appeared in 1941, but the book is still fresh and valuable. It breathes the spirit of the school of physiology of Prague, where the author occupied the chair in succession to the great Ewald Hering, one of the few whose experimental and philosophical work will always exert an influence on the interpretation of visual sensations and perceptions so long as these subjects are studied.

Tschermak's great contribution to our understanding of the physiology of the visual process was his insistence on the relationship between objective and subjective phenomena. His philosophy implied the reality of a physical sphere independent of the observer and a subjective sphere, equally real and equally susceptible of analysis, not identical with but related to observable physical phenomena. The reader will not find details of the optical, photochemical, or neurological groundwork of visual sensations in this book, but rather an interpretation of this dual philosophy of visual perceptions as applied to the light sense, the colour sense, and our appreciation of space. The original German text was by no means easy reading; nor, indeed, is this translation; but few could have conveyed the sense of the author in more readable and fluent English than the translator, Dr. Paul Boeder, of the Harvard Medical School.

STEWART DUKE-ELDER.

INDIAN SOCIAL MEDICINE

Medicine and Our Social Welfare. By Praphulla C. Dutta, O.B.E., M.B., D.G.O., F.R.C.S. Foreword by Professor F. A. E. Crew, M.D., F.R.C.P., F.R.S., and Introduction by Rajkumari Amrit Kaur, Minister for Health, India. (Pp. 185. 6s.) Calcutta: Thacker Spink and Co. 1953.

Professor Crew is right when he says that India is beset by a multitude of problems, and this book offers to the statesman both a challenge and loyal co-operation. One influential statesman, the Minister for Health, agrees with the author that the giants are ignorance, poverty, and disease, against whom must be brought environmental hygiene, health education, and housing—which is true of Britain also, but the needs are much more urgent in India.

In this book a short chapter on the history of medicine is interesting and salutary—salutary in that medical practice in some of the earlier civilizations is discussed from what to British readers is an unusual viewpoint, philosophic as well as geographic. Under the heading of socio-economics, the relationship in India between poverty on the one hand and morbidity and mortality on the other is starkly revealed. Here, as elsewhere, bad housing presents an appalling problem, but the basis of all the distress in India is clearly poverty and the other problems are essentially sequelae. The average income per head in dollars in India is given as 34; in the U.S.A. it is 554; in the United Kingdom it is 468.

There are at least two possible remedies—an increase of income and a reduction in the number of heads. The author is in favour of both, and in relation to fertility he discusses continence, the safe period, home-made contraceptives, sterilization, and contraceptive paraphernalia invented by Europeans and Americans for the destruction of the human race. The author, much burdened by the distress of the people and so much in earnest in his efforts to help, would increase his services to India if he would advise the first two methods only of family planning.

This little book produces a sense of grief—a sorrow that there should be so many millions of people in the world who are deprived of a minimum of the basic necessities to which in accordance with natural justice they are entitled. For that reason, I hope the book will be widely read, with consequent enlightenment and stimulation of conscience.

C. METCALFE BROWN.

THE TUBERCLE BACILLUS

The Metabolism of the Tubercle Bacillus. By William F. Drea, D.M.D., and Anatole Andrejew, I.C. With a foreword by Professor E. R. Long, M.D., Ph.D., Sc.D. (Pp. 448; 24 illustrations. 90s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953.

This book is intended for the research worker in the field of tuberculosis and is compiled by two authors, one of whom is associated with tuberculosis research in the United States of America and the other in France. The present volume brings up to date *The Chemistry of Tuberculosis* published by Wells and Long in 1932 and *L'Infection Bacillaire et la Tuberculose* published by Calmette in 1936. In five chapters the authors review all the recent work on the metabolism of the tubercle bacillus, such as the organic and inorganic requirements of the tubercle bacillus for its growth *in vitro*, the modern methods and the principles of the depth culture of the bacillus, the respiratory requirements of the organism, both *in vitro* and *in vivo*, the enzymes associated with the bacillus and the products of metabolism of the organism. The most informative chapter is that on the enzymes, and the reading of this leaves one in little doubt how complex the whole problem of attacking the tubercle bacillus through its enzyme system must be. The work has been carefully compiled and reports the knowledge gained from about 750 recent publications on the subject. A list of these is given in the bibliography. The book requires intensive study to be appreciated, and its value would have been enhanced if the authors, who are authorities on the subject, had stated more frequently their own opinion on many of the papers under review.

JOHN W. S. BLACKLOCK.

PROBLEMS OF THE NEUROSES

Problems in the Field of Neurosis and Psychotherapy. By Professor H. C. Rümke. (Pp. 74. 15s.) Oxford: Blackwell Scientific Publications. 1953.

Professor Rümke attaches great value to Hughlings Jackson's principle and considers that its importance in psychiatry—especially in the understanding of the neuroses—has been overlooked. Jackson says, "The symptomatology of nervous diseases is a double condition: there is a negative and there is a positive element in every case." Disease produces negative mental symptoms due to the disturbance of integrative activity. What we observe in psychopathological states—namely, the positive element—is normal psychic life going on under the conditions brought about by the dropping-out of some function. Psychogenesis, Rümke believes, has been given too much significance, because psychiatrists, concentrating on the positive, have neglected the negative element. Only in a few cases is a psychogenic condition aetiological. A neurosis is not only a clinical condition but a syndrome made possible by entirely different circumstances. The neuro-physiological and neuro-anatomical studies of psychiatric disease have too often been neglected. Often unchangeable qualities in the personality are present, and it is here that psychotherapy finds its limitations. Nevertheless, Rümke considers psychotherapy to be indispensable. He admits that we must rely on clinical experience and acumen to realize the psychogenic factors and to separate them from the non-psychogenic. Psychiatric "sects" have been a source of weakness in the development of effective psychotherapy. There have been too many enthusiasts who feel that in one system or another lies the final answer to the problems of neurosis and psychotherapy. The personality of the patient must be assessed, and here he follows the teaching of Klages on the structure of the personality. The sections devoted to the personality of the psychotherapist are thoughtful and salutary. We must rid ourselves of the illusion that any psychotherapist who has had a training analysis is *ipso facto* an efficient psychotherapist.

This slim volume contains five lectures given to experienced psychiatrists with special reference to the organization of psychiatry in Denmark. Unfortunately the lecture form

has been maintained and the material is somewhat condensed and at times irritatingly dogmatic. Nevertheless this contribution is stimulating and will repay careful reading.

E. A. BENNET.

A GOOD DOCTOR

The Good Doctor, and other selections from the Essays and Addresses of William de Berniere MacNider. With tributes by Chancellor Robert B. House, Dr. William M. Coppridge, and Victor S. Bryant. Edited by William W. McLendon and Shirley Graves Cochrane. (Pp. 179. 40s.) North Carolina: University Press. London: Geoffrey Cumberlege. 1953.

William MacNider, the subject of this memoir, was born in 1881 in Chapel Hill, and he died there in 1951. One of his Negro fellow-citizens declared that he was "the best pneumonia doctor that's ever been on Chapel Hill." He was not only a horse-and-buggy doctor but he was also professor of pharmacology in the University of North Carolina. The long list of his scientific papers at the end of this finely produced book demonstrates the importance of his research work. His colleagues and his students write here eloquently of his enthusiasm, his devotion, and his goodness. "This little city of Chapel Hill has become indeed the Capital of the Southern Mind" we are told, and in no one was this better exemplified than in Dr. MacNider. He was a character if not a card: he would say to his pharmacology class, "It is spring; and this weekend forget pharmacology, send some red roses to your girl, go to church, and worship God." He came early under the influence of Osler, and the essays in this book are in the Oslerian tradition, but they have none of Osler's genius. In 1937 he addressed the medical school of the University of Tennessee on "The Biologically Minded Physician." This is a fine subject and we turned to the essay with eager expectancy. Two extracts will indicate its quality. "The great advance made in the understanding of heart diseases did not come from an elaborately mechanized laboratory but from and through the mind of a country doctor in Scotland carrying on his inquisitiveness on human beings living under thatched roofs in districts remote from medical centers." Can this be Burnley? "Money is refuse which comes as a by-product of thoughtful living in which happiness develops through a loss of the individual in thought and reason." One does not need to be a Stephen Potter to see that the example of William Osler encourages a turgid and unreasoning sententiousness in more ordinary physicians. Dr. MacNider was a great and good man in his place and in his generation; this expensive memoir has no more than a local and topical value.

D. V. HUBBLE.

Each year medical workers coin new words to describe their discoveries and express their hypotheses. So long as medicine is on the march this is inevitable—at least to some extent. True, some of the new terms are unnecessary, and some misbegotten, but there remains a useful modicum without which we could not well manage. This alone would be enough to justify the existence and regular revision of the several excellent medical dictionaries on the market. But, in addition medical nomenclature is so adorned—and muddled—by a wealth of synonyms, many eponymous, that it is hardly possible to read the briefest medical paper without recourse to a dictionary. *Stedman's Medical Dictionary* is one of the best available, and Messrs. Baillière, Tindall and Cox, Ltd., have recently brought out a revised edition (the eighteenth). It has been edited by Dr. Norman Burke Taylor, professor of medical history and literature in the University of Western Ontario, Canada, in collaboration with Lieutenant-Colonel Allen Ellsworth Taylor, classical editor. The printing was done in the United States, and the style and spelling are American. Besides the main body of the book, comprising 1,536 pages of double-column entries, there are an introductory chapter on medical etymology and some useful appendices (weights and measures, comparative temperature tables, anatomical nomenclature, etc.). This edition contains several thousand new entries and over 500 new illustrations. Although the great majority of the terms are medical, there are also words from dentistry, chemistry, botany, biology, and veterinary and electrical science. Brief medical biographies are given and eponymous terms are described. The dictionary is strongly bound, and is about the size of *Gray's Anatomy*. It costs 63s.

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REACTIONS TO STRESS

When an animal is injured, develops an infection, is exposed to x rays or to cold, or is subjected to almost any circumstances not ordinarily encountered in its day-to-day existence, a series of bodily reactions take place which allow the animal to withstand and adapt itself to the insult. Professor Hans Selye, in Montreal, has carried out extensive and ingenious investigations in an attempt to elucidate the mechanisms by which this adaptation is achieved.^{1,2} Out of this work have grown his conception of the general adaptation syndrome and his belief that certain pathological conditions in man and animals—the so-called diseases of adaptation—are caused by some abnormality in this process of adaptation. Some of Selye's ideas are hard to accept, and his terminology does not make the understanding of them easier. Other investigators³ have not always been able to reproduce his experimental findings, and the interpretation and significance of the results, particularly when applied to man, are not clear.

When an animal is exposed for a long time to a particular noxious stimulus it adapts itself, and a series of bodily changes may occur, such as a fall in body temperature and blood pressure, involution of lymphatic tissue, lymphopenia, a polymorphonuclear leucocytosis, adrenal hyperplasia, and diminished resistance to other non-specific stimuli. The sum of these non-specific bodily reactions constitutes the general adaptation syndrome, and Selye believes that the adrenal cortex plays an essential part in causing the anatomical and biochemical changes found in the syndrome. Certainly adrenalectomized animals and patients with untreated Addison's disease are unable to survive minor traumata which would not cause any apparent disturbance in a normal subject. Other investigators^{4,5} have contended that the adrenals

play only a permissive role, that the presence of adrenocortical steroids is required for the changes found in the adaptation syndrome to take place but that they are not themselves the cause of the changes.

Selye observed that rats, when exposed to cold, forced exercise, or formalin, developed hypertension, transient arthritis and pathological lesions akin to nephrosclerosis, periarteritis nodosa, and Aschoff bodies, particularly if the animals were previously conditioned by unilateral nephrectomy and a high-salt diet. He postulated that, because these pathological lesions developed during the process of adaptation to a variety of different stimuli, they might be causally related to overactivity or abnormal activity of the adrenal glands. Support for this hypothesis was obtained by observing that the lesions could be potentiated with deoxycortone (D.O.C.) and prevented or attenuated with corticotrophin or cortisone. Selye suggested that for unknown reasons adrenal secretory activity sometimes becomes abnormal during adaptation to prolonged stress, that the balance is disturbed between the amounts secreted of mineralocorticoid inflammation-stimulating hormones (such as D.O.C.) and of glucocorticoid anti-inflammatory hormones (such as cortisone and cortisol), and that in consequence the diseases of adaptation develop.

These hypotheses have been criticized on many grounds.⁶ There is no satisfactory evidence that non-specific stressors will cause adaptation diseases in laboratory animals under naturally occurring conditions. It is doubtful whether the experimentally induced pathological lesions in rats, previously conditioned by removal of one kidney and fed on a high-salt diet, are the same as those occurring in the human connective-tissue diseases. While certain forms of stress, such as surgical trauma, undoubtedly cause increased adrenal activity, it has not been proved that all types of stress cause such a response.^{7,8} Until recently there was little evidence that a specific mineralocorticoid, especially potent in controlling electrolyte metabolism, was elaborated in man, but this objection must be overruled since the isolation of aldosterone (11,21-dihydroxy-3,20-diketo-4-pregnene-18-al), formerly called electrocortin.^{9,10} Preliminary reports^{11,12} on this substance suggest that it has glycogen-depositing and eosinopenic, in addition to sodium-retaining, properties, but it remains to be seen what are its physiological effects and whether there is any disturbance in the relationship between the amounts of this compound and of cortisol secreted before or after the onset of the so-called diseases of adaptation. There is little evidence to support the suggestion that non-specific therapy is beneficial in

- ¹ Selye, H., *J. clin. Endocr.*, 1946, **8**, 117.
- ² *The Story of the Adaptation Syndrome*, 1952, Acta, Inc., Montreal.
- ³ Ingie, D. J., and Baker, B. L., *Progress in Hormone Research*, 1953, **8**, 143.
- ⁴ *Ann. intern. Med.*, 1951, **35**, 653.
- ⁵ Engel, F. L., *Progress in Hormone Research*, 1951, **6**, 277.
- ⁶ Bauer, W., and Clark, W. S., *ibid.*, 1953, **8**, 217.
- ⁷ Cope, C. L., and Hurllock, B., *Clin. Sci.*, 1954, **13**, 69.
- ⁸ Thorn, G. W., et al., *Progress in Hormone Research*, 1953, **8**, 171.
- ⁹ Simpson, S. A., et al., *Lancet*, 1952, **2**, 226.
- ¹⁰ ———, *Experientia*, 1954, **10**, 132.
- ¹¹ Mach, R. S., et al., *Schweiz. med. Wschr.*, 1954, **84**, 407.
- ¹² Gaunt, R., Ciba Foundation Colloquium on Endocrinology, to be published.
- ¹³ Bayliss, R. I. S., and Steinbeck, A. W., *Lancet*, 1954, **1**, 1010.
- ¹⁴ *British Medical Journal*, 1951, **2**, 1189.
- ¹⁵ *Progress in Hormone Research*, 1953, **8**, 128.
- ¹⁶ Perera, C. A., and Ragan, C., *Proc. Soc. exp. Biol. (N.Y.)*, 1950, **75**, 99.
- ¹⁷ Bauer, W., et al., *Practitioner*, 1951, **188**, 5.
- ¹⁸ Thorn, G. W., et al., *Ann. rheum. Dis.*, 1949, **8**, 307.
- ¹⁹ Goulding, R., *Communication to the Society for Endocrinology*, 1954.

rheumatoid arthritis, for example, by increasing the secretion of glucocorticoids.¹³ Although in a carefully conducted study Caughey and McCoy¹⁴ have reported that D.O.C. aggravated the arthralgia in a patient with pre-existing rheumatoid arthritis who subsequently developed Addison's disease (they did not, to quote Selye,¹⁵ "produce arthritis with D.O.C. at will"), Perera and Ragan¹⁶ failed in a similar case to aggravate the arthritis with D.O.C., and other workers¹⁷⁻¹⁹ have not found that D.O.C. exacerbates the symptoms of rheumatoid arthritis or counteracts the beneficial effects of cortisone.

The communication from Selye published in our opening pages this week is related to the observation that the inflammatory response to a locally applied irritant is much reduced when the experimental animal is exposed to stress. It has been previously supposed, but not proved, that the reduction in the inflammatory response is related to increased circulation of adrenocortical hormones, since it is well known that cortisone and cortisol diminish the intensity of an inflammatory reaction. In the present experiments croton oil was used as a local irritant to produce an inflammatory reaction, and starvation and forced immobilization to produce the general stress. The effects of the presence or absence of the adrenal glands and of the administration of glucocorticoids or D.O.C. were observed. Under the conditions of the experiment a general stress decreased the local inflammation. This decrease was greatest in animals with intact adrenal glands but occurred to a less extent in adrenalectomized animals maintained on small doses of cortisone or cortisol and not in animals maintained on D.O.C. Thus Selye postulates that the anti-inflammatory effect of general stress is mediated by two factors—an increased discharge of endogenous glucocorticoids and a peripheral synergism between the corticoids so liberated and some other effect not mediated through the adrenal glands. He also found that further application of the local irritant caused a greater degree of necrosis in those animals that were subjected to stress and previously had shown the least inflammatory reaction. Selye uses this as evidence that local tissue reactions can be modified by stress applied several days earlier.

What deductions about human reactions may be drawn from these experiments is uncertain. It remains to be shown how much starvation or forced immobilization activates the pituitary-adrenal system, and what is the nature of the non-adrenal factor which reduces the inflammatory reaction and increases the tendency to necrosis. Critics may question whether the condition of an immobilized rat "is not unlike that occasioned by physical and mental fatigue in

man." When all has been said, Selye's technical brilliance as an animal experimenter, and his imaginative boldness in theory, continue to act as a provocative stimulus to other workers.

OCCUPATIONAL MORTALITY

The late Professor M. Greenwood¹ described the Registrar-General's decennial studies of occupational mortality in England and Wales as "the most valuable single instrument of socio-medical research our national armoury contains," and many will wish to study the latest contribution in this series, a preliminary analysis of deaths in 1950 related to the 1951 Census 1% sample tables. This publication² is the more welcome in that it is twenty years since the previous occupational mortality analysis was undertaken, when deaths in 1930-2 were related to the 1931 Census, and many changes have taken place since then in our national life and in medical science and practice, changes that could have the effect of rendering some of these earlier findings out of date. In due course this report will be followed by a much more detailed one covering the five years 1949-53.

Since 1851 the Registrar-General has taken the deaths registered in or about each census year and has related them to the numbers of people enumerated in various occupations at the census; and since 1911 the occupations have been grouped into a number of so-called social classes. Eight classes were distinguished in 1911, but since 1921 there have been five—I (professional occupations), II (intermediate), III (skilled), IV (partly skilled), and V (unskilled occupations). This social classification is purely an occupational one, and takes no regard of personal circumstances, income, education, and so on except in so far as these are reflected by the individual's occupation. As only one year's deaths have been tabulated for this latest report and as the population estimates are based only on a 1% preliminary sample, most of the mortality rates that are given are for the social classes; little attempt has been made to calculate rates for individual occupations, though a few are shown for one or two large groups such as miners, transport workers, and clerical workers. Mortality indices for various diseases are given separately for men aged 15-64 and aged 65 and over, and for married women classified by their husbands' occupations.³

Though it will probably be advisable to await the detailed five-year tables before drawing too many conclusions from this interim report, comparison of

¹ *Some British Pioneers of Social Medicine*, 1948, London.
² *Registrar-General's Decennial Supplement: England and Wales, 1951. Occupational Mortality, Part I*, H.M.S.O., London, 7s. 6d.
³ See *British Medical Journal*, May 15, p. 1162.

some of the 1950 results with those for 1931 makes an interesting and profitable study. In the 1931 analysis, as in the one before it, the standardized mortality ratio (S.M.R.) of men aged 15-64 increased steadily from social class I, where it was 90, to social class V, where it was 111. The same kind of difference has persisted between these two classes in 1950, with S.M.R.s of 97 and 118, but the indices for the three intermediate classes have lost their uniform gradient. In 1950 the lowest index of all was given by social class II (86) and the second lowest by social class IV (94). This reorientation of the social class mortality gradient has not arisen, it is believed, from random fluctuations in the data, but the report suggests the advisability of awaiting confirmation from the full 1949-53 analysis before speculating unduly about the reasons for the change.

Among causes of death that, as in 1931, showed a steep gradient of increasing mortality from professional to unskilled occupations were bronchitis (S.M.R. increasing from 33 in social class I to 172 in social class V), pneumonia (43 rising to 157), gastric ulcer (56 to 144), cancer of stomach (57 to 132), myocardial degeneration (67 to 137), and respiratory tuberculosis (64 to 149—but only 62 in social class II). Once again coronary disease displayed the opposite tendency, with highest mortality among professional men and the lowest among unskilled workers. In 1931 the range of S.M.R.s was from 237 to 67, and though the disparity was less in 1950 (namely, 150 to 89) it is still a striking feature of this disease. One odd finding, however, was that the gradient for coronary disease in married women was in the opposite direction to men, a new development since 1931. With so much interest centring upon cancer of lung these days it is worth observing that the social-class mortality gradient among men was indefinite in 1921 and 1931; and the new figures do not help much. S.M.R.s were lowest in social classes I and II (80 and 79) and highest in social classes III and V (108 and 116), the index for social class IV being 89. There was evidence, as in 1931, of higher mortality from leukaemia in professional than in unskilled occupations and of a similar, though less certain, gradient for appendicitis.

An analysis of infant mortality and of stillbirths by social class confirms what has been suspected for some time, that despite the enormous reduction in mortality that has been achieved during recent decades the characteristic social class differences have remained relatively unchanged. Total infant mortality has remained more than twice as high among the children of parents in unskilled occupations as among the children of those in professional occu-

pations—rather less than twice as high for stillbirths and deaths under 4 weeks of age, but four times as high for infants dying between 4 weeks and 1 year. If social advance during the course of this century has been responsible, as most believe, for much of the recent improvement in infant mortality, it is clear that all sections of the community have shared in these advances and that the social factors that influence infant mortality are as widely dispersed as they were thirty years ago.

At a recent meeting of the Epidemiology Section of the Royal Society of Medicine Dr. W. P. D. Logan discussed the development of occupational mortality studies and gave a preview of the 1950 results. He summarized the value of these studies as a means not for detecting specific occupational risks but for providing background data for epidemiological research and for widening our understanding of the aetiology of disease. Like its predecessors, the latest report provides ample material for this purpose.

FITNESS, FERTILITY, AND BLOOD GROUP

The human blood groups are remarkable in that they show how several alternative, not uncommon, genetic factors may occupy a particular place on a chromosome and yet their relative frequencies remain remarkably constant so far as can be judged. In England the proportions of the three genetic factors or groups of factors responsible for the A, B, and O antigens were estimated by Dobson and Ikin⁴ to be 32, 6, and 62% respectively. Most other populations have appreciable amounts of each of these three antigens, though the proportions differ from country to country. If any one of these genetic factors contributed even some slight extra element of fitness to their possessors, we should have expected this factor to be common and the others to be rare. It is natural then to look for mechanisms which could produce a stable balance between the different groups.

One possibility, as Fisher⁵ indicated in a general discussion of problems of this kind, is that the heterozygotes (for example, those who are AB, AO, and BO) have some extra element of fitness over individuals who are homozygous (those who are AA, BB, and OO). To take an extreme theoretical possibility merely by way of illustration, if those who are AA and OO were unable to reproduce, while those who were AO were fertile, random mating would always give a population one-quarter AA, one-quarter OO, and one-half AO. Another possibility is that the genetic factor for one antigen may have

¹ *J. Path. Bact.*, 1946, 48, 221.

² *The Genetical Theory of Natural Selection*. Oxford, 1930.

³ *British Medical Journal*, 1953, 1, 799.

⁴ *Brit. J. prev. soc. Med.*, 1951, 5, 223.

⁵ *Klin. Wschr.*, 1926, 5, 741.

⁶ *Les Groupes Sanguins*. Paris, 1938.

⁷ *Brit. J. soc. Med.*, 1947, 1, 1.

⁸ *Ann. Eugen. (Camb.)*, 1950, 15, 120.

⁹ *Brit. J. prev. soc. Med.*, 1953, 7, 1.

¹⁰ *Ibid.*, 1953, 7, 220.

¹¹ *Lancet*, 1953, 2, 456.

an advantage under one set of circumstances, say town-life or life in the valleys, while that for another has the advantage in country-life or life in the hills. Constant migration between town and country or hill and valley would prevent either antigen from finally ousting the other.

Several workers in consequence have been searching for such balancing selective advantages of one or other of the blood groups. Perhaps the best-established finding hitherto is that by Aird, Bentall, and Roberts³ that there is a definite excess of group A among patients with carcinoma of the stomach. The selective effect of this would be small. More striking, though perhaps needing confirmation, is Struther's⁴ finding that in a Glasgow hospital there were an excess of A children among those dying under the age of 2 years and that this was confined to those in whom, macroscopically at least, bronchopneumonia was present at necropsy.

Another approach is that begun by Hirsfeld and Zborowski.⁵ They noted that in some series where both parents and child had been grouped there were relatively fewer A offspring from the mating of O mothers with A fathers than in the mating of O fathers with A mothers. Hirsfeld,⁶ however, was unable to confirm this in his later work. Waterhouse and Hogben⁷ retested the hypothesis on a mixed collection of series published up to 1944, selecting only those series which they considered were reliable. They found a highly significant shortage of A children from the mating of O mothers with A fathers and that this deficit increased with increasing birth order. This work may be criticized on the grounds that the series were not homogeneous and because of possible unconscious bias in selection. No one has tested the hypothesis on a single large personal series where the groups of children and both parents are known, but Boorman⁸ in a large series from one hospital found no deficit of A children of O mothers compared to O children of O mothers. On the other hand, support for the idea of progressive loss of A children of O mothers has come from Kirk and Stenhouse's⁹ observation that in an Australian hospital O women had significantly more pregnancies before the age of 25 and after the age of 35, though A women had more children between 25 and 35 and also a slightly higher overall fertility. They suggested that O women might be basically the more fertile, but that some of them became sterile from A-O incompatibility.

The most recent contribution on these lines is an ingenious analysis by Allan¹⁰ of Waterhouse and Hogben's collected series. He shows that in these series it is not compatibility of mating that appears important but rather that each sex has its own order of fertility according to blood group. For example, men who are group A have relatively few children not only when married to an O woman but also when married to women of any other group. Disregarding the marriages where both parents have the same group, he finds that the order of fertility for mothers is A, O, AB, B, and for fathers is precisely the reverse, B, AB, O, A. It is not clear that these differences in fertility according to sex could by themselves produce a balanced polymorphism, but combined with differences in survival rate

they might well do so. Allan¹¹ has in fact found some indication of such differences in the relative ages of blood donors of groups O, A, and B in earlier wartime series from south-west England and from Ulster. For men the order of increasing age (and so perhaps of increasing fitness) was B, A, O, while for women the order was the reverse, O, A, B. These tendencies run counter to the differences in fertility. All this work so far has thrown up intriguing hypotheses rather than definite facts. New series are required on which the hypotheses can be further tested—not only series of families but series of children according to age and sex, and series of patients with many different diseases.

THE APOCRINE GLANDS

According to the recently published researches of Shelley, Hurley, and Nichols¹ the characteristic smell emanating from the human adult is due to bacterial decomposition of the secretion of the apocrine glands. These glands, which do not become active until puberty, are normally to be found only in the axillae, around the nipples, and within the genital and perineal area. They are situated in the deepest part of the dermis or in the subcutaneous tissues, and consist in a single coiled tube from which a duct passes to convey the secretion to the surface of the skin. The duct commonly empties into hair follicles. Secretion of the apocrine glands is stimulated by adrenaline and the result is a viscid, white, milky fluid. Hurley and Shelley² have provided considerable evidence that this is the only secretion produced by the apocrine glands. Other workers have at times suggested that these glands may also produce a clear watery fluid, but according to Hurley and Shelley the latter is always the product of adjacent eccrine glands of ordinary sweat-gland type. The function of the apocrine glands is not precisely known, but it is suggested that they have the property of attracting the opposite sex. It is certainly difficult to believe that any vestigial structure would show such active function as the apocrine glands.

Shelley, Hurley, and Nichols have now demonstrated that when apocrine fluid is secreted it is entirely without smell; if it remains sterile or if antiseptic is added no odour develops, but if the ordinary bacterial inhabitants of the axilla are allowed to contaminate the sweat the characteristic odour develops within a few hours. In these experiments it was found virtually impossible to sterilize the skin of the axillae, and the presence of hair makes this even more difficult. The development of axillary odour can be considerably delayed if the area is shaved and treated with an antiseptic such as hexachlorophene, and these authors found that if the axilla is shaved and washed axillary odour fails to develop within 24 hours in nine out of ten subjects. The same authors have examined the effect of deodorants; they conclude that deodorants make no notable difference to

¹ Arch. Derm. Syph. (Chicago), 1953, 68, 430.

² Brit. J. Derm., 1954, 66, 43.

³ Ibid., 1952, 64, 116.

⁴ Brit. J. plast. Surg., 1953, 6, 231.

the amount of apocrine secretion, but they were able to show that aluminium chloride has an antibacterial effect in addition to a property of neutralizing in some way those products of bacterial decomposition which actually cause the smell.

The apocrine glands do not commonly give trouble. The rare disorder known as Fox-Fordyce disease consists in an itching papular eruption which usually appears on all those areas where apocrine glands are present. It is believed to be due to blockage or inflammation of the ducts of these glands, but nothing is known of its nature. Occasionally the glands become infected, and this leads to painful boils. The axillary fat is liable to be infected, with the production of chronic sinuses which may undermine the skin for some distance around. It is usually the axillae which are affected, but in more severe cases the groins and perineum may be involved as well, and an extensive area may become undermined by fistulous tracks. In milder cases conservative local treatment is all that is necessary and it is probably better if the temptation to incise the abscess is resisted. In more resistant cases this treatment is not enough, but hormonal therapy, which has sometimes been tried, seems to be ineffective. Long courses of antibiotics given systemically do not often accomplish a great deal.

The unhappy plight of these patients has led surgeons to attempt more drastic measures. Goldsmith showed at the Royal Society of Medicine a patient who had been treated by Naunton Morgan.³ On several occasions deep abscesses and sinuses had been opened on to the surface and packed so that they were made to heal by granulation from the bottom. Healing is slow and results in considerable scarring, but eventually the infection seems to be overcome.

Wynn Williams⁴ now records the results in his cases of excising the entire area of skin together with subcutaneous tissue and grafting. Only the axillae required treatment and the results were entirely satisfactory. On the perineum this might not be so. This procedure may at first seem rather drastic, but the apparently hopeless plight of the patient who is seriously affected no doubt justifies the operation.

THE CAMBRIDGE MEDICAL SCHOOL

The Cambridge Medical School occupies a distinctive position in the medical services of East Anglia, and it is fitting that the headquarters of the school should now occupy new, though still temporary, premises in the grounds of Addenbrooke's Hospital. As Sir Lionel Whitby, the Regius Professor of Physic, writes in his latest annual report,¹ the new premises, which include haematological and chemical laboratories, will afford further opportunities for the closer integration of the teaching and research staffs of the university departments with the staff of the United Cambridge Hospitals. The school of postgraduate teaching and clinical research comprises the departments of medicine, experi-

¹ Cambridge University Reporter, 1954, 84, 841.

mental medicine, radiotherapeutics, and human ecology; and the pathological and biochemical services of the United Cambridge Hospitals are provided by university teachers under the direction of the professors of pathology and biochemistry. Undergraduates cannot, as yet, complete the full clinical course at Cambridge, but a limited number can work for a time as medical clerks, surgical dressers, or obstetrical clerks. During the long vacation there is a course in elementary clinical methods, which helps to bridge the gap between the pre-clinical and clinical periods of the curriculum. One of the most popular features of postgraduate training at Cambridge are the one-day symposia on subjects of particular interest to general practitioners. These are held on Saturdays at monthly intervals, and the total attendance at the ten symposia during 1952-3 was 290.

Under arrangements made with the Ministry of Health many general practitioners are able to attend the postgraduate courses and symposia without fee. Clinico-pathological conferences, also held once a month, afford useful opportunity for local general practitioners to meet the staffs of the hospitals and of the medical school. In these and other ways the several departments of the university medical school are being used to help clinicians with the day-to-day problems of clinical practice.

MEDICINE IN INDIA

In its campaigns for educational and hospital reform in India, for improved public health measures, and for the suppression of quackery and other abuses, the monthly periodical the *Antiseptic* holds a prominent place of honour in that great subcontinent. It was started fifty years ago by two remarkable men—Dr. T. M. Nair, its first editor, and Dr. U. Rama Rau, who succeeded to the editorship on the early death of Dr. Nair. By a family succession unique in scientific journalism Dr. Rau's son, Dr. U. Krishna Rau, followed him as editor, and his son, Dr. U. Vasudeva Rau, has now taken over in turn, his father remaining proprietor. A special issue of the journal to mark its golden jubilee has now appeared, and we join with many other well-wishers in offering our congratulations to those responsible for producing this vigorous publication. It is only natural that on some occasions during these fifty years of campaigning to improve both the standards and the working conditions of the medical profession in India the *Antiseptic*, and those who thought like it, should have had differences of opinion with British Government representatives. But a retrospect shows that men of good will in the two nations were not seriously divided over these issues, which may be seen now rather as the struggles of humane idealists against the traditional conservatism among the people of the country and the caution habitual to governing bodies. With Sir Arcot Mudaliar, who contributes a foreword to the golden jubilee number, many will hope that the *Antiseptic* "will continue its great mission."

CLINICAL PATHOLOGY IN GENERAL PRACTICE

LABORATORY CONTROL OF CHEMOTHERAPY

BY

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In the past few years our ability to deal with most bacterial infections has been transformed by the discovery of a series of powerful antibacterial drugs. But knowledge of the correct use of these drugs has not advanced so fast, and there is a danger that, through misuse, many of them may lose their effectiveness or even do harm. The practitioner, knowing that laboratory results are often too late to be of immediate use in urgent cases, tends not to consult the laboratory in those cases in which it can be really useful. The laboratory worker often lacks the experience or imagination to understand the practitioner's difficulties and is apt to criticize him for using drugs blindly without laboratory tests. Yet if these drugs are to be used wisely and safely there is urgent need for clinician and laboratory worker to share their ideas and experience.

Chemotherapy for our present purpose may be defined as "the treatment of infections by specific drugs"—specific both because ideally they are drugs which attack the infecting organism without harming the tissues of the patient and because many of them selectively attack some micro-organisms and not others. In both these ways they differ from antiseptics, though it is not always easy to draw the dividing line. The chemotherapeutic substances in use at the present time fall into two main groups: (1) substances of known constitution prepared by the chemist, such as the sulphonamides, *para*-aminosalicylic acid, isoniazid, etc.; (2) substances which may be of known or unknown chemical composition synthesized by living organisms—the class of antibiotics such as penicillin, streptomycin, chloramphenicol, aureomycin, oxytetracycline ("terramycin"), polymyxin, and erythromycin. The distinction can, of course, be artificial, since chloramphenicol when synthesized by the micro-organism *Streptomyces venezuelae* is classed as an "antibiotic" but it becomes a "drug" or chemotherapeutic substance when made by the chemist.

The laboratory can take part in the control of chemotherapy in the following ways: (1) by identifying the causal organism by direct microscopy and culture; (2) by determining its sensitivity to drugs and reporting the development of drug resistance; (3) by finding out whether adequate concentrations of drugs are being attained at the site of infection or in the circulation; and (4) by preventing or detecting undesirable side-effects.

In this article only bacterial infections are considered, and infections due to protozoa, fungi, and viruses are excluded.

Identification of the Causal Organism

The most useful piece of information the bacteriologist can give is to tell the practitioner *before* he starts treatment what the causal organism is. In a certain number of cases an answer can be given within a matter of minutes or at the most an hour or two. It is often possible by direct microscopy to identify beyond all reasonable doubt the *Treponema pallidum* of syphilis in a primary lesion, the gonococcus in a urethral smear, the tubercle bacillus in

a specimen of sputum, the meningococcus or the tubercle bacillus in a specimen of cerebrospinal fluid. We know that syphilis and gonorrhoea usually respond to penicillin, that cerebrospinal fever usually responds to sulphonamides, and that tuberculosis often responds to streptomycin, *para*-aminosalicylic acid, and isoniazid. The mere identification of the causal organism may therefore give a strong indication of the right drug to use—an indication which clinical judgment alone could not always give.

More often it is not possible on direct microscopy to say what the causal organism is, and we must wait for the results of culture. With most of the common pathogenic organisms cultural results should be available in 24 to 48 hours, though complete identification of a pathogenic species takes much longer. In whooping-cough, cultures may take two to five days. In tuberculosis it is often necessary to wait for several weeks even for the results of primary culture. In such cases the choice of drug has to rest on clinical judgment alone, and the practitioner is tempted to ignore the laboratory altogether. But whenever possible he must make efforts first to obtain a specimen for culture and drug-sensitivity tests, even though he may not be able to wait for the results. These may indicate that a change of treatment is necessary long before failure to respond clinically to a wrong drug is obvious. Repeated cultures during treatment may give useful information about the patient's progress.

It is essential that the practitioner should give details of any chemotherapy the patient is known to have had, since high concentrations of drugs in specimens sent to the laboratory may make cultural work valueless unless special precautions are taken—for example, adding *para*-aminobenzoic acid to antagonize sulphonamides or penicillinase to destroy any penicillin in the specimen.

Sensitivity Tests

From what has already been written it is obvious that for different reasons many infections have to be treated without waiting for the results of drug-sensitivity tests. But properly used these can be of great value in guiding treatment.

As soon as the bacteriologist has obtained a pure culture he can test it for its sensitivity to various drugs which are likely to be useful. In many cases tests of drug sensitivity can be performed on primary cultures inoculated direct from the specimen. This may save valuable time, especially with slow-growing organisms.

There are two methods in common use for testing pure cultures for drug sensitivity—diffusion methods and dilution methods.

Diffusion Methods

If diffusion methods are used, the culture is inoculated on to a suitable solid medium such as a blood-agar plate, and solutions of the drug or drugs to be tested are placed in a reservoir from which they can diffuse into the agar. The reservoir is provided in various ways—by cutting holes in the agar and dropping solutions of the drug into the holes, or by placing on the agar porcelain cylinders, blotting-paper disks impregnated with the drugs, or tablets of the drugs. All these methods are in principle the same: there is a race between the molecules of drug diffusing out from the reservoir and the molecules of nutrients in the medium diffusing into the inoculated organisms, whose fate will depend on the relative speed of these two

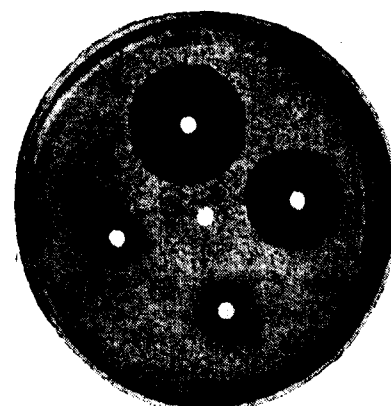


FIG. 1

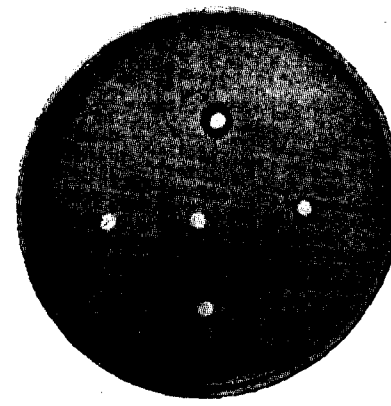


FIG. 2

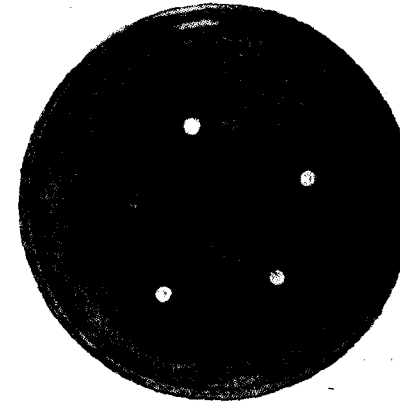


FIG. 3

FIG. 1.—Penicillin-sensitive staphylococcus showing zones of inhibition of growth obtained with paper disks soaked in penicillin solutions of the following strength: 1,000, 100, 10, and 1 unit per ml. (from the top in a clockwise direction) and a control disk with no penicillin in the centre. The culture has grown confluent over the surface of the nutrient medium except in the areas inhibited by the penicillin. FIG. 2.—Penicillin-resistant staphylococcus. Penicillin concentration, etc., as in Fig. 1. Note that even this organism shows a small zone of inhibition around the disk containing the highest concentration of penicillin (=1,000 units per ml.). FIG. 3.—Antibiotic sensitivity of a coliform organism. The antibiotics are (from the top in a clockwise direction), the penicillin (200 units per ml.) and streptomycin, chloramphenicol, aureomycin, and oxytetracycline (200 µg. per ml.). The organism is resistant to penicillin, but sensitive to the other four antibiotics.

processes. Those micro-organisms which are in a position on the plate close to the drug reservoir may be damaged or killed by the drug before they have a chance to start growing; micro-organisms further away from the drug reservoir may have already grown freely before an inhibitory concentration of the drug reaches them—and then, even if the drug goes on diffusing (as it will if the reservoir is big enough or the concentration in the reservoir high enough) it may be too late, for many of the drugs used are not bactericidal, and even those that are bactericidal often kill bacteria only when they are actively growing. The result is that when the culture plate is examined the next day a zone of inhibition appears around the reservoir of any drug with a strong inhibitory action on the growth of the organism under test.

The size of the zone of inhibition ("no growth") depends, other things being equal, on the concentration of drug used in the reservoir and on the sensitivity of the organism to the drug. The size of zone can thus be used in two ways, either for indicating the relative sensitivities of different organisms when standard concentrations of drugs are used in the disks, or for estimating the concentration of drug, for example in body fluids, if a standard organism of known sensitivity to that drug is used. Methods which involve diffusion from a reservoir cannot be used for accurate quantitative work unless they are carefully controlled, but for rough estimation of the sensitivity of an organism to various drugs they are very useful (see Figs. 1, 2, and 3).

When there is great urgency, time can be saved in two ways: (1) By performing sensitivity tests directly on primary material such as pus or sputum whenever this is likely to contain large numbers of organisms. A control plate free from all drugs must always be inoculated as well, for obvious reasons. (2) By looking for zones of inhibition on culture plates a few hours after inoculation. If these are inoculated early in the morning it is often possible to give a preliminary sensitivity report the same day—a point of great practical value. Such reports are almost invariably confirmed when the culture plates are re-examined the next day.

Dilution Methods

If dilution methods are used a series of dilutions of drug in nutrient medium are inoculated with the organism under test and after a suitable period of incubation the presence or absence of growth in the different dilutions is observed. Fig. 4 shows a typical "titration" of this kind. The culture has grown in the control tube of broth and in the tube containing 0.015 unit of penicillin per ml., but not in the tubes containing 0.03 unit per ml. or higher con-

centrations of the drug. The organism is therefore said to be "sensitive" to 0.03 unit but not to 0.015 unit of penicillin per ml. of medium.

Dilution methods may be used either with liquid media or, less frequently, with solid media. But to investigate the sensitivity of only one culture to, say, five drugs—penicillin,

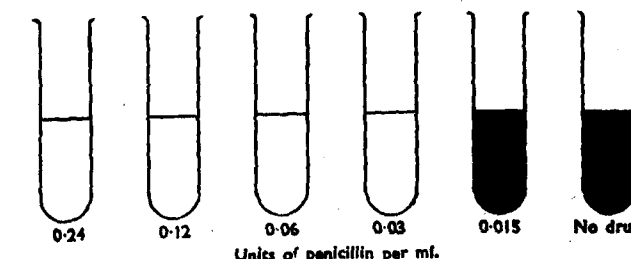


FIG. 4.—Dilution method of testing sensitivity of an organism to penicillin.

streptomycin, chloramphenicol, aureomycin, and oxytetracycline—involves a considerable amount of time, and dilution methods in solid media are not commonly used for routine work.

Dilution methods, like diffusion methods, can be used not only for determining the sensitivity of a culture to a number of drugs but also for estimating the concentration of drug in the serum or other fluid.

Reports of Sensitivity Tests

Different laboratories have different methods of reporting sensitivity tests. If diffusion methods only are used it is enough to report cultures as sensitive or resistant to the various drugs tested. Some laboratories go further and report cultures as "highly," "moderately," or "slightly" sensitive or resistant. When dilution techniques are used, the sensitivity of the organism can be reported with some precision. For example, a strain of *Staphylococcus aureus* might be reported as sensitive to 0.03 unit of penicillin per ml. and to the following concentrations of other drugs—streptomycin 1 µg., aureomycin 0.5 µg., oxytetracycline 0.5 µg., chloramphenicol 2 µg., and erythromycin 0.1 µg. per ml. These figures can be taken as indicating that the organism is about normal in its sensitivity to the commonly used antibiotics. On the other hand, a strain which needed 100 units of penicillin per ml. to inhibit its growth would be regarded as highly resistant to penicillin. There is some difference of opinion concerning the precise form in which laboratory reports on sensitivity tests should be worded.

The most useful laboratory report is one which gives the results of the tests performed, but also gives enough information to tell the clinician which drugs are likely to be useful in practice.

In most cases the results of *in vitro* sensitivity tests are in harmony with clinical experience. But there are many discrepancies, and not all of them are easy to explain. Tests of sensitivity of bacteria to sulphonamides and to aureomycin, in particular, are apt to be unreliable for various technical reasons.

In tuberculosis most methods of culture are slow, and drug-sensitivity tests involving subculture are even slower, so that it may take weeks to report on the drug sensitivity of a strain of tubercle bacillus from a patient's sputum or cerebrospinal fluid. In patients with positive sputum microscopic examination of the sputum can give evidence of the response to a particular drug or combination of drugs much more rapidly than most of the sensitivity tests at present available.

Drug Resistance

Many a drug has shown great promise at first only to prove disappointing later, because of the rapidity with which resistance emerges in bacteria originally sensitive to it. How does this come about? Several mechanisms have been described. (1) All the individual organisms may be changed by contact with the drug and so become adapted to resist its action. If this were purely a response to environment it might be expected that such resistance would not be permanent, once the drug which stimulated it was stopped. (2) Since it is known that even in the purest of pure bacterial cultures no two bacteria are exactly alike, it is easy to see how, in the presence of a drug, resistant members of the bacterial population could survive its action by a simple process of natural selection. This could occur to some extent whether or not these resistant organisms were true mutants—if they were, the resistance developed would be more likely to be permanent. (3) A culture of predominantly drug-sensitive organisms may be replaced by foreign invaders of a different type from an outside source. Each of these mechanisms is known to operate in some circumstances, and sometimes it is possible that all may be operating together.

The problem of drug resistance is more serious with some drugs and with some organisms than with others. The value of streptomycin is greatly reduced by the ease with which almost all species of sensitive organisms develop resistance—for example, in coliform infections of the urinary tract and in tuberculosis. In tuberculosis isoniazid suffers from the same defect. For this reason neither streptomycin nor isoniazid should be used alone if it can possibly be avoided, and it is now well known that development of resistance can be greatly delayed by the combined use of more than one drug at a time or perhaps in rapid rotation. With penicillin, on the other hand, the development of drug resistance has not proved a serious menace except in staphylococcal infections, and there the incidence of penicillin-resistant organisms has increased greatly, especially in institutions in which there is opportunity for resistant strains to become dominant. With the sulphonamides drug resistance has provided a serious problem in streptococcal and gonococcal infections, yet in meningococcal infections it is seldom important clinically. With the newer antibiotics examples of drug resistance are being more frequently reported as their use becomes more widespread, and here too it seems that staphylococcal infections may present the most serious problem.

Drug Concentrations in Body Fluids

The laboratory is often asked to determine the concentration of drugs in the blood, the cerebrospinal fluid, or other material. Such estimations are of greatest value when new drugs are being tested out for the first time, or when new routes of administration or new preparations of

drugs are being tried. It is worth remembering, however, that, in any particular case, failure to respond may be due to failure of the drug to reach the site of infection rather than to development of resistance, and therefore the measurement of blood levels may be of value—for example, as evidence of whether a patient has in fact been taking a drug at all.

With some drugs chemical methods of estimation are available; with others it is necessary to use microbiological methods similar to those described above for determining the drug sensitivity of organisms, using as standard an organism of known sensitivity to the particular drug concerned. It is obvious that the situation can become very complicated when the patient is receiving more than one drug at a time, and the laboratory work involved may become very time-consuming.

Prevention of Undesirable Side-effects

It is gradually being realized that the powerful chemotherapeutic drugs which are now being used, like all other drugs, can be dangerous either by direct toxic action or by giving rise to a state of hypersensitivity (allergy). Examples of direct toxic action are the deafness and vestibular damage produced by prolonged administration of streptomycin in large doses and perhaps the gastro-intestinal disorders caused by aureomycin. Examples of hypersensitivity are the skin reactions produced by penicillin and streptomycin and perhaps the agranulocytosis or aplastic anaemia produced by chloramphenicol.

The laboratory can sometimes help in preventing these and other dangerous side-effects—for example, by regular blood counts on patients receiving chloramphenicol, and examination of throat swabs, faeces, and other material for the presence of fungi which may replace bacteria and cause fatal complications.

General Conclusions

It is clear that the laboratory control of chemotherapy is no simple matter. There cannot be hard-and-fast rules laying down what kinds of sensitivity tests should be carried out, when they should be performed, and how often they should be repeated during treatment. The need for such tests varies greatly both with the drug being used and with the nature of the infection. Laboratory tests of the sensitivity of organisms to drugs can be misleading, but so can the results of therapeutic trials. Discrepancies between the two can be resolved only if there is opportunity for frequent personal consultation between clinician and laboratory worker.

Next article on Clinical Pathology.—“Biopsies,” by Dr. Raymond Whitehead.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

Although approved medical schools in the U.S.A. are now accepting their largest freshman classes, totalling nearly 7,500 students, for the fourth consecutive year there has been a decline in the number of applicants for admission, according to an article by Dr. John M. Stalnaker in the April issue of the *Journal of Medical Education*. Of those that apply about 57% are accepted, while of those who apply after rejection the year previously about 40% find places. It is said that the medical schools which limit their applications to State residents in many cases had to “scrape the bottom of the barrel” to secure a freshman class.

AMERICAN SURGEONS IN LONDON

THREE-DAY SECTIONAL MEETING AT ROYAL COLLEGE

The American College of Surgeons came to London this week as a body for the first time to hold a three-day sectional meeting at the Royal College of Surgeons. More than 500 members attended (including about 50 Canadians), and were reinforced by a large contingent of British surgeons. The meeting was the first to be held in the spacious new hall of the Royal College, which has a seating capacity of 700. The meeting in London was only a portion of the American itinerary. The members had already attended the annual meeting of the Association of Surgeons of Great Britain and Ireland, held at Harrogate, and were going on to further meetings in Paris and Brussels.

The papers, which numbered between 60 and 70, followed one another according to a strict schedule, and even at the luncheon tables informal discussions were held, including, on the first day, one on intestinal obstruction, with Mr. A. DICKSON WRIGHT as “moderator.” In the course of the meeting the president of the American College, Dr. F. W. RANKIN, conferred its honorary fellowship on Sir HENRY SESSIONS SOUTTAR, Sir CLEMENT PRICE THOMAS, and (*in absentia*) Sir ARTHUR KEITH.

Sir CECIL WAKELEY, P.R.C.S., presided over the first session on the morning of May 17, and the first event was the showing of a film, made chiefly at the Royal National Orthopaedic Hospital and designed for postgraduate instruction, on the reduction of surgical haemorrhage by controlled hypotension. Sir ARCHIBALD MCINDOE, in a brief commentary, spoke of the effects of posture and also of neuromuscular blocking agents.

Two papers were next given on abdominal emergencies in infancy, the first by Professor C. W. MCLAUGHLIN (Omaha), who discussed duodenal and small bowel obstruction, and the other by Mr. G. H. MACNAB (Westminster Hospital), who confined his remarks to intestinal atresia. He described the treatment of jejuno-ileal atresia by resection and end-to-back anastomosis.

Internal Fixation of Fractures

Sir REGINALD WATSON-JONES (London Hospital) introduced the subject of internal fixation of fractures. He urged that no surgeon should undertake internal fixation until he was fully trained and experienced in every other method of fracture treatment. He showed a specimen from the College museum of a fracture sustained 5,000 years ago and treated by external splinting and bandaging, a method which was used to-day in a very large number of fractures and which, he had no doubt, would still be used 5,000 years hence. Internal fixation was needed in only a very small proportion of fractures. It was important that the metal used should be non-toxic and of sufficient strength, and that recognized physiological principles should obtain, for it was not with metal they were dealing but with living bone, and the less metal used the better. This matter must not be interpreted in terms of engineering but in terms of physiology.

Professor E. F. CAVE (Boston) said that the use of metals for internal fixation still evoked controversy in the United States. A joint committee was now sitting for the standardization of the most suitable materials. There were, for example, more than fifty grades of stainless steel.

Professor I. S. RAVDIN (Philadelphia) read the first of two papers on operative cholangiography. He pleaded that surgeons should be more sure of the absence of stones in the common duct. At present many such stones were not removed at primary operation. It was now generally agreed that cholangiography represented a distinct advance in the diagnosis of biliary abnormalities. It was of value pre- and post-operatively as well as at the operation itself.

Mr. R. J. MCNEILL LOVE (Royal Northern Hospital) said that cholangiography served a dual purpose. A normal

cholangiogram rendered exploration unnecessary in otherwise doubtful cases, and on the other hand the information obtained sometimes prevented the surgeon from overlooking a duct which demanded exploration or some other operative interference. He had used cholangiography in over 500 cases.

Vascular Spasm

Sir JAMES PATERSON ROSS (St. Bartholomew's) chose to speak on arterial spasm because it had so much to do with trauma, and he hoped that some of their American friends would relate their experiences of Korean casualties. The time had come to review what was known—and not merely suspected—about the part played by arterial spasm in organic disease. He indicated some reasons for doubt about the meaning or importance of the presence of spasm in organic arterial diseases. Dr. F. W. COOPER (Emory University, Georgia) followed with a paper on the same subject.

Dr. LESTER DRAGSTEDT (Chicago) closed the morning session with a discussion on physiological principles in surgical treatment of duodenal and gastric ulcers. He described some animal experiments as well as clinical observations which suggested that hypersecretion in duodenal ulcer patients was largely of nervous origin, confirmed by the evidence that such patients usually show a certain amount of nervous tension; whereas in gastric ulcer patients the hypersecretion was of humoral origin. In these latter vagotomy ought not to be performed; hypersecretion would be abolished by removal of the antrum.

Gynaecological Symposium

At the second session, with Dr. G. GAVIN MILLER (Montreal) presiding, a symposium on gynaecology was opened by Mr. DOUGLAS MACLEOD (St. Mary's), who read a comprehensive paper on endometriosis and its treatment in relation alike to patients in whom it was important to preserve fertility and in older patients after the menopause. Professor D. G. TOLLEFSON (Los Angeles) said that external endometriosis, next to malignant disease, was the most crippling condition with which gynaecologists had to deal. In a series of 600 gynaecological laparotomies for miscellaneous conditions the incidence of endometriosis was nearly 10%. He believed that the tension of modern living was causing an increased incidence. The greatest service to be rendered to a patient, once the diagnosis had been established, was early surgery.

Professor G. I. STRACHAN (Cardiff) discussed the diagnosis of carcinoma of the cervix. Duration of bleeding, he said, was no index to the extent of the condition likely to be found. There was no reliable early symptom. Any symptom found might be associated with it. Therefore clinical examination was of first importance, and once the diagnosis was established by such examination the case should be put back for investigation under anaesthesia.

Pre- and Post-operative Care

A panel discussion on various aspects of pre- and post-operative care was conducted by Dr. W. G. MADDOCK (Chicago), who himself brought forward the question of gastro-intestinal distension. He pointed out how exceedingly quickly air passed through the intestine. For treatment of intestinal distension any air already present should be removed and air should be prevented from entering the intestines by continuous aspiration of air from the stomach. Moderate to severe distension at operation could be relieved by not closing the incision over the distended intestine.

Professor F. A. R. STAMMERS (Birmingham) said that the dramatic leap forward of surgical progress had brought into prominence four special requirements: readily available compatible blood, refined anaesthesia, chemotherapy (including antibiotics), and the understanding of fluid and crystalloid balance. He discussed the last of these. In the immediate post-war period younger surgeons were inclined to forget the difference between the trauma of warfare and the conditions seen in civil practice, especially in older

people, in whom the question of physiological balance was of fundamental importance. Every patient undergoing more than slight operative interference should first be brought into physiological balance.

Professor J. GARROTT ALLEN (Chicago) discussed the advantages and disadvantages of the storage of pooled plasma at room temperature. In his view the advantages outweighed the disadvantages. Finally, Professor D. MACLEOD DOUGLAS (St. Andrews) discussed the management of operative incisions.

The concluding scientific event of the day was a Hunterian Lecture on progressive exophthalmos by Dr. HOWARD C. NAFFZIGER (San Francisco). It was delivered before the President and the full Council of the Royal College. The later proceedings of the Sectional Meeting will be reported in our next issue.

On the evening of Monday, May 17, the President and Council of the Royal College of Surgeons held a reception (through the generosity of Ethicon Suture Laboratories Ltd.) at the College. The Great Hall was filled with guests of many nationalities, and special displays were on view in the museum and library.

Reports of Societies

THE ANAESTHETIST AND THE MANAGEMENT OF PAIN

At a meeting of the Anaesthetic Section of the Royal Society of Medicine on May 7, with Professor R. R. MACINTOSH presiding, Dr. J. J. BONICA read a short paper on "The Role of the Anaesthetist in the Management of Pain." Dr. Bonica began by emphasizing the important part the anaesthetist could play if he was prepared to assume the responsibilities of a physician and also to devote sufficient time to a study of this subject. The management of cases of intractable pain had taxed the skill of the greatest physicians, and it still remained one of our most difficult problems. If the anaesthetist was to be adept at the various complicated techniques of local anaesthesia it was most important that he should use these methods in his everyday practice in surgical anaesthesia.

At the outset the diagnosis must be confirmed by a full history and a thorough physical examination performed. Once this had been achieved, taken against a background of the knowledge of the various pathways of pain, the anaesthetist must determine whether a nerve-block was indicated. It was important to recognize the predominant psychological element of pain, particularly in the intractable variety, and the anaesthetist must always exhibit to the patient full confidence in his methods.

The indications for analgesic injections or nerve-blocks fell into three main clinical categories—namely, diagnosis, prognosis, and therapy. Diagnostic blocks could be used to determine the pathways of the pain and to aid in the differential diagnosis of diseases with confusing signs and symptoms, such as coronary occlusion, pancreatitis, cholecystitis, renal colic, and ruptured peptic ulcer. Prognostic blocks were frequently performed to afford the patient the opportunity of temporarily experiencing the effects of interruption of a nerve-block before the interruption was made permanent and at the same time to allow the neurosurgeon to prognosticate on the possible value of a surgical operation. This type of block was of particular value in such conditions as tic douloureux, angina pectoris, causalgia, and other reflex sympathetic dystrophies. Therapeutic nerve-blocks might be usefully employed in a wide variety of pain syndromes, such as thrombophlebitis, post-operative pain, herpes zoster, and various types of visceral pain.

The proper choice of solution for injection was important. For diagnostic and prognostic blocks a 1-2% solution of lignocaine hydrochloride was the most satisfactory. For

¹Beard, R. L., *Bulletin* 562, Connecticut Agricultural Experiment Station, New Haven, 1952.

prolonged blocking various local analgesic agents in oily solution had been advocated, but these had not been found satisfactory, for the blocks were often incomplete and unpredictable. Recently a solution of procaine base and hydrochloride in polyethylene and propylene glycol, called "efocaine," had been introduced for the purpose of producing analgesic blocks of several days' duration. Recent reports indicated that it was not an innocuous drug.

Benzyl alcohol in 0.75-2.0% concentration was a satisfactory agent for prolonged blocking, and although neuritis was occasionally seen after its use it was mild and of short duration. Absolute alcohol remained one of the most effective drugs for prolonged interruption of nerve impulses. Unfortunately, its use was frequently followed by post-injection neuritis, but this was usually mild and lasted only a few weeks. It remained, however, the method of choice in the treatment of intractable pain from an inoperable malignant condition. Disturbance in function of the bladder and rectum might be experienced, but Dr. Bonica felt that the benefits usually obtained were sufficient to justify the risk of this complication. In conclusion, Dr. Bonica emphasized the importance of a nerve-block clinic, run by an anaesthetist as part of the activities of a pain clinic.

Wasp Venom and Anaesthesia

Dr. E. H. SEWARD, in a paper entitled "Wasp Venom and Anaesthesia," pointed out that there were two types of wasp, the social wasp and the solitary or hunting type. The social wasps were so called because they lived in communities, and were familiar by virtue of their anti-social behaviour. Their sting was purely defensive and they usually killed other insects by biting them. The solitary wasps were less well known, for they rarely came in contact with man. There were many hundreds of varieties, and peculiar to them all was the power of paralyzing certain other insects by stinging them. Only the female could sting; she selected her prey and then stung it when she was ready to lay her eggs. The prey was almost instantly paralysed and was then taken by the wasp to a safe place, where she laid her eggs around it. When in due course the grubs hatched out, the victim was still alive but unable to move, so that it supplied a ready source of fresh meat on which the grubs could prosper.

Though the behaviour of solitary wasps had been quite extensively studied, the toxicology and pharmacology of their venom had received little attention. However, Beard¹ in America had recently shown that one type of solitary wasp—the *Habrobracon*—possessed a very powerful sting and was able to paralyse its prey almost instantly by a single sting. The injected venom, which was capable of producing a permanent paralysis in larvae in a concentration of one part in 200 million, was carried by the blood stream.

The evidence available at present suggested that, in this one solitary wasp at least, the paralysis produced by its venom was due to an action at the neuromuscular junction; and in all probability the venom of other wasps acted in a similar way. Curare, however, did not produce paralysis in those insects which had so far been tested, but the effect of depolarizing drugs which produced paralysis in vertebrates had not yet been studied. The venom was either a protein or a protein-like material, water-soluble, and was carried in the plasma portion of the blood.

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

ANNUAL CONGRESS AT NEWCASTLE

The Ophthalmological Society of the United Kingdom held its seventy-fourth annual Congress at Newcastle-upon-Tyne from April 22 to 24, under the presidency of Mr. ALEXANDER MACRAE. The main discussion this year was on "Inflam-

matory Vascular Diseases Affecting the Eye," the three opening speakers being Mr. R. C. DAVENPORT (London), Dr. S. P. MEADOWS (London), and Professor J. B. DUGUID (Newcastle-upon-Tyne).

Retinal Vasculitis

Mr. DAVENPORT took for his subject retinal vasculitis, with particular reference to its association with various forms of uveitis. Four features of this association had impressed him: the long interval which may separate the retinal and uveal inflammations; their occasional alteration or simultaneous appearance; the fact that the retinal changes may affect either arteries or veins, alone or together; and the occasional siting of a venous lesion entirely within the nerve head. He described four cases illustrating these features. The first developed bilateral iridocyclitis 20 years after an attack of bilateral retinal phlebitis. In the second, unilateral sclerokeratitis associated with cervical adenopathy was followed, 15 years later, by retinal phlebitis in the same eye. In the third, intermittent attacks of retinal phlebitis, uveitis, and episcleritis continued during 13 years. The fourth suffered from mild anterior uveitis, some degree of retinal vasculitis, and bilateral papillitis for two years. In every case all investigations were negative, showing that the cause of the diseases in question remained a matter for further research. In conclusion, the speaker alluded to the association of retinal vasculitis with lesions of the central nervous system, particularly disseminated sclerosis.

Temporal Arteritis

Dr. MEADOWS's theme, based on 12 personal cases, was "Temporal Arteritis and Loss of Vision." After describing the distribution, incidence, and pathology of the disease he outlined the clinical picture. There is often an initial period of malaise, anorexia, and slight fever, followed by headache and tenderness of the scalp. Forty per cent. of cases show ocular signs, of which the most common (25%) is blindness of rapid onset in one or both eyes, the second eye being affected at the same time or within a few days of the first. Ophthalmoscopy shows retinal arterial occlusion in a few instances but, more commonly, only moderate papilloedema. Sometimes the fundi are normal. Other neurological changes such as hemiplegia and dementia occur. The diagnosis is confirmed by the nodular, tender, usually pulseless temporal artery or arteries, and by temporal artery biopsy. The sedimentation rate is raised. The disease is self-limiting, lasting for three to four months, and though sight rarely recovers the general prognosis is surprisingly good. Treatment by anticoagulants and cortisone has been disappointing, though the latter is theoretically the most promising drug.

Periarteritis Nodosa

Professor DUGUID discussed the aetiology of periarteritis nodosa. Consideration of the haphazard distribution of this disease and of the fact that in the kidney it causes infarction had led the speaker to the tentative conclusion that its lesions are caused by embolism or thrombosis. The objection to such a hypothesis is that histological sections of affected vessels often show no evidence of such events. The answer to this was, first, that in the histological examination of the course of a vessel a small lesion was easy to miss. Secondly, as a series of personal experiments demonstrated, when an embolus or thrombus was lodged in a vessel it rapidly became covered by endothelium and incorporated in the vessel wall, so that its original nature became difficult to identify. Although the application of this theory to lesions affecting large vessels was not easy, with small vessels there was no insuperable objection to it on histological grounds, and it did, in Professor Duguid's opinion, offer the most satisfactory explanation of observed facts.

Other subjects discussed included: "The Changes in the Incidence of the Eye Affections of Coal-miners in the Last 25 Years," in which Dr. DOROTHY CAMPBELL, Mr. W. J. WELLWOOD FERGUSON, and Dr. G. I. SCOTT took part; and a symposium on "Gonioscopy after Glaucoma Operations"

was introduced by Mr. H. E. HOBBS and Mr. REDMOND SMITH. There was also a series of interesting short papers. The meeting had been opened with a presentation of the Nettleship Medal to Dr. Norman Ashton, director of pathology at the Institute of Ophthalmology in London, in recognition of his valuable contributions to ophthalmology.

This was in all respects a most successful congress. The annual dinner was held at the Station Hotel on the night of April 22, and the next evening a civic reception was held by the Lord Mayor of Newcastle-upon-Tyne at the Laing Art Gallery. The following morning an expedition was arranged for 70 members under the guidance of Professor Ian Richmond to visit the Roman Wall.

Correspondence

Cortisone Therapy in Rheumatoid Arthritis

SIR,—Cortisone has now been used in the treatment of rheumatoid arthritis for some five years. After the initial enthusiasm the inevitable negative reaction set in and we are now, at last, nearing an accurate unemotional assessment of this form of suppressive therapy. Leaving aside its short-term use in rehabilitation and orthopaedic manoeuvres, there are certain types of the disease that we feel are very suitable for this therapy. The acute, florid type of rheumatoid arthritis, rapidly progressing in the face of orthodox measures, and the relapsing-remitting case with much soft-tissue swelling and minimal irreversible change, are usually entirely suitable for cortisone therapy. Unfortunately it is impossible to forecast what the future course of the disease in any individual case is likely to be, and there is no simple clinical or side-room test which will help us in our choice of patient. The previous history of the case may help, the steadily progressive unremitting case appearing less suitable than the one with long periods of remission. In the final analysis, however, one has to proceed hopefully and expectantly, keeping a rather closer watch and control of the case than with other forms of therapy, and using, in addition, the same basic orthodox regimen of graded rest and exercise, local and general, as in all cases.

Last week you published an informative report on this subject by Dr. W. S. C. Copeman and others (*Journal*, May 15, p. 1109). In our unit we have cases of rheumatoid arthritis taking part in the Empire Rheumatism Council's controlled cortisone-aspirin trial now nearing completion. We have in addition a long-term uncontrolled trial of which the facts and figures are, on assessment at May 13, as follows: 22 patients, 12 female and 10 male, have now been on continued suppressive cortisone therapy in our unit for over six months. Five are receiving 25-37½ mg., 17, 50-75 mg. a day; none are on higher dosage. The ages of these patients range from 27 to 65, only three being under 40 years of age; in 15 the ages lie between 40 and 60. Nine patients had had rheumatoid arthritis, prior to cortisone treatment, for six months to one year, six had been afflicted between one and four years, seven between five and 24 years. Treatment has lasted 6-11 months in 16 cases, 12-17 months in five, and over 18 months in one. The following is our assessment of their progress at this date as compared with their pre-treatment assessment:

	No. of Patients			
	Improved	Worse	No Change	Not Assessable
Grip	7	2	2	11
Finger swelling .. .	8	0	7	7
Employment capacity ..	4	4*	14	0
General functional ability ..	10	4	8	0
Joint tenderness .. .	4	2	4	12
Patients' own assessment ..	15	2	5	0

* These 4 patients are the only ones unfit now for work.

The last line is the measure of the patient's own opinion of, and satisfaction with, this form of treatment. Our own feelings as to the results might be expressed as satisfactory in 13 cases, unsatisfactory in four, unchanged in five. Grip was measured by a metal grip meter, finger swelling by jeweller's rings. Employment capacity was assessed on whether the patient was capable of the same work as before therapy, or increased or decreased duties. Function was a rough assessment of the sum of the day's simple activities. Tenderness refers to finger tenderness only.

One point that has appeared to us of interest is that, where finger swelling was adequately reduced on cortisone therapy and remained diminished (eight out of 15 cases), increased functional ability usually ran parallel. As this is a measure of the reduction of tissue swelling, it is not surprising. Those patients who showed a satisfactory diminution in finger swelling early and who maintained it after two to three months were usually the worth-while ones. One patient with a duodenal ulcer and one with a gastric ulcer have been maintained without trouble on 50 mg. a day. One patient developed duodenal ulceration, has had to discontinue cortisone, and has relapsed. In addition to the above 22 patients, six other patients showed insufficient improvement after 4-16 weeks' therapy rising to full dosage (100 mg. daily), and their treatment was therefore discontinued. The 22 patients detailed above were therefore in a sense a selected group. Although the series is uncontrolled, all the patients were put on to cortisone because of failure to respond to simpler measures with plentiful analgesic cover; in one sense each was his or her own control.

To summarize our findings in this series of 22 patients, four could do more than before therapy, four less, and 14 the same job of work. Patients showing prompt reduction of soft tissue swelling appeared to benefit most from continued cortisone therapy. Fifteen of the 22, however, experienced increased relief from those annoying and distressing symptoms which, while hardly appearing in statistical surveys, do make the lot of the rheumatoid sufferer somewhat easier. The present orthodox treatment of rheumatoid arthritis is not so dramatic or so effective as to allow us to neglect any new form of therapy, even if it helps only a modest percentage of sufferers.

Our thanks are due to Dr. Augustus Gibson, of Merck & Co., Rahway, New Jersey, for a generous gift of cortisone which helped greatly in the above trial.

—We are, etc.,
London, W.1.

F. DUDLEY HART.
J. C. LEONARD.
FORDE CAYLEY.

Herpes Zoster and Chicken-pox

SIR,—The case of herpes zoster followed by chicken-pox reported by Dr. C. Spencer Whitehouse (*Journal*, May 8, p. 1097) is consistent with previous cases which were reviewed by Dr. D. I. McCallum (*Journal*, March 8, 1952, p. 520) under the very apt title "Herpes Zoster Varicellousus." A brief review of the literature will be found in that article. Dr. E. G. L. Mark (*Journal*, May 12, 1951, p. 1079) reports a case in which the varicella eruption followed herpes zoster within 12 hours.—I am, etc.,
London, S.E.5.

T. D. SAYER.

SIR,—The case of herpes recorded by Dr. C. Spencer Whitehouse in his letter (*Journal*, May 8, p. 1097) closely resembles a case which I reported in a letter to the *Journal* some 20 years ago (*Journal*, 1933, 2, 1152). Like Dr. Whitehouse, I regarded my case as one of true chicken-pox occurring within a few days of the appearance of a herpes eruption, but after the publication of my letter a note was published from the then professor of medicine at Bristol University (*Journal*, 1933, 2, 1240) stating his opinion that the case I had described was one, not of chicken-pox following on a herpetic eruption, but of *herpes generalisatus*, an exceedingly rare condition and one having special interest in regard to the virus theory. My patient, who was aged 60, had had an attack of chicken-pox at the age of 5. Further reports and opinions on such cases would be of great interest.—I am, etc.,
London, N.W.11.

SYLVIA G. CHAPMAN.

SIR,—Dr. C. Spencer Whitehouse (*Journal*, May 8, p. 1097) asks whether the simultaneous appearance of chicken-pox and herpes zoster has been seen before. In March this year I was asked to visit a man of 83 who had ophthalmic zoster with some ocular involvement. On examining him I was surprised to see that the zoster eruption, although otherwise characteristic, widely transgressed the midline on the forehead, and I discovered that there were also spots widely distributed over the trunk. Being now unfamiliar with the exanthemata, I asked the opinion of the patient's general practitioner, Dr. D. R. Harris, of Falmouth, who told me that, although lacking the typical vesiculation, the eruption resembled chicken-pox in distribution and there seemed no other likely explanation. This case, alone, seemed too inconclusive to record, but may corroborate Dr. Whitehouse's observation.—I am, etc.,

Redruth.

CHRISTOPHER HEATH.

SIR,—I saw a man of 48 with shingles on the right side of his abdomen on October 13, 1952. A generalized varicella rash appeared in the same patient on October 18. By October 28 the varicella and half the shingles lesions were scabbed, and on December 21 the shingles lesions were still very painful. He retains the zoster scars to this day, and one chicken-pox scar on his face.

In my small experience shingles in young children is exceptional, but a child of 9 presented with the rash of herpes zoster on the left side of his chest on March 16, 1953. Pain was not experienced until three days later, and lasted one week in all. His brother, aged 5½, developed chicken-pox on April 1. Incidentally, at the other extreme of life I have seen very mild chicken-pox in a man more than 70 years old.—I am, etc.,

Ilford.

R. N. C. SMITH.

* Letters recording cases of chicken-pox following herpes zoster have also been received from Drs. E. Banji, H. Banks, C. Barnett, M. Fishman, W. Henderson, and F. Rose.—ED., B.M.J.

Jelly Test in Tuberculosis

SIR,—Dr. P. D. Mulkern (*Journal*, May 1, p. 1039) has suggested a syndrome in children characterized by upper respiratory catarrh, a negative Mantoux reaction, and a positive jelly test. It would be interesting to know whether Dr. Mulkern employed the plain or the flourpaper technique for his jelly testing. If the plain technique was used, the association of a negative Mantoux reaction and a positive plain jelly test is a surprising one. In a recent investigation which we conducted we failed to find such an association in over 400 East London schoolchildren. The reverse of Dr. Mulkern's finding, a positive Mantoux and a negative plain jelly, is of course common experience.

If, on the other hand, Dr. Mulkern employed the flourpaper technique his findings are not unusual. In our investigation we showed that experienced observers using the flourpaper technique found a much higher percentage of positive reactors than was found by the Mantoux test done at the same time. But, whereas there was virtually no disagreement over the Mantoux findings, there was considerable disagreement between the flourpaper test observers as to which reactions were positive and which were negative. In our view this test is a fallacious one. If Dr. Mulkern used this test, then we suggest he has observed a non-specific reaction due to the trauma of flourpaper occurring in a tuberculin-negative catarrhal subject. After all, the response to tuberculin in a sensitive subject is specific and as likely to be observed with an intradermal injection of tuberculin as with the percutaneous application of tuberculin jelly, which contains only old tuberculin in a tragacanth base.—We are, etc.,

M. CAPLIN.
C. P. SILVER.
S. GRZYBOWSKI.

London, E.2.

Changes in Skin Response in Asthma

SIR,—I write to add a few observations to your correspondence on this subject, because, in an indeed limited experience of allergy, I have been forming the impression that the apparent dubiety of the skin-test depends in fact on variations in behaviour which might prove exceedingly instructive if effort could be directed to studying them for their own sake instead of trying to iron them out by generalizations.

First, the magnitude of response to any standard test procedure is influenced by the physiological state of the skin. To exclude this in recording "true" variations of skin response in a single subject it may be well to use a comparative method in which simultaneous tests are done with appropriate concentrations of histamine. Some observations have also suggested a possible dependence of the gradient, relating size of test response to concentration of antigen used, and consequently also of the size of response to any standard concentration of antigen, on the threshold concentration of histamine needed at the time to secure minimal skin response. Alternatively, direct determination of the antigen threshold concentration for skin response, by a standard method of the observer's own choice, may be more independent of such variation and more convenient.

Beyond these questions is that of immunologically determined variation, and here there seem to be intrinsically different patterns of behaviour quite apart from the effects of treatment. For example, in certain pollen asthmatics a moderate skin reaction (of the order: prick response to 25,000 N.U./ml. = prick response to 1/1,000 histamine or higher) has been elicited in September and then a virtually negative reaction in the following January, while others have appeared to be maintaining a more uniformly brisk response throughout the year. The interest of characterizing such types is both theoretical and very practical if there is any relation to the clinical features and mode of response to desensitization treatments.

Within such superficially homogeneous groups as pure grass-pollen asthma or grass-pollen hay-fever patients there is, in fact, much clinical diversity if attention is paid to the timing of the symptoms. Broadly, three types appear to be emerging: (1) patients with immediate attack reaction to direct exposure, (2) with delayed attack reaction to exposure, and (3) with a regular 24-hour cycle of symptoms during periods of exposure but not related directly to exposure. Much more observation than I have yet had opportunity of making would be necessary to establish properly the impression I am at present receiving that rather small and variable skin responses are mainly characteristic of the third type. This has a bearing on the assessment of a patient's sensitivity from the skin response; within the first and perhaps the second group above this assessment may be valid, but a small skin response or a high threshold of response is certainly no indication of relative insensitivity and of presumptive tolerance to a high desensitizing dose in patients of the third type. These patients may have delayed symptomatic reactions to treatment with a very low dose; they seem, however, far less liable to urticarial reactions than are low skin threshold patients of types 1 or 2.

Such preliminary impressions obviously need much correction and amplification before statements of fact can be made firmly on these very complicated matters, but I want to suggest that there is much scope for a more positive type of clinical study of skin responses in relation to other aspects of case histories. There appears to be an equal richness of variety in other allergies than pollen, and one may suspect that quite a diversity of immunological mechanisms may be involved in phenomena which there is a tendency to regard as homogeneous. There is particular interest in the variable character of skin response in food allergies where the positiveness or otherwise of the response is broadly related to the interval between taking the food and the onset of symptoms rather than to any more simple manifestation of the degree of "sensitivity"; one explanation of this has been that in cases with delayed reaction and absent skin response the true allergen is a transformation product of the native food protein, but it is also possible that the difference in behaviour depends on a difference in immunological mechanism.—I am, etc.,
Oxford.

R. M. MORRIS-OWEN.

Mondor's Disease

SIR,—I was most interested in the article on Mondor's disease by my friends Mr. G. M. Lunn and Mr. J. M. Potter (*Journal*, May 8, p. 1074) in which they record five cases of this uncommon condition and give a helpful review of it. All their cases were in women, and some had a lesion in the breast. I thought, therefore, that it might be of interest to refer to a case of this condition in a male whom I saw in November, 1950.

He was a medical practitioner, in good health, and for about a week had noticed a little discomfort in the upper part of his abdominal wall and had himself felt a thin elongated swelling. There was no history of trauma or unusual exercise. In my note, made at the time, I described it as "a peculiar subcutaneous cord-like structure about four inches long lying obliquely." It was in the upper part of the epigastrium on the right side and came over the costal margin for a short way. Its oblique direction was as described by the present authors. I had not seen anything like it before in this position and recorded it as a case of superficial venous thrombosis, not then being acquainted with Mondor's disease. No treatment was prescribed and the lesion gradually and spontaneously cleared up. The patient has had no subsequent thrombosis.—I am, etc.,

London, W.1.

JOHN HOSFORD.

SIR,—The very interesting article on this subject by Mr. G. M. Lunn and Mr. J. M. Potter (*Journal*, May 8, p. 1074) clarifies a condition personally observed on several occasions. It is, perhaps, worth adding to the clinical picture the fact that one such case showed linear elevation of the skin running down from the lower thorax to the upper abdomen in the anterior axillary line on raising the arms in a man. Another case, a young probationer nurse, developed a tight bowstring spanning the right antecubital fossa. On this occasion, as she was prevented from full extension of the elbow by pain, the string was divided and a piece excised. It proved to be a narrowed sclerotic vein.

In this odd type of phlebitis the vein shrinks in length as well as thickness. The condition is not limited to the female and can occur in the limbs as well as the anterior trunk.—I am, etc.,

London, W.1.

F. HARWOOD STEVENSON.

Animal Technicians

SIR,—My attention has been drawn to the annotation on animal technicians (*Journal*, April 3, p. 808) and the two letters thereon by Mr. A. E. Brown (*Journal*, April 24, p. 983) and Mr. F. Mather (p. 984). One can agree with the annotator until he claims that "the animal technician shares, or should share, equal status with the laboratory technician." It seems obvious that the writer can have little knowledge of what is required of the present-day technician in hospital laboratories and cannot, therefore, be in a position to make a comparison.

A statement in the letter from F. Mather is to be greatly deplored. His opinion expressed in the second paragraph on the responsibility of the pathologist in relation to the interpretation of results in no way reflects the views of the Institute of Medical Laboratory Technology, nor that of the vast majority of its six thousand members. Such statements as these can do much harm to the laboratory services. In the last paragraph of his letter there is a reference to the senior technician teaching laboratory technique to young medical men commencing their laboratory careers in pathology. With his wide knowledge and long practical experience, who should be better able to guide the beginner through the intricacies of modern laboratory technique? This has been customary for as long as I can remember and I hope it will continue in the same atmosphere of goodwill and mutual respect as has been evident in the past.—I am, etc.,

London, W.1.

A. NORMAN,
Chairman,
Institute of Medical Laboratory Technology.

Single Incision for Bilateral Orchidectomy

SIR,—I am in turn dismayed by Mr. C. J. Cellan-Jones's comments (*Journal*, May 1, p. 1039) on Sir Heneage Ogilvie's letter (*Journal*, April 17, p. 934). As one of the young, though greying, surgeons whom he apostrophizes I should like to advocate as strongly as I can the scrotal approach to the testis wherever possible. I have used it in all cases of hydrocele and spermatocele for the last seven years with uniformly satisfactory results, nor have any of the chiefs for whom I have worked in that time ever criticized it.

The position of the scrotum does not interfere with its adequate cleansing: all that is necessary is a pair of forceps to hold it up. The scrotum is not corrugated, but smooth and lax, in a normally heated operating theatre. The approach to the testis is direct and easy, and avoids the manipulation and trauma involved in hauling a sometimes bulky hydrocele up into the groin, thereby opening further tissue planes which will ooze post-operatively and which cannot be dealt with from the inguinal incision at the time of operation. The inguinal canal is left undisturbed and unnecessary handling of the cord obviated. Furthermore, incisions in the scrotum heal better, and with less scarring, than those in almost any other part of the body: even the jagged and infected lacerations that one sometimes sees almost invariably heal without complications. Lastly, the patient is less conscious of the irritating sequelae of the unavoidable division of small cutaneous nerve twigs by the inguinal approach.

The tendency to scrotal haematoma, common after both approaches, but in my experience more widespread after the inguinal, is easily frustrated by a simple manoeuvre, for which I claim no originality, but which does not seem to be as widely known as it deserves. At the end of the operation, after wide cleansing with spirit to remove grease, the most dependent part of the scrotum is seized by tissue forceps, and held vertically upward, with the skin of the scrotum in a taut cone. After applying a small dressing to the sutured wound a strip of "elastoplast" about an inch wide is wound firmly in a spiral round the cone of scrotum from apex to base. The testis will have fallen to the base, or neck, of the scrotum, and is not included in the spiral. If desired, further strips of elastoplast may be applied, more gently, over and round the base. This dressing is left on four or five days, and causes little or no discomfort—certainly less than stitching the scrotum to the abdominal wall, supporting it on a shelf of strapping between the thighs, or any of the other methods of varying effectiveness which are advocated. After removal of the dressing—which slips off easily, without having to be unwound—there is no haematoma formation, and the testis drops immediately back into its normal position.

I cannot help feeling that Mr. Cellan-Jones was unusually unfortunate in his experience 25 years ago, and even more so in the lesson which he learnt from it. And now we have antibiotics, too.—I am, etc.,

Beaconsfield, Bucks.

MICHAEL REILLY.

Immunization Against Tetanus

SIR,—With reference to Dr. G. M. Bailey's letter (*Journal*, February 20, p. 454) which has just reached me in distant Australia's bush, will you please permit me to make a remark or two? Dr. Bailey claims that only one booster dose of tetanus toxoid should be adequate within ten years of active immunization with three doses of the toxoid. Is this claim arbitrary or authoritative? If the latter, will he please quote the same?

He concludes his letter with some disapproval, if not disparagement, of Service men in uniform being given "3,000 A.T.S." by casualty officers. It calls for little experience to know that tetanus can result from an almost invisible wound as from an extensive battle injury where A.T.S. is given with all possible speed in the regimental aid post in the British Army (the Americans, I understand, still stick to toxoid). What would be the legal position of the casualty officer who, on the reasoning advocated by Dr. Bailey,

omitted the "3,000 A.T.S." and found himself sued by the relatives of a patient dying from tetanus? Your expert's advice in "Any Questions?" dating back to December 3, 1949 (p. 1305), in the concluding sentence is relevant and contrary to what Dr. Bailey would have us do.

Lastly, is it not true that some individuals, including Service men of course, are resistant to active immunization; and, this being so, how is a casualty officer to know the case which is not? In the face of these and many more unsettled views and conflicting opinions, Sir, some of us have the temerity to call medicine a science.—I am, etc.,

Boulia, Queensland, Australia.

B. J. BOUCHÉ.

Relief for Entropion Sufferers

SIR,—I quite agree with Dr. Cecil W. C. Robinson (*Journal*, May 1, p. 1037) that the removal of a piece of skin from the lower eyelid or a skin and muscle operation is often unsuccessful in the relief of entropion, and I thought that these operations had fallen into disrepute. On the other hand, Wheeler's operation, where a strip of orbicularis muscle is attached to the periosteum of the malar bone, or the simple operation of an overlap of the orbicularis muscle, seldom fails.

Entropion of the lower lid is due to buckling of the tarsal plate which has become thin in the middle, and therefore a shortening of the orbicularis muscle is the obvious treatment from a mechanical point of view, as it will prevent the tarsal plate from buckling. This operation takes longer than a skin and muscle operation, but I should think anything is preferable to wearing a contraption on one's reading spectacles, and, also, in many cases an uncured entropion will cause constant irritation.—I am, etc.,

Camberley.

LESLIE HARTLEY.

Notification of Epidemic Diseases

SIR,—It would be interesting to know what the criteria are which determine the notifiability of epidemic diseases. It is, one supposes, a matter of ministerial policy, and one wonders whether it is guided by medical men. In my practice at present there are minor epidemics of infective hepatitis, of mumps, and of chicken-pox, none of which are notifiable: if there were also an epidemic of rubella, that also would not be notifiable; yet with the Australian experience of this disease one would have thought it very important to all pregnant women. But surely the whole absurd business of notification of some diseases and disregard of others equally infectious brings the whole apparatus of notification into disrepute. I well remember, about 1947, a small epidemic of glandular fever which was most interesting and unusual, yet it could not be brought to the notice of the public health authority simply because it was not notifiable. Yet pneumococcal pneumonia, which seems to have largely lost its epidemic quality and which can almost be relegated to the rank of a minor malady, is retained as a notifiable disease. There undoubtedly has been a profound shift in the importance relatively of a number of epidemic diseases: some, such as encephalitis lethargica, have virtually disappeared; others, such as erysipelas, are both milder and more easily dealt with; while yet others, such as poliomyelitis, have attained a much greater importance than they have ever had before. Surely this calls for a review of the situation?—I am, etc.,

Leeds.

C. E. GOLDSBOROUGH.

Appointment with Fear

SIR,—I read with interest the letter of Dr. P. R. Saville (*Journal*, April 17, p. 932) and that of Sir John Nicholson (*Journal*, May 8, p. 1094), and I heartily agree with the latter that "what most people dread is a sense of uncertainty and the unknown." This is particularly true of cancer. Dr. Saville and many other medical men do not seem to realize that "apprehension" about this disease (true cancerphobia is fortunately rare) already exists in nearly 100% of the population. There are a great many causes for this apprehension, ignorance and uncertainty being at the top of the list, but death itself is at the bottom.

as Sir John Nicholson suggests. Pain is high up, as is the idea that all cancer patients "die in agony." This misapprehension on the part of Dr. Saville and many other practitioners concerning the attitude of the public in regard to cancer is very serious, as it is preventing some local authorities embarking on a scheme of cancer education such as is advocated by the Ministry of Health. Dr. Saville cannot put the clock back. The public from childhood to the grave is being encouraged to be interested in all sides of life, and people cannot be expected to lower an iron curtain where their own health and bodies are concerned.

Many medical men think that if a patient does not talk about cancer they are not thinking or worrying about it, whereas the exact opposite is true. It is only by encouraging people to talk about it and bringing it to the surface that apprehension can be diminished. Emerson was right when he wrote: "Knowledge is the antidote to fear."—I am, etc.,

York.

MALCOLM DONALDSON.

"Lobster Claw" Hands

SIR,—An East African negro boy of the Maragoli tribe, aged 12 years. His first three fingers of the right hand are enlarged very much both in length and thickness. There is a deep cleft between the index and the second finger. The small finger and the ring finger are of normal size. He uses these to eat and to hold things. All the fingers of the left hand are enormously enlarged. He has no defect of feet or of any other part of the body. His brain is very alert and he earns a good living by begging, at which he is an expert in exploiting his deformity. He has no pain and has not been suffering from any other illness. His hands were examined and his blood tested for filarial disease. The result was negative. He is quite cheerful and resigned to his condition. When asked what he thought of it, he replied, "Shauri ya Mungu," which means in Swahili, "It is God's will."



His father and mother state that he was born with this deformity of the hands, and the child confirms that he has always had this condition since infancy. None of the other members of the family are affected.

This congenital anomaly of the hands has three factors in it: (1) lobster claw deformity, because of the cleft between the fingers; (2) megalodactylism, because of the enormously enlarged fingers and their corresponding bones; (3) crab claw hand, because the left hand has all five fingers enormously enlarged.—I am, etc.,

Nairobi.

AYRES L. RIBEIRO.

Heart Failure and Phenylbutazone

SIR,—In view of Drs. D. J. O'Brien and Geoffrey Storey's report of a patient dying with heart failure after phenylbutazone (*Journal*, April 3, p. 792), the following may also serve as a warning specially regarding the use of this drug in patients with established heart disease.

A 42-year-old English school-teacher was admitted to hospital on September 19, 1953, with severe heart failure. There was

no previous history suggesting rheumatic fever, but on entry to university (age 17) he was graded A2 on "account of his heart." Four years later the same doctor examined him and said his heart was "now all right." He had routine medical examinations for the Fire Brigade, Ministry of Supply, and Army. No comment was made about his health. During the war he performed an active job inspecting coastal defences without difficulty. He first noted undue breathlessness on walking quickly in 1950 (age 39), but this symptom disappeared after three months, and he was then able to run upstairs without any undue dyspnoea. In 1952 he was examined for £1,000 life insurance policy. The premium was not loaded.

On September 5, 1953, he tripped and fell on his back. Following this he had considerable lumbar pain which was not much relieved by massage and salicylate. On September 15 1 g. phenylbutazone was injected intramuscularly at 11 a.m. One hour later the pain had gone and he felt fine. That night he started to cough and became breathless. During the next four days the breathlessness became progressively worse. On admission he was in considerable distress with marked orthopnoea, ventricular rate 140, blood pressure 130/80, slapping apical first heart sound, apical diastolic rumble, and widespread crepitations at both lung bases. There was slight leg oedema. X-ray showed an enlarged heart shadow with mitral configuration (later confirmed by screening) and the fan-shaped opacities of pulmonary oedema. Electrocardiograph confirmed auricular fibrillation and right ventricular dominance. He responded well to rest, digitalization, and mersalyl, and was discharged on October 7. Fibrillation has since continued, and when digitalis was stopped a month after returning to work undue breathlessness recurred. Probably permanent digitalization will now be necessary. X-ray seven months later (April, 1954) showed clearing of the lung fields but little change in the heart shadow.

The onset of symptoms 12 hours after the phenylbutazone injection and his previous good health make it very probable that this drug precipitated the heart failure. This could be due to direct action on the myocardium or water retention effect. It would seem therefore that established heart disease is a contraindication to use of phenylbutazone.—I am, etc.,

Penang, Malaya.

H. A. REID.

Clergy and Doctors

SIR,—As both clergy and doctors are so deeply concerned with the Ministry of Healing in its faltest sense, it is surprising and lamentable that there should be any lack of co-operation between them, as is suggested by the letters of the Rev. Tony Clemens (*Journal*, April 24, p. 983) and Dr. F. Gray (*Journal*, May 1, p. 1041). Where it does exist it must be due to shyness of approach, or to ignorance on the part of the one of the help and co-operation which the other is willing and anxious to give.

To overcome both these difficulties in this area, the Torquay and District Medical Society organized a meeting of clergy and doctors some time ago, at which the Bishop of Exeter and one of the doctors initiated a most useful discussion. A desire was expressed at the meeting that regular joint meetings should be held, and the Bishop instructed one of the rural deans present to form a small committee to arrange them. This was done, two further meetings have been held, and it is intended to continue them three or four times a year. They have been well attended on both sides, and have already abundantly proved their value. B.M.A. Divisions, medical societies, and rural deans, please copy!—I am, etc.,

Newton Abbot.

G. M. TANNER.

SIR,—As a member of the medical profession, I would like to endorse the opinions stated by the Rev. Tony Clemens in his letter (*Journal*, April 24, p. 983) under the above heading. It must be painfully obvious that there is something wrong in a country in which, despite all the "benefits" of the Welfare State, we are told that "50% of the hospital beds are occupied by psychological cases," and that "75% of the cases seen by the average G.P. are in some degree of neurotic." Is it possible that the strain of living has increased since 1948? Is there some truth in the assertion that the institution of the N.H.S. has fostered hypochondria? Are all these patients neurotic from choice, because

it doesn't cost them anything, or is there something missing in our "free world"?

I venture to suggest that one of the main reasons for the increase in neurosis lies in the fact that because of the N.H.S. the average doctor can no longer be the friend and adviser his predecessors were to their patients. The "old" G.P. was an excellent psychologist, and his abilities were, to my mind, the reason why his patients brought their worries to him for solution. To-day, few medical men have the time or inclination to just sit and listen to matters outside the "normal" sphere of work, so that the patient who is worried can find no other alleviation for his worry than phenobarb. He continues to worry and develops neurosis in one form or another.

Although I am not a particularly religious person I still feel that the "common man" can find much solace in religion, and that his particular minister can be of help to him in much the same way as the "old" G.P. in the solution of his personal problems. My own practice is based on the treatment of psychosomatic conditions, and I am impressed by the number of patients who lose their physical ailments once they have been able to talk-out their worries. In many cases I refer patients to their clergyman, because I believe that in this scientific age there is a greater than ever need for spiritual balm. Thus I feel that there are positive indications for closer co-operation between medicine and the church.—I am, etc.,

Manchester, 2.

S. F. GILBERT.

Women in Medicine

SIR,—With reference to your interesting annotation on "Women in Medicine" (*Journal*, May 15, p. 1143), there is an important correction which we are sure you will be anxious to make. One of our members very kindly undertook the task of counting the number of medical women listed in the 1954 issue of the *Medical Directory*. The result of her labours was reported to our Council at its meeting in Sheffield last week, and the figures, right up to date, are 13,374 women's names, included in the *Directory*, of whom 12,500 are in active work.—I am, etc.,

JOSEPHINE BARNES,
Honorary Secretary,
Medical Women's Federation.

London, W.C.1.

** According to another source of information, in January, 1954, there were 10,800 women in the *Medical Register*, of whom 7,600 were known to be in active work.—ED., B.M.J.

Dangers of Induced Hypotension

SIR,—I should like to endorse Dr. Florence Faulkner's letter (*Journal*, May 1, p. 1041) drawing attention to the dangers of poor anaesthetic technique associated with the methonium drugs. I believe there are many surgical procedures where blood loss may be detrimental to the patient, or may so fog the surgical field as to render the operation almost impossible.

It is a remarkable fact that after a correctly administered hypotensive technique patients are much more fit the next day than those given ordinary routine anaesthetics. Although this may be due to the low blood loss, it is perhaps, in such cases as operations on the vagina and pelvis, due to a splanchnic block produced by the ganglion-blocking agent. Like all new methods, it is condemned by the few catastrophes, but these are due to bad technique or a misjudged choice of patient. These patients with low pressure must have oxygen "all the time, and after." Too much premedication—excess of thiopentone or of pethidine—will reduce the respiratory exchange, possibly as much as a deficient airway. Full oxygenation is essential, and must be produced by a high oxygen mixture even, if necessary, by assisted respiration throughout; oxygenated blood must reach the cerebral circulation during the four hours that the pressure remains low after return to the ward: this

means a thoroughly competent nursing ward staff well schooled in the technique.

I quite agree that "hypotensive" methods are dangerous, and should be embarked on warily by the uninitiated. As new "ganglion-blocking" agents are produced, controlled hypotension will one day become "controlled." It will be safer when an efficient antidote, similar to the action of neostigmine on tubocurarine, is obtainable.—I am, etc.,

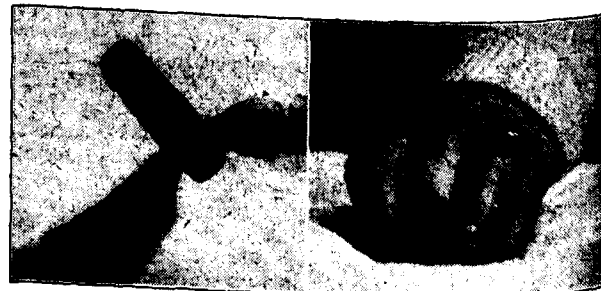
Manchester.

WILLIAM B. BACON.

Ring Incorporated in Finger

SIR,—The following is an unusual case that I thought might interest readers.

A woman, aged 56 years, appeared in casualty recently. The accompanying photographs show more clearly than words the way her wedding ring has been incorporated in her finger. She had had the ring on for almost 40 years, and for the last 10 had noticed it gradually being covered by folds of skin on the palmar surface. She would admit to no incidents of infection or ulceration. Her doctor had noticed the condition on visiting her for another ailment.



The finger was greatly hypertrophied, especially on the palmar surface, but there was no induration except around the sinus of the ring. The palmar surface showed normal skin with some accentuation of the proximal skin fold but no obvious scarring. There was nearly an inch (2.5 cm.) of normal tissue in front of the ring. The x rays show erosion of bone on the flexor surface, but the flexor tendons are functioning.

My thanks are due to Mr. G. N. Golden for permission to publish this case.—I am, etc.,

Guildford.

J. H. NEAME.

World Population and Food Supplies

SIR,—Your "Medical Notes in Parliament" (*Journal*, May 8, p. 1100) on world population and food supplies gives one the impression that opinion was sharply divided between increased food production and birth control as the answer to the problem of the rapidly increasing world population. Is this division of opinion entirely necessary? Surely an improvement in the standards of living in Eastern countries would lead to a diminution in the size of the family even as it has already done in the West, so that in time the Orientals would be faced with the Occidental problem of an ageing and hence potentially declining population. If priority was given to increased food production much acrimony over methods of birth control would be avoided, for the Indians and Japanese would then adopt these methods in conformity with their own codes.—I am, etc.,

Dublin.

JOSEPH BARNES.

A Question of Seniority

SIR,—But London's two greatest hospitals—St. Bartholomew's founded by Rufus's courtier, Rahere, in the Smithfield Marshes, and the even older St. Thomas's in Southwark for sick and needy travellers—had been established by Augustinian canons in the twelfth century. Such spitals were very small: St. Thomas's, rebuilt after the fire of 1207, had rush beds for forty patients, and a staff of four canons, three nursing sisters, and a warden." This quotation from

The Story of England: Makers of the Realm, by Arthur Bryant, caught my eye shortly after a brisk discussion with an eminent surgical alumnus of St. Bartholomew's, a fanatical follower of Rahere.

Is it not possible for this highly debatable problem to be brought up to date by the elimination of legend and the citation of the existing documentary evidence? After the heat engendered by this process has subsided, the medical profession will at long last know which is *primus inter pares*.—I am, etc.,

Bideford.

M. W. LITTLEWOOD.

¹ *The Story of England: Makers of the Realm*, 1953, p. 326. London.

Visit to Poland

SIR,—On May 3 I returned from a ten-day visit to Warsaw and other parts of Poland, where I had been as a member of a peace delegation. As a recently retired assistant county medical officer, I was particularly interested in the care of children and provision made for them in crèches, kindergartens, schools, youth clubs, and hospitals. For the children of working women there are crèches and kindergartens attached to factories and elsewhere in adequate numbers. Most women in Warsaw appear to go to work. They are not compelled in any way to do so, but when one sees the ruins which remain still after the vast amount of reconstruction which has already taken place one can well accept the fact that every pair of hands is welcome in rebuilding the city which Hitler so wantonly destroyed and which is rising like a beautiful phoenix from its ruins.

Among medical institutions visited was a premature baby unit in Warsaw where 1,500 premature babies have been admitted in the last four and a half years. We were told by the young woman paediatrician in charge that their mortality rate is 30%. The hospital appeared very well equipped and up to date, and all the staff keenly interested in their work. I was very much impressed by a sanatorium in the Tatra Mountains. This modern, excellently equipped hospital was built in 1949, the workers of Silesia subscribing 60% of the money required and the State providing the rest. We were taken over every corner of the sanatorium and were able to mix freely with the small patients. It had 580 beds, all occupied with cases of lung, gland, and bone tuberculosis. On one vast semicircular balcony we saw numbers of spinal cases, looking very brown and extraordinarily cheerful, playing with a great variety of didactic and other toys. The teachers of these younger children appear utterly devoted to their small charges, and have a four-hour day of work, as so much is demanded of them in the way of patience and interest. There is nothing lacking in the way of education for the older children, as teacher members of our delegation soon found after numerous questions and inspection of class-rooms, science laboratories, art rooms, etc.

To-day 1.3–1.5% of the population have tuberculosis; 10% require hospital treatment. Mortality before the war was 20 per thousand. This increased very much during and after the war, but has now been reduced to 8 per thousand. Before the war the number of beds available for tuberculosis was 8,000. To-day there are 13,000 beds for adults and 95,000 for children. As the chief sufferers from tuberculosis are babies, a vast campaign is being waged. Every baby born in hospital is given B.C.G., and wherever possible also those born at home. Since the campaign began a few years ago 8,000,000 children have received B.C.G. Factory and other workers have mass x-ray examinations every 4–6 months, and mobile x-ray units are sent to villages in rural areas.

I was extremely favourably impressed by the way Poland is caring for her children, ill and well, not only with efficiency but with loving kindness. The doctors we met were keen and kindly colleagues, and, apart from language difficulties, no vestige of an iron curtain separated us.—I am, etc.,

Dunmow, Essex.

WINIFRED M. COPPARD.

POINTS FROM LETTERS

Unwrapping the "Journal"

Dr. W. BRUCE FRAY (Sydney, Australia) writes: Some weeks ago I had a small accumulation of *Journals* which required opening and reading. I became irritated with the difficulty of unwrapping and cast around for a simple method. By grasping the protruding end of the wrapper with thumb and forefinger and exerting pressure on the *Journal* with third and fourth fingers it was found comparatively easy to remove the wrapper in its entirety without damaging the *Journal*. Coincidentally, the first *Journal* to be opened by this method contained the first reference (*Journal*, December 12, 1953, p. 1326) to the difficulty being experienced by others.

Teaching Bacteriology in Schools

Dr. A. J. ESSEX-CATER (Swansea) writes: In reference to a comment by Dr. Arthur Turnbull in "Points from Letters" (*Journal*, April 10, p. 878) I am pleased to be able to inform him that a few secondary modern schools do include lessons and demonstrations on the bacteriology of simple human pathogens. It is naturally difficult for schools to obtain the necessary slides, but I am sure public health departments or public health service laboratories would be only too happy to help interested science teachers. I certainly share your correspondent's opinion that the teaching of elementary bacteriology in all schools would be of great value in sharpening the general public's interest in health.

Fear of Litigation

Dr. MAURICE ANDERSON (Birmingham, 14) writes: Dr. C. J. Cellan-Jones (*Journal*, April 10, p. 876) is perfectly correct when he points out how unfair it was for a barrister to make sweeping (and derogatory) generalizations about doctors and hospitals on the grounds of the evidence in one single case. Abbott's *Elements of Logic* contain the axiom: "*E particulare ad universalem, consequentia non valet*." Learned counsel, however good he may be at law, would appear to be unsound in logic.

Ulcerative Colitis

Dr. F. E. TILLYARD (Worthing) writes: With reference to the letter by Mr. C. Horvitz in "Points from Letters" (*Journal*, April 17, p. 937), when at Edinburgh University about 1912 Arbuthnot Lane addressed a meeting of surgeons and medical students. I think that he had just returned from the U.S.A. He recounted how on the voyage home he asked the ship's librarian to recommend him a novel (I forget the name) and "there I read the story of two constipated females." He continued: "The other day a lady hobbled into my consulting-room on two sticks. I looked at her and said, 'Madam, I will give you a new pair of boots through your abdomen.'"

Cancer of the Lung

Dr. A. A. CLAY (Newport Pagnell, Bucks) writes: With carcinoma of the lung looming large in the minds of both lay people and medical practitioners, I feel, as a general practitioner, that something should be done to expedite admission in suspected cases. I find that cases picked up by the mass radiography unit may have to wait a month or more to be admitted to hospital. The only way to ensure adequate results from operation is to see that such cases are treated—as well as diagnosed—at the earliest possible moment, and many of us feel that carcinoma of the lung—indeed, most cases of carcinoma—should be treated with almost the same priority as an acute abdomen.

Clergy and Doctors

Dr. J. B. GURNEY SMITH (Redhill) writes: I read the Rev. Tony Clemens's letter (*Journal*, April 24, p. 983) with interest. He would appear to plead for co-operation between the two callings of the church and medicine. I would like to inform him of the existence of the Union of St. Luke. This Union was founded in 1948 to deepen the spiritual lives of communicant Anglican doctors and to foster a warm-hearted alliance with the clergy. In six years the Union has over 60 doctors as members and associates and a number of clerical associates. The Union circulates newsletters and holds retreats from time to time, especially at St. Luke's tide. Mr. Clemens is cordially invited to become a clerical associate. I feel sure my friend, the honorary secretary of the Union of St. Luke, Dr. R. H. Hardy, 1, Rolfe Villas, Exmouth, would be very glad to hear from intending members of the Union.

Obituary

MABEL L. RAMSAY, M.D., F.R.C.S.Ed.,
M.R.C.O.G., D.P.H.

The sudden death of Dr. Mabel L. Ramsay while attending a council meeting of the Medical Women's Federation at Sheffield on May 9 has removed a vivid personality from the ranks of the medical women in this country. She was 75 years of age.

Mabel Lida Ramsay was born in London in 1878, the daughter of Paymaster-in-Chief A. J. Ramsay, R.N., and as a girl she expressed the desire to become a surgeon, an ambition not easy of accomplishment by a woman in those days. Born with the spirit of a fighter, however, and having decided on the career she wished to pursue, she studied at the Medical College for Women, Edinburgh, and at Owens College, Manchester, but before enrolling as a medical student she trained for two years as a gymnast, with the idea that such training would help her in the orthopaedic work in which, at first, she planned to specialize. She graduated M.B., Ch.B. at Edinburgh in 1906, took the Cambridge D.P.H. in 1908, and proceeded to the M.D. two years later. In 1921 she was elected F.R.C.S.Ed., and in 1929 was admitted a foundation Member of the Royal College of Obstetricians and Gynaecologists. After qualifying she held the appointments of house-surgeon at the Glasgow Maternity Hospital and then for a time was in the public health service as assistant medical officer of health at Huddersfield. Later, she was senior house-surgeon at the Women and Children's Hospital, Leeds. She went to Plymouth a few years before the outbreak of the first world war in 1914, during which she worked for a time as a surgeon with the Women's Imperial Service at hospitals in Belgium and France.

It was as an obstetrician and gynaecologist that Mabel Ramsay came to specialize and not as an orthopaedic surgeon. At Plymouth she became in due course consulting gynaecologist to the City Hospital and to the Infirmary; consulting obstetrician to the Three Towns Maternity Home, to the Salvation Army Maternity Home, and to the counties of Devon and Cornwall; and consulting surgeon to Plymouth Public Dispensary. She also lectured to midwives in the district and examined for the Royal College of Nursing.

For many years she was a familiar figure at the headquarters of the British Medical Association. She served on the old Insurance Acts Committee from 1919 to 1938, on the Additional Benefits Subcommittee from 1928 to 1938, and on a number of other committees, including the one concerned with the causation of puerperal morbidity and mortality. When the Association held its Annual Meeting at Plymouth in 1938 she acted as one of the vice-presidents of the Section of Obstetrics and Gynaecology. A founder member of the Medical Women's Federation, she had been its honorary secretary and in 1932-3 and again in 1933-4 its president. In 1934 she offered herself for election to the General Medical Council as a direct representative in the place of Sir Henry Brackenbury, whose term of office had expired; but the opposition was too strong. Locally, she was the first woman member of the Plymouth Medical Society and its president in 1930-1, and for a time she was honorary treasurer of the Plymouth Panel Committee and honorary secretary of the Plymouth Local Medical Committee. She was also a former honorary

secretary of the Plymouth Citizens' Association and a past president of the Plymouth Soroptimist Club.

Mabel Ramsay's life was spent in one long fight for the rights of women. Recalling the days of the suffragettes, she could tell how her mother, then over 60 years of age, was one of the band of pilgrims who walked from Land's End to London in 1914. Dr. Ramsay herself accompanied the pilgrimage as far as Taunton, but then had to return to Plymouth to fulfil her professional duties. She loved to recall the excitement caused in those early days by the suffragettes, and with relish she would relate how once it had been said of her, "Dr. Mabel Ramsay is a devil: we must watch her." She was certainly watched, and admired, for many years thereafter.

We are indebted to Dr. ANNIE BRYCE for the following appreciation: The medical women of the South-west, and indeed medical women generally, will sadly miss the gallant figure of Mabel Ramsay. She herself would be delighted to know that she ended her days still in harness, and at a council meeting of the Medical Women's Federation. She was a founder member of the Medical Women's Federation, and the medical women of to-day owe much to her energy and fire and enthusiasm, which played such a big part in getting them equality with their male colleagues. She never lost her energy and drive, and was always fighting for some minority cause. She was a steadfast friend to the young and newly qualified, and I have many grateful memories of her kindness to me when I timidly started out in general practice thirty years ago. Our friendship never faltered, and her example spurred me on to undertake many things I may otherwise have shunned and therefore failed in my duty to medical women. A pleasant memory is her last Christmas card, with its usual little doggerel written by herself, ending: "And so I jog along, singing my happy little song."

A. A. MUSSEN, M.D., D.P.H.

Many of the older members of the public health service will have learnt with regret of the death of Dr. A. A. Mussen, formerly medical officer of health for Liverpool and a vice-president of the Liverpool Medical Institution, at Harrogate on May 3. He was 84 years of age.

Arthur Augustus Mussen was born in Antrim on April 4, 1870, and received his medical training at Trinity College, Dublin, where he obtained the degrees of M.B., B.Ch. in 1892, proceeding to the M.D. three years later. Like so many of those who intended to make public health their career at that time, Mussen studied this subject at Cambridge, taking the D.P.H. there in 1899. Before he joined the Liverpool public health department in 1900, then and for many years after under the direction of the late Professor E. W. Hope, Mussen spent several years in hospital appointments and gained some useful experience as assistant medical officer of health for Huddersfield. In 1909 he was appointed to a similar post at Liverpool, and thus began his long career in that city. He retired in 1931.

When Mussen went to Liverpool some interest was being shown by Hope in the experimental work which was being done by Variot, in Paris, and Nathan Strauss, in New York, on the subject of the artificial feeding of infants. The first milk depot in Liverpool was opened in 1901, and this step initiated the great advances which were to take place there in the care of infants and young children, in which Mussen played a notable part. The personal health services—begun in Liverpool by the appointment of health visitors, the supply of special milk feeds, and the opening of child welfare clinics—

were broadened by the setting up of the school medical service in 1907 and the tuberculosis service in 1912. Mussen, who could have truly said with Abou Ben Adhem that he loved his fellow men, brought much energy and enthusiasm in those early days to the organization and development of the personal services; but, with his appointment as deputy medical officer of health in 1912 and the strengthening of the medical staff of a rapidly growing department, he began to spend more and more of his time on the purely administrative side of his work. He twice held office at Annual Meetings of the British Medical Association: at Toronto, in 1906, he was one of the honorary secretaries of the Section of State Medicine, and at Liverpool, in 1912, he was a vice-president of the Section of State Medicine and Industrial Diseases.

His work in the Liverpool public health department was interrupted by the outbreak of war in 1914, during which he saw service in France, first in a mobile hospital and later as a specialist sanitary officer, attaining the rank of major. When Hope retired in 1924 Mussen was asked to take over the appointment of medical officer of health. Although he had been lecturer in practical sanitation in the University of Liverpool for a good many years, Mussen was not anxious to accept the more serious responsibility of the professorship of public health, and so Hope continued to occupy the chair until 1931. Mussen was not an ambitious man at this stage of his career, when he was in the middle fifties, and throughout his official life rather tended to shun the limelight, perhaps, indeed, to the advantage of the work of his department.

He was keenly interested in sport in his younger days, especially in skating and climbing. He was a member of the Liverpool Racquets Club, the Liverpool Athenaeum, and the Liverpool Chess Club, and for a time he was chairman of the Philharmonic Society. On his retirement he and Mrs. Mussen moved to Surrey, but during the last few years they had lived in a hotel at Harrogate. The sympathy of his colleagues will be extended to his widow in her bereavement.—W. M. F.

W. L. BURGESS, C.B.E., M.D., F.R.C.P.Ed., D.P.H.
The death of Professor William Leslie Burgess at his home in Dundee on April 22 has deprived public health of one of its most outstanding exponents, while the school of medicine of the University of St. Andrews mourns the loss of a distinguished teacher.

Born in Aberdeenshire 68 years ago, he received his medical education at the University of Edinburgh, graduating M.B., Ch.B., with first-class honours, in 1909. His interest in preventive medicine dated from his undergraduate days and was maintained throughout his life. Within three years from graduating he obtained the Diplomas of Public Health and of Tropical Medicine and Hygiene, while, in addition, he proceeded to the higher degree of M.D. in 1912, his thesis being awarded a commendation.

Burgess went to Dundee in 1913 as chief tuberculosis officer, and, after service with the Scottish Horse in the first world war, returned in 1918 to become medical officer of health, a post which he held until 1951. During his tenure of office as medical officer of health the development of public health, from both the professional and administrative points of view, was rapid: his clinical acumen ensured that the professional advances were put to the best advantage of the population he served with such devotion, and his ripe judgment that admini-

strative changes were introduced with minimum disturbance of continuity. Professor Burgess was of that generation of public health officers who maintained an active interest in the practice of medicine, and he was as able a physician as he was an administrator. His sustained contact with clinical work made him an exceedingly valuable colleague of the practitioners in the city, and also gave stimulus to his interest in research. His collaboration made advances in the diagnosis of smallpox possible, while his willing co-operation allowed of accurate information being obtained concerning some very puzzling aspects of the epidemiology of diphtheria. Of his achievements, that which gave him most solid satisfaction was, however, the marked reduction which took place in the infantile mortality rate in Dundee during his tenure of office.

When the National Health Service was instituted it was but natural that the Eastern Regional Hospital Board of Scotland should benefit from his wide experience of clinical medicine, of hospital management, and of public health administration, and his sage counsel was as much appreciated by that body as it had been by the municipality.

His service to medical education was no less notable than his contribution to public health. Appointed lecturer in public health in the school of medicine of the University of St. Andrews in 1918, he was responsible as lecturer and as reader for instruction therein until 1951, when he was invited to become the first incumbent of the James Mackenzie Chair of Public Health and Social Medicine. Many generations of students have benefited from his lucid and logical teaching, while his academic colleagues were indebted to him for wise guidance on Faculty and on Senate. Possessed of the qualities of experience, judgment, patience, and tolerance, he was called upon to serve on many committees of national importance, and he was as unsparing of himself in performing work of this nature as he was in fulfilling his more obvious duties: for his services he was appointed C.B.E. in 1944.

Of his attributes as a man, those which were perhaps most outstanding were his breadth of vision, his consideration of others—his staff was a happy family—and his kindness to all. The sympathy of those who had the good fortune to know him goes out in full measure to his widow and son.—W. J. T.

ALISTER T. MACKENZIE, M.D., D.P.H.

Dr. Alister T. Mackenzie, one of the pioneers of health education and physical education in Scotland, died at Glasgow on January 5 at the age of 70.

A native of Alness, Ross-shire, Alister Thomas Mackenzie was born on June 27, 1883, and educated at Tain Royal Academy and Edinburgh University. When he entered the University he combined the work of two faculties—arts and medicine—and during the next six years obtained concurrently the degrees of M.A. and M.B., Ch.B., besides devoting a considerable amount of time to research. He held numerous bursaries and scholarships during his courses. Immediately after graduating in 1907 he was awarded a Carnegie Research Scholarship and worked under the late Sir Thomas R. Fraser. In 1909 he proceeded to the degree of M.D., being awarded a gold medal for his thesis. He was also awarded the Milner Fothergill Gold Medal in therapeutics and the Crichton Research Scholarship in Materia Medica and was appointed a research fellow of the University of Edinburgh.

After spending some time on the staff of the Edinburgh City Fever Hospital, Dr. Mackenzie obtained the Cambridge D.P.H. in 1910 and in the same year was appointed lecturer in anatomy and physiology in the Dunfermline College of Physical Education and Hygiene. This was the beginning of his lifelong interest in school medical work and in physical education, to which he brought not only his outstanding intellectual gifts but also the fruits of his visits to Norway and Sweden, where he had studied the work being done in those fields. In 1912 he was appointed principal medical officer to the Carnegie Trust and principal of the College of Physical Education. He continued to hold the two posts until 1931, although the College was taken over by the National Committee for the Training of Teachers in 1921. During the first world war he served as a major in the R.A.M.C.

As medical officer to the Carnegie Trust, Dr. Mackenzie was responsible for initiating many activities to do with children which we now regard as commonplace. He persuaded the Trust to found their well-known children's holiday home at Bandrum. Medical inspection for schoolchildren, remedial clinics, a school for mothers, and a school for mentally defective children were other aspects of work in Dunfermline owing their inception to Dr. Mackenzie's enthusiasm and foresight. During his term of office as principal, the new college buildings and clinic were erected for the Scottish School of Physical Education in Dunfermline, and a three-year course was developed for the training of men and women teachers of physical education. Because of this expansion of the school, the men students were moved to Jordanhill Training College, Glasgow, in 1931. Dr. Mackenzie then became principal medical officer of the Training College and held that office as well as acting as head of the Scottish School of Physical Education for Men until his retirement in 1948.

A man of wide culture, great personal charm, and a quick and acute mind, Dr. Mackenzie might well have secured a place in the world of medicine much more conspicuous than that obtainable in the somewhat restricted sphere of teacher-training. He chose his field deliberately, and many generations of Scottish teachers have cause to be glad of it. Clear, thorough, and up-to-date, his work was further distinguished by its wit and its crisp and polished style. In his particular field he had the satisfaction of finding his views and his methods securing an ever-widening approval. Men of the Scottish School of Physical Education and Hygiene are to be found to-day all over the English-speaking world. They have taken with them not only the fruits of his experience, his constant study, and his wisdom, but that interest in youth, that belief in their subject, and that readiness to test and adopt new ideas that were an integral part of his teaching.

Dr. Mackenzie married in 1916 and leaves a widow and a son and daughter.—H. P. W.

H. J. ROBINSON, M.R.C.S.

One of the oldest doctors in this country, if not the oldest, Dr. H. J. Robinson died at his home at Simonstone, near Burnley, Lancashire, on May 13, nine days before his 102nd birthday.

Henry James Robinson was born near Dudley Castle on May 22, 1852. After taking the Cambridge B.A.,

he became a Wesleyan minister and travelled in various circuits, chiefly in Yorkshire, before resigning from the ministry to become a medical student at Manchester University. He qualified M.R.C.S., L.R.C.P. in 1893 and set up in practice at Burnley, where he had lived for some years. He became medical officer to the Burnley Union Institution and later medical officer of health to the Burnley Rural District Council, retaining the latter appointment until his 90th year. Dr. Robinson's work as a general practitioner did not prevent him from taking a keen interest in the affairs of the Wesleyan Church, and his services were in demand as a local preacher. In the early years of this century he was an active member of the British Medical Association and represented his constituency at six Annual Representative Meetings from 1912 to 1917. A familiar personality in Burnley and the district, his sympathetic understanding of people, his interest in social welfare work, and his influence for good in the life of the community made him many friends. His long life was remarkably free from illness, for at the age of 100 he could recall only an attack of rheumatic fever when he was 21 and a broken arm in 1951.

Dr. F. J. CHILD, formerly consulting surgeon to the Royal Hampshire County Hospital, Winchester, died at his home at Bournemouth, where he had been living in retirement, on April 28 at the age of 78. Francis Joseph Child was born on October 24, 1875, and was educated at Christ's College, Cambridge, and at St. Thomas's Hospital, where he gained the Sutton Sams memorial prize in gynaecology in 1900. He obtained the degrees of M.B., B.Chir. in 1901, and proceeded to the M.D. four years later. After qualification he held a number of house appointments at St. Thomas's Hospital, and then for a time was resident medical officer at St. Thomas's Home. In 1905 he settled in general practice at Winchester, becoming also honorary surgeon to the Royal Hampshire County Hospital and medical officer to Winchester College. He retired from practice in 1929, when he went to live at Torquay. From 1930 to 1934 he was resident at Bordighera, in Italy, and then returned to Torquay until 1937, when he moved to Bournemouth. The last months of his life were saddened by the loss of his eldest daughter, who died in September, 1953.

J. T. writes: A kind and gentle man and a good neighbour, Dr. F. J. Child was one of my chiefs at the Royal Hampshire County Hospital, where I worked with him until his retirement. His kindness and sympathy to his patients and his patience and forbearance with his juniors are among my chief recollections of him. His technique was scrupulous, and he was always willing to pass on his wealth of experience to those whom he taught. He was never in a hurry and was never known to be late for any hospital commitment. He always appeared to be pleased to be summoned to the hospital, whether it was early morning or late at night; and his calm and deliberate assessment of any problem was a comfort to the patients and to his colleagues. Until he retired it was a common sight to see him on his bicycle at 8.30 a.m., going to pay his daily visit to Winchester College before the start of his ordinary day's work. He was a man much beloved and universally respected, and there are many still living in the Winchester district who think of him with gratitude for his skill in their treatment and who will mourn his passing. I personally look back with gratitude to him for what he taught me, not only in surgery, but in the better understanding of the individual patient and the assessment of his particular problems.

The recent death of Dr. DAVID KINLEY, who was a general practitioner in Belfast, has removed a well-known personality from the medical profession in Northern Ireland. Born at Gilford, Co. Down, he was educated at Lurgan College, and then served in the first world war, losing a leg in Mesopotamia. On returning to civilian life, he entered Queen's University, Belfast, as a medical student, and graduated M.B., B.Ch. in 1924. He then settled in general practice in the city, where he led a busy life for thirty years. During the air raids on Belfast in the last war his work for the casualty services was outstanding.

Dr. R. ENGLISH writes: It was with deep regret that I learnt of the death of Dr. David Kinley ("Davy" as he was known to a great number of the medical profession in Northern Ireland). I was closely associated with him, first in the City Hospital about thirty years ago, then subsequently as a dispensary medical officer. It was in the changes which occurred in our status owing to the introduction in 1930 and 1948 of the various Health Acts which made Davy Kinley our leader. His knowledge of the various Acts of Parliament was phenomenal, and he was our backbone in the discussions with the Ministry of Health and Local Government. He was outstanding as a man who would defend his friends and fight for any cause he thought was just. He conducted a very successful practice in the north of Belfast, and many of his patients, especially ex-Service men, have every reason to be grateful for his efforts on their behalf. David Kinley was a keen fisherman, and he and the wooden leg had many a tussle with a salmon on the banks of the Bush river in Co. Antrim. He also took a keen interest in Rugby football. Endowed by nature with a happy disposition, he was always the life and soul of a party. He is survived by his widow and two sons, both of whom are undergraduates of his old university. To them the deepest sympathy is extended.

Mr. L. G. SCOLAR, who was senior ophthalmic surgeon at the Royal London Homoeopathic Hospital, died in University College Hospital on May 4. Leslie Gemmill Scoular was born on February 4, 1901, and was educated at Glasgow University, where he graduated M.B., Ch.B. in 1924. He took the D.O.M.S. of the English Royal Colleges in 1934 and proceeded to the M.D. four years later. After graduation he held appointments in the ophthalmic departments of various hospitals in London, later becoming senior house-surgeon at the Glasgow Eye Infirmary and ophthalmic house-surgeon at Hull Royal Infirmary, before finally settling in practice in London in 1931. Four years later he gave up general practice to become a consultant ophthalmic surgeon, and in due course was appointed to the staff of the Royal London Homoeopathic Hospital, and, later, to the North Middlesex Hospital and Hornsey Central Hospital. Joining the R.A.F.V.R. a few months before the outbreak of war in 1939, he served until August, 1945, having attained the rank of wing commander.

A. J. M. B. writes: The untimely death of Leslie G. Scoular at the age of 53 has appalled an exceptionally wide circle of sorrowing friends. He had a genius for making lasting friendships, and was at his best when entertaining his friends. All who knew him will long remember his good looks and boisterous laugh, and his engaging way of bringing a party to life by making some deliberately provocative remark and then defending his thesis against all comers. His interests were protean, and included gardening, music, and golf. His reading covered a wide field, especially philosophical works. He was gifted, too, with an inventive faculty, and his description of an improved undine to facilitate the work of nurses was published in the *Journal* of January 9 last. After six years of war service in the R.A.F. he resumed work in London, and, despite long hours of professional work, contrived to find time for his numerous social and cultural activities, including the duties of honorary secretary of the Glasgow University Club of London. As ophthalmic surgeon at the Royal London Homoeopathic Hospital, his skill

and conscientiousness were known to all his colleagues, and his many patients had good cause to be grateful for his thoroughness, kindness, and consideration. All his friends mourn his loss and will wish to extend deep sympathy to his widow, sister, and brothers.

Dr. MARGARET E. PEAKER, an assistant medical officer in the Middlesbrough school health service, died suddenly while on sick leave on April 27 at the age of 54. Born on July 16, 1899, the daughter of the late Mr. Frederick Peaker, a former president of the Institute of Journalists, Margaret Eveline Peaker was educated at Sydenham High School for Girls and at King's College Hospital, qualifying M.R.C.S., L.R.C.P. in 1928. She held resident posts at the Sheffield Children's Hospital and at the East Anglian Children's Sanatorium, Nayland, near Colchester, and in 1932 she became a school medical inspector under the West Riding County Council, her work there being interrupted by service in the R.A.M.C. in the last war from 1942 to 1946. After demobilization she obtained the appointment at Middlesbrough. Dr. Peaker was a very capable school medical officer, being particularly keen on the social side of her work. Her sunny disposition and interest in each child made her popular with patients and staff alike. During the last few years of her life she had frequent illnesses, but she worked on with great fortitude almost to the end. A pleasant memory of a real lover of children is left with her colleagues and her friends.

Medico-Legal

DANGER TO WIFE'S HEALTH

"Deliberate failure of a husband suffering from tuberculosis to take precautions recommended for the protection of his family" was held by the Divorce Divisional Court on May 3 to constitute cruelty towards his wife. The appeal by Mr. P. N. Enticknap, of Hull, against the finding of the Hull stipendiary magistrate on August 14, 1953, that he had treated his wife with persistent cruelty, was dismissed. Mr. and Mrs. Enticknap were married in 1943. There were three children.

Lord Merriman, giving judgment, said the wife complained of two acts of violence separated by 3½ years—which it was impossible to characterize as persistent cruelty—together with acts of neglect in connexion with his disease. Mr. Enticknap was found to have tuberculosis in 1951 and was off work for six months. The disease became quiescent, but there was a further outbreak in September, 1952, which continued to the following April. The magistrate found that during the second period Mr. Enticknap "persistently and flagrantly disregarded the precautions he had been enjoined to take, and in particular flouted the instructions as to the disposal of sputum." Mr. Enticknap had been informed that his disease was active and infectious and was told he should take precautions against the spread of the infection—the use of a separate bedroom, the use of separate bed linen and crockery, and, particularly, safeguards for the disposal of sputum. The wife repeatedly remonstrated with him, and these remonstrances later became of great frequency. The husband's attitude, according to the wife, was that he would always agree on the surface, but in his actions he carried on in the same way.

Two of the children developed a tuberculous infection, his lordship added, and, though he was not saying that the husband infected either of them, it might be so. It was sufficient for the court to be satisfied that the husband knew that by his acts he was endangering the health of his family. His lordship had no hesitation in all the circumstances in attributing such knowledge to the husband. It was said acts of omission could not be "aimed at" the victim, but, applying the test laid down as to what was meant by "aimed at," he found it was amply justified. "If

Davy, M. G. D. Davys, Cecile R. Doniger, Stefanie Felsenburg, N. Goldman, J. D. Haldane, T. H. Kaplan, R. R. Knowles, T. A. Lambo, Stephanie M. Leese, J. Newcombe, H. Rifkin, W. Rodger, D. C. V. Stewart, W. H. Tait, B. B. Zeitlyn.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—A. W. Duke, W. M. McCutcheon, R. N. Mitra, K. Saakwa-Mante, D. R. P. Suriapperuma, K. S. Tun, E. E. Vella.

DIPLOMA IN INDUSTRIAL HEALTH.—P. K. Bose, W. R. Brown, Patricia M. Elliott, B. Ghose, R. Malan, C. R. A. Martin, F. G. Neild, M. K. Qureshi-ul-Hashmi, T. Simpson, W. J. Smither.

DIPLOMA IN PATHOLOGY.—P. B. Adamson, G. Aung, A. J. E. Brafield, P. W. Harvey, Phyllida M. M. Roberts, B. Ruebner, B. A. Woodger.

DIPLOMA IN CHILD HEALTH.—D. E. Williams.

DIPLOMA IN MEDICAL RADIODIAGNOSIS.—J. D. Nelson.

At a meeting of the Council of the College held on February 11, with Sir Cecil Wakeley, President, in the chair, an Honorary Fellowship of the College was awarded to Professor Arthur Steindler, of Iowa City, U.S.A.

A Moynihan Lectureship was awarded to Dr. Walter C. Mackenzie, of Edmonton, Alberta, Canada.

Professor Merle D'Aubigné (Paris) was appointed Robert Jones Lecturer for 1954.

Mr. R. G. Macbeth (Oxford) was admitted as an *ad eundem* Fellow.

The Hallett Prize was awarded to Asitkumar Mitra (Calcutta).

The Handcock Prize was awarded to Sheila C. Hay (Sheffield) and to Margaret S. Meyer (Royal Free).

It was agreed to hold a Primary Fellowship Examination in Colombo in November, 1954.

Regulations were approved for the award of the Edridge-Green Lectureship in Ophthalmology.

Diplomas of Membership of the College were granted to the candidates whose names are printed in the report of the meeting of the Royal College of Physicians of London (p. 1217 of this Journal) as recipients of the L.R.C.P.

Diplomas in Anaesthetics and in Public Health were granted, jointly with the Royal College of Physicians of London, to the successful candidates whose names are printed in the report of the meeting of the Royal College of Physicians of London (p. 1217 of this Journal).

Vital Statistics

Infectious Diseases

The largest variations in the trends of infectious diseases in England and Wales during the week ending May 1 were decreases of 226 for measles, from 2,196 to 1,970, and 166 for scarlet fever, from 789 to 623, and an increase of 100 for whooping-cough, from 2,133 to 2,233.

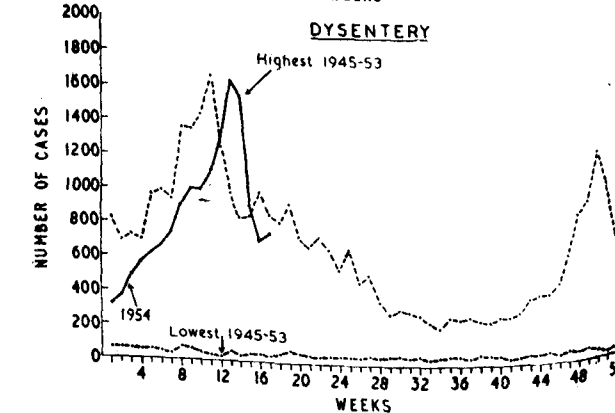
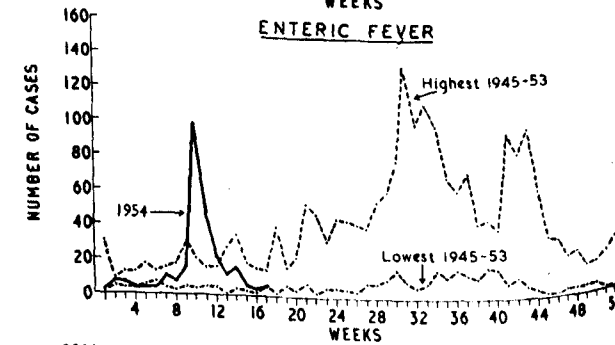
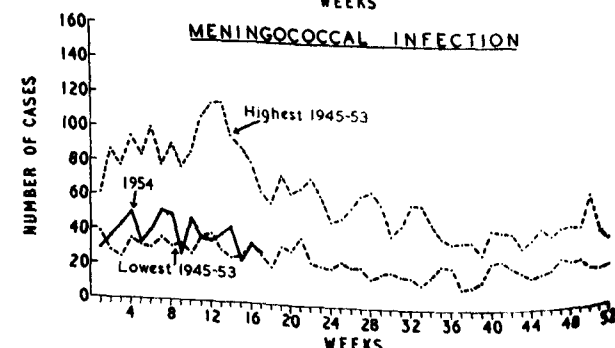
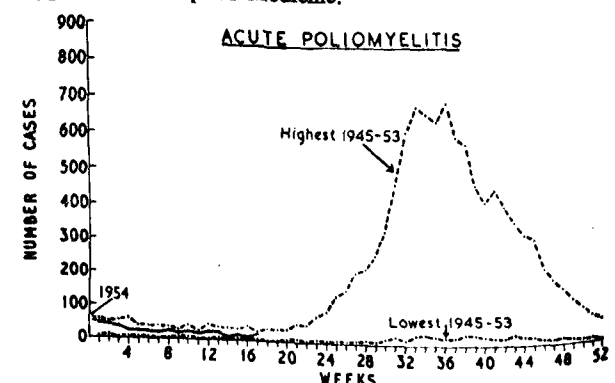
The largest fluctuations in the local trends of measles were falls of 86 in Cheshire, from 191 to 105, 66 in Lancashire, from 437 to 371, 62 in Yorkshire West Riding, from 221 to 159, and 46 in Norfolk, from 372 to 326, and a rise of 85 in Durham, from 79 to 164. Only small variations in the number of notifications of whooping-cough were recorded in local trends. The only variation of note in the returns of scarlet fever was a decrease of 35 in the number of notifications in Essex from 67 to 32, 12 cases of diphtheria were notified, the same as in the preceding week. Half of the cases of diphtheria were notified in Lancashire.

20 cases of acute poliomyelitis were notified. These were 9 more for paralytic and 1 more for non-paralytic cases than in the preceding week. The largest returns were 3 cases in Yorkshire West Riding and in Staffordshire (Cannock U.D. 2) and 2 cases in London, Worcestershire, and Lancashire.

759 cases of dysentery were notified, being 48 more than in the previous week. The largest returns were Lancashire 143 (Blackpool C.B. 27, Denton U.D. 15, Liverpool C.B. 13, Salford C.B. 13), Yorkshire West Riding 120 (Sheffield C.B. 27, Dewsbury C.B. 14, Leeds C.B. 13), London 108 (Islington 30, Lewisham 12), Leicestershire 85 (Leicester C.B. 80), Cheshire 33 (Ellesmere Port U.D. 27), Devonshire 28 (Plymouth C.B. 19), Sussex 26 (Brighton C.B. 24), Glamorgan-shire 26 (Llchwyr U.D. 18), and Middlesex 20.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending May 8

The notifications of infectious diseases in England and Wales during the week included pneumonia 506, scarlet fever 719, whooping-cough 2,381, diphtheria 9, measles 1,734, dysentery 948, acute poliomyelitis 23, paratyphoid fever 13, and typhoid fever 2.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 1 (No. 17) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	12	0	3	0	0	13	1	3	0	1
Dysentery ..	759	108	280	3	3	466	34	82	2	1
Encephalitis, acute	3	2	0	0	0	7	0	0	0	0
Enteric fever: Typhoid ..	3	0	1	0	0	0	0	0	0	0
Paratyphoid ..	3	1	0	0	2	6	1 (B)	0	1 (B)	0
Food-poisoning ..	112	13	0	0	0	86	15	0	0	0
Infective enteritis or diarrhoea under 2 years ..				15	17				24	20
Measles*	1,970	72	212	87	340	10,752	419	427	336	203
Meningococcal infection ..	29	6	17	0	1	32	3	12		3
Ophthalmia neonatorum ..	38	3	12	0	0	29	3	19	0	0
Pneumonia†	521	39	144	5	1	549	28	212	7	2
Poliomyelitis, acute: Paralytic ..	15	2	0	0	0	19	4	1	0	1
Non-paralytic ..	5	0	0	0	0	10	1	0	0	0
Puerperal fever‡	222	26	14	0	0	226	30	16	1	0
Scarlet fever ..	623	40	136	27	39	1,139	69	180	52	75
Tuberculosis: Respiratory ..	810	107	134	30	0	194	39	31	5	0
Non-respiratory ..	128	8	32	3	0	39	5	0	0	0
Whooping-cough ..	2,233	88	402	29	26	3,373	239	452	42	120

DEATHS In Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0	0	0	0	0	0	0	0	0
Encephalitis, acute	0	0	0	0	0	0	0	0	0	0
Enteric fever ..	0	0	0	0	0	0	0	0	0	0
Infective enteritis or diarrhoea under 2 years ..	9	0	4	0	0	8	2	2	3	3
Influenza ..	10	2	1	1	0	21	2	1	0	1
Measles ..	0	0	0	0	1	0	0	0	1	0
Meningococcal infection ..	0	1	0	0	0	0	1	0	0	0
Pneumonia ..	194	28	23	15	9	203	34	22	10	2
Poliomyelitis, acute	1	0	0	0	0	1	0	0	0	0
Scarlet fever ..	0	0	0	0	0	0	0	0	0	0
Tuberculosis: Respiratory ..	87	19	14	0	7	121	13	12	3	9
Non-respiratory ..	0	0	0	0	0	5	1	3	2	0
Whooping-cough ..	0	0	0	1	0	1	0	2	0	0
Deaths 0-1 year ..	191	23	29	9	10	202	28	30	11	10
Deaths (excluding stillbirths) ..	5,270	743	702	148	189	5,047	691	562	98	171
LIVE BIRTHS ..	8,266	1,229	1,039	247	440	7,849	1,125	929	243	375
STILLBIRTHS ..	244	39	26	0	0	224	27	33	0	0

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Honorary Degrees at Annual Meeting.—During the Annual Meeting of the B.M.A. in Glasgow this year the University of Glasgow will confer the honorary degree of Doctor of Laws on the following distinguished medical men: Sir Andrew Davidson, formerly Chief Medical Officer of the Department of Health for Scotland; Dr. J. B. Miller, a Vice-president of the B.M.A. and former chairman of the Representative Body; Mr. J. W. Tudor Thomas, President of the B.M.A. in 1953-4; and Sir Lionel Whitby, President of the B.M.A. in 1948-9. The degrees will be conferred at a special ceremony on July 8.

Surgeons Honoured.—The Princess Royal, Chancellor of Leeds University, on May 14 conferred the honorary degree of doctor of laws on Sir Cecil Wakeley, P.R.C.S., and Professor Everts A. Graham, chairman of the board of regents of the American College of Surgeons. They were attending the conference held last week of the Association of Surgeons of Great Britain and Ireland. On the same day Mr. Philip Allison, thoracic surgeon of Leeds United Hospitals, and Professor Digby Chamberlain, of Leeds University, were made honorary fellows of the American College of Surgeons. Professor A. Blalock gave the Moynihan Lecture at Leeds University.

Surgeons at Edinburgh.—A reception was held on May 11 at the Royal College of Surgeons of Edinburgh in honour of Fellows of the American College of Surgeons attending meetings in Edinburgh. The President, Professor Walter Mercer, presided over a large audience including the Lord and Lady Provost of the City of Edinburgh. The proceedings were opened by the Very Reverend Dr. C. L. Warr, Dean of the Thistle and Chapel Royal and Chaplain to the Royal College of Surgeons, who read the prayer of the College attributed to John Knox. Dr. Alfred Blalock, Dr. Everts A. Graham, Dr. Henry W. Cave, and Dr. Frederick A. Collier were admitted honorary Fellows of the College. After Dr. Blalock had replied on behalf of the new honorary Fellows, Professor Mercer was admitted to the honorary Fellowship of the American College of Surgeons.

Chelsea Clinical Society.—The Chelsea Clinical Society has a well-earned reputation for a high standard of after-dinner speaking. As the retiring president, Dr. J. Nigel Loring, said at the annual dinner last week, it is a characteristic of the Society to correlate medical interests with other human activities, and he referred to some of the successful and well-attended meetings of the past session. The toast to the Society was proposed by Sir Terence Nugent, Comptroller of the Lord Chamberlain's Office, who was entertaining, and reassuring, about the censorship of stage shows. Mr. S. H. Wass proposed the health of the guests in a lively and epigrammatic speech. In reply His Honour Judge J. B. Blagden showed that the legal profession is capable of taking an even gloomier view of mankind than the medical profession; and it was left to Sir Heneage Ogilvie to cheer the company up with some excellent stories. At the end of the dinner Dr. Loring transferred his badge of office to the new president, Mr. Victor H. Riddell.

Harveian Society of London.—The Buckston-Browne-Gray-Hill dinner was held at the Charing Cross Hotel on May 12, with the president, Dr. R. Cove-Smith, in the chair. In speaking to the toast of the Harveian Society of London the Bishop of Willesden deplored the diminishing sense of personal responsibility in modern society: without a feeling of intimate concern for one another, all that the Welfare State was trying to achieve would be doomed to failure. In reply Dr. Cove-Smith mentioned the various activities of the Society designed to honour the memory of William Harvey, and referred particularly to the successful efforts of the present Mayor of Folkestone to inaugurate in that town, Harvey's birthplace, an annual

ceremony of remembrance. The Society had endowed a prize at the Harvey Grammar School of Folkestone—founded by Harvey's nephew with money left by Harvey—for original research in any subject carried out by a pupil of the school. Dr. Cove-Smith underlined the Bishop of Willesden's remarks about personal responsibility, an ideal which the learned societies could do much to foster. The profession's future, he added, was in a poor state if the possession of higher degrees reduced the chances of a young doctor getting into general practice. This attitude of mind must be challenged and the better qualification of the doctor be encouraged rather than discouraged. The health of the guests was proposed by Dr. D. G. H. Sylvester, and the Mayor of Folkestone, Alderman J. Moncrieff, unabashed at having to stand in at a moment's notice for Sir William Wavell Wakefield, made an urbane and entertaining reply. Mr. C. Hamblen Thomas also replied for the guests.

Obstetrics Prizes.—The Royal College of Obstetricians and Gynaecologists offers the following: the appointment of one or more William Blair-Bell Memorial lecturers (honorarium 20 guineas); Green-Armytage Short-term Travelling Scholarship (value £75); Bernhard Baron Travelling Scholarship (value £500); Edgar-Gentili Research Scholarship in the form of grants or research fellowships (£850 per annum); Leverhulme Scholarships (value up to £500 per annum); prize of £50 for the best original work on "Methods for improving the results of forceps delivery." Entries for the last and applications for the others (or recommendations for the first) must reach the honorary secretary of the College before September 1. Full details should be obtained from him at 58, Queen Anne Street, London, W.1.

W.H.O.'s New President.—Saying that W.H.O. was the first world-wide organization to elect "a true African as its president," Dr. J. N. Togba, on behalf of Liberia and all Africans, expressed his gratitude for the honour placed on him. He added that in W.H.O. "the concept of democracy is being translated into action without regard to size or development of a country, race, colour, or creed."

London University.—Dr. R. B. Lucas has been appointed professor of oral pathology in respect of his post at the Royal Dental Hospital of London School of Dental Surgery. Dr. F. T. G. Prunty has been appointed professor of chemical pathology in respect of his post at St. Thomas's Hospital Medical School. Dr. R. A. Kekwick, D.Sc., has been appointed reader in chemical biophysics in respect of his post at the Lister Institute of Preventive Medicine.

Birmingham University.—Professor H. L. Saha, of Calcutta University, and Dr. Bernard Shaw have been made University Research Fellows in medicine and pharmacology respectively during the tenure of their posts at the University.

Edinburgh University.—Dr. G. J. Romanes has been appointed professor of anatomy in succession to Professor J. C. Brash, and Dr. G. L. Montgomery has been appointed professor of pathology in succession to Professor A. M. Drennan.

New Zealand Honour.—Professor W. E. Le Gros Clark, of Oxford University, has been elected an honorary member of the Royal Society of New Zealand.

Beit Memorial Fellowships.—Professor T. R. Elliott, F.R.S., has resigned from the board of trustees after 19 years' service, and his place has been filled by Sir Alan Drury, F.R.S. The following elections have been made to Junior Fellowships (£630 a year): Dr. R. G. Tucker, to investigate the action of divalent metals on the multiplication of bacteriophage, at the Sir William Dunn School of Pathology, University of Oxford; Dr. D. S. H. W. Nicol, to study the chemistry and pharmacology of peptide fractions of insulin, at the Dunn Institute of Biochemistry, University of Cambridge; Mr. B. T. Donovan, B.Sc., to study the hypothalamic control of the secretions of anterior pituitary hormones, at the University of London Institute of Psychiatry.

COMING EVENTS

Newcastle-upon-Tyne Consultants and Specialists.—A meeting of the Consultants and Specialists Committee, Newcastle-upon-Tyne Region, will be held in the New Lecture Theatre, Royal Victoria Infirmary, Newcastle-upon-Tyne, on Monday, May 24, at 8.30 p.m. Mr. John Pringle (Public Relations Officer of the British Medical Association) will address the meeting on "Public Opinion and the Hospital Medical Service." The meeting is open to consultants, S.H.M.O.s, registrars, and other hospital medical staff in the region.

Atomic Energy.—Members of the B.M.A. are invited to apply for tickets for a reception to be held by the Institute of Atomic Information for the Layman at the Royal Society of Arts, Adelphi, London, W.C., on Saturday, May 29, 8 to 10.30 p.m., when Lord Hore-Belisha will open the proceedings. Dr. J. Cranston, D.Sc., will speak on "The Discovery of Isotopes" and Professor F. Soddy, F.R.S., will give a demonstration. Details from Major Howorth, 55, Park Lane, London, W.1.

Florence Nightingale Centenary Concert.—The United Hospitals Festival Choir, with the London Symphony Orchestra, will give a concert with distinguished soloists, including Dame Myra Hess, at the Royal Albert Hall on June 3 at 7.30 p.m. The concert is in aid of the National Florence Nightingale Memorial Fund. Tickets from the box office and the usual agents.

Polish Medical Association in Great Britain.—The annual meeting will be held at the White Eagle Club, 2, Albert Gate, Knightsbridge, London, S.W.1, on June 5 and 6. Further information may be obtained from the honorary secretary of the association, 14, Collingham Gardens, London, S.W.5.

The Diabetic Association.—The Banting Memorial Lecture and Scientific Meeting will be held at University College Hospital Medical School, London, W.C.1, on July 16 and 17. Scientific contributions are invited. Dr. K. Hallas-Møller, of Denmark, will deliver the Banting memorial lecture on July 16 at 2.30 p.m. He will speak on the new insulins. Further information may be obtained from the Diabetic Association, 152, Harley Street, London, W.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked *. Application should be made first to the institution concerned.

Monday, May 24
LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—5.15 p.m., Newholme Lecture by Professor W. M. Frazer: State Medicine in the Nineteenth Century—The Industrial Era.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. A. C. Donohorst: Respiratory Function in Failure.

Tuesday, May 25
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. F. R. Bettley: Eczema-asthma Syndrome.
INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. D. McAlpine: Intracranial Hypertension and Hypotension.
INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Professor J. Louw (Capetown): Constriction Ring Dystocia.
LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—5.45 p.m., Newholme Lecture by Professor W. M. Frazer: State Medicine in the Nineteenth Century—The State and Medical Research.
ROYAL SOCIETY OF ARTS: COMMONWEALTH SECTION.—5.15 p.m., Sir Leonard Rogers, F.R.S.: Progress Towards the Eradication of Leprosy from the British Commonwealth. (Illustrated by lantern slides.)
ROYAL STATISTICAL SOCIETY: STUDY CIRCLE ON GENERAL STATISTICS.—At Westminster Medical School, 5.45 p.m., annual general meeting. Debate: This House Welcomes the Growing Influence of Statistics in all Branches of Medicine. Proposer, Dr. R. A. J. Asher; Opposer, Mr. R. S. Murley.
SENATE HOUSE.—5.30 p.m., Special University Lecture by Air Marshal Sir Harold Whittingham: Medical Science and Problems of Flying.
WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Altmouth Wright Lecture by Professor G. Payling Wright: Recent Studies on Tetanus.

Wednesday, May 26
EUGENICS SOCIETY.—At Royal Society, 5.30 p.m., Lord Simon of Wythenshawe: Some Aspects of World Population and Food Resources.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Miss B. M. Partridge: Mycology—Diagnosis of Ringworm Infections.
INSTITUTE OF ORTHOPAEDICS.—At 234, Great Portland Street, W., 8 p.m., Senior Clinical Conference with Mr. M. Pilcher: Preventive Tendon Transplantation in Poliomyelitis.
LIVERPOOL MEDICAL INSTITUTION.—At Liverpool Royal Southern Hospital, Dr. G. W. Bamber: demonstration of dermatological cases.
LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—5.15 p.m., Newholme Lecture by Professor W. M. Frazer: State Medicine in the Nineteenth Century—State Hospital Policy.

LONDON UNIVERSITY.—At King's College, Strand, W.C., 5.15 p.m., Special University Lecture in Physiology by Professor C. J. Wiggers (Ohio, U.S.A.): Basic Studies on Ventricular Fibrillation and Defibrillation.
PHARMACEUTICAL SOCIETY: DARTFORD AND DISTRICT BRANCH.—At the Welcome Club, High Street, Dartford, 8 p.m., Dr. F. E. Camps: What Shall We Do with the Barbiturates?
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. A. C. Thackray: Pathological Conditions in the Salivary Glands.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnott Demonstration by Dr. D. R. Haynes: Relations of the Facial Nerve in the Temporal Bone.
ROYAL EYE HOSPITAL.—5.30 p.m., Mr. G. C. Pritchard: Visual Fields (1).
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. E. A. Bennet: Lecture-demonstration in psychiatry.

Thursday, May 27
CAMBRIDGE MEDICAL SOCIETY.—8.30 p.m., B.M.A. Lecture by Dr. F. E. Camps: Disposal of the Body.
HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. J. Ralston Paterson: Some Radio-sensitive Tumours.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Inflammation and Other Complications of Fractured Skull.
ROYAL SOCIETY.—4.30 p.m., Croonian Lecture by Sir Howard Florey, F.R.S.: Mucins and the Protection of the Body.
ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Dr. J. E. Caughey (Dundee, N.Z.): Some Aspects in the Treatment of Acute Poliomyelitis.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Dr. D. Curran.
SENATE HOUSE.—5.30 p.m., Special University Lecture by Air Marshal Sir Harold Whittingham: Air Transport of Sick and Wounded.

Friday, May 28
BELMONT HOSPITAL, Sutton, Surrey.—3 p.m., Dr. M. N. Pai: demonstration of psychiatric treatment.
BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At St. George's Hospital, Stafford, 4 p.m., subject: Surgery in Psychiatric Disorders.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. P. J. Hare: Necrobiosis Lipoidica and Granuloma Annulare.
INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—3.30 p.m., Mr. Wallace Black: Ulcers of the Mouth and Tharynx.
INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 2 p.m., Professor J. Louw (Capetown): Diabetes in Pregnancy.
LONDON UNIVERSITY.—At Physiology Lecture Theatre, University College, 5.30 p.m., special university lecture in psychology by Professor B. R. Flaher, Ph.D. (Wisconsin): Study of the "Projection" of Attitudes Towards Social Groups.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor G. A. G. Mitchell: Innervation of Blood Vessels, 4 p.m., Dr. I. C. Gilliland: Diabetic Control and Allied Disorders.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Sir William Gilliat: Minor Disturbances of Pregnancy.

Saturday, May 29
INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 11 a.m., Professor J. Louw (Capetown): Enterococci.

APPOINTMENTS

ROGERS, W. J. BLACHFORD, M.B., B.Chir., M.R.C.P., D.P.M., Whole-time Consultant Child Psychiatrist, Crichton Royal, Dumfries.
SOMERVILLE, W. M.D., M.R.C.P., Consultant Assistant Physician to Department of Cardiology, Middlesex Hospital, London, W.
TAGGART, JAMES, M.C.A., M.B., B.Ch., D.P.H., D.P.A., Deputy Medical Officer of Health and Deputy Port Medical Officer, County Borough of Belfast.
WALTON, H. C. M., M.B., B.Ch., Lieutenant-Colonel, R.A.M.C., Consultant Pathologist, Glantawe H.M.C., Swansea, Glamorgan.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS
Bowker.—On March 19, 1954, in Lisbon, Portugal, to Margaret (formerly Lyon), M.R.C.S., L.R.C.P., wife of Dr. Colin M. Bowker, a brother for Elsie and Andrew-David.
Brown.—On May 7, 1954, at King's College Hospital, London, S.E., to Jean, wife of Dr. R. J. K. Brown, a daughter.
Frain-Bell.—On May 10, 1954, at Cardiff, to Dr. Catherine Frain-Bell (formerly Sharp), wife of Dr. W. Frain-Bell, a daughter.
Harrison.—On May 11, 1954, to Mary (formerly Marryat), wife of Kent Harrison, F.R.C.S., a son.
Maclure.—On April 15, 1954, at Bromhead Maternity Home, Lincoln, to Nancy (formerly Macfarlane), M.B., Ch.B., wife of Dr. W. Alastair Maclure, a son—Alexander Graeme.
Mathers.—On May 1, 1954, at Stroud, Gloucestershire, to Diana (formerly Mould), S.R.N., wife of Dr. G. C. Mathers, a sister for Richard—Gillian Diana.
Mulhern.—On April 30, 1954, at the Queen Elizabeth Hospital, Birmingham, to Ruth (formerly Heller), L.D.S., wife of Dr. P. H. Mulhern, a daughter.

MARRIAGES
Batty Shaw-Heckels.—On May 7, 1954, at Epsom, Anthony Batty Shaw, D.M., to Patricia Heckels.
Fletcher-Astill.—On April 22, 1954, at St. Andrews Church, Aylesstone, Leicester, Ronald Frank Fletcher, M.B., Ch.B., of Bromsgrove, Worcs., to June Margaret Astill, M.B., Ch.B., of Leicester.

DEATHS
Anderson.—On April 11, 1954, in an infirmary, James George Anderson, M.B., Ch.B., D.P.H., of "Kilrenny," Abbots Grange Road, Grange-mouth, Strirlingshire.
Apperly.—In February, 1954, Herbert Claude Apperly, M.R.C.S., L.R.C.P., L.D.S., of 37, Crossways, Sutton, Surrey, and 92, Harley Street, London, W., aged 59.
Costes.—On April 10, 1954, Thomas Seymour Costes, C.B., O.B.E., M.B., B.S., Major-General, A.M.S., late R.A.M.C., retired, of 1, Metropole Court, Folkestone, Kent, aged 74.
Donelan.—On April 10, 1954, at Sydn, Foxrock, Co. Dublin, John O'Connor Donelan, L.R.C.P.S.I. & L.M.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Liability of Diabetics to Peptic Ulceration

Q.—Is there any evidence that diabetics suffer from peptic ulceration less frequently than others?

A.—Clinical impression strongly suggests that peptic ulcer, particularly duodenal ulcer, is less common among diabetics than among the general population. Wilder¹ found an incidence of 2.3% among 2,584 diabetics during 1935-47, when the incidence of peptic ulcer in other patients at the Mayo Clinic was 3.5%. Joslin² found peptic ulcer only rarely among his diabetic population. Dibold³ was able to find only seven peptic ulcers in 800 diabetics, Landé⁴ 10 peptic ulcers in 2,000 diabetics, and Rothenberg and Teicher⁵ found an incidence of ulcer of 1.49% in 130,500 general admissions, while in 3,525 diabetic admissions only 0.25% suffered from ulcer. Portis and Jaffé⁶, in discussing the post-mortem findings in 339 peptic ulcer cases, mentioned that only one of the patients had diabetes.

It is interesting to note that Marple⁷ found that the incidence of achlorhydria was 32.8% in 399 diabetics. The usual incidence of achlorhydria in patients above 40 years is 10 to 15%. A proper comparison really needs to be made by age and sex groups. Muir⁸ found that raising the blood sugar depressed the gastric acidity response.

REFERENCES

- ¹ Clinical Diabetes Mellitus and Hyperinsulinism, 1940, W. B. Saunders, Philadelphia.
- ² Treatment of Diabetes Mellitus, 1933, Lea and Febiger, Philadelphia.
- ³ Med. Klin., 1933, 29, 1606.
- ⁴ Klin. Wschr., 1931, 10, 359.
- ⁵ Amer. J. dig. Dis., 1938, 5, 663.
- ⁶ J. Amer. med. Ass., 1938, 110, 6.
- ⁷ In E. F. Joslin.
- ⁸ Quart. J. Med., 1949, 18, 235.

Industrial Dermatitis and Chloronaphthalene Wax

Q.—What treatment is advised for cases of industrial dermatitis? How may one due to a naphthalene-based wax (used in chromium plating) be prevented?

A.—Industrial dermatitis is not a clinical entity. The majority of cases diagnosed as industrial dermatitis are due to primary irritation from the various materials encountered, such as acids, alkalis, solvents, etc., and the basic principle of treatment is to protect the inflamed skin from further damage. For such conditions the use of a bland application such as calamine lotion in the early stages is important. It is very easy to produce exacerbations by the use of strong ointments. Usually the patient may remain at work provided adequate cover and protective clothing are available, but this decision should be based upon the severity of the eruption and the nature of the job. Infection of the lesions should be avoided by the use of sterile materials and a good dressing technique. The use of antibiotic creams (such as penicillin cream 500 units per gramme) is indicated in the presence of infection. The risks of sensitization to antibiotics, however, make it desirable for these drugs to be used under specialist guidance. In the later stages, when drying and fissuring tend to occur, oily applications are desirable. Suitable preparations are: zinc paste and olive oil in equal parts or calamine compound cream (B.P.C.). The questioner will find further information in the appropriate chapters of Schwartz, Tulipan, and Peck,¹ and in the paper by Squire, Cruickshank, and Topley.²

The naphthalene-based wax to which reference is made is probably a chlorinated compound, chloronaphthalene. This is sometimes used for "stopping-up" in the electroplating

process. "Stopping-up" refers to the covering of areas of metal with an insulating wax when it is desired to prevent deposition of chromium on these parts.

The chlorinated naphthalenes are very apt to produce comedones and acne. These comedones and acne-like lesions may be distinguished histologically from acne vulgaris. As under some circumstances systemic poisoning from these substances has been reported,¹ considerable care is required in their handling.

The use of chlorinated naphthalenes in the electroplating process is not widespread and many plants function efficiently using a non-irritating, paraffin-type wax. It would therefore be worth finding out whether the former substances are really necessary: to change the type of wax would solve the problem. Should this be impossible, special attention should be paid to the cleanliness of the plant and to the clothing of the people handling the wax. Clean overalls with long sleeves and gloves should be provided. These should be changed every day, and there should be double lockers for each worker. Adequate changing and washing facilities are necessary. Periodic inspection for lesions is essential. The ease with which these substances cause acne makes it important that all the means of preventive medicine should be employed.

REFERENCES

- ¹ *Occupational Diseases of the Skin*, 1947, 2nd ed. Philadelphia.
² *Brit. med. Bull.*, 1950, 7, 28.

Water Softener for a Sterilizer

Q.—I sterilize my glass and metal syringes by boiling them in a saucepan. The deposit from the hard water is spoiling them. Can you advise a suitable substance for softening the water?

A.—The water should be made slightly alkaline and a small quantity of sodium hexametaphosphate ("calgon") added. From 1 in 100,000 to 1 in 50,000 usually suffices, but more may be added if necessary, as the substance is harmless.

Is it a True 24-hour Specimen?

Q.—Does the estimation of the total creatinine content of a supposed 24-hour collection of urine provide a reasonable check on the completeness of the collection? Is the urinary output of creatinine influenced by diet or disease?

A.—The urinary excretion of creatinine in normal people is almost constant for the individual, being related to the body weight, and more particularly to the muscle content of the body, and is therefore regarded as a useful check on the accuracy of a 24-hour collection of urine.

It is not influenced by a change in the protein of the diet unless creatinine or creatine be included in such diet. In disease it is the creatine content of the urine that is generally increased, usually with a corresponding decrease in the creatinine. This will occur in all wasting diseases and starvation, and is particularly marked in the muscular dystrophies, where the creatine reaches its highest levels but the total creatinine + creatine remains relatively constant at least for some time.

Bone Regeneration after Mastoidectomy and Antrostomy

Q.—To what extent does bone regeneration occur in the temporal bone after a mastoidectomy, and in the lateral wall of the nose after an antrostomy? What are the factors which control regeneration?

A.—After a mastoidectomy a layer of new bone may form subperiosteally, closing over the cavity made in the substance of the mastoid process. After a cortical mastoidectomy this is concentric and has a central opening; where the posterior osseous wall has been removed the layer of bone forms eccentrically and leaves a dehiscence over the aditus and even the antrum. The bone does not intrude on the cavity. Bone reformation occurs mostly in children and adolescents, especially if there is residual or recurrent sepsis.

After antrostomy, a certain amount of new bone formation occurs around the edges of the opening made between the antrum and the inferior meatus of the nose, and if small fragments of bone are left adherent to the mucous membrane of either nose or antrum the new bone formation is more likely to occur. This is also more likely to occur in children and where there is persistent infection. The bone formation causes progressive narrowing of the opening until it may become completely closed, and the thin layer of bone separating the two cavities may be replaced by a thicker and tougher one. There is, however, no encroachment on the cavity of the nose or antrum.

Treatment of Recurrent Corneal Herpes

Q.—What symptomatic treatment is advised for long-standing recurrent corneal herpes? Antibiotics, autogenous vaccines, etc., have all failed to bring relief.

A.—As various previous treatments have failed to give relief, the best plan would be to avoid, in so far as they can be avoided, all things which tend to provoke an attack. Other useful palliative measures are anti-glare spectacles and saline drops. If the trouble persists in spite of such precautions then the question of x-ray treatment would be worth considering, but such treatment should be carried out only by a radiologist who has had special experience of eye conditions.

Scarlet Fever in a School

Q.—Throat swabs have been taken from apparently healthy children in a school where many of their classmates are at present down with scarlet fever. In quite a number haemolytic streptococci have been found. Should these carriers be treated, and should they be excluded from school until a negative swab is obtained?

A.—Children whose swabs produce profuse growths of streptococci, especially if they have also a nasopharyngeal discharge, should preferably be kept at home. If the culture plate reveals relatively few haemolytic streptococci (30% or less) in a mixed growth, such children, especially in the absence of any local lesion, may be regarded as relatively harmless.

The treatment of carriers is unsatisfactory. In military units in the U.S.A. where streptococci were rampant, success has been claimed in cutting down the number of cases of scarlet fever and associated conditions by giving 0.5 g. of sulphadiazine daily to all contacts while the outbreak lasted. But such schemes should be under strict medical control, and the possibility of creating a drug-resistant strain through prolonged and unchecked chemotherapy should be borne in mind. There are obvious objections to the use of penicillin, either locally or parenterally, for healthy carriers. Where, however, a heavy streptococcal growth is associated with a nasopharyngeal discharge, parenteral penicillin therapy is often successful.

"Any Questions?" Book.—The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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A COMPARISON OF CORTISONE AND ASPIRIN IN THE TREATMENT OF EARLY CASES OF RHEUMATOID ARTHRITIS

A REPORT BY THE JOINT COMMITTEE OF THE MEDICAL RESEARCH COUNCIL AND NUFFIELD FOUNDATION ON CLINICAL TRIALS OF CORTISONE, A.C.T.H., AND OTHER THERAPEUTIC MEASURES IN CHRONIC RHEUMATIC DISEASES

In 1951 the Medical Research Council and Nuffield Foundation Joint Committee on Clinical Trials of Cortisone, A.C.T.H., and Other Therapeutic Measures in Chronic Rheumatic Diseases decided that, for an effective assessment of the value of cortisone within its field of study, it was essential to carry out relatively small-scale but carefully controlled clinical trials. One of these trials, it was agreed, should deal with the important problem of the treatment of patients in the early stages of rheumatoid arthritis. The aim would be to measure the therapeutic effects of cortisone treatment upon the rheumatoid process while that process is still uncomplicated, either by severe anatomical changes in the joints or by metabolic or endocrine disturbances resulting from a prolonged and debilitating disease. In short, such a trial would have two objects: first, to compare the relative efficacy of cortisone and another drug usually regarded as efficacious in relieving symptoms and in improving the patient's functional capacity; and, secondly, to study the evolution of the rheumatoid process during prolonged therapy with these different agents. A scheme for this trial was drawn up by a subcommittee of the Joint Committee, and six centres in England and Scotland agreed to take part.*

Type of Patient

It was agreed that the patients to be included in the trial must (a) be within the ages of 2 to 59 years inclusive; (b) have a polyarthritis of rheumatoid type affecting at least four joints and bilateral involvement of either

*The members of the Joint Committee are: Sir Henry Cohen (chairman), Dr. E. G. L. Bywaters, Dr. W. S. C. Copeman, Sir Charles Dodds, Dr. J. J. R. Duthie, Professor A. Bradford Hill, Mr. H. Osmond-Clarke, Dr. F. T. G. Prunty, Dr. J. Reid, Dr. H. F. West, Professor J. H. Kellgren and Mr. W. A. Sanderson (joint secretaries).

The Subcommittee and participating centres were: Professor J. H. Kellgren (chairman), Rheumatism Research Centre, Manchester; Dr. E. G. L. Bywaters, Postgraduate Medical School of Chester; London and Canadian Red Cross Memorial Hospital, Taplow; Dr. W. S. C. Copeman, West London Hospital; Dr. J. J. R. Duthie, Northern General Hospital, Edinburgh; Dr. H. F. West, Sheffield Centre for the Investigation and Treatment of Rheumatic Diseases; Professor A. Bradford Hill; and Dr. F. T. G. Prunty.

The Subcommittee was assisted at these centres by the following workers, to whom it expresses its thanks: Dr. B. Ansell, Dr. C. K. Crawford, Dr. G. Fearnley, Dr. H. Lackner, Dr. I. Meanock, Dr. J. Redmill, Dr. O. A. Savage, Dr. J. Sharp, and Dr. M. Thompson.

The results of the trial were analysed by Dr. J. T. Boyd, of the Statistical Research Unit of the Medical Research Council, London School of Hygiene and Tropical Medicine, and the Subcommittee is greatly indebted to him for his work.

hands or feet, ankles, or wrists; and (c) have had the disease at their time of entry to the trial for not less than three months and not more than nine months. In deciding upon this duration it was required that the initial symptoms of the present illness, which had brought the patient to the centre, should be the first evidence of any rheumatoid disease in the patient—except that a previous episode of polyarthritis suggestive of rheumatoid disease would not exclude the patient from the trial provided that this episode had been of less than 12 months' duration, had left no residual signs, and had resolved completely at least one year before the onset of the present illness. A previous history of a painful incident of up to three weeks' duration would not be considered evidence of previous rheumatoid disease.

No other diagnostic criteria were considered necessary, but centres were asked to make every effort to exclude other diseases such as rheumatic fever, Reiter's disease, and neisserian infection. In addition the sheep-cell agglutination test first described by Rose *et al.* (1948) was performed in most of the patients, and usually on several occasions.

Allocation to Treatment

In a long-term trial of this nature it was obviously out of the question, on ethical grounds, to set up a control group on a dummy treatment. The contrast must lie between treatment by cortisone and another drug usually regarded as efficacious in the treatment of rheumatoid arthritis. The two modes of treatment adopted, and allocated at random, were therefore (1) cortisone and (2) aspirin, with both groups receiving the same basic regime of splints, physiotherapy, etc. No patient would, of course, be brought into the trial unless he or she could be regarded as a suitable case for treatment by either of these agents.

Because clinicians at the participating centres would have to select patients for admission to the trial it was necessary to ensure that they would not know whether each patient, in the event of being brought in, would be on cortisone or on aspirin. The procedure adopted was as follows. The clinician at the centre accepted a patient as suitable on the basis of the criteria laid down. Having done so he applied to a central office to know whether the treatment of that patient should be with cortisone or aspirin. At the central office a register had been constructed showing the order in which the

treatments were to be applied. It was held by one person. Such a random order of treatments was constructed separately for each of 48 small subgroups of patients—namely, according to whether they were (a) male or female, (b) aged 2–16 or 17–59 years, (c) had a duration of symptoms of three to five months or seven to nine months, and (d) were treated at one or other of the six centres. Within each of these small subgroups random sampling numbers were used to give approximately equal numbers of patients on cortisone and aspirin. In summation, therefore, the cortisone and aspirin groups would be very similar in these four characteristics—sex, age, duration of illness, and treatment centre.

In detail, the technique was that on admitting a patient a treatment centre would send particulars of the sex, age, and duration of illness to the holder of the register. The prepared list for a person of that sex, age, and duration would be consulted, the patient's name entered on the next available line, and the nature of the treatment already inscribed on that line would, with supplies of hormone or aspirin, be sent to the treatment centre.

Treatment

Each patient was admitted to hospital for a minimum period of four weeks, but subsequently could be treated and observed as an out-patient. It proved impossible to make up cortisone and aspirin suspensions to look alike. The aspirin was therefore given in brown tablets with a bitter flavour so that they would be unrecognizable by the patient as "merely aspirin." They were labelled "Tabs. Rheumatic C."* Cortisone acetate was given orally either in tablet form or as a suspension made up in syrup. It was labelled "Tabs. (or Mist.) Rheumatic A." Patients were asked not to take additional drugs or tablets. For the first year of treatment it was laid down that therapy would be given in twelve-weeks courses separated by one week off treatment. Each course would start with a standard dosage, after which the physician was free to adjust the dose to suit the requirements of individual patients. The specified courses for adult patients, given in divided doses not fewer than three times a day, were as follows:

		Cortisone	Aspirin
First week:	Day 1	300 mg.	6 g.
" "	" 2	200 "	6 "
" "	" 3 to day 7	100 " daily	6 " daily
Second week:	" 8	100 "	6 "
" "	" 9	50 "	2 "
Third to twelfth week:	" 15 " " 84	Individualized at 25 to 200 mg. daily with graded withdrawal in week 12	Individualized at 1 to 8 g. daily with graded withdrawal in week 12

In the "free" period—that is, the third to twelfth week—the physician was asked to employ the minimum dosage that would restore maximal functional efficiency without producing serious side-effects. In the thirteenth week no treatment by cortisone or aspirin was given, observations and measurements being made (in this week analgesics other than aspirin could, if necessary, be given). If symptoms recurred the twelve-weeks course was repeated, except that the selected dose for the individual patient replaced the standard dose of the second week.

Assessment of Patient

Clinical assessment of each patient (including measurement of the haemoglobin level and blood sedimentation rate) was required one week before and also immediately before the start of treatment. After therapy had begun, an assessment of some or all characteristics was called for at the end of the first, second, fourth, eighth, twelfth, and thirteenth weeks of the first course, and at the end of the

*The Committee is indebted to Mr. J. B. Lloyd, chief pharmacist at the Manchester Royal Infirmary, for the preparation of the tablets.

first, eighth, and thirteenth weeks of the second and subsequent courses.

The clinical assessment included (a) a defined judgment of the patient's general functional capacity (for the five grades laid down, see Table VII); (b) a judgment of the activity of the disease as inactive, slightly active, or very active; and (c) a statement whether the patient appeared to be in remission. In addition to these subjective assessments the clinician was required to measure the strength of grip for each hand. (The patient had to squeeze an oblong rubber bag 5 by 3 in. (12.5 by 7.5 cm.) inflated at a pressure of 10 mm. Hg, and the figure recorded was the average of three grips.) Two tests of dexterity were applied—namely, in patients with affected hands the time taken to tie six double knots with 12-in. (30-cm.) pieces of household string, and in patients with affected legs the time taken to go up and down ten steps. Estimates were also made of joint tenderness and of range of movement, and the number and site of any new joints involved were recorded as well as of previously affected joints which had recovered. Complications and side-effects were noted. The only obligatory laboratory tests were the blood sedimentation rate and the haemoglobin level.

The Analysis of the Data

In total, 62 adult patients (aged 17 to 59) and 14 children were admitted to the trial. The latter are too few to be informative, and the present report is confined to the adult group. One of these patients, allotted to the aspirin group, refused to co-operate, so that the numbers available are 30 on cortisone and 31 on aspirin. In 53 cases the results of a sheep-cell agglutination test are available. They are lacking for three patients on aspirin who were lost to the trial at an early stage (see below) and for five other patients who were followed up for the first year but never tested (three on aspirin and two on cortisone). The cases admitted at Edinburgh, Sheffield, and Manchester were tested by the method of Ball (1950), the test being regarded as positive if agglutination occurred in a titre of 1:4 or higher when read at one hour, or 1:32 or higher when read at 18 hours; a positive result was obtained on at least one occasion in 29 out of 40 patients (73%). The cases admitted at Ham-mersmith and West London were tested by the original method of Rose, in which the test is considered positive if the two titres recorded show a ratio of 1:16 or higher; in 9 out of 13 cases a positive result was obtained on at least one occasion (69%). In view of the close similarity of the results given by the two methods the data from the different centres may be added in comparing the two treatment groups. It is then found that 18 of the 28 patients on cortisone who were tested were positive at one time or another (64%), and 20 of the 25 patients on aspirin who were tested (80%). In other words, each treatment group had a high proportion of positive tests and there is no statistically significant difference between them.

Ball, whose method was principally used in this trial, has reported 50% of positive results in a large unselected series of out-patients diagnosed as suffering from rheumatoid arthritis; and in a carefully selected series of typical cases of varying duration admitted to the Manchester Royal Infirmary for special study 41 out of 61 (67%) gave a positive test (Ball, 1952). Scott (1952), using the Rose method, has reported positive results (a ratio of 1:16 or more) in 60% of an unselected series of 124 confirmed rheumatoid arthritis patients. The 38 positive results in 53 patients in the present trial (72%) compare very favourably with these various figures. They are good evidence of the accuracy of the diagnosis of rheumatoid arthritis in the patients admitted to the trial.

Details of the patients by centre, sex, age, and duration of symptoms are given in Table I. The data show how effective the method of allocation has been in equalizing the two treatment groups in these respects. Their initial equalities or inequalities in other characteristics will be seen

TABLE I.—Comparison of the Patients on Cortisone and Aspirin at Start of Treatment

Treatment Centre	No. of Patients on			Male		Female	
	Corti-sone	As-pirin		Corti-sone	As-pirin	Corti-sone	As-pirin
1	2	5	Age: 17-39 years	5	5	4	6
2	5	4	40-59 "	8	6	13	14
3	1	—	Total	13	11	17	20
4	8	8	Duration of symptoms: 3-5 months 7-9 "				
5	6	6		5	4	6	8
6	8	8		8	7	11	12
Total	30	31	Total	13	11	17	20

in each of the tables that follow, where these initial assessments are set alongside the subsequent observations.

It must be noted that during the first year of treatment and observation three patients, all on aspirin, were lost to sight. The reasons were as follows:

- (1) Male aged 48, West London Centre. After some preliminary improvement his condition deteriorated and he did not, after six months, feel that he was gaining any benefit from the tablets.
- (2) Female aged 53, Sheffield Centre. Relapsed on leaving hospital, had a psychological breakdown and declined to return (at week 12).
- (3) Female aged 60, Edinburgh Centre. Left the country for New Zealand (at week 30).

The first two must clearly be counted as failures of treatment and must be remembered in considering the results. The third patient was responding satisfactorily up to week 30, and subsequent information has confirmed that she continues to do well on aspirin. For the remaining 58 patients assessments were available towards the end of the first year. The centres, however, were not able invariably to fulfil the agreed schedule, and it was found that the number of patients off treatment in week 52, as required by it, was not sufficient to allow an effective analysis at that point (only about half had the off-treatment week at the end of the year). On the other hand, assessments were available for all 58 patients at some point close to the end of the year while they were still on their personal dosage. The week chosen for analysis, therefore, was, for each patient, that week of personal dosage which provided assessments and was nearest to week 52—with the proviso that it must lie at least four weeks before an off-treatment week—that is, before any "tapering off" of dosage would have begun. There were six patients (four on cortisone and two on aspirin) who at the end of the year had been off treatment for periods varying from 9 to 26 weeks. In these cases the personal dosage was taken to be nil and the week nearest to the end of the year was chosen for inclusion. The actual points taken lay between the 46th and 54th week in all but three cases (which were at the 42nd, 44th, and 45th week).

Results

(a) Joint Tenderness

The changes in joint tenderness are shown in Table II. In reaching the figures there set out an overall "tenderness" index was first computed separately for each patient by taking the average of his recorded joints. The mean of these averages gave, at each point of time, an index for the treatment group as a whole. It will be seen that the average position at the start of treatment is almost identical in both there is a significant and considerable reduction in pain in the first week of treatment, when the averages fall by 0.80 and 0.72 respectively. This fall continues, though

TABLE II.—The Average Changes Observed in the Joint Tenderness Index*

Joints Measured	Treatment Group	Average Joint Tenderness in Week 0	Average Changes in Joint Tenderness			Joint Tenderness at 1 Year	
			Week 0 to Week 1	Week 1 to Week 8	Week 8 to 1 Year	Average	As % of Average at Week 0
All relevant joints (including wrist and hand, given below)	Corti-sone	1.91	-0.80†	-0.29	-0.09	0.74	39
	Aspirin	1.89	-0.72	-0.21	-0.15	0.76	40
Wrist-joints	Corti-sone	1.80	-0.83	-0.10	+0.13	1.00	56
	Aspirin	1.93	-0.79	-0.21	+0.08	0.96	50
Small joints of hand	Corti-sone	2.25	-0.93	-0.50	-0.25	0.58	26
	Aspirin	2.05	-0.82	-0.24	-0.34	0.53	26

* Tenderness was graded on the scale 0 for no pain, 1 for slight pain, 2 for wincing, and 3 for wincing and withdrawal. The records have been used as an ordinary numerical scale.

† In this and subsequent tables, values in italics are statistically significant changes between specified times, and in the penultimate column between the beginning and end of the year ($P < 0.05$).

more slowly, up to week 8, and very slightly thereafter, between week 8 and the end of the year. As a result the final averages are still almost identical, though at a much lower level (0.74 cortisone and 0.76 aspirin); the percentage reduction over the year has been some 60% in each group.

In the second and third rows of Table II similar figures are given separately for the wrist-joints and the small joints of the hand. Though the changes are not statistically significant, it appears that with each of the treatments the average levels of pain tended to continue to decrease up to the end of the year in respect of the small joints of the hand, but to show some increases after week 8 in the wrist-joints. In both instances, however, the initial and final averages are closely similar for the cortisone- and aspirin-treated groups.

(b) Range of Movement and Strength of Grip

Table III gives the figures for range of movement in the wrists and strength of grip. In these respects the cortisone group reveals, by chance, some advantage before treatment was started—the average range of movement and average strength of grip were greater. (The difference in the average range of movement is statistically significant.) It is not possible, however, to detect any material difference between the two groups in their responses to treatment. There is, in each characteristic, a substantial improvement in the first week of treatment; week 1 to week 8 and

TABLE III.—The Average Changes in (a) Range of Wrist Movement and (b) Strength of Grip

Characteristic Measured	Treatment Group	Average Measurement in Week 0	Average Changes in Measurement			Measurement at 1 Year	
			Week 0 to Week 1	Week 1 to Week 8	Week 8 to 1 Year	Average	As % of Average at Week 0
Range of wrist movement (in degrees)	Corti-sone	99*	+13.9	+4.6	+1.1	120*	121
	Aspirin	78	+23.2	-1.8	+2.3	103	132
Strength of grip (in mm. Hg) left hand	Corti-sone	138	+33.3	+17.8	+12.2	202*	146
	Aspirin	111	+35.3	+8.5	+0.4	164	148
Strength of grip (in mm. Hg) right hand	Corti-sone	134	+46.7	+2.5	+3.7	187	140
	Aspirin	116	+34.5	+15.1	-7.1	166	143

* The mean of the cortisone group was significantly greater than the mean of the aspirin group.

week 8 to 1 year reveal, on the whole, some further increases, but the changes are much smaller and very variable. At the end of the year the average for the cortisone group, compared with the aspirin group, is significantly greater for the range of movement in the wrists but by no more than it was initially. In respect of strength of grip the averages for the cortisone group at the end of the year are also above those for the aspirin group, but once again by no more than they were initially. In other words, the mean percentage changes have been remarkably similar—an increase of 20-30% in range of wrist movement and of 40-50% in strength of grip.

(e) Tests of Dexterity

Table IV gives the results of the timing tests. The average starting-points of the two groups are reasonably alike, and the progression under treatment and the end-results are again very similar. Each treatment group shows an average improvement of some 20-25%.

TABLE IV.—The Average Changes in Time Taken to (a) Tie Six Knots and (b) Go Up and Down Ten Steps, by Patients With Affected Hands and Legs Respectively

Characteristic Measured	Treatment Group	Average Measurement in Week 0	Average Changes in Measurement			Measurement at 1 Year	
			Week 0 to Week 1	Week 1 to Week 8	Week 8 to 1 Year	Average	% Change
Time (in seconds) to tie 6 knots	Cortisone	38	-4.2	-0.2	-4.2	29	76
	Aspirin	41	-3.0	-3.9	-0.8	34	83
Time (in seconds) to go up and down 10 steps	Cortisone	14	-1.3	-2.6	+0.6	11	79
	Aspirin	18	-4.5	+0.8	-0.2	13	72

(d) Haemoglobin Level and Blood Sedimentation Rate

The changes in the level of haemoglobin and in the blood sedimentation rate are shown in Table V. In both these respects there is apparent some difference between the cortisone- and aspirin-treated groups. In haemoglobin level they start alike with mean values of 12.2 and 12.1 g.%. Under treatment the patients on cortisone show, on the average, an improvement, and at the end of the year the mean has reached 13.1 g.%. The corresponding changes under aspirin are erratic and statistically insignificant, with the final average of 11.3 g.%, rather below the initial level and significantly below the average for the cortisone group.

TABLE V.—The Average Changes in (a) Haemoglobin and (b) Blood Sedimentation Rate

Characteristic Measured	Treatment Group	Average Measurement in Week 0	Average Changes in Measurement			Measurement at 1 Year	
			Week 0 to Week 1	Week 1 to Week 8	Week 8 to 1 Year	Average	% Change
Haemoglobin (in g.%)	Cortisone	12.2	+0.2*	+0.6	+0.1*	13.1*	107
	Aspirin	12.1	-0.4	+0.4	+0.8	11.3	93
E.S.R. (mm./hr.)	Cortisone	42	-18.1*	-4.4	+5.5	27	64
	Aspirin	42	-1.4	+0.4	-6.1	35	83

* The averages shown by the cortisone and aspirin groups differ significantly.

The mean blood sedimentation rate at the start of treatment was identical—42 mm./hour in each group. In the first week of treatment there was a pronounced fall in the cortisone group and an insignificant fall in the aspirin group. Subsequent mean changes were slight, and at the

end of the year of observation the final averages of 27 mm./hour for patients on cortisone and 35 mm./hour for patients on aspirin do not differ appreciably, though still slightly favouring the former group. On the other hand, in each treatment group five patients had a value of 10 mm./hour or below at the end of the year.

(e) Clinical Assessments

At the end of the year two patients on cortisone and three on aspirin were reported to be in remission (though two of those on aspirin were still on maintenance doses of 4 g. and 1.7 g. respectively). There were a further

TABLE VI.—Clinical Assessments of Activity at One Year

Grade	Cortisone No.	Aspirin No.
Inactive	2	2
Slightly active	21	19
Very	7	7
Total	30	28

two patients on cortisone and a further one on aspirin who had not been on treatment for 10, 40, and 20 weeks respectively. Thus four patients in each group were regarded as either in remission or as not requiring treatment at that time. The overall assessments of condition and progress at the end of the first year are shown in Table VI, and reveal little difference between the two groups. If the two aspirin patients who progressed unfavourably and were lost to view are included as "very active" the picture would not be materially altered.

The assessments of functional capacity are given in Table VII, and once again the two treatment groups are more remarkable for their similarity than for their dissimilarity. At the start of treatment the majority of

TABLE VII.—Number of Patients with Given Functional Capacity at Different Points of Treatment*

Treatment Group	Time of Assessment	Functional Capacity			Total
		1 or 2	3	4 or 5	
Cortisone	Week 0	4	18	8	30
Aspirin	Week 0	5	18	6	29
Cortisone	" 8	18	11	1	30
Aspirin	" 8	15	11	3	29
Cortisone	" 13	10	16	4	30
Aspirin	" 13	10	13	5	28
Cortisone	1 year	23	5	2	30
Aspirin	1 year	21	5	0	26

* Functional capacity grades were:
Grade 1: Fully employed or employable in usual work and able to undertake normal physical recreation.
" 2: Doing light or part-time work and only limited physical recreation. For housewives, all except the heaviest housework.
" 3: Not employed and unemployable. No physical recreations. Housewives, only light housework and limited shopping.
" 4: Confined to house or wheel-chair, but able to look after themselves in essentials of life. Hospital patients confined to bed.
" 5: Completely bedridden.
† No record was made in this respect for two patients, and, as stated previously, three were subsequently lost to view.

patients were placed in grade 3—not employed and unemployable, no physical recreations. By the eighth week many had been moved to the higher grades—full or light work, etc. In the week off treatment, the thirteenth, a number returned to the lower grades, but by the close of the year about four-fifths of the patients were capable of either full (grade 1) or light work (grade 2). Division of these patients into grades 1 and 2 separately gives 13 and 10 patients on cortisone and 11 and 10 on aspirin, or approximately 40%, with full functional capacity in each treatment group. Only two patients, both on cortisone, were bedridden at the end of the year. The two missing aspirin cases may be set against these—that is, putting the most unfavourable complexion upon them.

(f) Side-effects

Side-effects were recorded for 19 patients in the cortisone group and 21 patients in the aspirin group. Most of these patients had more than one complication, the most frequent in the cortisone group being moon-face or rubicundity (11 patients), depression (5 patients), and euphoria (4 patients), and in the aspirin group tinnitus (11 patients), deafness (10 patients), nausea, dyspepsia, or anorexia (13 patients). There were no severe complications in the cortisone group necessitating discontinuance of treatment despite a final personal dosage at the end of the year of between 100 and 125 mg. a day in 11 of the 26 patients.

The numbers of patients showing side-effects in each consecutive three months of this first year's treatment were 14, 15, 11, and 12 in patients on cortisone, and 16, 10, 6, and 6 in patients on aspirin. In other words, the numbers with these minor complications were equal in the early months of treatment, but became less in the aspirin group as time passed.

Discussion

This trial, as emphasized in the early paragraphs of the report, was designed to answer a specific but very important question—namely, in early and uncomplicated cases of rheumatoid arthritis is it possible to maintain the patient's well-being more efficiently by treatment with cortisone than by treatment with aspirin? Simultaneously, if the trial can be continued into a second or third year, as is envisaged, light may be thrown upon the evolution of the rheumatoid process during prolonged therapy with these different agents. While scientifically it would obviously be of much value to be able to compare the changes in both these treated groups with those taking place in a group receiving neither cortisone nor aspirin, ethically such a course is impossible. One or other agent, it was held, must be administered—together with any other basic treatment that might be required (splints, physiotherapy, etc.).

It was, however, decided that treatment should be tapered off at the end of each three-months period and then withheld for one week to allow of assessment of the patient's condition. Analysis of the data thus provided at the end of the first course—that is, at the thirteenth week—revealed a distinct "relapse" in some of the patients, though an equal degree of "relapse" occurred on the two forms of treatment. For example, the average joint tenderness at the start of treatment was 1.91 in the cortisone group and 1.89 in the aspirin group (see Table II). By week 8 the average had declined by 1.09 in the cortisone group and by 0.93 in the aspirin group. In the week off treatment it increased again by 0.49 and 0.31 respectively, giving average levels in the thirteenth week of 1.32 on cortisone and 1.29 on aspirin.

Very similar reversals were seen in all the other characteristics measured or observed. In Table VII they have already been shown for the functional capacity. It is, however, apparent that the two treatment groups have, on the whole, kept remarkably in step. They closely parallel one another in their immediate and favourable reaction to the first week of treatment; in the continuation of that reaction, but at a much slower rate, up to the observations made at week 8; in their unfavourable response to the cessation of treatment in week 13; and, finally, in their position at the end of the first year of the trial.

The haemoglobin levels and blood sedimentation rates have responded rather more favourably to cortisone than to aspirin. In all other respects there has been little to choose between the two agents. On each form of treatment joint tenderness is substantially reduced, on each form the disease is judged at the end of one year to be inactive, or only slightly active, in three-quarters of the patients, on each form two-fifths of the patients were regarded at the end of one year as capable of normal work and activity. As usual with cortisone treatment, certain more intangible differences have been observed. Some patients appear to experience a

sense of well-being, and sometimes an almost excessive and inappropriate cheerfulness during therapy, followed by a swing to a mood of depression during the periods off treatment. On the other hand, the patients receiving aspirin tend to have changes in mood which are more in keeping with the increase and decrease in their symptoms. For practical purposes, however, there seems to have been surprisingly little to choose between cortisone and aspirin as adjuvants in the management of these 61 early cases of rheumatoid arthritis. The maintenance doses that were being employed at the end of the first year to produce these results are shown in Table VIII.

TABLE VIII.—Daily Maintenance Doses being Administered at the End of the First Year (Before any Tapering-off)

Cortisone (mg./day)	No. of Patients on Given Dose	Aspirin (g./day)	No. of Patients on Given Dose
125	2	6	8
100*	9	5	2
75†	7	4	13
62½	2	3	1
50	4	2	1
37½	1	1.7	1
25	1		
Total	26	Total	26
Nil (off treatment)	4	Nil (off treatment)	2
Mean value for those on treatment	80 mg.	Mean value for those on treatment	4.5 g.

* Including 1 at 105 mg. † Including 1 at 80 mg.

In the second year of the trial it is intended that treatment shall be continuous—unless the patient is in remission or is held to require no maintenance dose.

Summary

Sixty-one patients in the early stages of rheumatoid arthritis, and regarded as suitable for treatment with either cortisone or aspirin, have been allocated at random to treatment with one or other agent (cortisone 30 cases, aspirin 31 cases). Two comparable groups of these early cases were thus constructed and have now been treated and observed for one year. For most of the year treatment was "individualized" by the physician in charge of the patient at a level sufficient to restore maximal functional efficiency without producing serious side-effects.

Observations made one week, eight weeks, thirteen weeks, and approximately one year after the start of treatment reveal that the two groups have run a closely parallel course in nearly all the recorded characteristics—namely, joint tenderness, range of movement in the wrist, strength of grip, tests of dexterity of hand and foot, and clinical judgments of the activity of the disease and of the patient's functional capacity. The haemoglobin level and blood sedimentation rate were slightly more favourably influenced by cortisone, but in no other respect do the two groups differ materially.

On each form of treatment the disease was judged at the end of one year to be inactive, or only slightly active, in about three-quarters of the patients, and on each treatment some two-fifths of the patients were regarded as capable of normal work and activity. For practical purposes, therefore, there appears to have been surprisingly little to choose between cortisone and aspirin in the management of these 61 patients in the early stages of rheumatoid arthritis.

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THE ARTIFICIAL MENOPAUSE

WITH PARTICULAR REFERENCE TO THE
OCCURRENCE OF SPINAL POROSIS

BY

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Many states of ill-health have been attributed to the menopause, and it has been suggested that these manifest themselves more severely if the menopause is produced artificially. In addition to the disorders already recognized there has been added in recent years the occurrence of osteoporosis affecting mainly the spine and pelvis. Thus Albright and Reifenstein (1948) state that "a moderate degree of osteoporosis of the spine is almost physiological after the menopause: its degree increases as the time during which the post-menopausal state has existed increased." This statement implies that one should expect to encounter a larger number of cases of spinal porosis, possibly at an earlier age, in women who have been subjected to an artificial menopause.

It was with the idea of investigating this problem that the present inquiry was instituted, and an opportunity was taken to study other manifestations attributed to the menopause.

In discussing post-menopausal osteoporosis we are adhering to the definition of Albright and his associates presented in a series of recent publications. The term implies a condition in which there is no abnormality in either calcium or phosphorus metabolism, but in which there is a depression of osteoblastic activity, presumably due to hormone imbalance brought about by oestrogen lack; and the serum calcium, phosphorus, and alkaline phosphates are within normal limits, though there is a tendency for the serum phosphate to be slightly higher (Reifenstein, Kinsell, and Albright 1946).

Post-menopausal Osteoporosis: Clinical Investigation

Two groups of patients formed the basis of this investigation. The first group consisted of 94 women who had been subjected to an artificial menopause either by surgery or by radium at St. George's Hospital at least eighteen months prior to this study. For comparison a second group was studied; this consisted of 28 women who attended hospital because of backache and were found to have spinal porosis. All but two of these patients were seen at the Royal National Orthopaedic Hospital. Both groups were interviewed and clinically examined by one of us (J.R.N.). Particular attention was given to the following points: (1) radiological evidence of osteoporosis, (2) estimation of serum phosphate, (3) dietary history, (4) blood pressure, (5) changes in weight, (6) the incidence of hot flushes, and (7) changes in libido.

Radiological Evidence.—The radiological evidence of the early stages of osteoporosis of the spine is difficult of interpretation, and we were fortunate in having all the films assessed by the same radiologist. For convenience the abnormalities found have been divided into three grades: (1) A marked stencilling of the vertebral bodies with coarsening of bone trabeculation. (2) The above, together with swelling of the intervertebral disks, giving rise to biconcavity and the so-called codfish vertebrae. (3) The above with, in addition, crush fractures.

Group 1

In the first group of patients follow-up inquiries were sent to 150, but 56 could not be traced. Of the 94 patients who were interviewed and examined, 82 had had surgical removal of both ovaries and 12 had had the menopause induced by radium. The interval between operation and interview ranged from 18 months to 13 years. The age of the patients at the time of operation varied from 26 to 73 years, but the majority were in the fifth decade (56 patients) and the sixth decade (28 patients). Nineteen were spinsters, and of the remaining 75 who had been married 9 had never been pregnant.

Three of the 82 patients who had had surgical removal of the ovaries failed to have a radiological examination of the spine. Ten (12.6%) of the remaining 79 showed radiological evidence of osteoporosis. Only one of them complained of backache. Details of these 10 cases are:

Age at examination	49	51	55	56	58	59	61	69	69	76
Age at operation	43	48	42	50	55	56	58	67	65	73
Interval in years	6	3	13	6	3	3	3	2	4	3

Only 2 of the 12 patients who had been subjected to a radium menopause showed evidence of osteoporosis. They were aged 59 and 62 at the time of the examination, and 46 and 49 at operation, giving an interval of 13 years in both cases.

Thus of the 94 patients, 12 (12.7%) showed some radiological evidence of osteoporosis, and 3 of them were over 65 at the time of examination. Not one of these 12 patients showed a porosis which was of a greater severity than grade I, which can most certainly be regarded as physiological in the three patients over 65, and open to argument with regard to the remainder.

The average level of serum phosphate for the group which had undergone surgical menopause was 2.6 mg. per 100 ml. and for the 12 patients subjected to radium menopause it was 3 mg. per 100 ml. of serum.

All these patients were asked about their dietary habits, and no information was obtained indicating any marked deviation from normal.

In this series of patients the incidence of osteoporosis can be regarded as within the physiological range, and no significant abnormality in serum phosphate was observed.

Group 2

The second group, comprising 28 patients, all came to hospital with a specific complaint of pain in the back. Details are shown in Table I. The average age at examination

TABLE I.—Patients Treated for Post-menopausal Osteoporosis of Spine

Case No.	Duration of Backache	Age at Onset	Age at Exam.	Age at Menopause	Years Between Menopause and Exam.	Married or Single	Parity	Grade of Porosis
							C. Mla.	
1	6 months	43	43	41 (N)	2	M.	0 0	3
2	2 years	43	45	34 (A)	11	"	0 0	3
3	2 "	47	49	47 (N)	2	"	0 0	2
4	2 "	49	51	37 (N)	14	S.	1 0	2
5	2 "	49	51	46 (N)	5	"	0 0	3
6	2 "	51	53	40 (A)	13	M.	0 0	2
7	6 months	53	53	23 (A)	30	"	1 0	3
8	6 "	54	54	45 (A)	9	"	0 1	3
9	15 "	57	58	52 (N)	6	"	0 0	3
10	9 "	57	58	46 (N)	12	"	1 1	3
11	8 "	57	58	45 (N)	13	S.	0 0	2
12	6 "	60	60	43 (N)	17	"	0 0	3
13	6 "	62	62	30 (A)	32	"	0 0	3
14	9 "	61	62	52 (N)	10	M.	0 0	2
15	6 years	58	64	45 (N)	19	"	0 0	3
16	2 "	62	64	53 (N)	11	M.	10 0	3
17	2 "	63	65	45 (A)	20	"	3 0	3
18	7 months	64	65	41 (A)	24	S.	0 0	2
19	6 "	65	65	39 (N)	26	M.	0 0	2
20	3 years	63	66	45 (N)	21	"	3 0	3
21	1 year	69	70	50 (N)	20	"	1 0	3
22	14 months	69	70	38 (N)	32	"	3 0	2
23	4 years	66	70	52 (N)	18	"	3 0	3
24	1 year	70	71	50 (N)	21	"	0 0	2
25	1 "	71	72	30 (A)	42	"	0 0	3
26	3 years	69	72	31 (A)	41	"	3 1	3
27	2 "	70	72	45 (N)	27	"	1 0	3
28	2 months	73	73	50 (N)	23	"	0 0	3

N. = Natural. A. = Artificial. C. = Number of children. Mla. = Number of miscarriages.

tion and investigation of these patients was 61.6 years. Their individual ages ranged from 43 to 73. Nine patients were over 65, and 15 had had no pregnancies. Of these 28, 9 had been subjected to some form of pelvic surgery, with removal of either one or both ovaries. An accurate history of the surgical procedure was impossible to obtain in all cases.

Eighteen of these patients had grade 3 porosis and 10 had grade 2.

Of the 27 patients for whom serum phosphate figures were available the average was 3.6 mg. per 100 ml. This finding of an increase in the serum phosphate level is in agreement with the observations of Albright, Smith, and Richardson (1941).

The age of these women at the time of the menopause, whether artificial or natural, ranged from 23 to 53. The ages at the time of operation could be ascertained, but it must be understood that, particularly among the older women, the exact date of the menopause was difficult to obtain, but was probably accurate to within a year or two. The onset of symptoms after the menopause, whether artificial or natural, varied from 2 to 42 years. The average time of onset of symptoms in the 9 patients on whom an operation had been performed was 21.6 years from the time of operation. In the 19 patients on whom no operation was performed the average time of onset of symptoms from the date of their menopause was 15.2 years. We feel that this disparity is due to the small number of cases in this series.

Comment.—Albright, Smith, and Richardson (1941) gave clinical data about 42 patients with spinal osteoporosis, 40 women and 2 men. Because of the possibility of senescence being a factor no patient over the age of 65 was included. Of the 40 women in their series, 10 had been subjected to an artificial menopause. The average time of onset of symptoms in these 10 patients following the operation was 13.4 years, whilst in the remaining 27 (three women were excluded because of complicating thyrotoxicosis) the average time was 9½ years. The difference between these values was not regarded as being statistically significant.

Observations on Blood Pressure

A blood-pressure reading of over 150/90 was regarded as abnormal. In the first group of 94 patients 28 had a raised blood pressure; of these, 7 had a high blood pressure recorded prior to operation, and 20 (including 5 of the 7) gave a family history of severe cardiovascular disease in one or other parent. Thus 6 (6.3%) of the 94 patients had an unexplained rise of blood pressure, and the average age was 55.3 years.

Changes in Body Weight

In the first group of 94 patients, 54 stated that they had gained over 14 lb. (6.4 kg.) since the operation, 20 noted no change in weight, and 5 had lost weight. This confirms the impression that, following an artificial menopause, a gain in weight is to be expected, though it does not invariably occur. In 26.5% of patients the weight remained unchanged or decreased. Bland-Sutton and Giles (1926) were of the opinion that complete removal of both ovaries "may cause obesity in a woman who has a tendency to form fat." There was a correlation between marked increase in weight and severe hot flushes, and vice versa, in 70% of patients. Whether there is any significance in this observation is uncertain.

Incidence and Duration of Hot Flushes

These were studied in the first group of patients. In Table II this series is analysed according to age groups and method of induction of the menopause; the results of other observers are included for comparison. Approximately 75% of patients complained of hot flushes after removal of both ovaries; this agrees with the investigations of other

TABLE II.—Incidence and Duration of Hot Flushes. Present and Previously Reported Series

Information about Series Reported	Age Group at Menopause	No. of Patients	Total % Reporting Flushes	% of Severe Flushes	% Without Flushes	Average Duration
Present Series, Group 1:						
Removal of both ovaries	20-30	2	100	100	0	12 months
	30-40	8	74.4	62	25	6-12 months
	40-50	47	72.7	50	22.6	4-24 months
	50-60	25	32.0	24	52	6-24 months
Radium-induced menopause	40-50	9	66.6	55.5	33.3	Up to 24 months
	50-60	3	66.6	66.6	33.3	Up to 24 months
Natural and artificial menopause (Med. Women's Fed., 1933)	23-73	1,000	62.3	—	15.8	2-3 years up to 10 or 20
Natural menopause (McDowell and Paterson, 1940)	40-45	111	75	—	25	—
Removal of both ovaries (Bland-Sutton and Giles, 1926)	—	—	80	—	20	3-4 years up to 10 years
Tellinde and Darnier (1928) (Tellinde and Darnier quoted Cullen (1909), who gave same %)	—	—	74	—	26	—
Stacy (1930)	Under 36	51	78	—	22	—
Sessums and Murphy (1932)	36-44	36	80	73	20	7.2 months
Filler and Drezner (1944)	71% under 35	44	85	—	15	—
Richards (1951)	Under 45	42	98	—	—	—
Following radium menopause (McLaren, 1950)	—	—	50	—	—	Months or years

workers. The duration varied between 4 and 24 months. The younger the women were at the time of the menopause the greater was the increase in percentage. In the younger age groups the flushes were more severe, but the total duration tended to be shorter. It has been suggested that the flushes are worse after a radium-induced menopause; this contention is not supported by this small series, in which 66.6% developed this symptom. McLaren (1950) stated that 50% developed hot flushes. The incidence of hot flushes occurring in association with the natural menopause is obtained from two investigations into a larger series of women.

The Council of the Medical Women's Federation (1933) found that 62.3% of 1,000 women complained of hot flushes. The duration varied from 2 years up to 20 years. McDowell and Paterson (1940) found that 75% of 111 women between 40 and 45 complained of hot flushes.

It is interesting to note that about 20 to 25% of women do not complain of hot flushes after the artificial menopause. The reason for this, like the cause of the hot flush, has yet to be elucidated.

Changes in Libido

Alteration in libido following removal of the ovaries has long been studied. Battey (1876), writing about the "extirpation of the functionally active ovaries for the remedy of otherwise incurable diseases," was of the opinion that the aphrodisiac propensity was not annulled after the removal of the ovaries. Goodell (1879) was of the opinion that removal of the ovaries does not unsex a woman, and he quoted Koerberlé to the same effect.

Interrogation of the married patients in the first group showed that libido was decreased in 65%. These findings are further analysed in Table III with those of other workers for comparison.

A varying percentage of patients have decreased libido following removal of the ovaries; this is to be expected when the host of factors which influence libido are considered. Lewis and Jackson (1940) found that assessment was difficult because so many were frigid before operation.

The percentage tends to be higher in the younger age groups, though Filler and Drezner (1944), who studied 36 negroes in their series of 41 cases, did not confirm this, and

TABLE III.—Change in Libido Following Artificial Menopause

Series	Age Group	No. of Patients	Libido		
			De-creased (%)	Un-changed (%)	In-creased (%)
Present series, Group 1:					
Removal of both ovaries	20-30	1	100	—	—
	30-40	5	80	20	—
	40-50	32	62.5	34.3	3.1
	50-60	13	61.3	38.7	—
Radium-induced menopause	40-50	8	62.5	37.5	—
	50-60	1	—	100	—
Removal of both ovaries (Bland-Sutton and Giles, 1926)					
Telinde and Darner (1928)	—	—	32	68	—
	—	52	40.4	53	5
Lewis and Jackson (1940)	20-29	6	83.3	16.6	—
Filler and Drezner (1944)	36-55	25	50	—	—
	71%	41	7	88	5
Under 55					
Koppen (1948)	—	50	30	—	—
Huffman (1950)	26-40	68	10.2	89.7	—
Richards (1951)	Under 45	33	60	—	6

Huffman (1950), by careful supervision, reported only a small percentage with decreased libido.

In all series there is a significant percentage in which the libido is unchanged after artificial menopause; this stresses the fact that the ovary is not essential for sexual libido and demonstrates the importance of complex factors, including upbringing, education, and marital relationships. Bland-Sutton and Giles (1926) stated that "facts are accumulating which tend to show that the ovaries are not the seat of the sexual passion... the complete removal of both ovaries is followed in adult women by sterility and persistent amenorrhoea, and these are the only two constant effects attributed to it."

Novak (1948) stated: "In the human being the ovary has very little to do with libido, the sex sense... in the human female; the seat of libido is in the psyche with certain auxiliary erogenous zones such as the vagina, the clitoris, and the mammary gland. The ovaries in themselves are not essential at all to sex gratification."

These points have been further studied in pre- and post-operative discussions with patients not included in this series. Reassurance and correction of preconceived and erroneous beliefs has permitted return of libido, and it has been established beyond question that a full orgasm can subsequently be obtained. Adequate briefing should be considered as essential in the management of such patients.

Conclusions

There was no evidence that osteoporosis of significant degree was precipitated by an artificial menopause, or that, in patients with established osteoporosis, it occurred at an earlier age following an artificial menopause.

The occurrence of post-menopausal osteoporosis is unpredictable; the time of its onset or severity cannot be related to the age at which the menopause—natural or artificial—occurs, or to the number or frequency of pregnancies. The tendency for the serum phosphate level to be raised in patients with fully developed porosis is confirmed.

There was no evidence that hypertension was attributable to the artificial menopause. The hereditary factor was clearly demonstrated by the high proportion of those hypertensive patients who gave a family history of severe cardiovascular conditions in one or other parent.

An increase in weight occurs in most patients, but there was no increase or even a decrease in weight in 26.5%.

Hot flushes occurred in approximately 75% of patients. The duration varied between 4 and 24 months. The incidence is higher and the duration tends to be shorter in the younger age groups. There was no significant difference between patients who had had a surgical menopause and those with a radium menopause. The incidence and duration are similar to those following the natural menopause in comparable age groups.

After an artificial menopause libido was decreased in approximately 65% of patients. The fact that the ovary is not essential for the maintenance of the libido is shown by the percentage of patients who were unaffected.

This investigation emphasizes that the only two constant effects of removal of the ovaries are amenorrhoea and sterility.

Summary

The occurrence of post-menopausal osteoporosis is discussed. The incidence of osteoporosis in 94 patients following artificial menopause is analysed. A group of 28 patients with definite osteoporosis is investigated in relation to the lapse of time after a natural or artificial menopause.

The serum phosphate levels in both groups of patients are given.

The incidence of unexplained raised blood pressure after an artificial menopause is recorded and discussed. The change in weight following artificial menopause is recorded.

The incidence and duration of hot flushes in 94 patients who had an artificial menopause are detailed.

The change in libido in patients after induced menopause is discussed.

We are grateful to the gynaecological staff at St. George's Hospital for allowing us to use their material and to Dr. E. H. Allen for his kindness in assessing the radiological evidence.

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Turning down the \$10,300,000 recommended by its committee on programme and budget, the Seventh World Health Assembly adopted a regular budget of \$9,500,000 for 1955, an increase of \$1,000,000 over last year's. This decision was taken by a vote of 28 to 24, with 7 abstentions. The United States proposal for an even smaller budget of \$8,607,000 was rejected by 35 votes to 21, with 6 abstentions. The Indian proposal for a budget of \$9,900,000 did not come to a vote, and the ceiling of \$9,500,000 adopted by the Health Assembly came from a proposal of the United Kingdom. By unanimous vote the Federation of Rhodesia and Nyasaland, established eight months ago, was admitted to Associate Membership in the World Health Organization. Other W.H.O. Associate Members are Tunisia and Morocco. The Assembly has also recommended that the next Assembly consider methods of assessing only active members for the regular effective budget, and invited those States which have not been actively participating in the work of the organization to resume participation at the earliest date.

VARICOCELE IN GROUPS OF FERTILE AND SUBFERTILE MALES*

BY

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In the course of a study entailing physical examination and semen analyses in groups of fertile and subfertile men I have noted a higher incidence of varicocele in men with poor quality semen. Varicocele is a relatively common condition mainly affecting young men (Skinner, 1941; Turner, 1943; Boyd, 1947; Aird, 1949), and Bailey and Love (1941) quote an incidence of 5 to 10% in men between the ages of puberty and 35. Marriage and the passage of years usually bring about a diminution in the size of the varicocele (Skinner, 1941; Turner, 1943; Aird, 1949), so that the incidence is likely to decrease as age increases.

In this country the traditional attitude adopted by surgeons to varicocele is given by Professor Charles Wells (1948): "In civilian practice very little importance is attached to this condition. On the assumption that the condition is little more than an exaggeration of the normal with an added neurosis, reassurance and local support with a suspensory bandage may safely be advocated as the treatment in most cases."

Wells (1953, personal communication) has emphasized the very real danger of damage to the testis caused by active surgical treatment. Douglas (1921) and Campbell (1928) have also drawn attention to the inadvisability of operative treatment. Douglas followed up 106 cases of varicocele treated by operation and found that 41 of the men had hydrocele and 4 had atrophy of the testis. Haemorrhage, hydrocele, infection, epididymitis, and loss of a functioning testis by atrophy are possible complications of operative treatment (Douglas, 1921).

The investigation reported in this paper was begun in the Gynaecological Department of the Aberdeen Royal Infirmary in 1947 and continued in the Department of Obstetrics and Gynaecology in the University of Durham. The diagnosis of varicocele is a matter of opinion, but in this investigation there was one observer, and the criteria for diagnosis remained constant. Only in those cases in which there was palpable and visible enlargement of the pampiniform plexus was a diagnosis of varicocele made.

Clinical Material

The incidence of varicocele in the following groups is reported.

Group I.—This comprised 52 men of high fertility. All had had five or more children and their semen was of excellent quality. The spermatozoon counts ranged from 64,000,000 to 250,000,000 per ml. In each case the man's wife had been delivered recently either in the Aberdeen Maternity Hospital or in the Princess Mary Maternity Hospital, Newcastle-upon-Tyne.

Group II.—This consisted of 48 men who had had two, three, or four children. Their spermatozoon counts ranged from 37,000,000 to 250,000,000 per ml. Their wives had been delivered recently either in the Aberdeen Maternity Hospital or in the Princess Mary Maternity Hospital.

*Based on a paper delivered to the Society for the Study of Fertility, Liverpool, June, 1953.

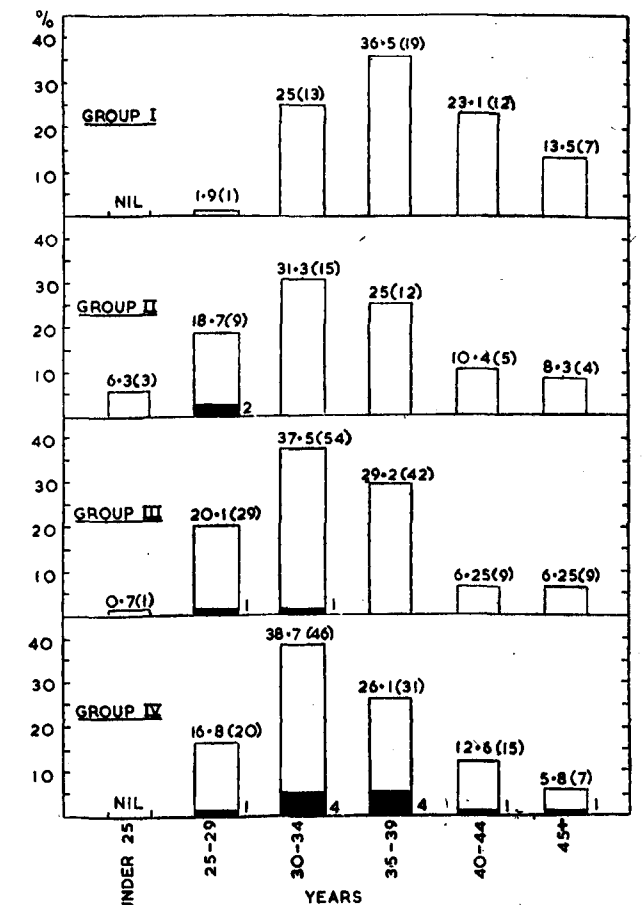
Group III.—This comprised 144 men examined at subfertility clinics in Aberdeen or Newcastle-upon-Tyne. Their wives had had no children, but these men were found to have good quality semen. In each case the count was above 75,000,000 per ml.

Group IV.—This consisted of 119 men examined at subfertility clinics in Aberdeen or Newcastle-upon-Tyne. Their wives had had no children, and in each case the spermatozoon count was below 50,000,000 per ml.

For the purpose of this paper spermatozoon density has been used as the criterion of semen quality. It is generally agreed that as the spermatozoon count per ml. falls other defects in semen quality increase (Hammen, 1944; MacLeod and Hotchkiss, 1946; Simmons, 1947; Tyler, 1951).

A standard method of collecting semen specimens was employed throughout the study. In each case a period of abstinence of at least four days was stipulated, and ejaculation took place into a clean glass jar. The specimens were analysed within three hours of production. One sample was examined from each of the fertile men in Groups I and II and from the 144 men attending the subfertility clinics who were found to have spermatozoon counts above 75,000,000 per ml.

Most of the men in Group IV had at least two analyses made, and in some of them had repeated analyses over periods of several months. The average figure has been calculated for each man in this group.



Percentage of patients in the groups studied. The actual number of patients in the various groups is given in parentheses and the shaded areas at the bottom of certain columns, with figures alongside, show the actual number of cases of varicocele and how they were distributed throughout the groups.

Results

Fertile Men

Group I.—No case of varicocele was discovered in these highly fertile men.

Group II.—There were two cases of varicocele in this group. The first was in a man aged 27 who had been

married three years and had had two children. No abnormality was detected in the testes, and the spermatozoon count was 129,000,000 per ml. The other case was that of a man aged 29 who had been married four years and had had two children. The testes appeared normal and the spermatozoon count was 68,000,000 per ml.

Men Examined at Subfertility Clinics

Group III.—Among these men with good quality semen two were found to have varicocele (1.4%). One was a man aged 32 who had been married two and a half years and whose wife had failed to conceive. The testes were normal in size and consistence, and the spermatozoon count was 78,000,000 per ml. The other was a man aged 27 who had been married three years and whose wife had failed to conceive. The testes were normal in size and consistence, and the spermatozoon count was 94,000,000 per ml.

Group IV.—Among these 119 men with poor quality semen 11 were found to have varicocele (9.2%). Details are given in the Table.

11 Cases of Varicocele Among 119 Men with Poor Quality Semen

Case	Age	Occupation	No. of Years Married	Site of Varicocele	Testes	Average Spermatozoon Count per ml.
1	28	Barman	5	Left	Normal	15,000,000
2	31	Electrician	5	"	"	43,000,000
3	32	Bus driver	6	"	"	33,000,000
4	34	Schoolmaster	10	"	Both small	10,300,000
5	34	Bus driver	8	"	Normal	38,000,000
6	35	Motor mechanic	9	"	"	13,500,000
7	36	Baker	12	"	"	9,000,000
8	36	Fisherman	11	"	"	35,000,000
9	37	Cobbler	6	"	Left small and soft	16,000,000
10	40	Schoolmaster	5	"	Left soft	10,000,000
11	45	Commercial traveller	2	"	Normal	17,000,000

Discussion

Hotchkiss (1945), a leading authority on male fertility, points out that there is no agreement on the exact relationship which varicocele bears to infertility.

A number of authors record the finding of cases of varicocele among men examined at subfertility clinics, but details of age, duration of marriage, etc., are not given. Hammen (1944), for example, reports the finding of varicocele, in varying degrees, in 11.9% of 291 patients referred to his subfertility clinic in the Kommune Hospital, Copenhagen—not all of these 291 patients were subfertile. He found that 92% of the patients with varicocele had spermatozoon counts below 60,000,000 per ml. Tyler (1951) found a "significant" degree of varicocele in 6 out of 82 men with spermatozoon counts between 20,000,000 and 59,000,000 per ml.—an incidence of 7.3%; among 53 men with counts above 60,000,000 per ml. the incidence was 3.8%. Jeffcoate (1946) found the condition present in nine men whose wives had been referred to him on account of childlessness. Seven of these men had poor quality semen.

On the other hand, Michelson and Michelson (1947) examined 519 men with poor quality semen and discussed the aetiological factors which were found, but the occurrence of varicocele in these men is not mentioned.

A number of interesting features are shown in the results of the present study. In men with poor quality semen (Group IV) the incidence of varicocele was found to be 9.2%, as compared with 2% among fertile men (Groups I and II) and 1.4% among men who, although their wives had failed to conceive, were found to have good quality semen (Group III).

It was stated above that the condition tends to affect young men, and it was therefore important to analyse the groups by age—the results are shown in the Chart. The highly fertile men in Group I were on the average a few

years older than the men in the other groups—73% were 35 or over. There was, however, little difference in age between the men in Groups II, III, and IV, the number of men of 35 and over being 44%, 42%, and 45% respectively. There is therefore the possibility that the greater average age of the highly fertile men in Group I may have been in part responsible for the absence of varicocele in these men. On the other hand, the men in Groups II, III, and IV are comparable so far as age is concerned, yet varicocele occurred almost seven times more frequently in the men with poor quality semen (Group IV). Although the number of cases of varicocele is small there is a significant increase in incidence in the subfertile group of men—the probability is less than 0.01.

One further point in regard to age is of some interest. Varicocele was found four times in men with good quality semen (Groups I, II, and III)—all were young men, the oldest being 32. Of the 11 men with poor quality semen who were found to have varicocele (Group IV) only one was under 30 and six were 35 or older (see Table). This suggests that a varicocele which persists beyond the age of 30 years is more liable to be associated with subfertility, and, conversely, one which disappears before the age of 30 is not likely to interfere with fertility. This is only a suggestion and may not be true, as it is equally possible that a number of cases of unexplained atrophy and softening of the testes among subfertile men may in fact be legacies from varicoceles which have regressed.

Although it is beyond the scope of this paper to discuss the aetiology of varicocele, I could find no evidence to support the view that late marriage is an important cause of the condition. The Table shows the age of marriage of the 11 men with varicocele in Group IV: most of them had married at an early age and had been married for several years.

The Table also shows the predilection of varicocele for the left side; this tendency is widely recognized and has been reported in the literature by many workers. Softening and even atrophy of the left testis is not unusual, and was noted in 3 of the 11 cases of varicocele occurring in the subfertile men. Hammen (1944) found diminution in size or consistency of the testis on the same side in 35.3% of his patients with varicocele. It is difficult to explain why a lesion which is generally one-sided should affect spermatogenesis in the other testis. A possible explanation is a slight but prolonged alteration in temperature within the scrotum, affecting both testes.

Summary and Conclusions

This study points to an important association between varicocele and subfertility, for the incidence of the condition is much higher in men with poor quality semen. The more frequent occurrence in subfertile than in fertile men cannot be explained entirely by their being in different age groups.

There is evidence to support the view that a varicocele persisting beyond the age of 30 is particularly apt to be associated with poor quality semen, but this study gives no information of the proportion of varicoceles that do continue beyond the age of 30.

The purpose of this paper is not to plead for more active treatment (indeed, attention has been drawn to the dangers of active surgical treatment), but rather to challenge the traditional attitude that varicocele is an innocuous condition and to stress the need for more extensive investigation into the natural history of varicocele and the effect which it may have upon fertility.

I am most grateful to Professor Harvey Evers and Mr. Frank Stabler for their encouragement and helpful criticism. The statistical significance of the increased incidence of varicocele in the subfertile men was confirmed by Mr. Hubert Campbell, statistical assistant in industrial health, University of Durham.

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THE AURICULO-TEMPORAL SYNDROME

BY

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In 1897 Parkes Weber demonstrated the strange case of a youth who, following a suppurating lesion in the region of his left parotid gland, sweated on that side of his face when he ate food. Accompanying this there was a flushing on the same side of his face. Because the area involved corresponds to the cutaneous distribution of the auriculo-temporal nerve this condition became known as the auriculo-temporal syndrome. Lucie Frey described it again in 1923, and because of her work on the subject it is also known as Frey's syndrome.

The auriculo-temporal syndrome consists of redness and sweating over the temporal and pre-auricular areas evoked by eating. It is a sequel of penetrating wounds, surgical incisions, or suppuration in the region of the parotid gland. The redness and sweating are not synchronous in appearance, the vasodilatation occurring first. Nor are they continuous in distribution. There may be pain during eating, and sensory changes in the form of diminished or increased sensation in the same area are commonly present.

Case Report

A woman of 36 had the superficial part of her right parotid gland and adjacent fibrous tissue excised for chronic parotitis. From 2 years of age she had suffered from repeated attacks of painful inflammation, and periglandular fibrosis had produced a partial false ankylosis of the right temporo-mandibular joint. The operation prevented further attacks of parotitis and she was enabled to open her mouth enough to take food normally. Six months later it was noticed that during a meal sweat appeared on the side of her face and trickled down her cheek.

Examination

On examination a 4-in. (10-cm.) scar was seen running parallel to, behind, and below the right ramus, angle, and body of the mandible. Skin sensation was normal. The parotid gland was palpable, and the orifice of Stensen's duct appeared normal, and saliva issued from it. When the patient was given a caramel to eat the skin on the affected side of the face became red. The hyperaemia extended over the forehead, temple, cheek, and ear. Within

a minute, pinpoint spots of sweat appeared over a less extensive area (see Fig.). Within five minutes the sweat had accumulated into drops large enough to run down the cheek. When she stopped eating the sweating ceased, the hyperaemia faded, and the skin returned to normal.

Anatomy and Aetiology

It is necessary to consider the anatomy, so far as it is known, in order to appreciate the theories that have been produced to explain the mechanism. Secretory parasympathetic fibres from the glossopharyngeal nerve pass to the auriculo-temporal nerve, providing the parotid gland with secretory motor fibres. The sweat glands of the face are innervated by the sympathetic outflow, the post-ganglionic fibres of which are believed by Wilson (1936) to be distributed with the peripheral branches of the trigeminal nerve. Sweating of the face in response to heat is mediated by sympathetic pathways, for destruction of the cervical sympathetic chain reduces heat sweating (Guttmann, 1940). List and Peet (1938) suggest that there is parasympathetic innervation of sweat glands of the face. Wilson (1936) concluded that such fibres join the trigeminal nerve at some point distal to the sensory root. There is no evidence to suggest that they play any part in sweating under normal physiological conditions.

The auriculo-temporal syndrome occurs most often as a sequel of suppurative parotitis, which is so severe as either to rupture spontaneously or to require surgical incision and drainage (Parkes Weber, 1897; List and Peet, 1938; Freedberg *et al.*, 1948; Pfeffer and Gellis, 1951). Triumhoff (1926) reported 14 cases having an antecedent history of suppurative parotitis and mainly secondary to typhoid or typhus fevers. Frey's case followed a gunshot wound which caused a secondary parotitis. Cases have been reported following excision of parotid tumours, and it has been described following mumps and in cases of syringomyelia (Kaminsky, 1929; Wilson 1936).

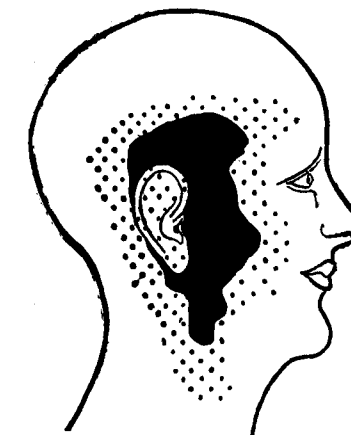
Mechanism

The hyperaemia and sweating are a reflex response, the afferent component of which is stimulated by taste. It appears that the disorder lies in the efferent arc which involves nerve fibres in the region of the auriculo-temporal nerve.

It has been suggested that scar tissue involves and anchors autonomic fibres which are subjected to pressure when the parotid gland distends, as it does when food is tasted.

Those cases in which the syndrome occurs promptly after a salivary fistula closes support this theory. Needles (1936) reported a case of temporary parotid fistula complicating the excision of a parotid tumour. The appearance of the auriculo-temporal syndrome coincided with the closure of the fistula. Needles referred to a case of bilateral parotitis. One side had a fistula and the other none. The auriculo-temporal syndrome occurred only on the side where there was no fistula. However, the phenomenon may occur when the parotid is either atrophied or functionless, and is not produced when pressure is exerted in the region of the scar.

Frey considered that the reflex was essentially a normal one, but that it had been accentuated through injury to the



The black area represents the region of sweating. The stippled area represents the region of hyperaemia.

auriculo-temporal nerve with subsequent irritation of vasodilator fibres in the cicatrix of the sclerotic parotid gland. In that way she incriminated scar tissue.

Another hypothesis is that it is due to faulty regeneration of parotid secretory fibres (Thomas, 1927; Ford and Woodhall, 1938).

Since one cholinergic fibre can replace another (Dale, 1935), a fibre originally destined for salivary glands may communicate with a sympathetic fibre passing to the skin. In that way a stimulus which would normally produce salivation evokes sweating. The frequently associated evidence of nerve injury supports this view. This includes abnormalities of skin sensation, decreased sweating in response to heat, pain, and facial palsy which is either transient or permanent.

The time interval that occurs between the injury and the appearance of the syndrome also supports this hypothesis. Time must be allowed for Wallerian degeneration and subsequent regeneration to take place. This theory fails to explain those cases in which the latent period is only of a few days' duration. Furthermore, one would expect the sudomotor fibres of the auriculo-temporal nerve, coming from the cervical sympathetic, to produce vasoconstriction and pallor and not the reverse when they are stimulated.

Freedberg *et al.* (1948) offer the explanation that the auriculo-temporal syndrome represents a response of denervated and hypersensitive sweat glands to previously unapparent cranial sudomotor impulses.

Hypersensitivity of afferent structures following denervation is an accepted physiological finding in both cholinergic and adrenergic nerves. It is a logical expectation that hypersensitivity of the sweat glands of the face may follow division of sympathetic fibres in the auriculo-temporal nerve. Freedberg *et al.* (1948) and Langenskiöld (1946) demonstrated this sensitivity.

Haxton's (1948) observation that sympathetic block in the upper thorax stops the response suggests that acetylcholine comes from intact nerve endings.

From the above findings it becomes apparent that the mechanism of the auriculo-temporal syndrome is not fully explained.

Allied Conditions

There are other conditions which at least superficially resemble the auriculo-temporal syndrome. The slight symmetrical sweating that occurs on the faces of normal individuals when they eat spicy food is accepted as a normal reflex. Sometimes this reflex is exaggerated and the sweating excessive. Its relation to the auriculo-temporal gustatory sweating is hypothetical but suggestive. Pfeffer and Gellis (1951) refer to Mellenkoff's case of an infant with a transient phase of sweating from a small area in the region of one tibial tubercle when milk was taken.

The syndrome of "crocodile tears," which consists of lacrimation occurring as a reflex response to eating, resembles the auriculo-temporal syndrome. It follows facial palsy, usually with the site of lesion in the region of the geniculate ganglion. Another condition which resembles the auriculo-temporal syndrome was reported by Uprus *et al.* (1934). Their patient had previously had cervical glands excised. Gustatory sweating subsequently developed in the submandibular region on the same side as the operation.

Prognosis and Treatment

The hyperaemia and sweating may continue for the remainder of the patient's life, but a diminution of symptoms sometimes occurs (Payne, 1940).

Since the auriculo-temporal syndrome is benign and non-progressive the patient can be reassured. If the discomfort warrants treatment the auriculo-temporal nerve may be divided surgically, but there are few records of this being done. Alcohol injection of the nerve is to be avoided because of possible injury to the facial nerve, and the value of radiotherapy is doubtful.

Summary

A case of the auriculo-temporal syndrome is reported. The anatomy is considered. Aetiology is discussed. Theories of explanation are reviewed. Reference is made to allied conditions. Prognosis and treatment are described.

I wish to thank Mr. J. A. Martinez for his permission to report this case.

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RADIO-IODINE MEASUREMENTS OF THYROID FUNCTION DURING AND AFTER P.A.S. TREATMENT OF TUBERCULOSIS

BY

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Over the past three years there have been reported nine cases of hypothyroidism with goitre occurring during para-amino salicylic acid (P.A.S.) treatment (Bergqvist and Maré, 1951, 1952; Clausen and Kjerulf-Jensen, 1951; Komrower, 1951; Librach, 1952; Davies and Galbraith, 1953). As many thousands of patients have received this treatment this seems a small incidence which may have depended on some special susceptibility in these few patients. Others have reported simple enlargement of the thyroid gland without signs of disordered thyroid function during P.A.S. treatment—that is, lesser antithyroid effects (Bergqvist and Maré, 1951, 1952; Hamilton, 1953); indeed, in some of the cases reported as goitre with myxoedema the evidence of thyroid deficiency has been slight. Because of these reports we have endeavoured to assess whether doses of P.A.S. commonly used clinically entail much risk to thyroid function. Radio-iodine tests of thyroid uptake have therefore been carried out on an un-

selected* series of 30 patients at the conclusion of their period of P.A.S. treatment; one test being given just before and the other four to seven days after the drug was stopped. The difference between the pair of tests should indicate whether this P.A.S. dosage had influenced thyroid uptake of iodide; and an excessive thyroid uptake should be seen on the second test when any hyperplasia and iodine deficiency had been induced by the period of P.A.S. administration. In addition, by an *in vitro* test, one of us (M.H.) has compared the antithyroid potency of P.A.S. with that of 2-thiouracil.

Like other amino-benzene compounds (Astwood *et al.*, 1945), P.A.S. might be expected to be an antithyroid drug interfering with the normal iodination of the thyroid hormone, provided that P.A.S. entered the thyroid gland. This action is indicated by our *in vitro* test results and animal experiments (Kjerulf-Jensen and Wolffbrandt, 1951), but its potency in the dosage used clinically cannot be predicted from its formula nor from the *in vitro* measurements, which take no account of its entry into the thyroid gland. Horn and Bogsch (1950) observed a retardation of radio-iodine uptake during P.A.S. administration in one patient, and Hanngren (1952) found an inhibition of radio-iodine uptake for four hours after an intravenous dose of 10.5 g. of P.A.S. in another patient. Davies and Galbraith (1953) found an increased uptake of iodine in their patient after withdrawal of P.A.S., suggesting that some hyperplasia had been introduced. Hamilton (1953) noted that a goitre which developed during P.A.S. treatment decreased with thyroid administration, suggesting that its development had depended on the drug's antithyroid action. Sutherland (1953), in the United States of America, registered maximum retardation of radio-iodine uptake after four to six weeks of P.A.S. therapy. He also states that iodine uptake returns to normal one to two weeks after cessation of treatment. No cases of goitre were reported in this series, but it is not stated whether any patient was tested after prolonged P.A.S. administration.

Method

Unselected patients available for assessment at the conclusion of their period of treatment were each given two tests—one just before and the other at four to seven days after stopping the drug. Most patients had had approximately three months' continuous chemotherapy, and some had had the drug for a longer period; the dosage of P.A.S. had mostly been 20 g. daily, but other drugs had also been given to most of the patients. Details of the dosage of P.A.S. and associated drugs are given in Table IV. The test used was the urinary excretion of radio-iodine as described by Fraser *et al.* (1953); following the radio-iodine dose the urinary excretion was measured in three periods, 0-8, 8-24, and 24-48 hours after the dose. The excretion in 8-24 hours offers an inverse index of thyroid uptake. Since the P.A.S. level might have fluctuated during the period of the first test, the 0-48 hour excretion has also been used to provide a similar index—its modifiability by abnormal renal function should not matter with these patients, and its reflection of thyroid uptake would not be invalidated by any fluctuation in P.A.S. level during the first test.

The *in vitro* method used to assess antithyroid potency was that described by Pitney and Fraser in 1953. It measures the inhibition of the peroxide-iodination of protein by various concentrations of a drug, in a test in which

*After the first cases were tested special search was made for patients given the drug for long periods; the cases were otherwise unselected.

the peroxide is provided by added milk enzyme powder and substrate. The antithyroid action of the drug is measured by the extent to which various concentrations of the drug inhibit the iodination of protein, and the data thus obtained have been referred to those obtained with 2-thiouracil for comparison.

Results

The results of the radio-iodine tests on the patients are summarized in Table I, and given in fuller detail in Table IV. The tests on the patients during P.A.S. administration are not clearly abnormal, but show more excretion of radio-iodine than do those after its withdrawal (Table I). The

TABLE I.—Radio-iodine Test Results on Patients During and After Stopping P.A.S.

Group	No. of Patients	Urinary Excretion of ¹³¹ I (As Percentage of Administered Dose)			
		In 8-24 Hours		In 0-48 Hours	
		Mean ± S.E.	S.D. (Range)	Mean ± S.E.	S.D. (Range)
(a) Normals	32	13.6 ± 0.65	3.7 (7-20)	55.8 ± 1.54	8.7 (35-70)
(b) Tuberculous patients: While on P.A.S. for 3 months or more	30	19.9 ± 1.95	10.7 (2.5-42.5)	55.3 ± 2.96	16.2 (22.1-91.8)
(c) 4-7 days after stopping P.A.S.	30	8.8 ± 0.93	5.1 (0.9-20.2)	33.2 ± 1.88	10.3 (14.9-57.6)
Difference (b)-(c)		11.1 ± 2.16		22.1 ± 3.41	
(a)-(c)		4.8 ± 1.14		22.6 ± 2.43	

The tests after cessation of the P.A.S. show more thyroid uptake than those during the drug administration and also than those of the normal patients—the excretions in either period are significantly higher.

8-24 hour excretion is high, but the 0-48 hour excretion is normal; clearly this dosage of P.A.S. had some antithyroid effect. Evidently the thyroid uptake of radio-iodine during P.A.S. administration is slowed but ultimately occurs to an approximately normal extent. Probably the slight compensatory thyroid hyperplasia induced over the previous months of P.A.S. administration is usually nearly enough to balance the weak antithyroid effect produced by the usual dosage of P.A.S.

As a group the tests on the patients after withdrawal of P.A.S. show less radio-iodine excretion in both periods than those of a normal group (Table I)—that is, there is a tendency to increased thyroid uptake of iodide after P.A.S. withdrawal, indicating some depletion of the thyroid hormone store during the previous drug therapy. These tests after withdrawal tend to show more abnormality when P.A.S. treatment has been more prolonged, particularly when it has exceeded six months (Table II). The increase of thyroid uptake is, however, usually slight, for, while the mean excretions for the groups are abnormal, few individual excretions are beyond the normal range, except when the drug has been given for over six months. Apparently slight compensatory thyroid hyperplasia had occurred during the previous months of P.A.S. administration, and usually it is only after more than six months of drug administration that much exhaustion of the thyroid hormone store is discernible. Probably the patients varied in their susceptibility to the drug, for among those given it for less than six months are several with one or both tests normal; and the differences between individual results (see Table IV) are greater than those between groupings according to the total duration of P.A.S. therapy.

Of the 11 patients given P.A.S. for over six months, 10 were found to have an obviously avid uptake of radio-iodine on P.A.S. withdrawal (Table II), and four were noted to have developed a small goitre of 40-50 g., first noticed 6½ months (Cases 29 and 30) and 8 months (Cases 27 and 28) after starting the drug. None showed any myxoedematous features. After the tests reported above, the first two patients (Cases 29 and 30) were given potassium iodide, 10 mg. daily for one week, and when seen one month later, while still off P.A.S., the radio-iodine uptake

TABLE II.—Radio-iodine Tests After Withdrawal of P.A.S.

Duration of P.A.S. Therapy (at 20 g./Day)	No.	Mean Urinary Excretion of I^{131} as % of Dose	
		In 8-24 Hours	In 0-48 Hours
Under 3 months*	8	10.7	39.2
3 months	8	11.5	37.1
3-4 "	3	10.2	33.4
6-10 "	11	4.3	26.0
(Normal group)	(32)	(13.6)	(55.8)

* Includes two cases receiving 10 g. P.A.S. daily for three months.

† On P.A.S. 20 g. daily for three months, then 15 g. daily.

had become normal, and the thyroid enlargement had subsided. Neither had previously noted a goitre; the third and fourth patients were not retested after iodide, but one had a family history of goitre and may have had some goitre before his treatment.

TABLE III.—In vitro Measurement of the Antithyroid Potency of P.A.S. and Isoniazid Compared with that of 2-Thiouracil

Drug	Antithyroid Potency (Relative to 2-Thiouracil)	
	For 50% Effect*	Speed of Increase with Rising Concentration†
2-Thiouracil	(1)	(1)
P.A.S.	(0.085)	(0.02)
Isoniazid	(0.025)	(0.18)

* Potency for 50% inhibition equals reciprocal of that molar concentration of the drug which gives 50% inhibition on enzymic iodination test; for this the molar concentration is expressed as equivalents of the iodide present in the test.

† Speed of increase of antithyroid potency with rising concentration = molar concentration for 10% inhibition / molar concentration for 90% inhibition on same enzymic iodination test.

Table III shows the results of the *in vitro* measurements of the antithyroid potency of P.A.S. and also of isoniazid expressed relative to the values found for 2-thiouracil. Both drugs appear to be weakly antithyroid, showing less than one-tenth of the potency of 2-thiouracil, and isoniazid

about one-third the potency of P.A.S. Their antithyroid potency also increases much more slowly with rising concentration than does that of 2-thiouracil. These tests take no account of the degree to which the drugs can enter the thyroid, but are in conformity with the clinical findings that these are very weak antithyroid drugs.

Summary and Conclusions

Tests on 30 patients before and after withdrawal of P.A.S. treatment showed that the drug causes a slight interference with the uptake of iodine by the thyroid: during less than six months' administration this seems usually to be adequately compensated by slight thyroid hyperplasia. *In vitro* testing of antithyroid potency showed P.A.S. to be a weak antithyroid drug, and isoniazid to be even weaker. Except possibly in occasional patients exceptionally susceptible to the drug, and in those given P.A.S. for over six months, this effect probably has no clinical importance.

When the drug is given for over six months at a dose of about 20 g. a day thyroid function may be affected. 10 out of 11 patients having shown on withdrawal of the drug an avid iodine uptake indicating previous iodine depletion, and 4 out of the 11 having noticed the development of a goitre. In two of these patients these abnormalities were shown to be correctable by iodide administration. We suggest that when P.A.S. is to be given for over six months, a weekly dose of iodide should be given to avoid these thyroid effects—for example, a weekly potassium iodide pill (4 gr., or 20 mg.).

We wish to thank the sisters and nurses for their help in the collection of specimens, and Miss M. Magee for the radio-iodine estimations. Our thanks are also due to Drs. J. C. Hoyle, W. Oswald, A. L. Punch, F. H. Scadding, and F. H. Young for permission to carry out these tests on patients under their care.

TABLE IV.—Individual Test Results

Case No.	Age and Sex	Drug Dosage				Urinary Excretion of I^{131} (% of Administered Dose)					
		P.A.S.			Other Drugs	On P.A.S.		Off P.A.S.		Difference	
		Duration (Months)	Total (g.)	Daily (g.)		8-24 Hrs.	0-48 Hrs.	8-24 Hrs.	0-48 Hrs.	8-24 Hrs.	0-48 Hrs.
6	41 M	2-3	860	20	S	35.5	49.8	17.7	57.6	-15.8	+7.8
13	24 F		900	10	H	22.1	57.4	7.9	30.8	-14.2	-26.6
20	38 F		900	10	H	22.0	63.6	9.6	49.0	-12.4	-14.6
8	29 F		1,120	20	S	23.7	84.4	16.2	54.7	-7.5	29.7
1	31 F		1,680	20	S	26.3	60.8	13.2	25.8	-13.1	-35.0
4	26 F		1,680	20	S	28.9	62.7	10.5	32.8	-18.4	-29.9
3	42 M		1,720	20	S	22.6	45.5	10.2	32.6	-12.4	-12.9
7	29 F		1,720	20	S	11.6	39.5	6.8	30.0	4.8	-9.5
5	45 F	3	1,800	20	S	23.0	59.9	10.2	36.6	-12.8	23.3
11	28 F		1,800	20	S	27.3	62.4	10.8	28.3	-16.5	34.1
12	30 M		1,800	20	S	23.6	80.7	5.4	36.8	-18.2	43.9
14	28 M		1,800	20	H	12.0	44.4	14.3	44.3	+2.3	-0.1
15	22 M		1,800	20	S	19.2	44.7	10.8	36.4	-8.4	-8.3
16	53 M		1,800	20	S	25.8	66.3	20.2	52.2	-5.6	-14.1
17	17 F		1,800	20	S	11.8	43.3	16.8	29.0	-5.0	-14.3
19	21 F		1,800	20	S	20.8	58.7	3.2	33.2	-17.6	-25.5
10	43 F	3-4	1,920	20	S	42.5	63.0	6.5	30.5	-36.0	-32.5
9	24 F		2,070	20	S	33.8	91.8	13.9	37.7	-19.9	-54.1
2	33 M		2,380	20	S	20.3	46.6	10.2	32.0	-10.1	-14.6
29	42 F†	6-10	3,200	20+15‡	S	18.4	71.5	1.6	15.7	-16.8	-55.8
21	48 M		3,300	20+15‡	S+H	11.0	44.3	5.0	24.2	-6.0	-20.1
22*	20 F		3,600	20+15‡	S	3.9	21.2	13.7	39.7	+9.8	+18.5
30	25 M†		3,600	20+15‡	S	14.9	45.3	1.4	14.9	-13.5	-30.4
23	33 F		3,800	20+15‡	S	10.7	41.3	4.3	32.9	-6.4	-7.4
24	35 F		3,800	20+15‡	S	18.6	77.1	1.9	30.0	-16.7	-47.1
27	40 M†		3,900	20+15‡	S	14.9	62.0	4.2	18.2	-10.7	-43.8
26	30 F		4,000	20+15‡	S	18.6	59.0	7.1	32.2	-11.5	-27.6
28	30 M†		4,200	20+15‡	S	2.8	22.1	0.9	19.0	-1.6	-2.1
18	28 F		4,800	20+15‡	S+H	13.8	38.7	2.8	28.6	-11.0	-10.1
25	27 M		5,000	20+15‡	S	17.1	50.9	5.9	30.5	-1.5	-20.4

Normal range: 8-24 hours, 7-20%; 0-48 hours, 35-70%. S—Streptomycin 1 g. daily for 3 months; interrupted—i.e., 1 g. two or three times weekly. H—Isoniazid, 100 mg. b.d.

* It is suspected that the results on Case 22 may have been entered in the reversed order—but they have been entered here as recorded.

† Developed goitre.

‡ 20+15—P.A.S. 20 g. daily for 3 months, thereafter 15 g. daily.

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ASSAY OF PLASMA INSULIN ACTIVITY BY THE RAT-DIAPHRAGM METHOD

BY

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Bornstein (1950) described a method for the assay of insulin in human plasma which was based on the fall of blood sugar of alloxan-diabetic hypophysectomized adrenalectomized rats (A.D.H.A. rats). Subsequently Bornstein and his colleagues determined the insulin content of plasma from various types of diabetic by this method (Bornstein and Trehella, 1951; Bornstein and Lawrence, 1951a, 1951b). The published results of these workers were of such interest as to merit further study.

A.D.H.A. rats prepared in this laboratory have proved to be too delicate and to possess too unstable a blood sugar to permit their use for accurate insulin assay. Groen *et al.* (1952) described a method for the detection and assay of insulin in human plasma which was based on the glucose uptake of the isolated normal rat diaphragm surviving *in vitro*; as was first shown by Gemmill (1940), this uptake is raised by the *in vitro* addition of insulin to the fluid in which the isolated diaphragm is suspended. This method has been critically investigated as a quantitative procedure for the assay of insulin and a modified procedure applied to the determination of the insulin activity of normal human plasma.

Methods

Animals.—The hemidiaphragms of normal male albino Wistar rats of 100-150 g. were used in these experiments. The animals were starved for 18 to 24 hours before use.

For the preparation of alloxan-diabetic hypophysectomized rats (A.D.H. rats) male albino Wistar rats of 170-220 g. were used. They were first of all hypophysectomized, and then, one week later, made diabetic by the intravenous administration of alloxan.

Insulin.—A single sample of crystalline insulin (Boots) of potency 23.2 units per mg. was used as standard in these experiments. Solutions of this were freshly prepared for each assay.

Human Subjects.—The different samples of plasma collected from human subjects are designated as ran-

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dom (collected without previous preparation of the subject) or fed (collected from subjects two and a half hours after the oral administration of 50 g. of glucose).

Chemical Analysis.—Blood glucose and the glucose content of the incubation fluid in the insulin assay was determined colorimetrically by the method of Somogyi (1945).

Procedure

For the qualitative detection of insulin activity in human plasma the glucose uptakes of rat hemidiaphragms suspended in buffer were compared with the glucose uptakes of rat hemidiaphragms suspended in buffer to which the plasma had been added.

For the quantitative assay of insulin activity in human plasma two methods have been used, the single standard method and a four-point assay.

In the single standard method, the absolute glucose uptake of rat diaphragm in the presence of plasma was compared with the absolute glucose uptake of rat diaphragm in the presence of a single standard dose of insulin (2 milliunits per ml.). In each assay (unless otherwise stated) four hemidiaphragms (from different rats) were used for the determination of the basal glucose uptake and six for the determinations of the glucose uptakes in the presence of plasma and of insulin respectively. A standard dose of insulin of 2 milliunits per ml. was chosen, since this gave results very similar to those yielded by normal human plasma under these conditions.

In four-point assays the glucose uptakes of rat hemidiaphragms in the presence of two dilutions of plasma (1:16 and 1:4) and two concentrations of insulin (0.5 and 2 milliunits per ml.) were simultaneously determined.

Experimental Procedure

The basal glucose uptake of the isolated rat diaphragm was determined in buffer (Gey and Gey, 1936) containing 2.5 mg. per ml. of glucose. The glucose uptake in the presence of insulin was determined in buffer-glucose containing the appropriate concentration of insulin. For the determination of the glucose uptake in the presence of plasma, buffer-plasma mixtures were prepared containing 2.5 mg. of glucose and 0.25 ml. of plasma in each ml. of mixture. In all cases the gas phase during incubation was 93% O₂, 7% CO₂.

In typical experiments, human blood was drawn from the antecubital vein by a dry sterile syringe. The blood was transferred to centrifuge cups containing a little heparin and the plasma separated by centrifugation. The plasma sugar was then determined, and after preparation of the buffer-plasma mixture 1-ml. samples of the incubation fluids were placed in the main compartments of Warburg manometer flasks. Normal rats were then killed by decapitation and their diaphragms removed, divided, and washed for exactly five minutes at room temperature in buffer-glucose (glucose concentration 2.5 mg. per ml.) previously saturated with 93% O₂, 7% CO₂. The hemidiaphragms were then lightly blotted, transferred to the manometer flasks, and incubated for three hours at 37° C. at a shake rate of 100 cycles a minute.

After incubation the flasks were removed from the bath, cooled, and 0.2 ml. of the fluid taken for glucose estimation. The hemidiaphragms were then blotted dry and weighed on a torsion balance.

Calculation of Results

The glucose uptake of the diaphragm was calculated as mg. glucose/g. wet wt. diaphragm/hour. The estimate of variance given in the tables is the standard error of the mean.

In single standard assays the insulin activity of the plasma was calculated from a log-dose (of insulin)/response curve previously determined, the standard dose of insulin incorporated in the assay being used to fix the position of this

log-dose response curve. In this calculation the slope of the log-dose response curve was assumed to be constant. The limits of error ($P=0.05$) were calculated from previously determined regression data for crystalline insulin, since the variance in different assays did not differ significantly.

In four-point assays the insulin activity of the plasma and limits of error were calculated from the assay data by the usual means.

The insulin activity of the plasma is expressed as milliunits of insulin per ml. of plasma (1 milliunit is 10^{-3} unit).

Results

Response of Rat Diaphragm to Insulin Added In Vitro

Table I and Fig. 1 record the glucose uptake of rat diaphragm in the presence of different concentrations of insulin added *in vitro*. The results are the mean values of data collected on six separate occasions during a two-week period in September, 1953.

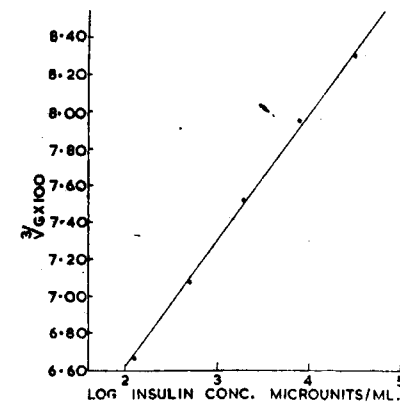


FIG. 1.—The effect of increasing concentrations of insulin upon the glucose utilization of the isolated rat diaphragm expressed as a log-dose (of insulin) response curve.

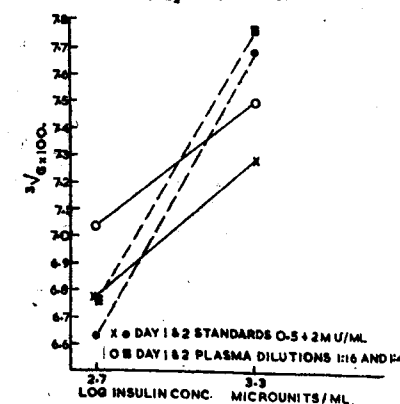


FIG. 2.—Four-point assays of the insulin activity of normal human plasma, by the rat-diaphragm method. Slopes of log-dose response curve for two concentrations of insulin and two dilutions of plasma. Insulin concentrations plotted as log dose (of insulin) in microunits per ml. Plasma insulin activity plotted as insulin concentrations in arbitrary units.

precision ($\lambda=s/b$) was 0.36. The slope of the log-dose (of insulin) response curve has been recently redetermined (January, 1954) and found to be 0.7081, in good agreement with the previous value.

The Insulin Activity of Normal Human Plasma

The method described has been applied to the determination of the insulin activity of plasma collected from normal human volunteers two and a half hours after the oral administration of 50 g. of glucose. The results of similar assays in acromegaly and hypopituitarism have been described in separate papers (Randie, 1954a, 1954b).

TABLE I.—Effect of Increasing Concentrations of Insulin, Added In Vitro, Upon the Glucose Utilization of the Isolated Rat Diaphragm

Insulin Concentration Microunits/ml. ($=10^{-4}$ unit)	Absolute Glucose Uptake	$\sqrt{(\text{Absolute Glucose uptake} \times 100)}$		No. of Hemidiaphragms
		Observed	Calculated from Linear Regression	
0	2.32 $\pm$ 0.05	—	—	16
125	2.96 $\pm$ 0.09	6.665	6.679	16
500	3.55 $\pm$ 0.08	7.081	7.090	16
2,000	4.25 $\pm$ 0.06	7.518	7.505	16
8,000	5.03 $\pm$ 0.09	7.952	7.910	16
32,000	5.73 $\pm$ 0.10	8.307	8.321	16

All glucose uptakes with insulin were significantly greater than the basal glucose uptake. Each increase in dose recorded produced a significant increment in response.

The mean plasma insulin activity by the single standard method was 13.5 milliunits per ml. (limits of error 12 to 19.8 milliunits per ml.); by four-point assays the mean plasma insulin activity was 12.4 milliunits per ml. (limits of error 6 to 24 milliunits per ml.). The experimental details and individual results are recorded in Tables II and III and Fig. 2.

TABLE II.—Insulin Activity of Plasma from Normal Human Subjects 2½ Hours After Oral Glucose, as Assayed by the Single Standard Method

Normal Human Subjects (Fed)	Blood Sugar	Glucose Uptake in Presence of		Plasma Insulin mU./ml.	Limits of error $P=0.05$	N
		Plasma Diluted 1:4	Insulin 2 mU./ml.			
1	103	3.95 $\pm$ 0.17	3.52 $\pm$ 0.23	20	8 to 53	12
2	77	4.18 $\pm$ 0.03	4.03 $\pm$ 0.08	11	5 to 28	12
3	102	4.14 $\pm$ 0.04	4.02 $\pm$ 0.27	10	4 to 26	12
4	72	4.16 $\pm$ 0.17	4.10 $\pm$ 0.14	9	3 to 26	12
5	80	4.27 $\pm$ 0.12	3.84 $\pm$ 0.22	19	6 to 62	8
6	89	4.65 $\pm$ 0.14	4.51 $\pm$ 0.14	10	3 to 32	8
7	90	4.26 $\pm$ 0.42	3.76 $\pm$ 0.11	22	8 to 63	11
		Mean:		13.50	12 to 19.8	(75)

N is total number of hemidiaphragms used for determining the mean glucose uptake in the presence of plasma and of insulin.

TABLE III.—Insulin Activity of Plasma from Normal Human Subjects 2½ Hours After Oral Glucose, as Assayed by Four-point Assays

Assay No.	Glucose Uptake with Insulin		Glucose Uptake with Plasma		Plasma Insulin mU./ml.	Fiducial Limits P. 0.05
	Concentrations		Dilutions			
	0.5 mU./ml.	2 mU./ml.	1 : 16	1 : 4		
1	3.14 ± 0.18	3.84 ± 0.22	3.48 ± 0.19	4.27 ± 0.12	16.7	7 to 38
2	2.93 ± 0.12	4.51 ± 0.14	3.10 ± 0.14	4.65 ± 0.14	10	7 to 14
Mean:					12.4	6 to 24

Four observations at each dose level.
All glucose uptakes significantly greater than the basal glucose uptake.

Recovery of Insulin Added to Plasma In Vitro

In Table IV are recorded the results of experiments in which the insulin activity of insulin-plasma mixtures prepared *in vitro* was assayed. In these experiments insulin

TABLE IV.—Recovery of Insulin Added In Vitro to Buffer-plasma Mixtures Prepared in the Usual Way

Basal Glucose Uptake	Glucose uptake due to plasma with insulin added <i>in vitro</i> to give a total estimated concentration of 8.25 mU./ml.	Glucose uptake due to Insulin. Concentration, 8 mU./ml.
2.54 $\pm$ 0.18 (4)	5.02 $\pm$ 0.27 (6)	5.08 $\pm$ 0.27 (6)
2.30 $\pm$ 0.05 (4)	4.33 $\pm$ 0.21 (6)	4.08 $\pm$ 0.10 (6)

Both estimates performed with a single sample of normal human plasma collected 2½ hours after oral administration of 50 g. of glucose. Insulin content, 13 mU./ml.

Figures in parentheses = number of hemidiaphragms.
For first assay, estimated insulin content of insulin-plasma mixture is 7.7 mU./ml. (limits of error, $P=0.05$, 2 to 30 mU./ml.).
For second assay, estimated insulin content of insulin-plasma mixture is 12.6 mU./ml. (limits of error $P=0.05$, 3 to 33 mU./ml.).
Recovery of added insulin not significantly different from 100% in either case.

was added, *in vitro*, to buffer-plasma mixtures prepared in the usual way, to bring the insulin content to a calculated value of approximately 8 milliunits per ml. The glucose uptake of the diaphragm in this mixture was then compared with the glucose uptake of the diaphragm in the presence of insulin at a concentration of 8 milliunits per ml. The recovery of insulin added to plasma *in vitro* and assayed in this way did not differ significantly from 100%.

Insulin Activity of Normal Human Plasma Assayed in the A.D.H. Rat

Previous workers have reported the insulin content of normal human plasma, collected after a glucose meal, to be 0.34 milliunit per ml. (Bornstein and Lawrence, 1951b), 1 milliunit per ml. (Groen and Willebrands, personal communication), and 0.1 to 0.6 milliunit per ml. (Vallance-Owen and Hurlock, 1954). The value obtained by the rat-diaphragm assay described in this paper is considerably greater than these reported values.

The discrepancy between whole-animal methods and the rat-diaphragm technique described in this paper is illustrated by the assay using A.D.H. rats (Table V). In this experiment the change in blood sugar of A.D.H. rats over

TABLE V.—Effects of Intravenously Administered Saline, Normal Human Plasma, and Insulin Upon the Blood Sugar of Alloxan-diabetic Hypophysectomized Rats

Nature of Injected Material	Mean Fall of Blood Sugar $\pm$ S.E. Mean	No. of A.D.H. Rats	t	P
1. Saline (1 ml.)	4.6 $\pm$ 4.1	8	—	—
2. Normal human plasma* (1 ml.)	13.8 $\pm$ 8.8	5	—	—
3. 2 milliunits of insulin in 1 ml. of saline	41.5 $\pm$ 5.2	5	t for 1 v. 3 is 9.3 t for 2 v. 3 is 6.8	<0.001 <0.001

* 1 ml. of this plasma possessed activity equal to that of 13 mU. of insulin in the rat-diaphragm assay.

a period of 20 minutes following the intravenous injection of normal human plasma was measured. It was observed that plasma, assayed by the rat-diaphragm method to contain 13 milliunits of insulin per ml., had no effect upon the blood sugar of A.D.H. rats. By contrast 2 milliunits of insulin produced a highly significant fall of blood sugar in the same A.D.H. rats under similar experimental conditions.

Insulin Activity of Cysteine-treated Plasma

Du Vigneaud *et al.* (1931) observed that cysteine treatment inactivated insulin. Other workers who have used the rat-diaphragm assay for insulin have reported that cysteine will abolish the insulin activity of human plasma or serum. This observation has been confirmed in experiments in which normal human plasma was incubated with cysteine (concentration 20 mg. per ml.) for 12 to 18 hours. The experiments were controlled by simultaneous incubation of the same plasma in the absence of cysteine. It was observed that incubation with cysteine consistently abolished the insulin activity of plasma, whereas plasma incubated

TABLE VI.—Insulin Activity of Human Plasma After Dialysis and After Treatment with Cysteine as Detected by the Rat-diaphragm Technique

Addition to medium of:	Change in Glucose Utilization	N	t	P
Dialysed normal human plasma	1.07 $\pm$ 0.19	6	3.5	<0.02 >0.01
Buffer incubated with cysteine	0.05 $\pm$ 0.09	6	—	—
Normal human plasma (1)	—	—	—	—
Incubated with cysteine	0.57 $\pm$ 0.10	6	4.40	<0.01
Incubated without cysteine	1.00 $\pm$ 0.12	6	5.50	<0.01
Normal human plasma (2)	—	—	—	—
Incubated with cysteine	0.14 $\pm$ 0.21	6	—	—
Incubated with cysteine and dialysed	0.14 $\pm$ 0.22	6	—	—

Glucose uptakes expressed as increments over the basal glucose uptake $\pm$ S.E. of mean.
N is $N_1 + N_2 - 2$ where N_1 and N_2 are the number of hemidiaphragms used for determining the basal glucose uptake and the glucose uptake in the presence of plasma or other added material.
All samples of plasma were random samples.

without cysteine still possessed significant insulin activity. It was observed in additional experiments that the basal glucose uptake determined in buffer incubated with cysteine was similar to the basal glucose uptake in untreated buffer. The results of typical experiments are recorded in Table VI. Some samples of cysteine-treated plasma were found to inhibit the glucose utilization of rat diaphragm, but this effect was not consistently seen (Table VI).

Samples of cysteine-treated plasma which had been dialysed against buffer for 18 hours, to remove residual cysteine, were also without insulin activity (Table VI). By contrast, untreated human plasma does not lose its insulin activity when dialysed against buffer (Table VI).

Discussion

Assay of Insulin by the Isolated Rat Diaphragm

The rat-diaphragm technique for the assay of insulin has not previously been critically investigated by conventional statistical methods. The results of statistical appraisal of the rat-diaphragm technique, reported in this paper, suggest that it is not a very precise method for the assay of insulin, though the index of precision ($\lambda=0.36$) compares favourably with that of some methods at present used for the bio-assay of other hormones—for example, the tibial band assay for growth hormone. It is difficult to compare the results of this investigation of the rat-diaphragm assay for insulin with those previously reported, since other workers have not supplied comparable statistical data. The variance encountered in the experiments reported in this paper is similar to that found by other workers who have studied the glucose uptake of the isolated rat diaphragm—for example, see Ottaway (1953).

The sensitivity of the isolated rat diaphragm to insulin was found in these experiments to vary considerably from time to time and the variation in sensitivity was not necessarily seasonal; in disagreement with previous reports (*Groen *et al.*, 1952; Vallance-Owen and Hurlock, 1954). The minimum effective concentration of insulin in these experiments was 10^{-4} unit per ml., though some workers have claimed that as little as 5×10^{-4} unit of insulin per ml. will increase the glucose utilization of the isolated rat diaphragm (Groen *et al.*, 1952).

Specificity of the Rat-diaphragm Assay for Insulin in Plasma

Many workers have previously reported that the plasma of normal animals will increase the glucose uptake of rat diaphragm when added to the fluid in which the isolated diaphragm is suspended. This effect has been variously attributed to non-specific effects of plasma protein (Park, 1952), or to insulin in the plasma (Tuerkischer and Wertheimer, 1948; Groen *et al.*, 1952; Vallance-Owen and Hurlock, 1954).

Park attributed the insulin activity of normal rat plasma in the rat-diaphragm assay to non-specific effects of plasma protein, since he found that crystalline bovine serum albumin and A.D.H. rat plasma would stimulate the glucose uptake of the isolated rat diaphragm. However, these experiments do not prove conclusively that the effects of normal plasma are not due to insulin, since crystalline bovine serum albumin and A.D.H. rat plasma may well contain insulin. In this connexion Gemmill (1940) reported that crystalline ovalbumin did not increase the glucose utilization of the isolated rat diaphragm.

Groen *et al.* concluded from their experiments that the insulin-like activity of plasma from normal human subjects and dogs in the rat-diaphragm assay was due to insulin, since the activity was not found in plasma obtained from severely diabetic patients and depancreatized dogs. The validity of this conclusion is, however, doubtful, since Park (1952) and Bornstein (1953) have reported that the plasma of alloxan-diabetic rats contains endocrine factors which inhibit the glucose utilization of the isolated rat diaphragm. The failure of Groen *et al.* to detect insulin-like activity

*Groen and Willebrands (personal communication) have more recently concluded that this variation in sensitivity is not seasonal.

in the plasma of severely diabetic patients and depancreatized dogs, by the rat-diaphragm technique, may be due to the presence of inhibitors in these plasma samples and not to their low insulin content. The fractionation and identification of the material in human plasma responsible for its insulin-like activity in the rat-diaphragm assay would appear to merit urgent attention.

Insulin Content of Normal Human Plasma*

The insulin activity of normal human plasma assayed by the rat-diaphragm technique reported in this paper was found to be 13 milliunits per ml. This is considerably greater than the value of 0.34 milliunit per ml. reported by Bornstein *et al.* (1951b), who used the A.D.H.A. rat assay for insulin. This discrepancy between animal methods and the rat-diaphragm technique described in this paper is illustrated by the A.D.H. rat assay (Table V). In this experiment normal human plasma, assayed by the rat-diaphragm method to contain 13 milliunits of insulin per ml., was found to have no hypoglycaemic effect when injected into A.D.H. rats, though 2 milliunits of insulin produced a highly significant fall of blood-sugar when injected into the same animals under similar experimental conditions. This discrepancy could be due to insulin antagonists in human plasma which antagonize the hypoglycaemic action of insulin in animals but which do not antagonize the action of insulin upon the isolated rat diaphragm *in vitro*, or it could be due to non-specificity of the rat-diaphragm assay for insulin in plasma. Some evidence for the former belief is provided by the report of Weitze and Hagedorn (Hagedorn, 1952). These authors, utilizing the fall in blood sugar of alloxan-diabetic hypophysectomized adrenalectomized rats to assay insulin, reported the insulin activity of normal human plasma after acid alcohol extraction to be ten times the value obtained by Bornstein *et al.* (1951b) for untreated plasma. The high value could result from a separation of insulin from insulin antagonists in the plasma by the extraction procedure which these authors used.

The reason for the discrepancy between the values obtained for the insulin activity of normal human plasma by various workers who have used the rat-diaphragm assay for plasma insulin is not clear. It may be due to differences in specificity between diaphragms obtained from different strains of rat, since some workers have reported wide differences in the sensitivity of the isolated rat diaphragm to insulin. The high values reported in this paper are not due to minor modifications of the technique (Randle, unpublished experiments). Since Ottaway (1953) has reported that small quantities of growth hormone *in vitro* will enhance the glucose utilization of rat diaphragm, the high values for the insulin activity of normal human plasma reported in this paper may result from the presence of growth hormone in the plasma. The insulin activity of acromegalic plasma assayed by the rat-diaphragm method is considerably greater than the insulin activity of normal human plasma, and it may be that this difference is also attributable to the presence of growth hormone in the plasma (Randle, 1954a). The nature of the material responsible for the insulin-like activity of human plasma in the rat-diaphragm assay is being further investigated.

Summary

The claim of Groen *et al.* that normal human plasma will increase the glucose utilization of the isolated rat diaphragm has been confirmed and the evidence for attributing this effect to insulin in the plasma critically re-examined.

The rat-diaphragm technique has been critically explored as a quantitative assay for small amounts of

*Bioassay methods for insulin in plasma almost certainly measure the resultant of the contra-actions of insulin and insulin antagonists present in the plasma. For this reason the term *insulin activity* has been used in this paper in referring to the biologically determined insulin content of plasma.

insulin and applied to the determination of the insulin activity of normal human plasma. By this technique the insulin activity of plasma collected from normal human subjects after a glucose meal was found to be approximately 13 milliunits per ml. This estimate of the insulin activity of normal human plasma is considerably greater than those previously reported by other workers. The possible reasons for this discrepancy are discussed in brief.

The importance of specificity in bioassays for plasma insulin is stressed.

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Meat hygiene was the subject of a recent seminar in Copenhagen organized by W.H.O.'s regional office for Europe. The following figures are given for the consumption of meat (carcass weight) in a year per head of population in different countries. The figures relate to 1952-3 unless otherwise stated.

Country	In Kilograms	In Pounds
Austria	41	90
Belgium and Luxembourg	45	99
Canada (1951-2)	66	146
Denmark	57	126
Finland	32	71
France	60	132
Germany (Federal Republic)	39	86
Greece	13	29
Ireland (Republic)	53	117
Italy	16	35
Netherlands	32	71
Norway	33	73
Sweden	50	110
Switzerland (1951-2)	47	104
Turkey (1951-2)	16	35
United Kingdom	47	104
United States of America (1951-2)	76	168
Yugoslavia	18	40

Meat is easily contaminated, and is an important source of food poisoning. According to figures collected at the seminar, in the United States from 1945 to 1947 32% of the food-poisoning outbreaks were due to meat. In England and Wales in 1950, 68% of the outbreaks affecting more than one person in which the source was identified were due to contaminated meat.

CONGENITAL HEART DISEASE REPORT ON AN UNUSUALLY HIGH INCIDENCE IN ONE FAMILY

BY

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Congenital heart disease in more than one member of a family, although relatively uncommon, has been reported in the literature on a number of occasions. Abbott (1927) found 11 pairs of brothers and sisters, and Brown (1939) reported six instances. Taussig (1947) has seen four families in which more than one member was affected, and in two of these the condition was transmitted through more than one generation.

The purpose of this paper is to report four cases occurring in one sibship. This is exceedingly rare, and, so far as we can ascertain from the literature, has been reported only once previously. That was by Walker and Ellis (1940-1), who described a father and four out of eight children with persistent ductus arteriosus.

The Family

1. The eldest child was a boy aged 11 years. Signs of persistent ductus were discovered at routine school medical inspection. There was a typical Gibson murmur with thrill, and confirmatory radiological signs. He is awaiting operation.

2. A girl aged 9 showed no cardiac abnormality.

3. A boy aged 8. Signs of persistent ductus were discovered at routine school medical inspection. His lesion was more severe than that of the eldest child. Surgical ligation of ductus was successfully carried out.

4. A girl died in 1946 at the age of 6 months, from what was believed to be pneumonia.

5. A boy aged 5 showed no cardiac abnormality.

6. A boy aged 4. He was the third member of the family with persistent ductus. His was the most severe lesion of the three, there being marked cardiac enlargement and gross engorgement of pulmonary vessels. A successful operation has been carried out.

7. A girl died in 1949, only 13 days old. She was found dead in bed, and the cause was not definitely ascertained.

8. A girl aged 2 years showed no evidence of cardiac abnormality.

9. A boy, a "blue baby," died at the age of 7 weeks. He was seen by one of us a few days before death, and a diagnosis of congenital heart disease was made on the basis of central cyanosis and a moderately loud systolic murmur audible all over the praecordium.

Both parents were examined and found to be normal. There was nothing significant in their past histories; maternal rubella had not occurred, and circumstances were such that adequate nutrition was available. Consanguinity was not admitted. Only a limited investigation of ascendants was possible owing to the fact that most of them resided outside Ireland. No significant abnormality was detected in those examined.

Comment.—In this family there were four definite cases of congenital heart disease, three of them having persistent ductus arteriosus and one cyanotic disease of undetermined type. In addition, two other siblings died in infancy from causes which were not definitely ascertained. In view of

the family history it is possible that a congenital heart lesion may have been a factor in the cause of death. The finding of such an incidence prompted us to review the literature and to consider possible aetiological factors, with particular reference to modern views on the subject.

Aetiology of Congenital Heart Disease

Congenital heart disease and congenital defects in general are believed to be due to genetic or environmental factors.

Genetic transmission, although difficult to prove, has always been considered important. In recent years, however, it has been shown that environment can play a part. Gregg (1941), in a series of 78 cases of congenital cataract occurring after maternal rubella during the early months of pregnancy, found that congenital heart lesions were present in 44. Swan *et al.* (1943) collected details of 31 congenital defects following maternal rubella, 17 of which were cardiac. Of these, seven had patent ductus; the others were varied, but cyanotic cases were not mentioned.

While this is strong evidence in favour of an environmental factor, it does not necessarily mean that maternal rubella is a very important factor in the transmission of congenital heart disease in general. In fact, the available evidence is to the contrary. In Campbell's (1949) series of 300 cases a history of maternal rubella was present in only four instances. In our own experience with a smaller number of cases no instance of maternal rubella has been found. Other environmental factors such as maternal nutritional deficiency have been suggested by Hale (1935) and Warkany (1944). Animal experiments by these workers have shown that congenital defects could be produced in the offspring if the maternal diet was deficient in certain vitamins. Can similar deficiencies cause congenital heart disease in man?

The answer would be obtained if the incidence of congenital heart disease in nutritionally deficient mothers as compared with the normal were known. Needless to say, this would have to be a large-scale survey, carried out as early as possible during pregnancy. So far as we are aware, such a survey has not been done, so that in the present state of our knowledge there is no evidence that maternal nutritional deficiency can cause congenital heart disease in man.

Genetic Factors

The best evidence of a genetic factor would be a positive family history. This is not forthcoming, and may be due to the fact that few women with congenital heart disease marry and have children (Campbell, 1949). However, as Campbell points out, the incidence in collaterals is more common than would be expected by chance. That would certainly be true of the family reported above, in which a genetic factor seems most likely. The collection of further evidence on this matter should be possible in future, in view of the developments of modern surgery. This applies particularly to persistent ductus.

We were unable, in a review of the literature, to obtain figures of the incidence of persistent ductus in population groups, with particular reference to schools. As additional evidence in favour of a genetic transmission of this lesion, we feel that the figures obtained by one of us at school medical inspection in County Roscommon may be of interest.

County Roscommon has a population of 68,000; land acreage is 608,540. The largest urban population is 2,000, so that the population is rural, mainly engaged in farming. The primary school-going population is 10,500, and of these 9,250 were examined routinely at school medical inspection over a three-year period. Fifteen cases of persistent ductus were observed among those examined. Twelve of these were confirmed subsequently by operation, and two of the remaining three by cardiac catheterization. Thus the incidence of persistent ductus among schoolchildren in this county is 1 in 616, or 1.6 per 1,000 examined between the ages of 4 and 15. There was no history of maternal rubella in any of these cases, and, in fact, rubella appears to be

uncommon in rural areas. Consanguinity was not admitted in any case. However, the tendency of farming or village populations to marry locally may be of importance.

This apparently high incidence in a rural population, if confirmed by a larger survey, would be additional evidence of a recessive genetic factor in the transmission of persistent ductus, and perhaps of congenital heart disease in general.

Summary and Conclusions

Details of four siblings with congenital heart disease are presented.

They include three cases with persistent ductus and one with cyanotic heart disease.

The aetiology of congenital heart disease is discussed and evidence indicating the importance of a genetic factor is presented.

Addendum.—Since this paper was sent for publication the diagnosis of persistent ductus in the boy aged 11 has been confirmed at operation.

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PANCREATICO-DUODENECTOMY FOR RELAPSING PANCREATITIS

BY

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The following case is reported as an example of the excellent result which may be obtained in relapsing acute pancreatitis following a pancreatrico-duodenectomy. Although such a result does not help to elucidate the problem of the aetiology of this disease, freedom from further attacks should follow that operation. However, it is not denied that excellent results, either temporary or permanent, may also sometimes be obtained by the use of splanchnicectomy, choledochoduodenostomy, etc.

For a variety of reasons a number of surgical measures have been proposed for the treatment of relapsing pancreatitis. These include cholecystectomy and choledochostomy (Mowat, 1951); choledochoduodenostomy (Burt, 1953); choledochoduodenostomy with total diversion of the bile (Barclay, 1950); splanchnicectomy, unilateral (Mallet-Guy and de Beaujeu, 1950) or bilateral (Connolly and Richards, 1950); subtotal gastrectomy, to cut off the secretin mechanism (Richman and Colp, 1950); sphincterotomy (Doubilet and Mulholland, 1948); and pancreatrico-duodenectomy (Cattell and Warren, 1952). There is no doubt that pancreatrico-duodenectomy would be the accepted method of treatment in cases with demoralizing pain if it were not for the magnitude of the operation and the risks it entails. Nevertheless, whatever operation is performed it should allow the pancreas and other abdominal viscera to be explored. It is especially important to determine whether or not the gall-bladder and common bile duct are normal.

According to Horton (1950) the first successful pancreatrico-duodenectomy for pancreatitis was carried out in 1944 by Clagett. Horton was of the opinion that pancreatitis should be treated by pancreatrico-duodenectomy only in most exceptional cases. On the other hand, in 1952 Cattell and Warren concluded that of the procedures they had used pancreatrico-duodenectomy had given the best results, and they considered it the current method of choice in the treatment of relapsing pancreatitis.

Case Report

A man aged 40 was referred to me by Dr. R. Jennaway and was admitted to Sydney Hospital on May 23, 1953. For 18 months he had complained of attacks of epigastric pain, often extremely severe and sometimes lasting for 24 hours, but not related to meals. The pain extended to both sides of the abdomen and was only partly relieved by morphine. Rarely, it radiated to the back. At first the attacks occurred every two to three weeks, but for the previous three months attacks occurred every two or three days. On a few occasions vomiting accompanied the pain. Between the attacks his appetite had been good. He had never been jaundiced, and Graham's test showed no abnormality in March, 1952. On February 10, 1953, laparotomy revealed an enlarged indurated head of the pancreas, and the surgeon considered this to be malignant. Other viscera, including the biliary tract, appeared normal, and there was no evidence of any metastasis. Three days later during a severe attack of pain the urinary diastase level was 100 units. Despite the severity of the attacks of pain there was no evidence of alcoholism or drug addiction.

On May 23 his general condition was still good despite the loss of 2 stone (12.7 kg.) in weight during the previous three months, and examination of the abdomen showed no abnormality. His serum bilirubin level was 0.1 mg. per 100 ml. On May 26 a barium-meal examination showed that the stomach was empty in four hours. A deformity with some constriction of the second part of the duodenum was present, and this was producing a mild partial obstruction. (Similar appearances have been reported by Cattell and Warren (1952) in relapsing pancreatitis.)

On May 28 a pancreatrico-duodenectomy was performed. Through an upper midline incision the pancreas was palpated and the replacement of its head and body by a hard irregular mass was confirmed, but the consistency of this mass was not uniform. The terminal portion of the tail of the pancreas appeared normal. The mucosa of the duodenum was intact though slightly hypertrophic, and no obstruction of the lumen of the duodenum was demonstrable. The biliary tract and liver appeared normal. There were a few small soft lymph nodes along the upper border of the pancreas, but no definite metastasis was detected.

The peritoneum to the right of the second part of the duodenum was incised, the stomach was divided immediately proximal to the pylorus, and the supraduodenal portion of the common bile duct was divided. The duodenum, together with the head and the body of the pancreas, was dissected free from the superior mesenteric vessels and other structures, and the tail of the pancreas was divided through what appeared to be normal pancreatic tissue about an inch (2.5 cm.) to the right of the hilum of the spleen. Reconstruction was then carried out in the order shown in the diagram. The end of the jejunum was closed about a small tube and was sutured to the peritoneum at the upper end of the abdominal wound. The inner end of this tube (which contained several holes) was passed down the jejunum and into the common bile duct, while its outer end was brought out through the wound. The anastomosis between the common bile duct and the jejunum was made with an outer interrupted layer of cotton sutures and an inner continuous layer of 00 catgut. The cut end of the remnant of the pancreas was fixed into an incision in the side of the jejunum with two layers of interrupted cotton sutures. No

tube was inserted into the pancreatic duct, which did not appear to be dilated. The severed end of the stomach was anastomosed end to side to the jejunum with an outer interrupted layer of cotton sutures and two continuous inner layers of 00 catgut. A drainage tube was inserted down to the area from which the head of the pancreas had been removed.

The pathologist (Dr. L. R. Finlay-Jones) reported that the excised specimen consisted of a segment of duodenum

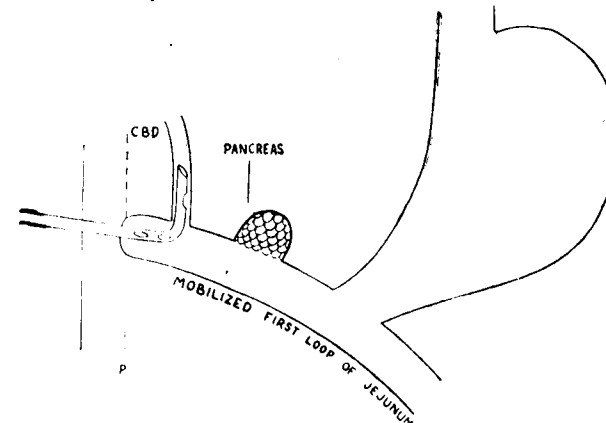


Diagram showing the order of reconstruction after pancreatrico-duodenectomy. The remnant of the pancreas was implanted end to side in the jejunum between the common bile duct (CBD) and the stomach. The end of the jejunum was closed around a tube and then fixed to the parietal peritoneum (P).

15 cm. long and 3 cm. in diameter, attached to which was a hard irregular piece of pancreas 8.5 cm. long and 5 cm. in diameter, and containing a cyst about 1.5 cm. in diameter. The ampulla of Vater and the main pancreatic duct were patent. Microscopic examination showed that the pancreatic parenchyma was traversed by bands of cellular scar tissue and granulation tissue. There were collections of inflammatory infiltrate consisting of eosinophils, plasma cells, and polymorphs; and pigment-containing histiocytes were conspicuous in many regions. The muscle coat of the attached duodenum showed similar inflammatory changes. The appearances were consistent with recent attacks of pancreatitis. No evidence of carcinoma was found.

For the first 48 hours after operation the stomach was aspirated, and at the same time 4% glucose in N/5 saline was given intravenously. Thereafter the diet was increased gradually. Only a few ounces of bile a day drained from the tube in the common bile duct. This tube was removed after eight days, and the wound was healed within a further five days.

On June 19 the serum bilirubin level was 0.5 mg. per 100 ml. and a glucose-tolerance test gave readings of 98, 105, 128, 117, and 120 mg. per 100 ml.; there was no glycosuria. On June 24 the dried faeces contained total fat 57% (unsplit fat 42%, split fat 15%); and the urinary diastase level was 5 units.

Convalescence was uneventful. The patient was discharged home on June 27 with the wound healed, and has remained symptom-free. He resumed work as a mechanic on July 13.

Discussion

Prior to operation the lack of jaundice, the recurrent attacks of severe abdominal pain, the well-being of the patient, and the elevated urinary diastase during an attack of pain all suggested a diagnosis of relapsing acute pancreatitis rather than carcinoma of the pancreas. At operation the small areas of calcification, which incidentally had not been shown by radiography, the lack of uniform hardness of the gland, and the absence of metastases were also in keeping with the former diagnosis.

Pain is a frequent accompaniment of carcinoma of the pancreas, but it is not usually in the form of intermittent severe attacks. Also, the urinary diastase level is rarely

more than slightly raised in the presence of a carcinoma of the pancreas. In this case the destruction of the pancreas had not been extreme and had not led to diabetes or to steatorrhoea. Even after operation no insulin or pancreatin had been required.

Biopsy of the mass in the pancreas was not performed, and is probably never indicated. There is always the doubt whether the portions selected for examination are representative; and biopsy may be followed by dissemination of malignant cells or a pancreatic fistula may develop.

Although the mucosa of the pyloric antrum was retained, its resection may be advisable, as the chance of jejunal ulceration would then be reduced. However, this patient has had the good fortune not to develop that or any other complication.

Because of the high operative mortality rate and the high recurrence rate doubt has been thrown on the possibility of cure of carcinoma of the pancreas by pancreatectomy (Cattell and Pyrek, 1949). It is, however, reasonable to assume that the mortality rate for pancreatrico-duodenectomy will be much less in relapsing pancreatitis than in patients with carcinoma of the pancreas, and it may be concluded that pancreatrico-duodenectomy has a place in the treatment of relapsing pancreatitis whenever there is any doubt about the coexistence of a carcinoma or when the condition has failed to respond satisfactorily to other methods of treatment.

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PANCREATICO-DUODENECTOMY OPERATION ON TWO ELDERLY PATIENTS

BY

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The two patients with carcinoma of the head of the pancreas detailed below may be regarded as rather elderly to undergo pancreatrico-duodenectomy. They were aged 67 and 70 years, and their rapid recovery demonstrates that age alone is no bar to the performance of this operation in patients otherwise suitable. The second case has the additional interest that a subtotal gastric resection for haematemesis had been carried out six months earlier.

Case 1

A woman aged 67, with a four-weeks history of jaundice varying in intensity, had a dull pain deep in the right hypochondrium but no colic; no vomiting; anorexia. She enjoyed fatty food and had had no dyspepsia prior to the onset of jaundice. She had noticed that the stools were pale and the urine was dark in colour. There was no loss of weight. Appendicectomy had been performed in 1917.

On examination a moderately obese woman, deeply jaundiced but otherwise apparently well, was seen. Her blood pressure was 196/90, Hb 95%. Her heart was slightly enlarged; the respiratory system was normal. The abdomen was well covered; there was no tenderness or guarding. The liver was just palpable below the costal margin; the gall-bladder was tense and distended. A diagnosis of carcinoma of the head of the pancreas was made.

Operation.—On May 5, 1952, under general anaesthesia, the abdomen was explored through a right paramedian

incision. The liver was normal but the gall-bladder and bile ducts were distended. There was a hard inelastic nodule in the head of the pancreas. Nothing else abnormal was found. Mobilization of the duodenum and the head of the pancreas revealed that the growth was much larger than had at first been suspected. Further mobilization showed that the tumour was operable, and pancreatoduodenectomy was performed. Reconstruction was effected by bringing up a loop of proximal jejunum through the transverse mesocolon and anastomosing the apex of the loop to the common bile duct, end to side. The divided body of the pancreas was implanted into the side of the jejunum distal to the choledocho-jejunostomy and, distal to this again, intestinal continuity was restored by fashioning a gastro-jejunostomy. The abdomen was closed with drainage. The post-operative course was uneventful, neither a biliary nor a pancreatic fistula developing.

Pathological Report.—"The specimen shows a tumour in the head of the pancreas surrounding a major pancreatic duct and incompletely obstructing it. The common bile duct also shows some compression, but the mucosa is intact. A few adjacent lymph nodes contain deposits of tumour. Histological examination shows an adenocarcinoma of pancreas of mucus secretory type."

This patient lived an active and comfortable life for ten months.

Case 2

A woman aged 70 had undergone an emergency partial gastrectomy for haematemesis six months earlier; a retrocolic anastomosis, afferent loop of jejunum to lesser curve of stomach and incorporating a Hofmeister valve, was used. She made a good recovery and was discharged from hospital apparently fit and well. Two months after gastric resection the stools became loose, pale, offensive, and frequent. Three months later she became jaundiced; at the time of admission this was less deep. The urine was dark in colour. She lost weight. Her appetite was good and she had no aversion to fatty foods.

On examination, a thin woman, deeply jaundiced, was seen. The epigastric scar was soundly healed, the liver was not enlarged; the gall-bladder was not palpable. The stools were negative for occult blood; the Van den Bergh reaction was direct positive; serum bilirubin, 10 mg. per 100 ml.; alkaline phosphatase, 31 units; colloidal gold +. The jaundice got progressively deeper and the liver and gall-bladder became palpable. A diagnosis of carcinoma of the head of the pancreas was made.

Operation.—On May 5, 1953, under general anaesthesia, a right paramedian incision was made. The gall-bladder and bile ducts were distended and contained clean concentrated bile. The common bile duct was not involved in any reaction secondary to the manipulations of the partial gastrectomy; the duodenal stump was free and mobile. An indurated tumour in the head of the pancreas was thought to be a carcinoma and was found to be operable. The body of the pancreas was fibrosed and scarred where it had been involved by the gastric ulcer. Pancreatoduodenectomy was performed; the site of section of the pancreas coincided with the scarred area.

Reconstruction.—Intestinal continuity existed as a result of the gastrectomy. The short proximal loop of jejunum was anastomosed end to end with the common bile duct; as this left little room above the gastro-jejunostomy for implantation of the pancreas, that structure was oversewn and was not reimplanted. The peritoneal cavity was drained.

Pathological Report.—"The specimen shows a cellular tumour in the pancreas, microscopically a carcinoma. In some areas this shows acinar pattern and in others a pattern of duct carcinoma."

The patient made a rapid recovery. A biliary fistula did not develop, but from the fourth day there was a discharge of pancreatic ferments which was profuse for ten days and then rapidly dried up. The patient left hospital

four weeks after operation; her condition at the time of writing is discussed below.

In this case carcinoma of the pancreas was almost certainly present at the time of gastric resection. However, as this was an emergency operation undertaken to control haemorrhage, further exploration was not performed when the cause of bleeding, a large active gastric ulcer, had been found.

Discussion

The classical description of jaundice due to carcinoma of the head of the pancreas as progressive and painless is no longer accepted as invariable; each of the cases reported here showed variation. It is true, however, that marked fluctuation in depth of jaundice is more common with ampullary growths than with carcinoma of the head of the pancreas proper.

It is apparent that with fit patients age need not necessarily be a contraindication to operation. These patients, aged 67 and 70, were both remarkably well after operation. The first patient was not given more than sips of water by mouth for several days, and it is possible that her early post-operative course was conducted with excessive caution. For the second patient, on the other hand, it was possible to discontinue intravenous fluids after 24 hours, there being a satisfactory gastro-jejunostomy as a result of her previous operation. In this case it was pleasing to find that the partial gastrectomy did not increase the difficulty of the pancreatoduodenectomy; rather it simplified matters, as the mobilization was partly done and intestinal continuity already existed. The healed well-functioning anastomosis proved of great value, enabling the patient to take nourishment by mouth, without risk, at an early stage in the post-operative period, and excluded the necessity for the prolonged use of the potentially lethal form of therapy euphemistically termed intravenous alimentation.

So useful was the antecedent gastro-jejunostomy found to be that I would be inclined to follow Whipple, Parsons, and Mullins (1935) in employing it as part of the first stage in those cases considered to require a staged operation. All that is necessary is transection of the stomach followed by gastro-jejunostomy, employing an afferent loop of jejunum long enough to take, at the second operation, the pancreas and common bile duct. Apart from closure of its severed end, the distal segment of stomach need suffer no interference, thus leaving the operative field undisturbed for the second stage. However, a one-stage operation, where possible, is infinitely preferable.

Many forms of reconstruction have been described, and from them three principles have emerged: (1) the gastro-jejunostomy should be distal to the entrance of the common bile duct and the pancreas; (2) the common bile duct, not the gall-bladder, should be anastomosed to the jejunum; and (3) the pancreatic stump should be reimplanted. The third principle was not followed in Case 2, as, in the peculiar circumstances, there was little bowel readily available for reimplantation of both common bile duct and pancreas; also the body of the pancreas was so scarred at the site of section that its duct could not be identified. In this case the pancreatic fistula persisted for only two weeks, and it seems possible that the fortunately short period may be accounted for by the fact that the pancreas was already fibrosed at the site of transection.

Whitfield, Gourevitch, and Thomas (1952) investigated the metabolic effects of total pancreatectomy. They obtained 83% fat absorption when giving 11.5 g. of pancreatin a day, and thus demonstrated that, while reimplantation of the pancreas may be highly desirable, satisfactory fat digestion can be obtained by extraneous means. Brunschwig (1952) does not practise pancreatic reimplantation, and claims satisfactory function even without replacement therapy. Unfortunately my second case does not support this claim, as the patient continues to have frequent stools and has not regained weight. It is probable that the combination of pancreatoduodenectomy—without pancreatic reimplantation—and partial gastrectomy puts too great a strain on the

Medical Memoranda

A Case of Complete Aortic Atresia with a Dissecting Aneurysm

Coarctation of the aorta is a reasonably common form of congenital cardiac abnormality. Abbott (1928) found 142 in her classic series of 1,000 cases. Wood's (1950) series of 200 cases contained 16 coarctations of the aorta. Until recently the diagnosis was of academic interest only; now that surgery may in certain cases effect a cure it is important that the diagnosis should be made as soon as possible. The following case is of sufficient interest to merit publication.

CASE REPORT

The patient was a man aged 33. As a child it was noticed that his heart was abnormal. Unfortunately no details are available. He remained well and joined the regular Army, in which he served for 12 years, passing a special medical examination in the Royal Engineers as fit for diving operations. He had no symptoms until the last month of his life, when he noticed that he became very tired on exertion; two days before death he developed flatulence. On the day of his death he was cycling home from work when he was seized with a violent precordial pain which went through to his back. He managed to dismount and was brought to hospital in a passing car.

On admission he was cold, shocked, and still in great pain. His pulse was regular with a rate of 120, and his blood pressure was 70/50. A well-marked presystolic triple rhythm was heard at the cardiac apex; there were no murmurs. An E.C.G. showed nodal rhythm with bundle-branch block and raised ST segments in Lead I and the precordial leads. The tracing was a poor one owing to the patient's restlessness. His general condition precluded further examination.

He was given morphine, and in view of the profound shock a plasma infusion was started, but was stopped owing to a rigor after half a pint (285 ml.) had been given. He died a few hours later, the clinical diagnosis resting between a dissecting aneurysm and a cardiac infarct.

Post-mortem examination showed gross left ventricular hypertrophy. The aortic valve was bicuspid. There was complete aortic atresia at the usual site of the adult type of coarctation of the aorta. The intima showed a split just above the aortic valve, and the dissecting aneurysm had burst through the aorta, producing a large haematoma round the base of the great vessels (see Fig.). This could well have pressed on and obstructed the left coronary artery, but no myocardial infarct was seen. The collateral circulation was not dissected.

COMMENT

Coarctation of the aorta is of two types. The infantile type consists of narrowing of the whole isthmus of the aorta from the left subclavian artery to the ductus arteriosus; the



Photograph of the specimen.

remaining digestive function: it seems that the rapid passage of food through the small bowel due to the gastric resection does not allow enough time for the impaired digestion to achieve maximum results. Consequently, despite the fact that this patient has a very large appetite and takes a pancreatin compound by mouth, she hovers close to the verge of starvation. Her condition is worthy of note, as there has been some demand for extensive gastric resection to be incorporated with pancreatoduodenectomy in an attempt to eliminate the stomal ulcers which sometimes occur. This case indicates that such a course would not be without its own hazards.

Brintnall (1952) reported a series of cases in which he used a form of reconstruction essentially that described by Child (1944); this entails telescoping the pancreatic stump into the open end of the jejunum; below this the common bile duct is implanted end to side, and lower still the gastro-jejunostomy is formed. No fistulae developed and the method appears to be very satisfactory. Brintnall also advocates mobilization of the portion of the pancreas to be removed from left to right; this, he maintains, gives the greatest possible exposure of the portal vein.

Is there a place for pancreatoduodenectomy in the surgeon's repertory? There has recently been some suggestion that so extensive an operation is not worth while for carcinoma of the head of the pancreas, because the post-operative survival is generally short. This is a fallacious argument; palliation is at times the sole aim of surgery, and, though not so in this instance, it should be noted that effective palliation is obtained even when life is not greatly prolonged. Two patients have been observed following short-circuit operations; they became, within four months, impressively miserable from the pain of their growths. Suffering can be avoided by resection, and this operation should be done for all operable cases. Furthermore, Orr (1952) reports an average survival of 15 months with the radical operation, in contrast to 4.4 months following palliative procedures.

We must always seek to progress, and there is no doubt that dissatisfaction with results obtained is a greater stimulus to further endeavour than is the counsel of despair which labels a condition beyond the scope of surgery and incurable. Neither should it be overlooked that, in regard to carcinoma of the pancreas, Brunschwig, one of the pioneers in this field and an advocate of radical excision, reported a seven-year survival for carcinoma of the head of the pancreas proper.

Dodd wrote in 1949, "I make a plea that in cases in which painless jaundice has been present for a month the possibility of carcinoma of the pancreas should be considered and a surgical opinion sought." This statement merits repeating because it indicates the correct line to be followed if cases are to come to surgery early enough to allow a determined attack to be made on the growth with hope of success.

Summary

Two successful cases of pancreatoduodenectomy for carcinoma of the head of the pancreas, in patients over 65 years, are reported. One patient had recently undergone emergency gastric resection for haemorrhage.

The place of the operation in present-day surgery is discussed; it may require to be made more radical.

The importance of early laparotomy for patients with undiagnosed or painless jaundice is stressed.

I am grateful to Dr. J. McMurray for the pathological reports.

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circulation depends on a patent ductus arteriosus, and is compatible only with a few weeks or months of life. The adult type consists of a localized narrowing about the level of the ductus arteriosus, and these patients may live for many years; in Abbott's series the ages of death varied from 3 to 92 years, with an average of 32. In 200 cases which came to necropsy the atresia was complete in 47, extreme (under 6 mm.) in 108, and moderate in 45. The figures of Reifenstein *et al.* (1947) are similar, the average age at death being 35. Both workers found that rupture of the aorta was a common cause of death, especially among younger patients. Abbott found it 40 times in her 200 cases examined at necropsy, and all Reifenstein's cases occurred between the ages of 10 and 30. The rupture generally occurred in the ascending aorta, but was sometimes seen at, or near the site of, the obliterated ductus. Here the aorta was often dilated at the emergence of the intercostal arteries, or kinked by the ligamentum arteriosum. Histological examination of the aorta nearly always showed medial degeneration. There was interruption and diminution of the elastica and muscle, with fatty and hyaline degeneration. The connective tissue was increased: Gore and Seiwert (1952) found this in 85 cases of dissecting aneurysm, not necessarily associated with coarctation; hypertension was present in only 58% of cases.

The recognition of coarctation of the aorta is not difficult if the diagnosis is kept in mind. Hypertension is present in most cases, but may be only slight in children. A systolic murmur is often heard over the front and back of the chest, where the enlarged collateral circulation may be seen and felt; the unusual site of the murmur is most suggestive of a coarctation. The femoral pulses are absent, or are feeble and delayed. Radiology may show notching of the lower borders of the ribs due to the hypertrophied intercostal arteries.

Surgical treatment of the condition is generally undertaken in children and young adults; therefore it is necessary to make the diagnosis early, generally before any symptoms arise.

If the femoral arteries are palpated as a routine during a medical examination cases of coarctation of the aorta will not be missed.

I wish to thank Dr. E. S. Duthie for the pathological examination and Mr. R. P. Welch for the photograph of the specimen.

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Rupture of a Congenital Solitary Kidney

The disaster of severe trauma to a solitary kidney of congenital origin is fortunately rare. Orkin (1950) has collected seven examples. The following case is a reminder of this tragic possibility.

CASE REPORT

A man aged 63, returning from his work in a dockyard, tripped and fell across a heavy chain, injuring his left side. He walked home and, fearing he had injured his ribs, then walked to hospital. The casualty officer found severe tenderness over the left loin and left lower ribs, and took the wise precaution of inspecting his urine. Gross haematuria was found and the patient was admitted. Shortly after admission the pulse rose and the blood pressure fell. In half an hour an enormous tumour grew in the left loin and projected anteriorly, to be clearly delineated like a huge hydronephrosis. Blood transfusion failed to control the falling blood pressure, and there was every justification for a rapid transfer to the operating theatre.

Operation.—Through a left lumbar incision a huge perirenal haematoma was explored. In the midst of free fluid,

blood, and clot lay a lacerated kidney with its pedicle almost completely detached. The kidney was lifted out and the bleeding pedicle readily controlled. The cavity formed by the haematoma extended more than an inch (2.5 cm.) beyond the right margin of the vertebral column. Palpation to the right was thought to confirm the presence of a right kidney. With control of haemorrhage the general condition improved rapidly. In all, six pints (3.4 litres) of blood was given.

Post-operative Course.—As no urine was voided twenty-four hours after operation a catheter was passed and 1 oz. (28 ml.) of bloody urine withdrawn. The blood pressure was normal, and with no further secretion by the end of the second day it was noticed that the right testicle was not palpable in the scrotum or elsewhere. On the fourth day cystoscopy was performed and in a contracted bladder no right ureteric orifice could be found. The absence of a right kidney was now presumed. The patient died on the tenth post-operative day. A post-mortem examination confirmed the complete absence of the right kidney and ureter. The right adrenal gland was present. The bladder was small and thick-walled, with poor development of the right side of the trigone. There was a small but complete right intra-abdominal testicle. Examination of the left kidney confirmed that it was split transversely through the hilum and that the vascular pedicle was almost completely torn.

COMMENT

In this case the rapid deterioration from haemorrhage necessitated urgent operation. It was not justifiable to attempt intravenous pyelography, although it is agreed that this practice has an established place in the management of renal injury. Orkin (1950), amongst many others, has stressed how this investigation may determine the necessity or otherwise for immediate exploration of the damaged kidney, and how valuable it is in revealing a functioning kidney on the other side. It would have been possible to do a cystoscopy before nephrectomy in the above case, and had the absent testicle been noted suspicion of a solitary kidney might have been aroused. The fact that the injured kidney could not be saved does not forgive this inadequate pre-operative management. In other circumstances recognition of a solitary kidney might have encouraged an attempt at suture or even vascular repair.

Hamilton and Peyton (1950) reported a case in which by pyelography and cystoscopy it was recognized that an injured hydronephrotic kidney was solitary. Bleeding persisted and the kidney had to be explored: a 10-cm. laceration was sutured and the kidney saved. Orkin (1950) described the radiological and cystoscopic confirmation that an injured kidney was solitary. In this case operation was not required and conservative treatment was successful.

Congenital solitary kidney is not unduly rare. Collins (1932) collected 581 examples, and Longo and Thompson (1952) suggested that the necropsy rate is about 1 in 1,000 cases and the clinical incidence about 1 in 1,500 cases. If we add the possibilities of hypoplastic or maldeveloped kidneys, of kidneys destroyed by disease, and of kidneys removed by previous nephrectomy, injury to a solitary kidney is an accident worth consideration. The solitary kidney may be damaged rather more readily, as it is usually larger and therefore less protected than a normal kidney. Longo and Thompson (1952) have shown a high incidence of disease in the congenitally solitary kidney. This, too, may make it prone to injury—hydronephrosis being a common complication. Anomalies of the genital tract are common in females with solitary kidney; in males the association occurs in only 10% of cases. This is the second case I have seen in which an absent testicle was noted with a congenitally absent kidney.

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Reviews

IN HONOUR OF CHARLES SINGER

Science, Medicine, and History: Essays on the Evolution of Scientific Thought and Medical Practice. Written in honour of Charles Singer. Collected and edited by E. Ashworth Underwood. Volumes I and II. (Vol. I: Pp. 563, illustrated. Vol. II: Pp. 646, illustrated. £11 11s. the set.) London: Geoffrey Cumberlege (for Oxford University Press). 1953.

The occasion of the presentation of these two volumes of *Essays* to Dr. Charles Singer has already been described in this *Journal*. To do justice to this splendid tribute to a great medical historian is no easy task. A brief biography of Dr. Singer with a bird's-eye view of his achievements, an introduction by Sir Arthur MacNalty, ninety learned essays, and finally a list of Dr. Singer's 412 contributions to the literature of medicine and medical history—all this can scarcely be treated adequately within the compass of an ordinary review.

Dr. Ashworth Underwood must have conceived the idea of these volumes and have started collecting the essays a good many years ago. Fourteen of his contributors have died without seeing the completed book, and the difficulties which oppress the editor of any composite volume are notorious. Dr. Underwood is therefore to be congratulated on bringing his heavily laden ship to harbour and to be thanked for the treasures it contains.

The essays in these two large volumes are as various in subject as the interests of Dr. Singer himself. They are divided into eight books, the first seven covering chronological periods, the eighth dealing with matters that could not be thus accommodated. The first book treats of the Ancient World, beginning with an illuminating essay by Professor Gordon Childe on "The Constitution of Archeology as a Science." Mr. Warren Dawson provides an authoritative account of "Egypt's Place in Medical History," in which he makes clear what were the original sources of medical and anatomical knowledge and how it was inextricably mixed with magic. The practice of mummification allowed the study of comparative as well as human anatomy and pathology, and so fostered the true beginnings of medical science in the Valley of the Nile. Another paper by Dr. Chauncey D. Leake and others reveals the fascinating contents of the Hearst Papyrus, from which it is clear that treatment of fractures by plaster casts was well established by 1500 B.C. An essay by the late Professor George Gask and the Rev. John Todd traces "The Origin of Hospitals," and from this it appears that no hospital in the true sense existed before Christian times and that probably they did not begin until the first half of the fourth century A.D. Dr. Wilfred Bonser's contribution on "General Medical Practice in Anglo-Saxon England" is remarkably interesting for its demonstration of how the curing of disease was virtually a monopoly of the Church. Saints and their relics were systematically exploited as the supernatural means of exorcising what was assumed to be a supernatural visitation. Christ had shown the way by His miracles, and the holiness of His saints was manifested by their power to do the same. Ignorance of the nature of disease was common to ecclesiastical and lay practitioners and their understanding of the remedies they used was correspondingly primitive. Blood-letting had been handed down from classical times, and, being connected with the doctrine of humours, was used indiscriminately and survived in medicine for more than another millennium. Dr. Henry Sigerist writes a characteristically interesting and important paper on the contents of the remarkable manuscript at Johns Hopkins University containing a gynaecological collection made by Johannes Hartlieb, a Bavarian court physician, in the middle of the sixteenth century. Dr. Castiglioni wrote not long before his death on Pliny's great book and the School of Ferrara, studying particularly the work and influence of Leoncenus. Mrs. Arber contributes a learned and interesting paper on

mediaeval herbalism and its progress to modern botany. Among the non-medical essays Professor F. J. Cole's history of Dürer's rhinoceros is particularly attractive. The animal passed through many pictorial transformations and in 1617 appeared as the crest of the Society of Apothecaries, its horn being then still of importance in the pharmacopoeia. Three papers on Vesalius—"Some Vesalius Studies" by Dr. Monteiro, of Oporto, "Vesalius and the Galenists" by Dr. Ashley Montagu, and "Vesalius: Imperial Physician" by Drs. O'Malley and Saunders—keep alive the subject of the great anatomist. Fernel's name is commemorated in Dr. Long's study of his ideas on tuberculosis. Dr. Galdston, of the New York Academy of Medicine, extracts much of interest regarding psychiatry in his survey of the writings of Paracelsus, who clearly used psychotherapy very much in the modern manner. Sir Arthur MacNalty pays his tribute to "Sir Thomas More as Student of Medicine and Public Health Reformer." Dr. Walter Pagel covers a wide field in seventeenth-century biological thought by consideration of the reaction of seven important writers to Aristotle. These include Glanvill, Charleton, Harvey, and Glisson. The importance of Glisson as a thinker in addition to his anatomical pre-eminence is well brought out.

The second volume covering the later seventeenth century, the eighteenth and nineteenth centuries, and the *Conspectus Generales* is perhaps less exciting than the first, but there is still plenty to attract the eye of a medical reader. Dr. Ashworth Underwood chooses for his own contribution an account of Gottfried von Berger and his textbook of physiology published in 1701. Mr. Johnston Abraham writes an all too short account of John Fothergill. Professor Cave draws attention to the fact that it was really Sir Richard Owen who first described the parathyroid glands, having dissected them in a rhinoceros in 1849. The credit is usually given to Sandström's monograph of 1880. Dr. Dorothy Turner examines the work of that extraordinary man, Sir Thomas Young, on the eye and vision. His dictum that "the longer a person lives the less he gains by reading" should not be a deterrent to the perusal of the volumes under review. The names of Professor K. J. Franklin, Dr. Major Greenwood, Dr. Douglas Guthrie, Professor J. F. Fulton, and Sir Charles Scott Sherrington among the writers of *Conspectus Generales* is sufficient evidence of their value.

Attention has here been directed chiefly to the contributions of medical interest, but this does not imply that those covering allied sciences are of any lesser significance. This splendid work is profusely illustrated, and, though the price seems high, the buyer may be assured that he is getting his money's worth. The full indexes provide an essential guide to the whole.

GEOFFREY KEYNES.

ANTIBIOTIC THERAPY

Recent Advances in Chemotherapy. Vol. III—Antibiotics. By F. C. O. Valentine, F.R.C.P., and R. A. Shooter, M.A., M.D. (Pp. 292, illustrated. 27s. 6d.) London: J. & A. Churchill. 1954.

The late Dr. G. M. Findlay had planned that the third edition of *Recent Advances in Chemotherapy* should be in four volumes, of which two had appeared before his death. The present authors have shouldered the main outstanding task, and the series now covers most of its immense subject, the chief hiatus being the absence of any section devoted to the sulphonamides.

Antibiotics do not belong exclusively to any one branch of medical science; clinicians, microbiologists, and pharmacologists are all entitled to write about them and have done so. Which of them can write the most useful book is a matter of opinion. The microbiologist starts with some advantages. Antibiotics are, after all, microbic products, and it is his business to understand them. Moreover, bacteria are his daily companions, and their behaviour in the presence of antibiotics is variously and vividly illustrated in cultures the examination of which now occupies much of his time. If at the same time he is in close touch with, and sometimes advising, numerous clinical colleagues,

perhaps in hospitals where new antibiotics are receiving their first trials in this country, his knowledge of the more difficult aspects even of clinical application may exceed that of the individual clinician.

This book is the product of such experience, and is the first satisfying one of its size on this subject to appear—at least to a reviewer who views these matters from the same standpoint. It is quite remarkably up-to-date: there is a reference to a paper which appeared in November, 1953—four months before publication. It deals thoroughly and soundly with all the specific infections in which antibiotic treatment is indicated and, regionally, with venereal diseases, infections of the lung, meninges, bowel, and urinary tract, but not with wound infections as such, or those of the eye, nose and sinuses, skin, or uterus. It is in these directions that expansion in further editions might enhance the value of the book, although it may well be argued that, since chemotherapy should be directed against the micro-organism rather than the particular type of disease, a regional approach is superfluous unless special techniques are involved. The index needs expansion, and more needs now to be said about reactions to penicillin: so-called anaphylactic shock, which has been fatal in many recently recorded cases, is not mentioned.

The table of sensitivities of 22 species to eight antibiotics and the chapter on the general principles of treatment in which it occurs are admirable features, and some of the best chapters are those on bacterial resistance, on staphylococcal infections, and on tuberculosis. The last in particular is the most informative and readable general account of this highly specialized branch of chemotherapy which has yet appeared. The book can be recommended confidently as a guide both to principles and to practical therapeutics.

L. P. GARROD.

FAVOURITE PRESCRIPTIONS

Favourite Prescriptions. Edited by Sir Heneage Ogilvie, K.B.E., D.M., M.Ch., F.R.C.S., and William A. R. Thomson, M.D. 2nd edition. (Pp. 88. 5s.) London: The Practitioner, 1954.

The second edition of this book contains a good new chapter by Dr. Philip Evans on paediatric prescriptions. It is doubtful, however, whether this justifies the perpetuation of a work so often advocating complex and irrational mixtures which are both unnecessary and uneconomic. The *National Formulary* fulfils most prescribers' requirements much more efficiently. The doses are expressed in imperial measures, and, except in Dr. Evans's chapter, the metric equivalents are clumsy and pedantically precise. Much of the treatment recommended is out of date and ill-advised. It is doubtful, for instance, whether 15 to 30 minims of oral nikethamide taken night and morning, or a mixture of strychnine hydrochloride and dilute hydrochloric acid, will help "the elderly suffering from arteriosclerosis and low blood pressure and/or vascular lesions in the brain"; and the addition of ammonium bromide to an iron mixture is likely to exacerbate rather than to relieve the "dull headaches and depression" met with in anaemia. It is a pity that the all-too-common belief that the neuritic pains commonly encountered in this country can be relieved by aneurine hydrochloride should be perpetuated, and that bromides should continue to be given pride of place in the treatment of epilepsy. Medical students would rightly be reprimanded for following the advice to use oily drops in nasal conditions, intravenous potassium (without qualification) for infective hepatitis, and topical sulphonamides for burns. Such examples could be multiplied many times. The advent of powerful and specific modern remedies should make us reconsider the advisability of using many of the preparations advocated in this book. There is a place for the use of placebos in medicine—though they are dangerous drugs for the doctor who prescribes them—but it is doubtful whether a book which gives them such a prominent place is necessary or desirable.

D. M. DUNLOP.

THE ACUTE ABDOMEN

Diagnosis of Acute Abdominal Pain. By William Requarth, M.D. Foreword by Warren H. Cole, M.D. (Pp. 243; illustrated. 38s. or \$5.) Chicago: Year Book Publishers, Inc. London: Interscience Publishers Ltd. 1953.

This is essentially a description of the surgery of the acute abdomen from the clinical standpoint. It is well illustrated by photographs, radiographs, and diagrams, and by clear descriptions of typical cases, and will reward careful study. Very full references to the literature will help those who want to make a special study of any one of the many different conditions described. To the student the elaborate laboratory tests described may be of interest, but we feel that they will be looked at a little askance by the practical surgeon—perhaps of the old and out-of-date school—who has dealt with many acute abdomens and often in the middle of the night.

To one who was taught by Henry Head and learnt at first hand his great work on visceral pain the book is a little disappointing, for it bears little relation to its title. There is no mention of the mechanism of abdominal pain or of what may be learnt from its study. Epigastric pain as an early symptom of appendicitis is mentioned, but not as indicating distension of the appendix; and the change in site and character of pain as infection reaches the lymphatics is not brought out. It is surely important to recognize the different characters and meaning of visceral pain, peritoneal pain, and referred pain, perhaps from the pleura, and to understand the mechanism of each. Apart from these small criticisms the book contains a large amount of useful information in small compass and is admirably produced, so that the excellent illustrations can be fully appreciated.

HENRY SOUTTAR.

MANAGEMENT OF PAIN

The Management of Pain: With Special Emphasis on the Use of Analgesic Block in Diagnosis, Prognosis, and Therapy. By John J. Bonica, M.D. (Pp. 1,533. 444 illustrations. £7 5s.) London: Henry Kimpton, 1953.

This book presents in one volume a complete discussion of the fundamental aspects of pain, the various diseases and disorders in which pain constitutes a major problem, and the methods employed in its management, with special emphasis on the use of analgesic block as an aid in diagnosis and treatment. The author is to be congratulated on the highly successful way in which he has covered this vast field. Numerous and detailed references are given at the end of each chapter, and these will prove of the greatest value to anyone seeking further information on a particular problem.

The book is composed of three parts: the first part includes a discussion of the fundamental aspects of pain, the author stressing that in order to manage pain properly its anatomical, physiological, and psychological bases must be understood. The second part is on the methods and techniques of managing pain, including not only analgesic block but also such subjects as the use of general analgesic methods, psychotherapy, physical therapy, and neurosurgery. Analgesic-block methods are discussed in great detail, and the account of them is one of the best yet published. The illustrations are excellent and the text is of remarkable clarity. Anaesthetists and others called upon to perform regional blocks for the management of painful conditions will find this section invaluable. In the third part the author presents the various diseases or disorders with painful syndromes which have been and can be managed with analgesic block with or without the aid of other methods.

Despite its size the subject-matter of this book is covered in a concise and readable fashion. The style of the text and layout of the book are most attractive; there are nearly 450 illustrations of excellent quality. This book is highly recommended to all interested in the management of conditions in which pain is prominent.

CYRIL F. SCURR.

BRITISH MEDICAL JOURNAL

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PROLONGED TREATMENT WITH CORTISONE AND A.C.T.H.

Much experience has been gained in the use of cortisone and A.C.T.H. in the five years since Hench and his colleagues¹ reported the remarkable remissions which could be produced by Kendall's Compound E in rheumatoid arthritis. Clinicians in the U.S.A. have had access to larger supplies of these substances and for a longer period than workers in this country, where both have been sparingly distributed by the Ministry of Health. As a result much of the available material has been devoted here to relatively short courses of treatment or used in topical therapy, and most of the reports on the results of prolonged treatment have emanated from abroad. In the last two or three years, however, enough has been distributed to enable studies to be carried out on several series of patients. No one who has seen the immediate effects of cortisone or A.C.T.H. can doubt that they bring about profound and dramatic improvement in a variety of serious disorders. Apart from Addison's disease and hypopituitarism, where they are rationally used as a form of replacement therapy, it cannot be claimed that they do more than suppress symptoms. It is true that in some conditions they may tide a patient over an acute phase until a natural remission occurs, and they have been likened to an asbestos suit which enables the wearer to remain unscathed in the flames until the fire has burnt itself out. Unfortunately far too often the fire remains alight, and it seems as if the victim is doomed permanently to wear this uncomfortable apparel.

Rheumatoid arthritis is by far the commonest of the diseases relieved by cortisone and A.C.T.H., and it will be long before there is enough of these drugs to treat every case. The original hope that short courses of treatment would give lasting benefit has proved unfounded, and it is now realized that when treatment is discontinued many cases relapse. Interest is thus directed towards the benefit which may reasonably be expected from indefinitely prolonged administration. It is, moreover, necessary to weigh this benefit against the side-effects and complications that

may arise. Some of these are avoidable or reversible by manipulation of the dose, but others endanger life and have sometimes proved fatal. Opinions about the ultimate value of long-term therapy with cortisone in rheumatoid arthritis vary considerably. Most observers agree that it is often difficult to find a dose which will continue to relieve symptoms without giving rise to side-effects; all agree that advanced cases with ankylosed joints are unsuitable. But experience shows that in general patients are definitely better when they are receiving cortisone. It has, however, been claimed² that this improvement is no greater than can be achieved without the use of a potentially dangerous drug. This view receives strong support from a carefully planned and statistically controlled comparison of cortisone and aspirin in early cases of rheumatoid arthritis. This clinical trial, published in our opening pages this week, was sponsored by the Medical Research Council and the Nuffield Foundation; it was designed to answer a specific question: "Is it possible to maintain the well-being of a patient suffering from early and uncomplicated rheumatoid arthritis as well with aspirin as with cortisone?" Somewhat surprisingly the answer is unequivocally Yes.

In this series of sixty-one patients two comparable groups were treated and observed for a year. Great care was taken to ensure that the cases were matched with regard to sex, age, and duration of symptoms. The sheep-cell agglutination test gave confirmatory evidence of the accuracy of the diagnosis. Observations were made on the patients' general functional capacity and the activity of the disease. Measurements were carried out on strength of grip, on range of movement of the wrist, and on dexterity of hand and foot. Joint tenderness was assessed and the haemoglobin level and erythrocyte sedimentation rate determined. Standard doses of both drugs were used during the first fortnight, but later the quantities were adjusted for each patient so that a balance was maintained between benefit and side-effects. This dose was quite high, with a mean value of 76 mg. a day of cortisone (range 25–125 mg.) and 4.5 g. a day of aspirin (range 1.7 to 6.0 g.). The aspirin was camouflaged in brown tablets with a bitter flavour, and it seems unlikely that patients recognized the nature of these "Tabs. Rheumatic C." The results were statistically analysed by Dr. J. T. Boyd, of the Medical Research Council, but so similar was the progress of the two groups that simple inspection of the tables is convincing enough evidence of the validity of the deductions. The cortisone group had significantly higher haemoglobin levels and lower sedimentation rates than the aspirin group at the end of a year's treatment, but the differences were small. Perhaps the most important fact revealed by the investigation is that in 75% of the patients treated by aspirin

¹ *Proc. Mayo Clin.*, 1949, 24, 181.

² West, H. F., and News, G. R., *Lancet*, 1953, 2, 1123.

³ *Ibid.*, 1948, 2, 771.

⁴ Smith, M. J. H., Gray, C. H., and Lunnon, J. B., *ibid.*, 1954, 1, 1008.

⁵ Bayliss, R. I. S., and Steinbeck, A. W., *ibid.*, 1954, 1, 1010.

⁶ *British Medical Journal*, 1954, 1, 1109.

⁷ *Ibid.*, 1954, 1, 1205.

⁸ *Ibid.*, 1954, 1, 1171.

the disease was judged to be inactive at the end of a year and that 40% were capable of normal work and activity. It is by this standard that other forms of therapy must be assessed. It is interesting to speculate on the degree of improvement which might have been achieved if it had been possible to treat a similar group of patients with inert tablets or with some other analgesic such as phenacetin. Possibly what is being observed is the natural progress of the disease rather than the specific effect of a salicylate; nor can the element of suggestion be entirely excluded. Asher³ showed that inert tablets relieve pain in 50% of administrations, partly through suggestion and partly because they may be given at a time when pain is remitting spontaneously. Moreover, it cannot now be claimed that aspirin exerts its effects by stimulating the anterior lobe of the pituitary or the adrenal cortex, since salicylates do not increase the excretion of adrenocortical steroids⁴ or raise the plasma level of 17-hydroxycorticosteroids.⁵

Dr. W. S. C. Copeman and his collaborators,⁶ in a paper published in this *Journal* a fortnight ago, approached the problem of prolonged therapy of rheumatoid arthritis with cortisone from a rather different point of view. They reported the results of at least a year's treatment of twenty incapacitated patients, of whom seventeen had been able to return to their occupations. They were all severe cases of at least two and a half years' standing and described themselves as "crippled." They had received previous treatment with salicylates and gold salts, though no details of the extent of the courses were given. The average maintenance dose in this series was 69 mg. of cortisone a day. These observers believe the most suitable patients for cortisone treatment are those in whom functional disability exceeds the anatomical joint damage. Dr. F. Dudley Hart and his co-workers⁷ have also recorded the effects of cortisone treatment in doses of 25 to 75 mg. a day on twenty-two cases for six to eighteen months with "satisfactory" results in thirteen, "unsatisfactory" in four, and "unchanged" in five. They make the point that those showing a prompt reduction in soft tissue swelling benefit most, and conclude that cortisone therapy is a valuable addition to existing methods, even if it helps only a small proportion of sufferers.

In comparing these somewhat conflicting views it should be noted that the cases reported in this issue by the joint committee were all early and relatively mild. It may well be true that different results would have been obtained if long-standing and crippled cases had been included. But it will in future be necessary to determine the effects of full doses of aspirin before claiming that cortisone gives better results. It might be possible to devise some sort of cross-over test in which the individual patient could act as his own

control, and no doubt observations on these lines will be made. One important difference between cortisone and aspirin is the nature and severity of the toxic effects to which they give rise. Copeman and his colleagues divide them conveniently into those which are dangerous to life and the less important side-effects. Of their twenty patients, one developed psychological disturbance and one hypertension sufficiently severe to require withdrawal of the drug, and peptic ulceration was diagnosed in three and diabetes mellitus in one. In the joint committee's series side-effects were relatively mild and were equal in the early months of treatment with both aspirin and cortisone, but became less in the aspirin group as time passed. It must be admitted, however, that aspirin administration in full doses, though it may lead to unpleasant side-effects, is unlikely to endanger life and is greatly preferable to cortisone from this point of view.

If further experience confirms the view that most cases of rheumatoid arthritis can be treated as effectively and more safely with aspirin than with cortisone, larger quantities of cortisone will be available for the maintenance therapy of other conditions. The results of long-term steroid therapy over two and a half years at Guy's Hospital are therefore of special interest. Last week in this *Journal* Drs. E. H. McGehee and K. MacLean⁸ list the diagnoses of 185 cases treated with A.C.T.H. and cortisone and describe their experience of prolonged therapy of twenty-six cases of "collagen" diseases, skin disease, and eye conditions. In general the results they describe are more satisfactory than in most reported series. Many patients entered a phase of remission. Of special interest is their account of intermittent therapy with A.C.T.H. gel, which enables patients to attend hospital for review at only weekly or bi-weekly intervals. Complications which were encountered included three cases of gastro-intestinal perforation with two deaths, three psychotic episodes, and one case of diabetes.

Cortisone and A.C.T.H. are substances of outstanding physiological and pharmacological interest. At first, high hopes were held that we had in our hands the clue to the mechanism of many obscure diseases and that we could give sufferers from them permanent relief. This prospect is fading rapidly, and we can do little more than suppress symptoms and hope that the patient will undergo a natural remission and will not suffer a serious complication from the drugs he is receiving. Most of these diseases are in any event rare. It will be ironical if the major practical outcome of all the intensive work of the last few years is the discovery that aspirin given in maximum tolerated doses is the best and safest treatment for rheumatoid arthritis, the only common disorder for which cortisone is used.

VIRULENCE IN VIRUS DISEASE

What matters about viruses, so far as man is concerned, is their virulence; and to combat virulence an absolute understanding is needed of the complex set of factors which determine it. This is the basis of the experimental approach to the problem of virulence in virus disease—the subject of the Ciba Foundation Lecture recently given by Sir Macfarlane Burnet in London. Virulence is shown by the capacity of a virus to produce recognizable disease with lesions, symptoms, or death in a given host. The virologist attempts to show this when trying to establish a virus to grow in a new host; and it must be remembered that virulence will be determined not only by the virus but by the susceptibility of the host. In some cases several passages may be necessary before changes indicating cell damage of some magnitude are obtained. When this happens the virus concerned will be regarded as one of high virulence. Many viruses exist in nature as inapparent infections, multiplying probably at a slower rate and producing less obvious changes. Similarly in the laboratory there are many viruses, such as influenza and mumps, well adapted to growth in a particular medium, which produce little or no recognizable cell damage. Therefore, according to the particular virus-cell system being studied, marked variation in degree of virulence must be expected both in nature and in the laboratory.

The assessment of virulence in terms of quantity of virus is technically difficult. Direct counting of virus particles by electron microscopy is not yet a practical procedure. Similarly, histological examination is only of value in a virus-cell system where specific changes can be seen. The capacity of influenza and certain other viruses, including mumps and Newcastle disease virus, to agglutinate red cells affords a new approach to the quantitative estimation of virus. Under standard conditions haemagglutinin titrations present a simple and accurate *in vitro* test for estimating the concentration of virus in a given suspension, irrespective of its degree of virulence.

In the last few years Burnet and his team in Melbourne have been investigating the virulence of different strains of influenza virus, using the chick embryo for culture and the haemagglutinin test for titration. Most influenza A strains, which on primary isolation from a human case grow well in the chick embryo, produce little change in the mouse lung, apart from minor toxic effects; virus multiplication, however, occurs, and at about the eighth passage first signs of pulmonary consolidation develop. By the twentieth passage the mice succumb regularly with complete consolidation of the lungs. Examination of the original virus (which was avirulent for the mouse)

and the final virulent material in the neutral medium of the chick embryo shows that the only significant difference between the two is their relative virulence for the mouse lung. With the standard technique of limit dilutions employed in this work it seems clear that virulence is a genetically determined factor. Analysis of the bronchial washings taken from mice at different stages of the development of pulmonary consolidation and tested by the same method of limit dilutions strongly suggests that the increase in virulence is due to the selective survival of increasingly virulent mutants.

Under certain conditions, when two strains of influenza virus dissimilar in virulence are allowed to infect the same host, recombination of virus occurs, and the progeny of the double infection may have individual characteristics of the two parent strains.¹ In an extensive series of experiments Burnet and Lind² have shown that when a virulent and a non-virulent strain are crossed, strains of varying degree of virulence will emerge in the redistribution of virulence which results from genetic interaction. Burnet considers that in the same way the gradual development of virulence seen in the adaptation of influenza A strains to the mouse lung results from multiple genetic interaction and suggests that virulence genes exist as part of the virus make-up.

This work has a bearing on methods of controlling virulence in virus disease. Active immunization against yellow-fever, for instance, has been made possible by reducing the virulence of the live virus in the vaccine by a process of attenuation. The control of poliomyelitis by active immunization may well require in the long run the use of an attenuated virus vaccine: to achieve this will demand a very clear understanding of all the factors that govern virulence. Burnet's work with the influenza virus has been possible because of the ease with which the virus can be handled in the laboratory. It remains to be seen whether the study of other animal viruses can be approached in the same way. From the practical standpoint it will be difficult, but this important contribution from the Australian workers will undoubtedly arouse great interest and direct attention to the problem of virulence in virus disease as a whole.

AMERICAN SURGEONS IN LONDON

Apart from their purely professional value, international medical congresses can do much to promote sympathy and understanding between the nations. This function could nowhere be better exemplified than at the sectional meeting of the American College of Surgeons which was held in London for three days last week. A large number of American, British, and other surgeons gathered together on this

¹ Burnet, F. M., and Lind, P. E. (1950). *J. gen. Microbiol.*, 5, 60.
² ——— (1954). *Nature, Lond.*, 173, 627.

occasion. Before their arrival in London many of the Americans had already attended meetings in Glasgow and Edinburgh, as well as the annual meeting in Leeds of the Association of Surgeons of Great Britain and Ireland. As if this programme was not enough for them, some of our visitors went on immediately to meetings in France, Belgium, and Italy. In London the surgeons have chiefly forgathered at Lincoln's Inn Fields, and the occasion proved a fitting inauguration for the beautiful new Great Hall of the Royal College of Surgeons, completed only a few weeks ago. Although other parts of the College were also used for the various discussions, the huge hall, with its English chestnut panelling, gurney floor, and power-driven window-blinds, was the centre of attraction. Adjacent to this, and used for a number of social occasions during the meetings, is the new council chamber, which has oak veneer panelling—presented to the College by Ethicon Suture Laboratories Ltd—from a single tree planted at Lilford Park, Northamptonshire, in the reign of Elizabeth I.

The scientific programme was unusually full and varied. Each morning from 9 to 12 o'clock there was a marathon of papers, and many of these were presented in pairs, the opening speaker having twenty minutes and the second speaker ten. These paired papers were in each instance presented by an American and a British surgeon, and the time limit was strictly enforced. This intensive method of presentation of so many papers in the course of a morning was sometimes rather overpowering for the listener; but, after experience of so many British medical meetings, where time control is lax, those who were present could not but admire the way in which speakers were made to adhere to the timetable. Among such a large number of papers it would be invidious to single out individual contributions, most of which are referred to in this or in our last issue. But of particular note was Sir Gordon Gordon-Taylor's remark that he had performed his seventy-first hindquarter amputation on his 76th birthday. Enjoyable variations from the ordinary run of meetings were the two luncheon discussions at the Connaught Rooms. At each of these gatherings a panel of four speakers and a moderator dealt with the chosen subject in the space of one hour. Once again it was good to see the efficient organization, and the way in which the main speakers were encouraged to be brief, informative, and to the point. Supplementary questions, written out by members of the audience, were selected and presented by the moderator, this task being undertaken by Mr. Dickson Wright for a discussion on intestinal obstruction, and by Dr. Frank Glenn, acting president of the American College of Surgeons, for one on massive haemorrhage from the gastro-intestinal tract. Dr. Glenn's breezy, incisive, and expert cross-examination of the members of his

panel kept them all on their toes and enhanced the value of a lively and helpful discussion.

In addition to the formal papers and luncheon discussions, visits were made to a large number of London hospitals where a variety of interests was catered for in the clinical and operative demonstrations which had been arranged. The presentation of a Hunterian Lecture by a surgeon from the United States and of a Moynihan Lecture by a Canadian, further panel discussions on pre- and post-operative care and on hand surgery, as well as other meetings for those specially interested in gynaecology, ophthalmology, oto-rhino-laryngology, and urology, all served to emphasize the catholicity of this gathering. Apart from this intensive professional programme, the social side of the meeting was so full as to tax the endurance of the keenest socialite. Receptions were held at Lancaster House on behalf of Her Majesty's Government, at the House of Lords, the Society of Apothecaries, and the Ciba Foundation, as well as the Royal College of Surgeons. Suitable entertainments were arranged for the ladies, and on the second night there was a banquet at the Dorchester Hotel which was attended by 850 surgeons, their wives, and guests. Dr. Fred W. Rankin, president of the American College of Surgeons, the news of whose death on May 22 will have saddened his many friends in this country and elsewhere, was to have presided, and Dr. Frank Glenn took his place. The toast of the two Colleges was proposed by the Marquis of Salisbury and acknowledged by Dr. Glenn and Sir Cecil Wakeley, P.R.C.S. The whole meeting was widely adjudged a great success and a delightful example of international co-operation of the best possible kind. At the present level of medical incomes, drastic taxation, and sparse dollar allowances, probably not more than a handful of British surgeons could manage to travel to the United States for a similar congress. Perhaps better days will come, and meanwhile all will be grateful to our American friends for coming over here in such large numbers.

ROYAL SOCIETY CONVERSAZIONE

The song of cicadas buzzing at the Royal Society's conversazione last week may have reminded some of the Fellows of their less intellectual evenings by vineyard or beach, but it served here to reveal the physiology of its production under the guidance of Mr. J. W. S. Pringle, F.R.S., of Cambridge. Near by, that humbler insect the housefly was on show, strains resistant to insecticides being displayed in jars by Dr. R. Busvine, of the London School of Hygiene and Tropical Medicine. A few strains resistant to D.D.T. have now been found in England. Also from this school came another exhibit of insects: Dr. K. Mellanby showed how they can be rapidly acclimatized to normally lethal temperatures if they are first kept for a short time at an intermediate

temperature. Mr. A. F. Huxley, of Cambridge, showed an interference microscope, an instrument that has some advantages over the phase-contrast microscope, one being that it gives a more faithful image. Another ingenious piece of microscopy was being demonstrated by Sir Geoffrey Taylor, F.R.S., and Lord Rothschild, F.R.S., also from Cambridge. They had bulls' spermatozoa swimming in water and illuminated in the microscope field by a rapidly interrupted light. By adjusting the rate of interruption, the tail of any particular spermatozoon could be made to appear motionless even though it was flickering rapidly. The various types of oxygen equipment used in the climbing of Everest last year made an unusual exhibit. Inevitably rather heavy and cumbersome, their display served to remind visitors, albeit unwittingly, of the human will and muscle that were as necessary as inventive skill for living at those heights. Physiology of a kind more reminiscent of student days came from Mr. J. E. Pascoe, of the Physiology Department of University College, London, who showed how changes of temperature alter the transmission of impulses through an isolated nerve ganglion, and from Mr. A. C. Downing and others, of the same department, who showed how changes of pressure alter the contraction of an isolated frog muscle.

Once again the Marine Biological Association of the United Kingdom had dredged from the sea a variety of starfish, sea squirts, worms, and crustacea. Some of these animals, with their highly coloured integuments, owe their brilliant pigments to their ability to concentrate such rare metals as niobium and vanadium from the sea-water passing through them. That Nature still outstrips Man in inventiveness seemed to be the lesson that this exhibit bore for the radar experts in the next room.

CONFERENCE OF HONORARY SECRETARIES

In this week's *Supplement* (p. 283) we report the proceedings of this year's conference of Honorary Secretaries of Divisions and Branches, which took place at B.M.A. House on May 19, with Dr. D. M. Hughes in the chair. This annual event is an important one in the Association's calendar. It enables honorary secretaries from all over the United Kingdom to get together in a not too formal atmosphere and to pool the resources of their wide experience in furthering the smooth working of the organization. Not the least valuable part of the Conference is the opportunity which it gives for making personal acquaintances between the secretaries in the periphery and the Headquarters staff.

Mr. H. H. Langston, who is chairman of the Constitution Committee, recently set up by the Council to review the Association's organization, spoke in the morning on the question of "What is the most effective area as the basic unit of the Association?" and left no doubt that in his view it was the Division—a view which was supported in the discussion which followed. It emerged that the majority present felt that a small Division had more chance of fulfilling its function actively than a large one, and that the friendly spirit was more readily evoked among a small number. The afternoon

session brought suggestions from Dr. V. Cotton Cornwall on how the Association in its Divisions and Branches could help the newly qualified hospital resident, and Dr. Joan Chappell, who followed, thought that the Divisional meeting should be the Association's local shop-window and should show itself to the hospital resident as worthy of more than a glance. In the general discussion it was clear that honorary secretaries fully realized the need to attract and to help the young doctor, and many gave useful accounts of what they were already doing in this direction.

THE PRESIDENT'S TOUR

Last week the President, Mr. Tudor Thomas, gave a full report to the Overseas Committee on his recent tour on behalf of the Association of its Branches and Divisions in the Middle and Far East. The object of the tour was to carry greetings and good wishes from the Association in the United Kingdom to its members in these places, to express an interest in their welfare, and to help them in any way possible. It is not always realized that the B.M.A. has responsibilities towards some 4,000 members in Branches scattered over many countries outside the British Isles, not to mention the 11,000 in the Branches in Australia and New Zealand. The President was able to visit only five Branches, representing some 1,500 members, but they are perhaps among the most isolated by distance from contact with Headquarters in London, and barred by geographical obstacles from frequent meetings of members within their own bounds. The 150 members of the Middle East Branch, for instance, are spread over seven countries.

Mr. Tudor Thomas, accompanied by Mrs. Tudor Thomas, left London on March 9 and returned on April 24, having travelled in the interval some 22,500 miles by air and reaching as far east as Hong Kong. But this feat, formidable in itself, was, so to speak, only the connective tissue of a programme of some 30 addresses and lectures, a broadcast, 50 official dinners, lunches, and receptions, and visits to over 30 hospitals (where patients were often seen in consultation) and university departments. These figures speak for themselves of the amount of official business that was got through, but they do not record those numerous personal contacts which are the essence of such a tour, and to the value of which the President refers as follows: "Many of the doctors whom I met had never been in England and had never seen the workings of the Association in this country. I felt that they were pleased to realize that they formed part of the Association and that by my visit they were perhaps making a closer contact with the Association than they had ever done before." That the journey fulfilled its object in every way is clear from the President's modestly phrased report, and in thanking him for undertaking this strenuous task the Association will be conscious of its good fortune in having at its service so able an ambassador. All who know Mr. and Mrs. Tudor Thomas will be sure that, wherever they went, they left behind them a greater understanding of the functions and traditions of the B.M.A. and an enhancement of its prestige.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

BIOPSIES

BY

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A biopsy is an examination of tissue removed surgically. Since the term "biopsy" implies an examination, it is superfluous to speak of "biopsy examination." When the surgeon says he is "taking a biopsy," he is in fact "taking a specimen for biopsy" or "taking a biopsy specimen"; biopsies are performed by the pathologist, not by the surgeon, who simply obtains the material. Another name for this branch of pathological work is "surgical histology," which indicates clearly both the source of the material and the characteristic feature of the examination. The term "histopathology" has no advantage over "biopsy" and "surgical histology," and does not indicate whether the material was obtained from the living or the dead.

Biopsy may be performed before, during, or after treatment of the patient. When the lesion is both large and readily accessible—for example, on the surface of the body or in the mouth or rectum—the surgeon may remove a small piece of it and await the pathologist's report before deciding on the treatment. A lesion that is both small and readily accessible should be excised completely; there is no point in subjecting the patient to two operations; one, an excision of a minute fragment of the lesion for pathological diagnosis, and the other, excision of the rest of the lesion. Surgical excision of a lesion is preferable to therapeutic destruction of it *in situ*, since excision allows of a microscopical examination. When the diagnosis is reasonably certain on clinical grounds—for example, if the patient has the usual signs of a mammary scirrhus—the surgeon treats the patient radically without preliminary biopsy in the confident expectation that the diagnosis will be subsequently confirmed by the pathologist. When the lesion is internal, preliminary biopsy is often impracticable, and the biopsy can be made only on the specimen obtained after treatment on the strength of the clinical findings.

Value of Biopsy

All material removed surgically is worth examining, no matter how sure of his diagnosis the surgeon may feel. Although the clinical diagnosis is often confirmed, surprises are not rare, and the prognosis or treatment may be radically revised as the result of the pathologist's report. Malignancy may be simulated exactly by benign conditions; familiar examples are certain inflammations of the large intestine; and giant hypertrophic gastritis, though rare, may be clinically indistinguishable from gastric cancer. Conversely, lesions that the surgeon thinks benign—in the breast, for instance—may prove on microscopical examination to be malignant.

The certainty of pathological diagnosis varies as widely as that of clinical diagnosis. Many diseases are identifiable with certainty on examination of a section; these include most surgically removed cancers and tuberculosis and other well-known infections. Sometimes only the general nature of the disease is determinable; for example, a malignant growth may be so undifferentiated as to be unclassifiable even broadly as carcinoma or sarcoma, but the fact of malignancy is nevertheless an important item of informa-

tion. Sometimes the same histological picture is given by different diseases; in some cases of Hodgkin's disease the lesion is microscopically identical with that of mixed-cell sarcoma, and the two conditions have probably been confused. Similarly, early Hodgkin's disease in a lymph node may be microscopically indistinguishable from lymphatic leukaemia or lymphosarcoma. Some clinically malignant tumours may show little or no histological evidence of malignancy; these include certain "myxomas," "lipomas," and tumours of the thyroid; in such cases treatment must obviously be based on the clinical findings, supplemented when practicable by examinations other than biopsy.

The Specimen

The sooner a specimen is fixed, the better the section will be; the specimen should therefore be put in a fixing fluid immediately after its removal from the body; if the fresh specimen is put aside in a dish to be dealt with at the end of the day's operating, it may easily be thrown away or be left to dry until the hatching of maggots reminds someone of its presence.

The best practice is for the laboratory to keep the operating theatres supplied with vessels of various sizes already containing the fixative. The most convenient fixative is 10% formal saline; a litre of this consists of 100 ml. of commercial formalin, 900 ml. of tap-water, and 8.5 g. of sodium chloride. Since commercial formalin is a 40% solution of formaldehyde, the fixative contains 4% formaldehyde. Owing to the similarity of their names, formal saline and normal saline could be confused, with serious results; it would therefore be best if each container bore a large coloured label with the words "Pathological Fixative—Poison."

The whole of the tissue removed should be sent to the laboratory. This enables the pathologist to see the lesion as a whole, to note its relation to surrounding tissues, and to choose the best points for sampling. The whole of an amputated limb is not often sent, but if the condition is serious enough to require amputation the pathologist ought to have the whole limb so that he can study the extent of the tumour or the state of the blood vessels. To deal satisfactorily with large specimens such as limbs or massive tumours, the pathologist needs the help of the surgeon; by examining such specimens together, they can decide on the most suitable parts for microscopical examination, and so obviate the necessity for cutting many blocks. It is not unknown for the laboratory to receive only a minute fragment of a large excised tumour, or even only tissue adjoining an excised tumour, because the tumour itself was wanted for somebody's private collection. The commonest mistake of the surgeon is to send a part when he should send the whole.

When the specimen is more than a few inches in diameter, the surgeon should bisect it through the part containing the lesion. This gives the fixative immediate access to the lesion and incidentally allows the surgeon to see at once what he has removed. The worst fault is to make multiple incisions into such specimens as lymph nodes and small tumours of the breast; in such cases it may be impossible to get a satisfactory section for microscopical examination. Another good reason for not incising lymph nodes is that they may be heavily infected; they should be allowed to fix for some time before being opened.

Urgent Specimens and Dispatch

When a request form is marked "urgent" the time normally needed for reporting is reduced by (1) processing faster than usual if the specimen is small, (2) examining the section as soon as it is ready, and (3) telephoning the report. Abnormally rapid processing may result in poor sections, and consequently the diagnosis may be difficult or impossible; extra tissue may then have to be processed, the final result being a longer delay in reporting than if the request had not been marked "urgent." It is not desirable to process lymph nodes faster than normal, although time can be saved by immediate examination and telephoning the report.

There may be a variety of good reasons for "urgent" requests, but such requests should be made with discretion, and preferably with an explanation of the nature of the urgency. The laboratory has equal obligations to many surgeons, and every "urgent" request from one surgeon means delay in reporting for others. Most surgeons in fact make "urgent" requests only at long intervals, and the requests are accordingly accepted without question; when "urgent" requests come in large numbers from a single firm, the pathologist may well suspect that the word "urgent" is being used with insufficient discrimination.

A specimen for examination deserves at least the same care as a registered letter. There is little or no risk of loss once the specimen has been collected from the operating theatre by the messenger; but loss and delay are familiar enough in the theatre. The trouble is that usually no one is responsible for seeing that specimens are dispatched promptly and properly. The surgeon may ask the theatre sister to send them, but she may well pass on the instruction to another nurse or orderly—and either may have gone off duty when the messenger arrives to collect the day's specimens.

One person should be made responsible for the dispatch of specimens, and the most suitable person is the surgeon's assistant, who knows the importance of pathological examinations and what the requirements are; no member of the nursing staff is properly qualified for this function. The assistant in charge of specimens should never delegate his responsibility, but see to it personally that the specimens are collected by the messenger. There should be no difficulty in fixing regular times for the collection of specimens.

Data Needed by Pathologist

The meaning of a histological picture sometimes depends on the patient's age and the history of the lesion; if the pathologist is not informed of these, he can easily make a wrong diagnosis. A familiar example is the pigmented mole of the skin; this may look particularly malignant under the microscope and a report in this sense might result in an amputation. In childhood such moles are usually benign, however malignant they may look, and inquiry may show that the lesion has been present for years without any increase in size.

The accumulated experience of pathologists finds expression in the blank form commonly supplied to the surgeon who wants a specimen examined. This form requests such obvious particulars as the patient's name, sex, age, and ward; the site of the lesion; the duration of the illness; the clinical diagnosis; and the treatment given, especially if it is likely to affect the microscopical appearances, as in toxic goitre. This represents the bare minimum of information needed by the pathologist before he can form a sound opinion. All the information asked for by the laboratory should be supplied, preferably by the surgeon himself and not by an assistant or nurse.

The printed form cannot provide for all the information sometimes required by the pathologist. In specially difficult or interesting cases the surgeon may realize this and anticipate the need by sending unusually detailed information, but the pathologist often has to extract the information himself from the surgeon or his staff. When full information has

been supplied, it is sometimes possible for the pathologist to suggest a likely diagnosis from this alone.

Whenever there is doubt or difficulty on either side, surgeon and pathologist should meet for discussion. Such consultations usually result in complete agreement on the most probable diagnosis and the most suitable treatment and are of immense benefit to the patient; some surgeons are well aware of this and consult regularly. At the other extreme we have the surgeon who goes in for "penny-in-the-slot" pathology; consulting, usually with the reporter's superior, only when a mistake has been made through the surgeon's failure to supply essential information; or seeking a second opinion on a section without the knowledge of the reporter. A competent pathologist knows when he ought to consult a fellow-pathologist, and, the more able he is, the more often he sees the need and consults. Any query about a report should of course be raised with the reporter, not with a third party.

Paraffin and Frozen Sections

Paraffin sections are normally used for diagnostic purposes; the sections are stained with haemalum and eosin or some other routine combination of dyes. The introduction of automatic tissue processors has greatly reduced the minimum time interval between receipt of the specimen and issue of the report. The normal interval is now from two to three days, but very small specimens, such as those from a bronchus, can be processed and reported on within a day of receipt. These periods are attainable only if the section is of satisfactory quality and the microscopical diagnosis obvious. The chief cause of delay in reporting is difficulty in diagnosis; this may call for staining of further sections by special methods, the making of extra blocks, consultation with the surgeon or another pathologist, or work in the library. In such cases it may be possible to issue a provisional report.

The advantage of frozen sections is that they can be made within a few minutes of receiving the material, and where special arrangements exist the surgeon can interrupt the operation until he receives the report. The disadvantage is that frozen sections are much less satisfactory for diagnostic purposes than paraffin sections. When the surgeon is reasonably certain of the diagnosis on clinical grounds, he sends the specimen for examination by the paraffin method after the operation; it is when he is in serious doubt, having begun the operation, that he would most like a report before proceeding. But when the surgeon finds it difficult to make a diagnosis, the pathologist often does so too, and finds it more than ever necessary to study a paraffin section before expressing any opinion. When a biopsy is not feasible before operation, the surgeon should normally act solely on the clinical data, without interrupting the operation for a frozen section to be made, and send the specimen afterwards for study in a paraffin section. An exception to this rule may be made by the neurosurgeon, since frozen sections of tissue (or squashes of tissue) obtained by needling during an operation may enable the pathologist to say whether a lesion is in fact a tumour. Work of this kind presupposes both special arrangements and special training in neuropathology and is therefore outside the scope of the general pathologist.

Cytodiagnosis

This means diagnosis from the appearance of isolated cells in such material as sputum, gastric contents, or uterine smears. The method is used chiefly for the diagnosis of malignancy. Its use has been advocated enthusiastically and perhaps uncritically, with the result that experienced pathologists often refuse to use the method at all or use it with considerable reservations. It is true that no preparation can compare with a good paraffin section of a piece of tissue for quality and reliability for diagnostic purposes. The pathologist who decides to use only such material ought not to be labelled conservative or out of date; he is, after all, thinking only of the best interests of the patient, and if he himself were the patient he would wish to be examined in the same way.

The one field in which cytodiagnosis is of proved value is that of gynaecology. Smears critically studied may be helpful in detecting early cancers of the cervix. It is not so much isolated atypical cells that are significant as the occurrence of atypical cells in large numbers; the preparation can then be regarded almost as a teased tissue, and the method does not differ radically from the examination of a section.

Cytodiagnosis has also been much used for the detection of bronchial carcinoma. I have examined many specimens of sputum for this purpose but have never been able to make a confident diagnosis of malignancy. Since the thoracic surgeon can often obtain a piece of tissue without much difficulty, and since malignancy can often be diagnosed with certainty even in a minute fragment of material, it is uneconomic to consume the time of technicians and pathologists in innumerable sputum examinations yielding negative or inconclusive results. The average pathological laboratory is already fully occupied with ordinary biopsies; if a routine cytodiagnosis service is required in addition, the hospitals will have to provide extra facilities, technicians, and pathologists, and to pay for the special training required—expenses that are certainly not warranted by the results obtainable.

Grading of Tumours

The pathologist is sometimes asked to grade tumours numerically according to the degree of their structural difference from the corresponding normal tissue. There is undoubtedly an infinite series of gradations in appearance between a normal tissue—epithelial or connective—and the most undifferentiated tumour derived from it, but so many factors other than tumour pattern may affect prognosis that the value of such grading is limited. Another difficulty is that we can usually examine only a small part of a tumour; the more tissue we examine, the clearer it becomes that there are often wide variations in the appearance of a tumour from point to point, even transcending the limits of recognized types. For example, a bronchial carcinoma, if thoroughly examined, may show features of several distinct varieties of this growth; estimates of the frequency of different varieties may thus depend on the extent of the examination. These remarks are equally true of carcinomas of the breast, and malignant tumours in general may be justifiably classified only according to the predominant pattern. While formal grading is not worth doing, the information of interest to the surgeon can be conveyed by skilful description in the pathologist's report, and more usefully, since the meaning of the report will be clear to all who may read it, and not only to those acquainted with a particular classification. A description of a tumour implies an assessment of the degree of malignancy, so far as this can be judged histologically; in this sense, tumours always have been graded by all competent pathologists for generations past.

Biopsy Reports

The object of a report is to help the surgeon, a fact that cannot be too often remembered by the pathologist. The writing of reports is an art that can be acquired only by practice, but some general principles are worth stating. The surgeon is busy: therefore reports should be brief. With many reports about many patients converging on him, he is not going to read a technical dissertation, without a heading, filling a page with single-spaced type. Every report should be headed by the diagnosis in two or three underlined words, and the text should normally require only a few lines of type, which should be double-spaced. The three or four salient points about a section can be got into such a report. When the result of the examination bears on prognosis or treatment, the report should make this clear; in particular, the pathologist ought not to leave the surgeon guessing whether he should perform a radical or conservative operation or no operation at all. When the pathologist himself is doubtful, he should discuss the case with the surgeon before writing the report; a short conversa-

tion often solves such problems. While a report must be truthful, it should also be tactful, so that an intelligent patient would not be unduly alarmed.

A rare or interesting lesion may call for an unusually full description, but long reports issued as a routine on all cases mean that the pathologist is incapable of selecting the salient points or of writing concise English. The worst possible reports are those that wobble helplessly between "benign" and "malignant," or consist of academic descriptions of phenomena from which no practical conclusion can be drawn. Most of us have probably written reports of this kind, but we learn in time to resolve our difficulties beforehand by consulting a fellow-pathologist.

Next article on Clinical Pathology.—"Tests of Gastric Function," by Dr. F. Avery Jones.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

AMERICAN SURGEONS IN LONDON

CONCLUSION OF SECTIONAL MEETING

The sectional meeting in London of the American College of Surgeons concluded on May 19. The report of the first day's proceedings was published last week (p. 1203). During the three days of the meeting 64 papers were read, 32 by American and 32 by British authors. The meeting on May 18, presided over by Dr. F. A. COLLIER (Michigan), took the form of a symposium on cancer.

Cancer of the Lung and Cigarette Smoking

Professor E. A. GRAHAM (St. Louis) presented the results of a survey of 600 patients with cancer of the lung. A questionnaire was devised for the purpose of finding out how far cigarette smoking was implicated, and each patient was asked the questions at an interview. The results were nearly identical with those brought forward by Professor Bradford Hill and Dr. Richard Doll in this country. A remarkable relationship between excessive cigarette smoking and lung cancer was demonstrated, and the same was true of six additional studies carried out in the States. Atmospheric pollution had been advanced as an alternative cause, but this would not explain the sex incidence. The disease was five or six times as prevalent in men as in women. Any carcinogenic agent in the atmosphere would affect both sexes equally. On the other hand, it took 20 or 30 years of cigarette smoking to establish cancer, and large numbers of women had not been smoking for that length of time.

Mr. HOLMES SELLORS (London) described the results of surgical treatment of cancer of the lung. There were two methods of treatment available: the surgery of excision and radiotherapy. Results with the latter had been unfavourable, though the picture might be different with improved technique and apparatus. Age was not necessarily a contraindication to surgical excision; he had operated on many patients in their seventies, and his oldest patient was 84. He showed a table of results of 700 cases from three hospitals. At the end of two years after operation the proportion of survivors was 45%; after three years, 30%; after four years, 22%; and after five years, 20%. The most favourable type of cancer for operation was the medium-sized central squamous-celled carcinoma; 72% of the patients were alive after three years, whereas with "oat-celled" cancer the figure was 40%.

Cancer of the Thyroid

Mr. GEOFFREY KEYNES (London) opened the subject of cancer of the thyroid, giving the history of three patients. He discussed the value of radioactive isotopes. Professor WARREN COLE (Chicago) said that in the experience of his clinic the proportion of thyroid disease amongst patients admitted to the surgical wards was 15% in 1927. The figure had fallen to 10% in 1943, when thiouracil came into use, and was less than 5% in 1952. Non-toxic nodular goitre, however, had risen in incidence. The average age for the development of this condition was 44.5 years, and for carcinoma, 47.3 years.

Cancer of the Colon

Dr. ARTHUR W. ALLEN (Boston) spoke on the trend of treatment in carcinoma of the colon. Public health statistics in the United States showed in 1951 23,517 deaths from cancer of the colon (15.4% of all deaths from cancer), and 10,103 deaths from cancer of the rectum (6.6%). He discussed 316 cases on which he had operated from 1943 to 1954. In these, resection for cure was carried out in 256, and palliative resection in 49, accounting for 96.5% of the total; 11 (3.5%) were non-resectable. 182 of the patients had survived for five or more years. The operative mortality in these cases treated between 1943 to 1954 was only 4.3%, whereas in an earlier series, from 1925 to 1942, it had been 17.5%. With palliative resection the shortest survival time was one month (local spread from the sigmoid), and the longest 4.5 years (liver metastases from splenic flexure). The average survival time was nine months. With resections for cure the longest survival time was 14 years.

Mr. LAWRENCE ABEL (London), who said that cancer killed one person every six minutes in this country, and cancer of the colon one person every fifty minutes, described certain points in diagnostic technique. In assessing the main symptoms of the disease he stressed the importance of rapidly developing anaemia and loss of weight. He suggested that their radiological colleagues should use very weak solutions of barium, because more could be learned from the result in that way. Air replacement after barium was also sometimes helpful. With regard to operation, he advised against blind caecostomy or colostomy and felt it important to emphasize even in that gathering that the object of surgical manoeuvre was to ensure the removal of the widest possible area of lymphatic drainage, together with not only the tumour-bearing portion of the bowel but all the colon which was supplied by the vessels that had to be ligated. Removal of the extensive lymphatic field entailed ligation of the main arteries as closely as possible to their points of origin. Another point in technique was the placing of clamps on the bowel to prevent dissemination of cancer cells. The only solution which he believed effectually killed cancer cells in the lumen of the bowel was 1 in 500 perchloride of mercury. In spite of more radical operations and more frequent resections, thanks to modern anaesthesia and antibiotics and pre- and post-operative care the mortality rate had been halved. Propaganda directed to the public, and to their family-doctor colleagues, should ensure that these cases were referred early to a surgical team, and the results might then show still further improvement.

Mr. PHILIP R. ALLISON (Leeds) discussed cancer of the oesophagus. Negative x-ray examination of the oesophagus should not be taken as final evidence of the absence of carcinoma. Any patient with dysphagia, even if only for a day or two and passing off, should be investigated; it was no use waiting until the dysphagia recurred. Bronchoscopy should always be done, because the tendency of these conditions to spread was considerable. He praised Souttar's tube, which he regarded as a wonderful apparatus.

The topic was further discussed by Dr. R. H. SWEET (Boston); and cancer of the stomach was the subject of papers by Dr. S. F. MARSHALL (Boston) and Professor

DIGBY CHAMBERLAIN (Leeds), and cancer of the skin by Sir ARCHIBALD McINDOE (London) and Dr. W. G. HAMM (Atlanta).

Cardiovascular Disease

In a concurrent session the subject of cardiovascular surgery was taken. Dr. MICHAEL E. DEBAKEY discussed the surgical treatment of aneurysms of the aorta by resection; Mr. C. G. ROB, the reconstruction of the large arteries; Mr. R. C. BROCK, modern techniques in intracardiac surgery; Dr. F. L. GERBODE and Mr. DICKSON WRIGHT, cardiac arrest; and Mr. A. MICHAEL BOYD, the diagnosis and treatment of obliterative arteritis of the lower extremities.

Sir JAMES LEARMONTH discussed the principles of treatment of arteriovenous fistula. These principles were, he said, the preservation or restoration of adequate blood volume, maintenance of adequate blood pressure, preservation or restoration of normal haemoglobin, and restoration to normal of the diseased or injured tissue.

The session concluded with a film, preceded by a few words by Dr. ALFRED BLALOCK (Baltimore), illustrating the creation in a young child of an artificial ductus in the treatment of the tetralogy of Fallot. The film was first shown at the clinical congress of the American College of Surgeons last year.

Recent Advances in Surgical Procedures

On the last day of the meeting, May 19, many papers were presented on surgical procedures. Sir CLEMENT PRICE THOMAS (London) gave a review of the surgical treatment of pulmonary tuberculosis. He had had experience of 220 cases submitted to resection during the last five years. The deaths following operation had numbered 18 (13 early and 5 late). Both he and his partner in the discussion, Dr. J. C. JONES (Los Angeles), presented a mass of statistics. Dr. Jones spoke of 729 cases of major operation and 542 of minor, carried out in the period 1943-54, during which the proportion of major operations had steadily increased. The mortality after resection for pulmonary tuberculosis had been 8% in males and 5.4% in females, and 75% of the patients were still active and working.

Adrenalectomy in Advanced Cancer

Sir STANFORD CADE (London) discussed recent advances in surgery of the adrenals in advanced cancer, and presented what he called a modest series of adrenalectomies. This comprised some 40 patients on whom he had carried out the bilateral operation. It was dangerous, he said, to draw conclusions on the effect of any therapeutic procedure from so small a series, and even more dangerous to do so after a period of only eighteen months; yet he thought this method could be studied even in a small series, and he gave particulars of four cases of patients who had previously undergone the orthodox methods of treatment—surgical, radiotherapeutic, hormonal—and in all of whom the disease was widely disseminated. They had all failed to respond to other methods, and there seemed to be every justification for resorting to adrenalectomy. It could never be said in advance that bilateral adrenalectomy would be successful. He had not been able to find any relationship between the histological structure of the tumour and its response to the operation. If adrenalectomy was going to be a failure it would be an immediate and complete failure, and if successful it would be successful immediately, though not completely. His operative mortality among 40 patients, some of them in the last stages of disease, was 15%. In nine cases excellent results had been obtained. He considered that bilateral adrenalectomy in the control of cancer was well worth doing.

Professor J. GARROTT ALLEN (Chicago) discussed surgical treatment in Cushing's syndrome. The considerable surgical risks involved in attacking basophilic adenoma of the pituitary had encouraged a tendency to do bilateral adrenalectomy, which, however, failed to get at the primary

problem. He mentioned the value of cortisone during the pre-operative period and of cortisone plus A.C.T.H. for a brief time post-operatively.

Malignant Disease of the Hip-joint

Sir GORDON GORDON-TAYLOR (London) described the treatment of primary malignant tumours in the neighbourhood of the hip-joint (hindquarter amputation). His first operation of this kind was performed in 1922, and his latest was done on his 76th birthday a few weeks previously. At his hospital the operation had been performed 77 times. The operative mortality was some 14%, but several of the patients were in an almost hopeless condition. Of the 33 patients alive to-day, 30% had survived operation five years or more. The most favourable type of tumour from the operational point of view was chondrosarcoma; 25 operations for this type of tumour were done, and 75% of the patients were alive. He described the case of a woman who had a large tumour attached to the gluteus maximus region of the great trochanter and who was on the point of being sent to a home for the dying. He was reluctantly persuaded to operate. Six years later this woman was alive and well. Disappointments were of course to be expected, but postponement of the decision to operate only worsened the outlook, and in some cases the results exceeded the most sanguine expectations.

Professor BRADLEY COLEY (New York) discussed the general subject of malignant disease in the neighbourhood of the hip-joint. Professor R. H. SWEET (Boston) and Mr. A. L. D'ARREU (Birmingham) gave their experiences of surgical treatment of achalasia of the oesophagus; Dr. R. S. DINSMORE (Cleveland) spoke on the changing status of hyperthyroidism; and Dr. W. E. ADAMS (Chicago) brought the session to an end with a film showing pneumonectomy for carcinoma.

Massive Gastro-intestinal Haemorrhage

At a luncheon discussion presided over by Dr. FRANK GLENN (New York) massive gastro-intestinal tract haemorrhage was presented from different aspects. Professor W. WALTERS (Rochester, Minn.) said that massive haemorrhage was almost always due to the perforation or rupture of a large blood vessel, but he had seen it occur as a result of multiple small erosions of the gastric mucosa, so small that they could not be seen gastroscopically or demonstrated surgically, but were visible only under the microscope. Mr. NORMAN TANNER (London) spoke on massive haemorrhage from the oesophagus. The oesophagus, he said, was not a frequent site of massive bleeding. Bleeding was sometimes seen as a symptom of oesophagitis, but only rarely was it massive. Massive bleeding had been associated with oesophageal paralysis. In many cases bleeding was due to portal hypertension. The mortality of this condition was heavy, and a number of survivors died of recurrent bleeding within a year or two. He had seen no cases where gastroscopy precipitated bleeding. Bleeding from oesophageal varices was a matter for medical management at first. If bleeding recurred twice, and after a minimum of 48 hours, then surgical intervention was indicated.

Mr. C. G. W. ILLINGWORTH (Glasgow) spoke on massive bleeding from the stomach. Bleeding sometimes occurred without relation to gastric ulcer, presenting a minute pin-head bleeding-point which could be seen only with difficulty. Atrophy of the mucous membrane was a factor, and in a few cases carcinoma or indeed multiple carcinomas might be implicated. Finally Mr. IVOR LEWIS (Rhyll) dealt with massive haemorrhage from the duodenum. An acute ulcer, he said, could burrow right through the intestinal wall and similarly could open up one of the large vessels. Of 196 cases of massive gastro-intestinal haemorrhage on which he had operated personally, only 30 were due to duodenal ulcers.

Hand Surgery

The final session of the conference was occupied with a panel discussion on hand surgery. Professor MICHAEL

MASON (Chicago) acted as moderator, and the collaborators were Mr. PATRICK CLARKSON (London), Dr. G. E. CLOUTIER (Montreal), Mr. R. G. PULVERTAFT (Derby), and Mr. WILLIAM GISSANE (Birmingham). Mr. Gissane said that conservative treatment in the right case gave ideal results, but all too frequently this treatment was surprisingly disappointing. Every case must be considered on its merits. It was utterly wrong to resort to open methods only when closed methods had failed. By doing so, very often the opportunity was lost of getting functional repair. To get a good functional result required attention not only to the bone but to the soft tissues also.

During the day's proceedings Sir CECIL WAKELEY, P.R.C.S., gave a talk on the relationship of the Royal Family, from George III onwards, with the Royal College of Surgeons, and showed a motion picture illustrating the laying of the foundation stone of the new building by Queen Elizabeth II on May 5, 1953.

The thanks of the American visitors to their British hosts were voiced by Dr. PAUL HAWLEY, Director of the American College of Surgeons.

BRITISH ORTHOPAEDIC ASSOCIATION ANNUAL MEETING AT BUXTON

The annual meeting of the British Orthopaedic Association was held at the Devonshire Royal Hospital, Buxton, on May 6-8, under the presidency of Professor BRYAN MCFARLAND.

Syme's Amputation

Mr. J. H. SHELSWELL (Stanmore) spoke about Syme's amputation, an operation with a much better reputation in Canada than in this country. He had reviewed the Syme's amputees from the material available at Roehampton; of 534 cases, the 302 patients operated on before 1939 were chosen for assessment, and a follow-up on 66 of these was done. Two-thirds had had no significant trouble. Twenty-three per cent., including immediate failures, needed re-amputation, and, as Mr. LEON GILLIS pointed out in the subsequent discussion, this was no higher than the proportion of failures after the standard below-knee amputation. Syme's amputation had no place in the neuropathic limb or in those with vascular failure, and it was seldom indicated in women, who had no means of concealing the necessarily bulky and obvious ankle-joint in the prosthesis. But for the working man it was a most satisfactory operation, enabling him to stand and walk for long hours and even to play games. It was particularly advantageous for the double amputee, and Mr. Shelswell concluded that a properly done Syme's amputation was an excellent and long-lasting operation.

Review of 650 Arthroplasties of the Hip

Mrs. M. M. SHEPHERD (Birmingham), in an excellent and painstaking review of 650 arthroplasties of the hip, described how these cases had been followed up for a maximum of six years from operation, which were nearly all of either the vitallium cup or acrylic head type. They were assessed according to pain, range of movement, the patient's evaluation, and the objective estimate of function. Out of the great mass of figures available certain facts emerged. Excepting loss of pain, stability and satisfactory unconscious control of the hip were of greatest value to the patient, but the better the range the better on the whole was the result. Even so the mobility index (Gade) was not much worse in the poor than in the excellent results. The presence of slight residual fixed flexion seemed to give improvement, but transplantation of the trochanter delayed a good result. With regard to durability, cup arthroplasties went on improving up to four years, when 45% had good or excellent results; after five years 54% had poor results. The Judet arthroplasty was characterized by quicker recovery, but the patients deteriorated sooner and progres-

sively. Not all arthroplasties, however, deteriorated in later years, some with no apparent peculiarity retaining their excellence unchanged for many years. Mrs. Shepherd believed that arthroplasties with no inserted foreign material lasted best, then those with unfixed inserts—for example, cups—and lastly those with fixed prostheses. The percentage of good results was higher in unilateral than bilateral cases, and in the latter was higher when only one hip was operated on. The massive amount of material embodied in this impressive paper fell beyond the scope of a brief report.

Mr. K. H. PRIDIE (Bristol) expressed his dissatisfaction with the Judet arthroplasty, which he maintained should be reserved for those with a brief expectation of life. In his hands 5-10% would fracture their prostheses. Even at a year marked flattening and wear of the head was to be seen, and he thought that lack of this flattened facet was evidence that the prosthesis was rotating in the femoral neck. In his survey, 20% had loose prostheses, though a period of plaster fixation might fix them again. As an alternative to replacing the head when fracture or a poor result necessitated further operation, he considered the Girdlestone "pseudarthrosis" procedure satisfactory.

Kyphoscoliosis

Mr. J. I. P. JAMES (London) called attention to the lack of British work on the subject of kyphoscoliosis, although there was an extensive German literature about it. Apart from the deformities (usually mild) occasionally seen in Pott's or Scheuermann's disease, he classified his 27 cases into (1) congenital; (2) those associated with otherwise typical idiopathic scoliosis; and (3) those seen with neuro-fibromatosis. In the first group radiographs or operation displayed the malformation, but even early films of the second group showed no vertebral abnormality. Most congenital cases occurred in the lumbodorsal region, but there was a small group in the cervico-dorsal region. The deformity was progressive and severe, and might cause paraplegia. Early operation was indicated, but fusion was difficult to achieve.

Mr. R. ROAF (Liverpool) reported an operation of wedge excision of the vertebrae for scoliosis. In the past there had been general fear of direct operation emanating from the difficulties encountered in attempting excision of hemi-vertebrae. With his experience of antero-lateral decompression, combined with skilled anaesthesia and plaster work of the highest order, he could say that he had found no great difficulty in doing what was really a lateral osteotomy of the spine, and he described the technique. It was stressed that this was not an easy operation for routine use, but was suggested tentatively for those curves not responsive to other methods.

Pros and Cons of Hip Arthroplasty

A debate was held on the motion: "In the opinion of this house all methods of arthroplasty of the hip have failed to achieve their purpose." In spite of spirited arguments from the openers and the considerable number who finally voted in agreement with the motion, few could be found to speak wholeheartedly in its favour, and the motion was lost by a substantial majority.

Mr. K. I. NISSEN (London), proposing the motion, based his attack on hip arthroplasty on four counts: (1) the serious post-operative complications that could occur; (2) early deterioration; (3) the expense of the seemingly endless physiotherapy required; and (4) the faulty conception of the operations due to ignorance of the true pathology. One concept of vascular degeneration in the femoral head had been exploded by recent work at Oxford. Any pain-relieving operation reduces the blood supply of the hyperaemic head, but the arthroplasties interfered with it too extensively. The more British operations of McMurray's displacement osteotomy, Girdlestone's pseudarthrosis, or arthrodesis could be relied on to give equivalent or better results, and the reason they were not in favour with younger surgeons, was that the latter had little experience of them, the result being permanently good and not necessitating the

patient's return to the surgeon. In most arthroplasties of all types the head eventually disappeared to leave some form of pseudarthrosis.

Mr. W. A. LAW (London) opposed the motion. After saying that there was no universally applicable hip operation, he enumerated the essential requirements of a good arthroplasty: (1) a joint must be made; (2) the pain of the arthritic joint must be alleviated and that produced later from over-fatigue of the controlling muscles must be limited; (3) fixed deformity must be corrected; (4) the new joint must be stable; and (5) an adequate range of movement must be produced, though a stable joint with small range was greatly preferable to an over-free joint where muscle control was poor and fatigue-pain therefore marked. With these criteria he maintained that cup arthroplasty was a good operation, the beneficial results of which lasted better than Mrs. Shepherd's investigation suggested. Patients, asked him to do an arthroplasty on their second degenerating hip 5-10 years after one had been done on the first hip. But he stressed that careful selection of patients was essential. Obesity was not a contraindication, but the surgeon must be satisfied that the patients had the morale to pursue the necessarily arduous aftercare, and Mr. Law mentioned private patients favourably in this connexion. They must be warned of and understand the limitations of the result to be expected. The essential exercises could perfectly well be done at home, but circumstances often made prolonged supervision in the physiotherapy department essential. He did not look on cases needing revision as "failures," which was suggested by Mr. Nissen to be their proper description, but considered revision as an essential part of the treatment of the rheumatoid hip.

Mr. N. CAPENER (Exeter) seconded the motion. He said that we had not yet overcome the difficulties of certain essential mechanical conditions: (1) the new joint surfaces must have not only congruity but conformity of hardness; (2) there must be proper lubrication; and (3) the problems of leverage and adequate power must be solved. Present methods were incompatible with the above requirements. He estimated the cost to the nation of an arthroplasty at £200, which he looked on as very expensive for an operation doomed to failure. According to Mrs. Shepherd's figures deterioration set in five years after a cup arthroplasty and two years after an acrylic head, which, on the basis of the life-expectancy charts of insurance companies, should confine the former operation to the over-80's and the latter to the over-90's.

Mr. LLOYD GRIFFITHS (Manchester) seconded for the opposition. He denied that the traditional British operations relieved pain, and compared their results with those obtainable by taking the local waters. Arthroplasty was in a state of rapid evolution, and even the best of operations, like aeroplanes, were liable to temporary "grounding." He considered even the present results as well worth while, and pointed out that little progress would be made if surgeons must always await exact pathological elucidation of the problem.

In the subsequent debate, Mr. R. G. TAYLOR (Oxford) said that good results could be obtained in a properly done Girdlestone's pseudarthrosis. Mr. W. E. TUCKER (London) thought it advisable to make patients write down their pre-operative complaints as objective evidence for comparison with their later troubles, and Mr. H. OSMOND-CLARKE (London) said that arthroplasty had no place in the young patient.

Professor MERLE D'AUBIGNÉ (Paris) said he thought that all the failures of arthroplasty were due to technical errors. It took perhaps 200 arthroplasties to learn the art. He reported a much lower failure rate than the British figures, and stressed the importance of providing the correct length of neck and of correcting anteversion. He thought the results on the whole did not deteriorate in later years; indeed, some cases classed as only "fair" a year after operation became "good" with further passage of time. Mr. K. H. PRIDIE (Bristol) supported the advantages of the

d'Aubigné type of prosthesis. Sir REGINALD WATSON-JONES (London), while maintaining that arthrodesis was incomparably the better operation in the young, said he would vote against the motion as it was worded. Mr. JOHN CHARNLEY (Manchester) spoke of the advantages, essentially of principle rather than technique, of his operation of central dislocation of the hip, and thought that arthrodesis was a good operation even in the elderly, particularly those of wiry build.

Dr. ROBERT JUDET (Paris) gave figures to illustrate the good results of acrylic-head arthroplasty and recommended the new prosthesis with an oblique base. He pointed out that the crushed cancellous bone around the stem of any prosthesis was in a state comparable to a bone graft, and that therefore weight-bearing should be delayed two months, until revascularization of the trabeculae was advanced. Acetabular changes resulted from incongruity of the prosthesis, which should be of exactly the right size. Fractures of the prosthesis were now seldom seen in France, owing to a better acrylic resin. Mr. J. H. MAYER (Tunbridge Wells) thought the poor results were due to failures on the part either of the surgeon or of the material, and advocated the use of metal prostheses rather than acrylic resin.

Acrylic Prostheses in Fractures of the Femoral Neck

On May 8 the meeting was under the chairmanship of the vice-president, Mr. A. CHANCE.

Mr. C. M. M. MURRAY (Portsmouth) presented a review by Mr. G. N. GOLDEN (Guildford), Mr. A. G. ORD (Portsmouth), and himself of 60 cases of fractured necks of femur treated by primary replacement with Judet's acrylic prosthesis. There was no immediate operative mortality, but seven died while still in hospital. Later complications included two dislocations, two fatal cases of infected haematoma, one broken prosthesis, late ossification in the capsule, and late varus deformity. At 18 months over 80% had a satisfactory result, and he recommended the operation for the older age group, especially those with high or vertical fractures.

Mr. J. C. F. CREGAN (Manchester) gave a review of 65 cases of high fracture of the femoral neck similarly treated. In contrast to satisfactory immediate results, by the third year 85% suffered increasing pain and disability, and by the fourth year results were even worse. He thought that the integrity or otherwise of the region of the calcar femoralis had an important bearing on these results.

Mr. K. H. PAIDIE (Bristol) pointed out that with a Smith-Petersen nail 50% of patients at five years had a hip indistinguishable from normal, and deplored the use of an acrylic head as immediate treatment, a view supported by Professor d'AUBIGNÉ. Dr. ROBERT JUDET confirmed his recommendation of the operation in this connexion to the very elderly.

In further discussions Professor MICHAEL MASON (Chicago) and Mr. R. G. PULVERTAFT (Derby) spoke about wounds and injuries of the hand; and Mr. H. R. LUNT (Derby) gave a demonstration of the results of treating tuberculosis of the hip by a method aiming at shorter hospitalization, a greater range of movement, less epiphyseal dysplasia, and less shortening.

A rehabilitation workshop has been developed by British Railways (Western Region) at Swindon. It will provide productive work for convalescent patients and an occupation of therapeutic value by adapting machinery to give graduated work to a selected group of muscles or to increase movement in one or more joints. The medical officer visits the workshop daily and considers the work of the patients with the assistance of the workshop foreman. A time limit of eight weeks, with some exceptions, will be given to patients in the workshop. Admission is entirely voluntary. The men begin work ten minutes later and finish work ten minutes earlier than the normal factory hours to enable them to avoid the usual rush in the approaches to the works. The number at present employed is ten.

Reports of Societies

MASS MINIATURE RADIOGRAPHY

Who Should be Examined?

A joint meeting of the North-western and Midland Tuberculosis Societies took place at the Cheshire Joint Sanatorium, Market Drayton, on May 8. The chairman was Dr. T. W. LLOYD. In a discussion on "What is the place, if any, of mass radiography?" the opening speaker was Dr. E. SNELL, who believed that mass radiography had indeed a place in the early diagnosis of pulmonary tuberculosis and other chest diseases, and that the only reasonable argument against its use was that of financial stringency. Mass radiography units could be used in four ways: (1) as a mobile unit visiting factories, etc., in a district and x-raying all employees; (2) as a mobile unit visiting specially selected factories and industries which are known to carry a heavy hazard of tuberculosis; (3) as a static independent unit concentrating on selected cases—for example, referred by general practitioners, men called up for National Service, etc.; (4) as a static unit situated in and operated by the chest clinic, also concentrating on selected cases—for example, from general practitioners, school medical officers, ante-natal clinics, contacts, etc. Dr. Snell produced figures to show that the yield of tuberculous cases was much greater in selected groups. In 1953 nearly one-third of the new cases of tuberculosis in Liverpool were picked up by mass radiography. Apart from the number of cases found, they are discovered earlier, when they are more amenable to treatment. In Dr. Snell's opinion mass miniature radiography units should be operated from chest clinics and should devote their time to selected groups.

Pros and Cons

The next speaker, Dr. GEORGE LUNTZ, in an opening summary of the extent of mass miniature radiography in this country, said that up to the end of 1952 over 10½ million examinations had been done by 63 units, and that in 1952 18% of all cases of respiratory tuberculosis had been discovered by mass miniature radiography. In view of the fact that the present number of units allowed less than 10% of the population to be examined yearly it was important to consider whether any group of the population should have priority, and whether any group should be re-examined. There were three main ways of applying mass radiography: (1) True mass miniature radiography—that is, surveys of whole populations, the aim being to x-ray every individual in the community. Such surveys had been undertaken in Stockholm (80%), and in the Rhondda Fach (89%). A similar survey was in progress in Salford. (2) Group radiography, where the units concentrate on selected groups which are likely to yield the most cases. (3) Individual radiography, where members of the public can attend a mobile or static unit, either on their own initiative or because they have been sent by their doctor.

The problem, Dr. Luntz continued, was to decide which was the best method, and whether in fact mass radiography had any place at all. When used indiscriminately it was an expensive way of finding cases (£10 to £600 per case), and, even so, less than 20% of cases of tuberculosis were found by this method. Another point against it was that a normal x-ray finding might lull the subject and his doctor into a false sense of security, and subsequent symptoms might be ignored. Ideally radiography should be repeated annually, but this was impossible. Dual observer readings were necessary to prevent lesions being missed. Although mass miniature radiography was originally designed for tuberculous case finding, it detected many non-tuberculous abnormalities in heart and lungs, and with the rising mortality due to bronchial carcinoma mass radiography on the vulnerable age-groups might make a valuable contribution.

Dr. R. STALKER was convinced of the value of mass miniature radiography, but thought that there could be

improvements by reducing the amount of record keeping, thus freeing some of the clerical staff to assist the secretary in the canvassing of susceptible groups. He gave some figures from his own unit showing that the yield of new cases of tuberculosis fell from 4 per 1,000 in 1942 to 1.2 per 1,000 in 1953. He considered that in industry repeat protective surveys were of doubtful value, though they were justifiable in, for example, mental hospitals. Mass miniature radiography in schools where a case of active pulmonary tuberculosis had occurred was valuable, but it was doubtful whether routine surveys in schools were worth while. The 100% geographical survey was the ideal, but was impossible, and became increasingly difficult with the size of the town. It was agreed that there was a high proportion of tuberculosis in the non-attenders in a general population survey.

Larger Surveys

Dr. Stalker thought that mass miniature radiography should be kept mobile and should x-ray males or young females as individual members of the general public in preference to industrial workers. He described the Manchester Regional Hospital Board policy of "miniature" as well as "mass miniature" radiography, which was implemented by having 4 in. by 5 in. or 70 mm. units in major chest clinics for x-raying selected groups. He mentioned the Salford survey by six mass miniature radiography units working simultaneously on a population of 170,000: powerful though this was, it was small by American standards. He proposed that two or more regional boards in this country should combine for large surveys on the American plan, where they used 22 units for towns of over 100,000 and aimed to x-ray 80% of the population in four weeks. There was a case to be made for combining mass miniature radiography with B.C.G. injections in the 15 to 25 age groups.

The fourth speaker, Dr. L. A. McDOWELL, said that the function of mass miniature radiography was to assist in the eradication of pulmonary tuberculosis, which it could do by finding the infective, and especially the chronic infective, cases of tuberculosis. These cases usually had symptoms, and should be sent from the doctors' surgeries to the mass miniature radiography units. General practitioners and industrial medical officers should be persuaded to send all patients with symptoms for radiological examination. This did not mean that the mass miniature radiography service was setting up as a rival to the chest clinic. It was saving the chest physician from seeing large numbers of cases, of whom 9/10 had normal radiological findings. It also saved money and time, and the patients preferred it. He suggested that mass miniature radiography units should be withdrawn from industrial surveys and should go on a regular circuit of large centres of population, where they could examine people with symptoms and other groups such as contacts, school leavers, National Service recruits, etc. By this means each unit should be able to do 40,000 to 50,000 examinations yearly and provide the chest physicians with 400 new cases per year.

In the discussion which followed Dr. J. R. SINTON pointed out that most of the speakers had been advocating "miniature" and not "mass miniature" radiography, and that this was best undertaken by the chest clinic. He was against the principle of x-ray before clinical examination. Dr. J. ASPIN thought that the mobile factory survey would have to continue because the public expected it. In his opinion static units should be an integral part of the chest clinic service. Dr. D. MORRISON SMITH said that in finding infective cases of tuberculosis it would be cheaper to examine sputa than x-ray patients.

Dr. W. GRIFFEL thought that mass miniature radiography found too many cases which could not be treated. Dr. COTTON CORNWALL thought that some cases which were discovered did not have clinical tuberculosis and should not be "labelled." The opening speakers replied to many of the points raised and agreed that it was soul-destroying to do only mass radiography: it should be combined with chest clinic work.

THE PROBLEMS OF POLIOMYELITIS

Are there localities in this country which poliomyelitis specially tends to visit, or in which it particularly cares to linger? This was the question that Professor BRADFORD HILL, F.R.S., set out to answer in the presidential address delivered to the Section of Epidemiology of the Royal Society of Medicine on May 21.

The most striking features of the geographical distribution of poliomyelitis during 1919-46, he said, were the unexpectedly low numbers of cases in most of the counties in Wales and Northern England, and the unexpectedly high numbers in three groups of contiguous counties—one in the north-east Midlands, another including Shropshire, Hereford, and Radnor, and the third in the south stretching from Devon to Kent and Essex. There was an appreciable similarity between this pattern and that found in the years of higher incidence after 1946. There were reasons for believing that these geographical differences were not the result of differences in the accuracy of diagnosis or thoroughness of notification.

A detailed study of epidemics in the large towns showed that only twenty experienced a substantial epidemic between 1919 and 1946, and only twelve had more than one epidemic. But these twelve included nine in which poliomyelitis was epidemic three or four times during the quarter of a century—namely, Bristol, Oxford, Sheffield, Plymouth, Kingston-upon-Hull, Cardiff, Portsmouth, Manchester, and Birmingham. Why certain towns should have been picked out for visitation was a mystery, but Professor Hill drew attention to the fact that half of the twenty towns were ports, and of the nine towns with repeated epidemic experiences six were ports. If the epidemics were the result of imported infection, it was of interest to note that they did not spread widely. Nevertheless a study of incidence in administrative counties showed, for instance, that the epidemic years in Lincolnshire (Lindsey) were also those of the epidemics in Hull (1927), in Grimsby (1930), and in both of these ports (1938), and a similar coincidence was found in the timing of epidemics in Plymouth and Cornwall and in Portsmouth and Hampshire. Two months before the famous Broadstairs epidemic in 1926 there had been small but sharp outbreaks at Sheerness and Queenborough in the mouth of the Thames. The lack of epidemics in certain large towns between 1919 and 1946 might be expected to have made them vulnerable to later infection. The fact that some of them remained little affected during the widespread infection of 1947 was therefore very striking.

Change in Age Incidence

It has been shown¹ that in the years 1944-8 a significantly higher proportion of reported cases of poliomyelitis were over the age of 5 years than in the years 1912-19. Professor Hill, by reference to the reports of medical officers of health of towns where epidemics occurred in the intervening years, had come to the conclusion that there was little sign of change in age incidence until 1938, when the country experienced the sharpest epidemic up to that time, and when the change in age incidence became quite marked. It persisted until 1947, and had since become even more marked. Using the same source of information, he concluded that there had been no change in the ratio of arm to leg paralysis as a result of the great increase in inoculations since 1942.

One of the purposes of epidemiology is to define problems needing special investigation, and Professor Hill has indicated several here. If, as appears from the figures, fresh introductions of infection frequently took place through the ports, why was spread so limited? If the shift in age incidence to older people was the result of their not being immunized when young owing to improving standards of hygiene, what is the explanation of the comparatively abrupt change in 1938? Why do certain cities have repeated outbreaks, while others with similar environmental conditions escape? And why does the disease tend to reappear in certain localities?

¹Benjamin, B., and Gale, A. H., *Monthly Bull. Minist. Hlth (Lond.)*, 1949, 8, 208.

Correspondence

Intravenous Ergometrine and the Undiagnosed Second Twin

SIR.—The value of intravenous ergometrine in the reduction of third-stage haemorrhage has been proved beyond doubt.¹ However, Drs. J. K. Russell, D. Tacchi, and Anne L. M. Graham (*Journal*, May 15, p. 1129) have drawn attention to the risk to an undiagnosed twin when intravenous ergometrine is given before the first child has been completely delivered. When ergometrine is given at the crowning of the baby's head or with the delivery of the shoulder, the rapid cessation of the placental circulation increases the risk of asphyxia neonatorum, especially by inhalation of mucus. This fear caused us, at Sorrento Maternity Hospital, to delay the injection until the baby has been born, when the uterus can be palpated abdominally before giving the ergometrine and all the risk of an undiagnosed twin avoided.

Out of 1,520 consecutive deliveries in this hospital, 130 cases were selected for intravenous ergometrine because they were considered liable to post-partum haemorrhage (grand multiparae, twin labour, inertia, previous post-partum haemorrhage, also after forceps and breech deliveries). In these cases 0.5 mg. ergometrine was given intravenously after the baby was born, and the loss of blood was no greater than that described by Drs. J. D. Martin and J. G. Dumoulin. In five cases where manual removal of the placenta became necessary, a slight contraction ring was found which relaxed readily when 3 min. (0.2 ml.) amyl nitrite was inhaled in addition to the general anaesthetic (nitrous oxide, oxygen, and ether). In no case was any difficulty encountered, although in all five cases part of the placenta was definitely adherent to the uterus. Surely this experience disproves the prevalent idea that it is necessary to administer ergometrine prior to the complete delivery of the baby when, in actual fact, there may be some danger?—I am, etc.,

Birmingham.

JEAN L. HALLUM.

REFERENCE

- ¹ Martin, J. D., and Dumoulin, J. G. (1953). *British Medical Journal*, 1, 643.

SIR.—In their article Drs. J. K. Russell, D. Tacchi, and Anne L. M. Graham (*Journal*, May 15, p. 1129) state that they had been fortunate in that none of their undiagnosed twins had been lying transversely, in which event a difficult intrauterine manipulation might be necessary, with risk to mother as well as child; nor do they appear to have experienced trouble from spasm of the cervix after administration of the drug. The following case illustrates both these complications.

An unbooked patient, a gravida-2, aged 28, was admitted to Queen Charlotte's Hospital as an emergency case on March 15, 1954. She was one of twins, but her pregnancy had been uneventful apart from a threatened abortion at two months. Labour commenced spontaneously at 33 weeks and the contractions became strong and frequent. She had two injections of pethidine, 100 mg., but the cervix did not dilate, and she was accordingly admitted to hospital after 44 hours in labour. Her general condition then was good; the uterus was not relaxing between frequent contractions, and it was not possible to determine per abdomen the presentation or position of the foetus, as the uterus was so hard. The fundal height was normal for 33 weeks, and a foetal heart was heard beating regularly at 170 per minute, thereafter remaining between 150 and 128 per minute. Vaginally, the presentation was found to be vertex with the head in mid-cavity in the R.O.A. position. The cervix was fully dilated and the membranes had ruptured. The head advanced very slowly, and, after 1½ hours in the second stage, an easy forceps delivery was performed under cyclopropane, gallamine triethiodide, nitrous oxide, oxygen, and trichlorethylene. The cord encircled the neck once, and was very tightly applied. The head and neck above this level were intensely cyanosed and swollen.

Although the heart was beating at birth, respiration was never established. The foetus weighed 3 lb. 8½ oz. (1.58 kg.).

Intravenous ergometrine, 0.5 mg., was given with the birth of the anterior shoulder. The uterus contracted firmly, but seemed rather large, and vaginal examination revealed the bag of waters of the undiagnosed second twin protruding into the vagina. The membranes ruptured during examination. The cervix now admitted only two fingers and the presentation of twin 2 was a shoulder. Time was allowed for the cervix to relax and an inhalation of amyl nitrite, 5 minims (0.3 ml.), was given, with some effect. As soon as a hand could be passed through the cervix, a difficult internal version was performed. A foot was brought down, followed by the other, and a breech extraction was performed. The extended arms were flexed and brought down. There was delay of 10 minutes in delivery of the head by the Mauriceau-Smellie-Viet manoeuvre, as the cervix was not completely dilated. A stillborn foetus weighing 3 lb. 8½ oz. (1.58 kg.) was delivered 70 minutes after the first twin. The placenta failed to separate and had to be removed manually. The uterus felt normal. The total blood loss was 14 oz. (0.4 l.) and the patient's condition was good throughout. She remained apyrexial and demanded to return home by ambulance on the third day of the puerperium.

Post-mortem Examination (Dr. Claireaux).—Twin 1: Intense engorgement and severe subcutaneous oedema of the head and neck above the level of the cricoid cartilage, the colour of the oesophagus changing abruptly at this level. Subpleural and thymic petechial haemorrhages. Subarachnoid and intraventricular haemorrhages. Twin 2: Subpleural and subepicardial haemorrhages. No intracranial lesion.

I am grateful to Miss K. M. Robinson for permission to record this case.—I am, etc.,

London, W.6.

ELLIS JONES.

Prolonged Cortisone Administration for Rheumatoid Arthritis

SIR.—The interesting article by Dr. W. S. C. Copeman and his colleagues on the management of rheumatoid arthritis with prolonged cortisone administration (*Journal*, May 15, p. 1109) once again raises the question not only of the criteria used for the evaluation of therapy, but also of our aims in treating this potentially crippling disease. In this well-observed and carefully followed up series of cases the authors, in their assessment, have correctly distinguished between the effects of therapy on functional capacity, joint involvement, and clinical and laboratory evidence of disease activity. The results were assessed largely on a practical functional basis, and the value of therapy appeared to rest chiefly on a definite functional improvement in 17 out of the 20 cases treated.

In spite of this, however, a number of cases showed radiological progression of damaged joints. In other words, although the treatment has been shown to be of practical value from the functional aspect, the disease has actually progressed from the point of view of joint damage. This may be the result of the natural course of the disease, but one cannot help but feel that increased use of damaged joints may be an important contributory factor. We may therefore ask ourselves whether, in treating rheumatoid disease over a prolonged period with a drug known to be non-curative, we should suppress symptoms and signs in order to encourage functional capacity. We may be justified in doing this with a short course of treatment in order to assist rehabilitation. On the other hand, in long-term treatment, encouragement of functional capacity may carry a danger of producing further joint damage. This applies particularly to the younger age group, where there is a greater opportunity for wear and tear of the joints over a period of many years. In such cases, our efforts should be directed chiefly to reducing rheumatoid activity. It is well known that the disease may undergo natural remission, and such remission is the best possible improvement short of a cure.

Having assessed and followed up many hundreds of patients treated with a variety of therapeutic agents, it is felt that, in rheumatoid disease, more emphasis should be laid on activity of the process than on functional capacity as a criterion in assessment. Although improved function

should be taken into account, reduction of rheumatoid activity must represent the major criterion for the effectiveness of any therapeutic agent.—I am, etc.,

Bath.

L. MANDEL.

Pleural Effusion in Young People

SIR.—The recent Ministry of Health memorandum on prevention of tuberculosis¹ (see *Supplement*, April 17, p. 174) urges an intensification of the war on this disease on many fronts simultaneously. To the various measures suggested we would make a plea for the proper assessment and treatment of cases of pleural effusion in young people, amongst whom it is a common condition. On the basis of recent work in England² and some Scandinavian investigations^{3,4} it can be calculated that, with the present rate of tuberculous infection in this country, at least 100 cases of pleural effusion will arise each year in schoolchildren alone per million total population. Most of these cases present with severe symptoms and are readily diagnosable. Indeed, the great majority are diagnosed, but the high probability of a tuberculous aetiology does not always seem to be sufficiently regarded. Many youngsters with pleural effusion receive no more treatment than a few weeks in bed followed by a few weeks more at a convalescent home. Too often the diagnosis of tuberculosis is not made because the doctor does not wish to cause anxiety to the parents.

Pleural effusion is a serious condition, being frequently followed by frank pulmonary tuberculosis. In our series² no fewer than 15% of girls who had what seemed to be a simple tuberculous pleural effusion between the ages of 10 and 16 developed obvious pulmonary tuberculosis during a follow-up period of six years. In young adults Thompson⁵ reports an even higher incidence. In addition, Sibley⁶ has shown that cases of pleural effusion run an appreciable risk of developing extra-pulmonary tuberculosis. These complications and sequelae are scattered over many years, and the short observation period often given to these cases is probably one reason why pleural effusion is too frequently said to be "benign." The seriousness of pleural effusion may be due, in a proportion of cases, to an underlying miliary tuberculosis which, for one reason or another, is not radiologically visible.

There seems good reason to advocate that pleural effusion in tuberculin-positive children and adolescents, in the absence of some definite alternative diagnosis, should be considered as tuberculous and should be thoroughly investigated and treated in special units where, of course, education can be continued. It appears likely that antibiotic therapy in selected cases, together with an adequate period of graduated rest and subsequent rehabilitation, will prevent the development of serious tuberculous trouble in many instances later in life, and will in consequence make a further contribution to the fight against this scourge, which, though retreating, still exacts too great a toll.—We are, etc.,

F. J. BENTLEY.

S. GRZYBOWSKI.

Brentwood, Essex.

REFERENCES

- ¹ *Prevention of Tuberculosis*, Circular H.M. (54) 30, 1954. Ministry of Health.
- ² Bentley, F. J., et al. (1954). *Tuberculosis in Childhood and Adolescence*. N.A.P.T.
- ³ Nissen Meyer, S. (1949). *Statistical Investigations of the Relationship of Tuberculous Morbidity and Mortality to Infection*. E. Munksgaard, Copenhagen.
- ⁴ Gedde-Dahl, T. (1948). *Tuberculoseinfeksjonen i lys av Tuberkulin-matrikkelen*. J. Grundt Tanum, Oslo.
- ⁵ Holmdahl, K. (1950). *Acta tuberc. scand.*, Supplement 22.
- ⁶ *Amer. Rev. Tuberc.*, 1946, 54, 349.
- ⁷ *Ibid.*, 1950, 62, 314.

Psychiatry and General Medicine

SIR.—Perhaps it is unwise for one section of the profession to be over-critical of another. Most of us, after all, live in glass houses. Also, when Dr. Cyril Josephs (*Journal*, May 8, p. 1096) takes such pleasure in scoring off the psychiatrist, one wonders what is his unconscious motivation. Dr. Josephs is more than critical of psychiatric treatment and insists that psychiatry as a discipline must be measured by its success in curing patients. I do not think

this is altogether a logical argument, and heaven knows where it would leave, for example, brain surgery, dermatology, and much of general practice. It is true that advances in treatment are nowhere more necessary than in psychiatry. Illnesses like schizophrenia fill thousands of hospital beds, and neurotics are said to throng practitioners' waiting-rooms. Are we then to give up the practice of mental health until a benevolent Government opens its coffers to research and hastens the psychiatric millennium?

I suppose no one is more conscious of the limitations of therapy, both physical and psychotherapeutic, than the mental hospital psychiatrist administering it. After all, far from burying his failures, he often has to live among them. E.C.T. and insulin are useful therapies and can transform abject misery into optimistic well-being. Certainly they are empirical and sometimes fail. I venture to suggest that this is also true of much in general medicine, despite recent advances. Psychiatry, of course, has other weapons, and the doctor's use of them depends on his opinions, his qualities of personality, and his psychotherapeutic skill. Here again, however, he can expend his resources without success, and therefore he tries to apportion his time wisely. The chronic neurotic, pitiful though his situation may be, is not only a poor prospect for intensive treatment but also uneconomical. There are so many others for whom the psychiatrist can do more.

Admittedly psychiatry has overplayed its hand. Too many films and stories have moulded the psychiatrist into the likeness of God and given him powers he sometimes forgets he does not possess. Dr. Hunter Gillies¹ put it well when he said: "... The myriad patients against whom the dice were loaded from the moment of their conception rarely figure in such selected material, and then only in the productions of our heavier and gloomier writers. But it is these patients who daily confront us, and our support of these handicapped people, valuable and indeed indispensable as it is, appears pedestrian beside the miracles that the public have been led to applaud."

Perhaps Dr. Josephs will consider these few points and arrive at a more balanced and charitable conception of our specialty. There is needed on the part of the general public a more enlightened attitude towards psychiatry and mental hospitals, and this will come more speedily if doctors show it first.—I am, etc.,

Aberdeen.

J. K. W. MORRICE.

REFERENCE

- ¹ *J. ment. Sci.*, 1953, 99, 321.

Anthrax Protective Antigen

SIR.—In your annotation (*Journal*, May 8, p. 1083) on anthrax protective antigen, you state: "The Pasteurian method of producing active immunity against anthrax... has hitherto not been superseded in the 70 years since it was introduced." This is not quite accurate. Sterne¹ and Stamatin² independently isolated an avirulent spore vaccine in 1937 which, although used in a living state, differs from the old Pasteurian vaccine in an important way. Whereas the Pasteurian vaccines contain organisms that are potentially virulent, the Sterne vaccine lacks an essential factor for virulence—namely, the polyglutamic acid capsule. This makes it perfectly safe to use and avoids the failures and disasters that occasionally occurred with the Pasteurian vaccines, and is a very important advance on these older vaccines. It has in fact been used on a very wide scale, particularly in South Africa, where several million head of cattle have been immunized without a single accident. By its use, anthrax among cattle has been virtually wiped out in that country. This is the strain that the Porton workers used for the production of their soluble antigen and called by them "Weybridge." With more justice to its discoverer, who sent it to the Ministry of Agriculture's laboratories at Weybridge, it should be named the "Sterne" strain.

It has been clearly shown that these living vaccines immunize by a local proliferation at the site of injection, liberating soluble antigen *in vivo* in the same way that it is liberated by virulent organisms in anthrax infection; but,

whereas lesions of the latter are progressive, the local lesion of the former is invariably retrogressive. The production of the soluble antigen on a large scale *in vitro* is obviously an important advance, and the Porton workers are to be congratulated.—I am, etc.,

Oxford.

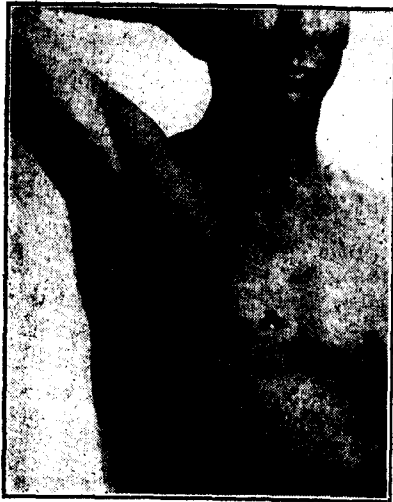
G. P. GLADSTONE.

REFERENCES

- ¹ Onderstepoort J. vet. Sci., 1937, 9, 49.
² C.R. Soc. Biol. (Paris), 1937, 125, 90.

Mondor's Disease

SIR,—We read with interest Mr. G. M. Lunn and Mr. J. M. Potter's article on Mondor's disease (*Journal*, May 8, p. 1074). At that time we had a patient with this condition of one month's duration. Although less evident than when first seen, the lesion is still well shown in the photograph.



The patient, a married male aged 57, attended in April, 1954. His general health was excellent, with no recent illness apart from osteoarthritis of both first metatarsal-phalangeal joints. He had marked congenital clubbing of the fingers, and so had his son, while this was less prominent in his daughter and absent in his wife. A non-tender subcutaneous cord-like structure was palpable from the right

anterior axillary fold to the level of the fourth right intercostal interspace. Just above the right breast it bifurcated, the less prominent of the two limbs of the bifurcation passing across the areola. The lesion was brought into prominence by abduction and external rotation of the arm and then caused marked puckering of the skin. There was no discoloration, but the patient stated that it was "a pinkish colour" on the third day after he first noticed it, but that it was normal the following day. The breasts were normal, no glandular enlargement was noted, and many pigmented moles were present on the chest and abdomen. The disease did not affect the patient's general health. There was no history of trauma, but three weeks before the lesion appeared the patient changed all the wheels of his car and noticed definite strain in the forcible jerking movements to loosen the bolts.

Unfortunately, the patient was unwilling to have a biopsy taken. We have only seen one other example of this condition.—We are, etc.,

London, E.4.

B. A. W. MARIEN.
F. SANDERS.

Drinking Sea-water

SIR,—Air Commodore T. C. Macdonald's attempt (*Journal*, May 1, p. 1035) to discredit Dr. Alain Bombard's achievement in crossing the Atlantic in a rubber raft surely deserves some comment. He says dogmatically sea-water should not be drunk, and that Bombard's evidence for doing so is unsatisfactory. It is generally accepted that salt intake is necessary to replace that lost in the perspiration, which in a castaway may be excessive. The men in the Kon Tiki recognized this and took salt tablets with them; rather unnecessary, surely, when they were surrounded by salt. Then by accident they discovered that sea-water tasted very well in their gruel, and they continued to add it after this purpose. They also found that they felt better and their thirst was quenched more by adding between 20% and 40% of sea-water to their fresh water. For Air Commodore

Macdonald to ignore this aspect of salt replacement by a certain amount of sea-water and advise castaways to wait for rain water, as in Bombard's case, for 21 days, is remarkable, surely, and seems to require some explanation and qualification.—I am, etc.,

Belfast.

R. A. MCILRATH.

Anaemia

SIR,—May I make a few comments on Dr. R. O. Gillhespy's letter (*Journal*, April 24, p. 983) on the "Treatment of Pernicious Anaemia"? I would like to suggest that the case which he describes was not in fact suffering from Addisonian pernicious anaemia, but from a megaloblastic anaemia due to folic acid deficiency. Two factors should rule out a diagnosis of Addisonian pernicious anaemia, the first being that she had no absolute achlorhydria, and the second that she did not respond to vitamin B₁₂. As she responded to proteolysed liver she must have a folic acid deficiency—due either to malnutrition or to malabsorption, the second being much more likely, and a fat analysis of her stools might be helpful.—I am, etc.,

Edinburgh, 10.

R. P. GOULDEN.

Racial and Religious Tolerance

SIR,—Dr. C. P. Seager is certainly right in deploring racial and religious intolerance (*Journal*, May 15, p. 1156). As a matter of principle we should always be aware of the difference between reasonable and prejudiced conducts wherever we meet them. Our colleague seems, however, to ignore the psychodynamic function of various prejudiced sentiments. Compliance, to a certain extent, with such tendencies serves a role similar to the avoidance of phobic situations or the performance of compulsive actions by a large group of patients. Therefore, as long as not much immediate harm to others results, prejudices of some sorts have to be put up with, because of a corresponding need for them in the prejudiced subject.

Indubitably, some professional men will find co-operation easier with colleagues with whom they feel at ease, and this fact must be considered however irrational the prerequisites of such mental ease may be. The same applies to patients whose anticipatory confidence in a doctor may be much disturbed if they have to suppress their prevailing religious or racial prejudices towards him. May Dr. Seager and other readers be referred to a book *Co-operation, Tolerance and Prejudice*?¹ It is heavy going and not well written, but explains in detail the phenomena in question.

We may be glad ourselves not to be dominated by unfriendly prejudices of the kind Dr. Seager has in mind, just as we should not like to have to comply with phobias or compulsions. But I cannot imagine the life of certain personalities without such "unreasonable" attitudes impelling them to select and avoid groups of fellow-beings in their daily social contacts. Only some of these sentiments are based on ignorance and automatic acceptance, and therefore capable of being discarded. The main thing is that prejudice, and intolerance based on it, should never be rewarded by approval or power; but we must wisely tolerate much of such manifestations.—I am, etc.,

London, N.W.4.

S. LOWY.

REFERENCE

- ¹ Lowy, S., *Co-operation, Tolerance and Prejudice*, 1948. Routledge and Kegan Paul.

SIR,—When Dr. C. P. Seager (*Journal*, May 15, p. 1156) is a little older he may appreciate that the likes and dislikes of our colleagues and patients are to some extent to be respected. We choose our wives, our husbands, our food and drink, our friends, and our politicians as we will. This is freedom. We behave with courtesy to those persons we dislike, and allow them the freedom we ourselves enjoy. This is civilization. If the patient prefers a papist, a Jew, a negro, or even an Englishman or Scotsman, to anyone else, why should not his doctor? Likes and dislikes do not necessarily arise from faulty reasoning or "emotionally toned prejudice."—I am, etc.,

Cricklade.

T. R. THOMSON.

Intravenous Iron

SIR,—I enjoyed reading the letter on intravenous iron by Drs. Frank Fletcher and E. London (*Journal*, April 24, p. 984). I am glad to see them admit that lethal factors in animals are not always related to factors producing reactions in man. I still cannot see, however, how increase of reticulo-endothelial activity *per se* can be invoked as the ultimate cause of reactions in man. Such abnormal activity is common in infections and reticuloses, yet no one invokes this as the ultimate cause of either. How can this evidence be marshalled? One method is surely to determine the presence of enlargement of liver, spleen, and lymph glands. These signs are commonly seen in the diseases mentioned, and also occur in serum allergy. It is strange, therefore, that no one has, to my knowledge, reported them so far to occur after injection of iron.

Their statement that reactions which follow the first administration of a dose of iron preclude an antigen-antibody response cannot go unchallenged. It is well known that severe anaphylactic reactions can occur in patients who have never had contact with the allergen before. I recall a patient of mine aged 16 years with no personal or familial allergic history who nearly died from anaphylactic shock following 100,000 units of intramuscular antidiabetic serum given for the first time. In the *Lancet* (April 24, p. 873) a case is reported in which a girl died following a small test injection of antitetanus serum. This is the so-called "phenomenon of natural supersensitivity." Some argue that such cases do not exist, in that unknown contact with a previously sensitizing substance always occurs. This may well happen if the complete antigen has not been introduced—that is, as I mentioned in a previous letter (*Journal*, March 6, p. 583) hapten activity occurs.

Finally, I do feel that, although instability of the preparation used may be operating, yet the main factor in the rapid onset of such reactions is that of direct introduction of the substance into the blood stream, whether this be intravenous or intramuscular. This was one of the disadvantages stressed by protagonists of the administration of vaccine by mouth—for example, for treating dysentery.—I am, etc.,

Romford, Essex.

I. M. LIBRACH.

Nutrition and Experimental Malaria

SIR,—The recent renewal of interest in the effects of nutrition of the host on the development of malaria parasites makes it seem appropriate at this time to recall some of the earlier work and to emphasize the importance of the caution expressed in an annotation which appeared about a year ago in the *British Medical Journal*: "It does not necessarily follow that a substance is metabolized by parasites because it facilitates their growth when administered to the animal harbouring the parasites. . . ."

Passmore and Somerville¹ in 1940 published the first report of experimental work on the influence of nutrition on a malarial infection. They found no effect of a diet deficient in vitamins A and C on the course of infection with either *Plasmodium cynomolgi* or *P. knowlesi* in monkeys. Three years later² it was found that biotin deficiency specifically decreased the resistance of chickens and ducks to certain avian malaria parasites. The same year it was reported³ that pantothenic acid favoured the survival and development of one of these avian parasites, *P. lophurae*, when it was maintained *in vitro* in suspensions of erythrocytes. These two findings set a pattern which subsequent experiments have fully supported: growth factors, depending on their nature (and, as later work showed, on their concentration) can either favour or retard the development of a malarial infection. The results with pantothenic acid led to the successful experimental use of analogues of the vitamin as antimalarial agents⁴ and to the demonstration of the inability of *P. gallinaceus* to develop in chickens deficient in pantothenate.⁵ Much additional significant information has since accumulated. Deficiencies in the host's diet of folic acid,⁶ protein,⁷ or nicotinic acid,⁸ like biotin

deficiency, favoured the development of avian malaria parasites, whereas a deficiency in riboflavin retarded the development of avian parasites,¹⁰ and deficiencies in vitamin C,¹¹ methionine,¹² or para-aminobenzoic acid¹³ retarded the development of simian malaria parasites. The effects of a milk diet on certain mammalian malaria parasites,^{14 15} and their explanation in terms of para-aminobenzoic acid deficiency,¹⁶ are well known to readers of the *British Medical Journal*. Despite all these facts, it would be premature to draw any conclusions concerning the nutritional requirements of malaria parasites. We must remember that the experiments referred to above relate to parasites growing in erythrocytes within a host animal, or at best to parasites growing in erythrocytes maintained for a short period *in vitro*. Recent work with *P. lophurae* has shown that when this organism is maintained extracellularly *in vitro* it requires coenzyme A¹⁷ and not the pantothenic acid moiety of coenzyme A. It is likely that some of the other factors in the diet of the host which favour the development of the parasite do so only indirectly. They must be present in the diet of the host in order to permit the host to elaborate other substances which are the materials actually utilized by the parasite.—I am, etc.,

New York.

WILLIAM TRAGER.

REFERENCES

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² *J. Malar. Inst. India*, 1940, 3, 447.
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Important Anomaly of Long Saphenous Vein

SIR,—In your medical memoranda of April 17 (p. 918) you had an admirable account of "An Important Anomaly of the Long Saphenous Vein" by Dr. A. J. M. Cathro. I would welcome an opportunity to stress this abnormality. Trendelenburg's operation for varicose veins is common, and in the course of the last three years I have, unfortunately, treated three cases of amputation, two above the knee and one below the knee, for the erroneous ligation of the femoral artery. In each case it was difficult to ascertain why this had occurred, but undoubtedly the femoral artery had been ligated, and this was probably due to the fact that it was not recognized that the long saphenous vein may pass spirally round the lateral side of the femoral artery. In these days of litigation it would seem most important for surgeons to be aware of the existence of this anomaly.—I am, etc.,

London, S.W.15.

LEON GILLIS.

Infectious Mononucleosis

SIR,—Dr. S. Varadi (*Journal*, May 15, p. 1155), writing on infectious mononucleosis, states that whether one adopts the theory of one causal virus or of different closely related ones, the blood count is the most important test of infection and is most likely to reveal the diagnosis at an early stage: also that this diagnosis is not excluded by a negative Paul-Bunnell test. In my experience the blood count and the blood picture in cases of measles, mumps, and lymphocytic choriomeningitis may be indistinguishable from that of an infectious mononucleosis, which gives a positive Paul-Bunnell test. I have in the past seen an experienced haematologist report the presence of numerous Downey Type II cells in the blood of a patient whose Paul-Bunnell test was negative, and who subsequently developed a rising complement-fixation titre for lymphocytic choriomeningitis.

Should pathologists admit that the blood picture in the diseases mentioned above is indistinguishable from that of infectious mononucleosis, it is doubtful whether infectious mononucleosis with a negative Paul-Bunnell test can be regarded as a disease entity. I think it is closer to the truth to state that known and perhaps unknown diseases may have a blood picture identical with that of infectious mononucleosis. Therefore a disease giving this blood picture combined with a positive Paul-Bunnell test with the complete adsorption procedures could be called infectious mononucleosis. If the Paul-Bunnell test is negative, complement fixation tests for known virus diseases might give the diagnosis. If these tests are not done, or are negative, let us be honest and say the disease has not been diagnosed. As yet, I have not seen a positive complete Paul-Bunnell test in a case of measles, mumps, lymphocytic choriomeningitis, or other undiagnosed form of benign meningitis, although the blood picture in some of these cases was indistinguishable from that described by Downey for infectious mononucleosis.

London, N.12.

PETER WOLF.

Women in Medicine

SIR,—Your annotation (*Journal*, May 15, p. 1143) draws attention to the dual responsibility of married women in medicine. This difficulty is now enhanced for those who have been overtaken by the new regulation requiring a pre-registration year of internship. The compulsory living-in during this year raises serious problems in the home, particularly for those who have young families. Would it not be feasible to permit living-out, provided that duties were not interfered with, at least for those women who took up medicine and incurred family responsibilities before this regulation was announced?—I am, etc.,

London, N.W.3.

RUTH D'ARCY HART.

Renal Clearance of Creatinine and Urea

SIR,—In his article Dr. R. A. Kenney (*Journal*, May 15, p. 1130) has shown that in nine out of ten West Africans the (maximum) urea clearance was lower than the average normal value accepted in Great Britain and the United States (75 ml./min.): in eight of the ten, the value was less than 3/5 of the average normal. He has shown that the creatinine clearance is similar in West Africans and in Europeans, and states that other investigations not yet published have shown the identity of the glomerular filtration rate and the renal plasma flow rate in the two groups. From these results Dr. Kenney argues that the mechanism of excretion of urea in West Africans differs from that in Europeans. Such a conclusion is not justified by the evidence in his paper.

The table of urea clearances given by Dr. Kenney is meaningless, because we are not told how the six results from each subject are combined to give the values tabulated. If, as one suspects, the results were arbitrarily separated into those corresponding to urine flows over 2 ml./min. and those corresponding to urine flows under 2 ml./min., the grand means for all the West African subjects are differently weighted by individual results and no conclusions are possible. In any case no comparison is possible with the European subjects, because the number of these is not stated.

Dr. Kenney states that the African subject "fails to show the 'augmentation' phenomenon which is characteristic of urea excretion in the European subject." The "augmentation limit" which was introduced by Van Slyke and his colleagues¹ represents the rate of excretion of urea at which the rate of excretion of urea is maximal. However, inspection of the original data on which this conception was based suggests that every increase in the rate of excretion of urea is associated with some rise in the rate of excretion of urea, and it seems fair to say that later authors²⁻⁵ have abandoned the idea of an "augmentation limit": it is a simplification which has been convenient in the clinical application of the urea clearance test. Six results were obtained by Dr. Kenney on each of his subjects; the results in full would permit of comparisons with corresponding results obtained in Europeans.

It is, of course, important to consider how much significance should be attached to urea clearance obtained in a period of rapidly increasing diuresis. Finally, it is worth noting that Gokhale⁶ and Srikantha and Shamanna⁷ found low values for the urea clearance in Indians. Low results were also obtained by H. Fairfield Smith⁸ in British prisoners in Japanese hands.—I am, etc.,

Sheffield, 11.

ARTHUR JORDAN.

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Winter Vomiting Disease

SIR,—I welcome the letter of Dr. M. C. McKinnon (*Journal*, May 15, p. 1154) criticizing the use of the name "winter vomiting" for this disease. This unfortunate name suggests that climatic conditions have something to do with the matter, whereas, in fact, this disease is undoubtedly an air-borne virus infection. I have myself described an outbreak of over 313 cases,¹ and this occurred at the end of September and beginning of October, which even in this northern part of the country is not usually considered winter, and the weather conditions at the time were far from severe. Dr. McKinnon rightly draws attention to the short incubation period of this disease as compared with the much longer period for infective hepatitis. In my own outbreak, although I have had the opportunity of observing the children for more than three years since the event, I know of no case of jaundice. Another point is the abrupt onset of this disease as a contrast to hepatitis. I am, etc.,

Accrington.

R. C. WEBSTER.

REFERENCE

- ¹ *Med. Offr.*, 1953, 90, 39.

Doctors and Technicians

SIR,—My friend Dr. J. F. Brailsford (*Journal*, May 15, p. 1152) sees the writing on the wall but misreads it. The trend of which he complains has nothing to do with the N.H.S. but must be studied against the background of social evolution. Hygeia, who, being the daughter of that respectable old G.P., Aesculapius, really ought to know better, now indulges in the most abandoned licentiousness, the latest offspring of her fecund womb being, apparently, the animal technician. The main cause of medical progress is the advance in technology. Consequently medicine itself must become more and more a technology, however deeply we may deplore the fact. Our mentors bleat *ad nauseam* that medicine is an art as well as a science, and that we must treat the whole man and not merely the diseased organ. The fact remains, however, that the fate of a patient is often decided by whether some backroom boy's burette reads 0.3 or 0.4. The backroom boy is not slow to realize his power.

The immense body of auxiliaries, the product of very efficient secondary education, is largely composed of those who, had Fate been kinder, could have entered medical schools and who would have made perfectly good doctors. These, urged by understandable ambition, and sometimes by resentment, are engaged in building parallel roads to a status equal to that which has been denied to them. Hence the claim that "the technologist has, or should have, equal status to the pathologist." Needless to say, this trend will become accentuated if the entry to medical schools is further restricted. At the same time these aspirants peck at every newcomer as savagely as barn-door fowls. This is what Messrs. A. E. Brown and F. Mather (*Journal*, April 24, p. 983) are now doing to the poor animal technician who is at the bottom rung of the ladder of diplomas, associateships, papers in journals, and annual congresses which they themselves are so successfully scaling.

Where will this end? I confidently predict that in 30 years all auxiliaries will have acquired consultant rank. The steps to this delectable consummation are not difficult to visualize. The training of auxiliaries in the last 20 years has made astonishing progress, while that of medical students has been comparatively static. Already there are some auxiliaries who hold the B.Sc. degree. Soon Ph.D.s will appear. They may, for all I know, be already with us. From this it will be but a short step to Doctors in Chiropody, Audiometry, Orthoptics, Speech Therapy, Radiography, Electro-encephalography, Medical Records, Operating Theatre Technique, and everything else. And if these, why not Doctors of Nursing? In the end the few who are not Doctors of some kind or other will hide their heads in shame. Never will so few have been so jealous of so many.

Some time ago I met a lady who had just been to a lecture given by a member of one of the auxiliary services. Her ecstasy knew no bounds. She might have been listening to the voice of God. I am afraid I could not conceal my amusement. "You shouldn't laugh," she said indignantly, "he's a great man. He talks to people at the Ministry."—I am, etc.,

Chesham.

FRRANCON ROBERTS.

SIR,—Dr. J. F. Brailsford draws attention (*Journal*, May 15, p. 1152) to a tendency in modern medicine on which others have also commented recently, and on which Dr. Ffrangcon Roberts dwells at length in *The Cost of Health*.¹ Dr. Brailsford suggests that the doctor who does little but stamp his signature on reports of work done by other people is in danger of losing both medical skill and status, and with this most would agree. It is also true that other workers now do for the doctor some tasks which he used to do for himself, but surely this is no cause for either alarm or despondency.

Modern developments in medical knowledge have resulted in the growth of aids to diagnosis and treatment, and in an abundance of specialized techniques so that no one person—however enthusiastic—could be expected to have an intimate grasp of them all. It seems to the impartial observer that the doctor or surgeon who makes wise and selective use of these various aids is benefiting himself and his patient, and is more likely to gain, not lose, clinical acumen and prestige. It is the non-use, or the indiscriminate use, of these subsidiary aids which is likely to harm both doctor and patient. The quotation made by Dr. Brailsford from the letters of two medical laboratory technicians ought not to be taken too seriously, especially out of their context. That context was a claim made in an annotation in the *Journal* of April 3 (p. 808) that "animal technicians" should be given equal status with medical laboratory technicians. When Mr. F. Mather's letter (admittedly ill-phrased) states (*Journal*, April 24, p. 984): "It would seem, therefore, to be more justifiable to state that in many respects the technologist has, or should have, equal status to the pathologist," I take him to mean "it would be as justifiable for the technologist to claim equal status with the pathologist as for animal technicians to claim equal status with the medical laboratory technologist," and no one would seriously support either claim. In any case the views of one or two medical laboratory technicians ought not to be taken as representing the views of the body of technicians nor that of the Institute of Medical Laboratory Technology. All professions, including the medical profession, have members who occasionally state views which would not be endorsed by the body corporate.

The approach to the problem posed by Dr. Brailsford is surely one of common sense. It is better that the physician or surgeon shall be free to concentrate his energies and training on the wider aspects of diagnosis and treatment than that he should dissipate his time and clinical specialty on the memorizing or performance of detailed technical procedures. He is not likely to have his status assailed because of the work performed by the various medical auxiliary professions: indeed, the effect of their work should be to increase it. Equally, it will profit nobody,

least of all the clinician, to undervalue the work which is daily being performed by the medical auxiliary professions.—I am, etc.,

Godalming.

W. H. VALENTINE.

REFERENCE
¹ *The Cost of Health*, 1952. London.

Seven Generations

SIR,—In the museum here is an MS. pedigree of the family of Kinneir from which the following is taken.

Walter Kinneir, surgeon, of Highworth (1671–1746) was father of Richard Kinneir (1711–1784), surgeon, of Cricklade, who was father of Richard Kinneir (1749–1813), surgeon, of Cricklade, who was father of Richard Kinneir (1787–1874), surgeon, of Cricklade, who was father of Richard Kinneir (1813–1892), M.D., M.R.C.S., L.S.A., of Cirencester, Purton, Weston-super-Mare, and Sherborne, who was father of Francis William Edward Kinneir (1858–1939), who was father of Guy Kinneir (b. 1891), M.R.C.S., L.R.C.P., now in practice. Seven generations. Can any family beat this record?—I am, etc.,

N. M. G. CARTER,
Hon. Curator, Cricklade Museum.

Standard of Anaesthetics in Britain

SIR,—My attention has been drawn to an article in the *Daily Express* of Wednesday, May 19, entitled "The Danger of Machines." This purports to report remarks made on the previous morning by Mr. Dickson Wright to a meeting of the American College of Surgeons. The article imputes a deplorably low standard of behaviour to anaesthetists in general. Its final paragraph, which mentions my own name as President of the Association of Anaesthetists, might have given the impression that I was present at the time and that Mr. Wright's remarks had my tacit approval, neither of which is true. It would not be necessary for me to refute these remarks if they had reached only those of us who are familiar with Mr. Wright's form of jocularity and who would give them the weight they deserve, but the American visitors may not be so familiar. It will be a pity if they have been left with a wrong impression of the standard of anaesthetics in this country, which is generally considered to be as high as anywhere in the world.

The effect of the article is to undermine the confidence of patients about to undergo surgical operations and can only be deplored—it is, as always, too late to undo the harm. I feel some sympathy with Mr. Wright that his light-hearted comments have received wider publicity than he intended. For the future, I feel that we should all remember that exaggeration as a humorous device is not wisely used in what is meant to be serious discussion, and, probably, never when it involves the denigration of colleagues.—I am, etc.,

GEOFFREY ORGANE,
President, Association of Anaesthetists
of Great Britain and Ireland.

London, W.C.2.

Chloramphenicol for Athlete's Foot

SIR,—The only paper that has been published on the value of chloramphenicol in the treatment of fungus infections of the skin is by Robinson *et al.*¹ These investigators found a 1% or 2% ointment to be of value in controlling secondary infections in 17 cases of epidermophytosis. It may therefore be of interest to know that I have treated 25 cases of athlete's foot, and over a period of six months have had only two recurrences which have cleared up again after further treatment. The majority of these cases had suffered from the complaint for a number of years. The basis of my treatment was: (1) wash the feet with warm water only each night; (2) dry thoroughly and apply every alternate night a little chloramphenicol ("chloromycetin topical") with a small piece of cotton-wool and allow to dry; (3) no dusting powders or any other medication required; and (4) change socks daily. In most cases I have found three or four applications were sufficient to clear up the condition completely.—I am, etc.,

Glasgow.

FRANCIS J. EVANS.

REFERENCE
¹ *Bull. Sch. Med. Maryland*, 1953, 38, 109.

Obituary

FRANK HOWITT, C.V.O., M.D., F.R.C.P.

The death of Dr. Frank Howitt on May 15 at the relatively early age of 59 removes a leading—indeed a pioneering—figure from the specialty of physical medicine and is a sad loss to a wide circle of professional colleagues and friends among whom he was held in unusual regard.

Frank Dutch Howitt was born on August 24, 1894, at Nottingham, and educated at Uppingham and Trinity College, Cambridge. In the first world war he served with the Royal Army Service Corps and later with the Royal Air Force. Returning to Cambridge, he took his M.A. in 1920, and graduated in medicine in 1923, proceeding M.D. two years later. He at once became attracted to physical medicine, and was appointed chief clinical assistant in the actinotherapeutic department at Guy's and physician in charge of physical medicine at the Royal Free Hospital and the Prince of Wales's General Hospital, Tottenham. Later he was appointed physician in charge of the large and



[Lafayette, Ltd.]

important department of physical medicine at the Middlesex, and in due course he became senior physician of the Arthur Stanley Institute for Rheumatic Diseases. Within five years of qualifying he was called in by Lord Dawson of Penn to administer certain physical treatments to George V during his serious illness in 1928, and he attended the King both in London and during his convalescence at Bognor.

Howitt was an active member of the British Medical Association, being honorary secretary to the Section of Dermatology at the Annual Meeting in 1927 and to the Section of Physical Medicine at the Centenary Meeting in 1932. In 1936 he was vice-president of the Section of Physical Medicine. He gave his services on several special committees of the Association. From 1932 onwards he was a member of the Practitioners of Physical Medicine Group Committee, and at the same period he took a prominent part in the consideration of proposals for the registration and training of physical treatment technicians and the training and recognition of balneological assistants. During the second world war he served in the R.A.M.C. with the rank of acting colonel in 1940 and the local rank of brigadier in 1942. He was placed in charge of the upgrading of recruits and of rehabilitation, and after the end of the war he continued to serve as senior consultant in physical medicine to the Army. He also became a director of Remploy Ltd. (the Disabled Persons Employment Corporation) and honorary adviser to the Ministry of Labour. When the Council of the B.M.A. set up a Rehabilitation Committee in 1945 Howitt served on it as a most valuable member for four years or more.

Industrial medicine and rheumatism were two of his great interests, and he was a member of the Nuffield Foundation committees on these subjects and chairman of the Research Board for the Correlation of Medical Science and Physical Education. He also served on the executives of the Empire Rheumatism Council and the Royal Institute of Public Health.

The illness which brought about his sudden end first manifested itself a year ago, but he faced the threat with splendid courage and patience, and his alert and eager mind continued at work. He might have looked forward to several more years of activity, but he could look back upon a career of high achievement, and also of great happiness, enhanced by his marriage in 1945 to Violet Norris, daughter of Alfred Leverton, to whom the sympathy of many friends will go out.

We are indebted to Dr. W. S. C. COPEMAN for the following appreciation: Frank Howitt, although popular in all of the numerous spheres of life in which, in addition to medical circles, he moved, was pre-eminently a man's man. He was gregarious, friendly, and easily approachable by his juniors. He entertained generously and elegantly, and was something of an authority on both food and wine. A dinner at his Harley Street home was always an experience. Although he became eminent in his chosen sphere of medicine, his real love was for the country life, and of recent years he spent all the time he could spare from practice at his farm in Gloucestershire. He was a first-rate tennis player and a fine shot throughout his life.

He came into prominence during the first illness of King George V, when he was invited by Lord Dawson to supervise the physical therapeutic measures which had become necessary. For this service he was appointed C.V.O. in 1929. It was characteristic of him that for several months subsequently he modestly avoided wearing the insignia, and later, if questioned about it, asserted humorously that he had been appointed "Mayor of Wigan, and was just showing the flag."

As a consultant in physical medicine during the second world war he was able to invest the subject with a far wider significance than had previously been attached to it. In this capacity he gathered round him a devoted band of juniors ("his boys") who carried his ideas into the various commands in which they later served. Much of what Howitt included under the heading of physical medicine has subsequently reverted to the provinces of social, preventive, and even general medicine, but he was successful in raising the subject from the status of a technique to that of a specialty. The conception, which he had inherited from Lord Dawson, that healthy living should be regarded as a powerful prophylactic against ill-health in later life led him to take a keen interest in the National Playing Fields Association and other similar movements.

In the Army he found great scope for the employment of his ideas in the upgrading of recruits and in the formation of rehabilitation centres where the concept of active convalescence was developed successfully. It was a considerable disappointment to him that these schemes proved to be less easy to apply in post-war civilian life. His friendship with the late Ernest Bevin while he was Minister of Labour, however, enabled him to exert considerable influence in the formation of industrial resettlement units, of which the chief is Egham, and other bodies such as Remploy Ltd., whose purpose is to return the defective worker to full-time productive employment.

He was an outstandingly successful Master of the Apothecaries Society, and he was at one time the vice-chairman of the Empire Rheumatism Council, in which he took a great interest.

Frank led a happy and useful life and we are all the poorer for his untimely passing.

ERIC POWELL, M.B., F.R.C.S.I., M.R.C.P.I.

The Kenya Branch of the British Medical Association has suffered a severe loss by the death while in office of its president, Mr. Eric Powell, on March 30 at the age of 36.

Willoughby Eric O'Connell Cole Powell was born in Yorkshire on May 12, 1917, the son of a doctor, but his early youth was spent with one of his uncles, Mr. George M. C. Powell, then a surgeon at Lusaka, in Northern Rhodesia. He returned to England to continue his education at Worksop College, Nottinghamshire, and from there he entered Trinity College, Dublin, where, with a grandfather, a father, and two uncles all members of the medical profession, it was hardly surprising that he should enrol as a medical student. A brilliant career at Trinity College was rewarded by the Daniel John Cunningham Medal in anatomy at the first medical examination, the John Mallet Purser Medal in physiology, biochemistry, and histology, the Professor's Prize in surgery, the Connolly Norman Medal in mental diseases, and the FitzPatrick Scholarship. He graduated in 1940 with second-class honours in the final M.B. and first-class honours in the final B.Ch. examinations. He had previously been awarded a gold medal as a moderator of exceptional merit. After graduation Powell held the appointment of house-surgeon at Sir Patrick Dun's Hospital, later becoming assistant in the ear, nose, and throat department, and for a time he was also assistant to the professor of pathology at Trinity College. Later he was appointed honorary consultant laryngologist to St. Patrick's Hospital, Dublin. He was elected F.R.C.S.I. in 1944 and M.R.C.P.I. in the following year. In 1947 he left Dublin to become ear, nose, and throat surgeon at King George VI Hospital, Nairobi. In addition, he established a private practice there and acted as surgeon to the British Military Hospital at Nairobi. As founder of the Nairobi Clinical Club he brought together once a month his colleagues in the profession, not only to discuss medical problems and to exchange views but to encourage the spirit of comradeship among them. His election as president of the Kenya Branch of the B.M.A. in January last was a tribute to the esteem with which he was regarded by his fellow members and to the ability they recognized in him. He had a variety of outside interests, being a city councillor, area commandant of the Kenya Police Reserve, and twice president of the Irish Society. As an after-dinner speaker and a performer on the piano accordion, his services were in great demand, while his love of children was particularly in evidence at the Christmas parties at the Children's Hospital. He was happy, too, in his well-equipped workshop, where the making and repairing of surgical instruments gave him great pleasure. He married Dr. Edna G. Merrick, daughter of Dr. William Merrick, of Castleknock, Co. Dublin, in 1941, the year after they both graduated in medicine at Dublin, and she survives him, together with the three children of the marriage.

F. W. RANKIN, M.D., LL.D., P.A.C.S., F.R.C.S.

Dr. F. W. Rankin, President of the American College of Surgeons, and a former President of the American Medical Association, died at Lexington, Kentucky, on May 22, aged 67. He was a son-in-law of Dr. Charles H. Mayo, one of the founders of the Mayo Clinic. His fatal illness prevented him from presiding at the meeting of the American College of Surgeons in London last week.

Fred Wharton Rankin was born at Mooresville, N.C., on December 20, 1886, and received his medical education at the University of Maryland, Baltimore. After graduating in 1909 he held a resident post in Baltimore until 1912 and served as assistant demonstrator in anatomy and as associate in surgery at his own university from 1913 to 1916. He then joined the Mayo Clinic as assistant surgeon until 1922, when he spent a year as professor of surgery in the University of Louisville. He returned to Rochester in 1926 as associate professor of surgery at the University of Minnesota Medical School and surgeon to the Mayo Clinic. He left these posts in 1933 to practise surgery at Lexington, Kentucky, where he was appointed surgeon to St. Joseph's Hospital, a position he held at the time of his death. Since 1941 he had been clinical professor of surgery at Louisville.

Rankin contributed much to the literature on clinical surgery, and was an internationally known authority on the surgery of the colon and rectum. His monograph on the *Surgery of the Colon* appeared in 1926, and he was also the joint author of *The Colon, Rectum and Anus* (1932), and *Cancer of the Colon and Rectum* (second ed., 1950).

During the last war he served as chief consultant to the Surgeon-General, U.S. Army, with the rank of brigadier-general. The American Medical Association in 1945 awarded him its Distinguished Service Medal for his meritorious services in this appointment. He was president of the Southern Surgical Association in 1937, the American Medical Association in 1942, the American Surgical Association in 1949, and the American College of Surgeons at the time of his death. In 1953 Rankin was awarded an honorary fellowship of the Royal College of Surgeons, and during the recent meeting of the Association of Surgeons of Great Britain and Ireland, attended by many distinguished members of the American College of Surgeons, the University of Leeds conferred upon him the honorary degree of LL.D.

Dr. E. WELLISCH died in hospital at Dartford, Kent, on March 11, after a short illness. Erich Wellisch was born in Vienna on January 21, 1898, the son of a high official of the municipality who made a name for himself by becoming an authority on blood groups after his retirement. To emulate his father's distinction was Erich Wellisch's fondest ambition. He graduated M.D. at the university of his native city in 1924. After a period of postgraduate study in neurology, he specialized in physical medicine and soon became an authority on light therapy. A monograph on this subject and a number of publications on the physiotherapy of neuritis and dermatitis bear witness to his great abilities as a clinical observer and to his therapeutic resourcefulness. Having had to leave Vienna in 1938, Dr. Wellisch started afresh in this country, taking the Conjoint Diploma in 1941. He took up psychiatry, and acquired the D.P.M. of the English Royal Colleges in 1945. With the seriousness and enthusiasm so characteristic of him, he specialized in child psychiatry, and from 1947 to his death was in charge of the Crayford Child Guidance Clinic at Bexleyheath, Kent.

Dr. E. STENGEL writes: Dr. Wellisch was a hard worker who did not spare himself. He succeeded in combining clinical and research work. He undertook a series of investigations into the application of projection tests in child guidance, and his papers on the Rorschach test were notable contributions in a field full of controversy. Other publications dealt with eye manifestations in maladjusted children, follow-up investigations in child guidance work, and dreamy states. Only a few months before his death he completed a book entitled *Isaac and Oedipus*, in which

he analysed the ancient Hebrew legend of the sacrifice of Isaac side by side with the Greek tragedy. Dr. Wellisch was deeply interested in the philosophical foundations of psychiatry. Had he lived he would undoubtedly have added to his achievements as a clinician and scholar. The sympathy of his friends and colleagues goes out to his widow and his two children.

Dr. V. E. BADCOCK, one of the best known and most respected medical practitioners in rural north Northumberland, died at his home near Cornhill-on-Tweed on April 6 at the age of 69. Vincent Edgar Badcock had a distinguished career as a student at Durham University, where he graduated M.B., B.S. in 1906, proceeding to the M.D. three years later, when he was awarded a gold medal for his thesis. After graduation he held resident appointments at the Royal Victoria Infirmary, Newcastle-upon-Tyne, and for a time he was assistant demonstrator in anatomy in the university. In 1909 he became assistant to the late Dr. Alexander Dey, of Wooler, and in the following year succeeded to the practice of Dr. W. H. Shand at Flodden Lodge, near Cornhill, and entered into partnership with Dr. Dey. In the first world war Dr. Badcock joined the R.A.M.C. and served with distinction in France as a regimental medical officer, being awarded the Military Cross for conspicuous gallantry in attending to the wounded when he himself was severely wounded in the foot. He would not have his wounds attended to until everyone else had been treated, and as a result his condition became worse. After numerous operations his leg was amputated below the knee. He returned to his extensive practice in a scattered rural district and was regarded in very high esteem by countrymen in all grades of society. He was beloved and trusted by his patients, and his colleagues in the profession found in him an honourable and delightful friend. In 1921 he was elected chairman of the North Northumberland Division of the B.M.A.; he was also a member of the executive and ethical committee for a number of years, and a regular attendant at divisional meetings as long as his health permitted. During the last war he was chairman of the local medical war committee and took a special interest in the protection of practices scheme and in the arrangements for the medical attention of evacuees in the area. Dr. Badcock was a keen cricketer and played regularly for the Tillside club, of which he became chairman. In his later years he rarely missed being present at a match on the delightful ground at Etal near his home. He was a bachelor and is survived by two brothers and several nieces and nephews. One of his nephews, Dr. Alan Bousfield, had been in partnership with him for some years, and will carry on the practice at Flodden Lodge.—D. T. McD.

Dr. R. S. DE BRUYN, who was on the surgical staff of the Stamford and Rutland Hospital, died at Capetown, South Africa, on May 6 at the age of 56. Robert Saunders de Bruyn, who was born on July 14, 1897, served in the Royal Flying Corps in the first world war and was awarded the D.F.C. in 1919. Soon after demobilization he enrolled as a medical student at Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1927, taking the diploma of L.D.S. of the Royal College of Surgeons of England in the same year. After qualification he held a number of appointments at Guy's Hospital before settling in practice at Stamford in 1932, the year in which he was admitted F.R.C.S.

We are indebted to Dr. E. C. TILL for the following appreciation: The untimely death of Robert Saunders de Bruyn on May 6 is a grievous and irreplaceable loss both to his colleagues and to the community he served so ably for 20 years. His stature in general surgery was such that he was most unfortunate in not securing a staff appointment at Guy's. After a period spent as surgical registrar and some months in the U.S.A., he joined a firm of general practitioners at Stamford as a surgical partner, and in 1932 came on to the staff of the Stamford and Rutland General Infirmary. It was typical of his wide interests in medicine that, until the rapidly expanding volume of his surgical work

made it impossible, he undertook and enjoyed a fair amount of general practice. During the last war he laboured for six years, virtually without any holiday or respite, and achieved a truly remarkable volume of major surgery at his hospitals at Stamford and Holbeach. After the commencement of the National Health Service, he relinquished his partnership and continued consultant appointments with the East Anglian and Sheffield Regional Hospital Boards. In July, 1953, after some weeks of increasing unfitness, he submitted to lengthy investigations which terminated in an abdominal operation. His death at Capetown occurred as the result of a relapse while on convalescent holiday. Much of his professional success lay in his judgment, which was rarely at fault. Strongly individualistic and endowed with a fine memory for faces and events, he had that rare quality of so shouldering his patients' burdens that all worry and tension vanished with his advent. His rich personality did not suffer fools gladly, and his lambent wit flickered impartially upon all and sundry according to their deserts. Essentially a man of simple tastes, he enjoyed good music, literature, and the arts. He bore the considerable travail of his long illness with great fortitude, much aided by the devoted care and encouragement of his wife, to whom we offer all our sympathy in her great loss.

Mr. W. E. SPRINGFORD, consulting surgeon to the Charing Cross Hospital unit at Mount Vernon Hospital, Northwood, died at his home at Northwood on May 18 at the age of 41. William Edmund Springford was born on November 29, 1912, and received his medical training at Charing Cross Hospital, graduating M.B., B.S. from London University in 1936 and winning the Governor's Clinical Gold Medal at the hospital in the same year. He obtained the F.R.C.S. in 1941, and in the following year he was awarded the J. H. Morgan Surgical Prize at Charing Cross Hospital. After graduation he held the appointment of house-surgeon at his own teaching hospital, later becoming resident surgical officer at the Chesterfield and North Derbyshire Royal Hospital and at the Kent and Sussex Hospital, Tunbridge Wells. On the outbreak of war in 1939, Mr. Springford, who was then in practice at Snaresbrook, entered the Emergency Medical Service and worked at Ashridge Hospital, Berkhamsted, until 1944, when he joined the R.A.M.C. as a lieutenant. Ill-health, however, compelled him to relinquish his commission in 1947, by which time he had attained the rank of major as a surgical specialist. Soon after his return to civilian life, Mr. Springford was appointed surgical specialist at Northwood, later becoming consulting surgeon to the Royal Masonic Institute for Girls.

T. D. L. writes: Mr. W. E. Springford was without doubt one of the nicest consultants we in this area have ever known. He was ever ready with good advice and never let a practitioner down. His good humour and charm delighted our patients, and these qualities, with his sound surgery, made us happy to consult him. Those of us who were privileged to observe the remarkable courage shown by him and by Mrs. Springford towards the end have had an object lesson in dignity and fortitude. To Mrs. Springford we extend our deepest sympathy. We shall miss him much.

Dr. C. H. R. PENTREATH, who was 81 years of age, died in hospital in Nairobi on May 19, four days after he had been savagely and senselessly attacked by Mau Mau terrorists. He left his home on May 15 to buy some cigarettes at a near-by inn, when he was bludgeoned by a terrorist in a country road near Nairobi, and left in a semi-conscious state on the roadway. Charles Henry Reginald Pentreath was born at Exmouth, Devon, on October 1, 1872, and was educated privately and at Cambridge University, where he took the Natural Sciences Tripos in 1892. Four years later he obtained the degrees of M.B., B.Chir., having received his clinical training at St. Mary's Hospital. He spent much of his professional life abroad. In 1900 he was resident medical officer at the Auckland General Hospital in New Zealand, and from 1902 to 1905 resident

medical superintendent at the Government Sanatorium at Cambridge, New Zealand. In 1911 he returned to England, and at the outbreak of war in 1914 was in a partnership at Maidenhead, where he was also surgeon to the local cottage hospital. He served in the R.A.M.C. from 1914 to 1916, and then went to live in Devonshire, where he was oculist to the Devon County Council. From 1918 to 1920 he was a medical adviser to the Ministry of Pensions. Soon after the end of the first world war he went abroad again, this time to Nairobi, where he was in practice as an ophthalmic specialist until 1947, when he retired.

Medical Notes in Parliament

Prescribing Cortisone and A.C.T.H.

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked the Minister of Health whether, under his regulations, cortisone and A.C.T.H. could be prescribed by doctors to their private patients. Mr. IAIN MACLEOD stated on May 20 that there were no regulations governing the prescription of these or any other drugs for the use of private patients. In the public interest he had limited the distribution of cortisone and A.C.T.H. to selected hospitals, from which they might be obtained for the treatment of private patients suffering from certain serious conditions.

Mr. BLENKINSOP said it was undesirable that patients should feel that they could get these things as private patients but might not be able to get them, at any rate from general practitioners, under the Health Service. Would he urge on doctors generally that these drugs should not be prescribed except in hospitals? Mr. MACLEOD said that distribution was limited to about 100 selected hospitals. The supply position was rapidly becoming a great deal easier, and it was hoped to extend the distribution very considerably. Obviously cortisone could not be denied to a patient merely because he happened to be in a private room and not in a ward.

Mr. T. WILLIAMS (Don Valley, Lab.): Before a general distribution of cortisone is made, will the Medical Research Council be consulted on how, by whom, and in what quantities it shall be prescribed? Mr. MACLEOD: Certainly. As cortisone becomes increasingly available this sort of problem will arise. We shall move in step with the Medical Research Council.

Dr. EDITH SUMMERSKILL (Fulham, West, Lab.) asked the Minister to make it clear that if a hospital doctor thought a Health Service patient would benefit from the drug he would be able to prescribe it. Mr. MACLEOD replied that he was not certain that he could give precisely that assurance yet, but the time was rapidly approaching when supplies would be fully adequate to fulfil all such purposes.

Chloramphenicol Treatment

Mr. IAIN MACLEOD told Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) on May 20 that information was not available about the number of deaths resulting from treatment by chloramphenicol. Dr. STROSS asked whether it was fair to say that this powerful and most useful drug should only be used for children if other drugs were not available or would not do the work. Mr. MACLEOD replied that that was not a matter on which a layman should pronounce. Certainly considerable dangers were involved in the use of the drug, and there had been a number of deaths—most of them due to an overdose being given.

Trichinosis from Sausage Meat

Mrs. E. BRADDOCK (Liverpool, Exchange, Lab.) asked the Minister of Health if his attention had been drawn to the recent outbreak of trichinosis in Liverpool; and what action he had taken to make it fully known that this infection was caused by eating raw pork sausage meat. Mr. IAIN MACLEOD replied on May 20 that the medical officer of health of Liverpool reported a localized outbreak of trichinosis there

last November, and at the time warned the public through the local and national press not to eat uncooked pork or pork sausage meat. Only three small outbreaks in England and Wales, of which this was one, had been reported in the past seven years. No further action on his part was called for. He did not dissent from Mrs. Braddock's further point that, although there had been only a few localized outbreaks, the danger existed and people should be made aware of it. The danger, he said, was in eating raw sausage meat as if it were meat paste.

Sale of Calomel

Mr. S. SWINGLER (Newcastle-under-Lyme, Lab.) asked the Home Secretary if, in view of public anxiety caused by the recent deaths of infants attributed to the presence of calomel in teething powders administered to them, he would state the grounds on which the Poisons Board had advised him against controlling the sale of calomel and request the Board to reconsider the matter. Sir DAVID MAXWELL FYFE, replying on May 20, declined, pointing out that the proceedings of the Poisons Board, the advisory committee set up by the Pharmacy and Poisons Act, 1933, were confidential.

Practice Loans in Scotland

Miss M. HERBISON (Lanarkshire, North, Lab.) asked the Secretary of State for Scotland on May 18 how many applications had been received from practitioners for an interest-free loan to establish group practices; and from which districts in Scotland they had originated. Commander T. D. GALBRAITH, Under Secretary, informed her that applications had been received from 18 groups of doctors in Edinburgh, Glasgow, Ayrshire, Fife, Lanarkshire, the Lothians, and Stirlingshire. Miss HERBISON asked how soon a decision would be given; and whether, as so many applications had been received in such a short time, "the miserable £100,000" would be sufficient to meet them. Commander GALBRAITH said the applications would have to be gone into before it could be decided which groups should get the first sums available. It might take some little time before a final decision was made.

Old People in Mental Hospitals

Mrs. JEAN MANN (Coatbridge and Airdrie, Lab.) asked how far it was the practice, when there is a shortage of beds in general hospitals, for old persons to be given accommodation in mental hospitals; and to what extent they were required to be certified, on refusing, in these circumstances, to enter voluntarily. Commander T. D. GALBRAITH said the Secretary of State was not aware of any such practice. Some forms of senile mental illness could be cared for properly only in a mental hospital; and where admission as a voluntary patient was not accepted, certification might be the only way of securing that the patient got the care and treatment needed. Mrs. MANN said there was widespread belief in industrial areas that old people were being put into mental hospitals because there were insufficient beds in general hospitals, and that when the old people protested and did not go voluntarily they were certified. Commander GALBRAITH said that if she would give him details he would look into them.

Mrs. MANN also asked if it was now permissible under regulations to certify elderly patients entering mental institutions as suffering from mental senility; and how far deviation from the words laid down by statute was permitted. Commander GALBRAITH stated that the conditions to be met before a person could be certified were laid down by statute, as also were the terms in which the relative certificates must be given. There was no power to permit any deviation, such as that suggested, from the terms and conditions laid down by statute.

Pay-beds in Scotland

Commander GALBRAITH stated in answer to Mr. W. HANNAN (Glasgow, Maryhill, Lab.) that during the year ended March 31, 1953, on an average less than a quarter of the pay-beds in Scottish Health Service hospitals were unoccupied. There were 913 such beds, or 1½% of all staffed

beds. The percentage occupancy of these beds was about 75, compared with 83½ for all the beds in hospitals. This was considered to be quite a high percentage.

Mau Mau Psychology

Mr. C. ALPORT (Colchester, Con.) asked the Secretary of State for the Colonies on May 19 whether the Government would appoint a technical group to inquire into the anthropological and psychological aspects of the Mau Mau outbreak. Mr. H. HOPKINSON, the Minister of State, replied that in February the Kenya Government invited Dr. J. C. Carothers, a psychiatrist with a number of years' experience in Kenya, to carry out a special investigation into the psychology of Mau Mau. He completed his report last month. Until this had been examined he could not say what further steps would be required.

M.P.'s Salaries

On May 24 Members of Parliament voted by 280 votes to 166 to raise their salary from £1,000 to £1,500 a year. This is two and a half times the 1939 salary of £600, and one and a half times the 1946 salary of £1,000.

Hospital Appointments Advertising.—Replying to Dr. A. D. D. BROUGHTON on the cost to the National Health Service for advertising to invite applications from medically qualified men and women for hospital appointments, Mr. IAIN MACLEOD said that complete information was not available, but the expenditure of all regional hospital boards and hospital management committees in England and Wales, and half the boards of governors, during the year ending March 31, 1953, was £191,000.

Birmingham Patients Waiting.—The Minister of Health has informed Mr. S. T. SWINGLER (Newcastle-under-Lyme, Lab.) that at the end of March there were 4,512 patients awaiting admission for gynaecological treatment at hospitals in the Birmingham region.

School Medical Service.—The Prime Minister, answering a question by Miss IRENE WARD (Tynemouth, Con.), said he was advised that it would not be desirable at present to transfer responsibility for the school medical service to the Minister of Health.

Stride Knee-joint Experiments.—Mr. IAIN MACLEOD has informed Lieutenant-Colonel M. LIPTON (Brixton, Lab.) that experimental tests of six Stride knee-joints were in progress, but no final decision had been reached. Experiments had been going on for just over a year.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Dr. E. D. ADRIAN, O.M., P.R.S., Master of Trinity College, has been appointed a manager of the E. G. Fearnside Fund until December 31, 1956, and a governor of the Darwin Trust until July 30, 1958.

The following reappointments are announced: Dr. F. G. J. Hayhoe as University Lecturer in the Department of Medicine from March 1, 1954, to the retiring age; Dr. J. R. Robinson as an Assistant Director of Research in the Department of Experimental Medicine from October 1, 1954, for five years; Dr. W. A. Fell as an Associate Lecturer in Physical Medicine in the Department of Medicine from April 1, 1954, to the retiring age or for so long as he remains a consultant in physical medicine to the United Cambridge Hospitals, whichever period is the shorter.

Mr. J. H. Daggart has been appointed representative of the University at the seventeenth International Congress of Ophthalmology to be held at Montreal and New York in September, 1954.

Dr. G. H. Wright has been reappointed University Lecturer in the Department of Anatomy, and Dr. G. R. E. Naylor University Lecturer in the Department of Pathology, both with tenure from October 1, 1954, to the retiring age. Dr. P. A. G. Monro has been reappointed University Demonstrator in the Department of Anatomy, and Dr. T. S. L. Beswick University Demonstrator in the Department of Pathology, both with tenure from October 1, 1954, for two years.

Dr. Raymond Williamson has been appointed representative of the University at the International Congress on the History of Medicine to be held in Italy in September, 1954.

Dr. S. D. Elliott has been appointed an Assistant Director of Research in the Department of Animal Pathology with tenure from July 1, 1954, for five years.

Dr. J. A. Hislop has been elected to an Elmore Medical Research Studentship from January 1, 1954.

In Congregation on January 23 the following degrees were conferred:

M.D.—W. M. Keynes, O. H. Wolff, W. H. Simonds, B. Schofield.

M.B., B.CHIR.—H. H. Shawdon, *L. Wilkinson, D. E. Corlett, R. H. Morgan, H. J. Wood, R. D. France, *C. P. D. Tong, *H. Eaton, F. McP. Low, *Ee Keng Lee.

M.B.—*J. D. Avison, D. K. Robinson, *G. P. Vaughan, R. C. Benians, G. N. Penlington, *H. M. Buckland, C. W. M. Cooper, *I. M. Allison, *L. R. L. Burton, *J. G. Pritchard, *G. A. Reed, *G. McC. Grandsen, *B. I. F. Eminson, *S. R. Laing, M. J. Purves, *E. S. Reed, *F. S. Cozens, *J. L. Tasker, M. C. G. Mantell, R. E. Williams, Mrs. Jane F. Mackworth, *E. Moran, *L. Weiss.

In Congregation on February 5 the following degrees were conferred:

M.D.—J. F. P. Skrimshire.

M.B., B.CHIR.—*A. M. Hammerton-Fraser, *D. W. Bentinck, M.B.—*I. Oswald, J. R. T. Finlayson.

In Congregation on March 20 the following degrees were conferred:

M.CHIR.—*J. F. Bolton Carter, *A. G. Dingley, A. Standeven, M.B., B.CHIR.—*A. J. Danby.

M.B.—A. D. Thursz.

*By proxy.

The following candidates have been approved at the examinations indicated:

FINAL M.B.—Part II (*Principles and Practice of Physic, Surgery, Midwifery and Gynaecology*) (the figures indicate the section or sections passed): *I. M. Allison, *J. D. Avison, *S. G. Bayliss, *R. C. Benians, *G. F. B. Birdwood, *R. J. Blow, *J. A. D. Briggs, *L. F. Brunt, *H. M. Buckland, *G. L. Buntton, *D. C. L'E. Burges, *L. R. L. Burton, *D. J. Buttery, *W. H. Carling, *Mrs. A. Clarke, *D. M. T. Cones, *C. W. M. Cooper, *D. E. Corlett, *P. S. Cozens, *J. L. Crammer, *J. Crook, *Mrs. E. J. P. Davies, *M. W. L. Davis, *A. E. L. de Thierry, *J. P. Dickson, *D. G. Dingle, *P. M. Dunn, *H. Eaton, *Mrs. E. A. Eldon, *B. I. F. Eminson, *J. P. English, *J. Gibbs, *P. Gortval, *Mrs. M. H. P. Gregory, *A. M. Hammerton-Fraser, *J. W. Harding, *M. E. Hern, *F. Heyes, *G. H. Hilton, *B. Holt, *M. Horowitz, *L. H. Hurrell, *H. Jacobs, *P. O. Jones, *F. E. Kenyon, *R. J. Knight, *S. R. Laing, *R. C. Lawson, *E. K. Lee, *S. P. Lock, *F. M. Low, *C. M. McGregor, *R. F. McKnight, *Mrs. J. F. Mackworth, *J. R. McNeill, *M. C. G. Mantell, *H. C. Masheter, *G. F. Mayall, *J. S. Miller, *E. J. Mitchell, *M. T. Moore, *E. Moran, *R. H. Morgan, *N. H. Moynihan, *J. C. Newell Price, *I. Oswald, *C. J. Pattinson, *A. B. L. Peake, *J. G. Pritchard, *M. J. Purves, *E. S. Reed, *G. A. Reed, *D. K. Robinson, *J. O. Robinson, *Mrs. L. M. Rochelle, *J. D. Salmon, *J. R. Scott, *H. H. Shawdon, *P. T. Smith, *J. K. Snell, *G. P. Starck, *G. Tait, *J. L. Tasker, *A. D. Thursz, *S. A. Tillyard, *C. P. D. Tong, *D. E. Tunnadine, *G. P. Vaughan, *J. D. S. Vernon, *J. A. A. S. Webber, *J. H. H. Webster, *I. Weiss, *P. D. W. Wickenden, *L. Wilkinson, *R. E. Williams, *R. V. F. Williams, *W. D. W. Williams, *W. A. Williamson, *H. J. Wood, *J. R. Wood, *S. M. Worrall.

Part I (*Pathology and Pharmacology*): D. P. Addy, R. W. Ainsworth, I. R. Aldous, D. L. Almond, J. Anderson, P. C. Anderson, P. C. W. Anderson, W. Atherton, D. W. Atkinson, J. Bamforth, R. B. Bennet, D. W. Bentinck, G. D. Blackledge, J. R. Blatch, J. W. Blaxill, L. H. Blonstein, J. N. Bodger, A. Bracewell, J. P. Brady, P. Brine, M. E. Budleigh, G. L. Buntton, E. Burkinshaw, P. J. Burrows, N. R. Burt, J. R. Burwell, S. T. G. Butterworth, P. G. T. Bye, D. H. Cameron, W. H. Carling, G. G. Carmichael, R. A. Carpenter, R. A. Carter, S. B. Carter, T. D. Carter, J. D. Chard, E. B. Clayton, T. R. Clendon, J. R. Cobbett, W. L. Cordeaux, M. Cornelius, I. J. Cour-Palais, E. E. Denman, P. A. Dinkel, B. H. S. Dixon, W. D. Dolton, H. Dovey, P. A. Eckstein, J. D. Fitzsimons, R. D. France, A. M. Freeman, J. S. Garfield, F. E. Garrad, E. F. D. Gawne, A. E. Gibbs, A. E. R. Gibbs, R. K. Gilbert, G. McC. Grandsen, C. M. B. Grigson, J. N. Harcourt, B. Holt, J. H. C. Hunt, L. H. Hurrell, R. D. Hyde, R. B. Jenkins, F. L. Johnstone, D. H. Jones, P. J. D. Kirk, W. G. R. M.

Laurie, E. P. Lawrence, J. A. S. Lees, M. J. Littlewood, I. V. Longfield, R. D. Lowe, R. S. McKim, I. E. McLaren, S. M. Madeloff, R. Malley, J. W. Maltby, P. B. C. Matthews, K. L. G. Mills, C. J. Moore, C. B. Mortimer, J. F. Mowbray, M. T. C. Mower, M. A. Newland, W. S. Ogden, A. M. Parfitt, R. W. Payne, R. J. C. Pearson, G. N. Penlington, M. R. K. Plaxton, A. Pollard, D. J. H. Prosser, M. J. Purves, J. C. L. Rawes, J. N. Rea, E. Redfearn, S. E. Reed, D. J. Roberts, I. R. Robertson, A. Robinson, B. H. B. Robinson, I. Ross Russell, A. O. Russell, J. R. Scott, G. G. Scott-Brown, R. O. Selby, P. R. Shires, R. G. D. Small, G. C. Spackman, J. A. Stamford, L. M. Stauffer, R. M. Stirland, F. Summers, E. I. Tanner, G. J. M. Thompson, J. E. Trapnell, J. C. S. Turner, A. S. Valentine, I. H. M. Veitch, J. F. Walker, C. A. M. Walkley, R. S. Wardle, N. A. Waring, J. R. C. Weatherly, D. N. Whitmore, B. M. Wild, J. C. Willan, J. T. N. Williams, R. E. Williams, W. A. Williamson, J. F. Wood, B. Woods.

M.CHIR.—J. W. Bolton Carter, A. G. Dingley, A. Standeven, J. S. W. Whitehead.

The following degrees were conferred on February 20:

M.D.—D. Ainslie, R. J. Harrison, P. H. Mitchell, A. L. Furniss.

M.B.—P. T. Smith (by proxy), C. J. Pattinson, S. M. Worrall.

UNIVERSITY OF LONDON

Dr. J. P. Collard has been elected and Dr. A. Talbot Rogers re-elected as two of the representatives of the Faculty of Medicine on the Standing Committee of Convocation for three years from January 9, 1954.

Professor J. M. Mackintosh has been nominated for re-appointment as representative of the University on the governing body of the Slough Industrial Health Service.

Mr. J. M. Pullan has been recognized as a teacher of surgery in the University at St. Thomas's Hospital Medical School.

UNIVERSITY OF MANCHESTER

The Council of the University has approved the following changes in status of members of the staff, to take effect, except where otherwise indicated in parentheses, from September 30, 1954: *To be Reader in the subjects named:* Surgery, Mr. R. P. Jepson; *Social Medicine*, Dr. R. F. L. Logan (from March 1, 1954). *To be Senior Lecturer in the subject named:* Ophthalmology, Dr. Alan Stanworth (from a date to be approved). *To be Lecturers in the subjects named:* Pathology, Dr. J. C. Burne, Dr. G. E. Paget, Dr. J. P. Smith; *Neuropathology*, Dr. P. O. Yates (from October, 1953). *To be Assistant Lecturers in the subject named:* Pathology, Dr. H. de C. Baker, Dr. B. L. Williams.

The following candidates have been approved at the examination indicated:

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Part II: D. L. Fox, K. Rawnsley.

UNIVERSITY OF LIVERPOOL

The degree of Ph.D. in the Faculty of Medicine has been granted to T. G. Richards, M.D.

The following diplomas have been awarded:

D.M.R.(D).—Part I: H. J. J. Beyleveld, A. Bhattacharya, H. E. Jones, J. P. Murray, I. P. Smyth.

D.M.R.(T).—Part I: B. Roy.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Faculty held on March 1, with Dr. Andrew Allison, President, in the chair, N. Radhakrishnan was admitted a Fellow of Faculty *qua* physician; on May 3 S. G. McAlpine was also admitted a fellow of Faculty *qua* Physician.

ROYAL COLLEGE OF SURGEONS IN IRELAND

On April 2 the Fellowship of the College was conferred on D. F. Doherty, J. Kyle, J. G. Maher.

The following diplomas have been awarded:

D.C.H.—B. P. K. Ryan, J. B. Shea.

D.O.M.S.—R. E. Tingey.

D.P.M.—E. Casement, A. C. Fleming, J. P. F. Fogarty, P. J. Meehan, D. C. Hutchison, K. A. McDaid, R. R. Steinert.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council of the College held on January 30, with the President, Mr. Arthur A. Gemmell, in the

chair, the following were elected to the Membership: G. T. D. Barr, D. J. Cassidy, Vivienne A. Croxford, H. F. Daghistany, P. J. Dwyer, A. L. T. Easton, D. W. S. Gordon, T. P. Grant, J. Greenwell, K. Greig, R. W. Hughes, G. A. Humphreys, P. D. C. Jackson, K. B. Layton, C. V. Love, A. C. McNelis, P. Manolis, M. Mukerji, F. A. Murray, R. F. O'Donoghue, G. D. Pinker, D. E. Savage, S. G. Singh, H. J. Tighe, J. R. D. Tomlinson, A. C. Turnbull, R. Vaish, P. S. Watson, V. T. White.

CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been granted the diploma of L.C.R.P.Ed., L.R.C.S.Ed., L.R.F.P.&S.G.: H. C. Carver, T. K. Chetty, J. B. Collinson, P. T. Huppert, G. C. H. Knight, A. B. Masters, E. P. McKay, J. M. Nichols, A. I. Y. Orr, M. P. Pather, A. Pribyl, Katalin E. Schopflin, F. Shoucair, S. A. Singh, V. Vahala, J. Vitolsins.

FACULTY OF RADIOLOGISTS

At the examination for the Fellowship of the Faculty held in November, 1953, the following satisfied the examiners:—*Radiology*: F. M. Benton, D. M. T. Cones, G. M. King, W. D. Rider; *Radiodiagnosis*: K. E. Jefferson, K. A. Rowley, P. W. E. Sheldon.

Vital Statistics

Week Ending May 15

The notifications of infectious diseases in England and Wales during the week included pneumonia 463, scarlet fever 898, whooping-cough 2,660, diphtheria 9, measles 1,706, dysentery 1,031, acute poliomyelitis 19, paratyphoid fever 7, and typhoid fever 3.

Infectious Diseases

Increases in the number of notifications of infectious diseases in England and Wales during the week ending May 8 included 189 for dysentery, from 759 to 948, 148 for whooping-cough, from 2,233 to 2,381, and 96 for scarlet fever from 623 to 719, while the only decrease of any size was 236 for measles, from 1,970 to 1,734.

The 9 cases of diphtheria notified were 3 fewer than in the preceding week and the smallest number ever recorded. 4 of the 9 cases were notified in Liverpool C.B. The largest variation in the local trends of scarlet fever was a rise of 31 in Yorkshire West Riding, from 44 to 75. The largest fluctuations in the returns of whooping-cough were a rise of 53 in Kent, from 149 to 202, and a fall of 47 in Warwickshire, from 169 to 122. The only large decline in the incidence of measles was 144 in Norfolk, from 326 to 182. The number of notifications of paratyphoid fever rose from 3 to 13.

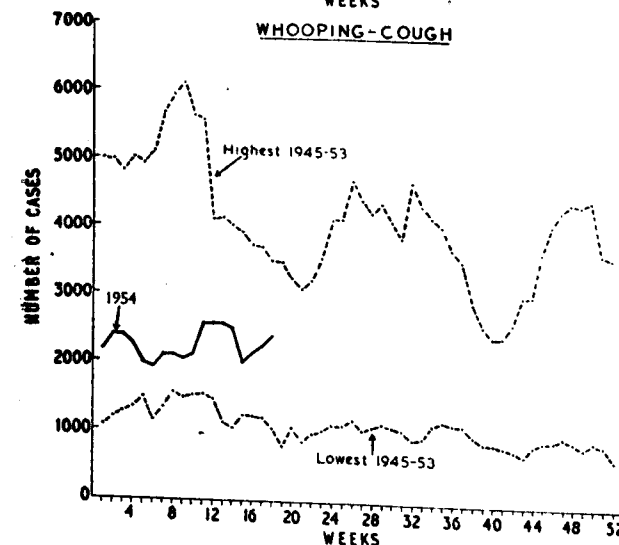
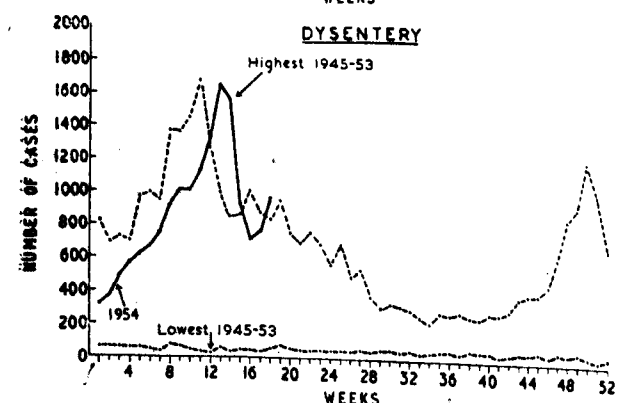
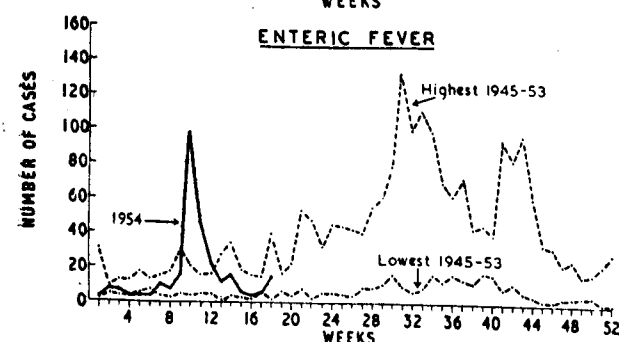
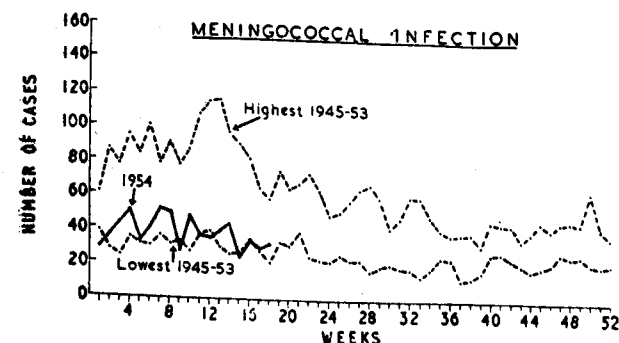
23 cases of acute poliomyelitis were notified during the week; these were the same for paralytic and 3 more for non-paralytic cases than in the preceding week. Two cases were notified in Leeds C.B., Sunderland C.B., and Lancaster M.B.

The largest rise in the notifications of dysentery was 119 in Lancashire. The largest returns were Lancashire 262 (Denton U.D. 54, Swinton and Pendlebury M.B. 31, Liverpool C.B. 23, Irlam U.D. 23, Manchester C.B. 19, Salford C.B. 13, Golborne U.D. 12, Blackpool C.B. 10, Bolton C.B. 10), Yorkshire West Riding 118 (Dewsbury C.B. 45, Bradford C.B. 13, Sheffield C.B. 10), London 107 (Islington 42, Lewisham 12, Hampstead 11), Middlesex 57 (Tottenham M.B. 22), Leicestershire 47 (Leicester C.B. 40), Kent 30 (Sevenoaks R.D. 25), Essex 29, Nottinghamshire 28 (Nottingham C.B. 21), Sussex 26 (Brighton C.B. 11), Cheshire 25 (Stalybridge M.B. 13), Warwickshire 25 (Birmingham C.B. 23), Glamorganshire 24 (Llchwyr U.D. 14), and Surrey 23.

In Scotland the number of notifications of dysentery increased by 31, from 280 to 311. The rise was due to the outbreak in Glasgow, where the cases rose from 178 to 220.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 8 (No. 18) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	9	0	3	0	1	22	1	10	0	2
Dysentery ..	948	107	311	3	4	729	80	90	1	1
Encephalitis, acute ..	5	0	0	0		0	0	3	0	
Enteric fever: Typhoid ..	2	1	1	0	0	1	0	3	1	
Paratyphoid ..	13	0	1	0	0	14	1	0	0	
Food-poisoning ..	231	102				137	23		0	
Infective enteritis or diarrhoea under 2 years ..				13	23				12	10
Measles*	1,734	71	201	108	331	9,809	369	359	262	195
Meningococcal infec- tion ..	32	2	11	1	2	37	1	15	2	
Ophthalmia neonata- rum ..	32	1	10	1		46		3	2	
Pneumonia†	506	23	183	10	2	479	15	219	6	2
Poliomyelitis, acute: Paralytic ..	15	2				28	4		1	3
Non-paralytic ..	8	1				1				
Puerperal fever‡	244	36	16	0		216	29	13	2	2
Scarlet fever ..	719	32	118	23	35	1,387	89	189	44	37
Tuberculosis: Respiratory ..	937	97	189	37				148	28	
Non-respiratory ..	149	8	30	4				27	4	
Whooping-cough ..	2,381	98	356	49	50	3,461	247	384	40	149

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0			
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years ..	9	1	1	2	1	12	2	0	2	2
Influenza ..	11	1	1	1	1	13	1	4	0	2
Measles ..			1	0	1		0	0		2
Meningococcal infec- tion ..		0	0				0	0		
Pneumonia ..	189	34	20	12	10	164	24	15	11	11
Poliomyelitis, acute ..	1	0			0	1	0			0
Scarlet fever ..		0	0	0	0		0	0		0
Tuberculosis: Respiratory ..	87	12	11	1	9	107	14	17	1	8
Non-respiratory ..			0				3	0		0
Whooping-cough ..	9	0	0	0	0	0	0	0	0	1
Deaths 0-1 year ..	226	28	37	9	17	226	31	21	11	40
Deaths (excluding stillbirths) ..	5,242	750	619	152	191	4,921	653	581	114	187
LIVE BIRTHS ..	8,009	1,227	1,008	240	426	8,415	1,192	917	261	440
STILLBIRTHS ..	213	26	32			210	29	27		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
‡ Includes puerperal pyrexia.

Medical News

Royal College of Surgeons.—At a meeting of the council on May 20, with Sir Cecil Wakeley, P.R.C.S., in the chair, Professor Arthur Steindler (Iowa City, U.S.A.) and Dr. G. Gavin Miller (Montreal) were admitted honorary Fellows, and Mr. J. W. H. Grice, Professor G. Hadfield, Professor J. Trueta, and Mr. W. A. Jackman were elected Fellows. The following prizes and awards were given: *Jacksonian Prize*: Mr. J. H. Peacock (Bristol). *John Tomes Prize*: Professor M. A. Rushton (Guy's). *Moynihan Lectureship*: Professor L. Deloyers (Brussels) and Professor Neils Dungal (Iceland). *Joseph Henry Lectureship*: Dr. R. A. M. Case (London). *Imperial Cancer Research Fund Lectureships*: Dr. J. Bamforth and Dr. E. F. Scowen (St. Bartholomew's). *Begley Prize*: Maurice A. Cowan (Sheffield). Mr. R. S. Handley (Middlesex) was elected and Mr. G. Qvist (Royal Free) re-elected members of the Court of Examiners for a period of three years.

The monthly dinner of the Royal College of Surgeons on May 19 was the first to be held in the new Great Hall, a graceful room in the building risen from the debris of war ruins. Many of the College's Fellows have given the chairs that furnish the hall. Their names appear on the backs of them, and as the President, Sir Cecil Wakeley, said, all the great names in British surgery are inscribed there. Sir Cecil welcomed the guests, and in particular Sir Bernard and Lady Dawson from New Zealand. In reply Sir Bernard said he had often wondered what were the components of the force that pulled them back to London from overseas, and he found part of the answer in this kind of occasion, in the opportunity it gave of meeting their colleagues again. Mr. Geoffrey Keynes, recently appointed the first honorary curator of the College's pictures, then gave a short discourse on them illustrated by lantern slides. Chiefly portraits, they were intimately bound up with the history of the College. The most famous of them, ascribed to Holbein, showed Henry VIII giving the Act of Union to the barbers and surgeons. The College had paid 50 guineas for it in 1786. The portrait of John Hunter in old age, by Reynolds, was now said to be a sombre ghost of what it had been, owing to Reynolds's practice of mixing bitumen with his paint. It had yet been declared by Sir Gerald Kelly, P.R.A., to be the best portrait in England. Mr. Keynes ended by showing some slides of paintings from the Hunter collection depicting abnormal human beings and exotic animals.

Mosquito Control.—A full account is given of the habits and distribution of British species of mosquitoes and of the best measures of controlling them in the revised *Memorandum on Measures for the Control of Mosquito Nuisances in Great Britain* (H.M.S.O., 1s. 3d.). The revision is by Sir Gordon Covell and Mr. P. G. Shute. *Anopheles atroparvus* is believed to be the only species responsible in Britain for indigenous malaria. It is largely confined to the coastal areas in east and south-east England, whence nearly all indigenous cases have been reported.

Parke, Davis & Co.'s new research and administration building at Hounslow was opened on May 20 by the Mayor of Heston and Isleworth in the presence of many distinguished guests representing the medical profession, the pharmaceutical industry, and the Ministry of Health.

"Family Doctor."—The June issue of *Family Doctor* presents its readers with a separate "Summer Beauty Book" as well as articles on such diverse topics as the psychology of war (by Dr. J. R. Rees), diabetes (by Dr. R. D. Lawrence), and travel sickness (by Dr. Alan Porter). Some of the many problems that mothers experience in rearing their children are also discussed and neatly solved.

Changing Trends in the Chest Service.—In a lecture recently given at the Royal Institute of Public Health and Hygiene Dr. Philip Ellman gave some interesting figures

showing how the work of tuberculosis dispensaries had changed over the course of the past 20 years or so. As long ago as 1929 he had succeeded in changing the title of the East Ham Tuberculosis Dispensary to "Chest Clinic" because of the opprobrium connected with the former term in the mind of the public. The total attendances had risen from 2,398 in 1928 to 27,521 in 1953, while the proportion of those found tuberculous had fallen from 28.5% in the former year to 5.8% in the latter. The majority of the other 94.2% of the patients were found to be free from disease, and among the remainder were cases of almost every other disease in general medicine, including every type of acute or chronic inflammatory lung disorder, new growths, especially carcinoma of the lung in males, and heart disease. Dr. Ellman's figures underlined his warning against any tendency to develop the tuberculosis service on narrow lines of specialization: prevention, diagnosis, treatment, and after-care must be considered as a continuous process. The chest clinic, situated within the parent hospital, should be itself one department of a whole chest service.

Oxford Graduates' Medical Club.—Founded in 1884 with the object of maintaining associations with the University and promoting good fellowship among members, the club has now extended membership to lady graduates. The life subscription is one guinea. The club dines twice a year, and the summer dinner will be held on July 2 at 7 p.m. in Oriel College, Oxford, with Mr. Ogier Ward in the chair. Guests may be invited. Tickets at 32s. 6d. may be obtained before June 26 from Mr. Selwyn Taylor, 3, Roedean Crescent, Roehampton, London, S.W.15.

B.M.A. Scholarships.—The following research scholarships have been awarded by the B.M.A. for 1954-5: Ernest Hart Memorial Scholarship (£250) to Dr. R. M. Acheson for research into radiological methods in tuberculous meningitis, to be carried out at the Radcliffe Infirmary, Oxford. Walter Dixon Memorial Scholarship (£250) to Mr. G. W. Taylor for research into lymphoedema, at St. Bartholomew's Hospital. Ordinary Research Scholarship (£200) to Dr. I. J. MacQueen, of Sheffield University, for research into radiological methods in tuberculous progressive resistance exercise.

Leverhulme Award.—A Leverhulme research grant has been made to Mr. S. G. Browne, a medical missionary in the Belgian Congo, for the training of medical auxiliaries there.

R.A.M.C. Dinner.—The medical officers of the 56 (London) Armoured Division (T.A.) held their first annual dinner at the Naval and Military Club on May 18. The A.D.M.S., Colonel J. A. Dudgeon, was in the chair, and Brigadier A. L. Crockford, honorary colonel, was also present. Among the principal guests who attended were Major-General D. Dawnay, Major-General B. C. H. Kimmins, Major-General A. Sachs, Colonel Walter Mourmand, Jr. (American Medical Services), Dr. S. Morley, Master of the Apothecaries, and Mr. Ronald Champness, of the Worshipful Company of Spectacle Makers.

Sheffield University.—Mr. R. P. Jepson has been appointed to the chair of surgery in succession to Professor R. St. Leger Brockman. Dr. J. M. Thoday is appointed from October 1 head of a new department of genetics.

Royal College of Obstetricians and Gynaecologists.—At a meeting of the council on May 22, with Mr. A. A. Gemmell, P.R.C.O.G., in the chair, the following were elected to the council:—*Representatives of Fellows*: Professor H. H. Evers, Newcastle-upon-Tyne; Professor C. H. G. Macafee, Belfast; Mr. T. N. MacGregor, Edinburgh; Professor W. C. W. Nixon, London. *Representative of Members*: Mr. I. McG. Jackson, London; Mr. R. Murdoch, Glasgow; Dr. J. Walker, Aberdeen.

Welsh Anaesthetists.—The Society of Anaesthetists of South Wales on April 9 elected the following officers for the year:—*President*: Dr. D. S. Jones. *Vice-president*: Mr. F. Y. Pearson. *Treasurer*: Dr. D. K. W. Picken. *Secretary*: Dr. H. G. Middleton.

Royal Sanitary Institute.—At the annual general meeting on May 18 Dr. A. Scott, M.O.H. of London County Council, and Dr. J. W. Starkey, M.O.H. of Kingston-on-Thames, were re-elected to the council of the Institute.

COMING EVENTS

Contraceptive Technique.—A lecture and demonstration will be given by Dr. Marie Stopes at the Mothers' Clinic, 108, Whitfield Street, London, W.1, on June 3, at 2.30 p.m. Tickets must be obtained in advance.

Leprosy.—An exhibition on leprosy by Dr. R. G. Cochrane will be shown at the Institute of Dermatology on June 7-26.

Brussels Meeting.—A medical conference will be held in Brussels on June 11-15 under the presidency of Professor Pol Gérard. Themes to be discussed include the treatment of pulmonary tuberculosis, liver diseases, and virus diseases. Excursions and other entertainments are offered. Full details from Secrétariat Général, Rue Belliard, 141, Brussels.

Industrial Health.—Dr. M. W. Goldblatt will give the Mackenzie Industrial Health Lecture, entitled "Research in Industrial Health in the Chemical Industry," on July 19 at 2.30 p.m. in the library theatre, Manchester, with Dr. J. A. L. Vaughan Jones in the chair. This is a biennial lecture, organized by the B.M.A. in memory of Mr. James Mackenzie, the founder of the Industrial Health Education Society.

NEW ISSUES

Journal of Neurology, Neurosurgery, and Psychiatry.—The new issue (Vol. 17, No. 2) will be available in a week's time. The contents include:

MENINGIOMAS WITHIN THE LATERAL VENTRICLE. A. E. Wall.
ISCHAEMIC SENSORY LOSS IN PATIENTS WITH PERIPHERAL NERVE LESIONS. R. W. Gilliat and T. Graham Wilson.
MEMORY DISTURBANCES IN THIRD VENTRICLE TUMOURS. Moyra Williams and Joe Pennybacker.
VARIATIONS IN THE NUMBER OF ACTIVE PALMAR DIGITAL SWEAT GLANDS WITH AGE. Pamela C. B. MacKinnon.
PHOSPHATE ESTERS IN MYOTONIC HUMAN MUSCLE. P. C. Caldwell and T. A. J. Frankard.
A RARE PRE-SENILE DEMENTIA ASSOCIATED WITH CORTICAL BLINDNESS (HEIDENHAIN'S SYNDROME). A. Meyer, Denis Leigh, and C. E. Bagg.
TWO CASES OF CONGENITAL ATRESIA OF THE FORAMINA OF MAGENDIE AND LUSCHKA. A. F. J. Maloney.
AUTONOMIC CHANGES FOLLOWING UNILATERAL LEUCOTOMY. Alick Elithorn, Malcolm F. Percy, and Margaret A. Crosskey.
A COMPARISON OF ISONIAZID WITH MODIFIED INSULIN THERAPY IN NEUROTIC STATES. Maurice Silverman.
RAPIDLY PROGRESSIVE CEREBRAL DEGENERATION WITH MENTAL DISORDER, FOCAL DISTURBANCES, AND MYOCLONIC EPILEPSY. D. P. Jones and S. Nevill.
BOOK REVIEWS.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Journal of Clinical Pathology.—The new issue (Vol. 7, No. 2) is now available. The contents include:

THE USE AND LIMITATIONS OF FILTER-PAPER ELECTROPHORESIS. N. H. Martin and G. T. Franglen.
THE ESTIMATION OF γ -GLOBULIN. George Discombe, Raymond F. Jones, and D. P. Winstanley.
SIMPLIFIED ESTIMATION OF CALCIUM IN BIOLOGICAL MATERIALS BY FLAME PHOTOMETRY. J. G. Liawado.
A STUDY OF THE BLOOD PYRUVIC ACID LEVEL IN PATIENTS WITH CONGESTIVE HEART FAILURE. J. Kleeberg and S. Gitelson.
MALIGNANT CELLS IN CEREBROSPINAL FLUID. Arthur I. Spriggs.
A CASE OF ANOREXIA NERVOSA WITH NECKROPSY FINDINGS AND A DISCUSSION OF SECONDARY HYPOPITUITARISM. R. R. Wilson.
THE STRUCTURAL FEATURES OF EPILEPSIA WITH SPECIAL REFERENCE TO ENDOCARDIAL FIBROELASTOSIS. L. Crome.
CEREBRAL MUCORMYCOSIS. F. Kuttel.
FURTHER EXPERIENCE WITH THE MALE-TOAD PREGNANCY TEST USING EUROPEAN SPECIES. Magnus Haines, H. P. Ferreira, J. W. Law, and Audrey May.
A STRAIN OF STAPHYLOCOCCUS RESISTANT TO FIVE ANTIBIOTICS. Kevin Anderson.
A NOTE ON THE SEROLOGY OF SARCOSPORIDIOSIS AND TOXOPLASMOSIS. F. I. Awad and R. Lainson.
STREPTOMYCIN-DEPENDENT VARIANTS OF BACT. COLI ISOLATED FROM PATIENTS DURING TREATMENT WITH STREPTOMYCIN. Aksel Stenderup.
THE USE OF A BILE-ASCULIN MEDIUM AND OF MAXTED'S TECHNIQUE OF LANCEFIELD GROUPING IN THE IDENTIFICATION OF ENTEROCOCCI (GROUP D STREPTOCOCCI). Alexander Swan.
THE ERYTHROCYTE SEDIMENTATION RATE AND THE PLASMA VISCOSITY. Robert D. Eastham.
ASSOCIATION OF CLINICAL PATHOLOGISTS: 52ND GENERAL MEETING.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Monday, May 31

EDINBURGH UNIVERSITY.—At Physiology Class Room, University New Buildings, 5 p.m., Dr. D. J. Guthrie: Primitive Medicine and its Influence.

EDINBURGH UNIVERSITY: FACULTY OF MEDICINE.—At Obstetrics Lecture Theatre, 60, George Square, 5 p.m., MacArthur Postgraduate Lecture by Professor Bruce Mayes (Sydney): Experiences in the Management of Pregnancy Toxaemia in Sydney.

INSTITUTE OF CARDIOLOGY.—9.30 a.m., Sir John Parkinson: Palpitation.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Professor J. Louw (Capetown): Eclampsia.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture-demonstration by Dr. E. Stengel.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. O. G. Edholm: Effects of Environment in Man.

ROYAL EYE HOSPITAL.—5.45 p.m., Miss J. M. Dollar: Films on Operative Surgery (2).

Tuesday, June 1

EDINBURGH UNIVERSITY: FACULTY OF MEDICINE.—At Anatomy Lecture Theatre, University New Buildings, 5 p.m., MacArthur Postgraduate Lecture by Dr. J. W. Clegg: Surgical Pathology of Pulmonary Tuberculosis.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. D. Samman: Reticuloses.

●INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. R. N. Ironside: Arteritis.

ORPINGTON HOSPITAL.—4 p.m., Dr. P. L. Mollison: Blood Transfusion: Indications and Contraindications.

WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Almoth Wright Lecture by Professor H. B. Maitland: Histamine-sensitizing Property of *E. pertussis*.

Wednesday, June 2

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Necrobioses and Erythema Elevatum Diutinum.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 12 noon, Professor J. Louw (Capetown): Rupture of the Uterus.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Arvik and Gale Lecture by Professor David Slome: Physiological Studies on the Nasal Circulation.

Thursday, June 3

EDINBURGH UNIVERSITY.—At Physiology Class Room, University New Buildings, 5 p.m., Dr. D. J. Guthrie: The Hippocratic School: The Apprenticeship Idea.

●FOOD EDUCATION SOCIETY.—At 16, Berkeley Street, W., 3 p.m., meeting on Milk and Health. Speakers, Professor H. D. Kay, D.Sc., F.R.S., Dr. J. G. Davis, D.Sc., and Mr. W. R. Trehan, M.Sc.

HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. F. S. Fiddes: Alcohol and Road Safety: The Role of the Doctor in Examining Suspected Car Drivers.

●INSTITUTE OF NEUROLOGY.—5.30 p.m., Mr. Valentine Logue: Injuries to Cranial Nerves.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 3 p.m., Professor J. Louw (Capetown): Urethral Pathology as it Affects the Gynaecologist.

ST. ANDREW'S UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor U. S. von Euler (Stockholm): Functional Relationship Between the Suprarenal Medulla and the Adrenergic System.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. J. H. Paterson.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.30 p.m., (1) Demonstration and discussion of clinical cases. (2) Annual general meeting.

Friday, June 4

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. G. B. Dowling: Scleroderma.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. E. F. Chin: Surgery of Acquired and Congenital Defects of the Diaphragm.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—4 p.m., Holme Lecture by Professor H. K. Beecher (Harvard, Mass.): Drug Induced Changes in Sensation.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Dr. W. Burridge: Excitation and Inhibition.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—J. M. Salmon, M.B., B.Ch., Assistant Chest Physician, Great Yarmouth and Lowestoft Chest Clinic.

Area: Mrs. Heather J. Lopert, L.R.C.P.&S.Ed., Anaesthetic Registrar, Peterborough Memorial Hospital; R. I. H. Welsh, M.B., B.Ch., Surgical Registrar, Peterborough Memorial Hospital; R. C. MacGillivray, M.B., Ch.B., F.R.F.P.S., D.P.M., Consultant Psychiatrist, Little Plumstead and Norwich Hospital; J. H. Jennings, M.B., B.Ch., Surgical Registrar, Stamford and Rutland Hospital; T. J. K. Merritt, M.B., B.S., Registrar in Psychiatry, St. Andrew's Mental Hospital; M. E. York-Moore, M.B., B.S., D.Obst.R.C.O.G., Registrar in Psychiatry, Hillesdon Mental Hospital.

HAGAN, J. G., M.B., B.Ch., D.P.H., Deputy Medical Officer of Health and Deputy Principal School Medical Officer, Northampton County Borough.

LAURIE, ALEXANDER, M.B., Ch.B., D.P.H., Assistant County Medical Officer of Health for the Derbyshire County Council and Medical Officer of Health for the Borough of Ilkeston and the Urban Districts of Alfreton and Ripley.

LIVERPOOL REGIONAL HOSPITAL BOARD.—A. R. Carrado, M.D., T.D.D., Whole-time Medical Director of No. 2 Mass Mobile Radiography Unit.

E. H. Strach, M.D., M.Ch.Orth., F.R.C.S., Whole-time Assistant Orthopaedic Surgeon to Clatterbridge General Hospital; J. R. Bryson, M.B., Ch.B., F.F.A.R.C.S., Consultant Anaesthetist to Clatterbridge General Hospital; Edith M. Thorp, M.B., Ch.B., D.P.M., Whole-time Assistant

Any Questions?

What is Fibrositis?

Q.—(1) What is fibrositis? What are the nodules which clinicians feel, or profess to feel, in the affected tissues? What are the so-called trigger zones? (2) What is the relationship between fibrositis and emotional stress and osteoarthritis of the spine?

A.—(1) Fibrositis is in large measure a medical myth. It is loosely applied to pain felt in the musculo-skeletal system for which a more exact nomenclature cannot be found. One of the most common types is pain associated with an anxiety neurosis (the so-called "psychogenic rheumatism" of the Americans). As commonly used, the term includes also pain due to subacromial bursitis, pain arising in tendons and ligaments as the result of chronic or acute trauma, postural pain, pain arising from disk lesions, and pain arising through pressure on sensitive structures such as nerves in the thoracic inlet. The nodules which are to be felt in this condition are usually normal fatty lobules; like any other structure, they may be the site of referred pain and tenderness. They are palpable in certain areas of the back in many people without fibrositis. There is no histological proof of any specific lesion in the muscles or connective tissue that justifies the name of "fibrositis." Trigger areas are those areas in which pressure produces radiating or referred pain.

(2) The relationship between fibrositis and emotional stress or strain is often a direct one. People in a disordered psychological state are often more aware of the ordinary aches and pains of everyday life and particularly more aware of any pain due, for instance, to postural disorders. Osteoarthritis of the spine is something that occurs in everyone with increasing age. However, when this is discovered radiologically it is frequently blamed for pain in the back. It may sometimes be the cause of it if the abnormal bony proliferation interferes with movement and the function of the spinous ligaments.

Storage of Oxygen Cylinders

Q.—In this district we propose to have oxygen for emergency cases kept by the local pharmacist. Can you kindly tell me what are the dangers of explosion? Can an oxygen cylinder be left stored in a room with a gas or open fire? We propose to use a B.L.B. mask. Can this be used in a room with a gas, electric, or coal fire?

A.—The risk of stored oxygen cylinders exploding is practically negligible. Where there is no alternative, an oxygen cylinder may be left in a room with an open fire, so long as the cylinder is placed as far from the fire as possible and shielded so that it does not become unduly hot. It is better, however, that cylinders should be stored under proper conditions, as outlined in British Standard 1319, 1946. It is dangerous to use oxygen therapy near an open fire because in the presence of oxygen inflammable objects catch fire more easily and burn more vigorously. If the use of oxygen with a B.L.B. mask is imperative in these circumstances, the patient and cylinder should be placed as far from the fire as possible and good ventilation of the room ensured. An oxygen tent is never permissible in the vicinity of an open fire.

Rosehip Syrup

Q.—Can you provide a recipe for making rosehip syrup so that it retains a high content of vitamin C?

A.—A good recipe may be found in the leaflet "Hedge-row Harvest," which was issued by the Ministry of Food. Two pounds (0.9 kg.) of hips are put through a coarse mincer, and at once placed in three pints (1.7 litres) of water which has been kept briskly boiling in readiness. The water is again brought to the boil, and the saucepan is then

Psychiatrist to Winwick Hospital; D. M. Prinsley, M.D., Senior Resident Medical Officer to Barrowmore Hospital.

MURRAY, FRANCIS J. A., L.R.C.P.&S.I., D.P.H., Medical Officer of Health, Stone Rural District Council, Staffordshire; became medical officer of health for Stone Urban District Council in February, 1953.

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WESTON, JOSEPH W., M.R.C.S., L.R.C.P., D.T.M.&H., Whole-time Assistant Pathologist (S.H.M.O.), Halifax Group, Leeds Regional Hospital Board. (Corrected announcement.)

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Ansell.—On May 19, 1954, at the Liverpool Maternity Hospital, to Beatrice (formerly Dubow), B.Sc., wife of Abraham Ansell, M.D., D.M.R.D., a daughter.

Baker.—On May 13, 1954, to Dr. Hazel Baker (formerly Hill), wife of Mr. J. A. C. Baker, M.A., of Wednesbury, Staffs, a third son—Francis William.

Eastcott.—On May 16, 1954, at Iver, Bucks, to Bobby, wife of Mr. H. H. G. Eastcott, M.S., F.R.C.S., a daughter.

Garrets.—On May 10, 1954, at the British Military Hospital, Iserlohn, B.A.O.R., 24, to Sheila Ruth (formerly Hirschfeld), wife of Captain Maurice Garrets, M.B., M.R.C.P., R.A.M.C., a daughter—Angela Edelle.

Hewitt.—On May 18, 1954, at Bristol Maternity Hospital, to Yvonne, wife of Dr. Keith M. Hewitt, a son.

O'Sullivan.—On May 13, 1954, at Doris Court Nursing Home, Manchester, to Una, wife of Dr. J. G. O'Sullivan, a son—Timothy Francis.

MARRIAGES

King-Watts.—On April 10, 1954, at the Cathedral of the Highlands, Nairobi, Kenya, Anthony John King, B.Sc., F.G.S., of Wallasey, Cheshire, to Anne Wendy Watts, M.B., B.S., of Newcastle-upon-Tyne.

DEATHS

Bradlaw.—On April 19, 1954, at 8, Hatherley Court, Baywater, London, W., David Barnett Bradlaw, L.R.C.P.&S.I.&L.M., aged 79.

Collins.—On April 14, 1954, at Virginia Water, Surrey, Michael Abdy Collins, O.B.E., M.D., of Saxmundham, Suffolk, aged 75.

Elliott.—On April 20, 1954, at 82, Stepney Road, Scarborough, John Lewis Elliott, L.M.S.S.A., late of Cudworth, Yorks, aged 81.

Fardon.—On April 19, 1954, at 23, Rose Hill, Dorking, Surrey, Albert Henry Fardon, M.D., D.P.H., aged 76.

Glicksht.—On April 9, 1954, at the North Staffordshire Royal Infirmary, Stoke-on-Trent, Adam Glicksht, M.B., Ch.B., of Bleak Hill House, Burslem, Stoke-on-Trent, aged 68.

Glynn.—On March 28, 1954, at his daughter's home, 76, Hawthorne Crescent, Stoke Poges Lane, Slough, Bucks, John Joseph Glynn, L.R.C.P.&S.I. & L.M., late of 159, Old Street, London, E.C.

Hammond.—On April 20, 1954, at the Royal Hospital, Wolverhampton, John Hammond, M.B., Ch.B., of Fantaile, Albert Road, Wolverhampton.

Heath.—On April 6, 1954, Thomas Lowthian Heath, M.R.C.S., L.R.C.P., of Thornton Heath, Surrey, aged 62.

Henderson.—On April 8, 1954, in hospital, David Henderson, M.D., late of Cheddleton, near Leek, Staffs.

Hoyten.—On April 4, 1954, William James Hoyten, M.D., D.P.H., aged 86.

Jones.—On April 7, 1954, at Camberley, Surrey, David Elgan Eiddig Jones, M.B., F.R.C.S.

Lowson.—On April 6, 1954, at Wendover, Bucks, James Prain Lowson, M.D.

Marcus.—On November 28, 1953, in Trinidad, British West Indies, Emil W. Marcus, M.D.

Mayberry.—On April 2, 1954, at 92, Holden Road, Finchley, London, N., Robert John Mayberry, M.B., Ch.B.

Mills.—On April 10, 1954, at Orpington Hospital, Frederick André Mills, M.B., B.Ch., late of 20, The Drive, Sevenoaks, Kent, aged 84.

Nickerson.—On April 10, 1954, at Court Kintyre, Argyll, William Henry Snyder Nickerson, V.C., C.B., C.M.G., M.B., Ch.B., D.P.H., Major-General, late R.A.M.C., retired, aged 79.

Peel.—On April 12, 1954, at Glenhorne, Staircase Lane, Bramhope, Yorks, John Percival Peel, M.B., B.S., aged 53.

Stanley.—On April 8, 1954, at St. Leonards-on-Sea, Sussex, Hubert Stanley, M.B., B.Ch., aged 90.

Sturrock.—On April 4, 1954, Herbert Monieriff Sturrock, L.R.C.P.&S.Ed., L.R.F.P.S., F.D.S.R.C.S.Ed., of 28, Melville Street, Edinburgh.

Vivian.—On April 4, 1954, at Westaway Drive, Bexhill-on-Sea, Sussex, Harold Sugden Vivian, M.B., B.S., D.O.M.S.

put aside to cool for 15 minutes. The water and hips are next poured into a jelly-bag made of flannel or linen, crushed, and allowed to drip until most of the fluid has come through. If the first drippings from the jelly-bag contain hairs from the insides of the hips they are put back into the bag. When the flow of fluid has ceased the hips are returned to the saucepan and are stirred up with another $\frac{1}{2}$ pints of boiling water. After standing for 10 minutes they are put back into the jelly-bag and more fluid is collected. The combined extracts are boiled down to a volume of $\frac{1}{2}$ pints, and a final boiling of five minutes is given after the addition of $\frac{1}{4}$ lb. of sugar. While still hot the syrup is poured into small bottles, which must be hot and sterile. If they are sealed with corks these should be boiled for a quarter of an hour just before use, and should be covered with melted paraffin wax.

About two teaspoonfuls of the extract should supply a daily dose of vitamin C. The syrup should be stable if kept in full bottles in a cool darkened cupboard, but the vitamin deteriorates in a few weeks after the bottles have been opened and air admitted. Cooking utensils made of copper or uncovered iron should not be used for making the syrup, since these metals accelerate the destruction of vitamin C.

Intraperitoneal Transfusion of Infants

Q.—When anaemic infants who are in no immediate danger from anoxia need blood transfusions, I have found the following technique useful in tropical practice. The freshly collected blood is injected into the peritoneum. If no sodium citrate or heparin should be available, fresh blood may be used, clotting being prevented by contact with the peritoneum. A 50- or 20-ml. syringe is satisfactory, provided one works quickly and leaves the needles in situ during the proceedings. The blood haemoglobin rises within a few days, and the procedure may be repeated at short intervals. Do you commend this technique? During the first few minutes of life, is it safe to use the mother's blood for this purpose without grouping?

A.—There is plenty of evidence that when red cells are injected intraperitoneally the majority eventually find their way into the blood stream. However, the process is relatively slow, and may not be complete one week after the injection. In practice the procedure appears to be fairly safe, since some authors have given quite large numbers of intraperitoneal blood injections to children without observing any ill-effects. Nevertheless, it cannot be considered as safe as an ordinary transfusion nor can it be considered so efficient.

During the first two or three months of life the only antibodies present in the infant's serum are those derived from the mother by placental transfer. Thus, at this time, the mother's red cells can be injected into the infant without any risk of a haemolytic reaction. However, it has to be remembered that the mother may be Rh-positive and the infant Rh-negative, so that there is a possibility of sensitizing the infant to the Rh antigen. In the case of female infants this is a serious matter, since sensitization to the Rh antigen, once established, persists indefinitely; therefore tests must always be made to ensure that Rh-positive blood is not given to an Rh-negative recipient.

Carbon Dioxide Bubbles on Acidifying Urine

Q.—When clearing phosphatic urine with acid is there a production of visible bubbly carbon dioxide?

A.—When a urine is very alkaline, as in alkalosis produced by taking excess of alkali-forming salts, there will be sufficient carbonate present to give rise to visible carbon dioxide formation on the addition of acid. The usual cause of evolution of carbon dioxide on acidifying is that the urine is stale and bacterial decomposition of the urea has formed a considerable amount of ammonium carbonate which gives a marked evolution of gas on acidifying.

Can a Doctor Practise as a Vet?

Q.—Can a doctor legally practise veterinary surgery for payment without a veterinary qualification?

A.—No person may practise veterinary surgery, whether for payment or otherwise, unless his name is entered in the Register of Veterinary Surgeons or the Supplementary Veterinary Register. The only exceptions to this rule are: (1) Treatment given to an animal by its owner or a member of his household or his employee; (2) anything done otherwise than for reward by a person engaged in agriculture to an animal owned for the purpose of agriculture; (3) the rendering in emergency of first aid for the purpose of saving life or relieving pain; (4) the destruction of any animal by painless methods; and (5) the castration of certain young animals, the tailing of a lamb, the docking of a dog's tail, or the amputation of its dew claws before its eyes are open.

Bleary Eyes

Q.—A young man of 26 in otherwise excellent health and with perfect eyesight complains that his eyes are persistently rather bleary and bloodshot, especially in the morning, i.e. which time he finds it difficult to face bright light without his eyes watering. On examination, his eyes are slightly bloodshot (although not nearly so markedly, he states, as in the morning). What is the likely cause and what treatment is recommended?

A.—The most likely explanation is that he is suffering from slight conjunctivitis together with a greater than average sensitiveness to bright light. Another possible factor is that his lacrimal glands secrete excessive tears on relatively slight provocation. It should be remembered that the visibility of the superficial vessels of the conjunctiva varies from person to person, even in the absence of inflammatory changes. Exposure to dust and to irritating vapours, including tobacco smoke, is a frequent cause of conjunctival injection. If this young man's eyes are actually inflamed, an attempt should be made to find out whether he is exposed to any avoidable irritant, and then treat the conjunctivitis on general principles if it should persist after elimination of the probable source of irritation.

NOTES AND COMMENTS

Infection from the Chalice.—Dr. JULIAN M. JEFFRIES (Hove) writes: In your issue of May 8 (p. 1107) under "Any Questions?" is a full and useful reply on infection from the chalice, but it states that "in fact no instance of transmission by this means has ever been substantiated." The following incident is within my recollection. It occurred in the Christian village church of Clarkabad in the Punjab, India, about 30 years ago. The English head of the C.M.S. mission, who was on a visit there, was the celebrant. One of the congregation developed hydrophobia shortly after communicating, and died. Later, one or possibly two others were also affected. The celebrant was severely infected and died. No doubt these facts are recorded and could be verified in the Church Missionary Society's records.

"Any Questions?" Book.—The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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THE DYNAMICS OF HAEMOPOIESIS*

BY

Sir LIONEL WHITBY, C.V.O., M.D., D.Sc., F.R.C.P.

Regius Professor of Physic in the University of Cambridge

Even the most casual survey of the activities of the haemopoietic system, which has to maintain a constant population of erythrocytes, leucocytes, platelets, and other factors in the face of losses caused by daily wear and tear, can leave no doubt that the system is highly dynamic. It is perhaps not inappropriate that I should have chosen this title for the Thomas Huxley Lecture, since Huxley himself, who qualified from this great school in 1845, was a most dynamic personality. I propose to present, in a necessarily most limited survey, a few of the active features of the haemopoietic system in the light of my experiences and work, as well as my considered opinion of the work of others; and I shall try to make some estimate of the nature and magnitude of the task of providing and renewing a normal population of blood cells. This will necessarily call for some survey of the physiological processes of blood formation.

It is fortunate, perhaps, so far as dynamic studies are concerned, that the many mobile cells of the haemopoietic system have an unmistakable appearance or a unique composition which enables something of their life histories to be accurately followed by cytochemical, serological, and radioactive techniques, and by these means some estimate has been made of what is required in everyday life, as well as in times of stress.

The active bone marrow in the average adult is estimated to weigh some 3,000 g. (3.5–6% of body weight, or 1,500–3,500 g.); it roughly equals the weight of the liver; its volume is large, being some 70 ml. at birth and about 4,000 ml. when the subject is full-grown. In the adult, however, only about half the marrow is in an active state, but it has an enormous reserve of functional capacity, as well as considerable room for expansion. The parent cells of the marrow can produce many times their own volume of mature cells in a relatively short time.

The Erythron

So far as the erythron (Fig. 1) is concerned the 3,000 g. of bone marrow makes use of the amino-acids derived from the protein pool and of iron derived from the catabolism of effete red cells, as well as some of the that which is absorbed from the intestine, and a little of that which is contained in the iron stores, in order to maintain a circulating erythrocyte population of some 25 million millions (25×10^{12}).

There is good evidence that in a normal person the life-span of the red corpuscle is some 120 days.

The task of maintaining the erythrocyte population, the replacement of $1/120$ each day, amounts, therefore, to approximately 2.1×10^{11} corpuscles a day, or about

*Thomas Huxley Lecture delivered at Charing Cross Hospital Medical School on March 18.

9,000 millions in an hour. This involves the incorporation of 6.5 g. of haemoglobin (each gramme containing 3.34 mg. of iron) a day on the production side, whilst the daily destruction of cells leads to the liberation of about 20–26 mg. of iron, together with porphyrin and globin.

The process of red-cell destruction is carried out by the reticulo-endothelial system, itself being about half the weight of the marrow, from whence the iron and globin are used again, whereas the porphyrin pigments, appearing in the bile, are excreted mainly in the faeces as some 250 mg. of faecal urobilinogen a day. Excretion, however, is very variable, and it is difficult to obtain correlation between corpuscular destruction and pigment excretion.

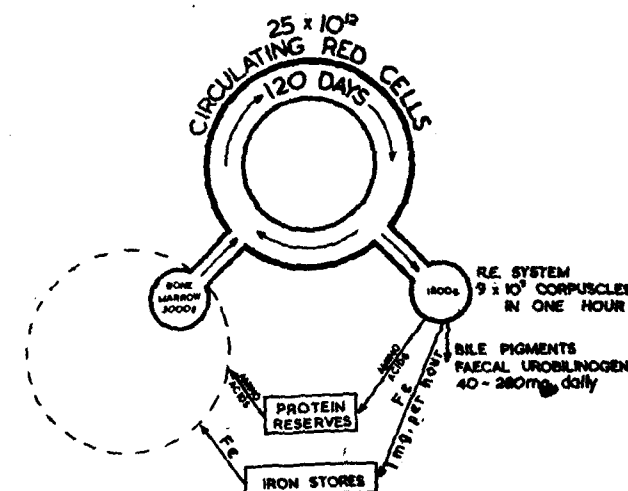


FIG. 1.—The erythron (after Wintrobe).

On the other hand, the amount of iron which is excreted is minimal, and is fairly precisely known, being a daily amount of from 0.6–0.8 mg. in the bile (Hawkins and Hahn, 1944) and 0.4–0.6 mg. in the urine (Barer and Fowler, 1937) according to sex. In all estimations, however, the fact that women suffer an iron loss of 10–40 mg. at each menstrual period, or about 1 mg. a day over the whole menstrual cycle, has to be borne in mind, since it means that women lose about twice as much iron as men.

Pregnancy, a physiological process, almost doubles the figure, but lactation adds no more than 1.5 mg. to the normal daily loss, unless menstruation becomes re-established, whereupon the total iron loss becomes almost as great as in pregnancy.

In effect, some nine-tenths of the dry weight of the red cell consists of haemoglobin, and this is contained in a complex stroma, itself a unique combination of

protein and lipids together with such specific factors as blood-group substance as well as enzymes, minerals, and other substances. The whole comprises a cell which is one of the most specialized structures in the mammalian organism, a cell whose functional activity is carried on for months after its nucleus has been lost, and with such efficiency that it consumes practically none of the oxygen which it transports.

This simplified and elementary summary of the everyday dynamics of erythropoiesis underlies the basic pathology of all anaemias, for when the pace is not maintained then anaemia occurs—that is, when blood loss or blood destruction outstrips the daily production (Whitby, 1937). And the principle is the same whether the blood loss is obviously direct, as with haemorrhage or a violent haemolytic process, or whether it is no more than the physiological hourly blood loss of some 9,000 million cells, to which I have already referred.

Failure to keep pace with the physiological blood loss may be due to very many causes. Some of these are trivial, some are serious, some curable, others incurable, and they may operate with different intensities, and singly or in combination, to reduce the efficiency of the process of blood formation to various degrees; these causes include everything in the vast field of what used to be called secondary anaemias. A proper understanding of these different stresses demands some knowledge of the processes involved in haemoglobin synthesis, iron balance and metabolism, red-cell production, and red-cell maturation.

Haemoglobin Synthesis

The synthesis of haemoglobin requires supplies for the formation of the sub-units and the building up from these of the main components of haemoglobin; in this process enzymes, hormones, vitamins, and other substances play a large part. Globin is synthesized from natural amino-acids; its availability is not usually impaired except by gross dietary deficiency of one or more of the ten essential amino-acids. Moreover, the deficiency has to be sustained and severe before globin formation is reduced, because the body preferentially breaks down even its own proteins to provide amino-acids for haemoglobin formation, rather than that there should be a globin deficiency. Tissue respiration is indeed a primary vital function.

The synthesis of haem requires adequate supplies of porphyrin precursors and of iron. Two porphyrins (I and II) are found in nature and in the animal body. In the human subject these porphyrins are synthesized and are not, as in some animals, derived from preformed pyrroles such as chlorophyll.

When haemoglobin is catabolized the porphyrins are not used again as such, but the iron which they contain is mainly conserved and, indeed, forms the major part of the iron used for the daily requirements of haemoglobin, since it appears to be preferentially used before either the iron which is absorbed from the intestine or that which is contained within the body stores. Nevertheless, as a protection against stress, the iron reserves of the body are very considerable, a fact which becomes obvious when one realizes the speed with which a patient who has suffered a moderate haemorrhage can regenerate his blood without supplementary iron treatment.

Iron Stores

Hynes (1949) found that the iron stores in a normal man probably amounted to some 600 mg., which is sufficient to replace about one-quarter of the circulating haemoglobin in times of need. This estimate agrees with the clinical observation that a haemorrhage of roughly this order is the

largest amount from which recovery is readily possible without supplementary iron treatment.

We have made a fairly close study of children in my department in order to arrive at some estimate of the amount of iron required by growing children to furnish an adequate tissue store. Because the blood volume increases with growth and because the tissue stores likewise enlarge, the growing child requires considerably more iron than the adult. We have estimated that infants, during the first year of life, need to lay down an additional store of some 200 mg. of iron, the amount falling to 100 mg. annually in the third year, and remaining at this figure until about the ninth year, when growth begins to increase rapidly. The amount of iron then laid down rises to about 350 mg. at the age of 17, and thereafter declines to zero at 21, when growth ceases.

The building up of iron stores is, however, by no means a straightforward process, since the manner in which iron is absorbed from the intestine and the form in which that which is derived from the catabolism of red cells or from intestinal absorption is transported to the various stores within the body, or, from the stores, to be incorporated in the haem molecule, is one of the processes in iron metabolism which are by no means simple.

Transport of Iron

At any one time the total serum iron of a normal man is about 4 mg., whilst every day some 20–26 mg. of iron leaves the blood stream, and of this about four-fifths is taken up by the marrow. This is used for the immediate daily requirement in haemoglobin synthesis, whilst the excess is stored primarily and mainly in the liver. In order to transport the amount of iron required for normal daily haemoglobin synthesis the iron in the plasma must therefore be turned over some five times a day.

The marrow is very active in removing serum iron from the blood. Theoretical calculations suggest that during increased haemopoietic activity more than 10% of the plasma iron passing through the bone marrow may be retained (Laurell, 1952), and since this iron in process of transport—so-called Fe-transferrin, a plasma-globulin—is mainly derived from the catabolism of red cells, and is rapidly used again, it follows that the iron stores of the body are turned over relatively slowly. The main cycle of iron turnover is from the plasma to the newly formed cells and from the old catabolized cells back to the plasma.

Thus the level of plasma iron in the blood represents an equilibrium among a number of dynamic processes which include the rate of haemoglobin breakdown and the release of iron therefrom, the rate of uptake of iron by the marrow for the synthesis of haemoglobin, the rate of removal of iron from the blood stream for storage in the tissues, the rate of formation and decomposition of transferrin itself, as well as the degree to which it is saturated with iron. This last point enters into the field of practical clinical medicine, since the level of plasma iron and the degree of iron saturation are considered to be sensitive and reliable indices of iron deficiency or iron excess.

For example, it is generally found that transferrin is saturated with iron in diseases, such as haemochromatosis, in which iron is in excess; or when haemoglobin catabolism is active, as with the haemolytic anaemias; or when the marrow needs iron but cannot use it properly, as with pernicious anaemia.

On the other hand, transferrin remains very unsaturated with iron when the bone marrow is highly active in a physiological manner, as with acute haemorrhage and iron-deficiency anaemia.

Absorption of Iron

From the aspect of physiology, as well as practical therapeutics, the control of iron absorption represents one of the key points in iron balance and iron metabolism. This likewise is not simple. A single guiding principle determines

the maintenance of iron balance—namely, that to the human body iron is a precious metal which is carefully conserved. Excretion is minimal.

Iron balance is maintained by a regulation of absorption according to the needs of the body, rather than by the excretion of unwanted excess. If this were not so, then every aged person would suffer from haemochromatosis. Sufficient iron to balance the small daily excretion is ordinarily derived from everyday foodstuffs, some of which contain reasonable quantities of the metal and others a negligible amount, and there is abundant evidence (Moore *et al.*, 1944) that ferrous iron is absorbed twice as effectively as ferric.

Without entering into detail, one may say that in certain foods iron is more available than in others, that valency and reaction, such as the difference between achlorhydria and normochlorhydria, affect absorption, and that an iron-free protein in the intestinal mucosa—apoferritin—can become appropriately and variously saturated with iron to form ferritin, according to body needs, until no more can be absorbed. This enters the plasma to contribute to the transferrin therein, and to be deposited therefrom in the tissue depots as ferritin once again.

It is instructive to note that, in experimental iron-deficiency anaemias, neither ferritin nor apoferritin can be detected in the cells of the intestinal mucosa, but that both quickly appear when iron feeding is instituted. This leads to the attractive theory that apoferritin is specifically formed in response to the stimulus supplied by the presence of ionized iron in the gut.

It would seem that ionic iron in the mucosal cell is in equilibrium with the plasma iron and this, in turn, with the iron in ferritin in the store depots. Thus, when the ionic iron in the mucosa attains a certain level, a state of mucosal block occurs and continues until the level of ionic iron in the cells falls low enough to allow more iron to be absorbed.

Utilization of Iron

Because of all the factors which govern the movement and utilization of iron, it is not easy to translate practical therapeutic principles into simple mathematical expressions, since the theoretical requirements are greatly influenced by such matters as absorption, route of administration, the nature of the preparation, and the extent to which its iron content is utilized.

An adult with 100% of haemoglobin has from 750–900 g. of circulating haemoglobin containing from 2.5–3 g. of iron. In order to replenish each 1% of haemoglobin deficiency, the body must absorb and utilize some 25 mg. of iron. Ferrous salts, the best preparations, are used only to the extent of about 15%. One gramme of anhydrous ferrous sulphate contains 360 mg. of iron, and if 10% of this is utilized the administration should cause a rise of about 2% in the circulating haemoglobin.

Practical experience has shown that there is no advantage in giving more than 2 g. of ferrous sulphate a day, which ought to ensure a rise of 4%. It is not justifiable, however, to assume that iron given to anaemic patients in optimal doses will be absorbed in accordance with the theoretically expected utilization; in that, with iron deficiency, it is often absorption which is at fault.

Many patients also do not respond to ingested iron, and it is quite useless to increase the dose beyond the optimum. On the other hand, with intravenous iron, the whole is absorbed and is rapidly available for utilization provided the pathological process is not such as to inhibit it.

In some circumstances the utilization may amount to as much as 80% (Whitby, 1949), causing an apparent increase in haemoglobin of threefold or more. I have deliberately said “apparent” since every now and again we become aware of the fact that figures obtained from samples of the peripheral blood are relative rather than absolute, and that they may be fallacious unless they are converted into total figures by means of a blood-volume determination.

Table I (a case of gross iron deficiency) is a simple illustration of this point, since it reveals the fallacy of estimating iron utilization by the peripheral blood figure alone without

TABLE I.—*Absorption and Utilization of Iron in Patient Weighing 50 kg. (Ferrous Sulphate=600 mg. Iron Daily)*

Day of Treatment:	0	9	23	49
Hb (g. per 100 ml.)	6.7	8.3	10.5	13.3
Increase Hb	—	24%	5.7%	100%
Plasma vol. (ml.)	2,120	2,250	2,410	2,180
Corpuscular vol. (ml.)	710	1,060	1,290	1,590
Total blood vol. (ml.)	2,830	3,310	3,700	3,690
Total Hb (g.)	190	280	390	490
Increase in total Hb	—	47%	105%	160%

reference to the total haemoglobin as determined by the blood volume. Whereas the former shows an increase of the order of 100% (from 6.7 to 13.3 g. per 100 ml.), the latter shows the true increase to be 160% (from 190 g. to 490 g.).

In theory, a patient with pernicious anaemia should have no need for iron, in that the haemoglobin was once normal and almost all the iron derived from the cells during the course of destruction is retained in the body. But we (Whitby and Britton, 1953) have found that some 40% of patients with pernicious anaemia require iron as judged by the mean corpuscular haemoglobin concentration, and, so far as women are concerned, a great number are iron-deficient before they contract pernicious anaemia.

Table II shows the very large amount of iron that is utilized during the cure of pernicious anaemia, as well as the adjustments in corpuscular and plasma volumes which

TABLE II.—*Iron Requirements in Pernicious Anaemia. Female Weighing 45 kg.*

Day of Treatment:	0	50
Haemoglobin (g. per 100 ml.)	3.9	14.0
Plasma vol. (ml.)	3,070	2,300
Corpuscular vol. (ml.)	400	1,500
Total blood vol. (ml.)	3,470	3,800
Total haemoglobin (g.)	150	550
Total iron (mg.)	434	1,770

occur at the same time; the patient, a small woman of some 45 kg., used as much as 1.34 g. of iron with a four-fold increase in total haemoglobin, and at the same time an initial high plasma volume became readjusted to a lower figure coinciding with an increase in corpuscular volume, though the total blood volume remained virtually the same.

It is unfortunate that there is no simple method, indeed no method entirely free from fallacies and objections, for the determination of blood volume, since an accurate appreciation of the movements and alterations in cells and plasma would be of great value in clinical medicine.

Erythropoiesis under Stress

The examples which I have given illustrate some of the features associated with the utilization of iron, but they also serve to show that even under apparently straightforward conditions the mathematics of iron balance may be complex.

Numerous factors may indeed intrude to upset a simple calculation, and even though as a basic principle it can be accepted that many anaemias are due to the fact that production fails to keep pace with the physiological but negative side of the iron-balance equation, it is axiomatic that a gross negative imbalance could not endure for long, otherwise the subject would soon have no red cells at all. This can be well illustrated by the dynamic activity that lies behind the clinical syndrome of haemolytic anaemia.

If the volume of the circulating cells is to remain constant, then production and destruction must be equal, even though the organism may need to adapt itself to a diminished population or to a population of cells ill-equipped to perform their proper function, assuming that both such

populations are composed of cells having a normal survival time.

When the negative side is rapidly increased, as with blood loss or violent haemolysis, balance can be maintained only by compensatory hypertrophy. When, therefore, as is usual in many of the haemolytic anaemias, the average red cell survives for a significantly, sometimes very considerably, less time than the normal average of 120 days, the degree of compensatory hypertrophy needs to be great, and may, indeed, be more than the latent reactive powers of the marrow can accomplish.

Crosby (1954) has given some instructive figures illustrating this point. Thus the function of the red marrow is to maintain a constant level of circulating red cells, and for this purpose, to quote Crosby, "Ten red cells that survive twelve days are equivalent to one red cell that survives 120 days, so that, to maintain a normal level with short-lived twelve-day erythrocytes the marrow would have to produce each day ten times the normal number."

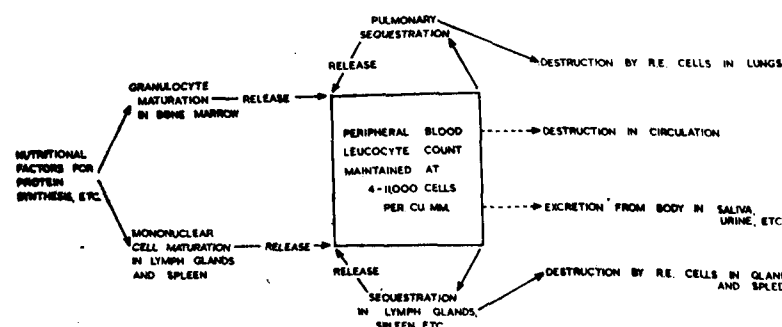


FIG. 2.—The maintenance of a normal level of circulating leucocytes.

In certain circumstances, both factors—red-cell survival and marrow function—may contribute to the production and maintenance of a severely anaemic state—namely, cells which have a short survival time, which are destroyed by random selection rather than by virtue of age, and a marrow which is incapable of an adequate response.

Another example is pernicious anaemia, when the life-span of the red cells is about 30 days (about one-quarter of the normal period), and it is perhaps difficult to appreciate that even though the bone marrow utilizes as much as 17 g. of haemoglobin a day, or two and a half times normal, the hypertrophy is insufficient to maintain the red-cell count at a normal level.

In congenital haemolytic icterus the utilization of haemoglobin by the hyperplastic marrow is even greater. This is because the spherocytes have the short survival time of some 12 days only, and because at times of an aregenerative (sometimes called aplastic) crisis the marrow cannot keep pace with the demands. The degree of anaemia may then rapidly become severe.

The Leucocyte

Leucopoiesis is also highly dynamic. The number of leucocytes needed to replace daily losses and maintain the circulating cells within the normal range has been studied frequently and by many methods, but the estimates made of the normal life-span of the different leucocytes vary widely. Studies in parabiotic rats (van Dyke and Huff, 1951) gave times as short as 23 minutes for the average neutrophil and 170 minutes for a lymphocyte. White (1954), however, estimated the intravascular life-span of transfused neutrophil leucocytes, tagged with mepacrine, to be from 30 to 90 minutes.

At the other end of the scale, when using radioactive phosphorus, the average survival time of the neutrophil polymorphonuclear in a normal subject was estimated (Kline and Clifton, 1952) to be thirteen days. Many other intermediate values have been obtained by different methods, and it is not possible in the present stage of knowledge to make more than a rough estimate of daily leuco-

cyte loss. The lowest figure must be of the order of 1,000 million leucocytes, and the highest may be as much as a million million. But as an approximate compromise, if it be accepted that the life of the neutrophil polymorphonuclear does not exceed five days, it is necessary for the marrow to replace at least some 5,000 million neutrophils each day, and if lymphocytes have a life-span of less than one day then the daily replacement figure needs to be some 3,000 millions.

With leucocytosis and leukaemia, in which the circulating leucocytes are greatly increased in number, the task of production is probably more exacting, though there is some evidence (Kline and Clifton, 1952; White, 1954) that the life-span of leukaemic leucocytes is several times that of the normal cell.

Leucocytic production, whether physiological or pathological, demands the synthesis and new formation of the basic fundamental substances comprising the cell. Cytochemical studies have shown that multiplication is associated with an intensive production of protein within the cells.

Granular leucocytes also contain considerable amounts of phospholipids and glycogen, as well as numerous enzymes, including trypsin, lipase, amylase, catalase, alkaline phosphatase, esterase, and oxidase.

Some of the factors concerned with and the processes involved in maintaining a normal leucocyte count are shown in Fig. 2. In general, there is a balance between production by the marrow and reticulo-endothelial system; sequestration in the lungs, lymph nodes, and spleen; and destruction in these same sites as well as in the circulation itself.

Nutritional Factors in Leucopoiesis

Nutritional deficiencies of various kinds have been found to cause defective formation of leucocytes under experimental conditions.

Several investigators (Daft, 1947; Guggenheim and Buechler, 1949) found that a protein-free diet would produce severe leucopenia in experimental animals which could be corrected with a diet containing optimum amounts of protein or amino-acids. The effectiveness of different proteins for regenerating leucocytes under such experimental conditions appears to bear some relation to efficiency in growth promotion, suggesting that the same amino-acids are necessary for growth as for leucopoiesis. Deficiencies of tryptophan (Cartwright *et al.*, 1945), pantothenic acid (Ashburn *et al.*, 1947), and riboflavin (Endicott *et al.*, 1947) will cause leucopenia which can be corrected with folic acid. Presumably the leucopenia of pernicious anaemia is due to a nutritional deficiency, since it responds to treatment of the disease with folic acid, citrovorum factor, or vitamin B₁₂.

Control of Leucopoiesis

The mechanism for the physiological control of leucopoiesis is unknown. Nervous and hormonal factors have been surmised, but there is little experimental or clinical evidence in support of such views. Corticotrophin and adrenal corticoids appear to influence the peripheral leucocytes in some way, but Rosenthal *et al.* (1951) found no alteration in bone-marrow cellularity or differential cytology as the result of treating human subjects with these steroids. Nevertheless, both corticotrophin and cortisone sometimes have a stimulating action on the marrow in cases of agranulocytosis.

The question of the existence of a splenic hormone is of interest, but the available evidence, such as the large leucocytosis which immediately follows splenectomy, suggests that any splenic controlling effect is on release of cells into the circulation rather than directly upon production and maturation.

For the past fifteen years Menkin (1940, 1949) has consistently studied certain substances present in inflammatory exudates, which affect not only the maturation of leucocytes but also their release into the circulation. These leucocytosis-producing and leucopenia-producing agents have, in Menkin's hands, caused hyperplasia and hypoplasia of myeloid marrow elements when injected into experimental animals. No physiological counterparts are known.

The mechanism controlling the release of leucocytes into the circulation is little understood, but it would appear to be intact, if not overactive, in the aleukaemic forms of leukaemia (Whitby, 1951) and in the refractory anaemias associated with a paradoxically hyperplastic bone marrow (Whitby, 1952). The concept of hypersplenism and the rationale of its treatment with splenectomy implies, in fact, that the spleen has the power of regulating the release of all types of cells. Splenectomy, for any reason, may cause a considerable leucocytosis which may persist for years, but a leucocytosis does not occur in parabiotic animals unless the spleen is also removed from the second partner (Palmer *et al.*, 1951).

The interpretation of such results is, however, not always straightforward, as, for example, with the increase in circulating leucocytes which follows upon the injection of adrenaline. A critical examination of the cells in adrenaline leucocytosis shows no shift to the left in the Arneith count, and it would seem that the increase in cells is due to release of white cells from various sites of sequestration (Fig. 2) rather than to direct stimulation of or release from primary sites (Smith and Hayhoe, 1951). It may well be that the leucocytosis and leucopenia-producing factors of Menkin act also by controlling release of cells, as well as by stimulating a change in marrow activity.

Nucleic Acid Metabolism

Most, if not all, of the cells of the haemopoietic system have developmental processes in common, involving the synthesis and incorporation of substances less specific than the iron which is the essential constituent of haemoglobin, and which provides such an excellent marker for radioactive studies. Nevertheless, many of the highly differentiated cells have a unique composition, and all have intricate enzyme systems. A considerable speed in cell multiplication is obviously essential in order to replace daily wear and tear.

The vital chemistry of both red cells and leucocytes is concerned with nucleic acid metabolism. The nuclei and the cytoplasm of the young actively growing cells contain nucleic acids in high concentrations which are attached to proteins as nucleoproteins. These, in general, fall into two groups—the ribonucleic acids with a sugar component of the pentose series, and deoxyribonucleic acids with a sugar component of the deoxypentose series.

Cellular growth and active multiplication obviously depend upon the new formation of these fundamental substances within the cell, the nucleoproteins being the controlling factors, in that the energy necessary for synthesis is available within the molecular structure of nucleic acid.

Mitosis of marrow cells can proceed very rapidly when required, but it is not known whether a demand causes an increase in the number of cells undergoing mitosis, or shortens the time interval, or accelerates the process. Bone-marrow activity can be observed directly and the histological changes accurately described, and these in turn can be expressed roughly in terms of basic chemistry by cytochemical methods of staining.

The nucleoli and cytoplasm of blood cells contain ribonucleic acids, and in the cytoplasm the ribonucleic acids are found especially in the mitochondria, which are the site of enzymatic activities and probably serve as centres for protein synthesis.

The ribonucleic acids of the nucleoli and cytoplasm appear to be concerned not only with the proliferation of young marrow cells but also with the synthesis of their

characteristic cytoplasmic contents—namely, haemoglobin in the red-cell series, and complex enzyme systems in the specific granules of the leucocytes (White, 1947); ribonucleic acid diminishes as these specific substances appear (Thorelli, 1947b).

The Feulgen reaction shows that the nuclei of early cells, particularly the chromatin and chromosomes, are rich in desoxyribonucleic acid, especially during the period of active division of the cells, when it may well provide the energy necessary for the protein synthesis which takes place at this time.

The widely distributed enzyme alkaline phosphatase, which is found in normoblastic nuclei, is formed in large amount around the nucleus during active blood regeneration. The nucleus becomes infiltrated with the enzyme, after which pyknosis, fragmentation, or extrusion occurs. It is believed that alkaline phosphatase is intimately concerned with nuclear destruction. During active haemopoiesis, also, the magnesium content of the red cell is increased (Dahl, 1950), which is of interest since magnesium is a potent activator of the phosphatases.

A balanced production of the cells of the bone marrow clearly depends upon a carefully regulated chemical system, and since nucleic acids appear to govern cell division the differences in their concentration or availability may even determine the proportions of red and white cells in the blood. In certain pathological conditions there may be competition within a cell or between cells for substances which are essential for maintaining normal equilibrium.

The importance of these basic facts in practical haematology becomes clear as advances are made in knowledge concerning the factors essential for blood formation, as well as the manner in which these factors act. It is significant, for example, that thymine and thymidine have a haematological therapeutic action, whilst folic acid, citrovorum factor, and vitamin B₁₂ may exert their essential activity as coenzymes for certain stages in the synthesis of nucleic acid from simple substances (Fig. 3).

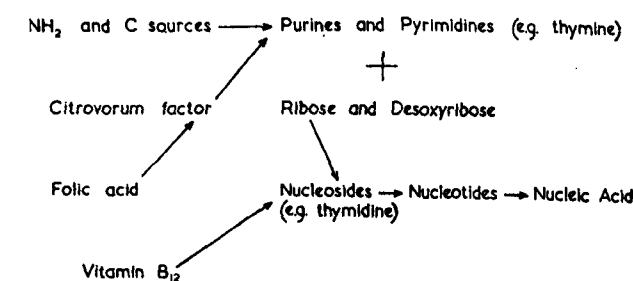


FIG. 3.—Scheme for the synthesis of nucleic acids from simpler substances, with suggested points of action of certain haemopoietic substances.

Abnormal Haemopoiesis

In some pathological processes the deviations from normal may be explained, or at least expressed, in terms of alteration in the normal rhythm. In other conditions the mode of action of an apparently specific material such as vitamin B₁₂ or folic acid may be thought of as being due to the part it plays in the synthesis of essential cellular constituents from simpler substances, and especially in relation to nucleic acid metabolism (Fig. 3).

For example, Japa (1945) suggested that the essential abnormality in megaloblastic erythropoiesis was one involving nucleic acid metabolism preventing the proper development of nucleoli, thereby inhibiting the capacity for cell division and leading to a prolonged duration of mitosis, decreased frequency of division, earlier cessation of division, and consequent differentiation at an earlier genealogical stage.

In the marrow cells in pernicious anaemia the ribonucleic acids of the cytoplasm and nucleolar apparatus do not disappear even when haemoglobin formation occurs (Thorelli, 1947a). This is in contrast to what happens in

the normal subject, as well as in the haemorrhagic anaemias, even though haemoglobin synthesis in the latter is retarded by lack of iron. In leukaemia, leucocytes accumulate a high concentration of ribonucleic acids in the cytoplasm and nucleoli which does not rapidly decline, as in the case of normal cells.

Desoxyribonucleic acids are an important constituent of chromosomes, being apparently attached at specific loci in the polypeptide chain which goes to make up the chromosome fibre; the amount differs at the different phases of chromosome division, and is noticeably abnormal in certain pathological states.

Under normal conditions there is more desoxyribonucleic acid in the chromosomes of the proerythroblast than the promyelocyte at the metaphase. In pernicious anaemia, however, the promyelocyte chromosomes contain very little desoxyribonucleic acid, and this leads to incomplete spiralization; the proerythroblasts and early megaloblasts, on the other hand, show an excess which consequently leads to over-spiralization. Over-spiralized chromosomes are associated with irregular division, multipolar spindles, and chromatoid bridges at the anaphase. In short, it would seem that mitotic abnormalities are closely associated with different distributions of desoxyribonucleic acid.

Conclusion

In this limited survey of some of the dynamic aspects of haemopoiesis I have naturally laid most emphasis on basic principles, some of which are now well established owing to the specific characteristics which the cells of the haemopoietic system possess. I have also paid some attention to the quantitative aspects of the subject and to some of the fallacies which may so easily intrude with hasty interpretation.

Simple quantitative aspects of haemopoiesis are indeed of such everyday application in clinical medicine that they are all too often accepted without critical analysis, without thought of possible alternative interpretation, or from a superficial viewpoint, to the neglect of fundamental principles.

Quantitative deductions cannot be accurate unless made upon unequivocal facts entirely free from ambiguity.

Leonard Huxley (1900) quotes Thomas Huxley, when writing to Charles Kingsley, as saying, "My business is to teach my aspirations to conform themselves to fact, not to try to make facts harmonize with my aspirations. Sit down before fact as a little child, be prepared to give up every preconceived notion, follow humbly to wherever and to whatever abysses nature leads or you will learn nothing."

In no field of medicine is this more true than in haematology, which in its daily clinical application to the dynamics of haemopoiesis is largely quantitative and in which precise results require the most critical appraisal if they are to be properly and accurately assessed.

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ASSISTED CIRCULATION BY PUMP-OXYGENATOR DURING OPERATIVE DILATATION OF THE AORTIC VALVE IN MAN

BY

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Interest in the clinical application of the various forms of pump-oxygenator (extracorporeal circulation or artificial heart-lung machine) is growing so rapidly, and the use of this type of apparatus in man has so seldom been followed by recovery, that it is customary for isolated examples of its use to be reported (Dennis *et al.*, 1951; Dogliotti, 1952; Gibbon, 1953; Dodrill *et al.*, 1953; Helmsworth *et al.*, 1953).

Three authors, Dogliotti (1952) in Turin, Gibbon (1953) in Philadelphia, and Dodrill *et al.* (1953) in Detroit, report survivors, and Helmsworth *et al.* (1952) have used an oxygenator for vein-to-vein perfusion in a case of fibrosis of the lung. The pump-oxygenator employed in the case here reported was that designed and developed by Melrose in the department of surgery of the Postgraduate Medical School. Melrose (1953a) has described the machine and Melrose *et al.* (1953b) have reported the animal experiments performed in the Buckston Browne Laboratories of the Royal College of Surgeons, which seemed to prove that the machine might be used with safety in man. The machine consists essentially of a rotating oxygenator and two rotary pumps. Its chief advantages are a high degree of efficiency in oxygenation (100 ml. of oxygen per litre of blood) and a low initial charge of blood.

The circumstances in which the machine might be used with profit in a clinical way have also been discussed (Aird, 1953), and the opinion was then expressed that the use of such a machine to by-pass heart and lung totally and to provide safely a dry heart for surgery was an aim not then immediately obtainable. We

now have evidence that with a machine of this kind the surgical approach to the interior of the heart and even to the mitral valve under vision may well be possible. We hope to approach this aim by using the pump-oxygenator as a form of assisted circulation during operation, gradually increasing the proportion of the total circulation for which it is responsible.

There are certain standard procedures in cardiac surgery whose performance at present carries the risk of a dangerous fall in the rate of flow in the coronary arteries and the development of a ventricular fibrillation or cessation of heart-beat which is sometimes irreversible. The maintenance of flow in the coronary arteries during such a procedure seems to lessen the risk of ventricular fibrillation, and its severity if it occurs. Notable among these procedures is an attempt to deal surgically with severe degrees of aortic stenosis. When a thoracic surgeon is faced during operation with a seriously low aortic pressure, decreased coronary flow, and loss of cardiac efficiency, he normally has recourse to cardiac massage, occlusion of the thoracic aorta, and gravity or pump transfusion of blood directly into the aorta above the clamp to maintain coronary and carotid flow, at least in part.

We decided that a more effective method of maintaining the mean aortic pressure at a level sufficient for an adequate coronary and carotid flow would be to apply the pump-oxygenator throughout operation in parallel with the patient's own heart and lungs as a form of assisted circulation which could function in emergency as a total replacement for heart and lungs if cardiac function should give rise to serious anxiety. The indication for its use should be, we feel, a patient seriously incapacitated by a form of cardiac disease amenable to surgery who would, without some form of assisted circulation, be refused operation as too great a risk. When a new apparatus is used in such cases and the patient does not survive it is extremely difficult to exonerate the apparatus from blame and to apportion responsibility fairly between the severity of the operation and the danger of the ancillary apparatus. Similarly, if the patient survives, it is difficult to say to what extent the machine was of benefit, and to disprove that the operation might perhaps have been performed without its use. Recovery does show, however, in what manner the apparatus may be used without doing the patient detectable harm.

Clinical Features

The patient with whom this report was concerned was 32 years of age. She had contracted rheumatic fever first at 13 years, with chorea thereafter, a second attack of rheumatic fever at 23 years, and progressive dyspnoea from 1948. Since 1949 there had been attacks of winter bronchitis, and in July, 1952, an attack of carditis with congestive heart failure. Consequent upon this there was anginal pain on the slightest exertion, and when the patient presented she had been bedridden for six to eight months. Before operation the heart was fibrillating slowly, the pulse was small and slow-rising, and there were clear signs of mitral incompetence and aortic stenosis.

The pre-operative electrocardiogram, the patient being on digitalis, showed slow auricular fibrillation. There was no evidence of ventricular hypertrophy or infarction.

It is perhaps clear even from so abridged a clinical description that an operative attempt to dilate the aortic valve would carry an extremely heavy risk of serious coronary inadequacy developing during operation unless some artificial method of maintaining a satisfactory aortic pressure were available. Before it was available, operation

had in fact been refused on grounds of risk to life, and an attack of acute appendicitis had been treated conservatively (July, 1953) because of the high risk even of appendicectomy.

Operative Details

Operation (W. P. C.) was undertaken on December 9, 1953. After premedication with promethazine hydrochloride and pethidine, anaesthesia (Dr. John Beard) was induced at 2 p.m. with thiopentone and maintained with nitrous oxide, oxygen, and relaxants.

At 2.20 p.m. the superficial femoral artery and saphenous vein were exposed in the upper part of the right thigh. Seventy mg. (1 mg. per kg.) of heparin was then injected slowly. A 4-mm. (internal diameter) "polythene" catheter with multiple perforations was passed up the saphenous vein for a distance of 30 cm. so that its tip should lie in the inferior vena cava just above the diaphragm. On insertion of this catheter quite rapid bleeding occurred, through the perforations, before all the perforations lay within the vein. An obturator has now been devised for this catheter to prevent bleeding during its insertion and to be withdrawn when the venous catheter is in place. The venous catheter was held in place by a ligature around the vein, the distal vein being ligated. The artery was then controlled by two tapes and opened by a transverse incision. The arterial catheter, 2.5 mm. in internal diameter, was then passed up the femoral artery to a distance of 45 cm. so that its tip should lie within the arch of the aorta. A tape around the proximal artery and catheter was kept tight as a temporary ligature by an artery forceps. The distal artery was controlled by a bulldog clamp. Both catheters were in place at 2.40 p.m. and at 2.43 the pump was started at a rate of 500 ml. a minute; the pulse was not palpable at the wrist at this time. The chest was entered through a postero-lateral incision in the fifth intercostal space. Bleeding was not excessive, though the clotting-time was 30 minutes. At 3.10 the pericardium was opened to reveal a moderate excess of pericardial fluid and a very large tense left ventricle. The left atrium was aneurysmal and exhibited well-marked systolic pulsation. A systolic thrill was felt on the atrial wall below the inferior pulmonary vein, a coarse systolic thrill on the ascending aorta. Aortic valve closure was not palpable. The heart rate was now 84 and the radial pulse was just palpable and irregular. The pump rate was increased to 600 ml. a minute.

At 3.16 p.m. the heart was opened through the auricular appendage to reveal free mitral incompetence through a circular valve opening approximately 3 cm. in diameter. There was no stenosis of the mitral valve.

At 3.23 p.m. left ventricular cardiomy was performed, using a purse-string suture and Rumel's tourniquet. A guide wire was inserted through the ventricle and aortic valve into the aorta. The valve was fully dilated on three separate occasions with the triradiate Bailey dilator. No noticeable disturbance of heart rate or rhythm or any alteration in the force of the beat was detectable during these manoeuvres. The heart rate was 50-60 with periodic extra beats. The pump rate throughout this manoeuvre was maintained at 800 ml. a minute. At 3.30, after the dilatation, the aortic systolic thrill was noticeably less. Re-examination of the mitral valve did not reveal any noticeable alteration in the regurgitant flow of blood through the valve. At 4 p.m. both cardiomy wounds were closed with interrupted sutures and the pericardium was loosely stitched. The blood pressure in the arm was now 100 mm. Hg and the radial pulse was palpable. The rate of extracorporeal circulation was slowed progressively from 800 ml. to 500 ml. during closure of the cardiomy incision and was decreased still further to reach 300 ml. a minute at 4.20, when it was discontinued, after the pump had been in operation for 97 minutes.

The chest was kept open for three-quarters of an hour after completion of the cardiomy until the rather persistent oozing, noticed towards the end of the operation,

had ceased. At 5 p.m. the catheters were removed from the saphenous vein, which was ligated, and from the femoral artery, which was repaired with 00000 arterial silk. The groin incision was closed in layers, and 70 mg. of protamine sulphate was given intravenously as a 0.01% solution in isotonic saline. The clotting-time after operation was 6-8 minutes. The estimated blood loss during operation was 6 pints (3.4 litres); and $7\frac{1}{2}$ pints (4.3 litres) of blood, 4 pints (2.3 litres) of them freshly drawn, were given by transfusion. The pharyngeal temperature was 36.4° C. at the end of operation.

The mixed venous blood during the running of the machine showed an oxygen saturation of 78 to 76%, and a carbon dioxide content of 47-45 volumes %.

The serum potassium arose from a pre-operative level of 3.7 mEq/l. to a maximum of 6 mEq/l. during operation, falling again to 4 mEq/l. on the evening of operation.

At 6 p.m. the patient was returned to the ward already conscious; at 6.5 she asked what time it was.

Electrocardiographic Studies During Operation

A continuous E.C.G. tracing was run during the operation, and some 40 feet (12 metres) of this was recorded. We are indebted to Dr. J. F. Goodwin and Dr. L. G. Davies for its interpretation. At the beginning of the operation the electrocardiogram showed, as it did before operation, slow auricular fibrillation. This continued until 3.16 p.m., when during exploration of the left atrium the E.C.G. showed occasional ventricular ectopic beats from multiple foci, and auricular fibrillation. At 3.23, during dilatation of the aortic valve, there were various multifocal ventricular ectopic beats, some T-wave inversion following normal QRS complexes, and auricular fibrillation. At 3.30, following aortic-valve dilatation, occasional ectopic beats were seen. The QRS complex lost its Q and developed a deep S wave, with T still upright and taller than before. This was thought to be due either to a clockwise rotation around the long axis of the heart or perhaps to a diminution of left ventricular strain. Auricular fibrillation was still present. At 4 p.m. auricular fibrillation was still present, but there were no ectopic beats and the T waves had increased in height. No further change in the E.C.G. occurred while the chest was closed. At 10 p.m. slow auricular fibrillation was present as before operation, and the QRST complex had returned to normal.

Post-operative Course

On the evening of operation there was slight cyanosis of the lips, but the patient was fully conscious and in possession of all faculties two hours after operation. Cyanosis faded within four hours of the end of the operation.

Subsequent progress was uneventful, only 26 oz. (740 ml.) draining from the chest, but there was extensive ecchymosis of the chest wall round the thoracotomy incision and around the stab drain. Clinically the aortic systolic murmur is now softer and the patient has not experienced anginal pain such as was her chief complaint before operation. Convalescence has proceeded satisfactorily apart from a thrombophlebitis of the catheterized saphenous vein. Pulses did not return in the ankle of the limb whose femoral artery had been catheterized, but the limb remained warm and identical in appearance and temperature with its fellow of the opposite side. An improvement in exercise tolerance permits the climbing of 48 steps without undue distress. Previously completely bedridden, the patient can now walk many hundreds of yards. She has returned home and her exercise tolerance still improves daily.

Bleeding

Dr. S. J. Baker, of the department of haematology, has been our adviser on this subject, and has provided this report.

All workers in the field of extracorporeal circulation experience trouble with haemorrhage, both in experimental

animals and in human subjects. In this patient excessive bleeding occurred especially towards the end of the operation, even after the administration of adequate amounts of protamine to neutralize the heparin. This bleeding is explicable, at least in part, by the development of a thrombocytopenia. The platelet count (direct method) fell from a pre-operative level of 217,000 to 44,000 per c.mm. in the first half-hour after application of the machine. It remained at this level until several hours after the completion of the operation. Over the next eight days it gradually returned to the pre-operative level.

Immediately after operation the one-stage "prothrombin time" was normal, so factors V and VII were apparently still present in adequate amounts. Antihæmophilic globulin and Christmas factor were not tested for in this case, and it is possible that these may have been reduced.

There are three factors which may produce a deficiency of coagulation components: (1) the operation itself—coagulation factors, especially platelets, are sometimes reduced during major surgical procedures; (2) the "dilution" effect of replacing a considerable proportion of the patient's blood by stored "bank" blood, which contains no platelets and will probably be deficient in antihæmophilic globulin and factor V, to an extent depending on the length of storage; and (3) the machine, which, although lined throughout by silicone, causes marked loss of platelets presumably by adhesion to foreign surfaces and/or by mechanical destruction.

The most effective available method of correcting the thrombocytopenia in a patient at the end of a procedure such as this would appear to be the transfusion, or replacement transfusion, of a substantial quantity of platelet-rich blood freshly drawn into siliconed apparatus, or the use of a direct platelet transfusion. Bell and others (Bell, 1953; 1954) in Gibbon's unit have made an extensive survey of coagulation disorders arising after massive simple transfusion, and also during the course of extracorporeal circulation. Their work suggests that, apart from the thrombocytopenia, the "dilution" effects could be prevented by the use of blood not more than 48-72 hours old; but this may be difficult to achieve.

Conclusions

The pump-oxygenator previously described has been shown at least not to be productive of serious immediate toxic effects, and no delayed effects can be predicted on theoretical grounds.

It is our impression that the machine has been helpful when used to assist the circulation of a human patient throughout a severe cardiac operation which would not have been attempted without some kind of artificial help. Throughout the operation no anxiety was felt concerning the coronary circulation, as measured by the visible contraction of the ventricle and the electrocardiogram. Previous experience without the use of the machine has shown that even less severe aortic dilatations performed in patients less debilitated have been accompanied sometimes by irreversible disturbances of cardiac rhythm. There was never any threat in this case of cardiac cessation or ventricular fibrillation during two explorations of the left atrium and mitral valve, and three separate forcible dilatations of the aortic valve.

We have previously stated that the chief therapeutic use we saw immediately for this machine was its application to extreme cardiologic emergencies, and we propose to apply it to this purpose, for it is capable not only of increasing oxygenation but of reducing the blood carbon dioxide to any desired level, so avoiding the dangers of present methods of oxygen therapy in heart failure. We consider now, however, that this machine may also be used to open the way gradually towards the ultimate aim of a pump-oxygenator for routine total replacement at surgical operations. Rare congenital defects in infants are susceptible to open repair under vision with the assistance of cooling. In adults, selected cases of aortic stenosis may be treated

with every chance of improvement without the use either of cooling or of the extracorporeal circulation, but the most important aim of modern surgery is the direct correction under vision of the adult mitral valve, and this can be attained only by some form of assisted circulation.

It may be that one way of progressing towards this aim of a dry adult heart for the routine performance of surgery on its interior may be the use of an assisted circulation to take over in successive cases more and more of the circulation.

Experience will show what amount of aortic flow per minute is required for the maintenance of an adequate coronary and carotid circulation, but previous experience with pressure perfusion of the clamped aorta in emergency, by quantities of blood per minute small in proportion to the output of the pump, suggests that the necessary flow may not in fact be particularly high. On this occasion a flow of 500 to 800 ml. was maintained for a total period of 97 minutes, and it might be estimated that in that time there was a total flow of 70 litres through the machine. Alternatively, it might be said that the patient's total volume of circulating blood passed through the machine about 15 times, or that, for 97 minutes, the machine was responsible for 20 to 30% of the total cardiac output.

Bleeding during and after the operation is the most serious problem which we have to face, but we prefer the risk of bleeding as we experienced it in this patient to the still greater risk of clotting around the tubes of the machine at some critical stage of operation during which the patient's life might depend upon the efficiency of the artificial circulation. It seems reasonably certain that the bleeding we experienced was due in the main to platelet loss, though the effect of operation, transfusion of foreign blood, and the machine on clotting function is highly complex, and other factors certainly operate too. Methods are being developed for the collection of fresh blood rich in platelets; even fresh blood, drawn by routine methods, loses a high proportion of platelets in collection.

All the data collected concerning the effect of the machine have not been presented here—much of the material cannot be fully analysed until a series of cases is available for study. The management of collecting devices and the drill for the timing of samples require a large team of medical and technical staff, and the arrangements and control of apparatus, especially collecting apparatus in an operating-room already occupied by a complex surgical team, have been the subject of prolonged study and experiment.

We wish to acknowledge our indebtedness to many colleagues and assistants who have been concerned in this work and in the management of the case here reported. To the cardiologists at Hammersmith Hospital, including Dr. J. F. Goodwin and Dr. R. I. S. Bayliss, we owe a great deal of day-to-day advice and the pre-operative investigation and management of patients who are considered for this and other forms of surgery. We are indebted for help and advice in our electrocardiographic studies to Dr. J. F. Goodwin and Dr. L. G. Davies. Dr. S. J. Baker, of the department of haematology, has given much time and thought to our problems of coagulation and haemorrhage. Dr. John Beard, anaesthetist for thoracic surgery in the Postgraduate Medical School and Hammersmith Hospital, has been a most important member of the operative team, and has collaborated most helpfully. Mr. Ralph Shackman and the staff of the Surgical Research Laboratories have given us constant help, and Mr. Gerald Rainbow and Miss Eva Bottoms particularly have been unwearied in the maintenance of the machine. With New Electrical Products Ltd. we have explored now for a long period, and very happily, the technique of liaison between surgical and technological research; and Mr. J. Brown of that company has not only devoted endless time and skill to the original construction of the machine but has attended and studied its performance in the operating theatre. A second phase of this prototype apparatus embodying improvements which the function of this machine has suggested is now under construction; the cost of its development is being borne by a grant from the Nuffield Foundation. We have had assistance from the National Research Development Corporation in our plans for the machine's development.

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INSULIN RESISTANCE FOLLOWING HYPOTHALAMIC LESIONS AND REMOVAL OF THE ADRENAL MEDULLA

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It has long been thought that insulin-resistant diabetes might be associated with the presence of an insulin antagonist (Himsworth and Kerr, 1940). Resistance to insulin has been shown to develop in intact animals after the injection of purified growth hormone (Young, 1950) and of cortisone (Campbell et al., 1950) over periods of some days. The work of Bornstein and Park (1953) has shown that neither of these hormones is an insulin antagonist, but that both are necessary for the development in the intact animal of the insulin antagonism found in alloxan-diabetic rats. Bornstein (1953) found that the insulin antagonism was confined to a specific lipoprotein fraction of the serum of such rats. The serum from a human subject rendered hypoglycaemic by a large dose of insulin also exhibited insulin antagonism, while that from a normal human subject and from normal rats possessed no such activity.

Section of those pathways from the hypothalamus to the brain stem which mediate autonomic function produced no change in insulin sensitivity (Beattie and Chambers, 1953a), but when the adrenal medulla was removed from these rats they developed marked resistance to insulin. These experiments are described below.

Material and Methods

Male albino rats of a single strain and weighing between 200 and 250 g. at the start of the experiment were used. For five weeks before the experiments began they were kept at a constant environmental temperature of 29.5° C. Rats of the series 1 experiments were kept at this temperature throughout the experimental period. Rats of the series 2 experiments were kept at 29.5° C. until day 12 of the experiment, when they were transferred to a cooler environment with a mean temperature of 18° C.

The rats of each series were divided into four groups. Group A rats were unoperated controls. Group B rats had brain lesions inflicted on day 0. The adrenal medullary tissue was removed from the group C rats on day 7. Group D rats had brain lesions made on day 0 and the adrenal medullary tissue was removed on day 7. All rats were killed on day 21.

Each group of rats in series 1 was divided into four subgroups. The first subgroup was used to obtain resting blood-glucose and resting liver-glycogen values. The second subgroup was given an intraperitoneal (I.P.) injection of insulin (1 unit per kg. body weight) on day 21. Blood-

glucose concentrations were determined on blood samples taken before and 30 minutes after the injection. The third subgroup received an I.P. injection of glucose (1 mg. per g. body weight) on day 21. Blood-glucose concentrations were determined as in the previous group. Samples of muscle were taken before and 30 minutes after the injection, and a sample of liver also 30 minutes after the injection. These tissue samples were used to determine the glycogen content. The fourth subgroup received an injection of glucose and insulin at the above dose levels and by the same route. Samples of blood, muscle, and liver were taken as in the third subgroup. The rats of series 2 were used only to determine resting blood-glucose and liver-glycogen values and the response of the blood glucose to an injection of insulin. The insulin used in all the experiments came from the same batch and had been assayed for glucagon content.

The site of the brain lesions and the method of producing them have been described already (Beattie and Chambers, 1953b). The adrenal medulla was removed by incising the cortex and expressing the medulla by gentle pressure on the cortex. At the end of the experiment the glands were fixed and sectioned to confirm that no remnant of medullary tissue had been left within the gland.

The procedures at the end of the experiment were:

1. Food was withdrawn at 5 p.m. on day 20 but ample water provided.

2. Between 10 a.m. and 12 noon on day 21 the rats were anaesthetized by an I.P. injection of pentobarbitone sodium (40 mg. per kg. body weight).

3. When anaesthetized a blood sample (0.2 ml.) was withdrawn from the heart. The left gastrocnemius muscle was exposed, ligated near its origin, and a sample (approximately 0.4 g.) removed, avoiding any obvious tendinous tissue. After weighing on a torsion balance, the sample was dropped into 4 ml. of a hot (100° C.) solution of potassium hydroxide (30% w/v).

4. Immediately after removal of the muscle sample the injection of insulin, glucose, or glucose with insulin was given. The total volume of fluid injected did not exceed 0.6 ml. per 100 g. body weight.

5. Precisely 30 minutes after the injection a second blood sample was taken from the heart, and after its removal a sample of muscle was removed from the right gastrocnemius muscle and treated as before.

6. The abdominal cavity was opened and a sample of liver (approximately 0.4 g.) taken from the left lateral lobe and treated in the same way as the muscle samples.

Blood samples were deproteinized by the barium-zinc procedure and the glucose content was determined by the method of Nelson (1944). After the samples of muscle and liver had dissolved, the tubes were cooled and the glycogen precipitated by adding 7.2 ml. of absolute alcohol. After centrifuging, the supernatant fluid was discarded, and the precipitate dried and then dissolved in 10 ml. of distilled water. Glycogen was determined (as glucose) by the anthrone method of Seifter *et al.* (1950). The glycogen content of liver and muscle was expressed as grammes of glucose per 100 g. wet tissue.

Results

Effect of Insulin on Blood-glucose Level.—The mean resting blood-glucose concentrations were considerably lower in group D rats of both series than those of the other groups. Rats of group D in both series failed to show a hypoglycaemic response after the injection of insulin (Table I).

Muscle-glycogen Content.—The glycogen content of muscle was determined only on series 1 rats. Rats with brain lesions only (group B) had a resting content of glycogen which was not significantly different from that in the control group. After removal of the adrenal medulla (group C) the resting level of glycogen was lower in one set of experiments and equal to that of the control rats in another set. Group D rats had a resting content significantly lower than that of the control group (Tables II and III). After the injection of glucose the glycogen con-

TABLE I.—Changes in Blood-glucose Concentration Following Insulin Injection

Group	Operation	Series 1 Environmental temp. 29.5° C.				Series 2 Environmental temp. 18° C.			
		Blood Glucose, mg./100 ml. ± S.E.				Blood Glucose, mg./100 ml. ± S.E.			
		No. of Rats	Resting Level	30 min. after Insulin	Diff.	No. of Rats	Resting Level	30 min. after Insulin	Diff.
A	Control	6	119 ± 3.6	71 ± 4.4	-48	8	96 ± 5.9	64 ± 4.9	-32
B	Lesions	5	100 ± 5.0	63 ± 3.3	-37	11	98 ± 4.0	46 ± 3.8	-52
C	Adrenal medulla removed	10	111 ± 5.2	71 ± 5.5	-40	10	115 ± 5.8	58 ± 3.3	-57
D	Lesions and adrenal medulla removed	7	60 ± 1.6	69 ± 9.2	+9	7	73 ± 4.1	89 ± 8.2	+16

Insulin dose, 1 unit per kg. body weight given intraperitoneally.

TABLE II.—Changes in Blood-glucose Concentration and Glycogen Content of Muscle and Liver After Injection of Glucose in Series 1

Group	Operation	Blood Glucose Mean ± S.E. mg./100 ml. blood			Muscle Glycogen Mean ± S.E. g./100 g.		Liver Glycogen Mean ± S.E. g./100 g.	
		No. of Rats	Resting Level	30 min. after Glucose	Resting Level	30 min. after Glucose	After Glucose	After Glucose
A	Control	7	104 ± 6.5	156 ± 7.2	0.635 (0.008)	0.691 (0.010)	1.346 (0.062)	1.107 (0.062)
B	Lesions	4	110 ± 5.9	145 ± 5.7	0.652 (0.009)	0.684 (0.006)	1.436 (0.178)	1.129 (0.064)
C	Adrenal medulla removed	4	102 ± 5.1	162 ± 7.9	0.515 (0.008)	0.541 (0.006)	0.840 (0.658)	0.064 (0.120)
D	Lesions and adrenal medulla removed	4	84 ± 4.7	104 ± 4.9	0.468 (0.004)	0.458 (0.007)	0.213 (0.024)	0.024 (0.120)

Dose of glucose, 1 mg. per g. body weight given intraperitoneally. Values in parentheses under the mean glycogen content of liver are mean resting values from Table IV.

TABLE III.—Changes in Blood-glucose Concentration and Glycogen Content of Muscle and Liver After Injection of Glucose and Insulin in Series 1

Group	Operation	Blood Glucose Mean ± S.E. mg./100 ml. blood			Muscle Glycogen Mean ± S.E. g./100 g.		Liver Glycogen Mean ± S.E. g./100 g.	
		No. of Rats	Resting Level	30 min. after Glucose and Insulin	Resting Level	30 min. after Glucose and Insulin	After Glucose and Insulin	After Glucose and Insulin
A	Control	7	109 ± 5.6	92 ± 5.2	0.736 (0.011)	0.750 (0.009)	1.463 (0.098)	1.098 (0.062)
B	Lesions	4	100 ± 4.1	79 ± 3.8	0.687 (0.007)	0.705 (0.010)	1.397 (0.178)	1.077 (0.089)
C	Adrenal medulla removed	3	106 ± 5.0	84 ± 4.8	0.690 (0.011)	0.736 (0.009)	0.948 (0.658)	0.089 (0.120)
D	Lesions and adrenal medulla removed	4	104 ± 3.9	124 ± 5.2	0.519 (0.008)	0.497 (0.011)	0.248 (0.027)	0.027 (0.120)

Dose of glucose, 1 mg. per g. body weight. Dose of insulin 1 unit per kg. body weight. Values in parentheses under the mean glycogen content of liver are mean resting values from Table IV.

tent of muscle rose by almost the same amount in groups A, B, and C, but that of group D remained unchanged (Table II). When insulin and glucose were given the glycogen content rose again in groups A, B, and C, but not in group D. The blood-glucose levels fell in groups A, B, and C, but rose in group D by the same amount as it had when glucose alone was given (Table III).

Liver Glycogen.—The resting glycogen content of the liver in series 1 rats was not significantly different in groups A and B. The mean content in group C was significantly lower than that of groups A and B. Rats of group D had

a very low content equal to about 15% of that in the control group. After exposure to cold conditions for nine days all liver glycogen values were markedly reduced. Group C rats again had a lower mean content than the control group and those of group D an extremely small amount (Table IV).

TABLE IV.—Resting Glycogen Content of the Liver and Blood-glucose Levels

Group	Operation	No. of Rats	Series 1 Environmental Temp. 29.5° C.		Series 2 Environmental Temp. 18° C.	
			Blood Glucose Mean ± S.E. mg./100 ml.		Liver Glycogen Mean ± S.E. g./100 g.	
A	Control	8	111 ± 5.3	0.962 ± 0.042	96 ± 5.9	0.073 ± 0.010
B	Lesions	8	103 ± 4.7	1.178 ± 0.061	98 ± 4.0	0.073 ± 0.008
C	Adrenal medulla removed	8	106 ± 5.7	0.658 ± 0.037	115 ± 5.8	0.045 ± 0.005
D	Lesions and adrenal medulla removed	8	78 ± 4.9	0.120 ± 0.008	73 ± 4.1	0.011 ± 0.004

All determinations were made on day 21 of the experiment. Series 2 rats had been exposed for 9 days to an environmental temperature of 18° C. from day 12 to day 21.

Body-weight Changes.—The differences between the mean weight at the start of the experiment and that on day 21 are given in Table V. Series 1 rats all showed an increase in weight which was not significantly different between

TABLE V.—Changes in Body Weight During the Experimental Period

Group	Operation	Series 1 Environmental Temp. 29.5° C.		Series 2 Environmental Temp. 18° C.	
		No. of Rats	Mean Change of Weight ± S.E. g.	No. of Rats	Mean Change of Weight ± S.E. g.
A	Control	28	+24 ± 7.6	16	+20 ± 5.2
B	Lesions	21	+20 ± 5.8	19	1 ± 4.2
C	Adrenal medulla removed	25	+22 ± 8.6	18	+5 ± 9.6
D	Lesions and adrenal medulla removed	23	+13 ± 11.7	15	7 ± 10.1

The change in body weight is the difference between the weights of rats on day 0 and those on day 21.

groups. The control rats of series 2 had the same overall weight increase as the corresponding group in series 1. Rats of groups B and C maintained their starting weight, and those of group D showed a slight fall below the weight at the beginning of the experiment.

Discussion

Rats of series 1 (kept at 29.5° C.), which had brain lesions and were without any adrenal medullary tissue, showed no hypoglycaemic response after the injection of insulin and were unable to increase the glycogen content of muscle either in the presence of a slight hyperglycaemia following the injection of glucose or when insulin was given with glucose. Rats with either no adrenal medullary tissue or with brain lesions responded to these various injections of insulin, glucose, and insulin with glucose in the same way and to the same degree as the control rats. The glycogen content of the liver in rats on whom both operations had been done was much reduced. These findings suggest that an insulin antagonist was present in the rats with brain lesions and without adrenal medullary tissue, and that this antagonist was probably inhibiting the hexokinase system.

Bornstein and Park (1953) found that the insulin antagonism shown by the serum of alloxan-diabetic rats was

reversible by insulin in a concentration of 0.1 unit per ml. in the medium in which the isolated diaphragm from a normal rat was suspended. If the test muscle was taken from an alloxan-diabetic rat and suspended in serum from such a rat then insulin in this concentration failed to produce complete reversal of the insulin antagonism. Krahl (1951) had already pointed out that reversal of insulin antagonism was possible, provided there was enough insulin available. In the present experiments insulin was given in a dose of 1 unit per kg. body weight. Assuming that all the insulin was distributed over the extracellular fluid of the rat, and that this space forms about 28% of the weight of the rat, then the maximum concentration of insulin in the fluid bathing the muscle cells could not have exceeded 0.1 unit per 28 ml. if the insulin were evenly distributed throughout the space. It was probably much less. Rats of groups A, B, and C responded to this low concentration of insulin by increasing the muscle glycogen content, but the rats of group D did not. It would appear, therefore, that the insulin resistance exhibited by rats of group D would require an extremely high concentration of insulin for its reversal.

Bornstein and Park (1953) demonstrated that the presence of both growth hormone and cortisone was essential for the development of insulin antagonism in the serum of the hypophysectomized and alloxan-diabetic rat. If either or both hormones were added to normal serum no insulin antagonism was developed in that serum. If the insulin antagonism found in the rats of group D was of the same type as that found by Bornstein and Park, it would require both hormones for its development. The data in Table V leave no doubt that rats kept at 29.5° C. with brain lesions and with no adrenal medulla were able to increase their weights over a period of 21 days. It may be presumed, therefore, that these rats produced growth hormone at a rate at least as great as that of normal rats. These rats, too, showed no evidence of adrenal cortical deficiency, and normal cortical tissue was found in all the adrenal glands examined. It is reasonable to infer that these rats were producing, in quantities at least sufficient for normal existence, both corticotrophin (A.C.T.H.) and adrenal cortical steroids. Thus there is reason to believe that the two hormones necessary for the production of insulin antagonist of the Bornstein and Park type were present in rats of group D.

The mere differences in body weights recorded on day 0 and on day 21 do not give a true picture of the pattern of weight change. When brain lesions of the type inflicted in the present experiments are made there is a loss in body weight of about 20 g. during the first four days after the operation. This loss is made good by the end of the ninth day (Beattie and Chambers, 1953b). Removal of the adrenal medulla is followed by weight loss of about the same amount and is repaired in about the same time. Rats in group D thus repaired a total post-operative weight loss of about 40 g., and in addition increased their body weight by 13 g. above that on day 0. The true increment of weight in group D rats during 21 days was thus about 53 g., as compared with a weight increase in control rats of about 24 g.

Rats exposed to cool conditions (18° C.) react to these conditions by increasing heat production. Normal rats increased their oxygen consumption by 8%, those with brain lesions by 13.5%, rats without adrenal medulla by 15%, and rats without adrenal medulla and with brain lesions by 22% (Beattie and Chambers, 1953c). Thus after single operations (groups B and C) a weight loss of about 20 g. was repaired in spite of an increased oxygen consumption of 13.5–15%. The rats of group D regained almost all the weight loss after the two operations in spite of a rise in oxygen consumption of 22%. It would therefore not be unreasonable to presume that the rate of growth-hormone production, and probably also that of adrenal cortical steroids in the group D rats, was greater than that in normal rats under the same environmental conditions.

The exact role of the hypothalamus in the control of production of growth hormone and of corticotrophin (A.C.T.H.) is still obscure. Information derived from the effects of lesions in experimental animals and from the effects of tumours in man is equivocal. For example, Spiros (1954) found that moderate-sized lesions of the hypothalamus (area unspecified) were followed by increased insulin sensitivity which could be countered by injections of growth hormone. Paton and Petch (1954) reported hyperglycaemia, a diabetic type of glucose-tolerance curve, and reduced sensitivity to insulin in a human subject in whom a brain tumour involving the hypothalamus (area unspecified) was discovered at necropsy. It would be valueless to attempt to explain the present findings in terms of hypothalamic function when such a conflict of evidence exists.

The interest of the present experiments lies in the fact that insulin resistance was produced in rats without destruction of pancreatic islet tissue and without the continued injection of hormones. Moreover, no direct damage was caused to the cell masses of the hypothalamus by the division of the fibre tracts leading from the hypothalamus to the brain stem. Late chromatolytic changes were seen in certain cell masses which could with certainty be attributed to the section of the efferent fibres from them. Neither of the two operative procedures used in the production of insulin resistance had any demonstrable effect on insulin sensitivity. The insulin resistance which followed when both operations were done on the same rats was present 21 days after infliction of the brain lesions and 14 days after removal of the adrenal medulla. It is therefore improbable that the insulin resistance could be due to some irritative action set up by the operative procedures.

If the insulin resistance induced in these rats were due to the presence of an insulin antagonist—and the evidence is consistent with this assumption—then the possibility that insulin-resistant diabetes might arise from a cause or causes which do not involve primarily either the pancreas or the pituitary gland must receive serious consideration.

Summary

After section of the pathways from the hypothalamus to the brain stem and removal of the adrenal medulla, rats kept at an environmental temperature of 29.5° C. showed no fall in the blood-glucose level 30 minutes after the injection of insulin in a dose of 1 unit per kg. body weight. Removal of the adrenal medulla alone or section of the hypothalamic pathways produced no change in insulin sensitivity.

The resting content of glycogen in muscle (gastrocnemius) was significantly lower than normal in rats with the hypothalamic lesions and without adrenal medullary tissue. The glycogen content did not rise after the injection of glucose (1 mg. per g. body weight) or after the simultaneous injection of glucose and insulin. The glycogen content of the liver was markedly reduced (15% of normal) in the resting state. When such rats were exposed to cold for nine days they still displayed no hypoglycaemic response to the injection of insulin. The glycogen content of the liver in the resting state was reduced to 11 mg. per 100 g. of liver.

The experimental data suggest that the insulin resistance found in these rats was due to the presence of an insulin antagonist.

It is a pleasure to thank those who have made this work possible. Dr. Honor B. Fell placed laboratory facilities at my disposal, Mr. F. G. Moore and Mr. H. N. Smith made it possible to acquire most of the necessary equipment, and the Medical Research Council met part of the cost of technical assistance. I am indebted to Mr. R. D. Chambers for carrying out the major portion of the technical work.

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THE OCCURRENCE OF ELECTROCORTIN IN HUMAN URINE

BY

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The discovery by Grundy, Simpson, and Tait (1952) of a new hormone, called electrocortin,* which has the ability to increase both sodium retention and potassium excretion by the kidney, must inevitably give a new impetus to the study of the many conditions associated with sodium retention in man.

In recent years several workers have found evidence of the occurrence in certain human urines of a substance having the power to increase sodium retention by the kidney; but careful analysis of extracts of such urines by modern chromatographic methods has failed to reveal any evidence of the presence of deoxycortone, the only steroid hitherto known to possess such sodium-retaining properties in marked degree. It now seems likely that the sodium-retaining effects observed by earlier investigators were due to the presence in the extracts of this new hormone, electrocortin.

Most of the original observations suggesting the presence of a sodium-retaining principle in urine were made by Deming and Luetscher (1950). Using a method of bioassay on young adrenalectomized rats, they found that chloroform extracts of some human urines had the power, when injected, of reducing sodium excretion by the kidney. Under the conditions of their test deoxycortone acetate in doses of 5 to 25 µg. per rat had a similar effect, but larger doses of extract did not give greater sodium retention. In their earlier experiments evidence for the existence of a sodium-retaining substance in normal urine was equivocal, but a significant degree of activity was found in extracts of the urine of five out of eight patients with cardiac failure. In one patient with nephrosis a high titre of activity was also found. An extension of these observations was reported by Luetscher *et al.* (1952), who then found that the titre of sodium-retaining substance was high in the oedematous stage but fell to normal levels after diuresis with elimination of the oedema.

In 1953 Singer and Venning also found some evidence of sodium-retaining activity in extracts of nephrotic urine, and McCall and Singer (1953) found a sodium-retaining substance in eight out of nine nephrotic chil-

*The chemical formula of electrocortin has just been published by Simpson, Tait, Wettstein, *et al.* (*Experientia*, 1954, **10**, 132). It proves to be a steroid similar to corticosterone, but with an aldehyde grouping on C 18.

dren when they were gaining weight, though it was present in only one out of six when weight was stationary and the patients were no longer retaining sodium.

Chart and Shipley (1953) have claimed to detect a sodium-retaining factor excreted by normal adult males, the daily amount being equivalent in activity to 40 to 80 µg. of deoxycortone. They found that patients with hepatic cirrhosis and ascites showed a high excretion equivalent to as much as 3,162 µg. daily, although when ascites was absent excretion was normal. These workers also obtained some evidence that the active principle differed from deoxycortone itself, for they noted that it entered the aqueous phase when partitioned between benzene and water, whereas deoxycortone itself tends to enter the benzene phase freely. They suggested that it is probably associated with the so-called amorphous fraction of the adrenal cortical extract.

In 1951 Zaffaroni and Burton made a careful analysis of the steroids in adrenal cortical extract, employing their own particularly suitable and sensitive methods of paper-partition chromatography. They were able to find small amounts of deoxycortone in aqueous extracts of adrenal cortex, but could not find any trace of the hormone in chloroform extracts of human urine made at pH 1. Since a large part of the cortisone and hydrocortisone (compound F) content of such urines is extracted by chloroform at this pH it seems likely that any deoxycortone present would also be extracted in this way.

In 1952 Grundy *et al.* first published their evidence for the existence of a hitherto unrecognized hormone in the adrenal cortex causing sodium retention by the kidney. They were able to show that the new hormone was quite distinct from deoxycortone, for there was a great difference in the rates at which the two substances ran on paper chromatograms. In the toluene/propylene-glycol system of Burton, Zaffaroni, and Keutmann (1951) it ran at a rate almost exactly the same as cortisone, whereas deoxycortone ran very much faster. The activity in the cortisone zone was much greater than could be accounted for by the activity of the small amount of cortisone actually present there.

Simpson and Tait (1953) have reviewed the further intensive work they have done on this new hormone. They find that it is a reducing steroid having from 50 to 90 times the activity of deoxycortone on an equimolecular basis. The culmination of this work has been the isolation of the new hormone in the form of crystals by Simpson, Tait, Wettstein *et al.* (1953). Desaulles *et al.* (1953) have tested this purified preparation and found it to be 25 times as potent as deoxycortone on sodium retention and five times as active in increasing potassium excretion. An independent account of the properties and isolation of this hormone has been published by Mattox *et al.* (1953).

In the work presented here we have employed the assay procedure developed by Simpson and Tait for electrocortin activity to look for this hormone in human urine extracts. Our results suggest the presence of a small amount in normal urines. In addition a patient has been found who was shown on several occasions to be excreting large quantities of a substance having the special properties of electrocortin but who showed no evidence of sodium retention.

Methods

The rats used in these experiments were young of an albino strain bred in the department and weighing 60 to

80 g. Bilateral adrenalectomy was performed by the dorsal approach under ether anaesthesia. Only animals whose adrenals were removed unbroken were used. After operation the animals were fed a stock diet of "research" rat cubes and drank unrestricted 1% saline solution. Assays were carried out on the fourth day after operation. Each group of test animals consisted of five to seven rats and a control group of the same size was used on each day of testing. In preliminary experiments it was observed that variations between control groups from one week to another were greater than the differences between males and females. For this reason both male and female rats have been used in these experiments, though all animals in any one assay were of the same sex. Control and test animals were mixed in the cages to avoid variations due to the order in which the animals were handled.

In the earlier experiments survival time after withdrawal of saline was determined as evidence of completeness of adrenalectomy, but survival, implying an incomplete adrenalectomy, was so rarely observed that this was finally abandoned as a routine. The rats were allowed to continue drinking saline until the morning of the test day.

For each test four groups of five to seven rats were taken. The first group served as controls, the second group all received 10 µg. of deoxycortone, and the third and fourth groups were injected with different quantities of the extract to be tested. All injections were made up to a volume of 0.1 ml., the solvent being 20% ethanol in water. The control group received solvent alone. The injections were made at about 10 a.m. on the morning of the test. One hour later the bladders of all rats were emptied by suprapubic pressure combined with a light inhalation of ether. After this, a subcutaneous injection of 1 ml. of a mixture containing 73 µg. of Na²⁴ and 295 µg. of K⁴² was made, the total radioactivity of the injected dose at the time of assay being about 60 µC. Immediately after injection each rat was placed in a separate 500-ml. beaker fitted with a raised wire mesh. All beakers had previously been cleaned with chromic acid and distilled water.

Three hours after the injection the rats were made to urinate by the method described above, all urine being collected in the beaker. Although every effort was made to get complete emptying of the bladder, this was not essential to the accuracy of the test. The beakers and wire meshes were carefully rinsed with 5 ml. of distilled water projected against the walls by means of a syringe and needle. The washing fluid was collected in a small bottle. The ratio between Na²⁴ and K⁴² concentration was determined in each sample by a method essentially similar to that of Tait and Williams (1952) and Simpson and Tait (1952) which involves measurement of the intensity of radiation with and without a thin aluminium screen.

Some modifications of the detail of the method were made. Only 0.2 ml. of the diluted urine sample was used for the radioactivity measurement, since this gave a sufficient number of counts a minute, from 5,000 to 10,000. This 0.2-ml. sample was placed on a disk of thin filter paper fitted into a nickel planchette 25 mm. in diameter. With the uniform distribution of this fluid thus obtained the radioactivity count could be made without drying the sample. Direct comparison showed that there was no significant difference between this wet method of counting and the method with dried samples used by Simpson and Tait. Counts were made on each sample, both with and without a filter screen composed of six sheets of 5/1000 in. (0.13 mm.) aluminium, and using a Geiger-Müller tube, G.E.C. type Z B 7, v.v. 1400.

From the ratio of unfiltered to filtered counts the relative proportions of Na²⁴ and of K⁴² in the sample could be derived by reference to a calibration curve constructed from mixtures of the two isotopes in known proportions. The degree of activity of the sodium-retaining factor in the extract under test was indicated by the fall in the ratio of Na²⁴ to K⁴² in the urine sample excreted after the injection,

this ratio being expressed as a percentage of the mean figure obtained for the control group on the same day.

The principle of measuring the Na/K ratio rather than the actual excretion rate of either sodium or potassium alone was introduced by Simpson and Tait, and has several important advantages. It eliminates the need to collect and measure accurately the whole urine sample excreted by each rat. To achieve this reliably Singer and Venning had to ligate the urethras of all their rats and sacrifice them to obtain the bladder urine. When only the ratio is required completeness of collection is much less important. The rats were not sacrificed in our assays, but were used again two days later for similar assays, using another method with Na^{24} and K^{42} with subsequent estimation of the Na/K ratio by means of the flame photometer. In this paper only the results obtained by the isotope method are considered. A comparative study of the results obtained by the isotope and two other methods will be published elsewhere.

Preparation of Urinary Extracts

Owing to our uncertainty about the stability of the sodium-retaining principle, the extraction procedure was deliberately made as simple as possible to minimize the risk of destruction. Twenty-four-hour samples of urine were collected without preservative. These were extracted by manual shaking with 15 volumes per 100 ml. of urine, repeated four times with fresh lots of chloroform. No acidification of the urine was done before extraction, the pH usually being between 6 and 7. The chloroform extract was evaporated to dryness under reduced pressure, using a water bath at 50° C. Suitable aliquots were obtained by dissolving the residue in a small known volume of fresh chloroform, dividing this into small tubes, and blowing off the chloroform with a stream of nitrogen. For injection into rats the residue was dissolved in 20% ethanol in water, the volume being so chosen that the dose to be injected into each rat was contained in 0.1 ml. solution.

All extracts were stored dry until the day of assay.

Results

Under the conditions of our experiments a linear relationship was found between the $\text{Na}^{24}/\text{K}^{42}$ ratio, expressed as a percentage of the mean figure for the control group, and the logarithm of the dose of deoxycortone injected. This relationship was found over the range of dose from 5 to

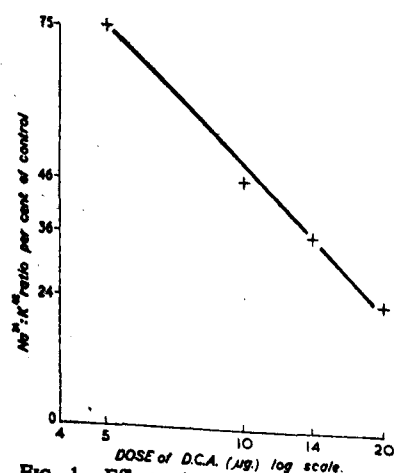


Fig. 1.—Effect of deoxycortone acetate. Linear relation between log. dose and percentage drop in $\text{Na}^{24}/\text{K}^{42}$ ratio.

5 μg . per rat, and is shown in Fig. 1. Below 5 μg . per rat a linear relationship was not found, the ratio rising above the control level. In this respect our observations confirm the finding of Forsyth (1953) that very small doses of deoxycortone may actually have a sodium-excreting effect. Because of this excreting effect activities equivalent to amounts of deoxycortone less than 5 μg . could not be detected. It was considered desirable, therefore, to test all extracts at two dosages in order to increase the likelihood of obtaining an optimum content of the sodium-retaining substance. In this regard it is of interest that previous workers have usually failed to establish any quantitative relationship between size of dose and degree of response. Thus Luetscher *et al.* (1952) had found that

increases in dose much above the equivalent of 20 minutes' urine output by the patient did not regularly yield a proportionate increase in response. Singer and Venning have also found sodium-retaining activity in the urine from some patients with nephrosis but had failed to get a bigger response with a larger dose of extract.

Five normal subjects have therefore been studied by injection of half-hour equivalent and of three-hour equivalent of urine extract into separate groups of six test rats. A sixth normal subject was also studied at the half-hour dose only. In four of the six subjects tested at the half-hour dose the ratio was depressed to 80% or less of the control level. An elevation of the ratio occurred in the other two (Fig. 2). This rise could have been due to a sodium-

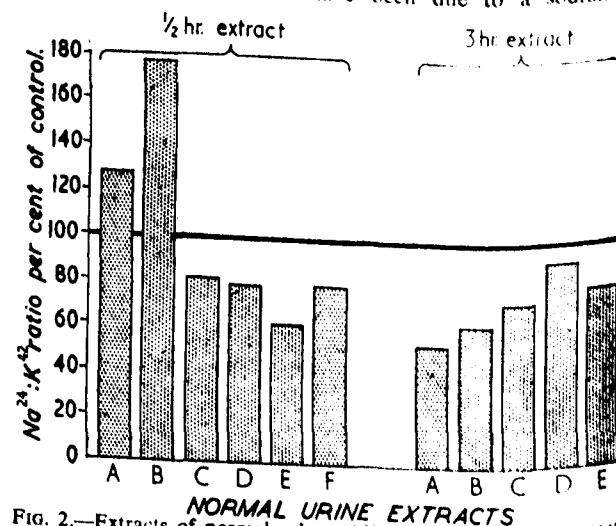


Fig. 2.—Extracts of normal urine. Mild depression of $\text{Na}^{24}/\text{K}^{42}$ ratio.

excreting effect of a very small dose of the active principle present in the extracts and comparable to the sodium-excreting effect of small doses of deoxycortone observed both by Forsyth and by ourselves. Support for this interpretation is found in the fact that both these extracts produced effective and significant depression of the ratio when given in the three-hour dose. With the other three extracts tested at both dose levels no significantly greater activity was observed at the higher dose than at the lower. Our experience of these extracts is thus the same as that of Luetscher *et al.* (1952) and of Singer and Venning (1953).

Since the $\text{Na}^{24}/\text{K}^{42}$ ratio can readily be depressed to a much lower figure by a sufficient dose of deoxycortone it would seem that the active principle whose effect is being observed in normal urine has very different pharmacological properties from deoxycortone itself. The results thus indicate the frequent presence of a sodium-retaining factor in chloroform extracts of normal urine, but they do not provide enough evidence on which to base an estimate of the amount present in terms of deoxycortone activity. Thus by reference to the deoxycortone calibration curve in Fig. 1, extracts C and E have respectively 4.5 and 6.5 μg . equivalents per half-hour sample. These figures correspond to 24-hour outputs of 216 and 312 μg . of activity expressed in terms of deoxycortone. On the basis of the three-hour assay, however, the same extracts showed activity indicating a daily output of active substance equivalent to only 40 and 35 μg . of deoxycortone respectively. Under such circumstances the assays are of little more than qualitative value.

They do serve, however, to show that such urinary extracts contain a principle which qualitatively alters the electrolyte excretion by the kidney. Methods of assay hitherto used have measured the effect on the rate of excretion of sodium only. Any factor in the extracts which may be toxic to the kidney and may cause a temporary impairment of renal function is likely to give a reduction in sodium excretion and thus, by a non-specific reaction, to suggest the presence of a specific sodium-

retaining factor. Any temporary impairment of renal function which may result from injection of the extracts is much less likely to affect the ratio of sodium to potassium. Changes in this ratio may be regarded, therefore, as a more reliable indication of the presence of a specific factor than will reduction in the rate of sodium excretion alone.

These results on normal urines may be contrasted with comparable assays on four patients suffering from rheumatoid arthritis. Extracts of the urine from these patients gave no indication of the presence of a sodium-retaining factor at either the half-hour or the three-hour dose. In Fig. 3 each column represents the mean effect on batches of five rats for each extract as compared with control groups of the same size.

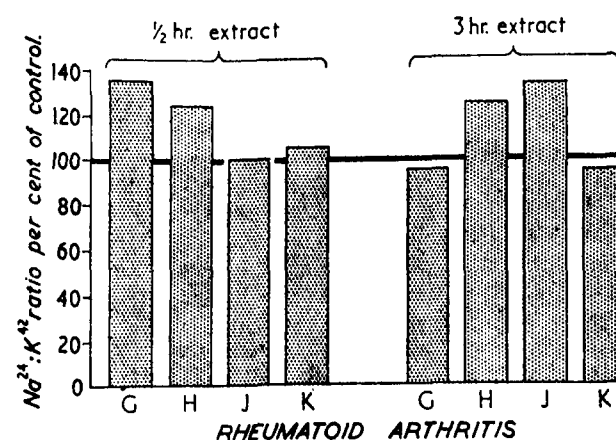


Fig. 3.—Extracts of urine from patients with rheumatoid arthritis. Failure to influence $\text{Na}^{24}/\text{K}^{42}$ ratio.

In three patients suffering from congestive cardiac failure with gross oedema, results were less consistent. Subject P, with recurring ascites associated with severe tricuspid incompetence, showed no activity at two- or three-hour dosage. Subject F, losing oedema under mersalyl therapy, showed no activity at either half-hour or three-hour dose. On the other hand, subject M, with chronic congestive failure not improving under treatment, showed considerable sodium-retaining activity at the three-hour dose on two occasions.

These results on cardiac subjects merely confirm the findings of earlier workers that a sodium-retaining factor is present in human urine at certain times, but they do not assist in the prediction of the conditions under which it is likely to appear. Under such circumstances it is difficult to define more closely the properties of this elusive principle and to determine whether these properties coincide with those of electrocortin.

We have made several attempts to increase the output of this principle in urine to more manageable levels. The

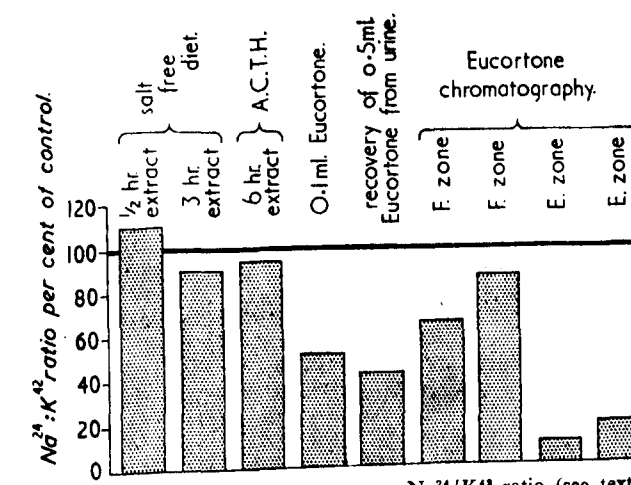


Fig. 4.—Effect of various extracts on $\text{Na}^{24}/\text{K}^{42}$ ratio (see text). Electroecortin in "eucortone."

maintenance of a normal subject for a week on a diet containing less than 0.5 g. of sodium daily did not result in any detectable amount of the sodium-retaining factor in a subsequent urine extract. Similarly, the urine of a patient maintained on large doses of A.C.T.H., which was shown to have provoked a large increase in hydrocortisone output, did not show any significant activity. Thus neither of these procedures seems to lead to an increased output of the sodium-retaining factor (Fig. 4).

Detection of Electrocortin

Electrocortin can be distinguished clearly from deoxycortone by the rate of its flow on paper chromatograms. When the toluene/propylene-glycol solvent system is used electrocortin flows at almost the same rate as cortisone. While several other steroids have similar rates of flow in the chromatogram, it is very improbable that any other will combine a similar rate of flow on paper with a high degree of sodium-retaining activity. The demonstration of both these properties in an extract will thus establish the presence of electrocortin with a high degree of probability.

The most easily available source of electrocortin at present is commercial adrenal cortical extract. Using the Burroughs Wellcome preparation "eucortone," we were readily able to show that it contained strong sodium-retaining activity. When eucortone was added to urine samples and chloroform extracts were then made in the usual manner, these extracts also had strong sodium-retaining activity in our test. This activity ran in the cortisone zone. Though quantitative conclusions could not be reached it was clear that when electrocortin was added to urine a large proportion was recovered by the extraction procedure we were using (Fig. 4).

The chance discovery of a patient who proved to be excreting continually large amounts of the sodium-retaining substance in her urine has luckily enabled us to establish the approximate rate of flow of the principle on paper chromatograms and to show that this is the same as electrocortin.

The subject, Mrs. A, was a West African negress, aged 41, who was under investigation by Dr. M. D. Milne because of recurrent attacks of severe muscle weakness, which were found to be due to low serum potassium. Balance experiments conducted by Dr. Milne showed that she suffered from a very severe potassium-losing condition, apparently due to a renal tubular anomaly which was associated with a chronic pyelonephritis. Blood urea and pyelogram were normal; albuminuria varied between 1 and 3 g. per litre. At no time was there any oedema or other clinical evidence of sodium retention. Careful balance experiments showed that she was neither retaining nor losing sodium at the time of study. The full clinical history of this case with extensive electrolyte investigations is being published (Milne, 1954).

Three separate urine collections from this patient were tested and all showed strong sodium-retaining activity—much greater than we had encountered in any other subject. Depressions of the $\text{Na}^{24}/\text{K}^{42}$ ratio with both half-hour and three-hour doses of extract are shown in Fig. 5. One of these highly active extracts, analysed for cortisone and hydrocortisone content by the chromatographic method described by Cope and Hurlock (1953), was found to contain 57 μg . of cortisone and 11 μg . of hydrocortisone a day. Thus a three-hour aliquot of this extract contained about 8 μg . of the combined hormones, a quantity much too small to influence the $\text{Na}^{24}/\text{K}^{42}$ ratio in the tests. As may be seen from Fig. 5, an injection of 30 μg . of cortisone acetate per rat produced no detectable alteration in the ratio.

A sample of this extract equivalent to 48 hours' urine output was submitted to paper partition chromatography, using the toluene/propylene-glycol system. After a run of 72 hours most components of the extract had run off the bottom of the chromatogram, there being retained on the paper only those as polar as, or more polar than,

cortisone. Two zones were cut out from the chromatogram, one corresponding to the cortisone level (E) and the other to that of hydrocortisone (F). Both were separately eluted from the paper with methyl alcohol. The eluted fractions after evaporation of the methyl alcohol were then tested in the usual manner. The cortisone fraction showed a strong sodium-retaining activity, whereas no activity

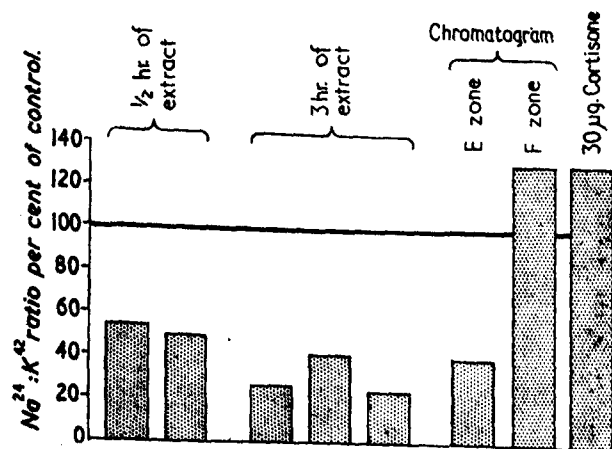


FIG. 5.—Strong electrocortin-like effect of urine extracts from Mrs. A. Activity confined to cortisone zone in the paper chromatogram.

was found in the hydrocortisone zone (Fig. 5). Thus the activity could be regarded as being due to electrocortin with a high degree of probability, the likelihood of any other substance combining a similar biological action with the same rate of flow on the chromatogram being extremely small.

Conclusions

The results obtained on normal urine extracts suggest the presence of small quantities of a substance having electrocortin-like properties, but they do not provide enough evidence on which to base any reliable estimate of the quantity present.

In contrast four urines from patients with rheumatoid arthritis all failed to show the presence of such a substance. It would be unwise to draw any conclusions from these relatively few cases, but, in view of the suggestions of Selye (1950) that disturbance of mineral corticoid production may play a part in the aetiology of rheumatoid arthritis, it is clearly of importance to determine whether such an absence of electrocortin from the urine is a regular feature of rheumatoid arthritis.

From the finding of activity in one of three patients with congestive cardiac failure examined no conclusions can be drawn. Although a high and maintained output of electrocortin by Mrs. A was demonstrated, it cannot be claimed that this throws any light on the nature of the peculiar renal and metabolic defect she was found to have. It is of great interest that in this patient there was ample proof that no sodium retention was taking place, and it must be concluded, therefore, that a high titre of electrocortin may occur in the urine in the absence of any sodium retention. Previous workers have claimed to find evidence of a sodium-retaining substance most readily in patients who were actively retaining sodium at the time. The fact that this patient was losing large amounts of potassium may, however, be of significance. It is at present quite unknown what are the relations between the level of steroid in the blood and the rate of excretion in the urine. Indirect evidence from the behaviour of hydrocortisone and allied steroids suggests that a rise in blood concentration is followed by a prompt increase in excretion. It is natural to assume, therefore, that a high output of electrocortin in the urine indicates a high concentration of this hormone in the blood, since it also is probably a very similar steroid. It is possible, however, that electrocortin may be bound

to protein or even to potassium salts, so that its excretion rate is determined more by permeability changes in the kidney or by potassium output than it is by the concentration in the blood. In the present state of our knowledge of this hormone, however, any such suggestion must be purely speculative.

While this work was being prepared for publication a report appeared stating that Luetscher and Johnson (1954) have also been able to show that the sodium-retaining substance they find in the urine of nephrotic subjects runs on the paper chromatogram at a rate similar to that of cortisone. This substance also is therefore presumably electrocortin. Much work remains to be done before the significance of a high excretion of this new hormone by the human subject can be properly judged.

Summary

A substance having the power to increase sodium retention by the kidney has been found in large amount in the urine of a woman suffering from a severe potassium-losing condition. Other properties of this substance suggest that it is the adrenal hormone electrocortin.

Indications of the presence of a similar active substance in small amount in normal human urine have been found. No such active principle could be detected in four patients suffering from rheumatoid arthritis.

Our thanks are due to Dr. J. E. F. Bradley and D. G. Arnott for advice on the handling of isotopes, and to Miss Mary Standing for much technical aid.

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A medical school will form part of the Rhodesia University College at Salisbury, Southern Rhodesia, plans for which are now rapidly maturing. Last autumn the college's inaugural board visited London and discussed the college's foundation and constitution with H.M. Government, the Inter-University Council, and London University. As a result a capital grant of £1,250,000 towards the cost of its building and equipment has been promised from Colonial Development and Welfare funds, subject to the balance of the total capital cost (estimated at £2,000,000) and the annual maintenance costs (over £250,000) being found locally. The city of Salisbury has provided 458 acres as a site for the college. Land will be available near the new Salisbury Native Hospital for a medical school, and about 1,000 acres for an experimental farm. The first faculties to be established will be those of arts and science, and after that faculties of agriculture and medicine. The college will provide education for London University degrees and will be open to students of all races without discrimination. It is hoped that the college will be ready for teaching to begin early in 1956.

A DANGER OF PEPTIC ULCERATION

A SURVEY OF EIGHT CASES COMPLICATING SURGERY AND TRAUMA

BY

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In the last seven years eight patients have been observed whose convalescence from surgery and trauma had been interrupted by the appearance or the recrudescence of peptic ulceration. Of these eight patients five died, four as a direct result of their ulcers. It is therefore a complication to be feared, whether the preceding trauma be strictly causal or not. A connexion between trauma and ulceration has long been known, and has been recorded in the literature.

Curling (1842), inspired by the observations of Cooper (1839) and Long (1840), collected 11 cases of ulceration following burns, four of which he had treated in person in the wards of St. George's Hospital. Billroth (1867) first reported ulceration following operation, citing a case of death from gastro-intestinal haemorrhage on the sixth day after an operation to decompress a large retrosternal goitre. Von Eiselsberg (1899) described eight cases of ulceration, five fatal, mainly after operations for strangulated hernia. Busse (1905) and von Winiwarter (1911), from the same clinic, developed the theme; the latter collected 30 cases of gastro-intestinal haemorrhage after operations other than on the bowel, 17 of which were fatal.

Cushing (1932) described ulceration and necrotic mucosal lesions following intracranial operations and disease. He believed these to be due directly to lesions in the hypothalamus, and he instigated animal experiments, such as those of Hoff and Sheehan (1935), to corroborate this belief.

Penner and Bernheim (1939), in their study of the pathological changes in "shock," disputed Cushing's conclusions, and ascribed the ulcerating lesions to the non-specific stimulus of the shock. Herbut (1945) and McDonnell and McCloskey (1953) investigated the frequency of acute peptic ulcers in necropsies on patients dying within two months of operation, and found an incidence greater than could be explained by chance.

There have been sporadic reports of cases following trauma, such as those by Griffiths (1922), Ramond and Chêne (1932), and Gray (1945). There can be little doubt, therefore, that there is a relationship between peptic ulceration and the trauma both of accident and of operation. The cases here reported show that peptic ulceration may follow or be reactivated by injury and operation; that it may present as bleeding, penetration, or perforation; and that it may cause death, or be an incidental finding after death. A knowledge of this complication will result in its more frequent recognition and in the undertaking of the early and energetic treatment which it demands.

Case 1

A wizened man of 68 was admitted to Guy's Hospital on November 30, 1946, with a four-years history of indigestion and epigastric pain. Operation had been advised in June, as radiography had revealed a large gastric ulcer, which was probably malignant, but he had refused it. Later his symptoms had compelled him to change his decision.

On December 19 Mr. Grant Massie performed a high subtotal gastrectomy for a large carcinomatous gastric ulcer involving the pancreas. Progress was satisfactory until the evening of the fourth day, when there was a sudden onset of upper abdominal pain and rigidity, and the patient became shocked. In view of his poor general condition and the bad prognosis of the disease, it was decided to treat him conservatively. He sank steadily, became jaundiced, and died on the fifth post-operative day.

Necropsy showed an intact suture line and revealed no cause of the jaundice. At the oesophago-gastric junction and extending 3 cm. up the oesophagus there was an ulcer, triangular in shape, with its base 2 cm. in length. The floor was covered with purulent exudate and there was a perforation in the lower part into the peritoneal cavity, which was generally inflamed.

Case 2

A man aged 73 was admitted to the Radcliffe Infirmary under Mr. D. C. Corry on May 26, 1948, complaining of retention of urine for three days. He had been relieved by catheter daily, and his nearest hospital had been unable to admit him after he had travelled some twenty miles to its casualty department. His blood pressure was 220/110, and he complained of some giddiness on stooping. Apart from occasional "flatulence," he was well.

On the day of admission cystoscopy under general anaesthesia confirmed the presence of a large prostate and a trabeculated bladder. Vaso-ligation and retropubic prostatectomy were performed. Progress was good, and urine was draining freely through a urethral catheter until May 31, when he complained of nausea and melaena occurred. Blood was taken for cross-matching, morphine was given, and he was placed in recumbency, being allowed sips of water by mouth. His blood pressure remained at the post-operative level of around 160 mm. Hg systolic, his pulse was steady at 80 a minute, and he was comfortable. The next evening, however, the sixth after the operation, he suddenly complained of nausea again, vomited a large quantity of coffee-ground material, and collapsed. A transfusion of plasma was started immediately, and while the first pint of blood was being run into an arm vein he died.

Necropsy showed a healthy site of operation, and hypertrophy of the left ventricle. In the duodenum, 2.5 cm. from the pylorus, there was an ulcer just over 1 cm. in diameter with a little puckering of the surrounding mucosa and some fibrous thickening. Microscopy showed fibrotic and necrotic pancreas in the base of the ulcer, and polymorph infiltration of the mucosa. At one end of the ulcer there was a small arteriosclerotic vessel, the lumen of which was patent and completely eroded. The jejunum and large bowel were filled with some altered and some dark red semi-clotted blood.

Case 3

A man aged 51 was admitted to the Putney Hospital on November 11, 1949, having been concussed in a crash while on duty in a police car. He had been unconscious for about five minutes, but was then suffering from lacerations of his forehead, chin, and hands, which required a few sutures only. He had a tender right second costo-chondral junction with some bruising, but there was no radiological evidence of bone injury or any clinical evidence of trauma to the abdominal viscera. He was kept in bed under observation and was about to be discharged, when, on November 19, he complained of faintness and dizziness and passed a large tarry motion; at the same time he vomited a small amount of "coffee-grounds." There were no physical signs other than those of haemorrhage, and inquiry elicited no previous history of indigestion. He was treated by rest, sedatives, and two-hourly milk feeds; his haemoglobin dropped to 66%, but there was no further bleeding. On December 7 radiography showed that the duodenal cap was a narrow channel which did not relax, and in it there was a barium-filled crater. There was no local tenderness.

After this he was under observation as an out-patient with very few gastric symptoms. Radiography on March 3, 1950, showed a healed ulcer; and on June 2 there was scarring and spasm, but no tenderness. He was finally discharged on November 24, a year after the original injury, with no symptoms other than occasional indigestion relieved by medicine and diet.

Case 4

A man aged 76 was admitted to the Putney Hospital on December 31, 1949, having been knocked down by a car while wandering across a road; he had not been rendered unconscious, but had sustained various lacerations and bruises about the right eye, the right side of the chest, and the crest of the left ilium, which was fractured. His main injuries were bilateral compound and comminuted fractures of the tibia and fibula. There was very little clinical evidence of shock and after resuscitation he withstood very well toilet of his wounds, suture of the skin, and the application of plaster-of-Paris to both legs, which were then suspended from a Balkan beam.

In spite of his severe injuries he gave no cause for concern until January 13, 1950, at 9.15 p.m., when he complained of a sudden onset of severe abdominal pain and breathlessness. On examination he was sweating, was very restless, and was increasingly pale; his blood pressure was 120/80 and his pulse rate 100 a minute. There was no cyanosis or any abdominal physical signs, but rectal examination revealed tarry stools. There was a smell of blood, and while being examined he vomited a large amount of dark altered blood. Morphine was given intravenously and a blood transfusion was started as soon as possible, but he died at 10.15 p.m.

Post-mortem examination revealed recent bleeding from a chronic duodenal ulcer and further blood throughout the intestines. There was no evidence of abdominal injury, and no other gross lesion was found.

Case 5

A man aged 57 was admitted to Guy's Hospital on November 19, 1952, with an acute on chronic intestinal obstruction due to faecal impaction and a volvulus of the splenic flexure of a long redundant colon. He gave a history of a duodenal ulcer which had perforated seven years before, but which had given him no trouble for six years; his left kidney had been removed for stone eighteen years before this admission. The strangulated loop of colon was resected by the Paul-Mikulicz method on the same day, and on December 12 an attempt was made to close his double-barrelled colostomy extraperitoneally. After two small bowel actions the wound broke down and all his faeces discharged through the wound and continued to do so.

As there was an area of dermatitis round the fistula and as the abdominal wall was weak and scarred it was felt that further operation should be postponed. He was therefore discharged on February 1, 1953, rather against his will. It was hoped that repeated rectal wash-outs might remove the faeces that kept impacting in the distal bowel, and that his fistula might close spontaneously.

His domestic arrangements were ill suited to this regime, and the dermatitis round the fistula became worse. Shortly after discharge he complained of fullness after meals and epigastric pain going through to the back. On March 9 he was readmitted as an emergency because for the last two days he had passed profuse, tarry, ill-smelling motions, and had become faint and giddy. He was pale, his pulse rate was 106, and his blood pressure 120/75. Rest, morphine, and two-hourly milk feeds were prescribed, and during the next few days five pints (2.7 litres) of blood was transfused. Frank melaena was present on only two more occasions, but occult blood was repeatedly present in his stools; a fractional test meal showed blood in all specimens and a high total acidity. At laparotomy on April 7 Mr. Wass found a duodenal ulcer with signs of recent activity and some fibrosis extending into the pancreas. A

partial gastrectomy was done with a retrocolic valvular gastro-jejunostomy. Finally on June 4, after repeated evacuations of faecal masses in the sigmoid colon, the fistula was successfully resected and the remaining colon anastomosed. On June 27 he went away for convalescence. He has since been seen, well and free from symptoms.

Case 6

A man aged 71 was admitted to Guy's Hospital on March 30, 1953, with symptoms due to an anal neoplasm of two months' duration. Biopsy the next day showed this to be an epithelioma of the anus infiltrating the sphincters. On April 14 a synchronous combined abdomino-perineal excision of the rectum and anus was done by Mr. Wass and myself; recovery was uneventful, apart from some sepsis in the abdominal wound. On April 27 he began to complain of epigastric pain and fullness; on April 29 he vomited 12 oz. (340 ml.) of dark material in which were seen "coffee-grounds." On questioning he admitted to having been treated two years before by his own doctor for ulcer symptoms. He had been put on a diet, to which his symptoms had responded, but no radiography had been performed. A diagnosis of duodenal ulcer was made, and he was treated with alkaline powder and atropine, his symptoms soon resolving. On May 14 a barium-meal examination showed that the stomach and duodenum were much displaced and distorted by an enlarged and tender head of the pancreas; further radiography on May 21 showed that this distortion was no longer present, but that there was a trefoil deformity of the duodenum with ulceration. On May 5 he was transferred for treatment of his anal neoplasm by radiotherapy; 2,500 r was administered to both groin fields, and no further digestive upset occurred.

Case 7

A spinster aged 68 was admitted to Guy's Hospital under Mr. Wass on May 31, 1953, complaining of "piles" for one year, malaise for six months, and constant watery diarrhoea for six weeks. She was a retired lady almoner who had lost 14 lb. (6.4 kg.) in weight in the last eight weeks. On examination she was pyrexial and looked ill; she had lower abdominal distension, especially marked in both iliac fossae. Rectal examination revealed at the fingertip a hard mass filling the upper pelvis. On June 9 at laparotomy the large bowel was found to be grossly distended and hypertrophied as far as the lower sigmoid, where there was a mass, the size of a foetal head, stuck to the left wall of the pelvis and to the bladder. A left iliac colostomy was fashioned to relieve the obstruction. For a week she did well, apart from an inability to pass urine unaided by catheter. Her colostomy worked well at first, but she then began to get colicky abdominal pain and her temperature rose. Attempts to break up hard faecal masses in her proximal colostomy loop were only partially successful, and she died on June 19, ten days after operation, in coma, with a temperature rising to 106° F. (41.1° C.).

At necropsy some smooth-walled cysts and two cavernous haemangiomas were found in her liver; the main cause of death was a peritonitis from two perforated stercoral ulcers of the colon proximal to the colostomy. The primary lesion was found to be a necrotic adenocarcinoma of the upper rectum, involving bladder and perirectal tissue, 10 cm. in diameter. In the first part of the duodenum there were five ulcers 0.5 to 1.5 cm. in diameter; from the floor of the largest projected a pedunculated blood clot which formed a cast of the duodenum. This ulcer had also penetrated the posterior wall of the duodenum, and a haematoma had formed between this and the pancreas. Microscopy showed an acute deeply penetrating ulcer.

Case 8

A man aged 74 was admitted to Guy's Hospital on September 15, 1953, under Mr. Law, complaining of increasing dimness of vision from his right eye for nine months. He had had a gastro-jejunostomy performed in

1912 for duodenal ulcer, since which time he had been troubled little by indigestion, save for a haematemesis in 1947, for which he had refused hospital treatment. On September 16 his right eye was removed for a malignant melanoma, with no local complications.

On September 22 he vomited altered blood on two occasions and passed a melaena. His general condition responded initially to blood transfusion and morphine, but he failed to maintain progress, dying on September 25.

Necropsy seven hours after death showed clean wounds and no local tumour cells, but microscopy of the liver revealed a minute melanotic deposit in one hepatic portal duct. His abdomen showed gross distension of the stomach and upper jejunum with thin grumous fluid. There was a retrograde ante-mortem intussusception of mid-jejunum, with the distal small intestine empty of contents and contracted to the size of a lead pencil. The large bowel was full of concentrated altered blood of various ages.

A retrocolic gastro-jejunostomy and four peptic ulcers were seen. Two were apparently of long standing—one on the lesser curve of the stomach and one on the jejunal side of the suture line. Two were recent—one in the fundus of the stomach and one in the jejunum about 2 cm. from the suture line.

Microscopy of the lesser-curve gastric ulcer showed a fibrous-tissue floor with two vessels filled with organizing thrombus; the mucosa showed some recent necrosis and infiltration with round cells and plasma cells, which suggested recent ulceration on the site of a long-standing ulcer. Microscopy of the distal jejunal ulcer showed the vertical edge characteristic of acute ulceration with the histological picture of acute mucosal destruction.

Discussion

Eight cases of proved peptic ulceration arising after trauma are presented. All the patients (seven male and one female) were over 50 years of age, the average being 67; four died as a direct result of the ulceration; in two cases the ulcers were multiple and in one they were an incidental finding at necropsy. The time interval from the original trauma to the first symptom varied from four days to ten weeks, but in seven of them it was from four to thirteen days. The original trauma varied widely.

The mechanism whereby this ulceration arises is a matter for conjecture. In Case 1 it may have been due to the pressure of the intragastric Ryle tube, but this was in place for only three days and the ulcer was much bigger than any such area of pressure. The direct trauma of the operation might be blamed, but the lower oesophagus and upper stomach share a blood supply, and the ulcer, which had the appearance of a typical peptic ulcer, stopped abruptly at the cardia. The vascular disease responsible for the hypertension in Case 2 might have been contributory, but the coronary arteries were only moderately atheromatous and the kidneys were normal. A direct injury to the abdomen might have originated the ulcer in Case 3, but there was no haematemesis at the time or any bruising of the epigastrium.

Physical disturbance in the form of severe shock was a feature in only one patient (Case 4), who had compound comminuted fracture of both lower limbs. None of the operations were minor, but none of the patients were unduly affected by them.

Mental disturbance may have been a factor in some. Case 1 evidently lay in dread of operation, having refused one previously; Case 2 had had the distressing experience of transport several miles to a hospital which had refused admission and sent him home again; Case 5 desperately wanted his faecal fistula closed, as his home conditions were quite unsuited to its care. On the other hand, no one could have seemed more placid than Case 3, who was quite unruffled by his illness.

An attractive hypothesis would be that the ulceration is the result of the excess secretion of adrenocorticotrophic hormone or cortisone during the adrenergic-corticoic phase of Moore (1953). The effects on the gastric secretion of these hormones have been well described by Gray *et al.* (1951).

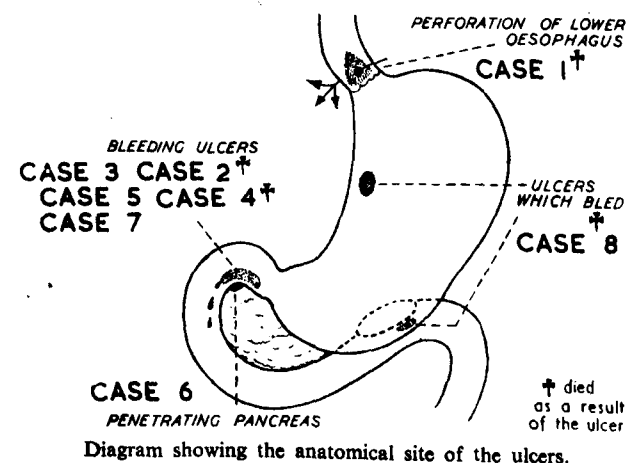
A previous history of indigestion was given by two patients: Case 2 admitted to occasional flatulence and Case 6 had been treated with diet for ulcer symptoms for two years previously. In two there was a history of ulcer: Case 5 had suffered from a perforated duodenal ulcer seven years before his admission, and Case 7 had had a gastro-jejunostomy performed 41 years before for duodenal ulcer. But neither of the two with a history of ulcer had been troubled with symptoms for six years.

Summary of Cases

Case No.	Sex and Age	Operation	Presenting Symptom	Ulcer	Result	Interval to Symptoms	Interval to Death (days)	Comment
1	M 68	Subtotal gastrectomy for carcinoma of stomach	Perforation	Oesophageal (juxta-cardiac)	Died	4 days	5	Had refused operation for carcinoma 4 months previously
2	M 73	Prostatectomy for urinary retention	Melaena	Duodenal	"	5 "	6	Had been admitted after 3 days' catheterization and after being refused admission by another hospital. History of occasional "flatulence" No epigastric injury
3	M 51	Road traffic accident, concussion and minor lacerations	"	"	Survived	8 "	—	
4	M 76	Road traffic accident, compound fractures both tibiae and fibulae	Pain and melaena	"	Died	13 "	13 plus 1 hour	No epigastric injury. Sudden pain and collapse with death during transfusion
5	M 57	Volvulus of large bowel, attempted closure of faecal fistula	"	"	Survived	10 weeks	—	Perforated D.U. 7 years before; no symptoms for 6 years. Sore skin round fistula and desperately eager for closure
6	M 71	Abdomino-perineal resection for epithelioma of anus	Pain, fullness, and coffee-ground vomit	"	"	13 days	—	Two years ago "ulcer" symptoms treated by own doctor by diet with success
7	F 68	Colostomy for massive infiltrating carcinoma of upper rectum	None	Duodenal (multiple)	Died	—	—	Incidental finding at death from perforation of stercoral ulcers in bowel proximal to colostomy
8	M 74	Enucleation of right eye for malignant melanoma	Melaena and haematemesis	Gastric and jejunal	"	6 days	9	Gastro-jejunostomy 41 years previously. Haematemesis 7 years previously

In those cases in which microscopy of the lesion was carried out the results have been reported. That it was not done in every case is no great defect: microscopical evidence of chronicity is probably unreliable (Tanner, 1953). Clinical differentiation of acute from chronic ulceration is also arbitrary. At one end of the scale is the patient with severe symptoms for many years, who at laparotomy is found to have a minimal lesion; at the other is the patient—often elderly—who has no symptoms until haemorrhage or stricture ensues, and who is found to have a gross chronic ulcer. However, from a consideration of these cases it would appear that the earlier a patient dies the more acute the appearances (Case 1); and the longer he survives the more chronic these are (Case 4).

More important from a clinical aspect would seem to be the anatomical site of the ulcer (see Fig.) and whether its



base is formed by peritoneum (Case 1), pancreas (Case 6), or blood vessel (Case 4). Perforation or haemorrhage brings a grave prognosis to elderly patients who are convalescing from accident or surgery, and in six of these patients the main symptom was haemorrhage.

It is apparent from a study of these cases that there may be some warning that ulceration is taking place. There was none in Cases 1, 4, and 7 (all of whom died); but there was warning with Cases 2, 3, 5, and 6 (of whom one died), and it is possible that early treatment might have saved life.

Conclusions

Peptic ulceration after trauma may be regarded as the abnormal reaction of an ulcer-prone patient to a physiological stimulus. Until such a time as the physiological reaction to stress and trauma can be measured and safely regulated, the best way to deal with this complication would be by prophylaxis and by early recognition and treatment. Prophylaxis is difficult, as the ulcer-prone patient does not declare himself. It is not the practice of surgeons to ask patients awaiting consultation to fill in "pro formas" on personal habits and previous and family history; were it so, however, it would be worth asking, "Have you suffered much from indigestion?" or, "Do you take stomach powders, tablets, or mixtures?" and if the patient be over the age of 50 and a man particular heed should be paid to such an admission. A careful general history is as important in surgery as it is in medicine.

If such a history is elicited the regime after operation should not be too active, and inquiry should be made into upper abdominal symptoms. In addition to the daily examination of the calves, a hand might well be applied to the epigastrium. If relevant symptoms appear, antacids and atropine should be given, and if tarry stools are passed the matter should be reported immediately, a serious view taken, and arrangements made at once to collect serum for cross-matching in preparation for a transfusion of blood that may be needed with great urgency.

Summary

Eight cases are presented of ulceration arising as a complication of operation or injury.

This ulceration may arise *de novo* or may be an exacerbation of previous ulceration.

A watchful outlook should be maintained for epigastric postprandial pain; particularly in the early convalescent phase. Melaena and coffee-ground vomit must be recognized as alarm signals, and immediate steps should be taken to arrange for rapid blood transfusion if necessary.

Energetic medical treatment may well avert death from a complication which has a high mortality rate.

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RECENT EXPERIENCE OF ENCEPHALITIS IN CHILDHOOD

BY

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This communication is based on a clinical study of 93 children with encephalitis seen since 1946 in the children's wards of three hospitals associated with the Department of Child Health in the University of Durham. This experience has been so varied that it invites an attempt to analyse it.

The term "encephalitis" is used without attempting to indicate any particular aetiological factor, whether of virus, allergic, or toxic origin. What is meant, therefore, is the occurrence, in a previously healthy child, of the classical symptoms or signs of disturbed cerebral function, which, after the exclusion of bacterial and vascular conditions and of chemical poisonings, are presumed to be the result of non-suppurative disorder of the brain.

The patients fall into two groups: (1) those associated or following on a recognized infective condition (measles, 12; pertussis, 8; varicella, 3; rubella, 1; mumps, 1; herpes simplex, 1; acute rheumatic fever, 1; infectious mononucleosis, 1), of which there are 28; and (2) those of unknown aetiology with no obvious causative factor, of which there are 65.

In attempting to define the clinical pictures of these diseases, this material could have been dealt with in two

ways. First, the cases associated with known infections might have been analysed to see if each had a distinctive clinical picture, and those of unknown aetiology could then be related to or compared with them. Bearing in mind that encephalitis may be the only manifestation of infections such as mumps, measles, and rubella, studies such as those of Greenfield (1950) have been of immense value in indicating the variety of conditions which can give rise to encephalitis, but they have been concerned solely with fatal cases and, even so, have shown quite clearly that there has been no uniformity of the clinical pattern in the various pathological groups. Second, all the cases might have been analysed according to the pattern of the clinical illness, regardless of aetiology or pathology, to ascertain whether any types were discernible. It is realized that in the absence of virus and histological studies, cases of encephalitis lethargica, subacute inclusion encephalitis (Dawson, 1933, 1934), haemorrhagic encephalitis (Baker, 1935), acute haemorrhagic leuco-encephalitis (Weston Hurst, 1941), and poliomyelitis (McAlpine *et al.*, 1947; Brewis and Neubauer, 1948; Jennings *et al.*, 1949; Kelleher *et al.*, 1949; Barrett *et al.*, 1952) may be grouped together in this way. This second method of analysis was chosen because it reveals clinical patterns of illness, irrespective of aetiology, which offer guidance to the practitioner in giving a prognosis.

Four main patterns of illness have been distinguished, although in this attempt at classification it has not been possible to insist on rigid criteria, and many of the signs and symptoms of impaired function of the nervous system have been common to all. Only the more obvious differences in onset, course, and duration have been used, and in some minor respects overlap between the types has occurred; in addition to which many cases could not be classified and have been described as a heterogeneous group.

Type 1.—Cases presenting as a sudden cerebral calamity in a previously healthy child or following an indefinite prodromal phase. Convulsions were prolonged or repeated, and unconsciousness lasted several hours or even two to three days. The duration of the acute phase was short, death or returning consciousness occurring in two to three days.

Type 2.—Cases beginning usually with a non-specific and meningitic illness with pleocytosis in the C.S.F. and followed by the acute onset of unconsciousness, stupor, or somnolence of a few days' duration, from which a rapid or sudden recovery frequently occurred. Cranial nerve paralysis and lower motor weakness were often encountered and recovery was the rule.

Type 3.—Cases often with a prolonged and insidious prodromal phase of indefinite symptoms or occasional convulsions, with periods of well-being followed by gradual unsteadiness developing into gross ataxia, tremors, and continuous choreiform movements of the whole body, particularly of the eyes. The illness was long, and was associated with emotional instability. Usually these cases had been diagnosed as chorea or cerebral tumour.

Type 4.—Cases which resembled encephalitis lethargica, with a short prodromal phase, and a slowly developing somnolence or coma. This lasted several days and was followed by cranial nerve involvement and a slow return to consciousness, interrupted by mental and emotional instability.

Type 1. Sudden Onset with Convulsions and Unconsciousness

Illustrative Case.—A. G., aged 10. On previous day, shivering, restlessness, and vomiting; no headache. Later

unable to speak; convulsion with bilateral clonic movements lasting 1½ hours. Temperature 107.8° F. (42.1° C.) reduced to 101° F. (38.3° C.) by sponging. On admission gravely ill, unconscious and vomiting; limbs immobile and flaccid. Face constantly twitching; eyes deviated, coarse nystagmus. No meningeal signs; C.S.F., 22 lymphocytes. Reflexes absent; W.B.C., 32,300. Remained unresponsive, with sporadic twitching of right hand, fingers, and toes; later, tonic neck reflexes present; head and eyes deviated to right, with facial weakness and hemiparesis. Constant variation in physical signs. Rapid deterioration, death 33 hours after first convulsion. Necropsy revealed small perivascular haemorrhages and cuffing in right basal ganglia, frontal cortex, brain stem, and spinal cord, and also perivascular collections of round cells in areas of the occipital and parietal cortex. No neuronal changes.

There were 19 cases of unknown aetiology in this category, 13 of them being below the age of 2 years. In nine there had been prodromal symptoms of malaise, listlessness, slight cold, and restlessness for one to five days. Eleven patients had vomited, six had loose offensive motions, and two had abdominal pain, although the bowel disturbance did not usually continue into the illness. In addition there were three cases of measles, four of pertussis, one of mononucleosis, and one of mumps which were similar in type.

Convulsions, generalized in 21 cases and limited to twitching or spasms of the face or limbs in 7, varied in number from 2 to 50 before admission. They had been continuous in 17 patients, and after admission were still continuous in 13, of whom 7 died. All patients were unconscious or stuporous from the onset of the fits. The temperature was raised in all but five, a high rising temperature being associated with a bad prognosis. Meningeal signs were present in only four cases due to measles or where the aetiology was uncertain, but were present in five of the other six cases of known infection. The C.S.F., examined in 26 cases, was normal in 18, while there was a mild pleocytosis of 12 to 56 cells in the remaining eight, one of which was blood-stained. Of these latter cases five were fatal.

The subsequent course of the illness in the survivors was very variable. Convulsions recurred in six cases and lasted for a few hours; drowsiness or coma for a day or two, accompanied by retardation, aphasia, slurring of speech, spasticity, choreo-athetosis, and ataxia were seen. Often recovery was quick, the illness lasting a week or less in nine cases, one to two weeks in four, two to four weeks in five, and two months in one case. The longer the illness the more likely were sequelae to develop; two cases were left hemiplegic with fits, three mentally retarded, and one with fits. Hemiplegia occurred in three other cases, one a fatal case and the others recovered completely.

Nine patients died, usually after short illnesses—six of 48 hours, two of three days, and one of 16 days. The last-mentioned case was that of a baby who continued to have convulsions for 10 days after admission and died a few hours after ventriculography. At necropsy, infiltration and old haemorrhages into the arachnoid were the only findings. Perivascular demyelination and haemorrhage were found in the mid-brain of one patient and the cortical areas of another; while perivascular cuffing and neuronophagia of polioclastic type, petechial haematomata, and capillary thrombi with infiltration were the appearances respectively in the other three patients on whom necropsies were done.

Type 2. Acute Onset with Short Somnolent Phase and Paralysis

Illustrative Case.—D. D., aged 10. Headache, sore throat, and fever lasting one day; then well for five days. Relapsed with pain in neck, headache, and sleepiness. Vomited continuously next day, but rational and co-operative. Marked meningeal signs, nystagmus, and right facial weakness, diminished tendon reflexes. Temperature 101° F. (38.3° C.); C.S.F., 45 cells, mainly polymorphs. Subsequent deterioration with deepening coma lasting five days, bilateral facial palsy, weakness of left arm and right shoulder, and diffi-

culty in swallowing. Slow improvement; becoming rational, though incontinent, excitable, and difficult to control. Went home 18 days after admission with paralysis of right face, deltoid, and left thigh, and emotionally labile. Went through a difficult phase, being bad-tempered, excitable, and nervous; often rude and vulgar. Speech staccato; appetite voracious; thin and restless. Eighteen months later had steadied down was doing well at school, and had recovered neurologically.

There were 15 cases in this category, all of unknown aetiology, all children in their early years, and most were encountered during outbreaks of poliomyelitis. Thirteen had some form of prodromal illness lasting two to eight days and consisting of headache, vomiting, fever, transient diplopia, disturbance of micturition, drowsiness, aphasia, and dysphagia. Fits were present in three cases, and in two cases siblings had a febrile meningitic illness about the same time. All but three were febrile. Meningeal signs were present in 12 cases, but in all there was a pleocytosis in the C.S.F.

The mental state on admission was variably described as: unconscious (2), stuporous (3), persistently asleep (3), retarded but rousable with difficulty (4), uncontrollable following three days' somnolence (1), conscious but aphasic (1), rational, becoming semicomatose for a week later (1).

Recovery of mental clarity occurred early: nine patients became conscious on or before the fourth day, four during the next three days, and only one took longer than a week. Sometimes this return of consciousness was very dramatic and sudden; a child having been deeply asleep or semicomatose for some days would waken in a few hours and become quite alert, would be found wandering round the cubicle, or, in one case, drinking out of the cubicle tap. Similarly, the return of speech followed the same pattern, and so striking was this apparent transformation from lethargy and sleep that the condition became known as the "Snow White syndrome."

The cranial nerves were not infrequently involved; strabismus (1), ptosis (1), facial palsy (3), aphasia (4), dysphagia (3). Paralysis of an arm or a leg occurred once each, and only five cases failed to show some form of lower motor weakness at some stage of the illness. Pyramidal signs were seen in six patients.

Only one death occurred: that of a 14-year-old child who was stuporous but responding on admission, and who became progressively comatose and died on the fourth day. At necropsy the lumbar cord was congested and showed punctate haemorrhages anteriorly, and perivascular cuffing was seen in the cervical cord and the thalamic region.

In only three cases did permanent sequelae persist: two cases of unilateral facial palsy and one of foot-drop; although temporary emotional instability was occasionally encountered.

Type 3. Insidious Onset with Continuous Choreiform Movements and Ataxia

Illustrative Case.—E. R., a male child aged 18 months. Previously well; then off his feet slowly; began to shake, and eyes moved from side to side. Very miserable; no temperature; C.S.F. normal. Seen again in one month; no progress and still very ataxic. A month after this, although bright and friendly, he had difficulty in balancing even when sitting still. His head was moving up and down regularly, and he was making mouthing movements. Unable to crawl, but could roll over. Reflexes, fundi, and C.S.F. normal. W.R. negative. E.E.G. indefinite. Developed basal ganglion tremor, particularly in arms. Excessive salivatory movements almost disappeared. Three weeks later he had again deteriorated, and the tremors were as bad as before, affecting head, eyelids, mouth, and to a less extent the limbs, and being continuous in sleep. These movements gradually became worse; arms, legs, and head jerked about uncontrollably; the eyes were never still, and

rolled upwards. He became uncooperative and resented interference. His condition was unchanged a year later.

There were nine cases similar in type to this, all of unknown aetiology, and all except one were under 5 years. There was an insidious onset from two weeks to three months, and occasionally isolated fits occurred two to three weeks beforehand, followed by a period of well-being before the characteristic signs developed. Sometimes a gradual unsteadiness of the limbs was the first manifestation, followed by stumbling and ataxia with tremors, squints and continuous eye movements or oculogyric crises, or a typical chorea-like illness. In four cases irritability, hysterical behaviour, or personality changes were also present, and frequently these patients were thought to be suffering from an intracranial tumour. The temperature was normal in all except one case.

The patients might be co-operative, lying quietly and slightly drowsy, or irritable, wildly excited and restless, violently choreiform and ataxic, with gross nystagmoid movements of the eyes. Coarse tremor on voluntary movement, nodding of the head, jerky speech, and salivation were present in some cases. Meningeal signs were seen in only one case, the C.S.F. contained a few cells in four cases, and the Lange curve carried out in five was normal. The subsequent course was usually slow improvement, often punctuated by relapses, emotional lability, staccato speech, outbursts of temper or excessive cheerfulness, and with slowly improving ataxia. The illness was usually long—between two and three months from the onset although in two cases it was only two to three weeks.

Two patients died: one with continuous writhing and twitching, upward deviation of the eyes, slow deterioration, and finally opisthotonos with death in the eighth week; the brain showed occasional microscopic haemorrhages and signs of neuronal degeneration. The other case showed a progressive increase of the choreiform movements, alternating with phases of quiescence, when the temperature subsided for a time, but, following mental degeneration and blindness, the illness terminated in a convulsion in the seventeenth week. Minor changes with neuronal degeneration were seen in the mid-brain and cervical cord.

Sequelae were not infrequent: only three cases left hospital apparently normal; one was unchanged and had gross tremor and ataxia, myoclonus, and eye movements more than two years later; one was abnormally restless; one was irritable and domineering; and another was attending a psychiatric clinic.

The cases of this type were very similar in description to those of subacute inclusion encephalitis, although the normal Lange curves in four cases and the subsequent course did not conform to the usual fatal result or complete disablement reported by most observers (Campbell *et al.*, 1952; Foley and Williams, 1953), and at necropsy in two cases no inclusions were found.

Contrasted with the prolonged illness and very marked disturbance of cerebral function, the pathological changes were surprisingly scanty.

Type 4. Somnolent and Lethargic Illness with Spasticity and Retardation

Illustrative Case.—B. H., a boy aged 4½. Illness began two days before admission, with abdominal pain, repeated vomiting, and large offensive stools; drowsy; temperature 101° F. (38.3° C.), but no abnormal signs. On morning of admission he was found in a state of coma, with slight muscular rigidity and bilateral extensor responses; mild meningeal signs; C.S.F. normal. If undisturbed he lay as though peacefully asleep, but he resented interference, grimacing and crying, but otherwise aphasic. The face had an "ironed-out" appearance, and, although occasionally his attention was attracted, lethargy and sleep rapidly returned. Breathing was shallow and periodic, with deep sighing; inability to swallow necessitated tube-feeding almost continuously for six weeks. State of consciousness varied;

flexibilitas cerea developed and increasing spasticity—in the arms, of "cogwheel" type. Illness complicated by hypostatic pneumonia, generalized rigidity, double incontinence, and thrombosis of the inferior vena cava, the last-named being compensated by large venous anastomoses over the abdominal wall. Slow improvement occurred, and emotional responses returned, together with ability to swallow and a decrease in spasticity. Further progress was relatively rapid, rigidity of the left side of the body being slower to recover than the right. Euphoria and emotional lability were seen for a long time and walking was ataxic. He left hospital in three months, and when seen one year later was happy but somewhat backward, and still had slight spasticity of the left arm.

Five cases of unknown aetiology showed this type of illness—an infant and four young children. Prodromal symptoms were present in all, lasting from two to three days to one week. They consisted of headache, vomiting, abdominal pain, screaming and staring, occasionally twitching or a definite fit. In addition in this group there were seven cases of measles, three of pertussis, one of acute rheumatic fever, and one of rubella.

Meningeal signs were present in nine cases and a pleocytosis up to 150 cells in eight—not always the same cases. When first seen these patients were comatose or apparently deeply asleep. The cranial nerves were often affected, squints (9), ptosis (3), facial paralysis (9), pharyngeal paralysis (7), and a mask-like face or "dead-pan" appearance (5) being seen.

The course of the disease varied in duration up to two and a half months, five cases due to the acute infections had illnesses lasting one to two weeks only. Usually the drowsiness or coma increased for a few days, then improved gradually, being followed by variable periods of stupor, aphasia, dysphagia (two cases required tube feeding for three to six weeks), wild tremor and ataxia, twitchings and occasional unilateral or bilateral fits, spasticity with extensor responses, flexibilitas cerea, irritability, screaming, salivation, and yawning. There was no sudden awakening from the lethargy such as occurred in the Type 2 cases.

There were two deaths, both in measles cases; 10 cases recovered completely; two were much improved but were mentally reduced; and one was apparently of normal intelligence but excessively noisy. One of the measles cases was backward, with infantile speech; another, who left hospital in a hopeless state and was little better a year later, when seen five years after the illness was second in his class at school, though his temper was uncertain. One pertussis patient was also left mentally retarded.

Cases with a Varied Clinical Picture not Resembling Other Types

There were 24 cases, 17 of unknown aetiology, which could not easily be placed in any of the other categories, although they showed certain similarities to them, often to more than one type. In many there were bizarre features; one child attacked another in the next bed and had alternating phases of aggression and docility; eventually he was transferred to a psychiatric ward, where he had several fits followed by stupor for three weeks. He made a complete recovery.

Three cases were thought to be associated with sensitivity reactions, sulphadimidine and "sulphatriad" probably being the responsible agents in two instances. The rashes were all urticarial and of mixed type, showing morbilliform, scarlatiniform, and petechial elements. There was sudden onset of drowsiness and slurred speech or aphasia. All had extensor responses, two were pyrexial, and initially the C.S.F. was normal in all, though later one showed a pleocytosis of 24 cells. Recovery was rapid, within two to three days, and with fading of the rash. One has a persistently abnormal E.E.G. and violent bursts of temper.

Four cases had illnesses resembling cerebellar tumour in which a variable period of dysphagia, dysarthria, disorientation, and fits preceded nystagmus, cerebellar ataxia, and

sometimes indefinite pyramidal signs. So marked were these signs that air encephalography was carried out in one case, with negative results. A diagnosis of tumour was originally suggested in many cases in the whole series, but exploration was carried out in only three other cases.

There were three cases following varicella which had a not dissimilar appearance to those just mentioned, but the diagnosis was never in doubt, and they all recovered quickly.

In two cases there was an illness progressing over five and sixteen days respectively, consisting of headache, vomiting, drowsiness, and apathy, and in one a fit, followed by a slowly developing hemiplegia. The temperature was normal and meningeal signs were absent; the C.S.F. in one case contained 22 cells, the other fluid being normal. On admission the patients were apathetic or fretful, becoming increasingly drowsy for a few days. One recovered from the hemiplegia in three weeks; the other was left with a spastic hemiplegia and an impulsive temperament. These cases were not unlike those described by Weston Hurst (1941), except that neither was fatal.

The remainder of this group were made up of two cases of measles, one of pertussis, and one of herpes simplex which could not be classified elsewhere.

The fatal case was that of a child of 3 months who was taken ill suddenly with continuous loud screaming and extreme restlessness. The temperature was only 99.3° F. (37.4° C.), and vomiting was absent. Apart from a depressed fontanelle, there were initially no abnormal signs. The screaming continued for five days, and was followed by unconsciousness and generalized spasticity. The C.S.F. was repeatedly blood-stained, was under normal pressure, and later became xanthochromic. The child lay completely unresponsive, developing nystagmus and intermittent squints and bilateral optic atrophy, apparently being blind and deaf. The limbs remained spastic, with occasional tremulous movements. The fontanelle later became tense, but otherwise the condition remained unchanged for three months, when, following a short period of continual spasms affecting the limbs, and hyperthermia, the child died. Different diagnoses had been entertained at different times, among them Schilder's encephalopathy, cerebral venous thrombosis, and cerebral sclerosis of Krabbe; but at necropsy the changes, though not gross, were compatible with haemorrhagic leuco-encephalitis.

Four other cases had sequelae, one was mentally defective and a severe epileptic, another was difficult to manage and had fits, a third had a slight hemiparesis, and a fourth was affected by sudden attacks of falling or stumbling.

The following Table shows the results according to type of case:

Type	Cases	Deaths	Complete Recovery	Survivors with Severe Disability
1	28	9 (32%)	13 (46.4%)	6 (31.6%)
2	15	1 (6.6%)	11 (73.4%)	—
3	9	2 (22.2%)	3 (33.3%)	1 (14%)
4	17	2 (11.6%)	10 (58.8%)	3 (20%)
Others	24	1 (4.1%)	18 (75%)	5 (21.7%)
Total	93	15 (16%)	55 (59%)	15 (19%)

Summary

A study of 93 cases of encephalitis is presented; 65 (12 deaths) were of unknown aetiology and 28 (3 deaths) followed definite infections.

Sequelae were encountered in 23 of the 78 survivors, an incidence of almost 29%. They were severe or disabling (fits, mental reduction, or hemiplegia) in 15 cases, or 19% of the survivors.

An attempt has been made to group many of the cases according to the type of the clinical illness, and it has been found that there appears to be no constant relationship between the clinical picture and the aetiology or pathology. The histological changes in the brain have

often been surprisingly mild and have been disproportionate to the degree of cerebral disturbance seen during life.

It is suggested that, to some extent, the severity of the illness may be assessed by observing the mode of onset, the depth and duration of unconsciousness, the frequency of convulsions, and the persistence of signs indicating focal damage of the brain.

I am indebted to Professor Sir James Spence for much help and criticism in preparing this paper, and for allowing me to use many of the cases under his care. My thanks are due also to Dr. George Davison, Dr. F. J. W. Miller, Dr. S. D. M. Court, and Dr. C. E. Cooper for inviting me to see and to use the records of their cases.

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EXTRAMEDULLARY PLASMOCYTOMA

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Plasma-cell tumours may occur in bone and in soft tissues. Multiple myeloma is the most common manifestation, and its clinical and pathological features are well known. The solitary plasmacytoma of bone and extramedullary plasma-cell tumours are less common, while the interrelationship of the three conditions is still not finally proved. This case of extramedullary plasmacytoma is recorded because of its rarity, its unusual clinical presentation, and its interest as a case for differential diagnosis.

Case History

A man aged 55, who had lived in Jamaica all his life, was admitted to the Royal Infirmary, Sheffield, in August, 1952. In March, 1950, he had noticed a swelling on the left side of his neck. The following day he had a pyrexia of 102° F. (38.9° C.), and was treated by his doctor with penicillin injections. After a week the temperature subsided, but the swelling in his neck remained. The temperature rose again for several days in May, 1950. A radiograph of his chest and a full blood count at this time revealed only a "slight anaemia." His doctor diagnosed tuberculous glands of the neck. Thereafter, at intervals of six weeks, he had pyrexia, occasionally as high as 104° F. (40° C.), which persisted for several days before subsiding. In April, 1952, a lymph-node biopsy was reported on as Hodgkin's disease.

On examination three enlarged lymph nodes were present in the left anterior triangle of the neck. The largest of the three was approximately 2 cm. in diameter. They were freely mobile and painless. Examination of the oral cavity was normal and there was no evidence of dental caries.

The nose, nasopharynx, pharynx, and larynx were examined by an otolaryngologist and pronounced normal. A complete clinical examination revealed no other abnormality.

Investigations.—X-ray examination of the chest, skull, lumbar spine, long bones, and accessory air sinuses revealed nothing abnormal. The Wassermann and Kahn reactions were negative. Agglutination reactions: *Brucella abortus* and *Brucella melitensis* less than 1/10. The urine was examined on many occasions: albumin was constantly present, but tests for Bence Jones proteose were repeatedly negative. Plasma protein: serum protein, 8.3 g. per 100 ml. (albumin 4 g., globulin 4.3 g.). Haematology: haemoglobin, 82%; red cells, 4,000,000; leucocytes, 7,000 (band cells 3%, lymphocytes 24%, polymorphs 64%, monocytes 6%, eosinophils 3%). The white-cell morphology appeared to be within normal limits. Platelets 620,000 per c.mm. (Lempert). Bone marrow (left ilium): The abnormal features included the presence of some macronormoblasts and an occasional megaloid cell. Abnormal nests of plasmocytes and their precursors were seen—in all, 5.6% of 500 cells. There was megakaryocytic hyperplasia.

Biopsy of the cervical lymph node on August 29 was reported on by Professor Willis as follows: "The extremely heavy infiltration of this lymph node by plasma cells is, I think, rather more than might be accounted for by any inflammatory disease, and my diagnosis is plasmacytoma. Whether this may be due to a primary growth in the upper respiratory passages or to skeletal myelomatosis can only be decided by other investigations, especially x-ray studies of the bone. The high plasma protein level favours myelomatosis. Bence Jones proteosuria should be carefully watched for."

The patient's general condition remained good and no further pyrexia occurred. As the radiological examination of the bones, the clinical state of the patient, and the other investigations were against a diagnosis of multiple myeloma, the lesion in the neck was treated with x-irradiation as a case of primary extramedullary plasmacytoma. Satisfactory regression of the remaining enlarged glands took place.

Since his return to Jamaica he has remained in good health. No Bence Jones proteosuria has been demonstrated. Radiological findings (skull, thorax, vertebral column, pelvis, long bones of upper and lower extremities) were normal in May, 1953.

Discussion

Solitary plasmacytoma is an established clinical condition. Although any part of the skeleton may be the site of such a lesion there appears to be a special predilection for the innominate bone and the long bones of the lower limbs. Amongst recorded cases are those of Rogers (1930), Chesterman (1936, 1948), Leedham-Green *et al.* (1938), Willis (1941), and Lumb (1948).

Willis (1941) considers that in order to establish a diagnosis of solitary plasmacytoma the following criteria must be fulfilled: microscopical proof that the tumour is of plasma-cell nature; exclusion of the possibility that the lesion is the first evidence of generalized myelomatosis; there must be radiological proof that no skeletal lesions are present, both at the time of examination and at subsequent examinations at repeated intervals; and Bence Jones proteosuria shall be absent on repeated examinations.

The validity of this last criterion is questioned by Lumb (1948), who found Bence Jones proteose in the urine of a case proved at necropsy to be one of solitary plasmacytoma of the sacrum. He concludes that the proteosuria is consequent on actual tumour volume—namely, the amount of bone-marrow involvement.

Plasmacytomas of soft tissue are much less often encountered. Hellwig (1943) found 127 published cases in the literature reviewed between 1905 and 1942, to which he added a case of his own. The lesions in most cases are situated in the upper air passages, especially the nasopharynx, maxillary antrum, and oral cavity. Cases have

also occurred in the conjunctivae, while odd sites recorded include the testis and uterus (Andersen, 1949) and pancreas (Hefferman, 1947).

The occurrence of extramedullary plasmacytoma in cervical lymph nodes unassociated with other lesions is referred to by Hellwig (1943) and by Andersen (1949). Andersen quotes a personal case, occurring in a submaxillary lymph node. Hellwig was able to find four cases, of which three subsequently developed lesions elsewhere. McNamara and Rogers (1943) recorded a case of extramedullary plasma-cell tumour of a tonsil with metastasis in a cervical lymph node, the interval between the removal of the primary lesion and the appearance of the metastasis being six years. In our case the lesion appears to be localized to a group of glands. A gland had previously been removed for biopsy elsewhere, and at the more recent biopsy a further complete gland was removed.

The possibility of a metastasis from a primary growth in the nasopharynx, antra, tonsils, etc., was considered. Radiological examination of the antra was negative, as was a complete clinical examination by an oto-laryngologist.

The late development of multiple myeloma in some cases of solitary plasmacytoma has led to certain conjectures regarding the pathogenesis of the two conditions. Some thought that the multiple lesions were due to a form of metastasis (Cutler *et al.*, 1936). Geschickter and Copeland (1928) found myeloma cells in marrow blood vessels, interpreting this finding as evidence of that possibility. Other authors, however, consider that the disease is multifocal in origin. The various forms of the disease, they say, should not be regarded as separate entities but as different manifestations of the same process (Lumb and Prosser, 1948; Lumb, 1948; Snapper, 1949). If this theory be accepted a solitary plasmacytoma must be regarded as a single focus of disease, which more usually presents in a multifocal form (Lumb, 1948). It is suggested by Willis, however, that as a plasmacytoma of the bone may remain solitary for years, and that, as a generalization, when it occurs it usually does so early, it is more probable that there are two separate types of the disease. He is of the opinion that "if thorough radiographic examination one year from the date of tentative diagnosis is unequivocally negative and proteosuria has been regularly absent, it is improbable that signs of generalized myelomatosis will appear later, and the tumour may be diagnosed with reasonable certainty as a solitary one."

Many cases of extra osseous deposits occurring in multiple myeloma have been recorded (Churg and Gordon, 1950; Hayes *et al.*, 1952). Any organ may be so implicated, but most commonly those of the extraosseous haemopoietic system—namely, spleen, lymph nodes, and liver. Churg and Gordon state that in their experience the more lymph nodes taken for section the more commonly is myelomatous infiltration found. The retroperitoneal nodes are involved most commonly, the hilar glands less frequently, superficial adenopathy being rare. In our case multiple myeloma was regarded as probably eliminated in view of the negative radiological findings and the absence of Bence Jones proteose. The marrow pictures were equivocal.

The history of attacks of high pyrexia was difficult to associate with a diagnosis of solitary or multiple myeloma. No abnormal pyrexia was noted during the patient's stay in hospital. Bailey and Haines (1951) found fever significant in only 1 to 3% of cases of multiple myeloma, and seldom was the temperature in excess of 100° F. (37.2° C.). Unfortunately, it was not possible to obtain the sections of the lymph-node biopsy reported on as Hodgkin's disease in April, 1952. The histological picture of Hodgkin's disease may be simulated by various kinds of chronic lymphadenitis, notably brucellosis, glandular fever, and torulosis. In view of the febrile history, it is possible that this biopsy may have shown a picture different from the latter one. Agglutination tests for brucellosis were negative.

The fact that albuminuria was present but Bence Jones proteose absent calls for cautious comment. Magnus-Levy (1932) (quoted by Bailey and Haines, 1951) thought that

where these findings occurred the albuminuria was largely due to the Bence Jones fraction and that negative reports of its absence were erroneous. In Bailey and Haines's series of cases, 29 out of 32 patients suffering from multiple myeloma had albuminuria. This was equal to 90% of their cases, and was the most frequently observed positive laboratory investigation in their series.

More than a year has elapsed since the first biopsy was made in our case, and in view of the normal findings on recent radiological examination it is most likely that the lesion was a primary extramedullary plasmacytoma. Diffuse plasma-cell myelomatosis with little or no radiographic evidence of bone lesions does occur, and this is still a possibility in view of the equivocality of the marrow picture. The continued absence of Bence Jones proteosuria is, however, a strong point in favour of the former diagnosis.

Summary

A case of extramedullary plasmacytoma is reported. The differential diagnosis, the interrelationship of the three main types of plasma-cell tumours, and the significance of the main findings are discussed.

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The Tobacco Industry Research Committee in the U.S.A. has invited university, hospital, and other medical research organizations to submit proposals for specific cancer research projects for consideration by the committee's scientific advisory board. The board is said to be now reviewing 60 applications and inquiries already received. An initial fund of \$500,000 has been appropriated for research. The Tobacco Industry Research Committee is composed of the large cigarette-manufacturers, tobacco-growers, and warehousemen. The scientific advisory board is guiding the development of long-term research to be conducted in institutions outside the tobacco industry. The industry will not set up any research facilities. No industry funds will be given to tobacco company laboratories. All projects will be in addition to research carried on by companies. The members of the advisory board are: Dr. CLARENCE C. LITTLE, director of the Roscoe B. Jackson Laboratory; Professor MCKEEN CATTELL, head of the department of pharmacology at Cornell University Medical College; Dr. LEON JACOBSON, professor of medicine at the University of Chicago; Dr. PAUL KOTIN, assistant professor of pathology at the University of Southern California Medical School; Dr. KENNETH LYNCH, professor of pathology at the Medical College of South Carolina; Dr. STANLEY P. REIMANN, scientific director of the Institute for Cancer Research, Philadelphia; and Dr. WILLIAM F. RIENHOFF, Jr., associate professor of surgery at the Johns Hopkins School of Medicine, Baltimore.

ISONIAZID AND WEIGHT GAIN

A PILOT INVESTIGATION

BY

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In groups of patients with pulmonary tuberculosis treated with isoniazid a remarkable gain in weight has been one of the principal effects reported (Medical Research Council, 1952, 1953). Compared with other treatments, weight gain has been so marked as to lead to a suspicion that a non-specific effect on metabolism was involved as well as a direct effect on the disease. There have also been reports of a great increase in appetite, undue sleepiness or wakefulness, and alterations in emotional tone, although none of these has been so frequent as the gain in weight. In order to determine whether it was worth while undertaking detailed metabolic investigations or a large-scale trial in normal subjects it was decided to carry out a controlled pilot trial on a small scale.

Methods

The subjects were eight male medical members of this department aged between 25 and 40. None had had tuberculosis, and in all a normal radiograph of the chest was obtained immediately before the start of the trial. They were divided by random allocation into a treatment group and a control group, each of four subjects. No subject knew to which group he had been allotted. The total period of the trial was fourteen weeks, including an initial observation period of two weeks before administration of any drugs and a final two-weeks period after administration had stopped. The control group received capsules containing lactose, and the treatment group was given isoniazid 100 mg. twice a day in identical capsules. The control group received lactose for the whole ten weeks. During the ten weeks of administration the treatment group received isoniazid for eight weeks and lactose for two weeks. By this plan each subject given isoniazid had control periods on lactose and on observation alone. In addition the whole treated group was compared with a control group, randomly selected, which received only lactose.

The subjects were weighed weekly to the nearest quarter-pound (0.1 kg.). In order to avoid suggestion or alteration in food intake they were weighed with their backs to the scale and were not informed of the readings. At the end of every week's treatment each subject filled in a questionnaire recording his impressions with regard to appetite, sleep, emotional tone, or any other possible effects of the drug.

Results

The weight changes are given in the Table. The individual gains or losses of weight over the two-weeks initial and two-weeks final observation periods are listed for both treatment and control groups. For the control group the weight change over the ten weeks on lactose is recorded, but for the treated group the changes during the two weeks on lactose and the eight weeks on isoniazid are given separately. The average weight change per man per week is calculated for each period. It will be seen that the average weight gain per man per week when the treated subjects were on isoniazid was 0.13 lb. (59 g.), compared with 0.12 lb. (54 g.) when on lactose and 0.53 lb. (240 g.)

Weight Changes in Normal Males Given Isoniazid and in a Control Group

Subject	Loss or Gain in Weight (lb.)				Net Change in 4 Weeks
	2 Weeks' Initial Observation	2 Weeks on Lactose	8 Weeks on Isoniazid	2 Weeks' Final Observation	
Treatment group:					
T1	+1	-1	-3	+1	1
T2	+1	+1	+3	-2	+4
T3	+1	+1	+4	-1	+4
T4	0	-1	-1	-1	-2
Total	+4	+1	+4	-1	+7
Average weight change per man per week (lb.)	+0.53	+0.12	+0.13	-0.17	+0.14
Control group:		10 Weeks on Lactose			
C1	-1	-1	-1	+5	+4
C2	-1	-1	-1	+1	+4
C3	+2	+1	+1	-1	+1
C4	+1	+1	+1	0	+2
Total	+1	+10	+1	+2	+14
Average weight change per man per week (lb.)	+0.22	+0.25	+0.36	+0.25	

* This subject stopped isoniazid after 64 weeks because of Raynaud's phenomenon. The next weighing was at 7 weeks, so he is included in the calculations as if he had had 7 weeks' isoniazid and 3 weeks' subsequent observation.

† Weight for final observation week not recorded; calculations based on a single final observation week and 13 weeks' total observation.

during the initial two-weeks observation period when no drug was administered. An average loss of 0.17 lb. (77 g.) occurred during the final two-weeks observation period, suggesting that there was no delayed effect of isoniazid in increasing weight. The control group averaged 0.25 lb. (110 g.) gain per man per week when on lactose and 0.22 (100 g.) and 0.36 lb. (160 g.) during the initial and final observation periods. The individual fluctuations in the two groups do not suggest that there was any difference between them attributable to the drug. It will be noted that both groups on average gained weight. This may be because the trial was started in January and continued to the early spring, or possibly because the trial itself had some psychological effect.

Appetite.—Of the four subjects in the control group, two noted no change; the other two recorded fluctuations at varying periods. In the treatment group, only one recorded an unchanged appetite; fluctuations occurred in the other three, but without any consistent pattern which suggested an effect of the drug.

Sleep.—In the control group two observed no change, whereas two recorded variations in their sleep requirements from week to week. They were the same subjects who had shown some variations in their appetite. In the treatment group three recorded no change, but the fourth said that he was definitely more sleepy in the evenings during the last three weeks of the course, and during the last two weeks had been having more frequent nightmares. It is, to say the least, doubtful whether these changes should be attributed to isoniazid.

Emotional Tone.—One of the control group stated that he had become more cheerful, but in the treatment group no changes were recorded.

Other Possible Side-effects.—The only other effect which might be of significance was an experience of one subject to whom isoniazid was being administered. After four and a half weeks of continuous isoniazid treatment he experienced Raynaud's phenomenon in both hands, with stiffness, blanching, and coldness. This became steadily worse during the ensuing two weeks, and the drug was stopped. There was steady improvement thereafter. This subject had never experienced Raynaud's phenomenon before, but its relation to isoniazid must remain in doubt.

Discussion

The results of this study in man, although its scale was limited, are consistent with experiments in animals. Normal rats treated with isoniazid showed no significant gain in weight (Benson *et al.*, 1952; Rubin *et al.*, 1952), and in dogs there was no change in metabolic rate (Rubin and Burke, 1953). In man, Faloon (1953) found no change in nitrogen balance, appetite, or food intake in three patients with non-tuberculous disease given isoniazid for six to eight days. The observations here presented provide no evidence that isoniazid has any effect in causing gain in weight in the normal human male. In view of the negative results, we do not contemplate engaging in a trial on a larger scale. It seems doubtful whether the minor side-effects noted above were attributable to isoniazid.

Summary

The average weekly weight gain in four healthy males receiving isoniazid for eight weeks was similar to the gain in the same group treated for two weeks with control capsules containing lactose and to the gain during four weeks on observation alone. The average weekly gain was less than that of a similar group of four males treated for 10 weeks with control capsules containing lactose. We have therefore obtained no evidence to suggest that isoniazid in tuberculous patients has an effect on weight gain other than that due to its effect on the disease. No side-effects were recorded which could be attributed with certainty to isoniazid. One member of the treated group became unduly sleepy; another experienced Raynaud's phenomenon for the first time. One of the control group experienced an unexpected increase in cheerfulness, but no change in emotional tone was recorded by any member of the treated group.

We are most grateful to our colleagues who cheerfully put up with the inconveniences of the trial. We also record our gratitude to Messrs. E. R. Squibb and Sons for a generous gift of the isoniazid and control capsules. This investigation is one of a series supported by a grant from the Royal Victoria Hospital Tuberculosis Trust.

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The annual report of the Fountain Hospital, the 600-bedded hospital at Tooting Grove for mentally defective children from London and Surrey, draws attention to Section 3 of the Mental Deficiency Act, which allows a child to be placed in hospital by the parents without the need of a magistrate's order. Of the 84 certified direct admissions to the Fountain Hospital during 1953, over 80% were admitted under this procedure. The admission of young children without any legal formalities, the report continues, would go a long way towards improving the public's attitude to mental deficiency in young children. Indeed, a plea is made that this should be tried out experimentally. "If the Fountain Hospital, owing to its special circumstances, could be exempted for a temporary period from the normal working of the Mental Deficiency Acts experience would be gained in the voluntary care of defective children, comparable to that made possible by the Mental Treatment Act of 1930. This evidence might be of considerable value to the Royal Commission inquiring into the certification and detention of mental patients."

BLOOD GROUPS
AND GYNAECOLOGICAL CANCER

BY

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AND

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Stocks showed in 1950 that the standardized mortality of cancer of the stomach tended to be greater in northern than in southern towns in England. He assumed this to be connected with the fact that gastric cancer depends on an irritant. In an attempt to explain the variations in mortality, Aird, Bentall, and Roberts (1953) demonstrated that the frequency of blood group A was greater in patients suffering from gastric cancer than in the general population of the same locality. They collected their series from a number of hospitals in England and Scotland, using as controls an equal number of patients chosen at random from the same hospital or, where this was difficult, estimating an equal control number from the blood-group frequencies in large numbers of the local population. In most cases diagnosis was confirmed by a histological report; in only a few cases were the authors dependent on radiological findings or on the clinical picture alone.

Table I shows the results of Aird, Bentall, and Roberts. It indicates that in different parts of England and Scotland the frequency of blood group A was

TABLE I

	Cancer Cases				Controls			
	O	A	B	AB	O	A	B	AB
Newcastle (101 cases)	43.6	43.6	11.9	1.0	52.5	37.4	7.6	2.5
Leeds (217 cases)	42.4	47.9	7.4	2.3	46.5	40.3	7.1	6.2
Manchester (771 cases)	44.7	44.5	6.4	3.8	52.1	38.4	7.0	2.5
Liverpool (217 ca. es)	39.2	44.7	12.4	3.7	49.7	39.6	7.8	2.7
Birmingham (100 cases)	37.0	57.0	3.0	3.0	49.6	44.4	3.0	3.0
Total of Northern England (1,406 cases)	42.9	46.4	7.6	3.1	50.7	39.3	6.8	3.2
London (1,340 cases)	43.1	46.0	7.9	2.9	45.8	42.2	8.9	3.1
Scotland (478 cases)	51.2	36.4	9.6	2.7	52.6	32.5	11.7	3.1
Overall figures (3,632 cases)	44.5	44.8	7.8	2.9	48.6	39.8	8.3	3.2

greater and that of blood group O correspondingly less in patients with cancer of the stomach than in the general population.

Our Own Investigations

It seemed of interest to make a corresponding study of the distribution of the blood groups in patients suffering from gynaecological cancer. Our series consists of 300 patients with uterine or other gynaecological cancer whose blood groups had been determined; they were treated at the Women's Clinic of the University of Helsinki during the period 1948–53. Diagnosis was confirmed in all cases by a histological report. Owing to the centralization of hospital conditions in Finland, the majority of all cases of gynaecological carcinoma, both operative cases and those given radiation, are treated at the Women's Clinic in Helsinki. This being so, the patients no doubt represent a cross-section of the population as regards distribution of blood groups. The control series was therefore selected on a similar basis.

All such acute cases of gynaecological disease as are predominantly from Helsinki or its immediate vicinity—for example, abortions and extrauterine pregnancies—were excluded. We also used for control purposes the data published by Streng and Ryti (1927) regarding blood-group distribution in the general population of Finland.

Table II compares our results with the data obtained by Streng and Ryti.

TABLE II

	Gynaecological Cancer				Controls			
	O	A	B	AB	O	A	B	AB
Krokfors and Kinnunen	113 37.7%	110 36.7%	57 19%	20 6.7%	98 31.6%	139 44.8%	48 15.5%	25 8.1%
Streng and Ryti					33.5%	42.7%	16.8%	7.0%

Comparison of the control data in Tables I and II shows, first, that the frequency of blood group O is considerably less and that of groups B and AB correspondingly greater in the general population of Finland than in that of England and Scotland. Group A is about equally frequent in both countries. But when we compare the distribution of blood groups in our carcinoma patients and in our controls we find that blood group O seems to predominate clearly in the cancer group, blood group A having a correspondingly lower frequency.

We subclassified our cancer group into cancer of the uterus and other gynaecological cancer, and this seemed to cause no appreciable changes in the distribution of the blood groups (Table III).

TABLE III

	O	A	B	AB
Cancer of the uterus	37.9%	37.1%	18.5%	6.5%
Other gynaecological cancer	36.5%	36.5%	20.0%	7.0%

It occurred to us that there might be a correlation between the blood group and the age of the patient at the onset of gynaecological cancer. We therefore studied separately 100 patients, the youngest in the series. Their upper age limit was 45 years. The blood groups were as follows: O, 42%; A, 33%; B, 17%; and AB, 8%. The relatively greater frequency of blood group O thus seemed to increase further when this subdivision was made.

Conclusion

On the basis of our own studies we can only state briefly that, in contrast to the English series of cancer of the stomach, a Finnish series of gynaecological cancer showed a clearly lower frequency of blood group A than the corresponding controls. It seemed, on the contrary, that the incidence of blood group O was particularly high in our series of gynaecological cancer; this appeared most distinctly in the youngest patients studied.

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From May 16 margarine must contain between 760 and 940 international units of vitamin A per ounce and between 80 and 100 international units of vitamin D per ounce. This vitamin-A content is roughly equivalent to that of butter. This Order applies to all home-produced and imported margarine sold by retail, including margarine sold as such by a caterer but not margarine used by him in made-up foods or in cooking. It does not apply to sales of margarine to a caterer.

Medical Memoranda

Extreme Sensitivity to Insulin

Since its introduction by Sakel in 1935, treatment by insulin has been widely used in various forms of mental illness. Considerable variations have been experienced in the reaction of patients to insulin, and it is generally agreed that there is marked individual sensitivity to the drug (Tennent, 1944). Success in the induction of coma has been reported with doses of 15 units (James *et al.*, 1938) and of 18 units (Parfitt, 1937). A case is described in which coma was induced with a dose of 2 units, and a method of desensitization is given. I have been unable to trace any record in the literature of coma being induced with such a small amount of insulin.

CASE REPORT

An unmarried woman aged 19 suffering from anorexia nervosa was referred to Fulbourn Hospital, Cambridge, for a course of modified insulin on July 20, 1953. Her weight at this time was 5 st. 7½ lb. (35 kg.).

The initial dose (see Table I) was 15 units, given intramuscularly at 7.15 a.m. At 9.30 a.m. she was in sopor and showed loss of a normal response to speech and

TABLE I

Days	Units of Insulin Given at 7.15 a.m.	Time of Sopor	Time of Coma
1	15	9.30 a.m.	10.5 a.m.
2	10	9.50 "	10.0 "
3	1	No reaction	No reaction
4	3	10.15 a.m.	10.25 a.m.
5	Sterile water	No reaction	No reaction
6	2	10.0 a.m.	10.30 a.m.

impairment of orientation. At 10.5 a.m. she was in coma: she showed loss of all purposive responses, none being elicited from visual, auditory, or tactile stimuli. The next day the dose was reduced to 10 units, and sopor was produced at 9.50 a.m. and coma at 10 a.m. Because of this marked sensitivity, the following morning she received only 1 unit. This produced no effect. The next day the amount of insulin was raised to 3 units, and sopor came on at 10.15 a.m. and coma at 10.25 a.m.

To ensure that it was in fact the insulin which was causing these reactions, on the succeeding morning an intramuscular injection of sterile water was given at 7.15 a.m., but this had no effect whatever on the patient. At the same time a specimen of blood was taken in order to ascertain the fasting blood sugar. This was 0.72 g. per 100 ml. The next morning 2 units of insulin was given, and this time sopor was induced at 10 a.m. and coma at 10.30 a.m.

It was decided to attempt to desensitize the patient by starting at a dose of 0.2 unit and increasing this by 0.2 unit daily. This proved successful, and by December 18 she was having 17 units daily, which was enough to induce drowsiness but not to produce sopor or coma. Her weight was then 6 st. 2 lb. (39 kg.).

COMMENT

It is known that insulin hypersensitivity is present in clinical cases of hypopituitarism—for example, Simmonds's disease (Wright, 1952). As the physical picture of this disease may closely resemble the classical "anorexia nervosa" and as there may be a secondary disturbance of pituitary function in the later and more severe stages of anorexia nervosa, the patient was investigated to discover if any pituitary dysfunction was present. The following factors were in favour of anorexia nervosa: she was a young unmarried woman of a neurotic obsessional personality, there was no loss of hair, and, in spite of emaciation, restless overactivity was very obvious.

Fraser and Smith (1941) have sought to differentiate between organic pan-hypopituitarism and "functional" anorexia nervosa by estimation of 17-ketosteroids and an insulin-tolerance test. In the organic disorder they found

extremely low or no excretion of 17-ketosteroids, and after injection of insulin under controlled conditions delay of blood sugar in returning to normal. The 17-ketosteroid output was often low in anorexia nervosa, but in no case entirely absent. Although neither test is specific, they believe that the combination of both enables a diagnosis of pan-hypopituitarism to be made with fair accuracy (Hemphill, 1944). In the above case the 17-ketosteroid excretion was 5.8 mg. a day (normal range, 4–20 mg. a day). The insulin-tolerance test showed no delay in the return of the blood sugar to normal after 120 minutes (see Table II). It would therefore seem that the pituitary was functioning normally.

TABLE II.—Insulin-tolerance Test (0.3 Unit per kg. Body Weight Given Intravenously at 7.15 a.m.)

Blood Taken	Result (g./100 ml.)
Before insulin given	0.077
20 minutes after giving insulin	0.056
30 "	0.047
45 "	0.059
60 "	0.057
90 "	0.065
120 "	0.077

I would like to thank Dr. D. H. Clark, medical superintendent of Fulbourn Hospital, for his valuable criticism of this report.

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Poliomyelitis in Mother and Child in Trieste

In recent years we have begun to recognize that poliomyelitis in infancy is not a rare occurrence. Reports by earlier observers, including Mouton, Smillie, and Bowers (1950), have stressed the rarity of infection in young children, but in recent reports such as that of Logan (1952) a different story is told. He records that in the outbreak in England and Wales of 1950 there were, for example, 82 reported cases in children under 6 months of age.

Infection in the neonatal period, however, although well known, is an event of some interest. Thus there are reports of five cases in 1950 in England and Wales in such an age group, of which four were fatal. In 1952 an outbreak occurred in a private nursing-home (Sims-Roberts and Thomson, 1953), and of the four babies affected three died. Wright and Owen (1952) record a further case of neonatal infection in which both mother and child died of the disease. This therefore brings the total of neonatal cases in England and Wales in 1952 to five, with four fatalities. Obviously the incidence is much greater than these figures would suggest, as subclinical and non-paralytic cases are more common than paralytic and more difficult to detect in the very young child. Indeed, it is usually the onset of paralysis which is the first indication that infection has taken place, and the pre-paralytic stages are very often silent. Thus in two outbreaks in England in 1950 and 1952 affecting many thousands of people there are reports of only 10 neonatal cases, of which 8 were fatal.

In Trieste there is an Italian-Slav population of approximately 300,000, and a British military population of 5,500, including troops and families. Only 14 cases of clinical poliomyelitis were reported here last year, and in the British military population only two. These two cases were in a mother and her newborn child, and are of interest because of the rarity of such an event, considering the total number of cases involved. No cases have been recorded by the American forces in Trieste.

Neonatal infection is rare and often fatal, but for some obscure reason infection in both mother and young child seems to be even less frequent. In Logan's figures for 1950 there were, according to Geffen and Tracy (1953), only six instances of infection in mother and child, and of these

only two of the babies were in the neonatal period when affected. The ages of the other children in whom there was this "mother-child" infection varied from 9 to 17 weeks.

Thus in 1950 there were only two cases in which clinical or subclinical poliomyelitis was recognized in both mother and newborn child. In 1952 only one case was recorded—that of Wright and Owen, in which both mother and child were affected—although in one case reported from the nursing-home outbreak poliomyelitis virus type III was isolated from the stools of one healthy mother. There are examples of only three cases of double infection in these two years, and it is of note that in all three cases the mother died, and in two the child died also. The remaining child was said to have suffered from a severe attack of the disease. The following cases are therefore of interest in that they record the occurrence of a "mother-child" infection in a very small poliomyelitis outbreak affecting a British population overseas. Further, both mother and child have survived and at the time of writing this report were improving.

CASE HISTORIES

1. The wife of a British Army sergeant was admitted to the B.M.H., Trieste, on September 13, 1953. Thirteen days previously she had been delivered of a healthy female infant in the same institution. When seen on September 12 she had complained of two days' headache and fever, and on the morning of admission she noticed weakness of both legs and inability to pass urine. On examination she was pyrexial, temperature 103° F. (39.4° C.), and there were signs of complete flaccid paralysis of the lower limbs without sensory changes, together with bladder and bowel paresis. Lumbar puncture on September 14 showed 234 cells per c.mm., 87% of which were polymorphs; and 75 mg. of protein per 100 ml.

2. The daughter of the above patient was admitted at the same time as her mother and isolated from her. She was then 13 days old, and it was noted that her rectal temperature was 101° F. (38.3° C.). One day later the child was still pyrexial, and suddenly developed a complete and flaccid paralysis of the right arm with minimal involvement of the muscles of the left shoulder girdle also. The general hypotonicity and drowsiness of the child were significant features during and immediately after the development of paralysis. These characteristics have been stressed by Shelokov and Weinstein (1951), the classical signs and symptoms of poliomyelitis in its early stages often being absent at this age. Lumbar puncture on September 16 showed 69 cells per c.mm. (17% polymorphs, 72% lymphocytes), and 110 mg. of protein per 100 ml.

After four weeks' observation both of these patients were transferred to another centre for further treatment. At this time their clinical condition had improved and some movement was beginning to return in the lower limbs of the mother.

SUMMARY AND CONCLUSION

Two cases of poliomyelitis are reported in the Army population in Trieste, where a very small outbreak occurred. These two cases consisted of a mother and her 13-days-old child, both of whom sustained paralysis and had typical cerebrospinal fluid.

The reported combination of clinical infection in mother and newborn child is rare, and that of poliomyelitis in the neonatal period is also of sufficient rarity to record.

Both of these patients have survived, which is of interest in that poliomyelitis in the neonatal period is often fatal to the infant and, indeed, to the mother when affected.

My thanks are due to Lieutenant-Colonel R. H. Hunt for permission to publish these cases.

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Reviews

THE SCIENCE OF PATHOLOGY

Lectures on General Pathology. Edited by Sir Howard Florey, M.D., F.R.C.P., F.R.S. (Pp. 733; 343 illustrations and 4 coloured plates. 63s.) London: Lloyd-Luke (Medical Books) Ltd. 1954.

This volume, edited by Sir Howard Florey, is a collection of 37 lectures delivered at the Sir William Dunn School of Pathology, University of Oxford. They form part of a 16-weeks course in general pathology taken by students who have spent the previous year reading Honour School of Physiology and are about to begin their clinical training. Each lecture occupies between 10 and 20 pages of text and there are 10 contributors. The volume is profusely illustrated by original photomicrographs, many of which are taken from the published research work of the authors.

The editor is responsible for 10 lectures; Professor G. R. Cameron, of University College, London, for four and part of another, and Dr. G. P. Gladstone, the University Reader in Bacteriology, for five and part of three others. Each contributor deals with subjects in which he has a special interest. Dr. A. H. T. Robb-Smith, the Nuffield Reader in Pathology, discusses collagen; Dr. R. G. Macfarlane, the University Lecturer in Haematology, the reaction of the blood and blood-forming organs to injury; and Dr. F. K. Saunders, a member of the external staff of the Medical Research Council, the cellular and tissue reactions to viruses. Equally fundamental problems are reviewed in the form of reported lectures given as part of the course by Drs. E. P. Abraham and W. E. van Heyningen, who are senior research officers, and Drs. K. B. Roberts and H. Harris, who are scholars in the Sir William Dunn School. It is quite clear from the high standard of these lectures that the Oxford medical undergraduate is given an exceptionally good opportunity in the seclusion of his University to get a firm grasp of the general principles of pathology before he enters the strange and confusing atmosphere of his hospital.

It is surprising that British pathologists have been so reluctant to provide the serious student with a full and authoritative account of the general principles of pathology. This may be partly responsible for the fact that the educational value placed upon this subject shows such wide variations from one university to another, yet no one would deny that general pathology ranks as an experimental science in its own right and deals with a branch of biological knowledge which is an essential prerequisite for the proper understanding of clinical subjects. It is certainly difficult to teach general pathology during the clinical years, for there are too many legitimate distractions in the clinical atmosphere for teacher as well as student. This, however, does not account for the wide variation in the scope and quality of its teaching. The fact is that this fundamental science is in great danger of becoming eclipsed by the enormous accumulations of knowledge which deal with the practical application of its principles to clinical diagnosis, and it is to be hoped that Sir Howard Florey's book will check this ominous threat to one of the most basic of the medical sciences.

The last British treatise confined to general pathology and written by a panel of experts was published in 1913 under the editorship of M. S. Pembrey and James Ritchie. It was greatly treasured by a former generation of pathologists, but is now outmoded and out of print. It is therefore most gratifying to find, after a gap of 40 years, that Pembrey and Ritchie now has, in this product of the Oxford school, a modern equivalent and a worthy successor which preaches the same sound doctrine and is based upon the deep conviction that "the student must try to grasp what is known of the general principles underlying the pathological changes that he will be called upon to diagnose and treat."

As one might have predicted before reading the book, the editor is a strong and convincing advocate for the use

of the experimental method, not only in pathology but with greater force in its clinical applications. He expresses the hope that "some students will find sufficient stimulus from the lectures to carry an experimental outlook into clinical medicine and surgery, for these subjects have suffered and continue to suffer in this country from an approach which pays too little attention to experimental science. At the present day nearly all significant advances in diagnosis, treatment, and prevention of disease depend upon the application of experimental methods."

For the most part the lectures deal with the various aspects of the "reaction to injury," using this word in its widest connotation. Inflammation, phagocytosis, haemostasis, fever, the tissue reaction to infective agents and to injuries inflicted by irradiation occupy over 40% of the text, while the general principles of immunity, the pathogenesis and virulence of micro-organisms, anaphylaxis, and specific hypersensitivity take up another 30%. Shock, haemorrhage, and oedema absorb 6%; healing and regeneration about 12%.

In a book devoting nine-tenths of its text to the reaction to injury it may be regarded as an unfortunate omission that the profound general metabolic response to injury receives so little consideration; but any criticism based on omission carries little weight, as the book was not planned to cover the whole subject, and in full compensation for its incompleteness it has two outstanding merits: first, that every lecture covers its subject in a commendably comprehensive manner which would be impossible in a textbook; second, that in almost all the lectures the author is dealing with a subject to the experimental study of which he has devoted a part of his life. One therefore finds, in dealing with such subjects as the participation of the lymphatics in inflammation, the secretion of mucus and inflammation in mucous membranes, blood coagulation and haemostasis, shock, regeneration, and the pathogenic action of bacteria, that the lectures have the indelible stamp of authority and are far more satisfying and infinitely more stimulating than the chapters of the average textbook. Almost every lecture is a model of the way in which scientific evidence should be handled and evaluated.

The inclusion of such general subjects as the pathology of growth and tumour formation, the functional failure of vital organs, the consequences of arterial ischaemia, and a number of other similar topics would have increased the bulk of the volume to unwieldy proportions. Having successfully but only partially filled so large a gap in British pathological literature, Sir Howard Florey and his colleagues, it is to be hoped, will regard it as a public duty to publish another volume of lectures—and the sooner the better.

GEOFFREY HADFIELD.

ADVANCES IN PAEDIATRICS

Advances in Pediatrics. Edited by S. Z. Levine. Associate Editors: John A. Anderson, Margaret Dann, L. Emmett, jun., A. Ashley Weech, Myron E. Wegman. Volume 6. (Pp. 323; illustrated. 58s.) Chicago: The Year Book Publishers Inc. London: Interscience Publishers Ltd. 1953.

This book, comprising seven monographs by recognized authorities, is well up to the high standard set by previous volumes in the series. Each article presents an up-to-date review of the subject and ends with a valuable list of references. Neonatal problems are very much to the fore at present, and this is reflected in the four monographs on, respectively, preventive prenatal paediatrics, intestinal obstruction in the neonatal period, haemolytic disease of the newborn, and pulmonary pathology in the newborn. Of these, perhaps the most stimulating is the first, by T. H. Ingalls, because he indicates the methods to be adopted if fresh light is to be thrown on the subject. As he points out, each approach—clinical, experimental, and epidemiological—presents its own difficulties, and the author's pen-picture of the clinician's feeling of frustration is worth quoting: "The nearly insurmountable obstacle to clinical study of prenatal sickness arises in the fact that the patient voices no complaint, remembers nothing about

his illness, hides himself from view, and puts off his visit to the doctor until the last possible moment."

S. van Crefeld's monograph on the lipoidoses is an excellent survey of a difficult subject; and the chapter by H. W. Dargeon on lymphosarcoma in childhood will be welcomed not only for its detailed information about a relatively uncommon growth but because the prognosis is viewed somewhat more hopefully than in the past.

The final monograph—on megaloblastic anaemia of infancy—is a comprehensive review of some 55 pages and with 122 references. The authors (W. W. Zuelzer and J. Rutzky) cover all aspects of this curious disorder and discuss their own cases in some detail. Prevention and treatment are carefully considered, and, as might be expected, the paper is a happy combination of the experimental and clinical viewpoints.

Each new volume of *Advances in Pediatrics* adds emphasis to the wisdom of having this series available in medical libraries.

NORMAN B. CAPON.

MYOCARDIAL CONTRACTION

On the Nature of the Myocardial Contraction: A Study of the Electrolytes. By F. Lenzi and A. Caniggia. Preface by Professor G. Izar. (Pp. 112; 19 figures. No price.) Basle and New York: S. Karger. 1953.

This little book describes the clinical application of the work of one of the authors on the electrolytes in the heart. The English is good and the book is most readable; even if the technical nature of the subject sometimes makes the expression rather hard to follow, there is really no great difficulty, for clarity and brevity are qualities to be found throughout. This subject is becoming of considerable importance to the cardiologist. The question of sodium metabolism is much to the fore. It seems likely that study of the electrolytes and the part they play in the contraction of the heart may provide the next big step forward in understanding what happens when the heart fails. The relative importance of the electrolytes and of adenosine triphosphoric acid is carefully discussed. It is with the former that most of the authors' work has been done. By using the terms of electrocardiography the authors have now sought to explain what goes on at the cell membrane. This gives some information about the variations of the concentration of ions inside and outside the cell. The opposition of the ions of sodium and potassium, the one mainly outside and the other mainly inside, affects the muscular contraction. They point out how particularly important is the "gradient" or actual differences in the levels of concentration of the ions across the cell membrane. How far the authors' theories are correct the clinician cannot judge, but it has been most interesting and stimulating to read about them. This book will certainly appeal to cardiologists as a good discussion of a fascinating subject which deserves careful study.

TERENCE EAST.

CANCER RESEARCH

Advances in Cancer Research. Volume 1. Edited by Jesse P. Greenstein and Alexander Haddow. (Pp. 590. \$12.) London and New York: Academic Press Inc. 1953.

The post-war years have been noted for a series of excellent summaries on various subjects in biochemistry. These have appeared on both sides of the Atlantic, and in the case of the volume at present under review many have been prepared on both sides of the ocean. *Advances in Cancer Research* is edited by Professor J. P. Greenstein and Professor A. Haddow, both well-known names in the field. This volume is the first of a series which will be produced from time to time, and the object is to provide an up-to-date account of various aspects of cancer research. That this has been done can very readily be verified by turning to the references, and one will see that there are a number of papers quoted in late 1952.

The book begins with a very able summary of the present position in relation to electronic configuration in carcinogenesis by C. A. Coulson. The second part deals with

epidermal carcinogenesis by E. V. Cowdry, and it is interesting in that the section is devoted to the question of epidermal carcinogenesis in the human subject. The milk agent is given a special section by Dmochowski, in which he gives a clear account of the rather complicated relationship of the milk agent and the hormonal production of cancer of the breast. W. U. Gardner gives a very full account of hormones in relation to the development of tumours in experimental animals, whilst R. J. C. Harris deals with the question of the Rous agent. This section concludes with an interesting speculative account on the origin of the Rous agent. Radioisotopes in relation to experimental cancer research are dealt with by C. Heidelberger, and a full summary of the present position of the carcinogenic aminoazo dyes has been written by J. A. Miller and E. C. Miller. The cytotoxic agents are discussed by W. C. J. Ross, and there is a most interesting account on nutrition in relation to malignant disease by A. Tannenbaum and H. Silverstone. There are some interesting observations recorded on cancer in man in relation to nutritional states. The volume concludes with a paper on plasma proteins by R. J. Winzler.

It is not possible to do more than mention the sections in this brief review, but in general it may be said that the standard of the whole book is very high indeed, and no cancer research laboratory can afford to be without it.

E. C. DODDS.

AGE AND ACHIEVEMENT

Age and Achievement. By Harvey C. Lehman. Memoirs of the American Philosophical Society held at Philadelphia for promoting useful knowledge. Volume 33. Foreword by Lewis M. Terman. (Pp. 359; 170 figures. 60s. or \$7.50.) Princeton, U.S.A.: Princeton University Press. London: Geoffrey Cumberlege. 1953.

Osler's severe judgment that the world could do without men over 40 and would be well rid of men over 60 is unlikely to appeal to a generation more concerned with raising the pensionable age than with lowering the age at death. Nevertheless, for anyone above or near the age of 40 it will be comforting to learn that the contemporary viewpoint is supported by something more than humanitarian considerations. This comfort is provided in a book by an American professor of psychology who has attempted to identify the "great works" (in science, medicine, philosophy, music, art, and literature), and to establish the ages at which they were produced. His data indicate that although the age of greatest output is undoubtedly below 40, and is surprisingly constant over a wide range of subjects, there is no age at which men cease to make important contributions. Chloroform at 60 (the newspapers' interpretation of Osler's remark) or even at 80 would remove some useful as well as many useless people.

After inspecting the 61 tables and 170 figures in *Age and Achievement* the reader may ask himself whether it was necessary for the author to put himself to quite so much trouble to make his points. It is an unfortunate practice among social scientists to expand to book length material which in other fields would be communicated in a modest paper in a research journal, and one feels that Mr. Lehman might have had a greater reward for less effort if instead of examining age of achievement so exhaustively he had taken up one or more of the numerous problems raised by his fascinating subject. Nevertheless some of his data are interesting, although those who doubt the relevance of statistics to the human situation are unlikely to be reassured by the statement that "appropriate computations suggest that if an author is destined to produce a book of such unusual merit as to be chosen by 8 or more compilers of best book lists, the chances are much less than one to a thousand that the author will publish that book when he is beyond 80 years of age." And they may feel that one place of decimals would have been sufficient to convey the information that at the time he published the second part of *Faust* Goethe was 3.56 standard deviations above the mean age of 101 authors of 224 best books.

THOMAS MCKEOWN.

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CARDIAC SURGERY AND THE ARTIFICIAL HEART

Many successful experiments have now been performed at various centres throughout the world in which a mechanical device is substituted for, or assists, the heart and lungs of an animal. A temporary artificial circulation of this sort has now been used in several human patients. Elsewhere in this issue of the *Journal* Professor Ian Aird and his colleagues describe the use of a pump-oxygenator during an operation for the relief of aortic stenosis. The apparatus used was the one described last year in this *Journal* by Melrose,¹ who with his colleagues reported experiments on dogs.² F. G. Dodrill, of Detroit,³ has recently reported four operations, using a mechanical heart.

The potential usefulness of such machines lies not only in cardiac surgery but also in the emergency treatment of acute cardio-respiratory failure. The apparatus consists essentially of a pump or pumps and of an oxygenator; the latter need not be used if the subject's lungs continue to function. Its purpose is to assist the heart, or to replace it entirely, or to replace one or other side of the heart. In reversible acute cardiac failure, as sometimes occurs with myocardial infarction, it should be possible to aid the enfeebled heart by withdrawing blood from the great veins, pumping it through the oxygenator, and returning it to the systemic circulation. The necessary cannulation of a major artery may mean its subsequent ligation is unavoidable. For cardiac operations a by-pass of one side alone will often suffice.

Since no efficient cardioscope has been devised, all operations on the heart valves must at present be done blindly, and guidance by the surgeon's sense of touch may often only be indirect, through instruments. The prospects of a dry heart offer attrac-

tive possibilities of operating under direct vision. To by-pass the right side of the heart blood must be withdrawn from the right atrium and returned to the pulmonary artery. Alternatively blood can be taken from the venae cavae, which are then clamped near the heart; but this manoeuvre allows the considerable blood flow from the coronary sinus and Thebesian veins to enter the heart, which is then by no means dry. The cannula returning the blood to the circulation can conveniently be inserted in the lower branch of the right pulmonary artery pointing upwards, so that the left lung is also supplied. There are not many conditions for which the right by-pass is needed: perhaps the most important is congenital pulmonary stenosis; the septum must of course be intact and the main pulmonary artery clamped just below its bifurcation. It has been shown in animals, and the finding probably applies to man, that reflexes arise from the right side of the heart which pass by the vagus nerve and help to control the systemic blood pressure; as the atrium empties, the pressure falls. This effect is increased in the presence of anoxia, which underlines the importance of good oxygenation.

The left side of the heart can be by-passed by extracting blood from the pulmonary veins—four cannulae being used—and returning it to the aorta via the subclavian artery. This enables the mitral valve to be exposed under direct vision. The aortic valve must be competent or reflux of blood will flood the field. There are good prospects here for advance on the crude surgery now possible, and hope that an effective technique for the relief of mitral incompetence may be devised. The left side can also be by-passed by extracting blood from the left atrium; if this is done the atrium must not be left open, since air embolism will occur. This prevents exposure of the mitral valve, but prolonged blind manipulations can be done. By a combination of the methods described above both sides of the heart can be completely by-passed without using an artificial oxygenator—an arrangement probably of most value in the treatment of congenital defects with a patent septum. Professor Aird and his colleagues used the pump-oxygenator to assist the whole circulation, extracting blood from the inferior vena cava via the femoral vein and returning it to the aorta via the femoral artery after it had been oxygenated. The patient, with aortic stenosis, severe angina, and congestive failure, would not have been fit for operation without assistance, especially as the necessary manipulation would have reduced the coronary blood flow below the tolerable level, resulting in irreversible ventricular fibrillation. A successful dilatation was carried out. To prevent blood clot-

ting in the apparatus heparin was added; in spite of neutralization by protamine, troublesome but not serious haemorrhage occurred towards the end of the operation. It was thought that this was mainly due to loss of platelets. The patient's angina was relieved, and her exercise tolerance greatly increased.

Dodrill and his colleagues^{3,4} by-passed the right heart in a young man for twenty-five minutes, and performed a pulmonary valvuloplasty under direct vision: the patient made a complete recovery. In another case, a left by-pass enabled an open operation to be successfully performed on the mitral valve. A left by-pass for a closed mitral operation lasting seventeen minutes had previously been reported.⁵

Dodrill also describes an operation for congenital pulmonary stenosis on a girl who had both sides of her heart by-passed: she survived four days. The use of a mechanical heart during operation for the repair of cardiac defects has also been reported by Dennis and his colleagues⁶ (successful repair of an atrial septal defect), by Helmsworth and his colleagues⁷ (repair of ventricular septal defect, with death sixteen hours later), and by Dogliotti.⁸ Operations have also been reported⁹ to have been carried out successfully on the hearts of patients with the aid of a compatible donor's lungs instead of an oxygenator. The subjects' venous and arterial circulations are connected to those of the donor by polythene tubing; a pump assists the cross-circulation.

Hypothermia, or artificial lowering of the body temperature, by reducing the demands for oxygen allows a greatly reduced circulation and provides another means of obtaining a dry heart for the surgeon—perhaps by a less complicated method than the mechanical heart. It may be found that a combination of the two techniques will be valuable.

ALDOSTERONE, THE NEW ADRENAL STEROID

Some months ago we referred¹ to a new and highly potent adrenal steroid, provisionally termed electrocortin, which was isolated in crystalline form from the adrenal glands by British and Swiss investigators working in collaboration—Simpson and Tait, of the Middlesex Hospital, London, Reichstein and von Euw, of Basle University, and Wettstein and Neher, of the Ciba research laboratories, Basle.² These same workers³ have now succeeded in establishing the chemical structure of the hormone, which chemically is closely related to cortisone and deoxycortone but differs in containing an aldehyde group. In view of this the new hormone has been named "aldosterone"

instead of "electrocortin." Drs. C. L. Cope and J. Garcia-Llaurado draw attention in this issue of the *Journal* to reports of the occurrence of a sodium-retaining substance in normal human urine and of an increased amount of this principle in the urine in conditions such as congestive heart failure, nephrosis, and hepatic cirrhosis with ascites. It is of interest that Cope and Llaurado think it likely that the sodium-retaining effects observed by these earlier investigators were due to the presence in the extracts of aldosterone, for by means of paper chromatography they have identified what appears to be this hormone in certain urinary extracts which they found to have sodium-retaining activity.

So far detailed investigation of the physiological activity of aldosterone has been difficult because of the very small quantities that are obtained by extraction of the adrenal glands. In a recent paper Gross and Gysel,⁴ of the Ciba laboratories, have reported experiments on the action of aldosterone in the adrenalectomized dog, the tests used being the survival test and the effect on the electrolyte and water metabolism. They found that the daily dose of aldosterone necessary for the maintenance of life in the adrenalectomized dog is 1.5 to 2.0 µg./kg. injected subcutaneously in two divided doses in oily solution, whereas the maintenance dose of deoxycortone acetate (D.C.A.) for animals weighing 13 to 16 kg. is 0.7 to 1.0 mg. injected subcutaneously daily. Aldosterone is thus 25 to 30 times more active than D.C.A. in this test. After changing over from D.C.A. to aldosterone, which owing to limited supplies could not be administered for more than ten days, the excretion of urine was increased and the urinary sodium and chloride showed a transient rise, while the concentrations of chloride, sodium, and potassium in the plasma showed no clear-cut changes. The authors suggest that the increased excretion was probably due to excretion of depots of sodium, chloride, and water which had been retained under D.C.A. therapy. These changes were accompanied by an increase in the haemoglobin concentration and in the blood non-protein-nitrogen, representing the disappearance of the hydraemia which develops in the adrenalectomized dog treated with D.C.A. In water-load experiments Gross and Gysel found that with aldosterone the excretion is delayed in about the same manner as with D.C.A., whereas, in contrast to D.C.A., overdosage with aldosterone for several days does not produce any marked retention of water, sodium, and chloride.

¹ *British Medical Journal*, 1953, 2, 552.² *Experientia (Basel)*, 1953, 9, 33.³ *Ibid.*, 1954, 10, 132.⁴ *Acta endocr. (Kbh.)*, 1954, 18, 199.⁵ *Schweiz. med. Wschr.*, 1954, 84, 407.¹ *British Medical Journal*, 1953, 2, 57.² *Ibid.*, 1953, 2, 62.³ *J. Amer. med. Ass.*, 1954, 154, 299.⁴ *J. thorac. Surg.*, 1953, 26, 584.⁵ Dodrill, F. D., et al., *J. Amer. med. Ass.*, 1952, 150, 642.⁶ *Ann. Surg.*, 1951, 134, 709.⁷ *J. thorac. Surg.*, 1953, 26, 617.⁸ *Bull. Johns Hopk. Hosp.*, 1952, 90, 131.⁹ *New York Times*, May 1, 1954.

On the clinical side Mach and his colleagues¹ have given aldosterone to two patients with Addison's disease and obtained results similar to those described above in the adrenalectomized dog. The effective dosage lay between 150 and 200 μ g. per day (2.5–3.3 μ g./kg.), aldosterone thus proving in man to be 20 to 30 times more potent than D.C.A. Within several hours of the beginning of treatment the clinical symptoms of the disease disappeared and within a few days skin pigmentation regressed and the blood pressure rose to normal. Like D.C.A., aldosterone caused sodium and chloride retention and increased the excretion of potassium, and unlike D.C.A. it converted the hypoglycaemic glucose tolerance curves to normal. In one of the patients who had arthralgia of the knees this symptom disappeared during treatment with aldosterone. The new hormone thus seems to combine the effects of deoxycortone with certain properties of cortisone. We now await its synthesis on an economical basis, for if supplies become generally available aldosterone will probably supplant deoxycortone and cortisone in the treatment of adrenal insufficiency.

ENCEPHALITIS IN CHILDHOOD

Twenty-five years ago the term encephalitis was almost synonymous with encephalitis lethargica (von Economo's disease). Since then many other varieties have been described, and encephalitis lethargica is no longer seen. The association of encephalitis with smallpox vaccination caused great concern about twenty years ago, but this complication has become exceedingly rare of late. It is almost never seen when primary vaccination is undertaken in the first year of life. Encephalitis may be due to the direct action of neurotropic viruses and may occur both epidemically and sporadically, or it may be due to poisons or to the toxic or allergenic effects of bacteria. It is known to follow some of the commoner infectious fevers, especially whooping-cough, measles and mumps, and occasionally german measles and chicken-pox, and is one of the very rare, but unpleasant, complications of whooping-cough vaccination. It may also occur in glandular fever and sometimes it accompanies poliomyelitis. Apart from these clear-cut causes there are various infections of unknown aetiology causing encephalomyelitis. The initial diagnosis is usually "influenza" until neurological signs of different kinds appear. Other forms also occur, but are rare. For example, Wernicke's haemorrhagic encephalitis, occurring in

¹ Arch. Neurol. Psychiat. (Chicago), 1934, 31, 685.

infantile beriberi, and the hereditary and familial degenerative diseases such as Schilder's disease have been known for many years. Some authorities would include chorea as a rheumatic encephalitis, citing the not infrequent hemichorea as supporting evidence, but there is scant convincing pathological proof of their association. Dawson¹ has described an encephalitis in childhood which runs a subacute course progressively downwards to dementia and death. The distinguishing feature is the finding of intranuclear eosinophilic inclusion bodies in the neurones, particularly in the cortical grey matter and the basal nuclei. Lead encephalopathy still occurs sporadically, usually in children suffering from pica, and is a serious condition. It should not be forgotten as a possible explanation for convulsions and tremors suddenly afflicting a child known to be given to sucking lead toys or the paint off his cot.

There is as yet no satisfactory classification of encephalitis, though attempts have been made to provide one related to the epidemiology, the aetiology, or the clinical pattern. Children seem to be more prone than adults to encephalitis, and in the last eight years Dr. E. G. Brewis, as he reports at page 1298 of the *Journal* this week, has collected no fewer than 93 cases from the children's wards in three hospitals. Of these 93 cases of encephalitis, nearly one-third followed recognized infections and the rest were of unknown aetiology. No constant relationship was found, either clinically, aetiological, or pathologically, in the 65 unclassified cases, but Brewis was able to distinguish four main clinical patterns among them. In the first group, consisting of 19 children, of whom 13 were less than 2 years old, the onset was sudden with convulsions and unconsciousness; recovery was rapid or death occurred in a few days. In the second group the disease began with meningeal symptoms, in the third with gradual ataxia and choreiform movements (eight children under 5 years of age), and in the fourth group with somnolence and disorders of the cranial nerves. Despite these fairly typical and clinically different pictures, nearly a quarter of the cases could not be fitted into any one because they overlapped or presented bizarre features.

The comparative frequency of encephalitis in childhood and the mortality (16%), together with the high incidence of severe sequelae in the survivors (19%), combine to make this disease of some importance. There is no effective treatment, but it may present the general practitioner with a problem in diagnosis. In any doubtful case a lumbar puncture should be performed; for this reason, and because of the special nursing that is essential to full recovery,

admission to hospital is advisable for all children in whom this diagnosis is likely. While the association of encephalomyelitis with the specific fevers is fairly well known, in the various unclassified forms the diagnosis may be in doubt until the cerebrospinal fluid is examined or neurological signs have become evident. Examination of the cerebrospinal fluid is the key to the diagnosis in most cases. The various forms may present signs and symptoms suggesting meningitis, chorea, cerebral tumour, or an infectious fever with convulsions. The cerebrospinal fluid is usually clear, with a mononuclear pleocytosis and increased protein, but may occasionally be normal, particularly at the outset. The withdrawal of a clear fluid by lumbar puncture excludes meningitis (except tuberculous meningitis and choriolymphocytic meningitis, which have, however, other characteristic findings) and thus is a contraindication to prescribing intensive chemotherapy, which is of no value in encephalitis. The prognosis may be difficult to determine, both of the immediate outcome and of the ultimate mental and physical state after recovery. In general, Brewis found that the mode of onset, the depth of unconsciousness, and the frequency of fits were the immediate guides to the severity of the condition. Viruses, and especially neurotropic viruses, seem to be on the increase. More forms, and more cases, of encephalitis are therefore likely to be seen among infants and children.

INSULIN-RESISTANT DIABETES

Most middle-aged, obese diabetics are strikingly resistant to insulin. The same phenomenon is seen temporarily in severe ketosis, and is a feature of the diabetes associated with acromegaly and Cushing's disease. A.C.T.H. and cortisone may increase insulin requirements if given to patients with diabetes, and Bornstein and Park¹ have recently shown that growth hormone and cortisone in combination are necessary for the development of insulin resistance in diabetic animals. Insulin resistance has also been recorded in patients developing diabetes in association with cerebral tumours affecting the hypothalamus,² though no consistent change has been demonstrated in animals with hypothalamic lesions.³ In the *Journal* this week Dr. J. Beattie reports at page 1287 the production of insulin resistance in rats by interruption of the hypothalamic nerve tracts and removal of the adrenal medulla. Rather surprisingly, neither hypothalamic lesions nor adrenal medullectomy alone caused any upset in carbohydrate metabolism, whereas the combined procedures resulted in hypoglycaemia, with depletion of liver and muscle glycogen and complete un-

¹ Bornstein, J., and Park, C. R., *J. Biol. Chem.*, 1953, 205, 303.
² Paton, A., and Petch, C. P., *British Medical Journal*, 1954, 1, 855.
³ Long, C. N. H., *Res. Publ. Ass. nerv. ment. Dis.*, 1940, 20, 486.

⁴ Himsworth, H. P., and Kerr, R. B., *Clin. Sci.*, 1940, 4, 287.

responsiveness to insulin. Moreover, when glucose was given, with or without insulin, the blood sugar rose to the same extent. The finding that insulin did not lower the blood sugar in these animals is a remarkable one and suggests the presence of one or more insulin antagonists. This has been a popular theory to explain insulin resistance since the experiments of Himsworth and Kerr,⁴ and both growth hormone and cortisone may well be insulin antagonists. Evidence from the present experiments suggests that both these substances were present in considerable quantities. Thus adrenal medullectomized animals with hypothalamic lesions put on more weight than the controls, and there was no reason to suppose that there was adrenal cortical insufficiency since normal cortical tissue was found when the animals were sacrificed. Moreover, rats exposed to cool conditions not only increased their oxygen consumption, but managed to regain their pre-operative weight. As the author points out, the interest of these results lies in the possibility that insulin-resistant diabetes may arise from causes which do not primarily involve the pancreas or the pituitary. Nevertheless many problems remain to be solved. Why adrenal medullectomy should result in insulin resistance in the presence of hypothalamic lesions is difficult to understand. It is a well-known clinical observation that patients with Addison's disease are particularly sensitive to insulin, and it is generally thought that the ability to recover from insulin hypoglycaemia is due in part at least to the production of adrenaline. The present study suggests that the presence of insulin antagonists may be more important than the role of adrenaline in the body's response to insulin.

COLOURED DRIVING-GLASSES

Road travellers returning on Monday night from the Whitsun holiday will experience severe and even dangerous discomfort from the dazzle of on-coming headlights, even though many devices against glare have been put on the market. The dipping of headlights and such-like mechanical measures have done much, but recently some drivers have taken to wearing yellow-tinted glasses in the belief that they absorb selectively that part of a beam of light which produces glare, whether in the more severe form of dazzling or in the lesser form of mere discomfort.

Subjectively such glasses give some drivers the impression that the visual field is brighter, and this has helped to increase their popularity—a popularity spuriously enhanced by the belief that the penetrating yellow light of fog-lamps is useful. There is, however, nothing to be said in favour of yellow-tinted lenses for driving. A clear-glass windscreen transmits 92% of light falling on it, and the lightest yellow filter passes about 88%. A combination of both will pass only 81% under ideal conditions, and considerably less in the presence of dirt and scratches. As might be expected, yellow-tinted driving glasses adversely affect the visual efficiency of drivers, especially at night, when the level of illumina-

tion is low. Richards^{1,2} and others have shown that visual acuity falls when using these lenses, and Miles³ found a reduction not only in visual acuity but also in resolving power and stereoscopic acuity, and, perhaps most striking of all, a slight but definite fall in visual acuity in the presence of glare, itself likely to increase with any scratches on the lenses. Davey and Sheridan⁴ have shown that under night-driving conditions the eye is adapted to a much lower level of illumination than is generally assumed, and that the wearing of yellow-tinted lenses is an impediment to detecting faint peripheral stimuli. Yellow-tinted lenses are particularly disadvantageous to colour defectives; Miles³ has stressed that such people (who are likely to seize upon any device which may help them) have a reduced sensitivity to light, so that even the palest filter will have a marked effect on their night vision. The subjective improvement experienced with yellow lenses may be the result of their sharp cut-off in the blue region of the spectrum. Blue light is scattered more than red, and the eye is myopic for blue light—an effect heightened by "twilight myopia." The beam from a motor-car headlight, however, contains very little blue light.

The use of tinted lenses is not so widespread in Britain as in the U.S.A., where both pink lenses and green wind-screens are used, sometimes simultaneously. Green glass is used there to absorb some of the sun's heat which floods through the wide curved sheets of glass at present fashionable in American cars. The fact that some States have banned the use of this green glass is a recognition of its potential danger. There do not appear to be any restrictions on the use of coloured driving-glasses either in Britain or in the U.S.A., but it may be questioned whether the use of coloured screens and coloured driving-glasses do not contravene the requirements of the Road Traffic Act,⁵ which lays down that all glass or other transparent material fitted to motor vehicles shall be maintained in such condition that it does not obscure the vision of the driver.

NUMBERING OFF

It might be said of many doctors, especially those who qualified before the last war, that they passed in medicine and failed in mathematics. They are apt to regard statistics with dislike and statisticians with that uneasy respect which King Arthur's knights must have accorded to Merlin. Perhaps this is because statistics often deals harshly with cherished conclusions, as Dr. R. A. J. Asher suggested when opening a debate held last week by the Study Circle on Medical Statistics of the Royal Statistical Society. Proposing that the house should welcome the growing influence of statistics in all branches of medicine, Dr. Asher listed the conventionally accepted applications of statistical analysis in medical research—for example, in assessing the probability that an event occurs by chance; in studying results which might be

influenced by several factors; in assessing the significance of apparent correlations, and in revealing those which are not so evident; and in the planning of clinical trials of drugs, when to the clinicians taking part it must sometimes seem that the statistician acts as a kind of *agent provocateur* by including in the trial inert substances indistinguishable in appearance from that under test. But it was in the moral field that Dr. Asher concluded statistics exerted their most beneficial influence. Their salutary discipline could but engender in doctors the twin flowers of modesty and admiration for the works of Nature. Common sense, he said, was not enough, and obvious conclusions could be fallacious.

Mr. R. S. Murley opposed the motion. He found it impossible to disagree entirely with Dr. Asher, but pointed out that the motion referred to *all* branches of medicine. Medicine was an art, statistics a science; he conceded that the latter had its uses, but when it came to mixing science and art statistics was as out of place as a skillet in a Crown Derby tea-service. Doctors and laymen alike read too much into the results of statistical analysis, he thought, which in any case could not give the answer to such human imponderables as the value to the patient of increased survival conferred by a particular line of treatment which left the sufferer a life of chronic invalidism at best or misery at worst.

This aspect of statistical analysis was criticized from the floor by a later speaker, who deprecated the application of statistics to the psychological assessment of personality structure. Another speaker referred darkly to the deliberate misuse of statistics, fostered for what sinister purpose?—by statisticians themselves. Statistical publications, he said, could be recognized by the prolixity of their tables. In his view no papers should contain any tables at all. The statisticians present coldly ignored this challenge, though the one who framed the motion affirmed that his profession were the champions of common sense, and he urged the house to welcome the growing influence of statistics in all branches not only of medicine but of life itself. Another statistician, supporting the motion, thought that statistical techniques available at any one time might not be of use in medicine, and went on to give a tantalizing glimpse of the technical world of becoming in which statisticians work. Summing up, Dr. Asher said that everyone should be his own statistician, while Mr. Murley struck an undemocratic note in concluding that statistics might be all very well for the elite but were a menace to the mob. On a show of hands the motion was carried by a narrow majority.

The freedom from bias of the opening speakers was emphasized by the revelation that the terms of the motion had been withheld from them until shortly before the meeting. Both had, with an impartiality admirable in two members of a conservative profession, expressed their willingness to speak for or against the motion, whatever it should turn out to be. With such a margin for the operation of chance, the significance of the result of the debate remains obscure. Even if it were not so, can one say, as one speaker did, that significant results are true?

CLINICAL PATHOLOGY IN GENERAL PRACTICE TESTS OF GASTRIC FUNCTION

BY

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Tests of gastric function have a limited role in clinical medicine. Sometimes simple inspection and analysis of a sample of the gastric contents may contribute towards the diagnosis. A fractional test meal will demonstrate the response of the stomach to various secretagogues, and the varying curves may be associated with different clinical conditions.

Passing of a Stomach Tube

There is considerable individual variation in the ease with which a tube may be passed, but if carefully done a minimum of discomfort is caused. For most patients it is more comfortable to pass the tube through the nose than over the back of the throat. The nose may feel sensitive to the touch of the tube, but this is rarely uncomfortable, and once the tube is down the gullet there is little discomfort in the throat. Pharyngeal irritation may be uncomfortable when the tube has been swallowed over the back of the tongue and is constantly touching the soft palate. For performing fractional test meals the nasal route is preferable, but if a brief aspiration of the gastric contents is to be undertaken a small but fairly rigid oesophageal tube may be quickly passed through the mouth into the stomach. For performing a fractional test meal, a soft rubber Ryle tube, 42 in. (107 cm.) long, No. 12 French, is probably the most useful one to use. It has a small metal olive at the tip, with four holes between 1 and 5 in. (2.5 and 12.7 cm.) from the olive. Alternatively a Levine tube may be used. This is a round-tipped tube size 14 or 16 F. with four openings in the terminal 3 in. (7.6 cm.). The average distance from the teeth through the cardia is 18 in. (46 cm.), and from the cardia through the pylorus another 11 in. (28 cm.). The nasal route is 2 in. (5 cm.) longer than the oral route.

The tube is well lubricated with water and passed gently into the nostril. As soon as the tube reaches the nasopharynx the patient is encouraged to swallow continuously until the first ring has reached his nostril. He is then allowed a pause and told to breathe through his mouth, while the tube is slid gently down until the tip is well below the pool of gastric juice; in most patients this is about the level of the third ring marked on the tube. Gentle suction is then applied with a syringe. If no gastric contents are obtained, the position is adjusted and a little air is injected. For any research work it is important that the position of the tube should be checked radiologically, but this is seldom necessary in routine clinical studies. It should be appreciated that the tube may curl up in the fundus of the stomach and prevent proper samples being obtained.

Performance of a Gastric-function Test

The purpose of this test should be explained to the patient. He is instructed to have neither food nor drink after 10 p.m. the previous day, the test being carried out early on the following morning. It is best to have the patient sitting upright with his back well supported by a pillow. His nose is inspected to see which nostril is larger, and the tube, well wetted, is then inserted and gently passed as already described. The stomach is emptied and the volume of the residual fluid measured. The free end of the tube is then spigoted and firmly attached to the patient's cheek by strapping.

When the necessary stimulus has been given, samples of about 10 ml. are withdrawn every 30 minutes for two and a half hours. After each aspiration the syringe is

washed out with water and a little air is injected down the tube, then the spigot is replaced. One and half hours later gastric juice is tested with Töpfer's reagent, which turns red with acid, or with Congo-red paper, which turns blue if free acid is present. If no free acid is present then an injection of histamine, 0.5 mg., is given subcutaneously. The patient is warned that this will make him feel flushed and may give him a headache, and that there will be redness and irritation at the site of the injection. When the test is completed he is asked to depress his chin on his chest while the tube is withdrawn. Throughout the test he is instructed not to swallow saliva. He should be provided with a receptacle in which to spit. The following are the commonly used tests.

Gruel Test Meal.—This provides evidence of the response of the stomach to a normal food stimulus. Gruel has the advantage of being practically colourless and of such a consistence as not to block the tube. It is prepared by bringing to the boil four tablespoonfuls of breakfast oatmeal with a quart (one litre) of water and then simmering down to a pint (half a litre) and straining through muslin. It is advisable not to add sugar or salt, and on no account must milk be used, as it may effectively neutralize the acid secretion.

Alcohol and Histamine Test Meal.—This is used to demonstrate the presence or absence of achlorhydria. Fifty millilitres of 7% alcohol is given and specimens are taken every fifteen minutes for one hour. Histamine, 0.5 mg., is then given and two further specimens are obtained.

Histamine Test.—By repeated aspiration or by continuous suction it is possible to determine the volume of juice secreted in response to histamine injection; this provides a quantitative estimate of gastric secretory function. With the *lhre* technique* a secretion volume at the rate of 180 ml. an hour is taken as indicating hypersecretion. This test is carried out by injecting 0.1 mg. of histamine per 10 kg. body weight and using continuous suction for one hour after the injection. The maximum acid secretory response† may be estimated by injecting four times the normal body-weight dose of histamine. An antihistamine, such as mepyramine hydrogen maleate (100 mg.), should be injected intramuscularly 30 minutes before the histamine is given. This is to protect the patient against the systemic effects of histamine. Continuous suction is applied, and the secretion collected from one-quarter to three-quarters of an hour after the histamine injection is taken as the maximum secretory response. More than 600 mg. of hydrochloric acid an hour suggests hypersecretion.

Indications for Examination of the Gastric Contents

In problem cases with symptoms referable to the upper abdomen—for example, patients with epigastric pain, loss of weight, but with a normal barium meal report—an examination of the gastric contents may help to establish the diagnosis. Examination of fasting juice alone may reveal gross blood-staining from a carcinoma of the fundus, which is easily overlooked radiologically. Gross blood-staining of all specimens in a test meal, together with an offensive smell and a big difference between "free" and total acidity, is strong evidence of a neoplasm, whether or not there is achlorhydria, and a gastroscopy is indicated. If only a blood-staining resting juice is found, it is worth repeating the observation, for a carcinoma of the ampulla of Vater or head of the pancreas can cause bleeding which

*Acta med. scand., 1947, Suppl. 196, 322.

†Kay, A. W., *British Medical Journal*, 1953, 2, 77.

¹ Highway Research Board (Washington) Bulletin, 1952, 56, 36.

² Highway Research Abstracts, 1953, 23, 32.

³ Arch. Ophthalmol. (Chicago), 1954, 51, 15.

⁴ Optician, 1953, 126, 33.

⁵ The Motor Vehicles (Construction and Use) Regulations, 1951, para. 74.

can be regurgitated back into the stomach. Again an excessive amount of fasting juice, together with a high-climbing curve, is suggestive of a duodenal ulcer which has been missed radiologically—a further x-ray examination is indicated. The odour of the gastric juice must always be noted. The normal pungent odour is lost with a fungating or ulcerating neoplasm, and also with a gastrocolic fistula, and the odour may be very unpleasant.

Another type of problem case is the patient with an anxiety state and abdominal symptoms, in whom it is necessary to exclude organic disease. A patient with a physical lesion suffering pain will usually accept a test meal when this is suggested, but a functional dyspeptic commonly reacts vigorously against the suggestion; indeed, the reaction of the patient may be another piece of evidence for or against a physical lesion.

Carcinoma of the Stomach.—It is important to appreciate that a normal acid curve and sometimes a high-climbing curve may be found in patients with carcinoma, particularly in those with small pyloric tumours. At least one-third of the patients with carcinoma ventriculi diagnosed radiologically will have free acid present, but, as mentioned above, there may be a bigger difference than usual between the total and free acid levels. The others will have achlorhydria with a high total acidity but no free acid. If there is a radiological diagnosis of gastric neoplasm but the clinical picture does not fit the diagnosis, it is certainly worth arranging both a test meal and a gastroscopy. Sometimes an unnecessary laparotomy may be avoided.

Gastric Ulcer.—A test meal does not contribute usefully to the management of a patient with a gastric ulcer. If there is any doubt about the benign nature of the ulcer, a gastroscopy is required. Gastric ulcer patients may have high acid curves, but more usually they are normal or low. Absolute achlorhydria does not occur with active gastric ulceration, but it may need additional tests, such as a 24-hourly pH test or Kay's special histamine test to demonstrate this (see above).

Duodenal Ulcer.—A test meal is not indicated in the routine management of duodenal ulcer, but may reasonably be done if operation is indicated. A high basal secretion, together with a high level of acidity, may encourage the surgeon to undertake a full 70% resection. Alternatively, a low level of secretion which may sometimes be found may encourage a gastro-enterostomy and vagotomy in a poor-risk subject, and particularly in women, in whom this is still a reasonable surgical procedure.

Chronic Gastritis.—A test meal does not provide conclusive evidence of chronic gastritis, but a low acid curve will be found with an atrophic gastric mucosa. The gastric biopsy technique introduced by Wood and Doig* is a simple method of providing definite histological evidence of the state of the mucosa and gives better information than gastroscopy.

Addisonian Anaemia.—A histamine-fast achlorhydria is a reasonable requirement for clinching the diagnosis, but it is very likely that a "tubeless" test meal will eventually suffice. This depends on the release of quinine by acid from a quinonium resin and measurement of its excretion in the urine.†

Factors Influencing Gastric Secretion

Gastric secretion may be divided conveniently into two phases—the period of digestive secretion and the inter-digestive phase. The period of digestive secretion is that in response to meals, and this may be further divided into three phases; the psychic, the gastric, and the intestinal.

The *psychic secretion* is provoked by sight, smell, taste, and even the thought of food, and the secretion evoked is highly acid and rich in pepsin. Vagal section or large doses of atropine will abolish this phase, but it is difficult to measure this secretion in man. In practice, using gruel test meals, this mechanism plays a small and unimportant part.

*Med. J. Aust., 1952, 1, 593.

†Harkness, J., and Durant, J. A. (1953). *J. clin. Path.*, 6, 178.

In the *gastric phase* are three types of stimulating agents which provoke gastric secretory responses. Simple mechanical distension is one mechanism, and it has been shown conclusively that distension of the pyloric part of the stomach stimulates the secretion of hydrochloric acid by the parietal cells of the body and fundus of the stomach. How much of this plays a part in man is still open to question. This secretion can be produced even in a denervated pouch and provides proof of the existence of a hormone for gastric secretion, which is called "gastrin." The second mechanism for acid secretion is the chemical stimulation of the stomach by the products of digestion of food or by food substances themselves. These secretagogues are present in many foods, such as milk, meat, and meat extracts, and in the breakdown products of digestion of proteins. The normal gastric phase of secretion is partly dependent on an intact vagus innervation, and a marked decrease in response to secretory stimulants, such as food, alcohol, and histamine, occurs after a successful vagotomy. It has been suggested that the response of a secretagogue depends upon the basal level of acetylcholine production in the gastric mucosa and thus upon vagal activity. A third mechanism of secretion may depend on actual chemical irritation of the mucosa with liberation of histamine, and this may be the way in which alcohol stimulates gastric secretion.

The *intestinal stimulatory phase* of secretion does not appear to play a significant part in man. More important is the inhibitory effect on secretion and motility that arises from the presence of fat in the intestine, which stimulates the formation of an inhibitory hormone, enterogastrone.

Interpretation of Tests

At one time there was a tendency to relate dyspepsia either to an increased or to a decreased peptic secretion, and a diagnosis of hyperacidity or hypoacidity was regarded as conclusive. Unfortunately this is not so, for both high and low levels of acidity can be found in individuals who are free from digestive disorders. The terminology has been most misleading. Test meals measure a concentration of acidity and not the total output of acid secretion, so that hyperacidity is not necessarily synonymous with hypersecretion. The concentration of acid in the gastric contents depends on two variables—the amount of acid secreted and the rate of emptying of the stomach. With rapid emptying there may be little fluid left to dilute newly secreted acid, and the concentration may therefore be far higher than if the stomach had emptied more slowly but secreted at the same rate.

At the other end of the scale, the term "achlorhydria" can also be misleading. The limit of free acid is reached when Töpfer's reagent turns from red to yellow. This colour change occurs at pH 3.5, which is well above neutrality point at pH 7, and there is, in fact, a small amount of free acid left at pH 3.5. Normally, however, it is perfectly adequate to take pH 3.5 as indicating achlorhydria.

The secretory response to a test meal depends on the quantity and chemical nature of the food, and to a smaller extent on the enjoyment with which it is eaten. The products of digestion of protein, or even their watery extracts, are good stimulants. Starches, on the other hand, are poor secretagogues and their secretory effect is mainly due to distension of the stomach. Nevertheless, the starch test meal has a considerable advantage over a meat-extract meal. The stomach may give an average response to a gruel meal but a hyperresponse to meat extract or alcohol, and the latter would therefore fail to differentiate between a normally secreting stomach and the hypersecretory response associated with a duodenal ulcer. The gruel test meal is commonly used, but the alcohol and caffeine tests are sometimes used instead. Alternatively, the quantitative response to histamine may be measured.

When a gruel test meal is given and samples of gastric juice are taken every 15 minutes, there is an initial fall in acidity followed by a steady increase, with a gradual

fall after about one and a half to two hours. The initial fall is due to the dilution of the small initial secretion by the bulk of the meal. The increase in acid is often due to the mechanical stimulation of the gruel, which unlike many foods, such as milk, eggs, or meats, does not have any intrinsic secretagogue action.

Gastric secretion consists of two components: the parietal cell component—that is, hydrochloric acid—and an alkaline secretion from the pyloric glands which, together with mucus, lowers the final level of acidity. The fall in acidity commonly found at the end of a test meal is mainly due to this "non-parietal" secretion; regurgitation of bile and pancreatic juice plays a minor part. The exact mechanism of co-ordination between the acid and alkaline components of the gastric juice is not yet fully understood. There seems to be a normal "brake" mechanism which operates through the duodenum; when the pH reaches a certain level an inhibitory mechanism begins to come into action and depresses gastric acidity either by increasing the alkaline component or by decreasing the acid secretion, or both. With duodenal ulcer this "brake" mechanism may be lost, hence the high rising curve sometimes found.

The standard gruel test meal provides a number of points for consideration: first, the amount and appearance of the resting secretion; and, secondly, the shape of the curve, the level of acidity attained, and the approximate rate of emptying of the stomach. The curve is commonly plotted on a printed sheet which gives the limits of the so-called normal responses in a shaded area. It must be remembered that this so-called normal response merely represents the limits which account for 80% of symptom-free subjects. The remaining 20% of normals had either well-marked "hyperchlorhydria" or hypoacidity.

In a standard test meal it is customary to give histamine, 0.5 mg., after one and a half hours if there is no acid present in the stomach by then. Histamine is a powerful stimulus to acid production, but if there is no response to histamine it is still not conclusive evidence of the complete inability of the stomach to secrete acid. For example, in a patient with a histamine-fast achlorhydria and a gastric ulcer, it is possible to get copious free acid for many hours during the day when hourly samples are taken round the clock, yet the histamine response may have been repeatedly negative. The ordinary dose of histamine does not get all the parietal cells into action, and about four times the usual dose is required to do this, but a dose of this size can be given only when covered by an antihistamine drug. This technique does enable one to assess the "total secretory mass" of the gastric mucosa.

Conclusion

The standard test meal is, in practice, full of pitfalls and fallacies, and unless done with care by an interested observer will not justify the discomfort caused to the patient or the time taken in the laboratory. It has been said that the test meal is a much better test of the patient's endurance than of his gastric function. Gagging and retching may cause secretory inhibition and produce an apparent achlorhydria. Achlorhydria, with increased difference between the free and total acid, may be due to the gruel being made with milk or to the patient having had a meal before the test was started. The presence of flecks of blood is sometimes misinterpreted and may be merely due to the trauma of suction on the mucosa. A chemical test for blood is too sensitive and it is better to rely on naked-eye appearance. Appreciable blood-staining is usually significant. The end of the tube may sometimes slip back into the gullet or pass through into the duodenum. Nevertheless, when the test is done by someone with experience and sympathy, particularly if the nasal rather than the oral route is used, it can be made reasonably comfortable and the major difficulties can be avoided.

Next article on *Clinical Pathology*.—"Laboratory Investigation in the Hyperchromic Anaemias," by Dr. John F. Wilkinson.

A SURVEY OF ST. ALFEGE'S HOSPITAL 'GERIATRIC UNIT FOR 1952

BY

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This geriatric unit is known as St. Alfege's Hospital II. It is situated in two separate blocks, each of three stories. Each floor consists of one ward divided into two—one for the bedridden, and the other for patients who are up and about. These arrangements have been made for the comfort of the patients and, more especially, to facilitate the work of the staff, particularly at night. The present bed establishment is 268—164 for women and 104 for men. As a considerable number of women patients are under 60 one ward is allotted to them together with diabetic patients. The same need does not arise in the case of male patients, but, on the other hand, there are more surgical and post-surgical cases, mainly due to urinary tract conditions (prostatic hypertrophy, cancer of the prostate, urinary retention, cystostomy), and therefore one ward is allotted to them. Male diabetics have a special ward.

Population Served

The area served by this hospital covers the boroughs of Greenwich and Deptford. According to the latest available figures the population is 170,000 (and therefore the present number of beds represents 1.6 per 1,000). If we regard 14% as being the geriatric group—that is, persons of pensionable age—this would amount to approximately 24,000, and therefore there are available 1.1 beds per 100 for the group.

It is well known that the social structure of the population is of great importance when assessing the number of beds required for elderly people. For instance, it is likely that a hospital situated in an upper-class residential area might require fewer beds than one in a working-class district. The population in our area consists almost entirely of weekly wage earners; most members of the family go out to work, and neighbourly help is therefore seldom readily available. Housing conditions are sometimes poor, with overcrowding. As a result of these circumstances there is often a heavy demand for hospital beds for old people. A large proportion of the population, mostly women, live alone, and the additional burdens which accompany winter may well bring their slender resources, already stretched to the utmost, to breaking-point, and compel them to seek hospital admission.

Admissions

During the year under review 300 women and 246 men were admitted. Requests for admission come from the following sources: General practitioners, acute wards of St. Alfege's and Miller Hospitals, the Emergency Bed Service, the medical officer of health, receiving-room, and other hospitals (teaching, cancer hospitals, etc.).

The procedure for the admission of patients put on the waiting-list by general practitioners is as follows.

In the late spring and through the summer, when the number of applications is not large, patients are admitted solely on their doctors' recommendations, because it is thought that even those patients who need residential rather than hospital accommodation will benefit from a stay in hospital before moving on to a local authority home.

Patients who are mentally deranged often benefit in the same way, but if after a period of observation their mental condition does not improve the advice of the consultant psychiatrist is sought. On his recommendation suitable patients can be transferred to Tooting Bec Mental Hospital.

where those over 70 are received for observation and treatment without being certified. Only occasionally do we find any reluctance on the part of the family to such an arrangement; when there is any reluctance it can usually be overcome by explaining the position. In very rare circumstances does a patient have to be certified, and, in fact, this was necessary only once during the year.

During the autumn and winter, when there is a heavy demand for hospital beds, the procedure for admission is different. Each patient who is put on the waiting-list by a general practitioner is visited and examined at home in order to assess his priority, which is based roughly on these grounds: (a) recent cerebrovascular accidents; (b) medical cases which should respond to treatment and be made fit for discharge in a short time; (c) medical cases which will require a longer time to be made fit for discharge; (d) patients requiring admission on social grounds not referred by the medical officer of health (the medical officer of health's patients have priority); (e) mentally deranged patients who may be put on the waiting-list for Tooting Bec Hospital; and (f) mental patients who cannot be kept or certified at home.

Stay in Hospital

After admission to hospital patients receive the necessary medical treatment, including physiotherapy and occupational therapy, both remedial and diversional. During their stay the lady almoner greatly assists by relieving their worries and, when necessary, putting their home affairs in order. Later, when the time for discharge has come, she supplies information on whether the home conditions are suitable for the patient's return. She may arrange for the district nurse to call or a home help to be supplied, or for such other assistance as is given by the Red Cross, St. John Ambulance Brigade, Women's Voluntary Service, Old People's Welfare Committee, and so on. Should the patient not have a suitable home, application is made to the local authority for accommodation. These transfers are arranged smoothly on an exchange basis, thus enabling patients in Part III homes to receive hospital treatment.

A high percentage of elderly people are mentally deranged as a result of arteriosclerotic processes of the brain, chronic softening of the brain, and so on. Such patients will be considered for transfer to Tooting Bec Hospital.

We have noticed a striking increase in the number of readmissions, and we regard this as a welcome and salutary phenomenon. As in the case of younger rheumatic heart patients who spend their lives between periods of some activity and periods for repair in hospital, it is a good policy to give old people periods of treatment and rest prophylactically, and thus prevent or delay deterioration where further recovery is not possible.

Discharges

Discharges for the year under review numbered 321. Seventy-two patients (23%) were transferred to local authority homes and Tooting Bec Hospital, or, if in need of specialized treatment such as neurosurgery, to other hospitals. The other 249 (77%) discharged patients returned to their own homes: this does great credit to the patients' relatives, who showed themselves willing to accept the task of caring for an invalid, often infirm and frail.

On discharge the patient is told to inform his doctor that he is at home again. By this time the general practitioner has received a summary of his patient's diagnosis, treatment, and other pathological and radiographical information. The patient is also visited by a health visitor from the London County Council Health Department, who sends a report to the lady almoner for the information of the doctor in whose charge the patient has been during his stay in hospital.

Patients are seen and followed up in a geriatric outpatient clinic and, when necessary, readmitted or provided with further amenities at home.

Long-stay Cases

The problem of long-stay hospital patients is one of great importance, for these reduce the turnover in hospital beds. The recognition of the factors which necessitate a long period in hospital may help to solve the problem. Those who remain in hospital longer than a year fall into three main groups:

(1) *Chronic Joint Conditions*.—There were 64 cases: 11 had rheumatoid arthritis; one had Charcot's syphilitic osteoarthropathy of hip, knee, and ankle-joints; and 52 had osteoarthritis of different localization, but chiefly of hip- and knee-joints. It is easy to fall into controversy on the problem of osteoarthritis in elderly patients. It is well known that all people over 60 have osteoarthritis, but not all are sufferers. The condition may be more or less marked or more or less dispersed. The discomfort and apperception vary from nil to 100%. Very many patients with thickened phalanges suffer psychologically without sustaining pain or impairment of movement. On the other hand, some patients are completely crippled by osteoarthritis of the hips. To suggest that osteoarthritis in these patients is the primary cause of admission to a geriatric hospital or of incapacitation would be incorrect. Many patients are admitted for other reasons, such as cerebrovascular or cardiovascular diseases, and even a marked osteoarthritis may be an accidental finding. There are, of course, many patients who seek admission only on account of osteoarthritis, particularly of the hip-joints. Their history often reveals that for months or even years their treatment has consisted in resting in bed, which frequently results in severe contractures. The 11 patients with burnt-out rheumatoid arthritis, in addition to being over a year in this hospital, spent several years in other hospitals during the active stage. The problem of rheumatoid arthritis in active and non-active stages is beyond discussion here.

(2) *Disseminated Sclerosis and Other Nervous Disorders*.—One man and five women suffered from this disease; three of the women were paraplegic.

(3) *Arteriosclerosis*.—Patients suffering from this illness form the bulk of long-stay cases, and they are discussed below.

Deaths

During the year 238 patients (124 men and 114 women) died. There were 12 coroner's post-mortem cases, 9 of which were held because death occurred within 24 hours of admission, two on account of fractures sustained at home before admission, and one sustained in the ward. Fifty patients died of cancer (34 men and 16 women), the distribution being as follows:

Men	
Alimentary tract (pharynx 1, stomach 9, pancreas 1, rectum 6, colon (ascending) 1)	18
Urinary tract (bladder 1, prostate 5)	6
Lung	9
Sarcoma of muscle (patient aged 54)	1
Women	
Alimentary tract (stomach 1, liver 2 (primary), gall-bladder 1, colon (ascending and transverse) 3, rectum 1)	8
Metastases in abdomen (primary not found)	1
Urinary tract (bladder 1, uterus 2—1 corpus, 1 cervix)	3
Breast	2
Lung	1
Cerebellar tumour	1

The causes of death in the remaining cases were chiefly of cardiovascular origin—primary, or secondary to chronic pulmonary disease such as emphysema and chronic bronchitis with chronic pulmonary heart.

Deaths during the year were as follows: January to March, 52; April to June, 44; July to September, 58; October to December, 84. The increased number during the last period can be largely attributed to the fog.

Conclusions

It is evident that an allocation of 1.1 beds per 100 of the geriatric population should be enough under normal circumstances, and only in the event of an exceptionally severe winter or epidemics of serious upper respiratory infections might a temporary shortage of beds arise. To

ensure that a high rate of turnover is maintained it is essential that such patients as those suffering from osteoarthritis should be treated in the early stages and encouraged by persuasion and physiotherapy to be mobile. Further improvement in the position could be effected by the development of clinics for rheumatic out-patients. These, if the patients were encouraged to attend conscientiously at the onset of illness, would prevent or delay immobility, thereby easing one of the burdens on the geriatric hospital.

The bulk of long-stay cases are those suffering from arteriosclerosis, especially of the brain, with consequent inability to walk, incontinence, and mental deterioration. Such patients need special accommodation, as they require little more than nursing supervision. We are convinced that it is of the utmost importance to create intermediate accommodation between Part I (hospital) and Part III (local authority), which should offer to suitable patients the attention and nursing which they require.

These "nursing annexes" would accommodate bedfast patients incapacitated through cerebrovascular accidents; disseminated sclerotics if they are paraplegic; incontinent; burnt-out rheumatoid arthritis; and those beyond the reach of active medical treatment, such as persons immobilized through severe osteoarthritis and advanced arterio-cerebral sclerosis. These "nursing annexes" would require only a small trained nursing staff, as the patients' chief needs—care and attention—could be provided by orderlies working under trained supervision. Medical supervision would be in the hands of the geriatrician, and such day-to-day care as was necessary could be given by the house-physician of the geriatric unit.

I should like to express my appreciation of the co-operation extended by the general practitioners in Greenwich and Deptford, who are carefully selecting their patients for admission, thus enabling us to admit really needy patients with little or no waiting.

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Preparations and Appliances

SIMPLE THYROID RETRACTORS

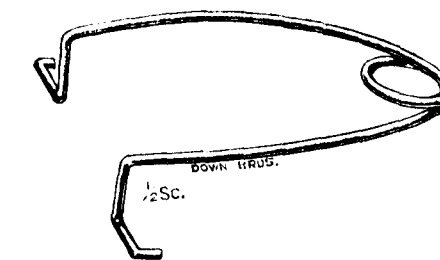
Sir HENRIE OGILOVE writes: In 1953 the surgeons of Wellington, New Zealand, gave me the privilege of taking part in a three-weeks postgraduate course in surgery as a member of the staff of the Wellington Hospital. I was

allowed the use of 25 beds, allotted a very able house-surgeon and ward sister, and given two operating days a week.

For a thyroidectomy I was provided with a pair of retractors of a type new to me,

and better than anything I had seen in England. I was unable in the time to buy some for myself, but on my return I drew what I wanted and asked Down Bros. to make them for me. The idea comes from the Wellington Hospital, but I cannot say who designed them, nor can I claim that mine are a true copy of the originals.

As will be seen from the figure, the retractors might be described as a pair of large opened hairpins made of spring



wire, with the points bent down. After the skin flaps have been turned up and down, towels are laid over them, and a retractor, closed by compression, is put under the edge of the towel and skin on each side of the midline and allowed to spring open. The points of the retractors should be about an inch (2.5 cm.) apart above and about 2 inches (5 cm.) apart below. Towel forceps are used to clip the towels at the ends of the incision, and as they drop back they hold the elbows of the retractors back as well. These retractors give adequate exposure, stay in all the time, are never in the way, damage nothing, are cheap, and need no repairs. *O si sic omnia.*

Nova et Vetera

SWEDISH PIONEERS OF MEDICINE GO TRAVELLING

In a "Docent" lecture published in the organ of the Swedish Medical Association, *Svenska Läkartidningen*, for September 4, 1953, Dr. Wolfram Kock, of Stockholm, shows how, in the past, if you wished to end up as a pioneer of medicine you had to travel far and see much in your youth. Not a bad thesis even now. His material consists of two distinguished quartets. The first was composed of Olaus Rudbeck, Petrus Hoffvenius, Urban Hiärne, and Johan von Hoorn, who made their mark in the seventeenth century.

A Seventeenth-century Quartet

Olaus Rudbeck was the discoverer in 1650 of the thoracic duct—a discovery made independently of the Frenchman Jean Pecquets, whose identification of this duct dates back three years to 1647. In 1652 Rudbeck's discovery of the lymphatic glands and lymphatic system earned him renown and an invitation to demonstrate this system to Queen Kristina of Sweden. When he finally settled in Sweden he founded the botanical garden in Upsala, having taken seeds and plants from Holland wherewith to stock it.

Hoffvenius, who died in 1682, had already successfully defended two theses, entitled respectively "De Oculo" and "De Symptomatibus," when he set off in 1658 for Leyden on a royal scholarship. After studying anatomy there he returned to Sweden in 1661, and was appointed professor of medicine "et Physices" in Upsala. His gifts as a physician earned him the title of the "father of Swedish medicine," but for want of hospital accommodation he taught his students by taking them with him on his rounds to his patients—a system he had learnt in Leyden.

Hiärne was only 25 years old when he set out on his travels as personal physician to a high Swedish official appointed Governor of Riga. From there he travelled to Germany, Holland, England, and France, and he spent three years studying chemistry in Paris under Christopher Glaser, apothecary to Louis XIV. On his way home from Paris in 1673, Hiärne picked up a useful tip from the famous Dutch doctor Helvetius, who told him that ipecacuanha was a cure for dysentery. The Polish campaign by Charles XII of Sweden was at this time seriously complicated by dysentery, for which the new drug proved a godsend under Hiärne. As well as being a popular physician in Stockholm, he was instrumental in founding Collegium Medicum, an organization for the control of the practice of medicine in Sweden.

Johan von Hoorn, the "father of Swedish obstetrics," earned this title by his prolonged studies in Leyden and Paris. By September, 1687, when he reached Paris, he had already mastered the literature of his subject, but still felt in need of some practical experience. He would have liked to acquire it at the old hospital, Hôtel Dieu, where a whole ward was set aside for obstetrics. But foreigners were not welcome here at this time, so Hoorn had to learn his trade by joining forces with a Madame Allegrain, known

to be a "wise and very quick" midwife. She had a large practice among the poor of Paris, and by tipping her patients judiciously Hoorn was allowed to be present at their confinements. There was only one snag: Madame Allegrain was not allowed to operate. So Hoorn got into contact with a Monsieur Le Frad, a duly accredited "accoucheur" who had mastered the technique, for what it was worth at that time, of the treatment of "partus praeternaturalis." Obstetric forceps had been discovered by this time, but were a strictly guarded and secret monopoly into whose cult Hoorn was never admitted. On his return to Sweden he took an active part in converting the "unscrupulous drunkards" practising as midwives at that time into a semblance of well-trained midwives.

An Eighteenth-century Quartet

The next quartet of Swedish pioneers of medicine was composed of Nils von Rosenstein, the botanist Carolus Linnaeus (raised to the nobility with the title of von Linné), Abraham Bäck, and Olof Acrel, the "father of Swedish surgery."

Rosenstein is perhaps best known to the vulgar world of to-day on account of his chest drops (vinum glycyrrhizae opiatum), still an infallible remedy. The son of a clergyman, Rosenstein was originally destined for the Church, and he had already pursued theological studies when he switched to medicine. In order to become a university teacher he studied abroad, first at Halle and later at Turin, Montpellier, and Paris. At the small university town of Harderwijk he graduated in medicine in 1730 with a thesis entitled "De Historiis Morborum Conscribendis," which in plain terms means the art of keeping case records. In 1740 he was appointed professor of natural history, with the task of teaching anatomy, physiology, pathology, and practical medicine. He also became the author of the first Swedish textbook of anatomy.

Linnaeus is so famous as a botanist and zoologist that his possession of a medical degree is often overlooked. His travels abroad between 1735 and 1738 brought him to Denmark, Germany, Holland, England, and France. At Harderwijk he graduated as doctor of medicine on a thesis written in Swedish and entitled "Hypothesis Nova de Febrium Intermittentium Causa." Here he showed that the clay content of drinking-water was the cause of intermittent fever or ague. He is said to have defended this thesis with "presence of mind and great ingenuity." At Leyden Linnaeus was anxious to meet the intellectual giant of his day, Boerhaave, old and rich and much sought after by his patients. To get Boerhaave's ear you had to tip his servants properly, and it took the penniless Linnaeus a week to secure an audience, for which he had applied in writing. But in due course he and Boerhaave became the best of friends, and the grateful Swede called his Dutch teacher "my father in medicine." Clinical medicine as well as botany was discussed by the two, and in 1737 Boerhaave suggested to Linnaeus that he should take part in a botanical expedition to Dutch Guiana. As a bait for this undertaking, Linnaeus was informed that a predecessor holding the same appointment for five years had secured some barrels of gold in a salubrious climate producing beautiful plants. But Linnaeus seems to have been more impressed by Boerhaave as a scientist than as a promoter of gilt-edged expeditions to the Tropics.

Abraham Bäck was disappointed in his youth over some academic appointment, so he undertook foreign studies wherewith to equip himself for later promotion. Setting forth in 1741, he spent four years abroad, studying anatomy and botany in Leyden. Later he proceeded to England, where, with introductions from Linnaeus, he visited Oxford, the botanical gardens in Chelsea, and the naval hospital at Greenwich. Going to Paris in December, 1742, Bäck spent two years studying anatomy, surgery, pathological anatomy, internal medicine, botany, and zoology. He learnt how to make anatomical preparations by injections and other methods, and he studied pharmaceutical chemistry at the Jardin des Plantes. He was also diligent in going the

rounds of the Hôtel Dieu. On his return to Stockholm in 1745 he became a teacher of anatomy and soon afterwards Court physician. He took an active part in founding a hospital for the combined care of the sick and the training of physicians. With his Paris background, Bäck was naturally inclined to think in terms of the Hôtel Dieu. But he was shrewd enough not to swallow Hôtel Dieu standards wholesale, with each bed shared by two or three bed-fellows and in the maternity ward by four bed-fellows at a time. For in Bäck's plan for a new hospital in Stockholm he referred specifically to "hospital wards with beds in two rows and only one person in each bed." One of his arguments in favour of a hospital for Stockholm was that "a well-equipped hospital should also render costly studies abroad superfluous." When the Serafimer Hospital was opened Bäck became as a matter of course its first medical superintendent.

Olof Acrel, also one of the founders of the Serafimer Hospital, learnt much of his surgery abroad under stormy conditions. Travelling through Denmark to Germany, he studied anatomy and physiology under Albrecht von Haller and surgery under Richter. However, he soon moved on, as there were only four corpses for dissection each year. In London he studied operations for stone under William Cheselden at St. Thomas's Hospital. War having broken out on the Continent, Acrel fitted himself out with surgical instruments at Strasbourg and joined the French Army as a surgeon. In the autumn and winter of 1743-4 he was a senior surgeon in the fortress of Lauterburg, where he had some 1,200 patients and 24 assistant surgeons under his care. When the fortress was taken in 1744, Acrel became a prisoner of war, but he was allowed to return to Sweden in the autumn of the same year. On the initiative of the Swedish Academy of Sciences, he published a study of hospital administration in connexion with the new Serafimer Hospital, to which he was attached as senior surgeon for 54 years, with the title of professor and general director.

CLAUDE LILLINGSTON.

Opening a hostel for rheumatic sufferers at Bracken Hill House, Northwood, Middlesex, last week, Miss PAT HORNSBY-SMITH, Parliamentary Secretary to the Ministry of Health, referred to the "unremitting research" that is going on. Since the war, she said, the financial support given to research on rheumatism both by voluntary and by governmental agencies had substantially increased. Research centres up and down the country now received steadily increasing support from the Medical Research Council, from the regional hospital boards, from many university departments of medicine, as well as from voluntary organizations such as the Nuffield Foundation. The Ministry would watch with great interest the present venture at Bracken Hill House, the fundamental idea of which was to enable patients to be temporarily resident near a hospital which possessed specially experienced medical staff as well as adequate treatment facilities. The British Rheumatic Association rightly regarded this as a pioneer effort, and it was, of course, a field of experiment for which voluntary effort was pre-eminently suited. Such pioneer ventures were always difficult for a Ministry to promote, but experiments by voluntary organizations often provided a useful guide to later official action. She welcomed the financial support which industry had given ventures such as this, for to them rheumatism presented a grave manpower and production problem. She said she was also glad to know that a two-years financial guarantee had most generously been given by LORD NUFFIELD of £1,000 a year against loss in operation. It was of particular interest that patients for the 25 beds with which the hostel was starting would initially be mainly drawn and selected from industry. The interests of the British Rheumatic Association were, of course, national in scope, and she understood that the association was exploring the possibility of similar hostels in other areas. She said the Ministry welcomed such experiments and would watch keenly and be ready to learn from the results.

FACIAL PARALYSIS

The first of what is hoped will become a series of informal discussions on clinical problems was held by the Ciba Foundation on May 10, the subject being the treatment of facial palsy. Dr. BASIL KIERNANDER was in the chair.

Miss JOSEPHINE COLLIER spoke first and stressed that it was important to differentiate between the pre-degenerative phase of the nerve lesion and the phase of established degeneration. Treatment should begin in the pre-degenerative stage and should be designed to prevent actual degeneration. Mr. TERENCE CAWTHORNE said he performed decompression two to three months after the onset of symptoms if there was still no voluntary or faradic response. One-third of these cases showed signs of recovery one week later. He believed local ischaemia to be an important factor in these cases. Wing-Commander P. F. KING gave the results of 160 cases treated in the R.A.F. Of these, three-quarters were Bell's palsy. The treatment was stimulation of the facial muscles by interrupted galvanism until voluntary mobility returned; thereafter active exercises were practised in front of a mirror. Fifty-eight per cent. of his cases had some form of splint. The rate of recovery was as follows: by two months 56% had recovered, by three months 70%, by six months 84%, by twelve months 90%, and over one year 94%. Of these, a total of three had to have fascial slings.

Dr. RITCHIE RUSSELL said the peripheral nerve lesions behaved as pressure palsies which either recovered rapidly or showed degeneration. A nerve could conduct impulses for 24 hours without a blood supply, and he suggested that the logical times for decompression would be in the first few hours of symptoms, or as soon as the reaction of degeneration occurred, or at eight or nine months. The treatment of paralysed muscles should not consist in keeping them permanently relaxed, and they should be put through a full range of movements daily. Mechanical support was necessary only with sagging. Dr. A. T. RICHARDSON said that the main points to decide were whether there was a nerve block or whether degeneration had occurred. He stressed the importance of testing for nerve conduction, stimulating the facial nerve as it emerged from the stylomastoid foramen. If nerve conduction was present at the fifth day there was a fair prognosis, if at the seventh day a good prognosis, and at the twenty-first day a very good prognosis, for no further degeneration usually occurred after twenty-one days. For treatment he agreed that short-wave diathermy or anodal galvanism applied to the stylomastoid foramen were of no value, and he used interrupted galvanism as previously described. Mr. D. N. MATTHEWS described his operation of fascial sling where the mouth was motored by the masseter muscle and the eye by the temporalis. Mr. C. R. McLAUGHLIN said there were three ways in which plastic surgery could help. The first was static support of the corner of the mouth and cheek; the second was reanimation with rounding of the cheek and corner of the mouth; and the third was the relief of epiphora. His indications for operation were complete failure to recover or partial recovery after five years.

The meeting closed with a vote of thanks to Dr. Wolstenholme and the Ciba Foundation.

A convention on social insurance, dealing with benefit for old age, widowhood, orphanhood, and industrial injuries, has been signed with Switzerland. It provides, among other things, that a national of either country who has qualified for benefit in one of the two countries shall receive that benefit while he is resident in the other country. It also relaxes the nationality conditions of the Swiss scheme in favour of citizens of the United Kingdom and Colonies; insured persons who have not paid enough contributions in one country to qualify for a pension under that country's scheme are enabled to receive a supplement to the pension payable by the other country. Any person in Great Britain who may be affected by the convention should get in touch with his local Pensions and National Insurance Office.

Correspondence

Undergraduate Education

SIR,—The Report of the Undergraduate Education Committee of the Council of the College of General Practitioners (*Journal*, May 15, p. 1146) emphasizes what have been the opinions of many of us for years, and adds some useful new recommendations in the form of answers to a questionnaire, rather than as a statement of the opinion of the Committee and Council based upon a summation of the individual opinions of general practitioners represented on the fifteen regional faculty boards.

It is indeed good to read that the great majority of doctors urge that the boy and girl while still at school should continue to receive a "broad general education" in the humanities before bending his or her entire thought to specialize in the materialism of the natural sciences. It is amazing that some universities should have so far forgotten their true function by insisting that the first premedical examination should be passed before leaving school.

The Report also repeats the criticisms, which have been voiced for years, of the undue time wasted in learning the unessential minutiae of anatomy, and those of more recent date, of the professorial type of teaching of medicine. For the student medicine now is little more than biochemistry, physical mechanical methods, and a mass of various diagnostic tests. Here is an illustration. Some three years ago, while walking through a maternity ward with a group of students, I stopped before a pregnant woman propped up in bed with glaring exophthalmos and a large lump in her neck. I asked one young man—who had "done his medicine"—"What is her trouble?" He looked at her for half a minute and then said, "I should first like to know her blood-cholesterol." Perhaps a knowledge of her blood-rhubarb would have been equally helpful in making a diagnosis!

The Report also stresses the necessity for instruction in the common disorders of daily general practice. Again, this has been urged on the schools for years, but still the teaching is deficient. How often does the student hear a talk on the man who tells us that he feels "run down," or the other who complains of increasing fatigue? I am surprised, however, to find no specific mention of the importance of teaching of so-called functional disease or symptoms without discoverable physical signs. This is a group of disorders which comprise, perhaps, three-quarters of all the patients we see, primarily based nearly if not always on disturbances of the mind and emotions. Psychiatry is mentioned along with three or four other incompletely taught subjects, but psychiatric patients are apart from those suffering from the many neuroses which belong to all the branches of medicine.

That no reference is made to the teaching of psychology, "the motives and mechanisms of the mind," as expounded some years ago by Graham Howe, is a reflection on the choice of questions submitted to the faculties and on those who answered the questionnaire, inasmuch as they neglected one of the most important of all the omissions in clinical teaching. By all means let the student be taught more about the common things—"run down," fatigue, insomnia, obesity, food, loss of weight, leucorrhoea, swollen ankles, "wind," constipation, and many others—but also give him much more emphasis on the protean manifestations of neurosis and functional disorders.

I wrote to you, Sir, in December, 1932,¹ on the urgent necessity for including some teaching on psychology in the curriculum, but even in 22 years there has been so little progress that still the student regards the neuroses as "clinical rubbish" to be passed from one out-patient department to another.—I am, etc.,

London. W.1.

ALECK BOURNE.

REFERENCE

¹ *British Medical Journal*, 1932, 2, 1122.

it in headlines. Nobody suggests that particular individuals should not do all the research they want to do into anything which takes their fancy. It is the premature presentation to the public, and method of presentation of unproved results, which is the cause of the matter. How a statement about "smoking and cancer of the mouth" at this stage could help to allay "apprehension, ignorance, and uncertainty" I really fail to see.

We cannot put the clock back, I agree, but there is no need deliberately to put it forward. There has obviously been a failure somewhere, on our part, in allowing this "cancerphobia" to develop in "nearly 100% of the population," so let's think again, examine our own fears, and find out what has gone so badly wrong in our methods, which has produced this modern mental disease. Make no mistake, we are responsible for it. It isn't the patient's attitude which needs changing. It is our own, which places the accent on organic disease to the exclusion of mental. For the greater part of the population it is the latter which is the more important, and the patient "dies a thousand deaths" instead of one. In conclusion, "Knowledge is the antidote to fear," but Emerson did not mean "knowledge" culled from kidney pill advertisements and press stunts.—I am, etc.,

London, E.9.

PAUL R. SAVILLE.

Pethidine for Pain and Insomnia

SIR.—The preference shown by Drs. R. G. B. Wigoder and H. Jeffs (*Journal*, May 15, p. 1156) for using pethidine instead of morphine in the symptomatic treatment of pneumonia deserves extensive trial. This is justified by the adequate reasons given. Since we have no memory for pain, however, the following case outline is submitted, as it may add weight (if indirectly) to their thesis.

An otherwise fit labourer first attended hospital in the early morning, bitterly complaining of the pain in his right thumb. He had no sleep during the night because of this. On examination there was an extremely tender, fully developed distal pulp infection, for which immediate surgery was imperative. A general anaesthetic was, of course, recommended to the patient. This he firmly refused to have. Still, he was anxious to have his thumb "lanced." Pethidine 100 mg. was given intramuscularly, then the part was suitably prepared for incision and an ethyl chloride spray was applied to it. Deep bilateral incisions of the affected volar pad were greeted with no more protest than a gush of pus. There was no pain.

Obviously, treatment would have been impossible had not pethidine first been given. In the circumstances more could not have been required if morphine had been administered alternatively.—I am, etc.,

London, S.W.1.

DUNCAN D. MACDONALD.

Single Incision for Bilateral Orchidectomy

SIR.—Mr. C. J. Cellan-Jones (*Journal*, May 1, p. 1039) looks on my recommendation of the scrotal approach to the testis as humorous. He should know from our meetings in the Middle East that I am a Scotsman, and therefore humourless. The phrase he underlines to make his point, "trim or enucleate," was used to summarize all these procedures (short of removal, in which case it is not replaced in the scrotum) to which a testis may be subjected. Enucleation through a scrotal incision is the best method of castration in the treatment of prostatic cancer.

The inguinal approach to the testis is, in my view, an example of muddled post-Listerian thinking, which looked on the avoidance of "germs" as more important than the preservation of tissue resistance. This attitude was knocked out by the experience of the first world war. The tendency of surgery to-day is to favour direct approaches where they are not traumatic, and to avoid the unnecessary dislocation of areolar planes implied in such incisions as the infra-umbilical paramedian rectus-retracting approach to the appendix.

I do not seek to convince anyone. I would only say: "Don't think; try the experiment." If Mr. Cellan-Jones was unlucky with the scrotal approach 25 years ago, he might be luckier to-day. Most of the surgeons with whom I have conversed during the recent meetings of the Association of Surgeons and the American College prefer the direct to the indirect operation.—I am, etc.,

London, N.W.8.

HENEAGE OGILVIE.

Tuberculin Testing

SIR.—In regard to Dr. P. D. Mulkern's letter on the "false positive" jelly test (*Journal*, May 1, p. 1039), may I make the following observations? From experience in the general B.C.G. contact clinic, and in routine tuberculin jelly testing in residential nurseries, it was found necessary to assess the reliability of the jelly test. In a sample test the children at two residential nurseries had jelly and Mantoux tests (1/1,000 old tuberculin) at the same time. Thirty-nine children were tested, and thirty had positive jelly tests. All had negative Mantoux tests and normal chest x rays. At the one nursery, control jelly tests were done, and there was no suggestion of any reaction; it was also noted that the results were almost identical with two different makes of jelly used simultaneously on each child. The cause of positive jelly reactions in children who were Mantoux-negative (1/1,000) was not found, but the practical significance is clear. There is general acceptance that the jelly test is equivalent to the ten units Mantoux test.

It has been the practice at the B.C.G. contact clinic for suitability for vaccination of infants under 6 months old to be decided on by jelly testing. If the occurrence of these anomalous positive jelly tests is not realized, there will be failure to vaccinate these infants. It appears that vaccination of contact children may be the most effective application of B.C.G. vaccination in the reduction of childhood tuberculosis in this country. It is most important that false positive jelly tests do not result in failure to vaccinate tuberculin-negative contact children. Experience in the general clinic substantiates the occurrence of these anomalous positive jelly reactions. In this work there was no appreciable association of a positive jelly test with a stereotyped catarrhal syndrome. A report is in preparation on the suitability of the jelly test for routine use by health visitors, and on B.C.G. vaccination of anomalous jelly-positive Mantoux-negative cases.—I am, etc.,

Birmingham.

W. I. GORDON.

REFERENCE

- ¹ Lorber, J. (1953). *British Medical Journal*, 2, 1122.

Domiciliary Obstetrics

SIR.—Your own kindly criticism (*Journal*, April 10, p. 861) of my essay on domiciliary obstetrics (p. 841) doubted whether the family doctor with consultant support but no postgraduate experience could give adequate intranatal care, but you were in no doubt about his ability to do so antenatally. Mr. C. J. Dewhurst (*Journal*, May 1, p. 1037) does not agree, for, he suggests, the newly qualified practitioner will forget to take a history, will forget that previous postpartum haemorrhage is an indication for hospital delivery, will agree to the delivery of twins at home, will be uncertain of his findings on abdominal examination, cannot diagnose a breech, and will examine cases of antepartum haemorrhage vaginally. He will attempt forceps delivery although he cannot estimate cervical help. To this, Mr. D. S. Greig (p. 1038) adds that general practitioners are not alert to note the onset of pre-eclampsia, and have little regard for the presence of anaemia in pregnancy.

Some would call this exaggeration. If it is not, then it is a terrible indictment of the teaching of the future general practitioner in the obstetrical departments of our medical schools. I find it difficult to agree with Mr. Dewhurst that these simple things cannot be taught, or to believe that it

is impossible to train the future family doctor to be adequate in domiciliary obstetrics; and, as the average practice produces about 30 normal cases a year, he would have a sufficient volume of work to remain adequate if all these cases remained under his care, including those now delivered in hospital for social reasons.

If it is demanded that the general-practitioner obstetrician must have postgraduate experience, the number of cases per doctor will be high enough to perpetuate the present state in which a large part of antenatal and intranatal care has to be delegated to the midwife. This may have been good enough in the past, but improvement in the future is likely to depend on close co-operation between the midwife and a doctor. If it is not with the family doctor, then it is likely to be, eventually, with a house-surgeon when general-practitioner midwifery disappears completely. Mr. Greig's figures, showing that 80% of maternal deaths in his area followed home delivery, tend, as he says, to increase the demand for hospital delivery, and serve to stampede normal primiparae into hospital beds. He does not say whether the patients who died were suitable for home delivery, and it may be, as Jameson and Handfield-Jones¹ have suggested, that too many normal cases are delivered in specialist hospitals, and too many abnormals outside them.—I am, etc.,

Gloucester.

REFERENCE

- ¹ *Lancet*, 1954, 1, 665.

IVOR COOKSON.

Herpes Zoster and Chicken-pox

SIR.—Coexistence of herpes zoster and chicken-pox in the same patient, a further example of which was recorded by Dr. C. Spencer Whitehouse (*Journal*, May 8, p. 1097), cannot be considered excessively rare. Indeed, a search of the records of this hospital for the five years 1949-53 shows that 31 patients suffering from herpes zoster were admitted during that period, and that four patients admitted for the treatment of other diseases developed zoster at some time after admission. Of these 35 cases, 11 also developed chicken-pox, usually about 3 days, but in one case 9 days, and in another case 12 days, after the herpetic eruption. Cases of trigeminal herpes were found to be complicated by chicken-pox about twice as frequently as cases of herpes of either cervical or thoracic roots; while the ophthalmic nerve was the site of the infection in four out of five cases of trigeminal herpes complicated by chicken-pox.

Most patients in whom zoster and chicken-pox coexist are, of course, elderly persons whose immunity to chicken-pox, developed in response to infection in childhood, might be presumed to have waned with the passage of time. A precise explanation of all the well-known phenomena which seem to suggest identity, or a very close relationship between the two diseases is, one feels, most likely to be supplied by further virological studies.—I am, etc.,

London, S.E.18.

C. F. L. HILL.

Animal Technicians

SIR.—I do not wish to introduce any note of acrimony into a correspondence that has already included two rather ungracious letters (*Journal*, April 24, p. 983), and I was glad to read a considered statement from the Chairman of the Institute of Medical Laboratory Technology (*Journal*, May 22, p. 1207) repudiating the extravagance of some of the views of these correspondents. However, Mr. Norman himself invites a like rebuke to that which he offers your annotator, whose ignorance of the knowledge required by present-day technicians in hospital laboratories he deplores. Might not the same be said of Mr. Norman in regard to the work of animal technicians in a research department, who are expected to handle and understand several different species of experimental animals? Hospital laboratories deal mostly with guinea-pigs on routine diagnostic tests, although small numbers of mice, rabbits, amphibians, and other species may sometimes be used; but

outside this restricted field—restricted from the point of view of animal work—the animal technician may find himself with responsibilities different from, but no less exacting than, those of the medical laboratory technician.

Comparisons are odious, and your annotator should perhaps have kept off a discussion of differential status among workers in complementary fields; but he has been justified retrospectively by the resentment apparently caused by his comparisons. Respect of one for the other's job is more useful than quibbles about status. Dog does not eat dog.—I am, etc.,

London, N.W.3.

W. LANE-PETTER.

Folic Acid and Pernicious Anaemia

SIR.—I was interested to see Dr. C. P. Lowther's report (*Journal*, March 6, p. 564) of a case illustrating the dangers of polypharmaceutical preparations containing folic acid, and your annotation (p. 573) on the wrong use of folic acid in pernicious anaemia.

I desire to draw your attention to the following case of mine. A girl of 18 was diagnosed in 1943 to be suffering from tropical nutritional megaloblastic anaemia on adequate grounds, including bone-marrow studies. She was doing very well for the next six years on a proper diet and maintenance therapy with liver extract. During this period she bore two children. Then someone told her that there was no need to have the periodic pricks with the advent of the new remedy, folic acid, which could be taken as tablets. Six months after she gave up the liver extract and took to folic acid alone, she was admitted in my wards with well-marked subacute combined degeneration and gross sepsis in the bladder, to which she succumbed within a week of her admission.

This case would show that the danger of precipitating neurological signs exists not only in true Addisonian pernicious anaemia but also in other megaloblastic anaemias in younger persons.—I am, etc.,

Madras.

K. S. SANJIVI.

Racial and Religious Tolerance

SIR.—While sympathizing with the sentiments expressed by Dr. C. P. Seager (*Journal*, May 15, p. 1156) I can't help thinking that he does less than justice to those who imply a preference for assistants of a particular race or religion. Preference for some is different from intolerance to others. By now we all know the type of person we are likely to get on with best, and if we happen to be Badmanians with a green skin is it unreasonable that we should prefer to work with similar beings?—I am, etc.,

London, W.1.

R. G. ISAAC.

Mitral Stenosis

SIR.—Dr. Paul Wood's treatise "An Appreciation of Mitral Stenosis" (*Journal*, May 8 (p. 1051) and May 15 (p. 1113)) will long be read as a Bible by all those interested in the subject. It is not an exaggeration to say that no similar work has been done in the world. On reading the paper one becomes aware of the fact that the mass of information at the author's disposal is so large that only part of it could have been published. More time will be needed for the proper digestion of that which is still to come. In the interest of the future work I would like to submit an objection and then a comment.

It is stated that there was no single instance in which primary myocardial fault was responsible for failure in mitral stenosis, but it is not disclosed how the myocardial failure was excluded—perhaps by E.C.G. It is emphatically stated that in cases of predominantly mitral stenosis the cause of heart failure is high pulmonary resistance. A table is produced in evidence, which shows that all cases of mitral stenosis with failure did have high pulmonary resistance although mitral incompetence could go into failure without the latter. The fact that high pulmonary

resistance was present does not prove that it was the cause of failure, because it could have been a concomitant phenomenon.

My comment is on pregnancy. Dr. Wood states: "Pregnancy aggravates the symptoms and usually [my italics] causes some permanent deterioration." This statement is contradicted by Dr. Paul Wood himself, because he says that in 83 mothers 140 pregnancies were recorded (probably not personal observation) and no symptoms developed in 97 pregnancies, while symptoms appeared in 43, which gives a ratio of 2.2:1 in favour of "no symptoms," or one could say that symptoms developed only in one-third of pregnancies. Moreover, Dr. Wood says that only 17% of pregnancies precipitated permanent disabilities, and 17% cannot be called usual. The statement then should be as follows: permanent disabilities usually do not develop.

This is so if we accept all Dr. Wood's figures, but in the leading article (p. 1138) we are rightly reminded that Dr. Paul Wood's cases were selected from the rather severe groups: he then obtained probably the worst results in pregnancy. It would be interesting to know how much even of this deterioration is due to the natural progress of the disease for a period of nine months without pregnancy. The table of life history (Table III) shows that once the symptoms appeared—average age 31 years—the deterioration from one severity grade to the next can be very short, from 0 months till 6 as a minimum (without pregnancy). This would apply to pregnancies after the appearance of symptoms only.—I am, etc.,

London, S.E.11.

J. KOHARI.

Standard of Anaesthetics in Britain

SIR.—As the author of the *Daily Express* article referred to by Dr. Geoffrey Organe (*Journal*, May 29, p. 1267), I should like to say how much I regret any trouble which my report has caused, either to Mr. Dickson Wright or to the anaesthetists. I must point out, however, that I attended the meeting by invitation along with several other newspaper reporters, including at least one representative of the *American Press*, and that in my account Mr. Dickson Wright was accurately reported.

It seemed to me and to some of my colleagues that Mr. Dickson Wright's statements were not mere light-hearted asides but that he was airing a serious grievance. This was also the view of two surgeons with whom I discussed Mr. Dickson Wright's speech. I have since learned from Mr. Dickson Wright that his comments were not intended to be taken so seriously, and that he was unaware that reporters were present.

I went to much trouble to give Dr. Organe the opportunity of commenting on the speech so that his views on behalf of the Association of Anaesthetists could be given similar prominence to those of Mr. Dickson Wright. Dr. Organe could not be contacted, but I left messages for him. My statement that Dr. Organe and other anaesthetists demonstrated their machines to the visiting American surgeons was not intended to suggest that Dr. Organe was present when Mr. Dickson Wright made his remarks. I do not believe that it did, in fact, give this impression to our readers.—I am, etc.,

Lopdon, E.C.4.

CHAPMAN PINCHER.

Homosexuality

SIR.—Recently I was rung up by a daily newspaper, asking my views on the Home Secretary's proposed committee on sexual crime and prostitution. Had I not been debarred from stating them, this would have been my answer: I am in favour of the Home Secretary's proposed committee, provided that, in the considerable time before it reports, the fact of its being called into existence is not taken in the slightest degree to condone homosexuality between adult males in private. It must be remembered that the word "homosexuality" has become a euphemism

for the practice of mutual masturbation, intra-crural and intra-anal intercourse, and other less easily stated practices between males.

I am confident that the committee will report against any legalizing or tolerating of adult male homosexuality in private. Otherwise it will be faced with the prospect in any or every city of the churches, the schools, the youth movements, the university, the Services in barracks and in the nearby aerodrome, and every parent, all trying to turn out clean and decent citizens, all holding that these unnatural practices are immoral or evil or deadly sin, and filthy and just as foul by whatever name they are called, while in the midst of them there might flourish two exclusive clubs—let us call them "The Wilde" and "The Gomorrah"—legally in being, open to men "above the age of consent only," with their many private rooms, corrupting men so that each has his character changed, a corruption that has a considerable degree of permanence and is passed on to others, so that chains of homosexuality are formed which may persist for generations. No responsible body of men and women could for a moment consider the possibility of creating such a state of affairs. Non-medical speakers and writers seem to have no difficulty in finding opportunities to express their views on this important and partially medical subject in the press, in B.B.C. "Any Questions?" and in so-called "brains trusts." Surely, in fairness, I should be allowed to state mine in a medical paper.—I am, etc.,

Beckley, Rye.

C. G. LEAROYD.

Mondor's Disease

SIR.—Following on the article by Mr. G. M. Lunn and Mr. J. M. Potter on Mondor's disease (*Journal*, May 8, p. 1074) and on the letters of Mr. John Hosford and Dr. F. Harwood Stevenson (*Journal*, May 22, p. 1207), I would like to describe a similar case which came under my care very recently.

The patient, a married man aged 39, attended surgical out-patients on April 27, 1954, complaining of pain in the right pectoral area, most marked when reaching for an object above his head. The pain had been present for two months. There was no history of infection in the area, but he stated that in December (four months before) he had been using a brace and bit for several hours, drilling some very hard wood, and in order to get firm pressure he had pressed the butt of the drill on to his chest. He was not used to this sort of work, his own occupation being clerical. On examination, there was an ill-defined area of induration in the lower lateral quadrant of the right breast, some 1 in. (2.5 cm.) in diameter, and a plexiform mass of hard cords extending from the right axilla to the right costal margin.

Two weeks later he again came to the out-patients, and the area of induration had nearly gone. The mass of cords was still present. A biopsy of one of these cords was taken, and the report on the section is as follows: "A section of this portion of tissue showed that it was lined by a normal stratified squamous epithelium and the subcutaneous tissues were entirely normal apart from a deeply placed mass of tissue which suggested fibrous tissue. No lumen of a vessel or other evidence of an obliterated vessel was seen."

My thanks are due to Mr. C. F. Critchley for his permission to publish this case, and to Dr. J. Keall for his help with the pathology.—I am, etc.,

London, S.W.11.

D. M. PAUL.

A Genetic Investigation

SIR.—We are anxious to extend a genetic investigation which is at present in progress into the rare syndrome which includes hypoplastic patellae and finger-nails. One recent description of this condition is that of Hawkins and Smith.¹ If any case is known to your readers we should be most grateful for the opportunity to do further family and linkage studies.—We are, etc.,

London, W.C.1.

SYLVIA D. LAWLER.
JAMES H. RENWICK.

REFERENCE

¹ *Lancet*, 1950, 1, 803.

Obituary

Sir JAMES SPENCE, M.C., M.D., F.R.C.P.

Paediatrics has lost a leading figure and the nation a wise counsellor in the death of Sir James Spence on May 26 at the age of 62. His reputation was international, and he had made it so by hard work, clear thinking, and a happy gift of exposition which often sounded more like a fireside chat than a set lecture.

James Calvert Spence was born on March 19, 1892, the son of Magnus Spence and Isabella Turnbull, and was educated at Elmfield, York, and at the University of Durham. He graduated M.B., B.S., with honours, in 1914, just in time to enter the R.A.M.C. and serve with distinction throughout the war of 1914-18, being awarded the Military Cross and bar. An appointment at the Hospital for Sick Children, Great Ormond Street, London, followed, and this probably determined in some measure the pattern of his life, for it has been said that those who are privileged to work at this hospital are influenced by it for the rest of their lives. He then moved to St. Thomas's Hospital during 1920-2, where he held the John and Temple Research Fellowship. After this Spence went north again to become clinical pathologist and medical registrar at the Royal Victoria Infirmary, Newcastle-upon-Tyne. Biochemistry as applied to medicine was just beginning to grow, stimulated in part by Professor Hugh Maclean at St. Thomas's, under whose influence Spence had come. The scientific

discipline thereby obtained was to shape his thoughts on medical education in the years to come. Next followed a year in the U.S.A. as a Rockefeller Fellow in 1926-7, mostly spent at the Johns Hopkins Hospital, Baltimore, and a return to the staff at Newcastle as a general physician. Local controversies kept him out of special paediatric work for several years, and to some extent the Babies' Hospital there was a reply to a policy which kept a man, already gaining an international reputation, off the staff of the children's hospital. Meanwhile Spence had proceeded M.D. in 1921 and had obtained the M.R.C.P. in the same year. He was elected F.R.C.P. in 1930.

As his ideas matured Spence managed to achieve a remarkable synthesis between a scientific approach and a deeply humanistic outlook, the latter no doubt influenced by his Quaker origins. At meetings of such bodies as the Association of Physicians and of the

British Paediatric Association, of which he was an original member and in 1950-1 president, his earliest contributions on scientific work gave place later in the case of paediatrics to a more social approach. During his chairmanship of the Social and Preventive Medicine Committee of the Royal College of Physicians of London in its early days—in the second war period under Lord Moran's presidency—there developed a growing interest in social paediatrics. His election to the Chair of Child Health in the University of Durham in 1942 was in keeping with the development of ideas in children's medicine and in tune with his own position. This was the second chair in the British Isles of this kind and the forerunner of others with similar titles in almost all the medical faculties in the United Kingdom. His choice as a medical member of the Curtis Committee was welcomed, and a great deal of the report of that

committee and the subsequent legislation owed much to Spence's inspiration. He was also at this time or later a member of the medical advisory committee of the Nuffield Provincial Hospitals Trust, the Medical Research Council, the University Grants Committee, and the Central Health Services Council. In 1953 he was appointed a member of the Clinical Research Board by the Medical Research Council. The establishment of the board was one of the principal recommendations in the White Paper on "Clinical Research in Relation to the National Health Service." All this entailed much travelling, and the strain undoubtedly contributed to an illness in 1952 which necessitated a slowing down of the pace. He was greatly in demand as a lecturer, and the list of official lectureships is long, including the Bradshaw Lecture

(1940), the Charles West Lecture (1946) at the Royal College of Physicians of London, the Dawson Williams Prize and Lectureship of the British Medical Association (1949), and the Linacre Lecture at St. John's College, Cambridge (1951). Abroad equally he fulfilled his role as ambassador and lecturer. He was the Inter-State Postgraduate Lecturer in Australia in 1948, and he gave the Cutter Lecture at Harvard in 1949 and the Blackader Lectures before the Canadian Medical Association in the same year. By now he was physician to the Royal Victoria Infirmary, Newcastle-upon-Tyne, with his child health department in the grounds of the hospital, to the General Hospital, and to the Babies' Hospital in that city. There he began to experiment with the admission of mothers with their babies, and so successful was this that many visitors sought out "Sir Spence," as overseas friends called him, to see exactly what was done. His knighthood had come in



[Elliott & Fry, Ltd., London]

1950 and was a culmination of many other honours, including an honorary D.Sc. from the University of Western Australia in 1948 and an honorary LL.D. of Cincinnati. He was a member of the American Academy of Pediatrics and of the Canadian Society for Study of Diseases of Children.

James Spence—"Jim" to his intimates—had an attractive personality. His twinkling blue eyes and uncontrolled lock of hair gave him a faintly puckish appearance, which was reflected also in his talk. "Whimsical" is the adjective that was often used. It was often uncertain what way he was thinking, and indeed he was often a jump or two ahead of current thought and practice. A faint but friendly exasperation would sometimes develop among those associated with him, easily dissipated by the next conversation. He married in 1920 Kathleen, youngest daughter of Robert Downie-Leslie, of Aberdeen, and had one son and four daughters. His home life was friendly and charming for those privileged to share it. The holiday house in Grasmere among the mountains he loved to climb was a popular trip for those visiting Windermere for the British Paediatric Association, in the founding of which he played a notable part; and to him largely was due the happy choice of Windermere as a meeting-place. He moulded the development of the B.P.A., especially in its orientation towards social paediatrics in the war years, and was a wise elder statesman long after he had held office on its committees. His work for university education revealed a mind which was deeply steeped in tradition and humanitarianism. Whatever it was—the development of some medical department, the securing of adequate remuneration for junior lecturers in all the faculties—he was equally keen and well briefed by his personal investigations of the problem which over and over again demanded a scientific analysis and a solution which involved a deep concern for personal problems. Spence was an international figure as well as a national one, and he has left the whole community in his debt.

We are indebted to Sir HAROLD HIMSWORTH for the following appreciation: The death of James Spence has deprived British medicine of an influence that it could ill afford to lose; but it was an influence which was so largely personal that it is difficult to pay tribute to it so that future generations will understand the esteem in which he was held by his contemporaries. There are some men—the majority—who achieve eminence by building some part of the factual structure of knowledge. There are others—the architects of knowledge—who give shape to particular concepts. Both leave contributions which are evident not only to their contemporaries but to their successors. But there are yet others—a few—whose contributions lie in appreciating needs and creating the climate of opinion in which these can be translated into realizable concepts. Their influence is to be measured not in terms of the factual contributions which survive them but in the value that was placed on their advice during their lifetime. To a certain extent no man can achieve eminence in his profession without contributing in each of these ways. James Spence made his own contributions to factual knowledge. In his work for child health he developed his concept of the particular field of medicine in which he was interested. But it is probable that it was in his contribution to professional thought, of the form and shape which medicine should take to meet the needs of its own development and the society which it serves, that his influence was most pervasive and profound.

At the time of his death James Spence was serving for a second period on the Medical Research Council. That in itself was an indication of the regard in which his advice was held. He attended his last Council meeting on April 23.

His advice on detail was as valuable as ever; but it was typical of him that, ill as he was, his main concern was to ventilate a problem broader even than medicine itself. He was concerned with the whole question of the relationship of scientific knowledge to the intellectual development of our society, not in any vague or sentimental sense, but as it expressed itself in the concrete problem of integrating the effort of the scientific organizations of government with that of the universities. It was this ability to appreciate the larger significance of the drift of events, and to arrest the attention of those who might influence them, that gave his advice its peculiar value. Not that he was proved always to be right. No man who attempted to foresee distant developments could hope to be. But his opinions were never negligible and, more often than not, showed a grasp that seemed almost inspired.

Foresight of this range is a talent which, in general, men appreciate only in retrospect. At the time it is seldom welcome. Perhaps the greatest tribute that can be paid to Spence as a man is that his contemporaries were prepared to heed him and yet still held him in affection. If his character had been different, he might so easily have followed the commoner lot of the imaginative and become a mere rebel. He had, however, a fundamental generosity of temperament which conditioned his attitude to others and their response to him. This, combined with a very characteristic whimsical charm, endeared him even to those with whom he was in most disagreement. To juniors he was an inspiration. His curiosity was ever alive, and he retained the capacity to see the fascination of the ordinary. But he never forgot the man behind the work; and there must be many who remember the appreciative aside which showed that the true measure of their achievement had not been overlooked. To both contemporaries and juniors alike, he was a very stimulating, very human, and most engaging colleague.

C. W. FORSYTH, M.D.

Dr. C. W. Forsyth, formerly medical superintendent of Winson Green Hospital, Birmingham, died suddenly at Capetown on May 16 while on a visit to his son. He was 77 years of age.

Charles Wesley Forsyth was born on June 28, 1876, and was educated at Owens College, Manchester, and at University College Hospital, London, where he had a distinguished career as a student. He graduated M.B., with first-class honours in anatomy, from London University in 1903, having taken the diplomas of M.R.C.S., L.R.C.P. in the previous year.

His early years were devoted to general practice, but he eventually became interested in psychiatry, and after serving in various hospitals of the London County Council proceeded to the M.D. (in mental diseases) in 1919. In the same year he was appointed deputy medical superintendent of Hollymoor Hospital, Northfield, Birmingham, and in that post was able to develop his undoubted clinical ability to the full. These qualities led to his promotion to the position of medical superintendent of Winson Green Hospital, an appointment he held until his retirement through ill-health in 1938.

On the academic side, too, Dr. Forsyth had a distinguished career, being lecturer, clinical lecturer, and examiner in psychological medicine at Birmingham University from 1932 until his retirement. The years covered by his tenure of office at Winson Green saw a steady development of the active treatment of mental illness, and alongside this, and indeed arising from it, an extensive programme of modernization of the hospital. In the inception of that programme Dr. Forsyth was personally responsible, and it constitutes a memorial to his energy and enthusiasm.

Aside from his purely medical interests his principal hobbies were gardening and cricket. Evidence of the former is to be seen in the layout of the hospital grounds, which are in striking contrast to the industrial surroundings; while as a keen cricketer he was responsible for the recruitment to the hospital staff of many sportsmen who later, under his guidance and tuition, became equally competent male nurses. Dr. Forsyth leaves a widow and a son, to whom we extend our sympathy in their loss.—J. J. O'R.

W. J. WILSON, M.D., D.Sc., LL.D., D.P.H.

By the death on May 6 of Professor W. J. Wilson, emeritus professor of public health in Queen's University, the Belfast Medical School has lost one of those who played an important part in its growth and development. He was 74 years of age.

Born at Straid Mills, Co. Antrim, on August 23, 1879, William James Wilson was educated at the Royal Belfast Academical Institution and at Queen's College, Belfast, then a constituent college of the former Royal University of Ireland, and there he had a brilliant career. He won the Henry Hutchinson Stewart Scholarship in anatomy and physiology of the University for 1901–2, graduating B.A. with first-class honours in the latter year. He secured first place in the final M.B., B.Ch. examination in 1905, again passing with honours, and two years later he proceeded to the M.D., gaining a gold medal for his thesis. In 1906 he obtained the Cambridge D.P.H. and won the studentship in pathology and bacteriology of the Royal University of Ireland, and four years later he took the degree of D.Sc. of Queen's University. Earlier, while at Queen's College, he won the senior scholarship in chemistry in 1902 and the Dunville Studentship in the following year.

After a period of postgraduate study in Berlin, Wilson returned to Queen's as Riddell demonstrator in pathology and joint lecturer in sanitary science, and it was in the latter subject that he made his greatest contribution to the University and to medicine in general. Under his guidance his joint lectureship grew into an independent department of public health, and in 1921 he was appointed to a chair in the subject. He retired from the chair in 1948 and was appointed emeritus professor; later, the honorary degree of LL.D. of Queen's University was conferred upon him.

Wilson early became interested in the improvement of bacteriological culture media, and before the first world war he made several contributions in that field. In this period, too, he described the presence of antibodies in the blood of patients with typhus fever, which had the power to agglutinate some coliform organisms, and thus paved the way for the development of the Weil-Felix reaction. After the war he continued his search for selective culture media, and with Dr. E. M. McV. Blair eventually developed the Wilson-Blair glucose-sulphite-iron-bismuth-brilliant green medium in the examination of sewage for the presence of *Salm. typhi*, a method which has proved itself of such value in public health bacteriology. In the first world war he served with the R.A.M.C. with the rank of major and continued his bacteriological studies. From 1914 to 1917 he was specialist sanitary officer and inspector of tetanus for the Belfast military district. He was one of the first to describe Zenker's hyaline degeneration in the muscles in the influenza epidemic of 1918. On returning to civilian life he was

appointed bacteriologist to several public authorities and took over the care of the water supply of Belfast, in addition to his university duties. Through such appointments he gave much service to the community at large.

Busy as he was on routine work, Wilson continued his interest in research. He also gave freely of his time to administrative matters. From 1928 to 1943 he was Dean of the Faculty of Medicine, and in that position was concerned with the welfare of the medical school in the early years of the last war. Many graduates and students owe him a deep debt of gratitude for his wise guidance in time of trouble and for his amiable interpretation of rules and regulations. A member of the British Medical Association for 48 years, he acted as one of the honorary secretaries of the Section of Pathology when the Association held its Annual Meeting at Belfast in 1909; at the Nottingham Meeting in 1926 he served as a vice-president of the Section of Public Health; and at Belfast in 1937 he was president of the Section of Hygiene and Public Health. He was also president of the Ulster Medical Society in 1934–5, and from 1942 to 1945 he represented Queen's University on the General Medical Council. He was appointed a member of the University Senate, and for over 20 years was a governor of his old school, being elected chairman of the board in 1942. When the Northern Ireland Tuberculosis Act was passed in 1946 he became a member of the Tuberculosis Authority.

As the years passed, "W. J.," as he was familiarly known, became more and more a character identifying in himself the Faculty. Though a quiet man, he could be roused to battle on behalf of his medical flock and through sheer persistency accomplished much for all. By his personality, hard work, and unity of purpose he has left his name deeply engraved on the annals of the University and on the medical life of Northern Ireland. He leaves a widow, a daughter, and three sons, who are members of the medical profession.

The death of Dr. DOUGLAS J. NICOL on May 8 at the age of 59, after a long period of ill-health, has deprived Birmingham of a much-loved general practitioner and the St. John Ambulance Brigade of one of its most distinguished surgeons. Douglas John Nicol was born in Glasgow. The first world war interrupted his medical studies at Glasgow University and he served as a captain in the Highland Light Infantry from 1914 to 1917, being awarded the Military Cross. He then returned to Glasgow University, where he graduated M.B., Ch.B. in 1919. After holding the appointments of house-physician and house-surgeon at the Royal Southern Hospital, Liverpool, he settled in practice in Birmingham, where he spent the rest of his life. His war-time experiences having shown him the great importance of skilled first aid to the wounded, he joined the St. John Ambulance Brigade as a divisional surgeon in 1923, being promoted corps surgeon in 1938 and county surgeon three years later. He did outstanding work as an instructor in first aid to the police and fire brigade, and later he advised the British Electricity Authority and other nationalized industries on first-aid training. It was indeed as a teacher of first aid that Nicol made his greatest contribution. He was one of the pioneers of the new spirit of realism in first-aid competitions in which "patients" were not only made up to represent the actual injuries from which they were supposed to be suffering, but were also trained by him to behave as though they really were injured. The effect on first-aid teams was unmistakable, and the value of the experience gained was shown in their greatly improved approach when actually called upon to deal with an accident. This encouraged

Nicol to extend the realism to the basic first-aid training in the "black book." He devised a series of what he termed "little cases," and these, carefully prepared and admirably demonstrated, served to teach the essential do's and don'ts of first-aid. Candidates were often nervous of meeting him, but they realized that to be examined and passed by Nicol was to be indeed an efficient first-aid. He demonstrated his methods to many hundreds of St. John surgeons and lay members all over the country. As a visiting industrial medical officer Nicol realized the great importance of the provision of efficient first-aid training to the responsible persons in charge of first-aid boxes in the thousands of small factories in Birmingham, and during his years as chairman of the St. John Ambulance Association in that city he had the joy of seeing hundreds of men and women so trained and to receive the valuable support of the public health department, the Birmingham Accident Hospital, the Factory Department, and many industrialists. For these services he was promoted Commander of the Order of St. John, an honour rarely given to anyone below the rank of county commissioner. A somewhat shy and dour manner hid a kind and understanding heart, for one had only to hear his patients praise him to realize what a tower of strength he was to them in their times of serious illness and anxiety. He had a very high professional standard and never allowed his outside activities to encroach upon his practice. Dr. Nicol leaves a widow, who is the St. John County (Nursing) Superintendent for Birmingham and who ably assisted him in all his work, a daughter, and two sons, one of whom is following his father's profession.—J. G. B.

Medical Notes in Parliament

HOSPITAL JUNIOR MEDICAL STAFF

Dr. A. D. D. BROUGHTON (Batley and Morley, Lab.) discussed the shortage of resident medical staff in hospitals in the House of Commons on May 28. He asked what were the reasons for the shortage of junior medical staff in the smaller hospitals. The main factor, he thought, was that those seeking hospital appointments preferred the larger hospitals because there they gained a wider clinical experience; another factor was that in the larger hospitals they worked as members of a team. The second choice of applicants was for the most pleasant parts of the country, such as seaside resorts. Applicants went either for rich experience or a good holiday. Who could blame them, since the salary was the same in all hospitals? The salary itself was an important factor, for junior appointments in hospitals were less profitable than national service in the R.A.M.C. and in strong contrast with assistantship in general practice.

Dr. Broughton also suggested that the recent substantial increase in the number of actions for negligence brought against junior house staff was having an effect in deterring recently qualified men and women from undertaking duties which exposed them to the danger of such charges. Would the Minister consider allowing beds to be used for patients under the care of the general practitioners?

Miss PAT HORNSBY-SMITH, the Parliamentary Secretary, replied that various methods had been tried during the past two years, and some progress had been made, but the causes were very deep, and were not capable of immediate solution. The two main features were supply and demand on the one hand and fair distribution of the available staff on the other. The supply of junior hospital staff fell short of the maximum establishment by something under 10%. The check on establishment had meant that, while the teaching and large hospitals had no difficulty in getting staff, there was a trickle to the more needy and in some ways less attractive hospitals. The priority needs of the small hospitals, it was felt, should come first, and this policy had already brought results.

The most difficult problem was in distribution, and it was particularly felt at the peripheral hospitals, especially those

dealing with a narrow range of work. The cause was not any decrease in supply, but a substantial increase in demand, often due to the upgrading of the smaller local hospitals with additional specialties. From the record of claims in the Ministry they had no evidence that claims for damages arose more particularly in respect of the peripheral hospital than elsewhere.

It was not practicable to increase the number of qualified doctors. There were about 2,000 a year. The number of probable vacancies in "career" posts appeared to be fairly well balanced in relation to intake, which a little while ago was a source of great concern. They could not reduce the number of doctors called up; apart from the undesirability of treating doctors exceptionally, the Services could not do without them. The most hopeful lines were to encourage general practitioners to work in hospitals, and to encourage men returning from national service to enter the hospitals for a period rather than go straight into general practice. The additional payment of £50 a year for house officer posts that were difficult to fill had not been found an efficacious method—it tended to "blacklist" a hospital; and the Ministry looked with considerable reserve on the idea of incentive pay for what should be a comparable job, and also on any suggestion that posts should be graded above their true worth.

Hospital Resident Officers

Dr. A. D. D. BROUGHTON (Batley and Morley, Lab.) asked the Minister of Health what was the total number of resident medical officers in hospitals in England and Wales, and how far this was below the establishment figure. Mr. IAIN MACLEOD, replying on May 26, said the information was not available in that form, but at the end of 1953 there were in the hospitals the whole-time equivalent of 7,815 medical officers other than specialists and senior registrars, compared with an establishment in December, 1952, of 8,499.

Dr. BROUGHTON also asked what means were available to regional hospital boards and hospital management committees for filling vacancies in the resident medical staffs of hospitals. Mr. MACLEOD said that the usual method was advertisement in the medical press, supplemented as necessary by direct contact with medical schools and other appropriate bodies and persons.

Pay in the R.A.M.C.

Dr. A. D. D. BROUGHTON (Batley and Morley, Lab.) asked the Secretary of State for War on May 25 what was the rank and the pay of a registered medical practitioner on joining the Royal Army Medical Corps for the period of national service, and after one year's service; and how far it was possible for a medical officer to hold higher, acting rank, with pay, during the period of national service. Mr. A. HEAD stated that a doctor was commissioned in the rank of lieutenant and got basic pay of £401 a year. After one year he was promoted captain and got £511 a year, and after a further six months £593 a year. He might get temporary promotion to the rank of major, and there were 20 National Service officers holding this rank: the basic pay was £785 a year in the first 18 months' service and £912 a year in the last six months. In addition to basic pay, marriage allowance of £117 a year for an officer under 25 and £228 a year if he was older, and specialist pay of £73 a year, were paid where appropriate.

Dr. BROUGHTON also asked what was the annual cost to the War Office of advertising to invite applicants for commissions in the R.A.M.C. Mr. HEAD said that up to last year advertising was mainly for specialists and the yearly cost was under £300. Last year just under £1,000 was spent on special publicity for the new terms of service of officers of this corps.

Cost of Training Students

Dr. A. D. D. BROUGHTON (Batley and Morley, Lab.) asked the Minister of Education on May 24 what was the annual

cost to her department for the education and training of medical students in the medical schools of England and Wales. Miss FLORENCE HORSBROUGH stated that the number of students taking medical courses in the current academic year with grants from the department was 1,948, of whom 1,121 held State scholarships and 827 held awards under the Further Education and Training Scheme. She estimated the cost in fees and maintenance for the year at approximately £574,000. In addition, the department admitted for grant the expenditure of local education authorities on making awards to students taking medical courses; but the returns of the authorities did not enable her to isolate this expenditure from their other expenditure on awards.

Tracing Trichinosis

Mrs. ELIZABETH BRADDOCK (Liverpool, Exchange, Lab.) asked the Minister of Food if he was aware that, in the outbreak of trichinosis in Liverpool recently, it was found to be impossible to trace the infected pig beyond the abattoir; and, in view of the serious infection which could be caused, what steps he was taking to have complete records of the movement of pigs available to medical officers of health responsible for tracing infections. Dr. CHARLES HILL, the Parliamentary Secretary, replied on May 26 that the movement of pigs was subject to the provisions of the Movement of Animals (Records) Order, 1925, which required records of movements to be kept in a prescribed form; this order was enforced by the local authorities responsible under the Diseases of Animals Act, 1950, and the records should be available to medical officers and others when tracing infections. He also said that he shared the concern about the Liverpool outbreak. In only two of the 89 cases was the infection traced to pork, and in those cases difficulty was experienced in tracing the infected pig back to the piggery. He was looking into those cases. In the remaining cases the infection came from sausages, and it was extremely difficult in a large sausage-factory to trace a carcass.

Television Advertising

In the resumed debate in committee on the Television Bill on May 31 Dr. EDITH SUMMERSKILL (Fulham, West, Lab.) moved an amendment to prohibit the advertisement of articles recommended as medicines. She said the purpose was to protect a small section of the community against the glib patter of the salesmen who represented the drug firms. An unscrupulous advertiser might play upon their fears with some worthless preparation.

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) said that the societies and associations in the medical profession would soon be creating an unholy row if doctors found their time was being wasted in having to explain to patients that these preparations were not as good as they were said to be, or that doctors could not prescribe them.

Mr. L. D. GAMMANS (Assistant Postmaster-General) said that all would agree with the spirit behind the amendment, but the authority already had sufficient powers. The standards laid down by the advertising bodies were very rigorous, and the advertising interests had volunteered to set up an advisory committee. The B.M.A. had volunteered to nominate representatives to sit on the committee. This method would provide a most effective safeguard against abuse.

The amendment was withdrawn.

Medico-Legal

ACTION AGAINST GENERAL PRACTITIONER FAILS

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On May 14, 1954, Mr. Justice Cassels gave judgment for the defendant, Dr. R. K. R. Henry, in an action brought against him by Mr. F. Sadler alleging that the death of his daughter, Kathleen Sadler, was due to Dr. Henry's negligence. Kathleen Sadler, a single woman aged 26, had died on April 27, 1952, from acute meningitis due to suppurative

otitis media, and the plaintiff's case was that Dr. Henry had been negligent in failing to diagnose otitis media or treat her for it; to recognize the symptoms of meningitis; to pay attention to a swelling behind the right ear; to examine the retinae; to consider or advise operative treatment or the administration of penicillin; or to send her to hospital until too late to save her life.

On Thursday, April 24, at about 10.45 p.m. Miss Sadler, who a day or two before had had a cut in her arm sutured at Barnet Hospital but was otherwise in good health, complained to her fiancé of pain in her right ear. In December, 1950, she had had wax syringed from her ears but otherwise had no previous history of ear trouble. Next day she complained to her fiancé of pain and told him she had been up all night. Between 9 and 10 a.m. she went to see Dr. Henry at his surgery, gave a history of having had a cold earlier, and complained of earache. Dr. Henry examined her ear with an auriscope, took her temperature, which was 99° F. (37.2° C.), looked and felt behind her ear, and saw partial inflammation of the right eardrum. He saw no discharge or sign of perforation, diagnosed "catarrhal drum," and prescribed drops to relieve the pain and a sedative. He told her to see him again after the weekend but if the condition did not resolve within 24 hours to call and tell him.

That evening she was restless and in pain from her ear, which discharged blood and pus, and she vomited during the night. On Saturday morning Dr. Henry was called, and saw her at about 11 a.m. He removed the stitches from her arm. He was told she had had a headache and some vomiting, and that she had "rushing noises like the sea" in her head. He again examined her ear through the auriscope and thought it slightly improved. He saw no discharge nor bulge at the drum nor perforation, and was not told that there had been a discharge. She seemed worried about her arm and he ascribed the vomiting to her nervous condition. He saw no indication of suppurative otitis, nor anything such as neck rigidity to indicate meningitis. Her temperature was still 99° F. and she talked rationally. He ordered glucose and codeine tablets.

On Sunday morning she vomited back a cup of tea, and there was discharge from her ear and some nose bleeding, but she said she felt better. At 12.15 p.m. she asked for the curtains to be drawn because she did not like the light. At 2 p.m. she vomited again and complained of her head. At 3 p.m. she complained of loss of use of her legs, and that her fingers felt funny. At 6.30 p.m. Dr. Henry called and made a thorough examination. He found her ear clean and that she could move her legs, and he could find nothing clinically wrong. Her temperature was again 99° F. and she was worried and emotional. He saw no signs of irrationality, no discharge from the ear, no perforation of the drum, no swelling, and no rigidity of the neck. He thought she had acute hysteria, and recommended her family not to fuss her.

At 8.45 she became irrational and Dr. Henry, communicated with by telephone, arranged for her admission to hospital. At 11.50 p.m. she died, almost immediately after admission.

At necropsy the mastoid cells were found to be full of pus. The eardrum had a small perforation at the back of a diameter of 1/32 in. (0.8 mm.), and the tegmen tympani had become eroded and was perforated by a hole 1/16 in. (1.6 mm.) in diameter resulting in fulminating meningitis, giving rise in turn to uncus herniation, which was the immediate cause of death.

The principal complaint against Dr. Henry put forward by the expert witness, Mr. T. E. A. Stowell, called for the plaintiff, was that on the Saturday he ought to have used an ophthalmoscope, and would then have seen early changes of optic neuritis, indicating meningitis; and that while neck rigidity may not have been present on Saturday morning it must have been by the afternoon. He conceded that on Saturday morning the usual symptoms of otitis media and meningitis were probably masked.

The expert witnesses called for the defence were Mr. Terence Cawthorne, Dr. Denis Williams, Dr. A. H. Douthwaite, and Dr. J. C. Gregory, a general practitioner. The defence's evidence was that the condition found at necropsy was consistent with no neck rigidity whatsoever

before death, and that there were no signs or symptoms present early enough to enable a reasonably careful doctor to take action to prevent death. Fatal brain infections could occur with no warning signs or symptoms at all.

Mr. Justice Cassels found that there were no signs or symptoms which could reasonably have led Dr. Henry to suspect localized meningitis. His diagnosis of hysteria was as it turned out a mistake, but one which others might well have made in the circumstances. He therefore gave judgment for the defendant, saying that Dr. Henry impressed him as a careful general practitioner who had failed in the difficult circumstances of the case to diagnose the real condition, which the necropsy disclosed. That did not prove him negligent, and he was entitled to return to his practice with a clear conscience.

The Medical Defence Union instructed Messrs. Hempsons to act for Dr. Henry. The defendant's costs of the action, which lasted 13 days, were about £3,500, but the M.D.U. was unable to recover them because the plaintiff was without means and had brought the case under the free legal aid scheme.

Vital Statistics

Week Ending May 22

The notifications of infectious diseases during the week included pneumonia 520, scarlet fever 832, whooping-cough 2,419, diphtheria 22, measles 1,940, dysentery 1,104, acute poliomyelitis 25, paratyphoid fever 4, and typhoid fever 3.

Infectious Diseases

In England and Wales during the week ending May 15 the largest variations in the number of notifications were increases of 279 for whooping-cough, from 2,381 to 2,660, 179 for scarlet fever, from 719 to 898, and 83 for dysentery, from 948 to 1,031.

The largest rises in the trends of whooping-cough were 59 in Lancashire, from 219 to 278, 47 in Warwickshire, from 122 to 169, and 45 in Yorkshire West Riding, from 156 to 201. A small rise in the incidence of scarlet fever occurred throughout the country; the largest was 39 in Lancashire, from 91 to 130. 1,706 cases of measles, 28 fewer than in the preceding week, were notified. The only variations of any size in the local trends of measles were a fall of 57 in Staffordshire, from 195 to 138, and a rise of 56 in Lancashire, from 355 to 411. 9 cases of diphtheria were notified, being the same as the record low level of the preceding week. 3 cases were notified in Lancashire and 3 in Warwickshire, Birmingham C.B. 4 of the 7 cases of paratyphoid fever were notified in Staffordshire, Burton-on-Trent C.B.

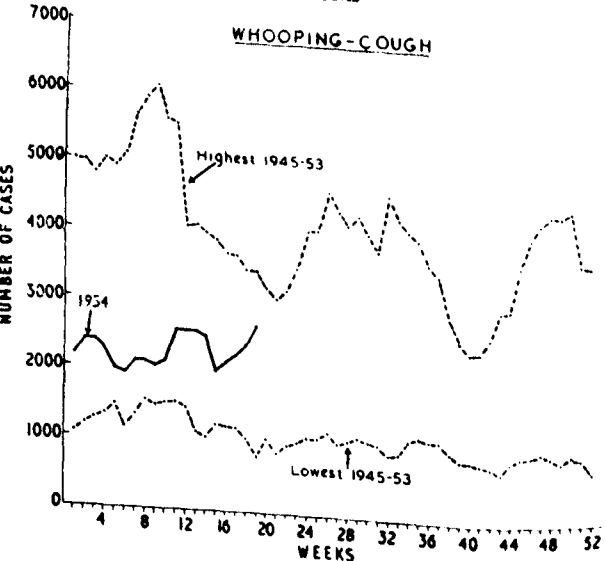
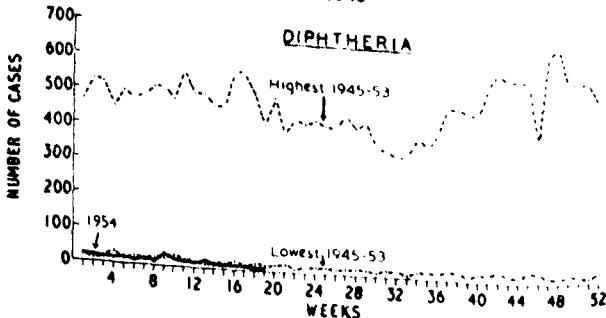
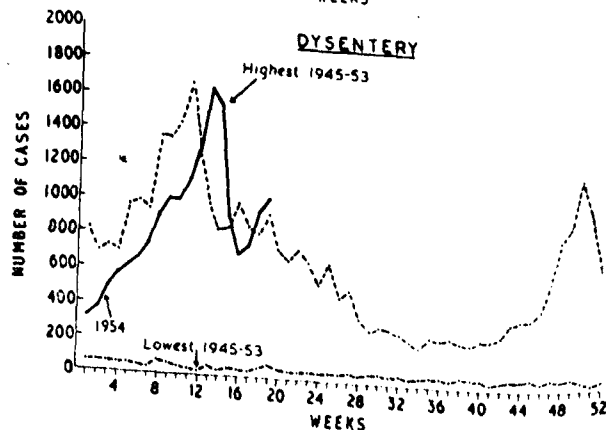
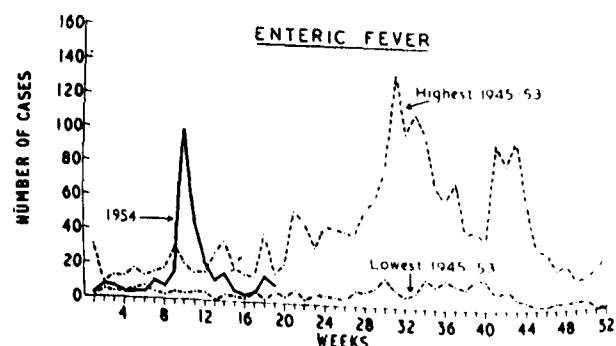
19 cases of acute poliomyelitis were notified. These were 1 fewer for paralytic and 3 fewer for non-paralytic cases than in the preceding week. 4 cases occurred in Essex and 2 cases in Gloucestershire, Staffordshire, Lancashire, and Yorkshire West Riding.

The largest rises in the number of notifications of dysentery were 59 in Yorkshire West Riding and 46 in London. The largest returns were Lancashire 272 (Stretford M.B. 54, Irlam U.D. 37, Rawtenstall M.B. 24, Bolton C.B. 21, Liverpool C.B. 20, Salford C.B. 18, Swinton and Pendlebury M.B. 16, Eccles M.B. 14, Manchester C.B. 13, Denton U.D. 12), Yorkshire West Riding 177 (Dewsbury C.B. 59, Sheffield C.B. 45, Baildon U.D. 10), London 153 (Islington 38, Lewisham 23, Deptford 10), Leicestershire 49 (Leicester C.B. 45), Sussex 38 (Uckfield R.D. 19, Brighton C.B. 16), Middlesex 33, Cheshire 33 (Ellesmere Port U.D. 21), Warwickshire 29 (Birmingham C.B. 14), Nottinghamshire 28 (Beeston and Stapleford U.D. 15), Staffordshire 26, and Gloucestershire 22 (Bristol C.B. 21).

In Scotland the notifications of dysentery rose from 311 to 335. The largest returns were Glasgow 226, Lanark county 20, Dundee 19, and Edinburgh 17.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus -----. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 15 (No. 19) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	9	0	4	1	2	17	1	12	0	3
Dysentery ..	1,031	153	335	6	1	736	119			9
Encephalitis, acute ..	5	0	0	0		4	0	1	0	
Enteric fever: Typhoid ..	3	1	0	0	0	2	0	0	1	
Paratyphoid ..	7	0	1	0	0	11	2	1(B)	0	
Food-poisoning ..	240	22		0		234	21		0	
Infective enteritis or diarrhoea under 2 years ..				8	20				19	17
Measles*	1,706	58	169	121	332	10,034	305	492	355	245
Meningococcal infection ..	35	5	15	0	1	43	3	11	1	
Ophthalmia neonatorum ..	29	4	12	0		47	7	10	1	
Pneumonia†	463	35	196	5	2	515	29	192	7	4
Poliomyelitis, acute: Paralytic ..	14	0	1	2	1	25	5	1	0	3
Non-paralytic ..	5	1				11	1		6	
Puerperal fever‡	258	43	14	1		254	15		6	1
Scarlet fever ..	898	54	110	32	43	1,286	68	174	30	62
Tuberculosis: Respiratory ..	816	91	170	21				165	33	
Non-respiratory ..	118	6	26	3				39	5	
Whooping-cough ..	2,660	85	308	47	39	3,312	244	480	50	153

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0	0	0	0	0	0	0	0	0
Encephalitis, acute ..		0	0	0	0		0	0	0	0
Enteric fever ..	0	0	0	0	0	0	0	0	0	0
Infective enteritis or diarrhoea under 2 years ..	9	0	1	1	0	9	0	0	1	3
Influenza ..	10	2	0	2	0	10	2	0	0	3
Measles ..	0	0	0	0	0	0	1	1	1	1
Meningococcal infection ..		0	0				0	0		
Pneumonia ..	200	41	25	19	9	209	17	9	11	6
Poliomyelitis, acute ..	0	0	0	0	0	1	0			0
Scarlet fever ..	0	0	0	0	0	0	0			0
Tuberculosis: Respiratory ..	86	11	13	2	9	100	14	16	1	7
Non-respiratory ..			1	0	2		1	1	0	6
Whooping-cough ..	2	0	0	1	0	1	0	1	0	0
Deaths 0-1 year ..	249	28	30	8	17	220	23	30	5	15
Deaths (excluding stillbirths) ..	5,441	755	637	139	180	4,861	677	526	102	203
LIVE BIRTHS ..	8,016	1216	962	235	445	8,411	1257	932	235	462
STILLBIRTHS ..	207	21	24			205	25	17		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
‡ Includes puerperal pyrexia.

Medical News

Opening of New Institute of Urology.—The new building of the Institute of Urology in Henrietta Street, Covent Garden, just opposite St. Peter's Hospital, was opened by Viscount WAVERLEY on June 1. The Institute is an adapted house dating back to Caroline days. It now contains a museum and lecture room, laboratories, library and reading-room, a photographic studio, and a records department. Viscount Waverley said that the inauguration of these premises was an important step towards realizing the conditions which must be fulfilled if the Institute were to remain a recognized unit of the Postgraduate Medical Federation. The ideal arrangement would be proximity to a large teaching hospital, but that was unattainable at present. St. Peter's, which had engaged in postgraduate training of urological surgeons as long ago as 1860, and St. Paul's which had taken a share in this work since 1928, were fairly close together, and the Ministry had also given ward accommodation at St. Philip's. The Institute now had available 138 beds in three separate buildings within easy reach. This should make possible the fundamental researches on which the Institute must rely to attract young workers interested in the academic aspects of urology.

New Chairman of W.H.O. Executive Board.—Dr. HENRY VAN ZILE HYDE, chief of the Division of International Health of the United States Public Health Service, has been elected chairman of the World Health Organization executive board for the coming year. He succeeds Dr. Melville Mackenzie. Dr. Hyde was born in Syracuse, New York, in 1906, and studied medicine at Yale and Johns Hopkins. Before turning to public health he was for several years in private practice. During the last world war he served in the Middle East, and subsequently was in charge of six U.N.R.R.A. refugee camps in that region. In 1945 he was appointed assistant chief of the Health Branch of the U.S. Department of State, and since then has been engaged in various capacities in international health affairs.

Westminster Hospital.—The old students dinner of the Westminster Hospital and Medical School was held at Grosvenor House on May 28 with Mr. A. GOODWIN, F.R.C.S., in the chair. In proposing the health of the hospital and the medical school Mr. Goodwin referred to the great loss sustained by the hospital in the untimely death of Dr. J. L. Lovibond. In giving the toast "The Guests," Dr. G. GARMAN, in a refreshingly witty speech, illustrated how a psychiatrist should tackle this familiar theme. Sir JOHN CHARLES responded. Mr. A. C. H. BELL, F.R.C.S., proposing the health of the chairman, said that he would always be remembered with deep affection by his colleagues; Mr. Goodwin was a great teacher and a first-class surgeon, and they all regretted his approaching retirement from the hospital staff. In his reply Mr. GOODWIN entertained the company with his reminiscences as a big-game hunter.

Clinical Research Unit at Glasgow.—The Secretary of State for Scotland, Mr. JAMES STUART, opened a new building at the Western Infirmary, Glasgow, for the Medical Research Council's clinical chemotherapeutic research unit. He described the building, which cost £50,000 and was paid for by the Western Regional Hospital Board for Scotland, as the first specially designed research unit to be built in Scotland since the war. The clinical chemotherapeutic research unit was established in 1946, under its present director, Dr. James Reid, and has been concerned mainly with the development and investigation of drugs for the treatment of rheumatic disorders. Until recently the unit was housed at the Gairdner Institute of Medicine. Other speakers at the opening ceremony included Sir HAROLD HIMSWORTH, secretary of the Medical Research Council, Sir HECTOR HETHERINGTON, principal of Glasgow University, Sir ALEXANDER MACGREGOR, chairman of the Western Regional Hospital Board, and Dr. REID.

Scottish Research Committee.—The following new appointments have been made by the Secretary of State for Scotland to his Advisory Committee on Medical Research: Professor R. W. B. ELLIS, Department of Child Life and Health, University of Edinburgh; Professor R. J. KELLAR, Department of Obstetrics and Gynaecology, University of Edinburgh; Professor R. B. HUNTER, Department of Materia Medica, University of St. Andrews; Professor W. M. MILLAR, Department of Mental Health, Aberdeen University; Professor C. M. YONGE, F.R.S., Department of Zoology, University of Glasgow. The chairman of the committee is Sir EDWARD APPLETON, F.R.S. They advise the Secretary of State on the initiation, direction, co-ordination, and conduct of medical research.

District Nursing in London.—Sir ZACHARY COPE was elected chairman of the Central Council for District Nursing in London at the annual meeting at County Hall on May 27. There had been great changes, he said, in the nurse's position during the last 50 years—changes in training, accommodation, remuneration (5s. to 10s. a week was the salary in 1905), and status. The changes were still continuing. Possibly the work of the district nurse had changed less than that of other branches of the profession, because, while the hospital nurse was to a certain extent tending to become more administrative, the district nurse was still primarily engaged in the actual nursing of the sick. She was closer to the patient than any other class of nurse, and often had to be the adviser, confidante, and friend as well. She was the "general practitioner of the nursing world." It was very necessary, continued Sir Zachary, that there should be more integration of the nursing services of the country, so that patients leaving hospital could receive proper care and attention, while the use of hospital beds for some patients who could quite well be nursed at home would be saved. Too often after patients left hospital their condition deteriorated owing to lack of aftercare.

Conference of Prison Medical Officers.—The annual conference of prison medical officers and psychologists was held at the Home Office on May 28. Dr. H. K. SNELL, Director of Medical Services, Prison Commission, was in the chair. Dr. D. S. MACPHAIL and Dr. R. C. SIMPSON, visiting psychotherapists at Wormwood Scrubs Prison, spoke on "Psychotherapy in Prison and Advances made in Group Treatment." In the afternoon Dr. A. A. S. McDONALD, Medical Officer, H.M. Prison Parkhurst, and Dr. M. R. P. WILLIAMS, Medical Officer, H.M. Prisons Bristol and Leyhill, read papers on "Some Medical Aspects of Long-term Imprisonment." The papers were followed by discussions. On May 29 the psychologists held a separate session.

Treponematoses Award.—An international award to honour outstanding workers in the field of venereal diseases and non-venereal treponematoses is planned. It will be administered by the W.H.O. and will consist of a bronze medal and a scroll. Individuals and organizations are invited to contribute. Cheques should be made payable to "The International Treponematoses Award Fund," and sent to Dr. R. R. WILLCOX, St. Mary's Hospital, London, W.2.

Colyer Medal.—Last year the Faculty of Dental Surgery of the Royal College of Surgeons instituted a medal for outstanding work in dentistry, in honour of Sir FRANK COLYER. The first award of the medal will be made to Sir WILLIAM KELSEY FRY at the annual meeting of the Faculty on July 16, for his work on maxillo-facial surgery.

Naval Awards.—Surgeon Commander D. D. STEELE-PERKINS, R.N., has been appointed C.V.O. and Surgeon Lieutenant-Commander A. P. M. NICOL, R.N., has been appointed M.V.O. (5th Class). These medical officers held appointments in the *Briannia* and the *Gothic* during the recent royal tour.

Medical Golfing Society.—At the summer meeting on May 27 Dr. A. J. MAY won the Lancet Cup with a score of 73. Dr. LESLIE HARTLEY was the winner of the Henry Morris Cup, 4 up.

Professor L. J. Witts, of Oxford University, has been elected an honorary member of the Danish Society of Internal Medicine and of the Association of American Physicians.

Dr. J. Greenwood Wilson, medical officer of health of Cardiff, has been appointed chairman of the Royal Sanitary Institute's standing committee on the hygiene of food.

Dr. J. L. A. Groat, honorary lecturer in radiology at Sheffield University, is to receive the honorary degree of M.D. from the University on July 3.

COMING EVENTS

Commonwealth Tuberculosis Problems.—The N.A.P.T. will hold an open meeting on June 11 at 6.30 p.m. in the Old Library, B.M.A. House, London, when the following speakers will describe tuberculosis work in their countries: Dr. A. R. SOUTHWOOD, Director General of Public Health, South Australia; Mrs. A. SONI, medico-social worker, India; Dr. S. C. HAWES, of New Zealand. Details from N.A.P.T., Tavistock House North, Tavistock Square, London, W.C.1.

Stewart Lecture.—Professor G. R. CAMERON, F.R.S., will deliver the first Matthew Stewart Lecture at Leeds on June 17. His subject will be "The Exploration of the Cell." The lecture will take place in the Littlewood Hall of the General Infirmary at 4 p.m.

Bakerian Lecture.—Professor A. R. TODD, F.R.S., will deliver the Bakerian Lecture to the Royal Society on June 17 at 4.30 p.m. His subject is "Chemistry of the Nucleotides."

Cambridge Graduates Medical Club.—The annual general meeting of this club will be held at Emmanuel College on Friday, June 25, at 7 p.m., followed by a dinner at 7.30 p.m. at an inclusive price of 32s. Those intending to be present should send their names and the names of their guests, with a cheque, to Dr. T. B. ANDERSON, 1, Huntingdon Road, Cambridge, not later than June 10.

NEW ISSUES

Abstracts of World Medicine.—The June issue (Vol. 15, No. 4), which is now available, contains abstracts of important papers drawn from medical and other scientific journals published in some 20 different countries and in all five continents. The subjects covered range over the whole field of clinical medicine and therapy; there are also sections dealing with medical genetics, public health, industrial medicine, anaesthetics, radiology, and history of medicine. Issued monthly; annual subscription £4 4s., single copy 8s. 6d.; a specimen will be sent free on request.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, June 7

EDINBURGH UNIVERSITY.—At Physiology Class Room, University New Buildings, 5 p.m., Dr. D. J. Guthrie: The School of Salerno: Systematic Teaching.

Tuesday, June 8

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. B. F. Russell: Pyococcal Infections.

● INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. Macdonald Critchley: Migraine and the Vascular Neurologies.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 3 p.m., Professor J. Louw (Capetown): Vesico-Vaginal Fistulae.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Ophthalmology Lecture by Professor A. Sorsby: Nature of Refractive Errors.

WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY.—5 p.m., Altmouth Wright: Lecture by Sir Edward Mellanby, F.R.S.: Some Actions of Vitamin A as a Controller of Structure and Function of Tissues.

Wednesday, June 9

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. Barbara M. Partridge: Infections due to Yeast-like Organisms.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Professor J. Louw (Capetown): Indications for Caesarean Section.

OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Professor A. D. Gardner: Bacteriological Episodes.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. D. F. O'Neill: Lecture-demonstration in psychiatry.

UNIVERSITY COLLEGE, LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, 5 p.m., public lecture by Professor J. R.appenheimer (Harvard): A Theory for Renal Haemodynamics.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Vascular Effects of Pneumonectomy

Q.—Please may I be informed of the effects of pneumonectomy on the vascular tree of the remaining lung in a young person, say aged 20 years? What type of occupation should such a person follow in the future, and is a cardiovascular cause of death a likely possibility?

A.—This is a very pertinent question. No immediate ill effects of pneumonectomy are discernible on the vascular tree of the remaining lung of a young person, provided the lung is healthy. It has, for instance, been shown that the pulmonary artery pressure is unaltered; immediate compensation occurs.

Not enough time has yet elapsed for the very late results to be observed; the first successful pneumonectomies were done only 20 years ago. It is possible that no adverse changes occur if the remaining lung is not overdistended; if the mediastinum remains in the midline. Disability would be more likely to accompany progressive emphysema if this followed overdistension; this emphysema could be accompanied by secondary vascular degenerative changes leading to pulmonary hypertension and possibly secondary heart failure. This would be more likely if the remaining lung was not, initially, entirely healthy; if it had been damaged by non-tuberculous or tuberculous infection. The only direct evidence the writer has seen of the possibility of a late cardiovascular death was in the case of a man of 60 who was dying from right-sided heart failure and who had a lung agenesis. This was in some ways the equivalent of a pneumonectomy in infancy. The single lung was grossly overdistended and filling both sides of the chest.

A young adult, after pneumonectomy, should definitely avoid a strenuous occupation. Really hard physical work could be carried out for many years without obvious disability, but it would surely result in earlier onset of disability. The only wise thing is to select a sedentary occupation or one that does not involve regular physical work; in this way a long life free from disability is much more likely to be attained.

Masturbation in a Married Woman

Q.—A happily married woman of 24, mother of two children, has recently been greatly distressed by an uncontrollable desire to masturbate. The habit began in early childhood and has recently returned, and a deeply satisfying orgasm always results, though this never follows normal coitus. I should be most grateful for your assistance in helping this patient.

A.—This patient's condition is by no means ideal; but, in fact, it is not a very uncommon one, and, provided she understands the nature of her difficulty and conducts her marital life wisely, she need not fear any grave consequences. Most young children masturbate and many psychiatrists believe the activity to be part of normal development. Like this patient, many adult people fail, for varied and abstruse reasons, to reach a fully normal sexual development. When, therefore, orgasm cannot be attained in marital intercourse, it is not surprising that earlier outlets are sought. These situations are probably commoner in men than in women; they bring some difficulties in marital adjustment, just as do all other sexual inhibitions. Usually, perhaps, it is wisest not to tell the other partner, for the difficulty is not of his or her making. Since this woman is unable to get orgasm with her husband it is more normal for her to relieve the

Thursday, June 10

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Professor A. P. Cawadias: Psychological Factors in Graves's Disease. EDINBURGH UNIVERSITY.—At Physiology Class Room, University New Buildings, 5 p.m., Dr. D. J. Guthrie: William Harvey: The New Outlook.

INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. Lawson Wilkins (Baltimore, U.S.A.): Endocrine and Non-endocrine Causes of Stunted Growth. INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Pyogenic Cocci in Skin Disease.

● INSTITUTE OF NEUROLOGY.—5.30 p.m., Mr. Harvey Jackson: Traumatic Intracranial Haemorrhage.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 12 noon, Professor J. Louw (Capetown): Surgical Emergencies in Pregnancy.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor H. S. Morton: Potentialities of the Electrogastrograph.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Lord Boyd-Orr, F.R.S.: Widening Field of Medicine.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., neurology demonstration by Dr. J. H. Paterson.

Friday, June 11

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. A. D. Porter: Pyococcal Infections.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. J. K. Monro: Some Observations on Urinary Stone. 4 p.m., Professor A. Bradford Hill, F.R.S.: The Clinical Trial.

ROYAL SANITARY INSTITUTE.—At Pump Room, Bath, 10.15 a.m., Dr. B. A. Astley-Weston: Personal Standards of Hygiene; Mr. A. Tyler: Chemical Agents and Poisonous Metals in Food.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Professor W. C. W. Nixon: Inertia in Labour.

Saturday, June 12

INSTITUTE OF ORTHOPAEDICS.—At Brockley Hill, Stanmore, 10 a.m., Dr. F. H. Stevenson: Teaching ward round.

NORTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At North Middlesex Hospital, Edmonton, N., 10.30 a.m., Mr. M. Bates: Thoracic Actinomycosis; Dr. J. V. Davies: Incidence of Tuberculosis in School-children and Their Contacts. 2 p.m., demonstration of clinical cases. 3 p.m., business meeting.

APPOINTMENTS

CHARING CROSS HOSPITAL.—Josephine Barnes, D.M., F.R.C.S., F.R.C.O.G., M.R.C.P., Consultant Part-time Assistant Obstetrician and Gynaecologist. P. B. S. Fowler, D.M., M.R.C.P., Consultant Part-time Assistant Physician.

EDGAR, WILLIAM, M.B., Ch.B., D.P.H., D.C.H., Deputy Medical Officer of Health and Deputy School Medical Officer, Borough of Luton.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—Rosemary W. Lawrence, M.B., Ch.B., House-surgeon to Orthopaedic and Plastic Departments; Lillian F. Jones, M.B., Ch.B., M.R.C.P., House-physician; F. J. Hedden, M.B., B.Ch., F.R.C.S.Ed., Part-time Senior Registrar to Orthopaedic Department.

MCARTHUR, CATHERINE B., M.B., B.S., D.P.H., Medical Officer of Health, Oswestry Borough and Rural District Councils, and Assistant County Medical Officer, Salop County Council.

MACARTHUR, PATRICK, M.D., F.R.F.P.S., D.C.H., Consultant Paediatrician, Northern Regional Hospital Board (Scotland), Raigmore Hospital, Inverness.

NABARRO, J. D. N., M.D., M.R.C.P., Assistant General Physician, Middlesex Hospital, London, W.

SEAL, ROGER MARTIN EWART, M.B., B.Ch., M.R.C.P., Consultant Pathologist to Cardiff Hospital Management Committee (Sully Hospital).

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Heller.—On May 18, 1954, at Robroyston Hospital, Glasgow, to Betty, wife of Lieutenant M. D. A. Heller, R.A.M.C., a son.

Martin.—On May 27, 1954, at Sedan House, Stanley Place, Chester, to Dr. Rosemary (formerly Bolam), wife of Dr. Geoffrey Martin, a son.

DEATHS

Dewar.—On May 1, 1954, at Saxilby, Lincs, Thomas Dewar, M.B., C.M., aged 82.

Dudding.—On April 25, 1954, Thomas Scarbrough Dudding, O.B.E., M.R.C.S., L.R.C.P., D.P.H., Colonel, late R.A.M.C., retired, of Greystone Holme, Lincoln, aged 75.

Elliott.—On April 28, 1954, at Oakburn, Toward Point, Dunoon, Argyll, William Marley Elliott, M.B., Ch.B., D.P.H., late of Glasgow.

Hendry.—On April 20, 1954, at Aberdeen Royal Infirmary, James Leith Hendry, M.C., L.R.C.P.S.Ed., aged 66.

Lister.—On April 18, 1954, at his home, Seaford, Sussex, Septimus Rayner Lister, M.D., late of Terrington St. Clement, Norfolk.

Logg.—On April 20, 1954, at St. John's Hospital, Lewisham, London, S.E., Matthew H. Logg, M.D.

Lowe.—On April 28, 1954, Frederick Boulton Lowe, M.R.C.S., L.R.C.P., M.R.C.V.S., of 23 Pearl Court, Eastbourne, Sussex.

McCart.—On April 19, 1954, at 2, Leigh Road, Havant, Hants, Frederick Buick McCart, M.C., M.B., F.R.C.S.

McEwen.—On April 20, 1954, at the Oval, Doncaster, John Dugald McEwen, M.B., F.R.C.S.Ed.

MacLachlan.—On April 16, 1954, at Tigh-na-Coille, Hunter's Quay, Argyll, Julia Crawford MacLachlan, M.B., Ch.B.

O'Donnell.—On April 27, 1954, at "Rostrevor," King's Avenue, Carshalton, Surrey, John David O'Donnell, M.B.E., F.R.C.S.Ed., late of Mysore Province, South India, aged 89.

Richmond.—On March 25, 1954, at his home, 5, Ruskin Terrace, Glasgow, Arthur Stanley Richmond, M.B., Ch.B., D.T.M.

Sturrock.—On April 27, 1954, at "Turlundie," Hillside Road, Radcliffe-on-Trent, Notts, George Sturrock, M.B., C.M., late of Woodborough Road, Nottingham, aged 87.

Thomas.—On April 24, 1954, Ellis Rae Thomas, M.D., of Kyrton House, Gillingham, Kent.

sexual tension herself than to live in continual frustration. It is important, however, for the medical attendant to make sure that a common source of confusion is not being overlooked—that is, that the woman is not just suffering from vaginal anaesthesia and would be able to get clitoral orgasm by digital stimulation, were this not, for some reason, being withheld. If such should be the case, her husband must be instructed how to provide this so that she can achieve orgasm either before coitus or after, whichever suits the couple best.

Sterility of Mucous Membranes at Birth

Q.—Are the mucous membranes of the nose and throat of a newborn baby sterile? If organisms are present, how did they establish themselves in a sterile amniotic cavity?

A.—The nasopharyngeal mucous membrane of the newborn baby is sterile if delivery occurs soon after the membranes are ruptured—that is to say, before the liquor has had time to become infected. If, on the other hand, delivery is delayed a considerable time and the liquor does become infected, then inevitably the mucous membranes of the nose and throat of the baby are contaminated with the organisms infecting the liquor.

These organisms are a mixed flora and vary considerably. The commonest to be recovered from the baby's throat are coliforms (including *Proteus*), diphtheroids, staphylococci, and streptococci (both anaerobic and aerobic).

Scarring from Boils

Q.—What can be done to improve the appearance of the back of a neck badly disfigured by pitting and scarring due to chronic furunculosis? The condition is now inactive, although the patient received a single course of superficial x rays for it about six months ago.

A.—This is one of the most difficult conditions to treat. In the chronic stage, when it is often due to acne as well as to hair follicle infection—and as a rule evidence of infected hair follicles can be seen throughout the scarred surface—epilation by tweezer is a satisfactory method of keeping the infection down and allowing healing to become complete. Only after healing is complete should any surgical means be adopted, and even then it is only too often true that in many cases the scarring must be accepted. In particularly bad cases excision of the entire area and free grafting is the only alternative, but it should be a last resort, for the graft is certain to make a prominent white patch on the back of the neck.

Treatment of Leukoplakia of the Tongue

Q.—I have a case of leukoplakia of the tongue which has been present for the past nine months. It started as quite a small area and is now almost the size of a halfpenny. It is quite superficial, and the Wassermann reaction and Kahn test are negative. I have given the patient large doses of vitamin A, and bland mouth-washes. In my student days the recommended treatment was excision. Will you please tell me the latest views on this condition and its treatment?

A.—There has not been much change in our views on the treatment of leukoplakia of the tongue. Some surgeons have always been inclined to more radical measures than others. It is certain, however, that many cases of leukoplakia persist for years without showing any tendency to malignant change. In the present case, with a negative Wassermann reaction, the correct attitude is probably an expectant one.

All sources of irritation, such as irritant foods, dental sepsis, smoking, etc., should be eliminated, and a regular and careful watch kept for the appearance of papilliferous overgrowth, fissuring, or ulceration. At the first recognition of any of these a local excision should be done, preferably by diathermic cutting. It is best not to use any local application—for example, chromic or silver salts—but the normal mild antiseptic hygiene of the mouth and teeth should be continued. The presence of dissimilar metals

in dentures and fillings which might set up an electrolytic couple should be looked for and corrected if necessary. Incidentally, lichen planus of the tongue, although rare, may closely resemble leukoplakia and must be excluded. It is usually of a lavender hue and there may be similar lesions on the skin.

Drowsiness in an Old Man

Q.—What is the likely cause of drowsiness amounting to narcolepsy in an old man, with some prostate obstruction (but no elevation of the blood urea), auricular fibrillation, and early evidence of heart failure? He can fall asleep while eating a meal or standing up. There is no sugar or albumin in the urine. Can any treatment be recommended? Methylamphetamine hydrochloride and amphetamine have had little influence.

A.—The presence of a normal blood urea and the absence of albumin in the urine do not, of course, exclude the possibility of renal failure being the cause of the drowsiness. However, the type of drowsiness is unlike that of renal failure in that it occurs when the patient is standing or eating a meal, as well as, presumably, at other times. This, as the questioner points out, is like true narcolepsy. It seems most likely that the drowsiness is due to a combination of cerebral arteriopathy and probably heart failure leading to a local ischaemia in the hypothalamic region, and thus to the symptoms of narcolepsy. In such a case methylamphetamine hydrochloride and amphetamine are unlikely to have much influence unless given in large doses, and treatment of the co-existing cardiac failure and anaemia, if any exists, is probably the most important factor in producing relief of the drowsiness. However, no great benefit from treatment can be expected in this case.

Plasma Potassium Estimation

Q.—What is the simplest reliable method of estimating the plasma potassium?

A.—Flame photometry is the simplest and most reliable method of estimating the plasma potassium, given a flame photometer and an experienced operator. In the absence of such facilities, the best method is cobaltinitrite precipitation, which is described in detail by King (*Micro-analysis in Medical Biochemistry*, Churchill, 1946). Samples of blood must be unhaemolysed, as the cells contain twenty times as much potassium as the plasma and contamination by cell content would lead to gross error; for the same reason, separation of plasma and cells should be done as soon as possible after withdrawing blood. It is also important to remember that the plasma potassium level may be misleading as an index of the state of potassium balance—for example, in diabetic coma the plasma potassium level may be high or normal until dehydration is corrected, although there is potassium depletion.

Correction.—In Table II in the paper on "Arsenamide Treatment of Filariasis due to *W. bancrofti* and *A. perstans*" by Drs. J. A. McFadzean and F. Hawking (April 24, p. 956) the weights of patients 19 and 23 ought to have been 51 kg. and not 31 kg. as printed.

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BRITISH MEDICAL JOURNAL

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ENGINEERING AND INDUSTRIAL HYGIENE*

BY

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Industrial Disabilities and Compensation Insurance

Of the disabilities falling within the jurisdiction of our various State Compensation Boards in the United States roughly 97% are accidents; about 3% are chronic diseases like benzol poisoning or silicosis. Of these 3% about two-thirds are dermatoses. In cost of time lost and of medical care the occupational diseases rank high, and actually may assume the spotlight of attention.

Our compensation awards are covered by insurance placed by the employers through insurance companies or through State insurance. In Ohio, for example, compensation insurance is a State monopoly, while in New York an employer can insure either with a private company or with the State. If the employer posts a bond for an amount approved by the State he can be self-insured. The premiums paid are revised periodically according to the experience or record. When the experience is very bad the premium charges may be so high that the employing company cannot afford to insure, or the insurance company can simply refuse to accept the risk. In such an event the Insurance Commissioner of the State can pro-rate the policy among companies doing business in the State, and the companies then become the reluctant recipients of the business.

The result of this method of compensation insurance is that the companies writing the policies have developed first-class inspection schemes, with excellent staffs of industrially minded physicians, engineers, industrial hygienists, and chemists, and it is to the interest of insured and insurer to cut lost time to the minimum. In the policies freedom of entry and inspection is given to the insurance companies. Their men visit the insured companies and give them valuable consulting service.

The insurance companies' inspection scheme reminds one very much of your British Government inspectorate. Yours is more than a century old while ours is very young. But your Governmental inspectors, operating from your Ministry of Labour in London and distributed all over industrial Britain, have no opposite number in our Federal Government set-up. The industrial hygiene laboratories of the Public Health Service are available to industry for consultation and research. Their surveys of various industries have often set the

health standards under which the industry operates. The laboratories of the Bureau of Mines and the Bureau of Standards likewise function for the service of industry (employer and employee alike). None of these three Federal Bureaus is in any sense administrative, and they have not the right of entry or inspection. That last function is vested legally in the States, every one of which zealously guards its "States' rights" as granted under our constitution.

Your statistics of industrial illness are consistently better than ours. In fact, they are so much better that I use them as a guide in estimating our American industrial illnesses—a somewhat humbling admission. But our accident figures I think are as good as or perhaps better than yours.

Development of Industrial Hygiene in U.S.A.

In 1906 New York State provided for the appointment of a physician to be known as a medical inspector of factories. The staff was gradually increased, and in 1913 included a mechanical engineer and a chemist in addition to the physician. In 1924 the Division of Industrial Hygiene of New York was made an independent body as the "Bureau of Industrial Hygiene," and started publishing its *Industrial Hygiene Bulletin*. In 1936 Leonard Greenburg, a physician who started out as a sanitary engineer, became executive director of the Division. The various bulletins, codes, and rules formulated by New York have set the pattern for such things throughout all the States of the Union.

One of our oldest governmental departments is the Public Health Service. In 1914, within its Division of Scientific Research, there was created an office of Industrial Hygiene and Sanitation Investigations. This same year A. J. Lanza and others from the Bureau of Mines and the Public Health Service began their study of the silicosis problem in our tri-state district (Oklahoma, Kansas, and Missouri). From 1920 to 1930 the Office of Industrial Hygiene was under the direction of L. R. Thompson, a physician of great experience in the general field of public health. He initiated the Service's series of surveys of the dusty trades, which were continued and expanded by his successors. In 1937 the organization became the Division of Industrial Hygiene under the very able leadership of R. R. Sayers, who had been for some years surgeon for the Bureau of Mines. Sayers had taught electro-chemistry and physical chemistry at Buffalo, where he took his medical degree in 1914.

The Bureau of Mines was established in 1910 within the Department of the Interior. About 1917 during the first world war the Experiment Station at Pittsburgh was under the charge of a chemist, A. C. Fieldner. One of the

*Taken from papers presented at the London School of Hygiene and Tropical Medicine on April 20, 1953, and at the Annual Provincial Meeting of the Association of Industrial Medical Officers, Newcastle-upon-Tyne, on July 4, 1953.

Bureau's duties was the supervision of safety in mines, so it was natural that these should include the testing of safety equipment and the appraisal of masks for protection against gases. Its special knowledge was used by the Chemical Warfare Service, and after the first world war the Bureau began issuing its specifications for protective equipment of all kinds. Industry accepted these specifications with alacrity, and industrial hygiene benefited.

The *Journal of Industrial Hygiene* appeared in 1919. The chief editors were physicians—David L. Edsall for the United States, and Thomas M. Legge (later Sir Thomas) for Britain. My brother, Cecil K. Drinker, a physician and physiologist, and his wife, Dr. Katherine R. Drinker, carried the real responsibility, and the prompt success of this journal was due to them on our side of the ocean, and to Professor Edgar L. Collis in England. Early contributors included a few men in general public health, like Professor C. E. A. Winslow, and, occasionally, chemists like Fieldner, Katz, and Yant, of the Bureau of Mines, but the general tone of the papers was medical. Dr. Alice Hamilton and Dr. C. K. Drinker, of Harvard School of Public Health, suggested that the journal's field should be expanded to include some engineering. I became managing editor, and we asked Yant to join the journal's editorial staff. From then on we took papers directed more towards industrial hygiene and industrial medicine and less towards industrial surgery.

In 1935 a group of industrialists, physicians, and industrial hygienists, with the Mellon Institute for Industrial Research, formed the Air Hygiene Foundation, later changed to the Industrial Hygiene Foundation as its scope and interests expanded. In 1938 the American Conference of Governmental Industrial Hygienists (A.C.G.I.H.), with J. J. Bloomfield, of the U.S. Public Health Service, as co-ordinating figure, formed a group which included all those in Federal and State industrial hygiene bureaus. In 1939 the American Industrial Hygiene Association was formed. From then on these last two societies have met annually with the much larger and older society, the Industrial Physicians and Surgeons. The combined programmes run over a period of about eight days and are usually held around mid-April. For a time the American Public Health Association had an active section devoted to industrial hygiene, but interest lapsed. Now it is again becoming an active unit. It meets in the autumn, as does the Industrial Hygiene Foundation.

The National Safety Council, with headquarters in Chicago, is supported by industry and concerns itself with accidents of all kinds, but especially with those of industry. Traffic accidents are a major problem in the United States. Many of our industrial physicians, our engineers, and our industrial hygienists are active in the field of accident prevention.

Establishing Standards of Industrial Hygiene

The word "hygiene" implies control of one's well-being, while "health" defines one's status at the moment. We are in good or bad health. The Surgeon General reports upon the health of the nation. The medical director of an industry reports upon the health of workers (and he may even include their families). These reports are based upon the results of medical practice.

Industrial hygiene is concerned primarily with prevention. It is the duty of the industrial hygienist to determine the causes of, and to prevent, industrial illnesses, not to diagnose and treat them. He reports upon the extent of the hazard, if any exists, and its control. The industrial hygienist may be able to define the aetiology of industrial illnesses better than the medical practitioner. If this state of affairs results in a little duplication, or confusion even, it does no harm. Clearly, the person held responsible for prevention must ferret out the cause if he is to see his preventive measures put into force.

The industrial hygienist's most convenient criterion of working conditions is the nearness with which the worker's environment approaches the ideal. We measure the quality

of the environment by our arbitrary specifications. In the United States these specifications are set up by different committees chosen from the qualified personnel of the nation.

About 1940 the American Standards Association, at the instigation of the late Steven R. Whiting, of Liberty Mutual Insurance Company, formed a committee to formulate "allowable concentrations" of such impurities as carbon monoxide, lead dust, and various solvent vapours. The series of approved reports began to appear in 1941. A few years later the governmental industrial hygienists started their less formal but more realistic series, "threshold limit values," which now are revised and published annually. As a practical guide to control of conditions they are most valuable, and are used all over the world. For some years the American Society of Mechanical Engineers has had specifications covering permissible stack emissions from power plants. The City of Los Angeles, troubled by a vexing smog problem, passed legislation covering emissions from chimneys: a reasonable minimum degree of cleanliness is required of all, while large plants are rated in terms both of the quantity of material charged into the process and of that emitted. In London, the large power plants like that at Battersea are required to control the emission of smoke and to scrub out sulphur dioxide gas from the stack gases, so that less than 35 p.p.m. escapes a specification many times more severe than ours.

To-day we have specifications governing the purity of water, milk, food, and various drugs. These have the force of law behind them. Why should we not have the same degree of hygienic protection from air-borne contaminants and from unfavourable working conditions? One often meets with a timid reluctance on the part of some of our colleagues to set limits for pollution. I have no sympathy with such timidity. If you are practising industrial hygiene and refuse to state what conditions should be attained, you are simply evading your issues. If you ask your doctor what régime you should follow and he won't tell you, the chances are that you'll get another doctor. I am fully aware of our great lack of data in establishing, and of the many practical difficulties in attaining, satisfactory standards of air cleanliness, but I insist that standards must be sought if we are to make intelligent progress in this field.

Our opinions vary on the precise figures or limits we use, but most of us now adopt these limits in our routine work. Yet we recognize the limitations of these quantitative figures. I think we should supplement our appraisal of working conditions by personal observation and by every illustrative means at our disposal. The concept of dosage—time $\times$ concentration—in all of this work is now generally accepted. In our Atomic Energy Commission plants the environment of the workers, their clothing, and even their persons are inspected and checked thoroughly and carefully, usually one or more times daily. The result has been virtual freedom from the common industrial poisons as well as from the special radiation hazards for which these extra precautions were designed.

In industry the difficult problem is the instilling of a sensible routine to prevent chronic and cumulative occupational disease. Respect for acute poisons like carbon monoxide is much easier to teach and to achieve than respect for repeated—and often not unpleasant—exposure to substances such as benzol vapour. Too often men know of fellow-workers who have seemingly been unaffected by the very conditions we say should be drastically improved. Once management, and then labour, are convinced that something must be done and the new régime instituted, the bad condition can be corrected. But unfortunately an adverse decision in a lawsuit for a compensation case is often the spur to bringing about desired improvements. This is a little like saying that you must be hurt once in an accident in order to avoid future accidents, a concept that is repugnant to the intelligent individual.

It is very rarely necessary to eliminate completely the poison in question, because man's tolerance is such that he

can usually stand a trifling amount of poison, a condition we can generally attain in industry at a reasonable operating cost. If safe conditions cannot be brought about by a change that industry can pay for, then there is usually nothing to be done except to abandon the process entirely.

Some American Standards

We, as engineers, may set up conditions that we deem safe until so proved by the medical records of health in

Threshold Limit Values for 1953. Adopted at the Meeting of the American Conference of Governmental Industrial Hygienists in Los Angeles in April, 1953

Gases and Vapours		Mineral Dusts	
Substance	P.P.M.	Substance	MPPCF†
Acetaldehyde	200	Alundum	50
Acetic acid	10	Asbestos	5
Acetic anhydride	5	Carborundum	50
Acetone	1,000	Dust (nuisance, no free silica)	50
Acrolein	0.5	Mica (below 5% free silica)	20
Acrylonitrile	20	Portland cement	50
Ammonia	100	Talc	20
Amyl acetate	200		
Isomyl alcohol	100		
Aniline	100		
Arsine	0.05		
Benzene (benzol)	35		
Bromine	1		
1,3-Butadiene	1,000		
n-Butanol	100		
2-Butanone	250		
n-Butyl acetate	200		
Butyl cellosolve* (2-butoxy-ethanol)	200		
Carbon dioxide	5,000		
Carbon disulphide	20		
Carbon monoxide	100		
Carbon tetrachloride	25		
Cellosolve* (2-ethoxy-ethanol)	200		
Cellosolve* acetate	100		
Chlorine	1		
Chlorobenzene	75		
2-Chlorobutadiene	25		
Chloroform	100		
1-Chloro-1-nitropropane	20		
Cresol	5		
Cyclohexane	400		
Cyclohexanol	100		
Cyclohexanone	100		
Cyclohexene	400		
Cyclopropane (propylene)	400		
1,2-Dibromoethane (ethylene dibromide)	25		
o-Dichlorobenzene	50		
Dichlorodifluoromethane	1,000		
1,1-Dichloroethane	100		
1,2-Dichloroethane (ethylene dichloride)	100		
1,2-Dichloroethylene	200		
Dichloroethyl ether	15		
Dichloromethane	500		
Dichloromono-fluoro-methane	1,000		
1,1-Dichloro-1-nitroethane	10		
1,2-Dichloropropane (propylene dichloride)	75		
Dichlorotetrafluoroethane	1,000		
Diethylamine	25		
Dimethylamine	5		
Dimethyl sulphate	1		
Dioxane	100		
Ethyl acetate	400		
Ethyl alcohol	1,000		
Ethylamine	25		
Ethyl benzene	200		
Ethyl bromide	200		
Ethyl chloride	1,000		
Ethylene chlorohydrin	5		
Ethylene oxide	100		
Ethyl ether	400		
Ethyl formate	100		

Toxic Dust, Fumes, and Mists

Substance	mg. per cu.m.	Substance	mg. per cu.m.
Antimony	0.5	Mercury	0.1
Arsenic	0.5	Pentachloronaphthalene	0.5
Barium	0.5	Pentachlorophenol	0.5
Cadmium	0.1	Phosphorus (yellow)	0.1
Chlorodiphenyl	1	Phosphorus pentachloride	1
Chromic acid and chromates as CrO ₃	0.1	Phosphorus pentasulphide	1
Cyanide as CN	5	Selenium, as Se	0.1
o,o-Diethyl-o-p-nitrophenyl thiophosphate ("parathion")	0.1	Sulphuric acid	0.1
Dinitrotoluene	1.5	Tellurium	1.5
o-Dinitrocresol	0.2	Tetryl	5
Fluoride	2.5	Trichloronaphthalene	1.5
Iron oxide fume	15	Trinitrotoluene	1
Lead	0.15	Uranium (soluble compounds)	0.05
Magnesium oxide fume	15	Uranium (insoluble compounds)	0.25
Manganese	6	Zinc oxide fume	15

Substance	MPPCF†	Substance	MPPCF
Alundum	50	Silica: High (above 50% free SiO ₂)	5
Asbestos	5	Medium (5 to 50% free SiO ₂)	20
Carborundum	50	Low (below 5% free SiO ₂)	50
Dust (nuisance, no free silica)	50	Slate (below 5% free SiO ₂)	50
Mica (below 5% free silica)	20	Soapstone (below 5% free SiO ₂)	20
Portland cement	50	Total dust (below 5% free SiO ₂)	50
Talc	20		

Material or Radiation Gamma (roentgens per week) 0.3 | Material or Radiation Roentgen (roentgens per week) 0.3

† MPPCF = Millions of particles per cubic foot.

* Trade marked name.

Note.—The above table is reproduced by courtesy of the American Medical Association from the *Archives of Industrial Hygiene and Occupational Medicine*, 1953, 8, 296. Copyright, 1953, by the American Medical Association.

the industry in question. The figures from the A.C.G.I.H. Committee (see Table) are the result of the annual canvassing, by the committee, of persons known to be working with these various substances or to have had experience in their use in industry. Many of them are "guesstimates" and are not based upon data scientifically arrived at. They represent what the committee regards as concentrations safe for eight-hour exposures. The persons exposed are presumed to be normal healthy individuals. The limits for gases are given in parts per million by volume, those for toxic dusts are given in milligrams per cubic metre, mineral dusts are measured in millions of particles per cubic foot, and radiations are appraised in the conventional units of roentgens per week. Of these the last are much the newest, and are certain to be revised almost yearly.

These figures should be thought of as the lowest limits in zones and not as precise values. They are no more precise than is the toxicological evaluation of various doses of inhalation, as of quartz dust or benzol vapour or carbon monoxide gas. It probably would be more scientific to give them as definite figures $\pm$ some number, thus showing the unimportance of slight variations.

It has been said to me often by colleagues, especially by Britons, that this idea of toxic limits is needless, and that better results can be had by watching the health of workers, as by blood or urine examinations. Consider for a moment what Sir Thomas Legge, Chief Medical Inspector of Factories, wrote in his memoirs in 1934: "If you can bring an influence to bear external to the workman (that is, one over which he can exercise no control) you will be successful; if you cannot or do not, you never will be wholly successful. Practically all industrial lead poisoning is due to the inhalation of dust and fumes; and if you stop their inhalation you will stop the poisoning."

Dr. Alice Hamilton has always supported this plea for prevention rather than cure. It is easier to prevent or control occupational illness (and even accidents) than it is to define the cause accurately.

Control of Noise

Considerable pressure is being brought on us in the U.S.A. to reduce noise in industry, or at least to isolate noisy jobs so that the number of persons exposed to excessive noise is kept to the minimum. Standards of noise levels concerning both frequency and volume are in the making, and are likely to be included in our standards in the reasonably near future. The trend is towards limits or noise levels which permit ordinary conversation.

This is a fruitful field for some good engineering. It is a nice challenge to ingenuity to devise ways of getting around the noise of a rivet hammer, a drop forge, a rock drill, or a spinning-frame or a loom in a textile mill. We wish we knew more about the expected or usual loss of hearing with advancing years in the life of the average worker. Perhaps physicians will supply the data needed.

Considering the speed with which these movements cross the Atlantic we wonder why you in Britain are not more concerned with the noise problem. A damage suit for

Although long survival in apparent good health is not uncommon in spite of an impaired upper urinary tract, it is incontestable that the development of dilatation and infection and their aggravation when such existed before operation are fundamental factors influencing morbidity and mortality. To what extent, then, is well-being affected by electrolyte changes? The B.A.U.S. survey showed that almost 50% of patients were in electrolyte imbalance at some stage in their post-operative career, and it is now

unquestionable that selective absorption from the bowel can result in hyperchloraemic acidosis and other chemical disturbances.* The capacity to deal with this seems, however, to be closely related to renal function. The analysis of the B.A.U.S. series and of my own revealed that 75% of those whose blood chemistry findings indicated hyperchloraemic acidosis had an elevated blood urea as well as objective evidence of renal impairment on excretion urography. It also showed that only 20% of that number exhibited symptoms of chemical imbalance and that almost without exception chemical imbalance with symptoms was associated with a raised blood urea and dilatation of the upper urinary tract.

I have recounted the mode of death which rapidly ensued after six years of well-being when there was no evidence of hyperchloraemic acidosis or even of acidosis, and for which a sudden overwhelming renal infection seems to have been responsible. Recently another patient died, 11 years and 6 months after transplantation for vesico-vaginal fistula. The Coffey technique had been used and there was no renal or ureteral dilatation at the time of operation. Just over a year before death biochemical examination had shown an elevated plasma chloride with a lowered alkali reserve (Table III). There was then well-marked dilatation in the

TABLE III.—Blood Biochemistry after Transplantation of Ureters in May, 1951

	June, 1951	Nov. 19, 1952	Nov. 26, 1952
Blood urea	28 mg./100 ml.	198 mg./100 ml.	196 mg./100 ml.
CO ₂ combining power	48.1 ml. CO ₂ /100 ml.	35 ml. CO ₂ /100 ml.	21 ml. CO ₂ /100 ml.
Plasma chlorides	109.4 mEq/litre	103 mEq/litre	117 mEq/litre
Plasma sodium	142		
Serum potassium	5.5		3.1

upper urinary tract, but the blood urea was only 28 mg. per 100 ml. She was working as an assistant hotel cook and her only complaint was that she had become very stout. In December, 1952, she was admitted to another hospital in a semicomatose condition, having been unwell for the previous 10 days, suffering from mild rigors and pain in both renal areas. Her blood urea was 198 mg. per 100 ml., but plasma chlorides were actually lower than a year previously. Acidosis was confirmed, the alkali reserve having further fallen. She failed to respond to alkaline therapy and died nine days after admission. Four days before death she exhibited definite hyperchloraemic acidosis though the urine output had risen from 7 to over 70 oz. (200 to over 2,000 ml.) a day. Post-mortem examination showed bilateral renal dilatation, moderate on the right, marked on the left, the kidney on that side having only a strip of functioning tissue, and the left uretero-colic anastomosis stenosed though patent. The histological picture was of advanced pyelonephritis.

The severe electrolyte imbalance which finally developed in the above instance was associated with gross renal damage and uraemia. I can find no evidence of any patient in my series whose death could be attributed solely to chemical imbalance. Indeed, I have had but few incidents in the past three years—during which I have been on a constant lookout for them—of serious disturbances arising from this cause, and such as have been encountered without marked renal damage have been readily corrected by appropriate infusion therapy, alkalis, and an in-dwelling rectal tube. Less severe symptoms, such as anorexia, thirst, salty taste, and polydipsia, are generally improved by regular evacuation of urine, salt limitation, and alkalis. I therefore deprecate transplanting the ureters into a segregated loop of bowel as a precaution against the onset of electrolyte disturbances. This measure will not eliminate the possibility of subsequent renal damage due to faulty union between ureter and bowel, and the wet enterostomy

*The reader is referred to the important contributions on the subject of chemical imbalance after uretero-colic anastomosis, published in the *British Journal of Urology*, 1952, 24, pp. 302, 307, 313, 317.

or colostomy which the procedure necessitates is a negation of one of the main objectives of ureteral transplantation—namely, to restore the patient to a normal-like way of life. It is as well to dispense with the uretero-colic anastomosis and divert the urine by ureterostomy.

Summary and Conclusions

The results of carrying out uretero-colic anastomosis on 162 patients are analysed.

It is evident that, provided the lesion for which urinary diversion is performed is not one which itself predisposes to ill-health and eventual mortality, transplantation of the ureters to the bowel can be followed by well-being and expectation of a long life. This in great measure is influenced by the renal status, which in turn is largely dependent on the success of the actual anastomosis. The union between ureter and bowel must therefore be accomplished with as high a degree of technical perfection as possible.

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PSYCHOPATHIC STATES AND ATTEMPTED SUICIDE

BY

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Suicidal attempts are medical emergencies which the general practitioner and the hospital surgeon and physician alike have to meet, since in many instances it is found necessary to remove the suicidal individual from his home to hospital for resuscitation or repair. When his physical treatment has been completed it often happens that he appears remarkably normal: if, as he may do, he then insists on his discharge from hospital, grounds for detaining him longer may not be found. There is evidently a type of suicidal attempt, dangerous enough to need medical intervention, of which the more obviously morbid mental accompaniments are transient. In some centres these cases are not referred to psychiatrists and pass quickly from observation; this apparently is one of the reasons why a relatively common phenomenon has been so little investigated. Experience over some years in a general hospital where all cases of attempted suicide are examined by a psychiatrist has shown that the large majority of these "birds of passage" are suffering from psychopathic states.

Henderson (1939), focusing attention on the suicidal proclivities of psychopathic individuals, gave a description of the situation which is admirable in its emphasis on the peculiar clinical features and the social implications. His lead has, however, not been followed; and it is thought that a detailed survey of a group of such cases might now promote their more general recognition and stimulate further research, particularly into their aetiology.

There are few papers in the literature which indicate the proportion of cases of attempted suicide which may be attributed to psychopathic states. Dahlgren (1945), in a follow-up study of 237 cases of attempted suicide, gave 12.2% (26 men, 3 women) the diagnosis of psychopathia; but his clinical material was unsatisfactory, being

so heterogeneous as to include morons and apparently also cases possibly based on cerebral trauma or infection. Stengel (1952) reported an incidence of 13.6% (15 men, 6 women) in a series of 138 cases similarly investigated by follow-up, and commented that his group was not representative of the suicidal attempts made in the general population. It is probable that the percentages quoted are too low.

General Characteristics of the Cases

In a series of 200 consecutive cases of attempted suicide admitted to a general hospital in the years 1950-2 and personally observed, 50 (25%) were given initially the diagnosis of psychopathic state. Further investigation has shown that in eight of these cases the diagnosis was perhaps disputable: three were difficult to assess, being foreigners, while in the other five the degree of instability revealed might be held to be insufficient to justify the diagnosis and to merit rather a label of hysterical or schizoid personality. In 42 cases, therefore, the specificity was not in doubt, and these have been investigated in detail.

The sex, age, and marital state of these 42 individuals are detailed in Table I.

TABLE I

Age Group	Male	Female	Total	Marital State	Male	Female	Total
0-19 years	1		1	Single	8	4	12
20-29 "	7	7	14	Married	12	7	19
30-39 "	5	5	10	Widow(er)		2	2
40-49 "	7	4	11	Separated	4	3	7
50 "	5	1	6	Divorced	1	1	2
Total	25	17	42	Total	25	17	42

Family Histories

In 28 (66.7%) of the cases there was a family history of psychiatric abnormalities, which were manifested in 78 of their relatives, 42 of these relatives being alcoholics. Six (14.3%) of the cases gave a family history of suicide, six of their relatives having attempted suicide, two successfully. Two cases had a family history of homicide. In 15 (35.7%) cases a history of mental illness, and in 16 (38.1%) cases a history of alcoholism (in six cases of both) was obtained in first degree relatives. There is apparently a significant relationship between psychopathic states and a family history of alcoholism.

"Broken Homes."—In 31 (73.8%) cases the patients had, in their first 16 years, been deprived of a normal life with their parents. Some of the details are given in Table II.

TABLE II

	Male	Female	Total
Broken home	17	14	31
Illegitimate	2	2	4
Permanent loss of father	6	8	14
" " mother	4	5	9
" " both parents	1	3	4
Alcoholism of father	8	4	12
" " mother	4	4	8
" " both parents	—	4	4

One man and six women had lost their fathers in the first five years of their lives, and one man and two women their mothers. Figures can, of course, indicate only very crudely some items in these childhood situations. They are, however, sufficiently striking: parental alcoholism occurred in 38.1% of the cases, loss of the father in 33.3%, loss of the mother in 21.4%.

The importance of a broken home in the genesis of the suicidal acts of this group seems undoubted, but we have only the roughest clues as yet about how this factor operates. We do not know whether an absence or distortion of parental influences is the more traumatic, nor which parent may be the more essential; nor do we know the ages

at which the greatest harm may be done. The broad implications of these findings have been discussed elsewhere (Batchelor and Napier, 1953a).

Previous Personal Characteristics

This suicidal group was typical of the psychopathic states as a whole. The majority were aggressive, the minority passive and inadequate. Reactions primarily of aggression were usual in the former, reactions primarily of evasion in the latter, but these correspondences were not absolute. All had shown persistent maladjustment, starting in childhood or adolescence, and all were complained of as unpredictable and totally unreliable in word and deed. One-third had previously received psychiatric treatment.

Impulsiveness is highly characteristic of the psychopath who attempts suicide. With equal haste, on the spur of the moment and without heed to the future, he may accept or reject serious social obligations and the most intimate personal ties, leave his home, throw up a profitable job, or act with physical violence. Explosive outbursts of temper, threats, and assault were very commonly reported. Many were described as bullying, vindictive, jealous, cantankerous, trouble-making. Many had been actively cruel to their spouses or to their children.

In this group one often encountered individuals who were egotistical, cold, friendless. Many were morbidly touchy or secretive, with sensitive ideas of reference. Several realized that, unable to tolerate constraint of any kind, they were more content and safer when left alone. A few had had paranoid episodes. Mood swings were common, and some gave a history of neurotic symptoms when under stress.

Exhibitionistic and narcissistic traits were also commonly seen, expressed in endless demands for attention, flamboyant dress or hair styles, fantastic lying, masquerading, tattooing. One woman had burnt on her arm with cigarettes the initials of her lovers. An exaggerated narcissism was in some cases associated with defective personal hygiene.

The majority were maladjusted sexually. Five men and 10 women were heterosexually promiscuous. Eight men and one woman showed homosexual trends, at least one-third of these being practising homosexuals. Five women had had illegitimate children.

Fourteen men and six women gave a history of alcoholism. Five men were drug addicts. Nine men and 10 women had made a total of 29 previous suicidal attempts.

The psychopath is typically a restless Ishmael. Almost half the cases had been truants in earlier years: some individuals still had recurrent overpowering urges to go off alone. Usually there was a history of numerous futile changes of occupation or of long periods of unemployment. In only six cases (one man, five women) was the work record satisfactory.

Religion played very little part in these people's lives. The majority expressed a belief in a personal God, but less than half believed in some sort of immortality or after-life. Three-quarters of the group admitted that they knew attempted suicide was an offence against the law: many had previously been charged on account of suicidal attempts. No evidence was found, however, to show that legal sanctions had acted as a deterrent: the suicidal individual gave no thought to the matter at the time of his act, or did not care, or expected to be dead.

Thirteen men had police records. The commonest offences were theft, housebreaking, assault, and drunkenness with disorderly behaviour; there were also convictions for sexual offences, fraud, begging, truancy, and arson. Two women had police records, convicted of theft and drunkenness. Other individuals were known to the police, or had committed petty thefts which had not been reported. At least five of the men were chronic gamblers.

The social incompetence of the group is further illustrated by their low social status and living conditions, their unemployment, poverty, and isolation, details of which are given below.

Social Data

Table III gives an analysis of the social conditions of the group. Ten individuals suffered from overcrowding, and six others lacked privacy in their living conditions.

TABLE III

	Male	Female	Total
Present social class:			
I. Professional	—	1	1
II. Intermediate between I and III	1	—	1
III. Skilled workers	2	1	3
IV. Intermediate between III and V	6	1	7
V. Unskilled workers	16	14	30
Present employment status:			
Employed (including domestic duties)	10	10	20
Unemployed, but-fit	9	5	14
" because unfit	6	2	8
Financial state:			
Adequate	7	9	16
Financial stress	9	6	15
Subsistence level	7	2	9
Below subsistence level	2	—	2
Housing and living conditions:			
Slum	8	7	15
Artisan	13	8	21
Middle-income group	3	2	5
Not known	1	—	1
Living with spouse or lover	12	8	20
" parent(s)	5	5	10
" other relative	1	1	2
" in lodging-house or hostel	6	2	8
" alone	1	1	2

Social Circulation and Mobility.—Of the group, 35 were born in Scotland; of these, 17 were born in Edinburgh. Nine were rural bred. A fall in social status had occurred in 19 (45.2%) cases—a circumstance which could easily be correlated with their personality defects. In the past 12 months 14 had changed the localities they lived in (some had made numerous changes); in six cases these moves were local.

Group Membership (including Religious Affiliations).—Among the 42 individuals were 28 Protestants, 10 Roman Catholics, a Salvationist, a Jehovah's Witness, a pantheist, and an atheist. Eight of the Catholics had lapsed. Only three individuals were even irregularly church-going. Four men were loosely affiliated to one of the following organized non-religious groups: Freemasons, Buffaloes, Alcoholics Anonymous, and a camera club. Two women were affiliated to groups, but again only barely so: one was a lapsing member of Alcoholics Anonymous, and another a quarrelsome performer in an amateur theatrical company.

Physical State

The physical state of 17 (68%) of the men was satisfactory. The following were the diagnoses of the eight who were ill: arteriosclerosis (2), osteomyelitis of spine, carcinoma of colon, peptic ulcer, mild bronchitis, disabling inguinal hernia, gonorrhoea. Those complaining of fatigue were physically ill.

The physical state of eight (47.1%) of the women was satisfactory. Three were physically ill, suffering from occupational dermatitis of hands and face, tabes dorsalis, gonorrhoea. Six others were suffering from debility or marked fatigue. In only two cases was the suicidal attempt closely related in time to menstruation.

Setting of the Suicidal Attempts

Nearly one-third of the cases reported no nervous symptoms in the period shortly before their suicidal attempts. The remainder complained of one or more of the following: increased irritability, tension, restlessness, fatigue, anxiety, depression, insomnia; or had somatic symptoms such as headache or head pains, flatulence, and "fibrositis." Some had an access of ideas of reference and believed that everyone and everything were against them. It is rather striking that 15 (60%) of the men and 8 (47.1%) of the women

were not under the care of their own doctors at the time of their suicidal attempts. Only one individual was receiving psychiatric treatment.

In 23 (54.8%) cases the individual gave no warning, either immediate or remote, of his suicidal intentions. Six men and six women had lately made suicidal threats: Four of these and two other men and one other woman had made many suicidal threats in recent years. The husband of one woman said, "She threatens suicide whenever she runs out of cigarettes"; of another it was said, "I couldn't tell you of all the times she has threatened to take her life."

Three men preface their self-injury by assaults on their wives. In two of these cases the assault was accompanied by threats of murder, and in the third case a police charge was brought. A fourth man had recently threatened to murder his wife. Five other men had histories of serious assaultive behaviour at home. One woman attempted to gas the man with whom she was living and then herself. Another woman attempted to strangle her homosexual partner. A third woman assaulted her stepdaughter. These facts make obvious the close relationship of homicidal to suicidal trends in this group.

The Suicidal Attempts

How Long Contemplated?—Table IV shows that 26 (61.9%) of these suicidal attempts were impulsive. The majority of those who had been contemplating the act for

TABLE IV

	Male	Female	Total
Impulsive	15	11	26
Contemplated for hours	2	3	5
" days	1	1	2
" longer	5	1	6
Information withheld	2	1	3

longer said that their suicidal thoughts had been intermittent. One man claimed that he had been brooding over his act for two years. Nearly identical statements about their attempts were made by many of the group: "I took them on the spur of the moment"; "I didn't think at all." It is interesting that some described their acts in the same phrases as an epileptic might use to recount his fit: "It came on us all of a sudden"; "It just came over me."

Immediate Stimulus.—The specificity of the precipitants in this series is impressive: in 85.7% the immediate stimulus was either a personal quarrel or imminent retribution, the former about twice as commonly as the latter (Table V).

TABLE V

	Male	Female	Total
A quarrel:			
With spouse	7	5	12
" lover	4	6	10
" other person	2	1	3
Environmental sanctions:			
Threat of arrest or trial	5	2	7
" mental hospital admission	—	2	2
Detention in gaol	2	—	2
Nil	3	1	4
Not known	2	—	2

The quarrel in the cases of four men and two women was over a jilting. In two cases the unexpected loss of a job and in two others the refusal of expected financial assistance contributed materially to a state of irritable discontent.

Drunk or Sober.—Eleven men and one woman were under the influence of alcohol at the time of their suicidal attempts. Enough had been taken to diminish their self-control, but not enough to render them amnesic.

Timing and Situation.—Half of the attempts (male 12, female 9) took place between 7 p.m. and midnight—at a time, that is, when the factors of fatigue and intoxication were most often operative, and the individual was apt to return home quarrelsome to a critical reception. April,

May, and June were the most favoured months. Twenty-seven of the attempts were made in the individual's own bedroom, kitchen, or living-room. Other sites selected were: (a) in own house—lavatory (2), bathroom (1); and (b) elsewhere—in the street (3), police cell (2), acquaintance's house, train, railway station, cinema, public park, hill-top, and house under construction.

Method.—Poisoning, a passive method, was chosen by 38 (90.5%) (Table VI). "Other poisons" employed were methylated spirits, digitalis, bromide and chloral mixture, "izal," potassium cyanide, tincture of opium (the last two combined).

TABLE VI.—Method Adopted

	Male	Female	Total
Poisoning:			
Barbiturate	10	13	23
Aspirin	4	1	5
Coal gas	4	1	5
Other	3	2	5
Cutting	3	—	3
Hanging	1	—	1

Reasons for Choice of Method.—In the majority of psychopathic cases availability appears to be the paramount factor determining choice of method. Barbiturates can now be found in a great many homes, coal gas is usually on tap, and aspirins may be bought for the purpose. The subject may report that he used the method nearest to hand: "I saw the box on the sideboard"; "I put my hand in my pocket and felt them there." Another determinant is the expected painlessness of the mode of exit: feelings of guilt do not compel the psychopath to inflict maximum suffering on himself, and he may confess to his hedonism—"I thought I'd sleep away nicely." There is no doubt that in some cases also deeper compulsions operate, and are expressed particularly by those who state, "I couldn't think of any other way." It is likely that the predominance of passive oral methods can in part at least be ascribed to the immaturity of the personalities and the incidence of early deprivations in this group. Direct suggestion seems only occasionally to be a factor.

Loss of Consciousness; Amnesia.—Eighteen men and 14 women lost consciousness as a result of their attempts. It was surprising that none claimed an amnesia for the act itself, since the intense emotional perturbation usually associated with it might have been expected in some cases to cause a clouding of consciousness.

Attitude after the Attempt.—The considerable number who denied their suicidal intentions is noteworthy (Table VII). Some of these admitted to having had feelings of hopelessness. Others stated that they had just wanted to

TABLE VII

	Male	Female	Total
Suicidal intention admitted freely	11	6	17
" partially	—	1	1
" later denied	3	1	4
" denied; later admitted	2	2	4
" denied	8	6	14
"Don't know"	1	1	2

sleep or to get some release: "It suddenly dawned on me that I could sleep and sleep and forget it all." Eleven individuals were vacillating, evasive, or confused about their acts: "I don't think I wanted to die actually"; "I don't know what I meant"; "Could I do this by mistake?" Attitudes may even be changed during the course of an interview. Remorse is hardly ever expressed.

Estimation of its Seriousness.—It is impossible to give a precise estimate of the seriousness of each of these attempts. One cannot gauge their gravity simply by reference to the means employed, since in many cases the rapidity with which the act was perpetrated marred its efficiency. Also, amongst this group of people one cannot believe all those who claim that they have been in earnest nor all those who

deny it; while others seem to know no more clearly than an observer what they had intended. It is certain, however, that the majority of these people had done things which were highly dangerous to themselves; and that in at least one-third of the cases the act was carried out with great determination. The severest difficulty in assessment arises in those cases in which the individual has felt that he must escape from a situation which has become intolerable to him; the duration of his proposed absence may be problematical. In perhaps a handful of cases in this series the suicidal drive may have been minimal.

Motives

As are probably all suicidal acts, these attempted suicides were complexly determined. Certain psychopathological trends have been isolated, and are discussed below. This atomistic arrangement, while it assists clarity in presentation, does some violence to the intimate interrelationships of the factors concerned and perhaps suggests that these acts are determined at a more conscious level than is in fact the case. The trends discussed here may be compared with the motives discerned in a group of 40 old people who made suicidal attempts (Batchelor and Napier, 1953b).

Hate.—The commonest precipitant of these attempts was a quarrel, mobilizing intense feelings of hatred for a person previously ambivalently loved and hated. In several cases it was quite obvious that the suicidal individual had felt the provocation to murder. In more than one-quarter of the cases motives of spite, pique, and revenge were apparent. The suicidal act may be consciously intended as the most bitter curse. One man's farewell note expressed this succinctly: "Dear Dad, this is Good-bye. You haven't been much of a Dad to me.—Johnny." The aggrieved individual may turn the tables on the hated person by attempting to lay a death at his door and so render him a murderer. For example, a young woman, believing herself jilted, went to her lover's house and gassed herself while lying on his bed. In the case of the morbidly narcissistic individual, a wound to self-esteem which would appear to the average person innocuous may be sufficient to precipitate a suicidal attempt. The culminating incident which provoked a youth to attempt to poison himself with drugs belonging to his mother was her order, which humiliated him before others, to take his cap off in the house.

Evasion.—These individuals often themselves recognized the evasive nature of their reactions. "When I get into a complete jam this sort of thing occurs to me"; "I didn't want to face it." Of alternative modes of escape, alcohol was frequently used. One man, who previously had had a fugue lasting two days immediately after being jilted, made his determined suicidal attempt immediately after he had experienced a similar disappointment. Closely related to fugues, though not associated with amnesia, are the impulsive journeys which psychopathic individuals often embark on. More than one of these people had been planning emigration as a solution of his difficulties; one, when his suicidal attempt had failed, announced his intention of entering a monastery.

Identification with a Dead Person.—Four men had identified themselves with their dead fathers: one of these parents had himself attempted suicide. One of these four men had in addition identified himself with a dead male friend, to whom he had been homosexually attached. Three men and one woman had identified themselves with their dead mothers. The suicidal individual may speak openly of wanting to rejoin the dead person.

Experimentation and the Dramatic Demonstration of Omnipotence.—Defiantly rejecting an unappreciative world, the malcontent may close his account in the most individualistic manner possible to him—by a murder of the self, by the self, for the self. The suicidal attempt in such cases may be deliberately, and romantically, staged. One of this group, after being jilted, climbed the Calton Hill at midnight, placed the girl's Bible beside him, and so slashed his wrist that he nearly died: he was sustained by an

exalted feeling of omnipotence as he looked down on the city of his nurture and the people he despised. Another blasé young man, before poisoning himself, left a long letter in which he took a sophisticated farewell of the world: "Sideral Time marks out the minute fragment of my life against a canopy of stars. I have chosen to shorten it. I am my own executioner. . . . I join Mayakovsky." The suicidal act is in such cases ecstatic. Closely allied to dramatic and erotic motives is the factor of experimentation. The excitement of danger clearly held a vivid appeal for these two men and for some others in this group. Their morbid tensions were geared to it. Feeling different and estranged from their fellow men, one can understand that they were the more ready for a crucial experiment to discover where they belonged. A suicidal attempt may be a form of initiation, a test of manhood.

Manipulation of the Environment.—While efforts to dominate and to punish the environment were clearly evident in the suicidal attempts prompted by frustration, spite, and revenge, efforts deliberately to cajole it were identified in a small minority of the cases. One woman stated later, "I thought it would change my husband"; a man admitted, "I just took the gas simply to frighten my wife; I didn't think it would have gone so far." These two acts may have been bungled gestures, and in any series of attempted suicides there are probably some such cases.

Fears.—Phobias were less common than well-founded apprehensions. In addition to those afraid of social consequences, two men justifiably feared the outcome of their physical illnesses, and one woman an illegitimate pregnancy. Two men and two women feared insanity. Two other individuals had hypochondriacal bodily complaints.

Loneliness.—This factor is more closely related to the suicidal individual's advancing age than to his psychopathic reaction. It strongly influenced an illegitimate girl aged 20, and three individuals past middle age.

Guilt.—In only one case did guilt seem prominently to be a factor. It may have been a factor overlooked in other cases; but one has the strong impression that it is an element of little importance in the genesis of psychopathic suicidal attempts.

Frustration Reactions.—It has been proposed (Batchelor, 1954) that the concept of an acute frustration reaction is applicable to many of these impulsive acts. This concept complements and does not minimize the importance of the psychopathological factors described above.

Disposals

In 35 (83.3%) cases the patients were discharged from the general hospital within two weeks, 22 being detained in the observation ward for a week or less and 13 for one to two weeks; three were detained for two to three weeks, and four for a longer period. Of the 36 (85.7%) discharged home, 16 attended for further out-patient psychiatric investigation and treatment. Three men and three women were transferred to a mental hospital: only one of these was under certificate.

Only one individual has committed suicide in the year following the suicidal attempt.

Discussion

When one compares the suicidal acts of psychopaths with those of individuals suffering from, for example, depressive psychoses, one is impressed with how much in the former is on the surface. Many have obvious environmental precipitants, aggression is more nakedly displayed, frictions in personal relationships are more easily identified, and, while both intrapsychic and external conflicts are undoubtedly operative, the latter are of considerable significance.

Motives of guilt and self-punishment are less potent in psychopathic cases; and for this reason alone these suicidal attempts would tend to be less fatal. Poisoning is more easily treated than many other injuries, and the act—following, for example, a quarrel at home—may be per-

petrated in circumstances which facilitate its detection. The flood-marks of the individual's rage or panic fear may therefore be soon removed, and his quick recovery of poise may belie the intensity of his recent emotional storm. The nearer in time that one stands to these acts the more seriously is one apt to estimate them, while in a retrospect one may be aware less of the act itself and more of its consequences. Impressed in his follow-up study by the modification of the social situation which the individual's suicidal act may effect, Stengel (1952) has drawn particular attention to the social element in suicidal attempts, and, considering these acts as unconsciously directed towards a re-establishment of human relationships as well as towards death, has emphasized their "appeal character."

That nearly half the cases had made previous suicidal attempts might be held to support the hypothesis of their "appeal character." Appeals to others for help might equally be repeated because of their previous failure or because of their learned effectiveness. But we should also link the repetitiveness of these acts with their outstanding quality, which is explosiveness. We are then strongly reminded of the behaviour of the epileptic. There are other correspondences: the psychopath's suicidal attempt, like the epileptic's fit, may come suddenly or be prefaced by a period of increasing tension and irritability; it may be precipitated by emotional frustration, alcoholism, or fatigue; some clouding of consciousness may accompany it (Henderson, 1939); and, while in some cases it may be followed by a period of collapse or of disturbed rather random behaviour, recovery is usually remarkably rapid. The suicidal attempt of the psychopath might often be fairly accurately described as a suicidal fit.

Like the child, the psychopath is self-centred, instinct-driven, and lives in the present; his wishes and his expectations approximate; he is deficient in self-control and natively destructive. His suicidal acts also bear a strong resemblance to those committed by children. Many writers, from Maudsley (1895) to Despert (1952), have drawn attention to the fact that children may embark on self-injury on sudden impulse, in a setting where emotional depression is often not obvious; have instanced motives such as jealousy, revenge, identification with a dead person, and fear of punishment (in the adolescents also disillusion and experimentation); and have emphasized that the precipitants of these acts may appear trivial. Though the evidence is less abundant and established, there is also some suggestion at least of a resemblance between the suicidal acts of psychopaths and those of primitive peoples.

It is likely that even under the most favourable conditions the number of these acts which could be forestalled would be small, since usually the self-injury follows its stimulus so quickly or unexpectedly. Prophylaxis must begin therefore in childhood, when, or before, the first indications of emotional instability or social maladaptation or delinquency become apparent; and it must deal with such severely traumatic factors as parental alcoholism. But here we are gravelled by lack of information: we need to know far more than we do about heredity, for example: about the pathophysiological relationships between psychopathy and epilepsy; about the structure and effects of the "broken home" situation; about the unconscious factors which go to produce criminal behaviour; about impulse and its control.

We are obviously confronted by complex problems. We have to work against a background of social changes outside our effective control, of which the phenomena we are treating are to some extent at least reflections. And we have to deal with a situation which, though it may be more common than formerly, is certainly not new: centuries ago a discontented man was defined as "one that is false out with the world and will be revenged on himself."

Summary

The cases of 25 men and 17 women suffering from psychopathic states, who attempted suicide and were

admitted to a general hospital, have been investigated in detail from psychiatric and social aspects. The sample suggests that at least one-fifth of attempted suicides belong to this group.

A family history of psychiatric abnormality was obtained in 67% and of suicide in 14% of the cases.

Of the group 74% came from "broken homes." Previous suicidal attempts had been made by 45%. The majority of the patients were in the first half of life, and all had shown persistent social maladjustment; most typically they were impulsive, aggressive, restless, egocentric, and affectionless; many gave histories of unemployment, crime, sexual maladjustment, alcoholism, drug addiction. 71% were in the lowest social class.

The physical state was satisfactory in 60%.

Nearly one-third had not been complaining of nervous symptoms, and one-half were not under the care of a doctor at the time of their suicidal attempts. Homicidal trends were in several cases obvious. The majority of the suicidal attempts were impulsive, precipitated by a personal quarrel or the threat of retribution. Alcohol and fatigue were significant factors. Poisoning was chosen by 91%. Many were confused about their real intentions.

The psychopathology of these acts is described and the following motives are considered most significant: hate, evasion, identification with a dead person, fears, experimentation, the demonstration of omnipotence, and manipulation of the environment.

Of the group 86% were discharged home.

The difficulty of judging the seriousness of these attempts is discussed, their resemblances to the episodically disturbed behaviour of the epileptic and to the suicidal attempts of children and primitives are briefly considered, and the need for further research and its possible directions are indicated.

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The decision of the Department of Health for Scotland to combine a publicity drive against tuberculosis with mass radiography surveys in selected areas is largely based on experience at Greenock. Here, last autumn, one-fifth of the adult population (13,537) came forward for x-ray examination, and as a result 58 previously unknown active cases of pulmonary tuberculosis were discovered—a yield of 4.3 per 1,000 of those examined. A further 93 patients (6.9 per 1,000) were placed under surveillance. It is pointed out that a far higher proportion of the population would have been x-rayed had not the radiography units been previously committed to routine work such as the examination of National Service men. The Department sums up the Greenock experience in these words: "The case for a change in emphasis in favour of mass x-ray drives is stronger when the incidence of active tuberculosis discovered in Greenock is taken into account."

MECKEL'S DIVERTICULUM AS AN ABDOMINAL EMERGENCY

BY

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"Meckel's diverticulum is frequently suspected, often looked for, and seldom found" (Charles Mayo, 1933). This vestigial structure may make its presence known dramatically, and the diagnosis is seldom made pre-operatively. Few surgeons have extensive experience of the condition, and this review is based on a small series of five cases.

Diverticula may be found anywhere in the gastrointestinal tract. Most of them are acquired and have their origin at the point of penetration of the muscle coat by the mesenteric vessels (Edwards, 1939). Among the congenital diverticula are the rare caecal diverticula and Meckel's diverticulum. Meckel's diverticulum is a remnant of the foetal vitello-intestinal duct, which in the foetus forms a channel between the midgut and the yolk sac. As distinct from acquired diverticula it is a true diverticulum, consisting of all the layers of the intestinal wall.

Pathology

Remnants of the vitello-intestinal duct may be encountered in the form of (1) a persistent duct from the ileum to the umbilicus with secretion of mucus, or even faecal matter; (2) a short umbilical sinus or an umbilical polyp; (3) a vitello-intestinal cyst; (4) a fibrous band from the umbilicus to a Meckel's diverticulum; or (5) the band may be attached to intestine, mesentery, or another viscus, commonly in the pelvis; (6) a solitary Meckel's diverticulum is the remnant most often found. An artery may be contained in the above band—namely, the vitelline artery.

The different intestinal diverticula were classified in 1812 by Johann Friedrich Meckel (the younger); he gave a full description of the solitary diverticulum of the ileum which bears his name. It had, however, been described earlier by others. Among the congenital abnormalities of the intestinal canal it has the highest incidence, and in necropsy materials it is found in 1–2% (Treves, 1918). Its average length is 2 in. (5 cm.) (varying from a slight bulge to a 6-in. (15-cm.)-long vermiform process), arising from the anti-mesenteric border of the ileum about 2 ft. (60 cm.) from the ileo-caecal valve, the distance varying from 4 in. to 5 ft. (10 to 150 cm.). It is shaped as a cone or a blunt cylinder protruding at a right angle, or more rarely at an acute angle from the intestine. Ileal mucosa lines its interior, but duodenal or colonic mucosa may also be found, and gastric mucosa is present in 16% of necropsy specimens (Schaetz, 1925). In the clinical material, however, gastric mucosa is encountered in two-thirds of the cases recorded (Schullinger and Stout, 1934; Bussey, 1938; Montant *et al.*, 1950). The French designation "petit estomac" is explained by these facts. Heterotopic pancreatic tissue may also be found.

Infection

Acute inflammation of Meckel's diverticulum, sometimes caused by foreign bodies, gives clinical symptoms and signs quite similar to those of appendicitis.

Case 1

A 5-year-old boy was admitted to Surgical Department A of Frederiksberg Hospital on March 30, 1952, with a diagnosis of appendicitis. He had been treated in the medical department for abdominal pain some months before. There had been short

spells of dizziness, nausea, and abdominal pain four weeks prior to admission. Another attack started the day before with abdominal pain. As the pain grew worse he was sent to hospital. On admission his temperature was 101.8° F. (38.8° C.), pulse 88. Tenderness was found below and medial to McBurney's point, and rebound tenderness and a dubious Rovsing sign were present, but no rigidity. A diagnosis of atypical appendicitis was made, and immediate operation was decided upon. At operation the thickened appendix showing moderate signs of inflammation was removed. As the changes found were not thought sufficient to explain the patient's symptoms, the terminal ileum was inspected. An inflamed Meckel's diverticulum 2.5 cm. long, about 3 ft. (90 cm.) from the ileo-caecal valve, was found and removed. Recovery was uneventful.

Histological Report.—Subacute appendicitis and diverticulitis Meckelii. The pathological changes in the diverticulum were described as more pronounced than those in the appendix.

Perforation

The clinical course is often more stormy than in appendicitis; inflammation may lead to gangrene, early perforation, and peritonitis. Cases of perforation peritonitis caused by foreign bodies, especially fish bones, have been described (see Fig.). Because of the ample and thin intestinal contents



Photograph of removed Meckel's diverticulum with fish-bone perforation, occurring in a 9-year-old girl. (Mr. Wallace Dennison, of the Royal Hospital for Sick Children, Glasgow, has given me permission to use this photograph.)

escaping into the peritoneal cavity and the meagre possibilities of walling off the inflammation at this site, the peritonitis arising is diffuse, and the outlook is more grave than in perforated appendix. Diagnosis is difficult; thus Sibley (1944) reports a case in which delay in operating, because of failure to recognize the inflammatory nature of the intestinal obstruction, led to death from peritonitis and septicaemia. This was partially due to the fact that the patient had been successfully carried through a previous attack with the Miller-Abbott tube and that he seemed to improve under conservative treatment at the beginning of the last attack. The diseased diverticulum may not be looked for at all if an inflamed appendix is found at operation. Discussing this problem, Aalkjær writes (1937): "In several of these cases no discrepancy has been found between the condition of the appendix and the peritonitis, and the surgeon has performed an appendectomy. Some days later necropsy has revealed the perforated Meckel's diverticulum."

Case 2

A 13-year-old boy was admitted to our department on November 10, 1947, with a 36-hours history of abdominal pain about the umbilicus. The pain later moved towards the right iliac fossa; it was moderate and colicky and more pronounced after meals. He complained of nausea, but there was no vomiting. His bowels had been opened several times.

On examination his temperature was 99.8° F. (37.7° C.) and pulse 112. There were no signs of dehydration, and abdominal examination showed definite tenderness at McBurney's point and a positive Rovsing sign. Appendicitis was suspected, and immediate laparotomy was performed through a lower right gridiron incision; the abdominal cavity contained seropurulent fluid. The caecum was fixed and could not be moved out of the wound;

the terminal portion of ileum was found red and inflamed with no distinct line of demarcation. The appendix was difficult to find; it was very long and in the subileal position; it was removed. The changes found were less than those in the ileum, and the surgeon diagnosed ileitis terminalis and closed the abdomen.

The next day, at 3 p.m., the patient had sudden severe pains in his abdomen and a rise of pulse and temperature. Next morning it was evident that a perforation had taken place with subsequent peritonitis, and a further operation was decided upon. At operation on November 12 the abdomen was opened through a lower right pararectal incision. Fibrin-covered intestines were drawn forward, and a ruptured Meckel's diverticulum was found. A simple removal without intestinal resection was possible, and the wound was closed without drainage. Convalescence was uneventful.

Histological Report.—"Meckel's diverticulum with gastric mucosa, severe inflammatory changes and perforation through ileal mucosa. Endoappendicitis levissime gradu."

Intestinal Obstruction

This may be produced by a Meckel's diverticulum. According to Walsh (1949-50) it was the cause in 6% of a large series. A strangulation is the mechanism most frequently met (Lejars, 1921), as the intestine is kinked upon a band extending from the tip of the diverticulum to adjacent mesentery, to the abdominal wall, another coil of bowel, or a pelvic viscus. Sometimes a snare is thereby formed in which an intestinal coil is caught and strangled (Thomsen, 1927). The rarest mechanism is the formation of a real knot in a Meckel's diverticulum around the intestine. This can take place only if the diverticulum is long, mobile, and free, and has an ampullary dilatation of the distal end, designated by French authors as "la clef de l'étranglement."

Among 63 cases of intestinal obstruction caused by Meckel's diverticulum Halstead (1902) found a band in 48, and a band was the cause in 8 out of the 15 cases of Guilleminet *et al.* (1950).

Case 3

A 79-year-old woman was admitted to hospital on July 5, 1947, with a 24-hours history of sudden colicky pains across the abdomen accompanied by nausea and vomiting; no flatus had been passed. There was a slight rise of temperature and she showed signs of dehydration. A straight radiograph of the abdomen revealed dilated coils of small bowel and the erect film many small-bowel fluid levels. Conservative treatment with hot fomentations and fluid diet resulted in an improvement in her condition, and ample flatus and thin stools were passed the next morning. She gradually improved, and some days later another radiograph showed no signs of intestinal obstruction. She returned home on July 23.

On December 23, 1952, she was readmitted as an emergency case. There was a 94-hours history of nausea, faintness, and later constant pains in the upper abdomen. The bowels had not been opened for 36 hours. On examination the patient was moaning and her tongue was dry. The abdomen was a little distended, but followed the respiratory movements. There was generalized tenderness, most pronounced in the epigastric region, but no rigidity. No tumours and no herniae were found. A pelvic examination gave no further information. Intestinal obstruction because of a tumour or constipation was suspected, and a straight radiograph was taken. Several dilated coils of small bowel and fluid levels in the erect position were seen. No gallstones could be detected and there was no air in the bile ducts. Immediate operation was decided upon.

At operation the abdomen was opened through a lower right pararectal incision. The abdominal cavity contained a considerable quantity of serous fluid. Distended coils of small bowel filled with fluid presented in the wound. After some search a fibrous band extending from the great omentum to the tip of an inflamed Meckel's diverticulum, which had strangled an intestinal loop, was found. On section of this band the intestine regained its normal colour, and the obstruction had thus been removed. Excision of the Meckel's diverticulum was then undertaken, followed by closure of the wound. Convalescence was complicated by a slight inflammation of the wound. Histological examination showed a Meckel's diverticulum with no pathological changes.

Volvulus

Volvulus of Meckel's diverticulum, with or without involvement of the coil of ileum bearing it, is well recognized as one of the ways in which the diverticulum may precipitate acute obstruction of the small gut. The obstruction is of the "closed-loop" type, clinically characterized by violent intestinal colic and absence of peristaltic sounds (Smith, 1945). It is a rare lesion; in the 15 cases of Meckelian obstruction of Guilleminet *et al.* mentioned above there was only one case of volvulus. Intestinal resection is often necessary in these cases (Philippe and Chattot, 1950; Tagart, 1953).

Case 4

A 37-year-old mechanic was admitted to hospital with a five-days history of vague and intermittent pains, most pronounced in the epigastrium. For the two days preceding admission he had been confined to bed because of pains and vomiting. On the day of admission his pains had increased in intensity. There had been two loose motions on the day before and a trace of thin faeces and flatus on the day of admission.

On examination he appeared ill, with an anxious expression, lying with his legs drawn up. His tongue was dry; temperature 99.8° F. (37.7° C.), pulse 80. Examination of the abdomen revealed some distension and generalized tenderness, especially around McBurney's point; here rigidity was present. Acute appendicitis with perforation was suspected and immediate operation was decided upon.

At operation the abdomen was opened through a right muscle-splitting incision. As the peritoneum was opened, 0.5 to 0.75 litre of serous fluid gushed out. The appendix was found swollen and red, lying in a subileal position, and was removed in the usual way. On account of the exudate the ileum was inspected after widening the incision, and about 75 cm. from the ileo-caecal valve a torsion of the ileum was found fixed to the root of the mesentery by adhesions around an inflamed Meckel's diverticulum. The gut was distended and bluish-red proximally to this point. After the adhesions had been cut and contracted distally to it. No resection of intestine was necessary as the gut was viable, and after excision of the diverticulum the abdominal wall was closed without drainage.

The patient's condition deteriorated, and he died 24 hours after the intervention, with the clinical picture of intestinal paralysis and hyperthermia. Necropsy gave no further information.

Intussusception

An introversion of a Meckel's diverticulum may take place, causing obstruction of the ileum (Wessel, 1925-6) or an ileo-ileal intussusception. According to Harkins (1933) this variety of intussusception has several distinguishing features: (a) it occurs in older individuals, (b) a history of previous attacks is more frequent, (c) vomiting is more intense, and (d) the course of the disease is more chronic and there is often a mild attack a day or two before the onset of the major illness. A correct diagnosis of this condition is usually made too late, and an intestinal resection is often required (Benson and Sharpe, 1950) because of irreducibility and gangrene. In infants the condition is very rare (Aitken, 1950).

Case 5

A 12-year-old girl was admitted to hospital on December 31, 1952, with a 16-hours history of sudden pains around the umbilicus, gradually subsiding. Fourteen hours before admission a new bout of pains occurred after a meal. She had no appetite, and her mother gave her an aspirin tablet. There had since been pains of constant character localized to the umbilical region and the right iliac fossa, of varying intensity. She had vomited several times and there had been a normal motion just before admission.

On examination her tongue was dry; temperature 99.4° F. (37.4° C.) and pulse 88. The abdomen was slightly distended, with no visible peristalsis and normal intestinal sounds. Direct tenderness and rebound tenderness were elicited about McBurney's point; Rovsing's sign was positive, and a rectal examination revealed tenderness to the right. Immediate operation was decided

upon, with a preliminary diagnosis of acute appendicitis, even if the symptoms were not typical and she appeared more dehydrated than was to be expected with such a temperature.

At operation the abdomen was opened through a gridiron incision; there were large amounts of serous fluid in the peritoneal cavity. The appendix was in a subcaecal position and showed no signs of inflammation, but a small carcinoid was present at its tip. The appendix was removed. Palpation of the uterus and adnexa revealed nothing abnormal. Inspection of the ileum revealed a 25-cm.-long ileo-ileal intussusception located about 30 cm. from the ileo-caecal valve. The intussusception was reduced, and at its apex an inflamed introverted Meckel's diverticulum was found. The diverticulum was excised without intestinal resection. Convalescence was uneventful. Histological examination showed carcinoid of the appendix and a Meckel's diverticulum with severe inflammatory changes.

Similar cases have been described by Vangsted (1918), Langballe (1918), Holst (1928), Pettersen (1928), Taylor (1947), and others.

Associated Conditions

Owing to the aberrant gastric mucosa a peptic ulcer may be formed in Meckel's diverticulum, especially at the junction between the ileal and gastric mucosa at the base of the diverticulum. Complicating the ulcer, perforation or bleeding may take place; numerous cases of this type have been reported—for example, Nielsen (1933-4), Klindt (1933-4), Aalkjær (1937), Manning and McLaughlin (1947), Jay *et al.* (1950), Hancock (1951), Aitken (1953). In melaena with no known cause an ulcer in a Meckel's diverticulum may thus be the origin of the trouble. Dragstedt (1933) has shown that the heterotopic gastric mucosa secretes hydrochloric acid and pepsin. These secretions become irritating to the ileum, producing spasm in the walls of the ileum and the diverticulum (Sibley, 1944). This author defines a condition called "dyspepsia Meckelii," characterized by pain in the lower right quadrant, the epigastrium, or the periumbilical region.

If the communication with the ileum is obliterated the rare retention cysts may arise. Isolated cases of calculi in a Meckel's diverticulum have been described (Allen and Donaldson, 1945; Palmström, 1950). They give symptoms simulating obstructive appendicitis, and the stones consist of faecal material and bile pigment; they are not visible in radiographs.

Solitary cases of carcinoid in Meckel's diverticulum have been reported (Stewart and Taylor, 1926; Hertzog and Carlsen, 1935; Pautler and Scotti, 1951). Even carcinoma of Meckel's diverticulum has been described (Weir, 1937).

A Meckel's diverticulum may be contained in a hernial sac, usually of a femoral hernia, as originally described by Littre (1700). Littre's hernia is a special variety of the so-called Richter's hernia. Inflammation of a Littre's hernia often takes place, and it becomes irreducible. The characteristic complication is incarceration which may go on to abscess and fistula formation (Mair, 1948).

A diagnosis of Meckel's diverticulum is seldom arrived at pre-operatively. Solitary cases of radiographic demonstration of a Meckel's diverticulum have been reported (Aalkjær, 1937; Rousseau and Martin, 1943; Butler *et al.*, 1950), but in the acute cases this method is not to be recommended.

Treatment

In cases of intestinal obstruction, perforation, or diverticulitis the diverticulum should be removed. Opinion on this is unanimous. Removal can often be performed in the same way as an appendectomy. If the base is thick (and the gastric mucosa is often at the base, as mentioned above) a large wedge-shaped excision should be performed, followed by repair. If this is not possible a bowel resection is required, and in our department we prefer a side-to-side anastomosis.

Many authors state that an incidentally found Meckel's diverticulum should be left alone. Sibley (1944), however, recommends the earliest possible removal of any Meckel's diverticulum. Considering the grave abdominal complica-

tions with a high mortality (about 15% according to Wagner *et al.*, 1950) it can provoke, any incidentally found Meckel's diverticulum should be removed if this procedure does not materially increase the operative risk.

Summary

The complications of Meckel's diverticulum which call for emergency surgery are infection, obstruction, intussusception, volvulus, and haemorrhage. The difficulties in diagnosis have been illustrated by five cases.

The incidentally found Meckel's diverticulum should be removed if this procedure does not materially increase the operative risk.

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In 1953 the accident section of the London Ambulance Service dealt with 90,896 emergency calls—compared with 87,691 in 1952 and 87,012 in 1951. Thirty-nine ambulances were in commission, operating from the 18 accident ambulance stations; they covered 457,514 miles, an increase of 15,246 over 1952. Fridays and Saturdays are still the busiest days of the week, with averages of 267 and 266 calls, and Sunday remains the quietest day with 188 calls. Unlike 1952, when most calls were received in December, in 1953 the highest average number of calls were received in June—280 calls a day—and May—269 calls a day. These figures reflect the record numbers reached on Coronation Day, when 650 patients were removed by the London Ambulance Service. The general section of the Service, which deals with the non-urgent removal of sick people, carried out 428,946 journeys in 1953, conveying 721,334 patients a distance of 3,625,430 miles. In 1951 550,621 patients were carried, and in 1952 660,206. The majority of these journeys were for the conveyance of out-patient cases to and from hospitals, clinics, etc.

COMPARISON OF SODIUM AND PROCAINE PENICILLIN IN TREATMENT OF EXPERIMENTAL STAPHYLOCOCCAL INFECTION IN MICE

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It is remarkable that there is still a division of opinion regarding the administration of penicillin in the treatment of infections. It has often been maintained that the therapeutic benefits of penicillin depend on the time during which there is an amount of penicillin in the blood stream sufficient to kill or inhibit the growth of the infecting organism. This possibility was recognized in the early days of penicillin therapy, and the continuous administration of penicillin by intramuscular drip rather than by intermittent intramuscular injection was advocated so that a bacteriostatic level of penicillin in the blood could be maintained throughout treatment. It was, however, pointed out by Hudson *et al.* (1946) that, for the same amount of penicillin over a 24-hour period, the intermittent method of administration gave a much higher average level of penicillin in the blood than the continuous method, and they also contended that intermittent therapy would be more effective in that the high peaks of penicillin obtained in the blood after each injection would enable penetration of penicillin into the foci of infection. The intramuscular drip method was soon abandoned, largely because of technical difficulties in its application, with the result that no clear-cut comparison could be made of its value relative to the more widely used intermittent method.

The question has again been raised with the introduction of depot preparations of penicillin, which have the advantage over sodium penicillin of prolonging the absorption of penicillin from the site of injection, so that effective concentrations are maintained in the blood stream for a much longer time. It is on these grounds that the advocates of the new preparations recommend their use, but it appears that little or no evidence has been adduced to show that they are better than aqueous solutions of sodium penicillin in the treatment of infections. The experiments described here have been designed to provide such evidence so far as it applies to an experimental infection which has been used by Selbie and Simon (1952) in their investigation on the virulence of *Staph. pyogenes* to mice.

Material and Methods

The two strains of *Staph. pyogenes* used for these experiments have been described by Selbie and Simon (1952). Strain No. 221 was used for five experiments, but had to be abandoned because of a fall in virulence. Fourteen experiments were done with Strain No. 144. At the time of the experiments the growth of the strains *in vitro* was inhibited by about 0.04 unit of penicillin per ml.

In each experiment four groups of six mice of about 30 g. body weight were inoculated intramuscularly in the left thigh with 0.2 ml. of an 18-hour culture of *Staph. pyogenes* in tryptic digest broth. The first group was left untreated, and the succeeding groups were treated with an aqueous solution of the sodium salt of penicillin G, a suspension of procaine penicillin G in arachis oil containing 2% aluminium stearate ("avloprocil"), and an aqueous suspension of procaine penicillin G ("distaqueine G"). Each

dose of penicillin preparation contained 30,000 units in 0.1 ml. and was injected subcutaneously in the right axilla so as to be as far away as possible from the site of infection and thus ensure that penicillin would reach the lesion by way of the blood stream rather than by direct diffusion through the tissues.

In two series of experiments treatment with penicillin was started three hours after inoculation, when some swelling of the thigh could already be detected. This was done on the basis of preliminary experiments which showed that earlier treatment rapidly abolished the lesions in most of the mice, whereas when treatment was started at three hours the great majority of the mice showed measurable swellings during the whole of the succeeding week, so that an opportunity could be afforded of measuring differences in response to the various penicillin preparations. In the third series treatment was not started until after 24 hours, when the lesions were first measured. Measurement of the lesions was made at 1, 2, 4, and 7 days after inoculation by determining the diameter of the left thigh by callipers to the nearest millimetre and subtracting the diameter of the normal thigh.

Results

The average effect of six experiments in which only one dose of penicillin had been given three hours after inoculation is shown in Fig. 1. The average effects of two further series of experiments in which four daily doses of penicillin have been given, commencing at 3 hours and 24 hours after inoculation, are shown in Figs. 2 and 3 respectively. The overall mortality rate of 1% has not interfered with the analysis of the results, especially as only one mouse has died in each affected group. Progressive infection, as judged by the increasing average size of the swellings, has been obtained in the untreated mice of all the experiments except for the onset of regression after two days in one experiment, and after four days in three experiments. All three penicillin preparations reduced the size of the lesions as compared with those in the control mice, but there were great differences between experiments in response to the three penicillin preparations.

The results have been submitted to Dr. L. J. Edwards for statistical appraisal. He finds that the most suitable way of dealing with these is to express the sum of the swellings on each day in each experimental group of six mice as a percentage of the sum of the swellings in the

corresponding control group on that day. The means of the percentages for each day in each treatment have been used to construct Figs. 1 to 3. Dr. Edwards has also calculated the variances of the means, and concludes that all three penicillin preparations significantly reduce the size of the swellings on all regimes of dosage and on all days of measurement, but none of them can be said to be demonstrably better than either of the others.

Concentration of Penicillin in Blood of Mice

The concentration of penicillin in the blood serum of mice at intervals after subcutaneous injection of the three penicillin preparations in the dose of 30,000 units used for treatment was estimated by the twofold serial dilution method described by Selbie *et al.* (1945). Each estimation was made on 1 ml. of serum from the pooled blood of three mice which were bled from the heart with a Pasteur pipette immediately after they were killed.

The results are shown in the Table. It will be seen that during the first 10 minutes sodium penicillin gives a concentration in the serum five times greater than the highest level attained at any time by either of the other preparations. It can also be seen that the concentrations given by sodium penicillin are lower than those given by the other two preparations from 30 minutes onwards and are no longer detectable by the method used at 18 hours. The results obtained with the procaine penicillin preparations show a more rapid absorption from the aqueous suspension, which, however, gives detectable levels of penicillin up to at least four days, as against seven days with the oily preparation.

Discussion

The clinical use of procaine penicillin preparations in preference to sodium penicillin is based largely on the contention of Eagle *et al.* (1950) that the curative effect of penicillin depends primarily on the concentration of penicillin in the blood and the total time for which it remains at effective levels. It has, however, been shown here that equivalent doses of sodium penicillin and two preparations of procaine penicillin are equally effective in controlling the lesions of an experimental staphylococcal infection in mice. If the presence of a bacteriostatic level of penicillin in the blood were the principal factor in determining a curative effect, the blood levels shown in the Table would indicate that the dose of sodium penicillin used would become ineffective

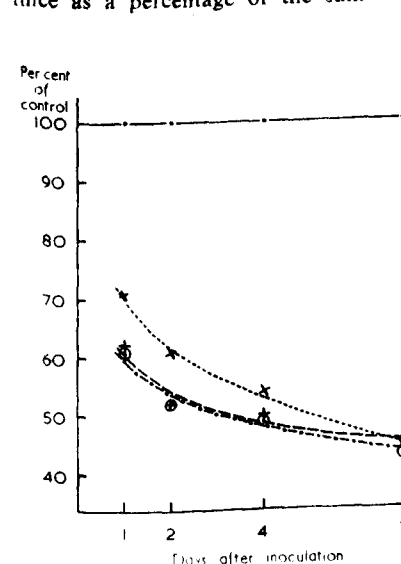


FIG. 1.—Average effect of one dose of 30,000 units of penicillin given three hours after intramuscular inoculation of *Staph. pyogenes*. —●—●— Untreated mice. —○—○— Mice treated with sodium penicillin. —×—×— Mice treated with oily suspension of procaine penicillin. —+—+— Mice treated with aqueous suspension of procaine penicillin.

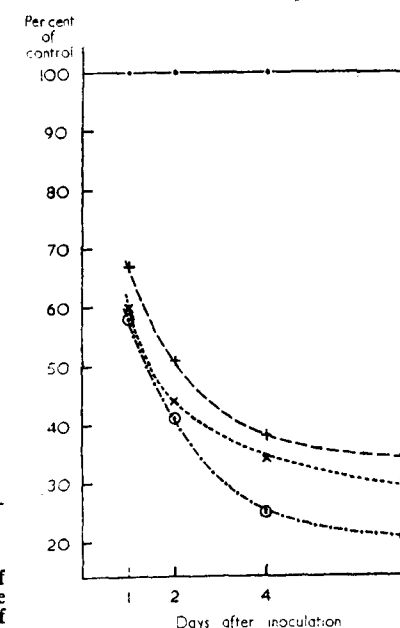


FIG. 2.—Average effect of four doses of 30,000 units of penicillin given 3 hours, 1 day, 2 days, and 3 days after intramuscular inoculation of *Staph. pyogenes*. Explanation as for Fig. 1.

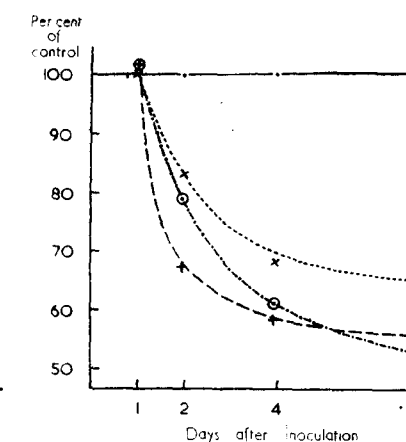


FIG. 3.—Average effects of four doses of 30,000 units of penicillin given 1, 2, 3, and 4 days after intramuscular inoculation of *Staph. pyogenes*. Explanation as for Fig. 1.

*Professor F. R. Selbie died on February 22.

Penicillin in Blood Serum of Mice After Subcutaneous Injection of 30,000 Units of Penicillin in 0.1 ml.

Preparation	Units of penicillin per ml. at												
	Minutes			Hours						Days			
	5	10	30	1	3	6	12	18	24	2	4	5	7
Sodium penicillin G	800	800	2.5	1.3	5	1.3	0.64	—	—	2	4	5	7
Oily suspension of procaine penicillin	20	40	160	10	5	2.5	10	N.D.	—	2.5	1.3	N.D.	—
Aqueous suspension of procaine penicillin	40	40	160	160	40	40	20	N.D.	0.64	1.3	0.08	—	0.04

— Less than 0.04 unit per ml. N.D. = Not done.

within 18 hours, whereas the equivalent doses of oily and aqueous procaine penicillin would remain effective for four and seven days respectively.

It is, however, obvious from Fig. 1 that the curative effect following one injection of sodium penicillin continues long after penicillin falls below a detectable level in the blood, and is as good as that obtained after an injection of procaine penicillin. This continuing effect after sodium penicillin treatment is also evident when four daily doses are given, whether the first dose is given at 3 hours or 24 hours after inoculation (Figs. 2 and 3); in both regimes the aggregate time during which effective levels of penicillin would be present in the blood is less than three days with sodium penicillin and seven days with the procaine penicillin preparations.

It would thus appear that the total duration of an effective level of penicillin in the blood is not the only factor that is of importance in determining the curative effect of penicillin in this experimental infection. Two of the factors that have to be considered are the maximum concentration of penicillin attained in the blood and the defence mechanisms of the host. The Table shows that the maximum concentration of penicillin detected in the blood after the injection of sodium penicillin is five times greater than that detected after injection of the procaine penicillin preparations. Sodium penicillin would therefore give a much higher concentration of penicillin in the staphylococcal lesions and so produce a greater therapeutic effect than procaine penicillin. This more intensive effect of sodium penicillin would, however, be maintained over a relatively short period.

The reason why such a short but intensive action of sodium penicillin should be as valuable as the prolonged maintenance of a lower therapeutic level by procaine penicillin may be found by a consideration of the part played by the natural defence mechanisms of the host. These mechanisms are constantly in operation, and are so effective that staphylococcal infections in man and the experimental infection described here are in the end usually overcome even when chemotherapy is withheld. The part played by penicillin may then be regarded as an intervention in this natural process whereby the suppression of the staphylococci by the antibacterial action of penicillin, even if it is only temporary, so tips the scales in the reactions between host and parasite that the defence mechanisms of the host become more effective. The relatively high concentrations attained immediately after an injection of sodium penicillin at an early stage of infection would thus exert a more intensive effect, and the later continuing effect would be entirely due to the operation of the natural defence mechanisms. Procaine penicillin, on the other hand, would have a less intensive initial effect, but the results of the experiments show that it largely overcomes this disadvantage by its much more prolonged intervention at a relatively low intensity.

These conclusions are at variance with the views of Eagle *et al.* (1950). They, however, have based their conclusions on a different type of experimental infection. In one of their recent publications they show that the effect of penicillin in reducing the mortality rate of a streptococcal infection in mice depends primarily on the aggregate time during which penicillin is present in the blood at or above the bactericidal level, irrespective of the dosage regime, pro-

vided that the interval between doses is not too long (Eagle *et al.*, 1953). It must, however, be borne in mind that the streptococcal infection used by Eagle and his co-workers and the staphylococcal infection used here are very different in their behaviour. Mice have little or no immunity to haemolytic streptococci, so that the experimental infection is rapidly fatal. On the other hand, mice are so much more resistant to staphylococcal infection that even the large numbers of staphylococci used for inoculation in the experiments described here produce only a local lesion with a very low mortality rate. The intense exudative response to the staphylococcal infection also appears to make the organisms less accessible to penicillin, as can be judged by the much larger doses required to control the staphylococcal lesions as compared with the streptococcal infection, in which the organisms are more directly in contact with the circulating body fluids. It is therefore not surprising that the two experimental infections should differ in their response to chemotherapy.

The application of these findings to the penicillin treatment of infections in man is difficult because of the highly artificial nature of animal experiments. It can be said that the experimental staphylococcal infection resembles conditions in man more closely than the streptococcal infection of Eagle and his colleagues because most human infections elicit some degree of response on the part of the body defences. If this view is accepted it is then apparent that to give maximum aid to the body defences. The results with sodium penicillin as with procaine penicillin even this view is to be found in the report by Tompsett *et al.* (1949), who have failed to detect any difference in response between 21 cases of pneumococcal pneumonia treated with daily doses of 30,000 units of procaine penicillin in oil, and by daily doses of 300,000 units of sodium penicillin.

Another investigation of this type is that of Griffiths *et al.* (1949), who found no significant difference in response to treatment between a group of 116 patients with acute septic infection, mainly staphylococcal, given a daily injection of 300,000 units of an oily suspension of procaine penicillin and a similar group of 116 patients given twice-daily injections of 300,000 units of sodium penicillin in saline. Both groups of authors suggest that their results warrant the conclusion that a continuous effective level of penicillin is not necessary for the control of the two respective types of infection.

The results recorded here and a search of the literature have been disappointing in that no clear evidence has been found to show whether sodium penicillin or procaine penicillin gives the better results in the treatment of infections. It is probably true that the prolonged blood levels obtained with procaine penicillin are of great value when only one dose of penicillin can be given, as in the mass treatment of syphilis and yaws. On the other hand, even when penicillin can be given only at infrequent intervals, it has yet to be proved in practice whether the prolonged low blood levels provided by procaine penicillin are more efficacious than the short-lasting but high blood levels provided by sodium penicillin in the treatment of the generality of infections amenable to penicillin therapy.

Summary

It has been shown that sodium penicillin is as effective as either oily or aqueous procaine penicillin in the treatment of an experimental staphylococcal infection in mice.

It is concluded that the curative effects of penicillin depend not so much on the aggregate time that an effective level of penicillin is present in the blood as on other factors, of which the most important is the co-operation of the defence mechanisms of the host.

The application of these findings to the treatment of human infections is discussed.

I wish to thank Dr. L. J. Edwards, of the Beecham Research Laboratories, Brockham Park, Surrey, for his help in this investigation.

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THE MALE CLIMACTERIC: IS IT AN ENTITY?

BY

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In Dorland's *Medical Dictionary* the climacteric is defined as "a particular epoch of the ordinary term of life at which the body is believed to undergo a radical change," and the male climacteric as "the phenomena attending the normal decrease in sexual function in the male." In an annotation entitled "The Middle-aged Man," in the *British Medical Journal* (1953), the following statements appear: "Claims have been made, and denied, that there is a rare syndrome properly described as the male climacteric. The symptoms of the presumed syndrome, briefly, are depression, irritability, lack of concentration, palpitation, weakness, and sexual impotence. . . . These claims, however, have been refuted by other workers unable to corroborate them. The so-called syndrome, they assert, is a psychiatric illness. . . . No one has described a condition in men with disturbance of hormone secretion as the only symptom of the so-called male climacteric. . . . Until an occult deficiency of testicular androgen—provided this can be estimated—is shown to bear a direct causal relation to the multiplicity of symptoms embraced by the term male climacteric, we have no ground for accepting the concept." These statements were repeated in *Prescribers' Notes* (1953), issued by the Ministry of Health. It is my endeavour in this article to demonstrate that the male climacteric exists as a clinical entity.

Female Climacteric

Before the problem of the male climacteric is discussed it is pertinent to refer to the complexities of the female counterpart, the existence of which, so far as I am aware, has not been denied. Although the climacteric is defined in a modern British medical dictionary as "the menopause," this definition needs correction, for the two terms should not be confused. Menopause simply means "cessation of menstruation" brought about by physiological failure of

ovarian function. All women have a menopause—if they live long enough—but not all women have symptoms of the climacteric; in fact, many women pass through this period of life with few or no disturbances.

As the critics of the existence of the male climacteric have insisted that its alleged symptoms must be shown to be caused by deficiency of testicular androgen, the cause of the symptoms of the female climacteric must be considered. At the time of the menopause the level of oestrogen in the blood falls as a result of the ovarian changes, and at the same time the titre of gonadotrophin (follicle-stimulating hormone, F.S.H.) rises through removal of the inhibiting influence of oestrogen on the anterior lobe of the pituitary gland. Climacteric symptoms may be directly due to oestrogen deficiency, to excessive gonadotrophin, or to some other factor. The improvement which may be effected by the administration of oestrogen is no proof that oestrogen deficiency is the direct cause of the symptoms, for their amelioration may be due to the fall in the level of gonadotrophin which the administered oestrogen produces. On the other hand, there are observations which suggest that neither of these two factors is responsible—namely: (1) many women do not have climacteric symptoms although their oestrogen level is low and their gonadotrophin titre high; (2) climacteric symptoms may appear before menstruation ceases—that is, when the oestrogen level is within normal limits; and (3) they do not occur in oestrogen deficiency due to hypopituitarism or (4) in ovarian infantilism. In fact, on grounds such as these Pratt (1950) concluded that a hormonal basis alone does not explain the symptoms of the female climacteric.

From this very brief and cursory survey it will be seen that the aetiology of the symptoms of the female climacteric is by no means established and that arguments similar to those brought forward against the existence of the male climacteric, such as those mentioned in the first paragraph of this paper, could well be advanced to deny the existence of the female climacteric.

Male Climacteric

Landau (1951), discussing the concept of the male climacteric, has stated that the period of life during which "climacteric" symptoms are presumed to occur is also the time at which the emotional and intellectual adjustment of the shift from maturity to old age must begin to be made, and that some men at that time develop neurotic reactions such as impotence and general subjective disturbances. This statement is undoubtedly true, and in my experience these patients are not improved by the administration of androgens. However, similar emotional and neurotic upsets occur in menopausal women and are not benefited by the administration of oestrogen, but this is not sound evidence that the female climacteric does not exist.

In discussing the problem of the existence of a male climacteric and whether it is due to or associated with testicular deficiency the following observations should be considered.

(1) Comparison of Symptoms of Male Climacteric with Those of Post-pubertal Castration

In post-pubertal castration libido and potency are generally diminished or absent, but this does not happen in all cases. Similarly, potency and libido may or may not be affected in the male climacteric. After castration has been performed in the adult he may experience hot flushes and sweats and suffer from generalized weakness, lack of mental drive and energy, diminished power of concentration, a sense of inferiority, emotional instability, and fits of depression. The same symptoms occur in the male climacteric. The argument, however, has been produced that in the middle-aged man they are primarily of psychological origin and that any improvement that may be obtained by the administration of testosterone is due to suggestion; yet I have had referred to me by psychiatrists castrated and eunuchoid patients with such symptoms which have disappeared or have been greatly improved with

androgen therapy. Should one assume that the improvement in these cases of known testicular deficiency is also the result of suggestion? This is unlikely, although it must be borne in mind that the improvement in these "neurotic" and "psychoneurotic" symptoms may be secondary and due to the attainment of potency (but see (3) below concerning the anabolic action of androgens).

(2) 17-Ketosteroid Excretion

The urinary excretion of 17-ketosteroids is an index of the amount of androgens produced by the Leydig cells of the testicular interstitial tissue and by the adrenal cortex. Because of the production of adrenal androgens it is often impossible by estimation of the urinary 17-ketosteroids alone to distinguish a eunuch from a normal man. Callow *et al.* (1940) found that normal adult men excreted 3.5 to 15 mg. of 17-ketosteroids in 24 hours and that eunuchs excreted 3.1 to 10.9 mg. in 24 hours. By this investigation, therefore, it is difficult to demonstrate androgen deficiency in the male climacteric. However, on the whole in men of middle age the excretion of 17-ketosteroids begins to decline: at the age of 40 the mean is 14 mg. and in old age 3.4 mg. in 24 hours (Dorfman, 1948). Howard *et al.* (1950) observed that in six patients whom they considered to be suffering from the male climacteric the urinary 17-ketosteroids "tended to be low," the values ranging from 3.9 to 10.2 mg. in 24 hours.

(3) Anabolic Action of Androgens

What is often overlooked or not fully appreciated is that in addition to their effect on the sexual organs androgens have a powerful anabolic action. They promote the anabolism of protein and increase muscular bulk and strength: thus are explained the weakness and early fatigue of the eunuch. One does not therefore have to search for a psychological cause to explain these symptoms in the middle-aged man with testicular failure. The effect of androgens on the central nervous system is not yet known. The psychological symptoms which may occur in the eunuch or in the male climacteric may be secondary phenomena resulting from sexual inferiority, or, on the other hand, they may even be primary, arising through deficiency of whatever action testosterone may have on the higher centres. In this connexion it should be noted that the administration of testosterone to women with panhypopituitarism improves their psychological disturbances and gives them a sense of well-being.

(4) Titre of Gonadotrophin

It is well recognized that high levels of F.S.H. of the anterior pituitary gland are present in the urine of men with primary hypogonadism. Heller and Myers (1944) found that in 15 men with psychoneuroses or psychogenic impotence the titre was normal, whereas in 23 men whom they considered to be suffering from the male climacteric the titre was unequivocally higher. Sniffen *et al.* (1951), who have made a careful and extensive study of testicular abnormalities, have stated that it is unusual for elderly men to have raised urinary gonadotrophin, although it is the rule in post-menopausal women, but that some men do suffer from symptoms similar to those experienced by women at the time of the menopause: in these men they found that the urinary gonadotrophin was significantly raised.

McCullagh and Hruby (1949) observed that in cases of severe hypogonadism in the male the titres of urinary F.S.H. were not reduced to normal levels by the administration of testosterone in amounts sufficient to create normal titres of urinary 17-ketosteroids and clinical signs of masculinization. This failure of testosterone to inhibit pituitary activity in doses sufficient to overcome androgen deficiency they cite as evidence in favour of the theory that a second testicular hormone (inhibin) exists normally and that it is this substance which has the power to inhibit the secretion of F.S.H. Howard *et al.* (1950) have also produced evidence in support of the existence of a second

testicular hormone, which they prefer to call "X" hormone: thus, in bilateral mumps orchitis the tubules are destroyed and the titre of F.S.H. is raised, while the appearance of the Leydig cells (which secrete testosterone), virilization, and excretion of 17-ketosteroids are all normal. These authors have brought forward arguments which suggest that the Sertoli cells are the source of X hormone and that F.S.H. stimulates its production. According to this view it is damage not of the Leydig cells but of the Sertoli cells which causes the increase in titre of F.S.H. These observations lead us to a consideration of testicular histology.

(5) Testicular Histology

Heller and Myers (1944) performed testicular biopsy on 8 of their 23 cases of the male climacteric. In five they found reduction in size and in activity of the seminiferous tubules and reduction in size and number of the Leydig cells of the interstitial tissue, and in three hyaline degeneration of the tubules. Nelson (1948), in cases which he classified as the male climacteric, observed essentially normal seminiferous tubules but decreased numbers of Leydig cells with abnormal cytological characteristics. Howard *et al.* (1950) and Sniffen *et al.* (1951), on the other hand, found normal testicular histology in their patients, although the excretion of F.S.H. was raised in all.

Howard and his colleagues divide the climacteric in both sexes into two stages: (a) compensated, and (b) decompensated. They state: "In the compensated stage there is a tendency to decreased production of one of the gonadal hormones (oestrogen in the female and X hormone in the male); this tendency is met by overproduction of F.S.H., so that the gonadal function remains essentially intact. In the decompensated stage this tendency to gonadal hormone production of F.S.H., and gonadal failure becomes clinically demonstrable. In the female the compensated stage lasts a very short time; in the male, on the other hand, one seldom meets the decompensated stage. In the compensated stage in the male, therefore, one would anticipate that the Sertoli cells would be normal microscopically, as indeed they appeared to be."

(6) Effect of Treatment

It has been mentioned above that the improvement obtained in the so-called male climacteric by the administration of testosterone has been imputed to suggestion. Heller and Myers (1944), however, have reported that the injection of an inert oil without the patient's knowledge of any substitution resulted in a relapse.

Conclusion

From these observations and from my own clinical experience I find it difficult to deny the existence of the male climacteric. Heller and Myers (1944) have stated that whereas the climacteric in females is a physiological process, in males it is rare and pathological. Bauer (1944) asserted that on these grounds the syndrome should be termed "testicular insufficiency" rather than male climacteric; he maintained that if the term climacteric is used, as it should be, to designate the cessation of gonadal activity, then there is little justification for using the term male climacteric, for although the functional activity of the testes declines with advancing years there is no definite age at which they stop functioning as do the ovaries. In this respect it would appear that decline of sexual function in the middle-aged and post-middle-aged man is not denied and that the problem is one of terminology. If we adhere to the definition of climacteric as given at the beginning of this paper I do not understand why application of the term to the male should be abandoned merely because cessation of gonadal activity occurs between the ages of 45 and 55 in women whereas in men it occurs between the ages of 50 and 70 or not at all. Further, why should decline in gonadal activity of elderly men be pathological, whereas in elderly women it is physiological? As

Abarbanel (1945) has pointed out, the process of ageing can become manifest in various organs at varying times, and just because the testis may be one of the last to succumb does not mean that it has now become the site of a pathological process while a similar state in the ovary is merely physiological.

Summary

It is considered that the male climacteric is a definite clinical entity, for the following reasons: (1) Similar symptoms occasionally occur in post-pubertal castrates and eunuchs and are improved by androgen therapy. (2) The 17-ketosteroid secretion, while by no means diagnostic of testicular insufficiency, tends to be low. (3) Some of the symptoms can be explained by lack of the anabolic action of testosterone. (4) The urinary excretion of gonadotrophin is raised—indicative of testicular, but not necessarily of androgen, insufficiency. (5) The testicular histology may show structural changes. (6) The symptoms are improved with androgen therapy, but relapse when an inert substance is substituted. (7) Arguments similar to those advanced against the concept of a male climacteric could be raised against the existence of a female climacteric, which, however, has never been questioned.

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Can better use of the domiciliary services provided by local authorities help to relieve the pressure on the hospitals? This was one of the questions put by the Minister of Health, Mr. IAIN MACLEOD, when he addressed the annual meeting of the County Councils' Association in London on May 26. Mr. Macleod made a plea not only for closer co-operation between those responsible for the operation of the health and welfare services and the general practitioners, but also for the fullest opportunity to be given for voluntary effort to make this contribution, especially in helping to solve the growing problem of the care of old people. "We know," he said, "that it is possible to relieve the hospitals of some part at least of the burden now falling on them if better and perhaps more intelligent use can be made of the services provided by the local health authorities. It is not only a question of cost. There are many types of patient who, provided always that there is no clinical reason to the contrary, are better cared for in their own homes than in hospital. This applies particularly to many children and old people, and to the majority of maternity cases, and it is even more true that the vast majority of healthy old people and children are far better if they can be enabled to continue living in their own homes and families and to receive there proper care and supervision." The home nursing of sickness, he continued, was entirely dependent on a sufficient number of home nurses and home helps. Local health authorities should carefully watch to make sure that there were enough of them in their areas. He would also like to see local health authorities consulting general practitioners in their areas, through either executive councils or local medical committees, to find out to what extent doctors felt themselves compelled, owing to the shortage of home nurses and home helps, to refer patients to hospital who might otherwise have stayed at home.

ISONIAZID IN TREATMENT OF BONE AND JOINT TUBERCULOSIS

A REVIEW OF 20 CASES

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The Medical Research Council's (1952) interim report on the use of isoniazid (isonicotinic acid hydrazide) alone in 173 patients with pulmonary tuberculosis and of streptomycin combined with *p*-aminosalicylic acid (P.A.S.) in 158 others, concluded that, "judging wholly from short-term results," isoniazid is "a very effective drug" in that condition. It therefore seemed necessary to us to make an immediate study of its short-term effects in bone and joint tuberculosis in circumstances in which the drug would be used as the sole chemotherapeutic substance in the patients under consideration. There have already been reports on the use of the drug with and after streptomycin in bone and joint disease, and especially in "advanced" cases with sinuses and other complications, but we are not aware of any reports of its planned use alone in reasonably early uncomplicated cases.

To study such effects means denying our patients the known and very real benefits of streptomycin, and to obtain many suitable cases of bone and joint disease takes a long time. We therefore planned a small short-term study, designed purely as a pilot experiment, to tell us whether or not anything unexpected would occur in the course of the disease under treatment with this drug alone. We decided that six months was as long as we might deny streptomycin to our patients, and, though this is a very short time in the evolution of skeletal disease, we regarded it as probably adequate for a pilot investigation. All we sought was the answer to one simple question, Does anything unusual occur in the early evolution of the disease under the influence of isoniazid?

The Investigation

To give the drug every chance we selected "good" cases, not failures after other measures. Our 20 patients all had short histories of hitherto untreated new tuberculous lesions of bones and joints. We carefully excluded any case which could have been a recrudescence of an old lesion, and any patient who had had previous chemotherapy. The details of the patients are summarized in the Table. All 20 were admitted to the Robert Jones and Agnes Hunt Orthopaedic Hospital. In all save six spinal cases the diagnosis was or had been proved by biopsy or by recovery of the bacillus by aspiration of abscesses and recovery of *M. tuberculosis* therefrom, and in one of these six, all of which were clinically and radiologically typical, we accepted the presence of a proved active tuberculous lesion elsewhere in the body as adequate evidence that the spinal lesion was in fact tuberculous. The patients' ages ranged from 5 to 45 years. Ten were aged 20 or under. There were 13 males and 7 females. The sites of the lesions were: lumbar spine, 6; hip, 5;

Summary of Cases

Case No.	Sex and Age	Site of Lesion	Type of Lesion	Treatment		Iso-niazid (mg./day)	Other Treatment Given	Weight			X-ray Appearances		General Response to Treatment	E.S.R. (mm./hr.)		White-cell Count		Comments
				Began	Ended			Before Treatment	After 3 Months	After 6 Months	Before Treatment	After 6 Months		Before Treatment	After 6 Months	Before Treatment	After 6 Months	
1	F 20	L. knee	Synovial (proved by biopsy)	31/5/52	1/12/52	250	Thomas splint and plaster gutter frame fixation	112 lb. (50.9 kg.)	126 lb. (57.3 kg.)	128 lb. (58 kg.)	Visible synovial thickening. No destruction. Joint space normal	Unchanged	Good	29	12	9,000	8,000	
2	F 37	Lumbo-sacral angle	Bony (not proved)	31/5/52	1/12/52	250	Frame fixation	122 lb. (55.5 kg.)	125 lb. (56.9 kg.)	133 lb. (60.3 kg.)	Uniform destruction of contiguous margins of L3 and S1; loss of disk space. No abscess visible	No further destruction. Some evidence of healing	"	18	18	15,000	8,000	Tuberculous pleural effusion remained unchanged
3	M 18	Dorsal spine (D8-9)	"	31/5/52	1/12/52	200	"	77 lb. (35 kg.)	84 lb. (38.2 kg.)	92 lb. (41.9 kg.)	Narrower disk D8-9. Small area of destruction lower margin D8. Small peri-spinal abscess shadow	No further destruction. Further loss in disk space. Lesion "hardening" a little	"	55	40	9,000	7,000	Psoas abscess present at onset continued to fill, and an abscess developed on the other side after 3 months' treatment
4	M 25	Lumbar spine (L4-5)	Bony (proved by culture of pus from hip)	31/5/52	1/12/52	300	"	124 lb. (56.4 kg.)	138 lb. (62.8 kg.)	144 lb. (65.5 kg.)	Narrower disk space L4-5. Slight collapse of body of L4. Erosion of anterior part of upper margin of body of L5. Diffuse porosis	A little further destruction of body of L5	"	50	48	8,000	5,000	Developed abscess over hip after 3 months' treatment; it continued to fill and pointed through an aspiration. Sinus periauricular. Organism insensitive to isoniazid after 5 months. Originally sensitive. General and local condition immediately improved on streptomycin after 6 months isoniazid
5	M 12	L. hip	Synovial (proved by biopsy of iliac glands)	31/5/52	1/12/52	200	"	88 lb. (40 kg.)	103 lb. (47 kg.)	113 lb. (51.4 kg.)	Narrowing of joint space. Erosion of acetabulum with small sequestrum. Porosis of head	Some loss of joint space and increased destruction of acetabulum. Roof. Sequestration	Moderate	16	4	9,000	5,500	Left gluteal abscess originally present was aspirated once and has not refilled. (Developed abscess, thought not due to isoniazid)
6	M 11	L. hip	Bony (proved by aspiration of knee and culture of pus from hip)	6/6/52	7/12/52	150	"	59 lb. (27 kg.)	70 lb. (32 kg.)	81 lb. (36.8 kg.)	Narrowing of joint space. Erosion of articular surfaces of tibia, femur, and patella	Porosis much less. Appearance of healing. Improved	"	55	27	8,000	5,500	Thick pus was aspirated from the knee-joint before treatment began
7	F 13	R. knee	Synovial (proved by biopsy)	6/6/52	7/12/52	200	Thomas and plaster gutter splints frame fixation	94 lb. (43 kg.)	114 lb. (51.9 kg.)	132 lb. (60 kg.)	Diffuse porosis. No loss of joint space. No soft-tissue thickening on x-ray	Unchanged	Very good	10	3	10,000	5,000	
8	F 23	L. sacro-iliac	Bony (proved by culture of pus from abscess)	13/6/52	14/12/52	250	"	107 lb. (48.6 kg.)	110 lb. (50 kg.)	107 lb. (48.6 kg.)	Widening and porosis of left sacro-iliac joint	Porosis much less. Appearance of healing. Improved	Good	19	4	9,000	5,000	
9	M 20	L. knee	Bony (proved by aspiration of knee and culture)	13/6/52	14/12/52	300	Thomas and plaster gutter splints	138 lb. (62.7 kg.)	150 lb. (68.2 kg.)	182 lb. (82.7 kg.)	Loss of joint space. Erosion of articular surfaces of tibia, femur, and patella	No further destruction. "Hardening" with much clearer definition	Moderate	10	4	7,000	8,000	
10	M 24	Dorsal spine (D9-10 and D11-12)	Bony (not proved)	27/6/52	26/12/52	300	Frame fixation	131 lb. (59.5 kg.)	137 lb. (62.1 kg.)	135 lb. (61.3 kg.)	Loss of disk space D9-10 and D11-12. Collapse of bodies of D9-10-11-12, with erosion of anterior margins. Paravertebral abscess	Slight collapse of D9 body with further destruction on right side	Good	12	4	6,000	9,000	
11	F 14	L. hip	Synovial (proved by iliac gland biopsy)	25/7/52	29/1/53	150	"	70 lb. (31.8 kg.)	81 lb. (36.8 kg.)	87 lb. (39.5 kg.)	Narrowing of joint space. Diffuse porosis	Slightly narrower joint space, but no destruction. Considerable porosis	Good	47	44	6,000	8,000	Abscess developed in thigh during last month of isoniazid therapy
12	M 45	L. hip	Bony (proved by culture of abscess pus)	1/8/52	3/2/53	300	"	131 lb. (59.5 kg.)	115 lb. (52.3 kg.)	146 lb. (66.3 kg.)	Loss of joint space. Erosion of head. Tendency to subluxation. Gross osteoporosis	No further erosion or tendency to subluxation. Erosion of head improved	"					

Summary of Cases—continued

Case No.	Sex and Age	Site of Lesion	Type of Lesion	Treatment		Iso-niazid (mg./day)	Other Treatment Given	Weight			X-ray Appearances		General Response to Treatment	E.S.R. (mm./hr.)		White-cell Count		Comments
				Began	Ended			Before Treatment	After 3 Months	After 6 Months	Before Treatment	After 6 Months		Before Treatment	After 6 Months	Before Treatment	After 6 Months	
13	M 15	Lumbar spine (L3-4)	Bony (not proved)	15/8/52	14/2/53	250	Frame fixation	126 lb. (57.2 kg.)	140 lb. (63.6 kg.)	150 lb. (68.2 kg.)	Narrowing of disk space L3-4. Erosion of both bodies anteriorly	Some collapse of bodies. Hardening of lesion. Improved	Good	21	14	5,000	6,000	Psoas abscess at commencement of treatment. Discharging sinus after 2 weeks and continued to discharge for 3 months
14	M 24	Lumbar spine (L4-5)	Bony (proved by culture from abscess)	15/8/52	14/2/53	350	"	150 lb. (68.2 kg.)	161 lb. (73.2 kg.)	170 lb. (77.3 kg.)	Narrowing of disk space L4-5. Erosion of anterior margin of bodies L4-5	Evidence of healing. Improved	"	12	5	6,000	7,000	
15	F 16	L. knee	Synovial (proved by biopsy)	22/8/52	26/2/53	300	Thomas and plaster gutter splints frame fixation	127 lb. (57.8 kg.)	126 lb. (57.3 kg.)	146 lb. (66.4 kg.)	Diffuse porosis. No loss of joint space	No change	Poor initially. Then good	23	38	6,000	6,500	
16	M 5	R. hip	Synovial (proved by biopsy of hip)	13/9/52	14/3/53	100	"	39 lb. (17.7 kg.)	28 lb. (12.7 kg.)	42 lb. (19 kg.)	Loss of joint space. Diffuse porosis	"	Poor initially. Then moderate	32	5	8,500	9,000	
17	F 40	Lumbo-sacral angle	Bony (proved by bacteriology of lumbar abscess)	13/9/52	14/3/53	350	"	160 lb. (72.7 kg.)	158 lb. (71.8 kg.)	164 lb. (74.5 kg.)	Destruction of lower margin of L5. Loss of L5-S1 disk space	Lesion "hardening" well. No further destruction. Improved	Poor	30	18	5,000	5,000	Large lumbar abscess opened and drained after 3 months. Healed one month later. General condition much improved on streptomycin after 6 months' course of isoniazid
18	M 34	Lower dorsal spine (D11-12)	Bony (not proved)	22/8/52	26/2/53	250	"	118 lb. (53.6 kg.)	126 lb. (57.3 kg.)	108 lb. (49.1 kg.)	Narrowing of disk space D11-12. Erosion of anterior border D12	"Hardening" of lesion. Some collapse. Evidence of healing	Moderate	38	27	7,000	7,500	
19	M 26	L. sterno-clavicular joint + L. ankle joints	1. Bony (proved by culture of pus) 2. Synovial (not proved)	26/9/52	28/3/53	300	Bed rest and plaster cast below left knee	142 lb. (64.5 kg.)	154 lb. (70 kg.)	158 lb. (71.8 kg.)	1. Some widening of joint space. No bony erosion. 2. Generalized porosis	1. No change. 2. Porosis of ankle disappeared. No destruction	Good	11	2	6,000	7,000	Abscess over sterno-clavicular joint aspirated at onset. No recurrence
20	M 24	Lumbar spine (L1-2)	Bony (not proved)	19/9/52	20/3/53	350	Frame fixation	160 lb. (68.6 kg.)	172 lb. (78.2 kg.)	206 lb. (93.6 kg.)	Narrower disk space L1-2. Erosion of anterior margins of these bodies. Slight collapse of body of L1	Some further narrowing of disk space. Hardening of lesion. Improved	"	34	5	10,000	8,000	

knee, 4; dorsal spine, 3; sacro-iliac joint, 1; sterno-clavicular joint and ankle, 1. One dorsal spine lesion was accompanied by a tuberculous empyema. Three lumbar spinal lesions had produced palpable abscesses, and there was an abscess over the affected sterno-clavicular joint. No other complications were present when treatment was begun.

As soon as treatment was started the patients were immobilized and the affected bones and joints splinted exactly according to the time-honoured practice of the hospital. A full open-air regime was established, but the patients received no other anti-tuberculosis drugs and no operations were performed apart from biopsy and aspirations of abscesses.

Dosage of Isoniazid.—All patients received 5 mg. of isoniazid per kg. of body weight per day, in two divided doses regularly at 12-hour intervals. The various weights of the patients meant that the doses given ranged from 100 to 350 mg. per day. In most of the patients the body weight changed appreciably during treatment, but we did not adapt the dose to this change. The drug used was "tubomet," kindly supplied by Bengers Laboratories, Limited. For the first two months of treatment the concentration of the drug in the serum was checked at weekly intervals in 10 cases, the estimations being made by Messrs. Bengers. As it was found that the dose was constantly giving a level of between 1.15 and 2.3 mg. of isoniazid per ml. of blood plasma, the estimations were stopped after the first two months. This concentration was regarded as adequate. The drug was given continuously for six months in all cases.

Criteria Studied.—The course of the 20 cases was studied with regard to general health and well-being, body weight, local clinical condition, progress of the lesion as revealed by x-ray films, E.S.R., and sensitivity of the organisms in those patients in whom repeated study of this aspect was permissible. The patients were weighed and x-rayed at the beginning of treatment, after three months, and after six months. The E.S.R. (Wintrobe) and full blood counts were estimated at monthly intervals. Regular routine urine analysis and clinical examination completed the study. A careful watch was kept for toxic effects. It was not possible to establish a control series. It takes years to find a group of identical cases of bone and joint tuberculosis, and for the purposes of this purely pilot survey we thought controls unnecessary as well as unobtainable.

Results

Effect on General Health.—It is, of course, manifestly impossible to analyse the results obtained in 20 patients as one would those of a much larger series, but there is no doubt that an immediate and striking improvement

occurred in the general condition of 17. Many of these patients had been pale and miserable on admission. They immediately developed a sense of well-being, with an increase in appetite and a striking improvement in appearance. The three exceptions (Cases 15, 16, and 17) ultimately improved in the same way, though to a lesser degree, but their early response was disappointing. Neither a good response nor a poor one in those respects, however, gave any indication of what was happening to the local tuberculous lesion. In the 17 patients who looked so much better so soon, this improved in nine, remained apparently unchanged in five, and was actually worse in three. In the three patients who made a disappointing general response the local lesion improved in one and was apparently stationary in the other two.

Weight.—Fifteen patients, not all of whom had apparently improved in health, gained weight steadily and at the end of six months were anything from 11 to 46 lb. (5 to 21 kg.) heavier. Two (Cases 16 and 17) lost weight in the first three months and then recovered it, and ultimately exceeded their starting weights. One (Case 8) gained 3 lb. (1.4 kg.) in the first three months and then lost just as much in the second. Another (Case 18) gained 8 lb. (3.6 kg.) and then lost 18 lb. (8.2 kg.). One (Case 10) gained 6 lb. (2.7 kg.) in the first period and lost 2 lb. (0.9 kg.) in the second. Again, however, there was no apparent correlation between the gain in weight and the progress of the lesion itself. Gains of 18 and 21 lb. (8.2 and 9.5 kg.) went with local deterioration, and a net loss of 9 lb. (4 kg.) with improvement.

Abscesses and Sinuses.—Two of the four abscesses which were palpable when treatment started resolved after aspiration during the course of treatment. The third required incision: the wound was sutured after evacuation of the pus; it healed well. The fourth, originally palpable in one flank, increased in size so as to become palpable in both flanks, although the patient (Case 4) gained 20 lb. (9 kg.). One patient (Case 6) developed an abscess, which became a sinus during treatment, despite a gain of 21 lb. (9.5 kg.) in six months and a good general response. Another patient (Case 12) developed an abscess three weeks after the drug was stopped, at which time his disease (a hip lesion) appeared to be much improved clinically and radiographically.

Changes in X-ray Appearances.—It is, of course, well-nigh impossible to judge, except very broadly, the progress of a tuberculous lesion in its early stages, as shown by x-ray films. Allowing, however, for this difficulty, we feel satisfied in saying that the films in 10 cases showed appreciable improvement. In seven there was no demonstrable change, and in three (Cases 4, 6, and 10) bone destruction advanced despite treatment. Case 6 is of sufficient interest to be described in detail (see below).

E.S.R.—This gave no indication of response. In most cases there was a slow fall over the six months, and in only one (Case 15) was the rate higher after that period.

Insensitivity.—Five patients had abscesses. The pus from one was sterile. Two others cleared up too rapidly for pus to be recovered more than once. In the fourth the organism was never grown in culture but produced tuberculosis in the guinea-pig (Case 4); and in the fifth (Case 6) relative insensitivity was demonstrated after five months' treatment. The abscess over the hip of a boy of 11 appeared after three months' treatment. After three and a half months the organism was sensitive to concentrations of 0.2 mg. per ml. after two weeks' incubation at 37° C., but after five months it was insensitive to 1 mg. per ml. and was inhibited only at a strength of 5 mg. per ml.

Toxic Effects.—One patient (Case 14) developed a rash after four months' treatment. Treatment was not stopped, and the rash disappeared in a week. Another's hair fell out (Case 8). We were unable to convince ourselves that these were toxic effects of the drug, and certainly no others were seen. The white-cell count fell in 9 cases, but never below 5,000 per c.mm. In 10 cases it actually rose.

Case Report

The patient was a boy of 11. Pain in the left hip and a limp had been first noticed in March, 1952. The diagnosis of tuberculosis of the hip had been proved by iliac-gland biopsy in another hospital and the patient was transferred to our care in June, 1952.

On admission he was a pale, thin boy, weighing 59½ lb. (27 kg.). His left hip showed a flexion-abduction deformity, with a good deal of soft-tissue thickening around and in front of the trochanter, and marked pain and spasm on attempts at movement. No abscess was palpable. The biopsy scar in the left iliac fossa was well healed.

A radiograph of the hip showed narrowing of the joint space, porosis of the head of the femur, and a little erosion of the roof of the acetabulum. His E.S.R. was 36 mm. in the first hour (Wintrobe).

The child was splinted on a Robert Jones abduction frame, nursed in the open air, and given 150 mg. of isoniazid daily. After three months his general appearance was much improved, he had gained 11 lb. (5 kg.), but a radiograph of the hip showed further destruction of the acetabular roof, with sequestration. Four months after the beginning of treatment an abscess became apparent and 30 ml. of thick pus was aspirated. *M. tuberculosis* was recovered from this pus, the organism being found to be sensitive to isoniazid at a concentration of 0.2 mg. per ml.

The blood concentration of isoniazid during the first two months of treatment had shown that the dose given was producing a concentration of 1.3 mg. per ml. but, despite the fact that a sensitive organism was receiving an apparently adequate dose of the drug, the disease continued.

The abscess was aspirated five times during the next two months and, despite all precautions, a sinus appeared in December, 1952. In November, 1952, the sensitivity of the bacillus had been reduced so that it was now sensitive only to a concentration of 5 mg. per ml. This concentration was not being obtained.

Gain in weight continued; so did destruction of bone, as shown by the radiograph. After six months isoniazid was discontinued and streptomycin with P.A.S. was given. The E.S.R. rapidly fell to 16 mm. in one hour, the next radiograph showed arrest of the bone destruction, and the sinus began to dry up. By June, 1953, the sinus was healed, the hip lesion quiescent, and the patient's general condition very good.

Comment.—This case is quoted in detail particularly because it illustrates our firm impression that isoniazid alone did not appear to make very much difference, at least during the six months in which it was being given. Even in the cases which improved we felt quite convinced that that improvement was no greater than we would have expected in the days when treatment would have consisted of fixation in the open air without chemotherapy. We were never convinced that the improvement was as great as would have occurred had streptomycin been given instead of isoniazid.

General Conclusions

We do not want to attach too much importance to this small experiment, which we regard as nothing more than a guide to future work, but our impression from these 20 patients is that isoniazid alone is no magical cure for early uncomplicated skeletal tuberculosis, and after six months of its use we felt we could no longer withhold the more certain benefits of streptomycin from our patients. Our original question was, Can anything remarkable be expected from this new drug in six months in circumstances as near ideal as possible? The answer in this series of cases was "No."

Summary

Twenty patients with early uncomplicated tuberculous lesions of bone and joint were treated with recumbency, splintage, an open-air regime, and isoniazid, 5 mg. per

kg. per day, for six months. Neither streptomycin nor *p*-aminosalicylic acid, nor any other drug, was used during this period. There was an almost regular improvement in general health, a gain in weight was usual, but the local tuberculous lesions fared no better and no worse than we would have expected had no drug been used.

We wish to record our gratitude to the members of the consultant staff of the Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry, who transferred to our care patients whom we thought suitable for this therapeutic trial; and also to Bengers Laboratories Ltd., for supplies of the drug and for the performance of most of the chemical tests and tests of sensitivity.

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MASSIVE LEFT ATRIUM AND MITRAL VALVOTOMY

BY

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The frequency with which massive (aneurysmal) dilatation of the left atrium in rheumatic mitral valve disease is associated with predominant mitral incompetence (Parsonnet *et al.*, 1946; Daly and Franks, 1949) has been a factor against attempting mitral valvotomy in such cases (Baker *et al.*, 1952). The case reported here is of interest in that the physical signs were purely those of mitral stenosis, which was confirmed at and relieved by a subsequent valvotomy.

Case Report

The patient, a nulliparous housewife aged 33, gave no history of rheumatic fever. Her heart lesion was first discovered at a National Service medical examination at the age of 23. By the age of 26 she had begun to be aware of dyspnoea on exertion and to have recurrent attacks of winter bronchitis. Her effort tolerance steadily decreased; from the age of 30 onwards she rarely left her second-floor flat because of inability to walk upstairs or more than 50 yards on the level. She used extra pillows at night, but had had no nocturnal attacks of dyspnoea. There had been no haemoptyses, nor congestive cardiac failure with oedema. She had atrial fibrillation, which was presumed to have been present for some years, for she had had a cerebral embolism at the age of 28 and had been on digitalis since the age of 25.

On examination she was very thin, with a pronounced mitral facies, and was dyspnoeic talking at rest. The pulse was of moderate volume, and the blood pressure was 125/80. The jugular venous pressure was not raised and showed no abnormal pulsation. The apex was in the fifth space outside the mid-clavicular line and was tapping in character. There was a widespread systolic heave to the left of the sternum. The first heart sound was loud and abrupt; the second sound was increased in the pulmonary area, with first-degree splitting; there was a very loud mitral opening snap, and a long rumbling grade 3 mitral diastolic murmur at the apex. Systolic murmur was not heard. She had impaired resonance to percussion over the right lower chest posteriorly. There was no hepatic enlargement or pulsation.

Radioscopy of the chest showed a large dense heart shadow, mainly due to gross enlargement of the left atrium (see Fig.). No pulsation of the atrium was apparent in either the anterior or the oblique views. The pulmonary arteries were considerably enlarged; the aortic knuckle could not be clearly distinguished; and no calcification of the

valve cusps was detected. The electrocardiogram (multiple unipolar leads) showed atrial fibrillation and considerable right ventricular preponderance.

At cardiac catheterization the following observations were made at rest:—Pressures (in mm. Hg to mid-point of chest): right atrium, mean 4; pulmonary artery, 52/26, mean 34; pulmonary capillary, 23/18, mean 20. Cardiac output,



Radiograph of the chest. Radioscopy showed that the right border of the heart in this view is formed by the left atrium, which owing to its size and density obscured the outline of the right atrium.

2.4 litres a minute. Cardiac index, 1.7 litres/sq.m./min. Blood oxygen saturation: pulmonary artery, 59%; brachial artery, 96%. Blood oxygen combining power, 17.7 ml./100 ml. Calculated pulmonary arteriolar resistance, 560 dynes/sec./cm.²

As her disability was considerable and her physical signs were those of mitral stenosis, mitral valvotomy was carried out by Mr. R. C. Brock on January 21, 1954. The pressure in the pulmonary artery was 48/27, mean 34 mm. Hg; and in the left atrium was 25/19, mean 21 mm. Hg. The enormous size of the atrium was confirmed. A large amount of old and recent thrombus was encountered in the appendage and in the body of the atrium, much of which was washed out by permitting free bleeding. It was regarded as impracticable to attempt to remove all clot from the atrium. Embolism of the carotid vessels was guarded against by occluding them by tapes while the valve and deeper parts of the atrium were explored. To the examining finger the valve orifice appeared to be about 4 mm. in diameter; the edges were fibrous, but no calcium was felt in the cusps; no regurgitation could be detected. Complete separation at both commissures was effected by means of a valvotome. The chordae tendineae were fibrous and fused, but the cusps opened completely at the medial commissure and partly at the lateral commissure. The resulting valve orifice was large and there was a little regurgitation.

Three weeks after the operation she was able to walk up three flights of stairs; at the time of writing her exercise tolerance was still improving.

Comment

The case of massive left atrium reported by Parsonnet *et al.* (1946) showed gross rheumatic mitral incompetence at necropsy. A review of the reported rheumatic cases suggested that this association was invariable, and they concluded that mitral incompetence was a causal factor in the production of massive left atrium, and that mitral stenosis was not. Similarly, Daly and Franks (1949) found clinical evidence of mitral incompetence in all their 15 cases of massive left atrium.

It is generally agreed that the severe fibrosis and loss of muscle fibres seen in the atrial wall in this condition are evidence of particularly severe local damage from the original rheumatic process, and that this is the prime causal factor of the extreme dilatation. Observation that the pressures in the left atrium are as high in mitral stenosis as in mitral incompetence (Venner and Holling, 1953) suggested that mitral incompetence need not be a concomitant factor, and it was of particular interest to observe this patient, in whom the physical signs were clearly those of mitral stenosis and in whom the left atrial pressure (at operation) was only moderately increased.

The diagnosis of mitral incompetence is difficult, and many of the accepted physical signs are unreliable, especially when there is also stenosis—although it seems to be general experience that where the physical signs are purely those of mitral stenosis alone (tapping apex beat, slapping first heart sound, mitral opening snap, rumbling apical mid-diastolic murmur), incompetence of an important degree is not found at operation. The case reported here offers a further illustration of this point and also shows that massive dilatation of the left atrium is not unequivocal evidence of mitral incompetence. In rheumatic heart disease both massive left atrium and gross mitral incompetence appear to result from a particularly severe rheumatic injury and their observed association probably depends on this fact alone.

I wish to thank Dr. C. G. Baker and Mr. R. C. Brock for encouragement to prepare this report.

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INTRA-ARTERIAL THERAPY IN OCCLUSIVE VASCULAR DISEASE

BY

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Degenerative arterial disease of the lower limbs produces intermittent claudication, ischaemic necrosis, or both. At the present time it is not possible to reverse this degenerative process. Consequently, treatment aims at the opening up of a collateral circulation and the abolition of sympathetic tone. Since occlusive vascular disease affects all the vessels in some degree, the best that can be hoped for is the maximal dilatation of all the arteries in the limb. In order to obtain the greatest local effect without a general vasodilatation, injection of drugs direct into the femoral artery has been advocated. Trying a series of drugs, Edwards *et al.* (1952) found papaverine and tolazoline (benzyl-imidazoline, or "prisco") to be most effective in their action, and reported some success in the treatment of these cases.

Selection and Technique

The present investigation was deliberately kept on an entirely clinical basis, as the object was to assess the value of these two drugs as a routine method of treatment in a busy peripheral vascular clinic. No attempt was made to measure the effects instrumentally by temperature change, oscillometer, or claudicometer. It was thought that if such therapy was to be of practical value it must produce symptomatic improvement. With this in mind the following procedure was adopted. Any patient arriving at the peripheral

vascular clinic suffering from intermittent claudication or ischaemic necrosis due to occlusive vascular disease was, without selection, started on a course of injections. The first 20 were given papaverine and the next 20 tolazoline. Both legs were treated when both were the subject of complaint. The course consisted of one injection a week into each artery for six consecutive weeks. The amounts used were papaverine 40 mg. in 20 ml. of saline and tolazoline 100 mg. in 20 ml. A 20-ml. syringe fitted with a No. 17 B.W.G. needle which had been ground down to a short bevel was used and the injections were made into the femoral artery immediately below Poupert's ligament. After a little practice no difficulty was experienced in the introduction, the injection being made against the flow of the blood. No local analgesic was used, and the patients were allowed to travel home shortly after the treatment. No untoward happenings occurred.

The sex and age groups of patients in the series are shown in Table I.

TABLE I.—Sex and Age Groups of Patients

Drug	Male	Female	Age Range			
			40-49	50-59	60-69	70+
Papaverine	18	2	2	8	7	3
Tolazoline	16	4	2	9	8	1

Results

Immediate Effect.—On making the injection most patients showed a rapid response with a local flush. This was most pronounced in the thigh, and almost always demonstrated the territory of the superficial external pudendal artery by a flush over the pubes. However, the extent down the limb varied, as did the patient's impression of warmth. In some it went as far as the knee; in others it included the whole limb. With tolazoline a general vasodilatation rapidly followed, and often shivering. The local flush was quite transient, lasting between 10 and 30 minutes. After this the patient felt quite normal. These injections were made by four different workers.

Assessment of the result was made by seeing the patient two weeks after finishing the course and again a month later. In the case of intermittent claudication he was asked how far he could now walk, and he was allowed to compare this with some definite distance he had to walk during the day. His own estimate had already been recorded before starting treatment. Usually it was possible to find how far he walked without pain first thing in the morning—for example, on going to work. In assessing these results alleged improvements or deteriorations of a few yards were

TABLE II.—Response in Intermittent Claudication

Drug	No. of Cases	Immediate Flush to Toes	Final Improvement
Papaverine	15	9	0
Tolazoline	13	7	2
Total	28	16	2

TABLE III.—Response in Ischaemic Necrosis

Drug	No. of Cases	Immediate Flush to Toes	Final Improvement
Papaverine	5	5	5
Tolazoline	7	5	4
Total	12	10	9

neglected—bearing in mind the stated object of the inquiry. Again four persons were engaged in the assessing. In ischaemic necrosis the healing was taken as the criterion, local treatment being confined to a dry dressing and crêpe bandage.

Tables II and III summarize the results in intermittent claudication and ischaemic necrosis respectively.

Discussion

Although this series was kept small because of the possible consequences of repeated arterial puncture, I feel that the results are significant. It seems that in intermittent claudication the benefits do not warrant this treatment. In ischaemic necrosis it would appear to be a worth-while procedure, especially as it can be performed in an out-patient clinic. Moreover, it seems to be a good alternative to lumbar sympathectomy, and can, of course, be applied to patients unfit on general grounds for a major operation. However, the results seem to suggest that the mechanism is just like that of sympathectomy in that the skin receives more benefit than the muscles; and this observation agrees with the findings of Lynn (1950), although he quotes Dr. H. T. C. Swan as having found increased blood flow in the sympathetomized hand after intra-arterial injection. Perhaps, too, the explanation lies partly in the transience of the response, the healing of an ulcer being helped even by a short-lived increase in blood supply. Indeed, Wilson and Quash (1951), studying the effects of tolazoline, also came to the conclusion that it was valuable in the treatment of refractory leg ulcers. It is worthy of note that Douthwaite and Finnegan (1950) were impressed by the results of oral tolazoline in patients with intermittent claudication.

It would be interesting to compare the results of intra-arterial injection with those of lumbar sympathetic block with phenol in the cases of ischaemic necrosis. Such a series is at present being investigated, but, of course, takes a longer time to complete, as ischaemic cases are less frequent than those with intermittent claudication.

Summary

A series of cases is described in which obliterative arterial disease of the lower limb has been treated by intra-arterial injections. Broadly, two groups of cases arise, one complaining principally of intermittent claudication and the other of ischaemic necrosis. The drugs used were papaverine and tolazoline. The results are assessed on a clinical basis with a view to finding a practical line of therapy.

The opinion is expressed that in intermittent claudication the method is not warrantable, whilst in ischaemic necrosis it may be a valuable adjunct to local treatment.

I wish to thank Mr. Clifford Jones, in whose peripheral vascular clinic this work was carried out, for his help and encouragement; and Mr. H. Ellis, Dr. F. Lothe, and Dr. H. W. Chambers for practical assistance.

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The Minister of Health, Mr. IAIN MACLEOD, speaking at the annual luncheon of the Hotel and Catering Institute in London, said that he was looking to hospital authorities to give a lead in standards of cooking and kitchen hygiene. He was pleased to say that the national scheme for training apprentice cooks in hospitals was getting off to a good start. Although the hospital authorities were only given details of the scheme in March, preliminary inquiries had already been received from over 80. Some idea of the extent of catering in hospitals could be gained from the budget for food in hospitals in England and Wales, he continued. In the year 1952-3 the cost was over £30m., or about one-eighth of the total expenditure of the hospital authorities. In addition, the wages of catering officers, dietitians, and other senior catering staff amounted to nearly £7m.

Medical Memoranda

Ulcerative Stomatitis Associated with Symptoms of Peptic Ulcer

The following case is of interest from both a diagnostic and a therapeutic point of view, and is one which I have had the opportunity of observing over a long period.

CASE REPORT

A woman aged 56 had had intermittent indigestion for many years. Her pain was epigastric, occurred half to one hour after food, was increased by meat, soups, and any form of alcohol, and was relieved by alkalis. There were periods of freedom, and the picture appeared to be typical of peptic ulceration. The blood count was normal. This diagnosis was reinforced by the family history. Her father had had a gastro-enterostomy for duodenal ulcer, a paternal uncle had died of a perforated duodenal ulcer, and two paternal cousins had had duodenal ulcers, in one of whom the ulcer had perforated. On the other hand, a paternal grandfather had died of pernicious anaemia.

Eighteen months previously the patient had developed ulcers of the mouth and tongue. At first they were intermittent, but later the exacerbations became so frequent that she was never entirely free. She could not eat with comfort, and spiced foods, vinegar, and alcohol produced considerable distress. During this period the indigestion also became worse, and invariably followed a heavy meal. Six months later she had agreed to have a barium meal and a gastric analysis. The x-ray film showed no abnormality and the gastric analysis a complete achlorhydria. Hydrochloric acid was given, but was soon abandoned as it increased the dyspepsia, which indeed continued to be relieved by alkali. The ulceration of the mouth got worse and nothing gave any relief, although the pain subsided temporarily with an alkaline mouth wash.

Two months ago I decided to try vitamin B₁₂, which was given in the form of "cytamen." At first she had an injection of 50 µg. (1 ml.) twice weekly; this was reduced to 1 ml. a week and eventually to 1 ml. a fortnight. Within a few days the ulcers had improved and in a week they had disappeared and have never returned. The indigestion also improved and she was able to take a normal diet and an occasional glass of sherry without any discomfort. She felt better than she had been for many years.

COMMENT

In this case all the symptoms suggested peptic ulcer, but the x-ray examination was negative and achlorhydria was present. There was an ulceration of the mouth and tongue, which was intermittent as in peptic ulceration. The family history of duodenal ulcer suggested that hyperchlorhydria was present in many members. On the other hand, the history of a grandparent who suffered from pernicious anaemia is evidence of another hereditary factor which produces an achlorhydria.

The theory I would put forward is that in my patient the two factors were present, but the tendency to ulceration was kept in check by the absence of acid, which prevented any gross and demonstrable ulceration from occurring. The administration of acid undoubtedly increased the indigestion, and it is probable that it would have led to frank ulceration if it had been persisted in. The simultaneous appearance of ulceration in the mouth and the increase in the indigestion, together with the immediate relief of both by vitamin B₁₂, suggests that the superficial ulceration of the mouth was associated with a similar condition in the stomach, and that the cause of both was the absence of some constitutional factor which was replaced by the injection.

The temporary relief from the indigestion brought about by alkali cannot be explained by neutralization, but was due to some other cause, and its action was similar to that

experienced in the relief of pain from ulcers in the mouth. I would suggest that a trial of vitamin B₁₂ might be helpful in the early stages of peptic ulceration.

T. H. OLIVER, M.D., F.R.C.P.

Bronchial Adenoma

Adenoma of the bronchus, a relatively rare condition occurring in approximately 6% of all bronchial tumours (Kramer and Som, 1935), is often not diagnosed for a considerable time after the onset of symptoms. The following case occurring in general practice is reported as a reminder of the disease and to record its unusual features.

CASE REPORT

A housewife aged 67 was in good health until April, 1952, when she developed a mild respiratory tract infection with an irritant cough, producing a symptom described by the patient as "like a bell ringing" in her chest. The illness resolved in 14 days with only symptomatic treatment. She became well and symptom-free, apart from slight loss of weight. Four months later (August) she developed a similar though more severe illness, with continued fever (maximum temperature 103° F.—39.4° C.), irritant cough, and a little sputum. Physical signs of right lower zone bronchopneumonia developed. Her condition was not improved after a course of "sulphatriad," and her fever and physical signs resolved slowly during the next two weeks, after six daily injections of procaine penicillin, 300,000 units.

Chest x-ray examination as soon as she was ambulant, 18 days after the onset of symptoms, showed a rounded shadow adjacent to the right hilum, with no apparent peripheral collapse. There was no relevant past history or family history; she was an occasional smoker (one or two cigarettes a day).

On September 17 she was seen by Mr. O. S. Tubbs, who found no abnormal physical signs. Two weeks later, while awaiting admission for investigation, she suddenly collapsed in her home with acute pain in her right lower chest. On examination shortly afterwards she was found to be collapsed and dyspnoeic, her pulse was 90, temperature 98° F. (36.7° C.), respirations 26. The trachea was displaced to the left, and physical signs of a right pleural effusion were present. Chest x-ray examination confirmed the findings of collapse of the right middle and lower lobes, with an effusion.

She was admitted urgently to the Thoracic Unit, St. Bartholomew's Hospital, where diagnostic aspiration of the effusion in three places produced blood only. The sputum showed no tubercle bacilli, and grew only a scanty growth of *Neisseria catarrhalis*.

Bronchoscopy (Mr. O. S. Tubbs) showed: "Protruding out of the right middle lobe bronchus was a small pale-pink cherry-like tumour. The bronchoscope could be passed beyond this into the lower lobe, which appeared normal. Biopsy specimen taken; rather profuse bleeding." The histological report on this specimen is of a "poorly differentiated adenocarcinoma."

At thoracotomy five days later a massive—2–3 pints (1–1.5 litres)—heavily blood-stained effusion was found, thought probably to be due to pleural carcinomatosis in view of the biopsy report and clinical picture presented. Accordingly, a right pleuropneumectomy was performed.

The patient made an uninterrupted recovery, and was discharged from hospital 15 days later. She has remained well since.

It was subsequently evident from examination of the specimen that haemorrhage had occurred into the middle lobe behind the tumour, and that the middle lobe itself had ruptured, causing considerable haemorrhage into the pleural cavity. This undoubtedly occurred two weeks before her operation, and had caused her collapse in her home and her subsequent sudden deterioration at that time.

Pathology.—The tumour measured 7 by 6 by 5 cm. The only remaining lung tissue of the right middle lobe was a

portion of the medial segment and a thin peripheral zone stretched over the tumour mass. Anteriorly there was a rupture of the middle lobe and visceral pleura, with haemorrhage into the adjacent rim of lung tissue and into the pleural cavity. Histologically, the tumour was found to be projecting into the lumen of the bronchus, to have an adenomatous appearance, and to show no infiltration of deeper structures. The specimen was examined at the Institute of Diseases of the Chest, Brompton, London, and five different opinions were given: (1) Columnar-celled carcinoma of the bronchus; (2) bronchial adenoma of low-grade malignancy, or possibly secondary malignant change in pulmonary adenomatosis; (3) benign adenoma; (4) malignant adenoma; and (5) adenoma.

COMMENT

Adenoma of the bronchus is slightly commoner (62%) in females (Foster-Carter, 1941). Symptoms may occur at any age, the average age of onset being 28. Diagnosis is most commonly made during the fourth decade, an average of five years after the onset of symptoms (Foster-Carter, 1941). Cough, haemoptysis, and symptoms due to bronchial obstruction and its sequelae are predominant.

Radiological evidence of bronchial obstruction and/or the presence of an opaque tumour point to the diagnosis, which must then be confirmed by a bronchoscopic biopsy. The tumours are more commonly in the main bronchi, and therefore relatively accessible to the bronchoscope. Histologically the precise nature of the tumour is often difficult to assess, and differences of opinion are common. The cells are usually uniform in shape and size; the cytoplasm is clear, and forms a fringe round the large deeply staining nucleus.

The tumours should be regarded as borderline between innocence and malignancy (Jackson and Norris, 1951). They may be locally invasive, and, very rarely, metastases have occurred through lymphatics (Adams *et al.*, 1942). Malignant adenocarcinoma developing in an adenoma has been demonstrated histologically (Umiker and Storey, 1952).

Treatment of this potentially malignant condition varies from pneumonectomy, lobectomy, resection of the bronchus with end-to-end anastomosis (D'Abreu and MacHale, 1952) to piecemeal bronchoscopic resection, varying with each individual case. Opinion is now more in favour of exploratory thoracotomy and lobectomy as the operation of choice (Delarue, 1951). Radiotherapy is not of proved value in treatment (Jackson and Norris, 1951).

I wish to thank Mr. O. S. Tubbs for permission to publish his case notes, and for his help and encouragement; Dr. G. J. Cunningham, senior lecturer in morbid anatomy, St. Bartholomew's Hospital; and the Department of Pathology, St. Bartholomew's Hospital, for the preparation of slides.

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The United States Armed Forces Institute of Pathology is to collaborate with a group of Japanese pathologists headed by Dr. TORU MIYAJI, professor of pathology at the Osaka University Medical School, in preparing a Japanese textbook on histopathology. The Institute will contribute about 300 standard photomicrographs to illustrate typical pathological conditions. The textbook is for use by Japanese medical students. Co-operation from the United States was requested for illustrations because of the difficulty of obtaining such material in the Far East. The project is expected to be completed within six months.

Reviews

THE VIRUS FRONT

Advances in Virus Research. Volume I. Edited by Kenneth M. Smith and Max A. Lauffer. (Pp. 362; illustrated. \$8.) New York: Academic Press Inc. 1953.

The problem of keeping abreast of the literature of any subject these days is one with which everyone engaged in medical research is only too familiar, but it is probably true to say that virus workers face this problem in its most acute form. Viruses are the cause of disease in animals and plants as well as in man; they are susceptible of investigation by a variety of scientific disciplines and their literature is widely scattered through a large number of journals. It is difficult, therefore, for the virus worker to keep himself widely informed of what is happening in all fields of virology, and it is with a view to remedying this that *Advances in Virus Research* is being produced. It is planned to publish in successive volumes authoritative review articles on all important aspects of virus research, and it can safely be predicted that if the standard set by Volume I is maintained in the rest of the series the editors will have amply achieved their object.

This volume begins with an article on the properties of the bacteriophage by H. T. Epstein which is especially valuable, since these viruses and their bacterial hosts have been used extensively for the study of problems concerned with host-virus relationship and in particular the nature of virus multiplication; in fact our views on this latter question have been largely coloured by the findings obtained with the bacteriophage. The interaction between viruses and virus strains, which include the interference phenomenon, is considered by C. W. Bennett; there is much of interest here, even though the illustrative examples are drawn almost exclusively from plant pathology. Another section by a transplant pathologist is on the role of leaf hoppers in the transmission of plant viruses by L. M. Black, and, following this, mission of plant viruses by G. H. Bergold provides a most instructive and beautifully illustrated account of insect viruses. This is of particular value, since there is probably no aspect of virology of which those who work with animal viruses are more ignorant. It is interesting to note how these viruses resemble the influenza viruses in the possession of both spherical and rod forms; it is also of interest that the author seems in no doubt as to the nature of these insect viruses—for him they are micro-organisms.

Of the viruses peculiar to man those of influenza and poliomyelitis find a place in this volume. Henle writes of the multiplication of influenza virus, and a first-class article it is. It is, of course, well known that a great deal of the work on this subject has been done by Henle and his colleagues, so the excellence of this particular section is not surprising. What is particularly attractive about it is the detached and unbiased way in which the author examines the evidence and draws his conclusions, which is by no means invariably the case in writings on this highly controversial subject. A most valuable article on poliomyelitis comes from J. L. Melnick, who has been in the forefront of research on this disease and its causal viruses during the last ten years or so. The volume is completed by a section on the purification and properties of animal viruses contributed by Dr. Gordon Sharp, and a short but most interesting account of virus nucleic acids by Roy Markham.

S. P. BEDSON.

INTERPRETATION OF AGGRESSION

Aggression and Its Interpretation. By Lydia Jackson, D.Phil., B.Sc.(Oxon.). Foreword by Felix Brown, D.M., M.R.C.P. (Pp. 237. 21s.) London: Methuen and Co. Ltd. 1954.

Miss Jackson has built up a considerable body of experience of child therapy which fully justifies her in writing a book. Moreover, she has added to her clinical statement a compara-

tive study of three groups of children based on her particular form of projection test.

While the reviewer can recommend this book for reading and for study, there is a peculiar difficulty arising out of the fact that Miss Jackson, while choosing to write on the subject of aggression, has "scotomized" the pioneer work which has enabled psycho-analysis and psychotherapy in general to take aggression into account. It is well known that it is through the work of Melanie Klein, dating from about 1923, that the theory underlying our work has come to include destructiveness and aggressiveness and the complex relationship of these to the erotic instinctual life. There is a complex theoretical construction here which covers the origin of guilt feelings and the important relationship of restitution tendencies to aggressive ideas, to which the author refers. It is certainly not necessary for Miss Jackson to agree with the Klein development of psycho-analytic theory, but it is not possible, in writing a book on aggression, simply to ignore this work and to give 38 references without mention of Mrs. Klein.

An intuitive flash of the author quite possibly goes very deep: "the primary, powerful innate urge to self realization as the basis of aggression."

As the author is apparently unaware of the theory of the very complex early development of the child, she is thrown back on the idea of the transformation of the child's destructiveness and hostility into constructive and friendly co-operation as something that results from the friendliness and tolerance provided by the therapist. One thoroughly believes in her results, which in some cases have been good, but Miss Jackson's theory as stated in this book appears to the reviewer to be deficient. One consequence of the naïveté of her theory as it is stated is that the author seems to leave out the important subject of aggressiveness related to paranoid organizations.

D. W. WINNICOTT.

INTRODUCTION TO TROPICAL PATHOLOGY

An Introduction to Pathology and Bacteriology for Medical Students in the Tropics. By the late E. C. Smith, B.A., M.D., D.P.H., Sc.D.(Dubl.), M.R.C.P.Lond., M.R.C.P.I., D.T.M.&H.Eng. Second edition. Revised by R. Kirk, O.B.E., B.Sc., M.D., D.P.H., F.R.F.P.S.Glas., M.R.C.P. Lond., F.R.S.Ed. (Pp. 390; 78 figures and 18 coloured plates. 50s.) London: Staples Press Ltd. 1953.

The harassed student is often at a loss to know just how much he is expected to learn for his examinations. Lecture notes are apt to be sketchy and disjointed, while the standard textbook is too elaborate and detailed to be easily mastered. Kirk's revision of Smith's *Introduction to Pathology and Bacteriology* can justly claim to fill the gap, being practical rather than academic, and neither too long nor too short. It is eminently readable and lucid, and is sufficiently detailed to provide the student with a sound background which will enable him, when the time comes, to make intelligent use of more advanced textbooks. The illustrations are numerous and clear, and the arrangement of the chapters logical. The first four deal with pathological processes and tumours; the next fourteen, with the pathology of diseases caused by infective agents of all kinds, which is of course the predominant type of illness in the Tropics. The last four chapters are devoted to the special pathology of certain organs and systems. Although the descriptions of the different conditions are necessarily brief, it is obvious that they have been written by someone with a wide practical knowledge of the subject. All the more important details are emphasized, and little that is of practical importance is omitted. The chapters on fungal, protozoal, and helminthic diseases deserve special mention, and within the space available give a well-balanced account of the pathological changes in and the diagnosis of these infections. An appendix in which the various causes of lymphadenopathy are tabulated will be of much practical use, and another on post-mortem technique should go a long way to improving the standard of necropsies when these have been carried out by someone with little previous experience.

This book can be strongly recommended not only to medical students in the Tropics, for whom it is written, but to anyone who may need a succinct and reliable account of the pathology of tropical diseases.

J. S. K. BOYD.

NEUROANATOMY

Human Neuroanatomy. Third edition, revised. By Oliver S. Strong and Adolph Elwyn. (Pp. 481; 357 illustrations. 57s. 6d.) London: Baillière, Tindall and Cox. 1953.

A book is obviously meeting with a demand when it reaches its third edition and has had no fewer than four reprints of its earlier editions. The present volume has undergone much judicious revision, for which, presumably, Dr. Elwyn was responsible, as his name alone is attached to the preface. There has been much re-writing and some expansion, including the introduction of a number of new and useful figures. The advances in neuroanatomy and neurophysiology made during the past ten years have been handled with discretion, and are woven rather than intercalated into the text. Consequently the staccato effect, so obvious and so irritating in many revisions, is pleasantly absent. A sense of proportion, too, is shown in the manner in which the more recent contributions have been handled, and the bibliography, though extensive, is judiciously selected. Some parts of the text, however, notably that on the olfactory system, would benefit from even more revision.

A good feature of this text is the attempt to link up the central nervous anatomy with the arrangements in the periphery. That this attempt is not always satisfactory is in the nature of things not surprising, and some attention to the figures, which are not always lucid or well considered, meant to demonstrate the integration of centre and periphery would make the book more useful. For example, Figs. 141 and 142 both show the brachial plexuses, but they show absences of correspondence that are bound to be confusing to the student; indeed, Fig. 142 contains the error of deriving the thoracodorsal and long thoracic nerves from the medial cutaneous nerve of the arm.

But it would be churlish to end this brief review with a critical note. The volume under consideration is one example of the contemporary attempt to bridge the gap between our knowledge of the structure of the nervous system and established facts and suspicions about its function. That such attempts should at this stage of the integrative process be, in some degree and in certain directions, faltering is not surprising. The important thing is that the integration is made, and in due course the details will doubtless sort themselves out. Certainly no student will be at a disadvantage for having read this new edition of Strong and Elwyn, and some teachers might even find it advantageous.

J. D. BOYD.

NEUROLOGY AND PSYCHIATRY

Physiological Foundations of Neurology and Psychiatry. By Professor Ernst Gellhorn, M.D., Ph.D. (Pp. 556. \$8.50 or 68s.) Minnesota: University Press. London: Geoffrey Cumberlege. 1953.

The subject-matter of this volume is intentionally far more restricted than is indicated by its title and depends on the interests of the author, who states in his preface: "By no means all, but only some, physiological foundations of neuropsychiatry are treated, those with which the writer is familiar through his own experimental work." Thus certain subjects are considered at greater length than their importance in clinical neurology and psychiatry would warrant—for instance, the autonomic nervous system and the physiological foundation of carbon dioxide therapy. On the other hand, there is no mention of some problems which are often encountered in practice and which in addition have a well-understood physiological basis: in this category migraine and the premenstrual tension state come to mind.

This intentional restriction of choice of subject-matter, however, is of less importance than the limitations of

approach due to the disproportionate consideration of the results of animal experiment. These limitations are of particular importance in this field of inquiry, since few neurological and probably no psychiatric disorders can be adequately reproduced in animals. Thus, to take the instance of E.C.T., it is doubtful what relevance the physiological response of a normal animal may have to the psychological response of a patient suffering from an endogenous depression. The author has failed to take advantage of one way of overcoming these limitations—namely, by drawing upon clinical neurology, whether for illustration, as for instance of the state of stupor, or for the enlightenment that animal experiments cannot give, as is the case with the problems of phantom limb and of anosognosia.

Within these limitations this book gives a competent and readable account of various selected aspects of the physiology of neurology and psychiatry. The neurologist has been well served of late with monographs and published symposia on various aspects of neurophysiology, and will be well advised to refer to these rather than to the corresponding sections of this book, with the exception of the chapters on the physiology of the motor cortex, which are excellent. On the other hand, the psychiatrist will find much information not well summarized elsewhere, in particular in the sections on physiological changes in emotion, on modifications in conditioned reflexes and autonomic reactions by shock treatments, and on the prognostic value with respect to response to E.C.T. of the blood-pressure changes after the injection of mecholyl. These sections give rise to hope of further advances in the understanding of the mechanisms involved in the physical treatments in psychiatry.

R. T. C. PRATT.

THERAPEUTIC ACCIDENTS

Maladies Medicamenteuses d'Ordre Therapeutique et Accidental. By Claude Albahary. Preface de A. Tzanck. Avec le concours de D. Christol, B. Damoiseau, N. Pardon, R. Umdenstock, J. Vacher. (Pp. 752; 55 illustrations. Paper bound 4,400 fr. Leather bound 5,500 fr.) Paris: Masson et Cie. 1953.

Fortunately for the reviewer, Dr. Albahary says in the introduction to his book that he does not expect that anyone will read it through from cover to cover; it is meant rather for someone looking up information about a case or about a treatment with which he is not familiar. Professor Tzanck in his preface makes clear the distinction between intoxication and intolerance. Intoxication is the result of an overdose of a drug, actual or relative; it can be reproduced in animals and the symptoms are specific for the drug. Intolerance, which is much more common in practice, occurs with a normal or even with a very small dosage. It is the result of individual predisposition, the symptoms cannot be reproduced in animals, and they are not specific for the particular drug. The therapeutic revolution of the last half-century has been associated with the introduction of large numbers of drugs from which people develop symptoms of the second type. We are by now familiar with the fact that the symptoms and frequency of intolerance cannot be predicted from experiments in animals and often require a decade of clinical trials for their assessment. The book is arranged under the headings of mineral compounds, synthetic compounds, antibiotics, drugs from plants, hormones, and glandular substances, vitamins, haematinics, transfusions, sera, vaccines, inoculations, and shock-therapy. There is a good table of contents and a reasonable index, and it is easy to find one's way about the book. References are perhaps not so copious or conveniently arranged as in comparable American and English books. There are just over 50 diagrams and illustrations in black-and-white. The text is extremely up-to-date and has stood up well to sampling. For the moment, at any rate, the book appears to be unique in the range and depth of the information it provides on the accidents of therapeutics.

L. J. WITTS.

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RADIOACTIVE IODINE IN THE TREATMENT OF ANGINA

In a recent review of the treatment of angina pectoris Dr. Paul White referred to the use of radio-iodine in this condition.¹ Several years ago Lev and Hamburger² pointed out that thyrotoxic patients may suffer from angina, which usually disappears after thyroidectomy. This observation led Blumgart and his colleagues^{3,4} to propose thyroidectomy as a possible method of treatment for angina and congestive cardiac failure in patients with normally functioning thyroids. They argued that when the basal metabolic rate was retarded the demands on the heart might be correspondingly reduced. Several series of patients were treated in this way, and in at least half the cases improvement is said to have occurred. The selection of patients was such as to make it most unlikely that the successes were due to spontaneous recovery. In a few cases the results were quite spectacular, some patients who had been bedridden for years with attacks of angina at rest being able to go back to a full day's work after the treatment.

Owing to the dangers of surgery in patients with advanced cardiac disease thyroidectomy could not be extended to all those for whom it might otherwise have been suitable.⁵ But when thiourea and other antithyroid agents became available there were grounds for hoping that the same results could be achieved without the risks of an operation. Good results were soon reported by several groups of workers.⁶⁻¹² There are, however, certain rather serious drawbacks to this type of "medical thyroidectomy" by substances acting by inhibition of the synthesis of thyroid hormone.¹³ The normal thyroid contains a large store of hormone and only a very

small part of this store is secreted each day; consequently the B.M.R. does not fall until the antithyroid drug has been given continuously for several months. Moreover, the treatment must usually be continued for the remainder of the patient's life and entails the constant danger of drug sensitivity or damage to the blood-forming organs.

Radioactive iodine has been shown by Blumgart and his co-workers to be a more satisfactory method of inducing hypothyroidism.^{14,15} The thyroid accumulates radio-iodine to a much greater extent than any other tissue, so that it can be completely destroyed by a dose of I¹³¹ which is without harmful radiation effects on the rest of the body. For example, a normal person's thyroid can be destroyed by a dose of I¹³¹ which will give to the blood a radiation dosage less than twice that to the abdomen during a diagnostic x-ray examination of the gastro-intestinal tract. This method of treatment has now been used extensively for several years.¹⁶ The patients who respond most favourably are those with angina due to coronary atheroma, but some cases of congestive cardiac failure from other causes may also benefit. The clinical response occurs more rapidly than is the case with antithyroid drugs, and the side-effects are generally trivial and short-lasting. In a few patients given the largest doses there may be a temporary exacerbation of symptoms owing to the rapid liberation of thyroid hormone into the blood stream, but this can probably be avoided by giving the radio-iodine in divided doses. In Blumgart's series of cases the best results were obtained by total destruction of the thyroid, followed by a daily dose of thyroid hormone sufficient to keep the B.M.R. at about 20% below the normal level. Patients treated in this way are said to have obtained great relief from their symptoms without suffering from the discomforts of myxoedema. But other workers have found it more difficult to strike this balance.

The mechanism by which thyroidectomy relieves some patients of angina is not altogether clear. It has been shown that the resting cardiac output is reduced in myxoedema¹⁷; this seems to be due not only to the diminished oxygen requirement of the tissues at rest, but also to more efficient utilization of oxygen,¹⁸ so that for a given oxygen demand by the body a smaller blood flow is required in the hypothyroid state. However, these factors can hardly explain the greatly increased exercise tolerance observed in some of Blumgart's patients, because during muscular work the basal oxygen consumption is only a small proportion of the total. It is difficult to see why a man who gets attacks of angina at rest when using 300 c.c. of oxygen per

¹ J. Amer. med. Ass., 1953, 153, 75.

² Amer. Heart J., 1932, 8, 109.

³ Arch. intern. Med., 1933, 51, 866.

⁴ Ibid., 1933, 52, 165.

⁵ Cutler, E. C., and Hoerr, S. O., Ann. Surg., 1941, 113, 245.

⁶ Raab, W. J., Amer. med. Ass., 1945, 128, 249.

⁷ Reveno, W. S., Amer. J. Med., 1946, 1, 507.

⁸ Sharpey-Schafer, E. P., British Medical Journal, 1946, 2, 888.

⁹ Ben-Asher, S., Amer. Heart J., 1947, 33, 490.

¹⁰ Frisk, A. R., and Lindgren, L., Acta med. scand., 1948, 132, 69.

¹¹ Hollander, G., and Mandelbaum, H., Ann. intern. Med., 1948, 28, 1150.

¹² Schoenewald, G., British Medical Journal, 1948, 1, 251.

¹³ Di Palma, J. P., and Magovern, J. J., Amer. Heart J., 1946, 32, 494.

¹⁴ Proc. Soc. exp. Biol. (N.Y.), 1948, 67, 190.

¹⁵ Circulation, 1950, 1, 1105.

¹⁶ Wolferth, C. C., Chamberlain, R. H., and Mead, J. J., Penn. med. J., 1951, 54, 352.

¹⁷ Blumgart, H. L., and Berlin, D. D., Amer. J. Physiol., 1934, 109, 1.

¹⁸ Altschule, M. D., and Volk, M. C., J. clin. Invest., 1935, 14, 385.

¹⁹ Bing, R. J., et al., Amer. Heart J., 1949, 38, 1.

minute, and is free from attacks at rest after his B.M.R. has been reduced by thyroidectomy, should not get his pain again when he increases his oxygen consumption to, say, 600 c.c. per minute by walking along the flat. Evidently the relation between thyroid function and anginal pain is far from being the simple one originally postulated by Blumgart. Emotional stimuli are known to precipitate attacks of angina at rest and may also increase the ease with which angina is brought on by muscular effort. The increased emotional stability which usually follows thyroidectomy might be expected to reduce the number and severity of attacks at rest or during exercise.¹⁵ It has also been claimed that thyroidectomy lessens the sensitivity of the cardiovascular system to adrenergic stimuli,⁶ but the evidence for this is not conclusive in humans. A further possibility is that the heart uses its oxygen supply more efficiently and so is able to do more work without becoming anoxic. Evidence on this point could be obtained with the methods now available for the direct study of cardiac metabolism by catheterizing the coronary sinus.¹⁹

There is now little doubt that "radio-iodine thyroidectomy," because of its permanence, simplicity, certainty, and freedom from serious side-effects, is the best available method for reducing the activity of the thyroid in patients with intractable cardiac disease. But more experience is needed before it can be said whether the induction of a state bordering on myxoedema should be more widely extended or should be reserved for a few patients who fail to respond to all other forms of treatment. Carefully controlled studies are needed to show whether thyroidectomy prolongs the comfortable life of these patients or whether it tends to shorten life by accelerating the development of coronary atheroma.

QUESTIONNAIRES IN CLINICAL TRIALS

Some clinical trials have been carried out in such a way that, in spite of the difficulties of measuring clinical responses, they can stand as models of scientific procedure. One example is the investigation by the Medical Research Council¹ into the use of streptomycin in pulmonary tuberculosis, though not all successful trials are on such a large scale, and not all are recent. The help which a study of these reports can give may perhaps be supplemented by considering separately some of the errors and difficulties that may arise in clinical trials, especially those in which the assessment of symptoms rather than of signs is an important feature.

Glaser and Whittow² have just reported the results of an interesting study carried out mainly on two

groups of students at Singapore. On eleven occasions at the end of a lecture period the students filled in a brief questionnaire in which they gave information about the presence of eight symptoms commonly found after taking hyoscine hydrobromide, and about two symptoms, hunger and backache, commonly found on routine inquiry. This simple procedure, carried out for the first three lectures, led to the surprising result that the frequency of the three major symptoms, sleepiness, dryness of the mouth, and headache, was initially very high but declined during the period of observation. The interpretation of the authors was that the symptoms were suggested by the questionnaires, so that the first response was unduly high, but subsequently habituation to the questionnaires took place and in consequence the frequency of symptoms showed a significant decline. It seems reasonable to suppose that the need for a subject to observe his own reactions should make him notice, or imagine, symptoms of which he would otherwise be unaware. This point is of interest because it is becoming increasingly popular in the U.S.A. for a patient to provide his medical history by filling in a questionnaire such as the Cornell Medical Index. It has been claimed by the authors who introduced this technique that they were able to detect a patient's need for general medical care much better than a physician who took the usual oral history.³ Glaser and Whittow, in the light of their findings, issue the warning that the questionnaires themselves may produce symptoms. Even so, this claim might well be as true of a patient's oral replies to questions as it is of his written replies to a questionnaire. At any rate the experiences of Cochrane, Chapman, and Oldham⁴ show clearly enough that different doctors attempting to elicit the same piece of information may vary greatly in their estimate of whether a symptom is present or not. These doctors were questioning miners, who had been allotted to them in such a way that there was no reason to suspect anything other than random variation in the frequency with which various symptoms would be found. An attempt was made to conduct similar types of interviews. Nevertheless, one physician found, for example, a history of cough in 40% of 300 subjects and another in as few as 23% of 261 subjects. The one encouraging feature of this investigation was that there were apparently some questions such as, "Have you ever had pleurisy?" which were so unambiguous that the various observers obtained substantially the same answer.

¹ *British Medical Journal*, 1948, 2, 769.

² *Clin. Sci.*, 1954, 13, 199.

³ *See British Medical Journal*, 1952, 2, 1246.

⁴ *Lancet*, 1951, 1, 1007.

⁵ *Biometrics Bulletin*, 1946, 2, 87.

⁶ *Brit. J. prev. soc. Med.*, 1953, 7, 163.

⁷ *British Medical Journal*, 1953, 2, 1284.

Glaser and Whittow were unable to detect any further significant variation in the level of symptoms after the third test, except on occasions when certain special factors were introduced. Thus, on the fourth and fifth day, the questionnaires were filled in both before and after the lecture, and fewer symptoms were recorded before the lecture than after. Most readers will not be surprised at this result, but it does serve to emphasize the variability of the subjects under different conditions. Throughout the study there were consistent differences between the frequency of symptoms in the two groups of students, group A showing more symptoms than B. However, group B was questioned at 9 a.m. and group A either at 11 a.m. or at noon. In the absence of a cross-over type of experimental design we are left to assume that these differences in the two classes were due to the different times at which the students reported their findings, and there is some confirmatory evidence for this.

In the main tests at Singapore a tablet containing 1 mg. of hyoscine hydrobromide was given before the ninth lecture, and produced characteristic symptoms in most of the students. Dummy tablets given before the sixth, seventh, eighth, tenth, and eleventh lectures produced no significant changes in the frequency of symptoms. In assessing the effect of placebos the reader must keep in mind the fact that the subjects were healthy, and the investigators were therefore concerned with the production, not the relief, of symptoms. The important part that a placebo may play in experiments of the latter type has been demonstrated by the careful work of Jellinek.⁵ He wished to find out whether the omission of certain ingredients from an analgesic tablet affected the ability of the tablet to relieve headache. Drug A contained all the usual ingredients; drug B had been deprived of ingredient b and drug C of ingredient c, and drug D was the placebo. The subjects were 200 patients who suffered from repeated headaches. They were divided into four groups; the members of each group used each type of drug for a period of two weeks, but the groups differed in the order in which they tried the various drugs. Thus one group received the placebo for the first two weeks, one for the second, and so on; and this admirable design separated the effects of the drugs from the effects of the order of administration. A first analysis of the results showed that the placebo was successful in 52% of cases, drug A in 84%, B in 80%, and C in 80%. From a less carefully designed experiment it might have been concluded that the effects of A, B, and C were not different, though each was superior to the placebo. However, in this case it was possible to compare A,

B, and C separately on those patients who responded to the placebo and on those who did not. The latter were clearly the better discriminators of analgesic effects, and in the results obtained from them it was found that there were clear differences, the order of efficiency being: A, 88% success; B, 77% success; and C, 67% success.

In contrast to this use of modern statistical methods is a paper by Hogben and Sim⁶ in which such methods are deliberately avoided. They described a technique for conducting a complete clinical trial on a single individual, in this way exploring those differences between individuals which are especially important to the clinician. The main feature of the method is to master the problem so thoroughly that the investigator can invariably obtain, in any individual, a particular response from a particular treatment. The anti-statistical approach here advocated is all the more effective because of the authors' great knowledge of conventional statistical methods. The difficulty is that the solution proposed would work best when least needed—that is, when knowledge is fairly complete. It would offer little guidance to an investigator struggling, as most investigators are, with interesting but obstinately variable phenomena. An essential requirement in these cases is that the methods of sampling used should be as sensitive and as representative as possible. In a recent paper White⁷ has outlined some of the methods of achieving this and some of the common causes of failure.

PYRIDOXINE DEFICIENCY AND CONVULSIONS

Epileptiform convulsions in infants, occurring sporadically in all parts of the U.S.A. during 1951–3, have been reported.^{1,2} There were no distinctive clinical or laboratory signs of organic disease of the central nervous system, and the only factor common to all cases was that the babies had been fed since birth on an artificial fluid milk mixture which had been sterilized in the process of manufacture by "rigorous autoclaving"; this had reduced its pyridoxine (vitamin B₆) content to less than 60 µg. per litre. In all cases the convulsions were cured at once by treatment with pyridoxine or by changing the milk mixture. More recently another case has been reported³ in a newborn infant of a woman who, during her pregnancy, had had hyperemesis treated with three to four intramuscular injections weekly of 50 mg. pyridoxine hydrochloride. After a prolonged and stormy clinical course in which many convulsions occurred while the responsible factor was being sought, the child was eventually maintained free of convulsions on 2 mg. pyridoxine hydrochloride daily by mouth. In spite of this, at 20 months of age she was mentally retarded. This case falls into a somewhat different category from the others, since the child has been kept

free of convulsions only by giving supplements of pyridoxine in addition to the normal diet, whereas the others have been controlled by the pyridoxine present in milk mixtures which were not reinforced with the vitamin.

Vitamin B₆ was first recognized as a separate entity in 1934⁴ and identified with the Factor Y which Chick and Copping described in 1930.⁵ Its indispensability in the nutrition of lower animals was established in the years that followed,⁶ but it was not until 1950 that unequivocal evidence was reported of the effects of its deficiency in human adults⁷ and infants.⁸ Snyderman *et al.*⁹ treated two mentally defective infants aged 2 and 8 months with a diet deficient in pyridoxine for 76 and 130 days respectively. Both children failed to gain weight, but apart from this the syndrome which resulted was different, the younger infant developing convulsions on the seventy-sixth day, the older a severe hypochromic microcytic anaemia which was refractory to treatment with iron. Both quickly responded to treatment with pyridoxine. It seems that the age at which deficiency is established has some bearing on whether the clinical picture should be a neurological one or not, since the age group affected by the artificial milk mixture^{1,2} was 5 weeks to 4 months, with a mean of 2½ months. It is during this period that myelination of many of the association tracts of the fore- and mid-brain is being completed, and it may be significant that degenerative changes take place in the myelin sheaths of peripheral nerves and the spinal cord of pyridoxine-deficient dogs,⁹ and epileptiform convulsions occur in pyridoxine-deficient rats.¹⁰ Pyridoxine is involved in fat and protein metabolism, and in its absence tryptophan is not converted to nicotinic acid. Snyderman *et al.*¹¹ noted inability to excrete N'-methyl nicotinamide in the urine after a dose of tryptophan as early as the twentieth day of the deficiency period in their two cases, and they suggested that this might form the basis of a clinical laboratory test for pyridoxine deficiency. However, Hunt *et al.*³ did not find an abnormal response to tryptophan loading in their patient or in her mother.

Pyridoxine is heat-stable but vulnerable to ultra-violet light,⁶ and presumably to autoclaving. In America whole human milk contains 11 µg., and cow's milk 48 µg., per 100 ml.¹² No British figures are available. The minimum requirement of pyridoxine in infancy has not been determined, but Snyderman *et al.*¹¹ maintained their cases on 0.67 mg. of pyridoxine daily before starting the experimental deficiency period. On this intake both infants were able to metabolize tryptophan normally, though unable to do so when the intake was cut to 0.15 mg. daily. No cases similar to the American ones have yet been reported in Britain. There is no doubt, however, that deficiency of pyridoxine in

the diet, and even inability to use pyridoxine in the amounts supplied in a normal diet, can cause convulsions in infancy.

NURSING-HOMES

Figures given in the annual reports of the county medical officer for London show that the second world war and the National Health Service Act caused great changes among the nursing-homes of London. At the end of 1937 170 nursing-homes were registered in the L.C.C. areas. Evacuation, damage by enemy action, shortage of staff, and other difficulties reduced the number of active homes to 108 in 1945, and the homes which survived the war had great difficulty in maintaining their standards. The replacement of equipment (particularly linen), rationing, and the shortage of skilled staff had to be surmounted during the difficult war years, and most nursing-homes were then faced with heavy expenditure on repairs and redecoration in the immediate post-war years. This alone was often enough to discourage the owners of the smaller type of home from continuing. In addition the pre-war nurse's salary of £60 to £90 a year, all found, had by 1953 become £350 plus a living-out allowance. It was not surprising, therefore, that between 1947 and 1953 there was a further drop in the number of nursing-homes from 63 to 48. This drop of 24% in the number of homes in London since the National Health Service began, when measured in number of beds available, shows a decrease of 9.4%. During this same period 19 new homes were registered, but 34 were closed.

Rising costs have alarmed the users as well as the owners of nursing-homes. Accommodation which before the war cost 5 to 8 guineas a week, with a maximum of about 12 guineas, to-day costs from 11 to 25 guineas a week—not a disproportionate increase when compared with rises in costs. Fees of this magnitude which may be borne for a short period by the acutely ill are an impossible burden on patients of advanced age with small fixed incomes: in many cases the expense is met for a time out of capital or by relatives or friends. This is one of the main reasons why the number of empty beds has increased in nursing-homes. There are still some small homes with from 6 to 10 beds charging about 6 guineas upwards, but at such a figure and with present-day prices no more than the bare minimum of nursing staff can be provided, and the food could hardly be expected to be of the highest quality. Homes of this type appear to be on the border of solvency, and it may well be that few can survive. On the other side of the picture are a few homes charging fees as high as 30 to 35 guineas a week. These homes are in constant use by physicians and surgeons of high standing, and the professional skill and care are matched by a service similar to that of a luxury hotel.

The introduction of the National Health Service came at a time when the falling birth rate was reducing the admissions to maternity beds in nursing-homes, and coincided with a period when maternity wards were being expanded in the hospitals. The number of confinements taking place in nursing-homes in London was 3,167 in 1947: in 1952 this had fallen to 1,091. This large drop

cannot be wholly accounted for by the fall in the birth rate from the exceptionally high figure of 20.9 per 1,000 of the population in 1947 to 15.3 in 1952. Recent annual reports of the medical officers of health of other large cities show the same trend. Most homes found that in the post-war years less use was being made of their operating theatres and more beds were being used for medical cases, particularly for the treatment of the chronic sick or senile patients: in 1948 30% of the beds in nursing-homes were occupied by patients in those two categories. By 1953 this figure had risen to 44%, and in the same period the proportion of beds occupied by maternity cases fell from 10% to 5%, and of all beds occupied from 75% to 71%.

State-registered nurses are not as a rule keen to work in private nursing-homes, and the comparatively uneventful nursing of the chronic sick does not greatly attract them. It is the State-enrolled assistant nurses, or the older women, trained but without State registration, who nurse such cases. The organization of comprehensive home-nursing and home-help services under the local health authority, and the establishment of old people's homes under welfare provisions, while in no sense a replacement of the private nursing-home, have added to the facilities available and undoubtedly had some effect in reducing the numbers of those who might have gone into a private home. The borderline between what constitutes nursing of the sick and caring for the old and enfeebled is very ill-defined. Establishments which provide care for the aged by ordinary unskilled staff fill a real need, and there are good reasons why some of the smaller nursing-homes should turn their attention to this type of elderly person who so often fails to find the accommodation for which he or she is seeking.

EPHEDRINE AND URINE FLOW

Recently letters to the *Journal* have referred to difficulty in micturition caused in elderly male patients who are sufferers from asthma, when using ephedrine. It is true that little attention has been given to this troublesome effect of ephedrine, but it is known and described. The earliest discussion seems to be that of Balyeat and Rinkel,¹ who observed that ephedrine caused urinary retention in asthmatics in 1925, those complaining being women as well as men. In men over 60 they noted a lack of desire to pass urine. They found no satisfactory explanation. They stated in their article that according to Pottenger² and to Kuntz³ the parasympathetic supply stimulates, while the sympathetic supply relaxes, the bladder, but that the reverse is true of the sphincter, which is therefore contracted by ephedrine since it potentiates sympathetic effects. Goodman and Gilman⁴ also stated that under the influence of ephedrine the tone of the trigone and of the sphincter is increased as it is by the trigone and of the sphincter is increased as it is by drugs like morphine. They pointed out that urinary discomfort is prone to occur in those approaching the age of prostatic hypertrophy. Dr. Hugh Cartwright⁵ referred in his letter to similar symptoms following the use of amphetamine and related substances. This is to

be expected, since their action in the body is similar to that of ephedrine, though usually they are given for different reasons. The fact that the spasm of the sphincter ceases on withdrawal of the drug indicates that there is no question of obstruction, and emphasizes that there is an important element of transient spasm as distinct from permanent obstruction in the difficulties of micturition met in advancing years. Some have observed that a slight amount of physical exertion relaxes the spasm. There is need for research in this field.

SERVICE IN THE COLONIES

Health in the Colonies continued to improve in 1953, and the year was a more fortunate one than usual in that no epidemics of communicable disease appeared.¹ In most respects the Colonial Office can report favourably on the health of the very diverse peoples under the care of its medical officers. But for these "there is still an urgent need for recruitment in the United Kingdom." The main difficulty is to attract candidates for Nigeria and the Gold Coast; demands in other parts of the world have been met fairly well, even other parts of Africa. Uncertainty about future prospects in West Africa is a deterrent, though, as Mr. Ian Fraser reported² in this *Journal* last year, the need for British doctors is great, particularly for specialists. The B.M.A. has had consultations with the Colonial Office on this problem, and meanwhile a reassuring statement of intentions has come from Nigeria. Leaders of Nigerian Delegations assembled at Lagos for the Constitutional Conference have affirmed that "the interests of overseas officers who continue in the future to serve in the public services of Nigeria shall be fully safeguarded." Pensions liabilities will be honoured, and appointments are to be kept free of political control. The whole statement should be obtained from the Colonial Office and studied by candidates who are considering applying for the Nigerian posts advertised in the *Journal* this week at advertisement page 45.

The remarkable variety of practice awaiting those medical officers who venture abroad is evident from the Colonial Office's report. While the year was, epidemiologically, a quiet one, it yet brought such tremendous challenges to medical relief as a tidal wave in Fiji, an earthquake in Cyprus, a disastrous fire in Hong Kong, and the worst drought for twenty years in the island of Antigua. Nor are fire and flood the only rivals to the tropical diseases as a cause of misery in hot climates, for some of the diseases characteristic of temperate climates are scourges there also. Outstanding among these is tuberculosis, while pneumonia, despite widespread use of antibiotics, "is still a killing disease." Some of the puzzles posed during the year included an unexpected epidemic of kala azar in Kenya, rabies caused by infected bats in British Guiana, and sixteen cases of undulant fever in Gibraltar, traced to imported goats' milk. But, in spite of environmental difficulties and staff shortage, the Colonial medical services' record of work in the year is one of which they may well feel proud.

¹ *J. Amer. med. Ass.*, 1953, **98**, 1545.

² *Symptoms of Visceral Disease*, 1925. St. Louis.

³ *The Autonomic Nervous System*, 1929. Philadelphia.

⁴ *The Pharmacological Basis of Therapeutics*, 1941. New York.

⁵ *British Medical Journal*, 1954, **1**, 1036.

¹ *The Colonial Territories, 1953-4*, H.M.S.O. 6s.

² *British Medical Journal*, 1953, **2**, 987.

¹ Molony, C. J., and Parmelee, A. H., *J. Amer. med. Ass.*, 1954, **154**, 405.

² Coursin, D. B., *ibid.*, 1954, **154**, 406.

³ Hunt, A. D., *et al.*, *Pediatrics*, 1954, **13**, 140.

⁴ György, P., *Nature (Lond.)*, 1934, **133**, 498.

⁵ Chick, H., and Copping, A. M., *Biochem. J.*, 1930, **24**, 1764.

⁶ Bicknell, F., and Prescott, F., *The Vitamins in Medicine*, 1948, Heinemann, London.

⁷ Mueller, J. F., and Vilter, R. W., *J. clin. Invest.*, 1950, **29**, 193.

⁸ Snyderman, S. E., *et al.*, *Fed. Proc.*, 1950, **9**, 371.

⁹ Street, H. R., *et al.*, *J. Nutr.*, 1941, **21**, 275.

¹⁰ Chick, H., *et al.*, *Biochem. J.*, 1940, **34**, 595.

¹¹ Snyderman, S. E., *et al.*, *J. clin. Nutrition*, 1953, **1**, 200.

¹² Macy, I. G., *et al.*, *The Composition of Milks*, National Research Council Bulletin, 1950.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

LABORATORY INVESTIGATION IN THE HYPERCHROMIC ANAEMIAS

BY

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It cannot be stressed often enough that an anaemic patient should be investigated at least by a blood count and a bone-marrow biopsy before anti-anaemic treatment is started. Unfortunately this is often not done. As a result, the physician is faced later with the almost insuperable problem of trying to decide, for example, whether a patient has or has had pernicious anaemia, when he has already been given active treatment with liver, folic acid, or vitamin B₁₂ without a proper laboratory diagnosis having been made. Since the patient with pernicious anaemia must continue treatment for life, it is of vital importance to be certain of the correct diagnosis in the beginning.

Varieties of Macrocytic Anaemia

Now hyperchromic macrocytic anaemia, although most often seen as pernicious anaemia, may occur in a number of other less common conditions not necessarily related aetiologically to pernicious anaemia. These conditions sometimes cause difficulty in diagnosis, but it is important to make a correct diagnosis, as they often require different types of treatment. Thus, the achylic, or "agastric," macrocytic group comprises primarily the classical pernicious anaemia, but also an identical but much rarer hyperchromic macrocytic anaemia which sometimes follows the removal of the gastric secreting cells by total gastrectomy or the destruction (as by corrosive poisons) of the haemopoietin- and acid-secreting cells of the stomach. If untreated, this anaemia is fatal.

The non-Addisonian group of hyperchromic macrocytic anaemias includes a number of conditions of varying aetiology and treatment. These anaemias are not necessarily progressive and fatal, nor are they usually associated with atrophy of the gastric mucosa or with achylia. They are seen in tropical sprue, idiopathic steatorrhoea (non-tropical sprue), and occasionally in coeliac disease in children; pregnancy; malnutrition; certain diseases of the liver or endocrine disorders; certain neoplastic changes affecting the bone marrow (myelosclerosis); and very occasionally in childhood. There is also a group of idiopathic refractory megaloblastic anaemias.

Patients with a macrocytic anaemia show a variable degree of anaemia, and, according to its severity, there may be a brownish, but more usually a light or pale (lemon) yellowish, colour of the skin and mucous membranes. Those with an achylic anaemia—for example, pernicious anaemia—will frequently have a sore smooth tongue with an atrophic mucous membrane, flatulent dyspepsia, often recurrent mucous diarrhoea, some tingling and numbness in the fingers and toes, and histamine-resistant achylia gastrica. These symptoms are usually quite mild and may be intermittent in the early stages but become persistent and much more severe as the anaemia becomes worse. On the other hand, those with one of the non-Addisonian macrocytic anaemias may show slightly different and often quite diagnostic features. Thus in the anaemias secondary to disturbances of the bowel we find, for example in tropical sprue, that there may be severe malnutrition, loss of weight, glossitis, and typical light-coloured, frequent fatty stools, with changes in fat balance, which may be relieved wholly or in part on return to temperate climates and after a reduced fat intake; usually the gastric secretion

contains both haemopoietin and a more or less normal amount of hydrochloric acid, although sometimes there is achlorhydria gastrica, but it is not necessarily histamine-resistant. In the non-tropical type of sprue, or idiopathic steatorrhoea, similar features are seen usually in adults in temperate climates, but the fatty diarrhoea may be quite mild and vary very much with the dietary fat intake, and it may be necessary to make a fat-balance test to detect this abnormality; the gastric acidity is usually normal, but there may be some decalcification of bones. Coeliac disease, the counterpart of idiopathic steatorrhoea in children, is much more rarely associated with a hyperchromic anaemia; usually there is a hypochromic microcytic or normocytic type of anaemia.

All these sprue-like conditions if associated with a macrocytic anaemia respond to folic acid but not to vitamin B₁₂.

The tropical hyperchromic macrocytic anaemias represent a heterogeneous group probably having several aetiological factors, according to the geographical situation, but in general they are nutritional anaemias probably caused by severe nutritional deficiencies of extrinsic factor and other vitamins and food factors. They often occur in young pregnant women with normal gastric acidity and a normal fat balance, and only rarely are they associated with glossitis and gastro-intestinal symptoms.

There is a definite but relatively uncommon macrocytic or megaloblastic anaemia of pregnancy in which the symptoms and the blood and bone-marrow pictures resemble very closely pernicious anaemia, but the gastric secretion is normal and a therapeutic test shows a rapid remission with folic acid but not following vitamin B₁₂. The patient remains cured and does not require treatment subsequently.

A very uncommon macrocytic (often megaloblastic) anaemia is encountered in children, and has been described as being pernicious anaemia, but it is not a genuine Addison's anaemia; achylia is not necessarily found and the anaemia appears to respond only to folic acid and, poorly, to vitamin B₁₂. Hyperchromic macrocytic anaemia with a megaloblastic marrow and usually normal gastric secretion may be seen in cirrhosis of the liver, and occasionally in diseases of the pituitary and thyroid (hyperthyroidism) glands, severe malnutrition, and neoplastic conditions mainly affecting the marrow as in myelosclerosis.

A typical hyperchromic megaloblastic anaemia without achylia or the Addisonian symptoms of glossitis, flatulent dyspepsia, diarrhoea, paraesthesiae, or neurological symptoms is seen in achrestic anaemia. This is due apparently to inability on the part of the liver to release its anti-pernicious-anaemia "liver principle" when required in the bone marrow.

Occasionally cases of idiopathic refractory megaloblastic anaemia are seen that do not respond properly to any treatment and whose aetiology is unknown. They may have normal or diminished gastric secretion, and often nutritional factors are involved.

Blood Examination

A full examination of the blood will show the following features in pernicious anaemia: a macrocytic hyperchromic anaemia, usually with a much greater reduction in the red-cell count than in the haemoglobin value so that the colour index (although a very inaccurate measure) may be very high (1.3 to 1.6). These changes are paralleled by an

increase in the mean cell volume (M.C.V.) to 95–160 μ^3 (normal 82–95 μ^3), and mean corpuscular haemoglobin (M.C.H.) 33–56 $\gamma\gamma$ (normal 27–31 $\gamma\gamma$); the mean corpuscular haemoglobin concentration (M.C.H.C.) is 32–36% (in iron-deficiency hypochromic anaemia this value is often considerably less than 30%). In the stained blood smear the red cells show marked variety in size (anisocytosis) and bizarre, oval, and pear shapes (poikilocytosis). The cells seem well filled with haemoglobin (mainly owing to their being bigger and thicker in strong contrast with the thin, pale, ring-like cells of hypochromic microcytic anaemia).

In a severe anaemia there will be polychromatophilia, basophilia with fine or coarse basophil stippling, and often some nucleated red cells (normoblasts) may be seen; the last are often noted in haemolytic anaemia. The presence of megaloblasts in the peripheral blood is not common, but is thought to be confirmatory evidence of pernicious anaemia. Sometimes unusual cells such as Howell-Jolly bodies may be seen, but they are not of any diagnostic significance in pernicious anaemia.

The platelets may be diminished in numbers, especially when there is severe anaemia, and may be lower than 50,000 per c.mm.; they increase rapidly with anti-pernicious-anaemia treatment. Clinically, purpuric manifestations, bleeding from the gums, epistaxis, and retinal haemorrhages occur only when severe anaemia is associated with a platelet reduction below about 40,000 per c.mm.

The reticulocytes are usually less than 2% except under two conditions, namely: (a) during spontaneous remissions which are accompanied by a reticulocytosis, and (b) during the first 14 days after adequate anti-anaemic treatment, when a peak of 15–60% occurs at about the sixth to the tenth day, the level being inversely proportional to the initial red-cell count. A persisting irregular reticulocyte count of 5–30% or more suggests a haemolytic anaemia.

Most of the secondary group of macrocytic anaemias described above (sprue, steatorrhoea, pregnancy, etc.) show an almost identical blood picture to that of pernicious anaemia, but, while there are no characteristic differences, tests of the gastric secretions and a therapeutic test allow further differentiation.

Generally the leucocyte count is somewhat reduced (3,000 to 5,000 per c.mm.). Usually there is a relative but sometimes an absolute lymphocytosis (1,000 to 4,000 per c.mm.) due mainly to a reduction of the granular cells. Quite often some large multiseptated (6–10 lobes) polymorphonuclear neutrophilic leucocytes (macropolycytes) are found in the blood smear, and these may appear even before there are gross changes in the red cells; much less frequently a few immature cells, usually myelocytes or metamyelocytes, may be seen.

In passing, it should be mentioned that it used to be common to see a temporary eosinophilia after treatment with liver or liver extracts, but this is a less frequent observation with modern forms of therapy.

Occasionally a patient with a hyperchromic macrocytic anaemia may be found to have a leucocytosis of, say, 10,000–14,000 per c.mm., with 8,000–12,000 being polymorphonuclear leucocytes. This should always suggest either a complicating infection or some other lesion such as a neoplasm of the stomach or lungs for which careful search must be made.

Marrow Biopsy

This has now become an essential procedure in the investigation of any disease of the blood, particularly in early and difficult cases. By its use some of the anaemias previously thought to be refractory have been elucidated and in other blood diseases diagnosis has been established with certainty and at earlier stages.

The technique for obtaining suitable material is simple. The best site in adults is generally the centre of the manubrium sterni, but in children an iliac crest or sometimes a vertebral spine may be easier. The skin is cleaned and infiltrated with a local analgesic, down to and including the periosteum. The sample is obtained with a Salath needle,

gentle suction being applied with a dry 1-ml. "tuberculin" syringe. In children the procedure is much simplified by the use of light anaesthesia, such as with ethyl chloride for two or three minutes, while the iliac crest is punctured at right angles to and just below the upper surface.

Failure to obtain a sample of marrow because of thickened hard bones, or absence of or failure to find a marrow cavity, suggests myelosclerosis.

The specimen obtained, which consists of marrow fragments in a variable amount of blood, is examined after making smears. Some prefer to examine the small fragments of marrow on a slide after they have first been expressed from the syringe on to a watch-glass.

The slide is stained by the Jenner-Giemsa or a similar technique, and examined under the 1/12 oil-immersion lens. An estimate is made of the degree of cellularity, the different types and relative numbers of erythroblasts, granulocytes, lymphocytes, plasma and reticulum cells, and megakaryocytes are ascertained, and any predominating type is noted. In pernicious anaemia and the other hyperchromic (macrocytic) megaloblastic anaemias the marrow picture will be absolutely characteristic. The marrow will be very active (hyperplastic) and contain a high proportion of megaloblasts of all types, sometimes proerythroblasts, often showing various nuclear patterns and active mitosis, but relatively few normoblasts; in milder cases there may be only a few megaloblasts.

In sprue, steatorrhoea, and the tropical macrocytic anaemias quite a number of normoblasts are commonly found, with a transitional rather than a fully megaloblastic type of myelogram; this may be even more marked in coeliac disease in children, who usually show a fully normoblastic marrow.

There is quite often evidence of an unusual and increased leucopoiesis, mainly demonstrated by an increase in the numbers of granular leucocytes and large metamyelocytes; giant hypersegmented polymorphonuclear cells may be noted and probably give rise to the macropolycytes seen in the blood film. On the other hand, there may be a definite reduction in the number of megakaryocytes which parallels the thrombocytopenia in the peripheral blood.

Since this whole marrow picture is typical and pathognomonic for pernicious anaemia and megaloblastic hyperchromic anaemia, it will be realized how important it is to make this examination before giving any treatment. The characteristic picture is completely converted to a normoblastic hyperplasia, with disappearance of the megaloblasts, within a few days of giving liver extract, vitamin B₁₂, or folic acid; it thus becomes impossible to make a correct diagnosis afterwards.

In the haemolytic anaemias the marrow shows a very active picture, with plenty of normoblasts of all types (which may be prematurely haemoglobinized), proerythroblasts, and sometimes haemocytoblasts; there are no megaloblasts. Owing to the intense erythroblastic reaction, which may occupy 75% of the cell space, there may be some reduction in megakaryocytes and early granular leucocytes.

Gastric Secretion

Some of the most striking symptoms in the hyperchromic anaemias are referable to the gastro-intestinal tract. Thus the glossitis, flatulent dyspepsia, gastritis, and recurrent mucous diarrhoea are all associated with atrophy of the gastric secretory glands. Every patient with pernicious anaemia (as well as with subacute combined degeneration of the cord) has a complete and irreversible histamine refractory achylia gastrica (commonly a familial hereditary feature), and normal gastric secretory function is never regained, even after treatment and relief of the gastro-intestinal symptoms.

Whatever may be the other pathological and haematological findings, if free hydrochloric acid is found in the stomach secretion, then the diagnosis cannot be one of pernicious anaemia. On the other hand, the secondary non-Addisonian types of hyperchromic macrocytic anaemias

usually have a normal or slightly reduced gastric acidity, although in patients with tropical sprue, and occasionally in non-tropical steatorrhoea, achlorhydria (not always histamine-refractory) may be noted quite often.

Fat Absorption

While in patients with tropical sprue the typical bulky fatty stools are obvious, it may only be necessary to determine the fat distribution in a simple sample to confirm the gross failure of absorption. In mild cases of sprue and in most cases of non-tropical steatorrhoea and coeliac disease, a single fat analysis may be inconclusive. It is then necessary to carry out a fat-balance test in which the patient is given a fixed diet containing 70 g. of fat, and the fat or fatty acid contents of the faeces are determined daily over a twelve-day test period. The first three daily totals of faeces are bulked together, and the average figure determined for fatty acids. If there is 95% absorption there is no abnormality of fat-splitting and absorption, but less than 70% indicates definite abnormality. If the fatty-acid determination indicates 80-93% fat absorption, further daily estimations must be made until the daily output of fatty acids or fats remains constant. If the value for fatty acids in the daily output is equivalent to less than 90% of the total daily fat intake, the steatorrhoea is confirmed.

Therapeutic Test

When all the preliminary and confirmatory examinations have been made the final test is the therapeutic one.

In pernicious anaemia and the agastric anaemias requiring or expected to respond to hog's stomach, liver extracts, or vitamin B₁₂ (cyanocobalamin), the appropriate dose is given, 1 to 2 ml. of liver extract intramuscularly daily for three days or 100 µg. vitamin B₁₂ subcutaneously daily for two to three days. A reticulocyte count is made daily and determinations of the haemoglobin and the red blood cell count twice weekly. No other treatment should be given during this test. If the diagnosis and treatment are correct then the reticulocyte count will rise rapidly in the course of the following four to eight days to a maximum peak of 15 to 60%, depending on the dosage and potency of the specific treatment and the initial depression of the red-cell count. At an initial level of 1,000,000 red cells per c.mm. a peak of 30 to 40% reticulocytes would be expected, while at 2,000,000 per c.mm. a peak of only 15 to 25% reticulocytes would appear. At the same time the number of red blood cells and the haemoglobin value would rise steadily and progressively to normal levels with further treatment. These results would thus confirm the diagnosis of a macrocytic hyperchromic anaemia due to the expected deficiency.

The non-Addisonian macrocytic hyperchromic anaemias do not respond to liver extracts and vitamin B₁₂. But, after a negative response in the above test, the administration of folic acid, 50 to 100 mg. parenterally for two or three doses, or of 10 to 20 mg. orally daily, will produce a similar haematological response. Failure to respond suggests an error in diagnosis, inadequate or inactive treatment, or some other complicating and concomitant disease or factor.

Conclusion

As a rule the differential diagnosis of these hyperchromic megaloblastic anaemias can be made quite readily by a full blood count, marrow biopsy, and an evaluation of the gastric secretory function.

A diagnosis of pernicious anaemia is certain if there is a macrocytic hyperchromic anaemia, with an active (hyperplastic) megaloblastic bone marrow, and an achylia gastrica, and there is a full haematological and clinical remission after adequate treatment with an active liver extract, vitamin B₁₂ parenterally, or hog's stomach orally. (Note: Folic acid must not be given to patients with pernicious anaemia or subacute combined degeneration of the spinal cord, as it causes the onset or worsening of the cord symptoms.) If there is additionally a history of total gastrectomy or

destruction of the gastric mucous membrane, then the pernicious anaemia is secondary to such gastric secretory deficiency.

A hyperchromic macrocytic anaemia with a megaloblastic marrow, but with a normal or reduced gastric acidity, may be seen in sprue, idiopathic steatorrhoea (non-tropical sprue), or coeliac disease. Clinically there may be a history of large bulky frequent pale stools with a variable degree of disturbance of fat absorption as shown by the fat-balance test. This type of anaemia fails to respond to vitamin B₁₂, but improves with folic acid or the less purified types of liver extract. The non-tropical sprue-like conditions may also be associated with a normoblastic marrow, in which case they will not respond to folic acid but will require iron.

A similar hyperchromic anaemia, with megaloblastic marrow, but without achylia gastrica, in a pregnant woman indicates macrocytic or megaloblastic anaemia of pregnancy. This again will respond to folic acid, but not to vitamin B₁₂. It does not require continued treatment.

Next article on Clinical Pathology.—"Investigation of Haemolytic Anaemia," by Dr. John F. Wilkinson.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1. or from booksellers.

RESETTLING MENTAL DEFECTIVES PSYCHOLOGICAL AND SOCIAL ASPECTS*

BY

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The type of adult female defective here discussed is determined primarily by administrative considerations. The ordinary mental deficiency colony caters for all types of defectives and can occupy a considerable proportion of the higher grades in work useful to the institution. A children's hospital such as the Fountain Hospital, which caters for 700 mentally defective children, has no such labour available, as any child who is at all trainable is in the hospital school and occupation centre. For many years, therefore, it was the custom to transfer adult "working" patients from other institutions to the Fountain Hospital to work in the wards and laundry. About 80 such patients were accommodated in the hospital itself, but in 1950 they were transferred to the newly opened annexe, South Side Home, at Streatham.

These patients came from other mental deficiency institutions. It must be stressed that they were classified as unsuitable for licence to a job in the community but possibly suitable for occupation as so-called "workers" in the Fountain Hospital, for which they would receive a small amount of pocket money—formerly sixpence a week but now a few shillings.

Material under Review

Transfers.—From 1918 to the time of writing 327 such adult patients were transferred to the Fountain Hospital. As institutions tend to keep their best workers, those sent to other hospitals are seldom of

*Paper read to the Section of Psychiatry of the Royal Society of Medicine on December 9, 1952.

a high standard. Consequently a large proportion of those transferred were incompetent or emotionally disturbed defectives. As a result nearly half of these patients were in due course returned to their original or some other institution. The remaining 166, plus nine patients who came as children and remained as adult workers, form the group of 175 adult females which is discussed. During the last 10 years an experiment has been conducted to see how these patients would fare in the community. As they had not been sent out on licence by their previous hospital, the presumption had been that they were regarded as unsuitable for supervised life in the community. It seemed, therefore, rather a forlorn hope to work on this group of failures specially selected by others for their unsuitability for licence. Nevertheless the experiment was made.

Discharge Rate.—So far 140 out of the 175 have been found employment in the community, and 101 of these have already been discharged under the Mental Deficiency Acts. Of 100 consecutive patients placed on licence 73 were discharged. Even with carefully selected licence cases a discharge rate of 73% would be a high one, but, as has been pointed out, these patients were regarded as unsuitable for licence, hence their transfer to the Fountain Hospital.

What do we know about the patients in this group? The outstanding feature is that they are a very mixed sample with a wide range of attributes. Their ages range from 16 to 66; their ages at certification as defectives ranged from 3 to 39. The dates of first certification extend from 1909 to 1950. Their ages when first licensed from the Fountain Hospital varied from 17 to 59. In view of this very wide scatter there is no particular type of patient that can be regarded as characteristic of his group, but on an average patients were 20 years old when certified and were placed on licence after an average of 20 years in institutions. It is remarkable that after so long an absence from the world they have been able to survive when suddenly returned to it.

Social Factors

Of the 100 consecutive patients put on licence, of whom 73 have been discharged, 17 (17%) were illegitimate. Children born to unmarried mothers have no normal home life, and illegitimacy nearly always means separation from the mother and institutional upbringing from a very early age. Emotional and apparent mental retardation is common in such children, and one may wonder whether they would all have been certified as mental defectives if they had had a more stimulating and secure childhood. Of the 72 legitimate patients whose sibship is known the average number of siblings is seven. In this relatively small group six patients were one of 11 siblings, and there were families of 12, 13, 14, 15, 16, 17, and 18 children. In the days before family allowances such large families must have implied poverty and overcrowding. The resulting lack of supervision and early training may well have been a factor in the mental immaturity and intellectual subnormality of these patients.

Standard of Education.—Some patients had been to elementary schools but had made poor progress. The majority had gone to special schools, but others had had very little schooling at all because of truancy, bad homes, or too early certification as defectives. A large proportion were therefore almost illiterate. Some later learnt to read and write on their own; others attend L.C.C. evening classes at the South Side Home for reading and writing. It is difficult to assess the level of intelligence of these patients because several factors obscure the true picture. Inadequate opportunities for special education, the stultifying effect of many years in an institution, and the unsuitability of the Binet type of test for these patients make the usual I.Q. figure meaningless.

Intelligence.—In the 100 consecutive licence cases the Binet I.Q. prior to licence ranged from 34 to 73, but experience of the world enabled most of these patients to

improve their score on this test. There was usually a gross discrepancy between the Binet and the Wechsler-Bellevue I.Q. Many patients score 20 points more on the latter test, which is a much better measure of their capacity, and some show differences of as much as 35 points. Some of our recent admissions have had I.Q.s of 100, which raises the vexed question of the relationship between intelligence and mental defect. Whatever the I.Q., these patients need experience of the normal world if they are to survive in it. In an institution they are cut off from many aspects of normal life, with a resulting atrophy of cognitive and affective functions. The first step to the rehabilitation of these defectives is to give them possessions and a locker to keep them in, clothes of their own and money to buy them with, stimulating work with adequate rewards for working, and a day off each week when they can go out on their own and exercise their initiative and broaden their experience on buses, in shops, and in cinemas.

Freedom.—For several years those patients at the South Side Home not on licence have been allowed one free day every week, when they go out, usually with another patient, but without any nurse or escort. Armed only with a card giving the hospital address and telephone number, they learn the ropes from each other and from their own experience. Some go to Brighton for the day, and, what is more, come back. It is this opportunity of freedom and experience which is the basis for successful licensing and ultimate discharge. In some institutions patients remain on licence for many years, with the constant threat of recall, and lose all hope of freedom. I believe that in general these patients appreciate their discharge and will not risk recertification. If a female is going to get herself into trouble she will do it while on licence or even in the hospital. Her opportunities are no greater if she is discharged.

Pregnancy

When dealing with female defectives the biggest single problem is the risk of pregnancy. Of the 100 consecutive patients on licence, only one, the hundredth, became pregnant while on licence. Lest it be thought that this group was singularly infertile, I should explain that before their transfer to the Fountain Hospital, and usually prior to certification, 31 of these 100 women had between them had 52 children. Many people believe that almost all of the offspring of defectives are themselves defective. It is encouraging to find that many of these children are normal, and that some, having grown up, have had their mothers discharged to their care.

It will be realized that, whatever the reason given at the time for certification of these patients, illegitimate pregnancy was the precipitating factor in a considerable proportion of the cases. Better facilities for the unmarried mother will reduce the need for certification under the Mental Deficiency Acts. Illegitimate pregnancy is not in itself a sign of mental defect. In view of the high percentage of first pregnancies conceived outside matrimony in the population as a whole, proper evidence of mental defect should be furnished when a slightly subnormal woman is in trouble.

When the large sibships of some of these patients (16, 17, 17, and 18) are remembered, it may be that their fall from grace was precipitated by an inherent fertility while other equally poorly endowed citizens avoided certification by not producing a baby.

Employment; Marriage

These defectives have learnt to do laundry work and various jobs in a gas-mantle factory, but most have obtained domestic jobs in private houses or hospitals. Hospital jobs are the more popular, as the girls are used to institution life and get more company and better pay. As resident hospital domestics they get the full scale of £4 18s. 6d. a week, less tax, insurance, and superannuation, and a charge of 33s. for board and lodging. Some are improvident and spend their money, others have several hundred pounds in

their Post Office accounts. One girl who became a senior maid in a hospital flew to Dublin for her holiday.

The regulations state that the patient while on licence must not form attachments to members of the opposite sex. Usually such behaviour results in the recall of the patient to the institution. This is one of the most difficult problems for the superintendent who wants to give his patients a fair chance in the world but must keep at least one eye on his reputation with the authorities.

It is natural for girls working with normal domestics and earning their living on the same terms in hospitals to behave in the same way as their colleagues. They will go out together and visit dance halls, etc., and meet boys. It is very difficult for a licensed patient to announce that she is a certified mental defective and is not allowed to meet boys.

My attitude has been that if such conduct is forbidden it is usually driven underground and becomes more dangerous in its results. I have encouraged the girls to feel that we should prefer to know if they have men friends and will not automatically ban them. As a result several men have come for a talk. Sometimes the undesirable type out to take advantage of the defective girl is warned of the legal situation with regard to intercourse with a known mental defective. If the friendship seems to be a genuine one the defective's discharge is recommended so that she is free to make normal emotional attachments, and, what is more, is free to get married. If the defective is forbidden to marry she can hardly be blamed if she eventually produces an illegitimate child. Several of my patients who were discharged in good time have since married and settled down satisfactorily in their own homes. Some have produced normal, healthy children; one is proud of her twins.

If ultimate success on licence is to be achieved those responsible for the welfare of this type of patient must be willing to risk several apparent failures with each case. One must persevere in finding alternative jobs until the patient has learnt to adjust herself to outside employment. If failure in the first job on licence is followed by recall and a further period in the institution, the patient has to re-adjust herself to a different mode of life, and will later be no better able to cope with the world after an interval away from it.

Learning comes by experience, and the maturation which is so evidently delayed in many of these patients will not occur simply with the passage of time spent in an institution. To develop towards normality the individual must experience and be able to respond to the formative stimuli of the ordinary world. Living is itself a conditioned response.

Certification

A scrutiny of the medical certificates which originally formed the basis for the detention of these patients makes one wonder if enough care was given in some cases to the evidence on which the diagnosis of mental defect was based. A practical difficulty in the borderline cases is that there are still so few alternatives to detention in a mental deficiency institution once a social problem case has come to the notice of the authorities. There is as yet no method of providing training and supervision on a voluntary basis comparable to the voluntary status under the Mental Treatment Act or the even freer access to neurosis centres.

Hostels

A considerable proportion of the patients in this experiment welcomed help and guidance if it was offered freely, but rebelled against coercion. This is shown by the behaviour of those who would run away from South Side Home while under a detention order, but who wanted to come back and live there temporarily if they were out of a job after their discharge. There is a need for a special hostel to help patients who have been discharged. If such hostels could be developed they would be available also for those who need help on a voluntary basis if they are to avoid certification.

Such hostels would work in close co-operation with, but distinct from, the mental deficiency institution and share the same team of social worker, psychologist, and psychiatrist to ensure continuity of supervision and follow-up. They could deal with the psychological and social aspects of the resettling of defectives more effectively than can the large institution designed for custodial care.

Conclusions

Mental deficiency practice has consolidated within the framework and experience of an Act designed 40 years ago in very different social circumstances. This has resulted in a wastage of human capabilities which I believe can, in more favourable circumstances, be developed and utilized to better advantage both to the individual and to the community. Mental deficiency of the so-called feeble-minded category is in many cases not a clear-cut clinical entity of an irreversible nature. Too often, as I have tried to show, it is the diagnosis which has created the disease.

THE CONCEPT OF RACE

A conference on "The Concept of Race" was held in London on May 15 under the auspices of the Medical Association for the Prevention of War. The discussion was opened by Professor L. S. PENROSE, F.R.S., who spoke of the mental and psychological characteristics of populations. He deprecated the way in which conclusions in this field were still so often based on impressions, as, for example, that the Chinese were "cunning and impassive," the Irish "bellicose," and the Germans "sentimental and ruthless." These traditional characterizations were not supported by scientific evidence.

So far as the evidence of psychiatry went, the types of mental disorders prevalent in different parts of the world were the same. According to a U.S. Army survey, levels of intelligence were highest in men of West European and Japanese origin, lower in people of Eastern European origin, and lowest in Negroes. In fact, there was great variation between the residents of different States, and the Negroes of New York and Pennsylvania ranked higher than Whites from Mississippi, Kentucky, and Alabama. Where differences were found, they might be either hereditary or environmental in origin; they did not necessarily imply that one group was inferior to another.

Dr. N. A. BARNICOT said that individual variation within groups was usually greater than the differences between groups. It was impossible to group individuals biologically according to geography, nationality, or religion. For example, judged by skin colour the African and Australian natives were similar and were distinguished from the European; judged by MN blood groups the European and African were similar and were distinguished from the Australian; judged by the sickle-cell trait the European and Australian were similar and were distinguished from the African.

There was evidence that characteristics which had been thought to be fixed could be altered by the environment—for example, the basal metabolic rate of Eskimos—and what was at one time regarded as a genetic weakness might have had a real adaptive value. The inheritance of one factor for the sickle-cell trait had been shown to give protection against malignant malaria.

Mr. S. SACHS discussed the social differences between races, and Dr. D. G. LEYS examined the question of whether there was any scientific justification for the separation of society into strata. Doctors, he said, had an opportunity to counter the tendency towards racial embitterment by helping to ascertain and spread knowledge about the biological truths behind the concept of race.

Reports of Societies

SURGERY OF THE ADRENAL CORTEX

At a meeting of the Section of Urology of the Royal Society of Medicine on May 27 the subject of adrenalectomy was discussed. Dr. A. C. CROOKE (endocrinologist, Birmingham United Hospitals) opened, and in reviewing Cushing's syndrome said that subtotal adrenalectomy was the elective operation. It aimed at reducing the level of circulating corticoids from pathologically high to normal levels and might be compared to subtotal thyroidectomy in hyperthyroidism; it could give equally good results.

In the treatment of hypertension adrenalectomy appeared to be of great value in carefully selected cases of rapidly progressive disease, provided arteriosclerosis was not gross. It might act by reducing the level of circulating corticoids from normal to lower levels, by preventing the normal rise in response to stress, or by removing noxious types of corticoids, which were replaced by less noxious cortisone.

In cancer, the object of adrenalectomy was to remove the sex-steroid element of adrenocortical secretion, but this could be achieved as effectively by giving cortisone in a dosage of about 50 mg. daily by mouth. This would cause atrophy of the adrenal cortex and suppression of its secretion. He questioned whether adrenalectomy for cancer could be regarded as an ethical procedure until it had been shown beyond question that a couple of pills of cortisone a day by mouth would not achieve the same result—pills which the patient would have to take anyhow.

Adrenogenital Syndrome

Mr. D. INNES WILLIAMS (genito-urinary surgeon, Great Ormond Street Hospital, London) confined his remarks to the adrenogenital syndrome, and confessed that he could add little to Dr. Lawson Wilkins's masterly review of the subject before the Endocrinological Section on the previous evening. Children with adrenal cortical hyperplasia presented with sex changes (virilism or pseudohermaphroditism in girls, and iso-sexual precocity in boys); an acceleration of somatic growth, followed by premature fusion of the epiphyses; and, during the infant years, a biochemical disturbance resembling in some respects Addison's disease. 17-ketosteroid excretion was raised even from the time of birth. Cortisone, in comparatively small doses, had a remarkable effect; it halted or reversed the virilizing trend, and caused an immediate fall in 17-ketosteroid output, and enabled the electrolyte balance to be rapidly restored. Cortisone treatment had to be continuous, and appeared to be replacement therapy.

It had been postulated that in these adrenal glands the precursors of the gluco-corticosteroids could not be synthesized into hydrocortisone but formed pregnanetriol, a substance found in great excess in adrenal tissue taken from one case in the series investigated. The lack of circulating one case in the series investigated. The lack of circulating hydrocortisone led to over-production of A.C.T.H., and so to stimulation of the adrenal cortex and excessive output of androgen.

Mr. Williams reported 12 cases (11 female, 1 male), seen in consultation with various medical colleagues. Seven of the females were treated with cortisone, and there had been two deaths from sudden biochemical storms. Two female pseudohermaphrodites had been brought up as boys, and it was thought unjustifiable for psychological reasons to try to reverse the accepted sex, so that cortisone was withheld.

Where the adrenogenital syndrome was produced by tumour as opposed to cortical hyperplasia, the administration of cortisone formed a useful diagnostic test, since in the tumour cases the 17-ketosteroid excretion could not by this means be brought down to the normal level.

Adrenalectomy for Cancer

Mr. L. N. PYRAH (director of surgical research, Leeds University) reported a series consisting of 25 cases of carcinoma of the breast and 3 of carcinoma of the prostate, all having metastases, which had been submitted to bilateral adrenalectomy and gonadectomy. Of the breast cases, 9 had had a major remission; 4 of these were still alive, 5 had later relapsed and died; one case had shown moderate improvement; of the cases showing no improvement, 5 were still alive and 8 had died of cancer. With regard to the prostate cases, 2 had had clinical improvement followed by relapse and death, and one had died of cancer without clinical improvement.

There had been 2 post-operative deaths. The majority of patients stood the operation well. In cases in which there was a major regression the patient experienced a sense of well-being very soon after operation and pain disappeared within 48 hours. Even when there was not much regression of growth, pain was very greatly relieved. The post-operative hormone therapy was that recommended by Huggins, and no difficulty had been found in regard to electrolyte control. The patients who had a remission (which was shown clinically, radiographically, and histologically) sometimes improved in a dramatic fashion.

Mr. J. D. FERGUSON (surgeon, Central Middlesex Hospital) reported similar experiences in 32 cases of total adrenalectomy for advanced malignant disease (17 prostatic cases and 15 breast cases). Before embarking on this form of treatment he liked to have evidence that the tumour had previously been hormone-dependent. A remission of symptoms was obtained in about three-quarters of the cases together with evidence of growth regression in many instances. Most of the prostatic cases lost their pain, and marked benefit was experienced in breast cases with pulmonary metastases. Patients previously bedridden had returned to normal activity.

Total Adrenalectomy in Hypertension

The case for total adrenalectomy in the treatment of progressive hypertension was presented by Mr. HOWARD G. HANLEY (surgeon, St. Peter's and St. Paul's Hospitals, London). The rationale of the therapy was to remove the source of salt-retaining steroids. He first reviewed the results of past workers who had employed a subtotal resection. He had operated on five patients with hopeless malignant hypertension. The results had been surprisingly good even when the blood pressure had not fallen appreciably, as in the two cases with advanced arteriosclerosis. All, however, had shown marked improvement in the eye changes, while signs of cardiac failure had disappeared. He quoted the case of a woman of 46 with pyelonephritis whose urea clearance had risen from 45% of normal to 85%. Renal failure was the main contraindication to this form of therapy. It might be justifiable in the future, he said, to perform adrenalectomy at an earlier stage of the disease, before the onset of arteriosclerosis, and the long-term follow-up of these cases would be invaluable in determining this point.

LOCAL MEDICAL SOCIETIES

Manchester Medical Society

Woman, unlike the cow, declared Dr. F. Charlotte Naish, speaking to the Section of General Practice on March 22, had not been bred for her good milking powers; on the contrary, we had kept alive the children of the poor milkers by wet-nursing and later by clean and careful artificial feeding. Possibly there were 15% of very poor milkers, 25% of moderately good milkers, and 65% of fully adequate milkers. What should we do with the 25% of moderately good milkers? They should be taught complementary feeding, she said. It had been stated that complementary feeding took too much time, but it was just a matter of suitable techniques. There was no need to do test-weighing if the baby was fed to its appetite.

Correspondence

Cortisone and Aspirin in Rheumatoid Arthritis

SIR.—The interesting and important M.R.C. report on the relative values of cortisone and aspirin in rheumatoid arthritis, published in the *Journal* of May 29 (p. 1223), has already received glaring publicity in the lay press, and will undoubtedly have considerable medical and political repercussions. Like all statistically controlled trials, it will be surrounded by an aura of sanctity, and will provide an unchallengeable "gospel" for years to come. Those who read it superficially will merely conclude that aspirin is as effective as, and a far safer treatment for rheumatoid arthritis than, cortisone. They will naturally relegate the latter to the rubbish heap of extinct remedies. Those who read it carefully—especially if they have had experience of the drug—will accept the conclusions that cortisone given in this particular way, to this particular group of patients, and judged by these particular criteria, is not a justifiable form of therapy. But they will still await statistical guidance on the wider and far more fundamental issues about the indications for cortisone therapy.

As Professor Hill has stated,¹ there are an infinite number of questions we might ask about any new regime, but the statisticians prefer to answer a single question at a time—that is, "If to a defined type of patient Y gr. of drug X are given daily by one particular route in so many divided doses, what happens?" Without wishing to appear facetious, I can tell him what happens: the correspondence columns of the medical press are filled for weeks to come by letters which, being paraphrased, read, "Ah, yes, but if you use another group of patients and give the drug in different dosage, and by a different route, you will get startlingly different results." And so the controversy continues.

My comments on this trial are largely a text on which to hang a plea to the statisticians to modify their rigid approach to clinical trials. Perfect statistical techniques are not possible when dealing with biological material, nor is it possible at the early stage at which the Medical Research Council generally formulate their trials for them to lay down the optimum regimes which are not liable to subsequent criticism. I would suggest that a more useful, if less perfect, protocol on which to base a clinical trial is: "Does drug X, given under optimum conditions (as judged by experienced, reliable, and unbiased clinicians), give better results than drug Y?"—leaving the clinicians to select both the patients and to adjust the dosage schedules to individual requirements. Possibly the "cross-over" technique mentioned in your leading article (p. 1249)—in which the patient becomes his own control—is the best compromise. A trial based on this essential degree of flexibility would give a far more useful and a broader picture of the problem, and at the same time would lack some of the specious sanctity which now arises from the statisticians choosing certain highly inaccurate assessments (such as joint tenderness and range of movement) as a means of overall assessment, whilst ignoring entirely such imponderable but important clinical features as the degree of stiffness and the patient's sense of well-being. As a *reductio ad absurdum*, unless we insist on some degree of clinical discrimination, we will soon be handing over these trials to technical assistants who will make a set of measurements without even asking the patient how he feels. We would do far better to learn to evaluate subjective factors in our patients than to ignore them.

To return to the cortisone-aspirin trial: *Selection of patients*.—The protocol laid down that the patients must have had the disease for not less than three months and not more than nine months. They should be suitable for either cortisone or aspirin therapy. Patients fulfilling even the first part of this criteria were exceptionally hard to find in two large clinics, drawing patients from all over England.

When such a patient did materialize, he was usually unsuitable for both types of therapy, either because the disease was too mild or because (as is so characteristic of this early stage of the disease) it was so unstable that it was almost impossible to evaluate any therapeutic results. No responsible clinician would give cortisone at this stage. None the less, they were included in the trial in most cases because more suitable material, fulfilling the criteria, was not forthcoming. This is probably the reason why the functional capacity assessments were identical in each group at the end of the year. It is of some interest that the one case (case 1 on p. 1225), whose disease was rapidly progressive, "drew" aspirin, and after six months he refused to continue in view of his deterioration. He was withdrawn from the trial, and was subsequently treated independently with cortisone. He is now back on full employment as a gold blocker; his disease is still very active, but well controlled. Thus he provides an excellent example of the "cross-over" technique. I am quite confident that no other type of drug would have controlled this man's disease. I am not convinced that in a small sample (such as the present one of thirty pairs) such anomalies are automatically ironed out by "pairing" on the basis of age and sex alone. It is of greater importance that one should aim to pair, if possible, similar clinical types.

Dosage.—Hench *et al.*² have laid down that it is of extreme importance to "individualize" the dose in cortisone therapy, and to give the minimum necessary to control most of the symptoms. The Medical Research Council trial required an initial dosage of 300 mg./200 mg./100 mg. followed by a sudden drop to 50 mg. in the second week, culminating in a period of abstinence on the thirteenth week, twenty-sixth, and twenty-ninth weeks, etc. It is difficult to imagine a regime so calculated to insult the psyche and the adrenals of the rheumatoid patient, and there is even some evidence (Lansbury, personal communication) that to allow the patient to get out of control in this way is very liable to spread the rheumatoid process. Certainly my own personal experience suggests that whenever a patient's disease breaks through the cortisone suppression, as a result of dose reduction, it may need considerably higher dosage to get him under control again. There are many other minor points of assessment on which one might comment in this trial, but they are of insignificant importance compared to those already mentioned.

To summarize: This trial has been expensive and laborious; it answers fairly conclusively, in spite of its technical imperfections, a problem with which few clinicians would disagree—namely, that there are very few cases of early rheumatoid arthritis for which cortisone is indicated. It completely fails to shed any light on the main problems of cortisone therapy. A plea is made that statistical rigidity in the planning of clinical trials should be modified so as to take some account of the clinician's discretion. In other words, the pendulum away from therapeutic empiricism has swung too far.—I am, etc.,

London, E.1.

JOHN H. GLYN.

REFERENCES

- ¹ *New Engl. J. Med.*, 1952, 247, 113.
- ² *Proc. Mayo Clin.*, 1949, 24, 181.

SIR.—In the admirable report (*Journal*, May 29, p. 1223) by the M.R.C. and Nuffield Foundation Joint Committee it is said that cortisone or aspirin was given "together with any other basic treatment that might be required (splints, physiotherapy, etc.)." One wonders what are the criteria which determine that physiotherapy is "required," and what particular variety of physiotherapy is in mind. This method of treatment embraces massage of various kinds, remedial exercises of infinitely variable scope, radiant heat, cold, diathermy, wax baths, hydrotherapy, and several types of electrotherapy. Is there any evidence that any of these remedies, with the possible exception of remedial exercises, gives any benefit beyond, in some cases, symptomatic relief? And is this symptomatic relief as great as that derived from regular aspirin, which is so much cheaper

and which can be had so easily, without dislocating the patient's life? May I suggest that the M.R.C., whose committees have done such useful work in obtaining evidence as to the value of drugs, gives its attention to examining the claims made for physiotherapy in treating rheumatoid arthritis?

May I also suggest that the M.R.C. inquires into the value of rest for this disease? It is categorically stated in the latest medical articles that rest is "essential," though the authors maintain an attitude of judicious reserve in the matter of the duration and degree of this rest in various circumstances. In *Medical Treatment*,¹ for example, it is said: "First, rest, mental and physical, general and local, is of paramount importance. In all cases, this rest is as essential as it is in pulmonary tuberculosis, and it is especially indicated when shock, worry, and fatigue have been the major factors in causing the onset of the disease. An initial period of rest in bed away from worry, which in a particular case means away from home, is most necessary." It may be conceded that when the joints of the feet or legs are badly affected, or when the patient has marked constitutional symptoms, a period in bed is indicated. Even that greatly abused word "essential" may be cated. But is there any evidence that rest of a degree greater than that dictated by the symptoms has any effect on the course of the disease? How grateful we should be to the M.R.C. if it provided such evidence and we were no longer dependent on the *ex cathedra* pronouncements of the textbooks.—I am, etc.,

Farnham, Surrey.

REFERENCE

- ¹ *Medical Treatment*, 1951, edited by G. Evans. London.

J. W. TODD.

Women in Medicine

SIR.—The pre-registration year of internship mentioned by Mrs. Ruth D'Arcy Hart in her letter (*Journal*, May 29, p. 1266) is a statutory requirement prescribed by the Medical Act, 1950, and the Medical Act, 1950 (Period of Employment as House Officers), Regulations, 1951, made thereunder by the General Medical Council. Section 2(1) of the Act requires "employment in a resident medical capacity in one or more approved hospitals or approved institutions..." but Section 2(5) states that "reference to employment in a resident medical capacity shall be construed as reference to employment in the practice of medicine, surgery or midwifery, where the person in question is resident in the hospital or institution where he is employed or conveniently near thereto, and is by the terms of his employment required to be so resident" (my italics). Thus employment required to be so resident is not a statutory requirement, and it is to be hoped that hospital authorities will not overlook this fact when considering an application to live out from a married woman house officer with family responsibilities in a "pre-registration post." It is, of course, the general practice to require all house officers to be resident owing to the nature of the duties involved and the difficulty in finding living-out accommodation conveniently near to the hospital. It would be a pity, however, if, in areas where suitable arrangements can be made, hospital authorities fail to realize that Parliament itself has recognized that "employment in a resident medical capacity" does not necessarily mean compulsory living-in during the pre-registration year.—I am, etc.,

London, W.C.2.

ALISTAIR FRENCH.

SIR.—Non-resident "residents" can be very useful to hospitals, but only on condition that they pull their weight. This means that they must live near enough to the hospital, be on the telephone, and if necessary possess means of transport, so that they can do their proper share of night work. Nor, however much we may pity her dilemma, may a woman opt out of this duty because, for instance, the baby has whooping-cough. In any hospital post the patients' needs must be paramount.—I am, etc.,

Hove.

C. M. OTTLEY.

Tuberculin Testing

SIR.—I would like to add my experiences in tuberculin testing to the recent correspondence. This winter I have jelly-tested approximately 250 children, using the "flour-paper" technique and checking these results with a Mantoux test. While I have had many positive jelly tests and a negative Mantoux, I have never had a negative jelly test and a positive Mantoux. The jelly tests were only read as positive when there was vesiculation and erythema on the old tuberculin side of the intra-scapular area. The point I cannot understand is that these false jelly tests should give a reaction on the old tuberculin side and no reaction on the control side. I find no association between upper respiratory catarrh and false positive jelly tests.

While there is no doubt that the Mantoux test is the more accurate, it would seem that the jelly test using the "flourpaper" technique is of value when negative.—I am, etc.,

Surbiton, Surrey.

T. J. C. WARRINER.

Pleural Effusion in Young People

SIR.—A fundamental principle in the management of tuberculosis is involved in the plea for "proper assessment and treatment of cases of pleural effusion in young people" and the advocacy of "treatment in special units" (presumably residential) with educational facilities, made by Drs. F. J. Bentley and S. Grzybowski (*Journal*, May 29, p. 1263). They suggest that "antibiotic therapy in selected cases, together with an adequate period of graduated rest and subsequent rehabilitation, will prevent the development of serious tuberculous trouble in many instances later in life." They are really pleading that children should be separated from their parents and incarcerated in an institution for long periods, since in their recently published book¹ they state that the average period of bed rest in High Wood Hospital was 17.8 weeks and the average stay in the sanatorium 8.5 months for children with benign primary tuberculosis complicated by pleural effusion. Is this undesirable separation from parents, and this most expensive form of treatment, really necessary? It can be justified, perhaps, as a short-term measure for children deprived of parental care and adequate nutrition and housing, provided that the main efforts of the State are directed towards improvements in these conditions, for these are the real foundation of the total individual resistance that must be maintained after proper management of the acute stage, if serious secondary disease is to be prevented. In the case of children with good homes, sanatorium treatment of pleural effusion is of course quite unnecessary. Their assessment by general practitioners and the chest clinics is done well at present, and the rest treatment, which is all that is necessary, is best given in their own homes where the normal parental relationship can be maintained and strengthened, and perhaps the seeds of juvenile delinquency prevented from germinating. Even antibiotic therapy can be given at home if this is proved to be worth while; but, in 19 out of 167 chest clinic cases of benign primary disease complicated with pleural effusion which I observed under treatment with antibiotics the results were in no way different from 148 cases being treated by rest alone during the same period.

Treatment of pleural effusion complicating the benign primary complex by rest for a few months is certainly to be strongly advocated, but its only effect is to hasten quiescence of the primary complex and the concomitant building up of acquired resistance. Once this has been achieved, even in untreated cases, the treatment given during the active stage of the primary disease has no influence on the subsequent development of secondary tuberculous disease. That depends wholly on the maintenance of acquired resistance during the subsequent period of quiescence, and especially in the first three years of it. In a series of 184 active primary cases which I have observed to quiescence, or which were diagnosed quiescent at first

examination, and all of which subsequently developed secondary pulmonary tuberculosis, the observed interval between quiescent primary and active secondary disease was three years or less in 67%. Accordingly it is the maintenance of a high level of resistance during the first few years of quiescent primary disease that is the most important factor in the prevention of secondary pulmonary tuberculosis. This means that the accidental and physiological factors in resistance—namely, standard of living, good working conditions, housing and nutrition, and special care in relation to age and sex—are more important in this respect than management of primary disease in institutions. The efficiency of management of the primary disease merely determines the duration of its activity, while efficiency in maintaining resistance determines the duration of the period of quiescence.—I am, etc.,

London, N.W.8.

M. SEKULICH.

REFERENCE

¹ *Tuberculosis in Childhood and Adolescence*, 1954. N.A.P.T.

New Apparatus for Insufflation Test

SIR,—The importance of Rubin's CO₂ insufflation test from a therapeutic and diagnostic point of view is to-day universally acclaimed. That being so, it is essential that the requisite apparatus should be in every gynaecological operating theatre, out-patient department, and consulting-room. But such an instrument must be strong, simple and not fragile, transportable, and independent of varying types of electricity, for there are still a great many places throughout the Commonwealth and Colonies where such an instrument is required but electricity does not exist.



For these reasons, with the help of Messrs. Down Bros. and Mayer and Phelps, Ltd., I have devised a simple, sturdy, foolproof, and readily portable apparatus which is worked by clockwork as was the original Rubin instrument. The picture shows the machine. The kymograph is on a horizontal disk and the pen with its perspex container is activated by a CO₂ cylinder fitted with a reducing valve. This cylinder is of standard 1 lb. (0.45 kg.) size enabling more than 200 patients to be dealt with. It will also permit continuous insufflation of not less than 30 cases during any operation such as salpingostomy or salpingolysis. The whole unit is housed in a leather-covered case with a detachable lid allowing free access to all the controls. It is fitted with the correct cannula and rubber connexion tubing for immediate use.—I am, etc.,

London, W.1.

V. B. GREEN-ARMYTAGE.

Varicocele and Male Subfertility

SIR,—I was most interested to read Dr. J. K. Russell's article (*Journal*, May 29, p. 1231) pointing out the high incidence of varicoceles in subfertile males. Having to deal with about 2,000 subfertile men every year, I can confirm his findings and would say that the incidence is probably even higher than his figures suggest. Since I have been collecting data on this problem from a different point of view—namely, that of therapeutic possibilities—I felt that the following observations might be of interest to your readers.

In my opinion, the effect of varicoceles on the semen picture represents only one aspect of a larger group—that is, that of disturbances of testicular temperature regulation. This group should include hydroceles, incomplete descent of the testes, and the wearing of scrotal supports. For normal spermatogenesis testicular temperature has to be kept about 2° C. below that of the body. A varicocele acts as a radiator at blood heat which follows testicular movements and thus counteracts the local thermoregulatory mechanism. This would explain the fact that a unilateral varicocele may depress spermatogenesis in both testes, as Dr. Russell points out. The semen picture in many cases falling within this group is characteristic, showing increased volume, oligozoospermia, poor morphology, and desquamated precursors of spermatozoa. If both the surgeon and the patient understand the underlying principle so that as much as possible of the varicocele is excised, and no scrotal support worn longer than necessary, the results of treatment are surprisingly good. Of a series of subfertile men treated by varicocele excision (mostly unilateral) twelve of the first fourteen completed cases showed unmistakable improvement, with seven pregnancies within six months of operation. Details of this series which was begun in 1950 are ready for publication, but may be reserved until the proposed series of fifty is completed later this year.

As to the risks of surgical treatment, provided it is in highly skilled hands my experience does not confirm this. Of the more than forty cases operated on by Mr. H. G. Hanley we have not seen a single case of infection, epididymitis, or testicular atrophy. Regarding the latter, we must remember that the testis on the affected side is often small and soft to begin with, and this may be mistaken for post-operative atrophy afterwards. On the other hand, both Mr. Hanley and myself, and sometimes the patients, have noticed that the testis increased in size after operation, as one would expect with increased spermatogenesis. In concluding, I would express my conviction that if we paid more attention to the problems of faulty testicular temperature regulation we should have far fewer cases of "intractable oligozoospermia" and might begin to emerge from the therapeutic pessimism so widespread in this field.—I am, etc.,

London, W.1.

H. A. DAVIDSON.

SIR,—Dr. J. K. Russell's excellent paper (*Journal*, May 29, p. 1231), which demonstrates the higher incidence of varicoceles in subfertile than in fertile men, lends further support to Dr. H. A. Davidson's,¹ which shows that a failure of the scrotal temperature-regulating mechanism can depress normal spermatogenesis, and that a common cause of such a failure is the presence of a varicocele. Having operated upon over 50 varicoceles for this condition, I am quite convinced of the therapeutic value of removing such a scrotal radiator, which, even if unilateral, can obviously influence both testes.

Any surgical procedure can be dangerous and should only be performed for very good reasons, but it is perhaps unfortunate that a surgeon of Professor Charles Wells's eminence, as quoted by Dr. Russell, should overstate the dangers of this particular operation. If the varicocele is grouped with the piles and varicose veins at the end of the list, to be done by the house-surgeon, I would agree with Professor Wells, but would add that all three operations are equally potentially dangerous. However, while humbly realizing

that—but for the grace of God—there go I, we have not seen any serious complications following the excision of a varicocele so far. I have used a scrotal incision as advocated by Sir Heneage Ogilvie (*Journal*, April 17, p. 934) ever since it was taught to me in 1935 by the late Mr. F. McG. Loughnane at all Saints' Hospital, and I have not encountered any of the serious complications hinted at by Mr. C. J. Cellan-Jones in his letter to your *Journal* (May 1, p. 1039).

The very high incidence of male subfertility is not generally appreciated, and Dr. Russell's paper, quite apart from its academic value, has done a service in drawing attention to this fact.—I am, etc.,

London, W.1.

HOWARD G. HANLEY.

REFERENCE

¹ *Proc. roy. Soc. Med.*, 1953, 46, 841.

Sex Diagnosis of Blood

SIR,—For some time we have been considering the possibility of sex differences in the human blood and have been particularly interested in the nuclear morphology of the polymorphonuclear neutrophil leucocytes. We have found a structural difference between the nuclei of the neutrophils in the two sexes. In the female there are typical drum-stick appendages which cannot be found in the male. In over 50 films studied of blood from over 25 males and 25 females the examiner diagnosed the sex accurately on this basis without previous knowledge of the origin of the blood. A paper giving a detailed description of the morphological differences has been submitted for publication and will appear shortly in this *Journal*.—We are, etc.,

London, S.E.5.

WILLIAM M. DAVIDSON.
D. ROBERTSON SMITH.

A New Oral Diuretic

SIR,—A potent oral diuretic is now available. "Mercloran" ("neohydrin," "chlormerodin"), however, was reported in your annotation (*Journal*, January 16, p. 144) to cause serious gastro-intestinal symptoms in a large proportion of patients, so that it had to be withdrawn in about two-thirds. I was interested to read that Dr. William A. Leff (*Journal*, May 8, p. 1093), using therapeutically effective doses, found the incidence of toxic symptoms to be only 10%. My own experience has been similar, and in the hope that this valuable drug will not be withheld because of reputed toxicity, I venture to record the results of a small clinical trial.

The subjects, 28 men and 4 women, were patients in a hospital for the elderly chronic sick, their ages ranging from 60 to 90. Thirty-one were suffering from chronic congestive heart failure, one from hepatic cirrhosis with recurrent ascites and oedema. Degenerative heart disease was the cause of failure in 22, hypertension in 6, and cor pulmonale in 3. Most of them had been receiving mersalyl regularly once or twice weekly, in addition to digitalis, but salt had not been restricted; fifteen were in frank congestive heart failure. Mercloran was given in a single dose each morning for six days per week. The initial dose in each case was 3 tablets (each containing 18.3 mg. of mercloran, equivalent to 10 mg. of mercury). This dose was gradually adjusted to the minimum which controlled oedema and orthopnoea. The daily maintenance dose was 2 tablets in 7 patients, 3 tablets in 5, 4 in 10, and 5 or 6 in the remaining 10 patients. Toxic effects were encountered in 8 of the 32 patients (nausea and vomiting in 4, diarrhoea in 4), and in each case the symptoms appeared within the first four weeks. In 6 cases the drug had to be withdrawn, usually because of vomiting, but further experience leads me to believe that a smaller initial dose enables more patients to develop tolerance. The remaining 26 patients have received the drug for 8 to 12 weeks. Most patients have felt better, and their oedema has either disappeared or been substantially reduced. The responses have in my opinion been superior to those given by parenteral

mersalyl. Outside hospital, long-term dietary salt restriction is unsuccessful, and frequent parenteral therapy may be irksome. Mercloran is therefore suitable for wider trial in chronic heart failure.—I am, etc.,

Sheffield.

F. J. FLINT.

Skin Responses in Asthma

SIR,—In view of the recent correspondence in your columns, our recently concluded investigations of skin responses in bronchial asthma¹ may be of interest to your readers. We have used the prick test in order to test the skin responses of 300 patients with respiratory allergy and of 100 normal subjects, and have found their outcome in the same subject most variable. Only in 3 out of 21 patients could we reproduce exactly the same result on two different occasions. The correlation between the positive skin reactions and history and clinical manifestations was poor. Although in many cases of clinical allergic disease the offending allergen gave a positive skin reaction, many other allergens produced positive reactions whose causative agency was improbable or could be excluded. This was not surprising: about 50% of our normal subjects had also one or more positive skin reactions, as other observers have noted. We have concluded that in respiratory allergy tests of the skin, as of any shock organ other than the respiratory passages, are of very limited value. They may be used as a guide in those cases in which the history gives no clue to the offending allergen, but without environmental or bronchial tests they cannot be regarded as conclusive evidence.—We are, etc.,

H. HERKHEIMER.

H. L. UTIDJIAN.

P. MCINROY.

H. M. D. UTIDJIAN.

K. H. SUTTON.

London, W.C.1.

REFERENCE

¹ *Acta allerg. (Kbh.)*, 1954, 7, in press.

A Question of Seniority

SIR,—With reference to Dr. M. W. Littlewood's letter (*Journal*, May 22, p. 1210), the Hospital of St. Bartholomew was founded in 1123 by Rahere, the court minstrel of Henry I. It was established as a public hospital with an organization distinct from that of the Priory of St. Bartholomew. The date of foundation of these two institutions is known from the *Liber Fundacionis Ecclesie Sancti Bartholomei* written by a canon of the priory 29 years after the death of Rahere.¹ The first royal charter to the hospital was given by Henry I in 1133, and copies of this document exist in the hospital and in the Public Record Office. The hospital archives contain a deed of Rahere himself dated 1137 and many other documents of the twelfth century.

The Priory of St. Mary Overy in Southwark is known to have been in existence between 1120 and 1125, and may or may not have been founded as early as 1106. No documentary evidence proving the existence within this priory of a public hospital has yet come to light. The earliest reference to a hospital in connexion with it occurs in 1212, when, consequent upon the fire in Southwark which destroyed most of that suburb and all the priory except the refectory, the canons of St. Mary founded a "hospital" on their own lands near the priory, in which they celebrated divine service until the priory was rebuilt. The reference occurs in the *Annals of Bermondsey Abbey*. In 1213, in the Cartulary of St. Thomas's Hospital (now in the British Museum) and in the Curia Regis Rolls, mention is made of Amyas, Archdeacon of Surrey, who is called the Master of the New Hospital of St. Thomas. After that date references to this hospital abound. The claim of St. Bartholomew's Hospital to date from the twelfth century is founded on documentary evidence, that of St. Thomas's appears to rest so far on conjecture alone.—I am, etc.,

GWENETH WHITTERIDGE,
Archivist to St. Bartholomew's Hospital.

¹ Published in an English translation in 1923, by E. A. Webb.

Acute Post-operative Laryngeal Obstruction

SIR.—Since the breathing end of the patient is very much the otolaryngologist's affair, it may be permissible for one to enter the forum of the anaesthetist, the more so if he can go back to the days when he passed many of the endotracheal tubes himself. Some of the newer recruits to anaesthesia seem to resent any guidance about children and tend to dismiss the advice of a middle-aged laryngologist as so much out-of-date fuss. Nevertheless, some things are worth repeating.

The narrowest diameter in the child is not at the glottis; it is below the glottis, and here the lining membrane is so sensitive that it may become oedematous with no more than a bad cold. Its reaction is such that modest pressure will produce oedema, and the longer the pressure the greater the oedema. A tube which is passed easily may not be withdrawn quite so easily, unless the operation has been short. A little oedema in the subglottic space of the small child, let us say a millimetre or two all round the circumference, is enough to cause a croupy cough and sometimes distress; slightly more may cause severe obstruction. It is to be noted that the same absolute quantity of oedema in the larger lumen of the adult may not even be an inconvenience. I speak as one who has carried out the tracheotomies or sat by the bedside wondering whether to act or not.

I fear that there is a growing tendency to use tubes which are far too big for small children, and this without any reference to the chance of injury in the passing; and I would say that far too little attention is given to the probable duration of operation in the child who is about to be intubated. It is quite salutary to observe children who have been intubated, to ask them to cough, to listen to the noise, and to meditate thereon. And sometimes the cough may have something to do with the cuff.—I am, etc.,

Newcastle-upon-Tyne, 2.

F. MCGUCKIN.

Motor-cyclists' Protective Hats

SIR.—Some prominence was recently given in sections of the lay press to a fatal accident in which the motor-cyclist victim was wearing a protective hat made to the requirements of British Standard 2001. A member of the medical profession who gave evidence at the inquest was reported as saying that the helmet was "too flimsy," and the jury in the case expressed the opinion that the "safety standards of certain makes of motor-cyclists' crash helmets should be investigated."

It would, we think, be of some value to the profession at large if the relevant facts on this matter were recalled. The British Standard for protective hats for motor-cyclists was based on all the information at the time of its publication—including the extensive researches of the Radcliffe Infirmary. The late Professor Sir Hugh Cairns represented the B.M.A. on the Technical Committee of the British Standards Institution which prepared the standard, and the Association's present representative on that Committee is Mr. D. W. C. Northfield, of the London Hospital. The Committee also included representatives of the Road Research Laboratory, the Royal Society for the Prevention of Accidents, the Ministry of Transport, and other Government departments, as well as the Auto-cycle Union and industrial groups concerned both with materials used in protective hats and with their manufacture. Before publication all these bodies and groups received copies of the draft standard for approval.

The salient features of the standard are: that the outer shell shall be durable, smooth, and free from projections; it shall be attached to an inner harness with space between the harness and the outer shell; it must withstand an impact test, pressure tests both fore and aft and sideways, a test for strength of harness, and a substantial weight test on the chin strap to ensure that the helmet is not likely to come off in an accident. The standard also stipulates that if a peak is fitted this must be pliable, so that it cannot possibly operate as a fulcrum, and, if in fact it should receive a

frontal blow, would bend and give added protection to the face and particularly to the eyes.

The Safety Division of the Road Research Laboratory has for some time been carrying out investigations on protective hats, and all the results tend to endorse the provisions of the present British Standard. The only new feature to improve the standard which is at present being considered is the possibility of incorporating additional padding between the harness and the shell. An adequate safety hat for the ordinary motor-cyclist must obviously be a compromise between what is economically possible for him to purchase, attractive enough for him (or her) to wear, and, while giving the maximum possible protection to the skull, not so resistant that it might transmit the shock to other equally vulnerable parts of the body. The standard as published represented the most carefully considered compromise between these factors which the available scientific and technical knowledge could provide.

A final point which should be recorded is that practically all the responsible makers of motor-cyclists' hats are now licensed to use the British Standards mark as an independent assurance of conformity with the requirements of B.S. 2001. The B.S.I. employs inspectors who regularly visit makers' factories and check both their production methods and their test procedures. Failure to maintain the standard would result in the manufacturer losing his licence to use the British Standards mark.

It is unfortunate that, although there are numerous known cases of very severe accidents at high speeds where certain death would have resulted if the rider had not been wearing a protective hat made in accordance with the British Standard, these incidents never achieve the publicity given to the much rarer cases in which a motor-cyclist wearing a protective hat suffers serious injury or death.—I am, etc.,

London, W.1.

E. WOODBRIDGE,
Assistant Technical Director,
British Standards Institution.**Standard of Anaesthetics in Britain**

SIR.—I would like, through you, to thank Dr. Geoffrey Organe (*Journal*, May 29, p. 1267) for his reproof, so urbane, even at times paternal, arousing in me all the emotion of George Washington as he stood beside his misdeed in the garden. Yet his letter misses the main point—namely, that never again should his innovation of admission of press reporters to surgical meetings be repeated. None of the speakers were warned, and I am still thanking God that I stopped where I did, because if I had gone on to some poignant case records it would have been terrible. Lay press reporters mean well, but cannot separate wheat from chaff: contrast your absolutely accurate six-worded report—"Mr. Dickson Wright discussed cardiac arrest," all wheat, no chaff—with that of the three columns of the *Daily Express*, all chaff and no wheat.

If I might make my point again, as it is rather hard to gather it from either account: Heart stoppage is easily overcome and does no harm, provided the preoccupied surgeon is told immediately. Modern anaesthetic machines give a semblance of life after it has departed and the finger, if it happens to be on the temporal or radial pulse, does not seem good enough. For the present, the price of safety must be perpetual vigilance, until some certain machine arrives to tell us (a) when the heart is wavering and (b) the moment it stops.—I am, etc.,

London, W.1.

A. DICKSON WRIGHT.

SIR.—Dr. Geoffrey Organe, as president of the Association of Anaesthetists of Great Britain and Ireland (*Journal*, May 29, p. 1267), is to be congratulated for taking Mr. Dickson Wright to task for certain remarks he made about British anaesthetists before an assembly of American surgeons on May 18 at the Royal College of Surgeons of England. Admittedly the situation was intensified by the fact that these remarks were made the basis of a rather sensational article in the *Daily Express* the following day; this could not have happened, however, unless these disparagements

had been made in the first place. Had they been meant seriously the Council of the Association of Anaesthetists might well have been advised to report the matter to the ethical committee of the General Medical Council. Assuming, however, that Mr. Wright was merely indulging in his peculiar "form of jocularity" he appears to have fallen into the trap against which all teachers of elocution warn those who endeavour to enliven their discourses with humour.

Even the most elementary manuals on the art of public speaking emphasize that there are three distinct factors involved in delivering a speech: "The audience, the speech, and the speaker. In other words, the occasion, the oration, and the orator; or to whom you speak, what, and how." It is noteworthy that all these manuals impress upon readers that the audience is the most important element in the understanding of any speech. Mr. Wright delivered his talk before an assembly of American surgeons whose sense of humour differs from our own and who are less familiar than we with the technique of introducing humour to lighten an otherwise stodgy scientific discussion. It is not unlikely, therefore, that, in common with the reporter from the *Daily Express*, many of them took these remarks at face value. This is unfortunate, for I am sure that anaesthetists in Great Britain are no less conscientious than those in the U.S.A. or other countries. Unlike surgeons, they spend all their working hours in the enervating atmospheres of operating theatres; and, owing to the shortage of junior staff, those of them who work in peripheral areas do more emergency work than their surgical colleagues, and are usually hard put to it to find a locum tenens to enable them to take even part of their statutory holidays.

Reverting to Mr. Wright's exaggerations, the lessons to be learnt are to curb the impulse to be amusing at the expense of the reputations of other colleagues, and to modulate the mode of delivery of all speeches to suit the particular audience concerned. Beau Brummell witticisms which may go down big among private friends, and the histrionic hyperbole which animates an after-dinner speech, have only a limited place during an international scientific congress, and then only when the entire audience is familiar with or conditioned to the sense of humour of the speaker concerned.—I am, etc.,

London, S.E.5.

A. H. GALLEY.

REFERENCE

- ¹ Pelsma, R. J. (1924). *Essentials of Speech*, part II, chapter 2, p. 179. Sir Isaac Pitman & Son Ltd., London.

SIR.—Addressing a surgical section meeting of the American College of Surgeons held recently at our own Royal College of Surgeons, Mr. Dickson Wright, of St. Mary's Hospital, London, is quoted in a national daily newspaper as saying, "The lives of hospital patients undergoing operation are being endangered because anaesthetists are relying too much on their machines instead of watching the patient's condition. . . . It will not surprise me to find that the latest anaesthetic machines are fitted with an ash-tray and a stand for holding a newspaper." The report continues that Mr. Dickson Wright revealed that several times during operations anaesthetists have told him that the patient had a good pulse when, in fact, the heart had stopped beating, and the quotation continues: "By the time the anaesthetist tells the surgeon that a patient's heart has stopped, it is sometimes too late to do much about it."

Mr. Wright has chosen this particular opportunity when speaking to a great audience to deliver an accusation of gross carelessness and slackness against anaesthetists all over the world. For years there has been continuous work undertaken by anaesthetists and manufacturers towards making anaesthetic machines safer. British manufacturers, Government departments interested, and individual anaesthetists are giving considerable time and thought to the design of anaesthetic machines.

Anaesthetists are junior members of the surgical team, but they have a contribution to make to that team and in doing so the surgeon often welcomes them as colleagues.

In this way surgical successes and advancement of knowledge may sometimes result. What Mr. Dickson Wright has said might appear to destroy this widely held belief in the value of the surgical team, but let him have no fear, he will not do this: modern surgery of all types has thrived on the experiences of surgical teams fashioned in the second world war. These teams continue under different titles in friendship and solid work throughout the large medical centres of this country. But what harm is caused to the patients unfortunate enough to have read the report in the newspaper quoted above? Here is something far more serious, and I ask Mr. Dickson Wright to reflect upon what a patient must have felt awaiting major surgery in the afternoon who happened to have read that newspaper in the morning. Also, what must that patient's relatives have thought as well? It is clear from his attitude that Mr. Dickson Wright had not considered in any way this effect of his address, and it would be a most generous action on his part if now he could see his way to withdraw the whole of his opinion about anaesthetists.—I am, etc.,

London, W.C.1.

R. W. COPE.

Complaints about Catgut

SIR.—During the last ten years or so my advice as a surgeon has from time to time been requested by a firm of manufacturers with regard to complaints from hospital surgeons concerning the alleged unduly easy breakage of their catgut in use during surgical operations. On these occasions the remainder of the accused batches of catgut have been returned to the makers and tested by them—the tensile strength of this catgut has invariably been found to be considerably in excess of B.P. requirements, and I have been able to confirm this high tensile strength; it has been impossible to cause breakages except by ill-usage.

It is perhaps not always realized how easy it is to treat catgut unfairly in the operating theatre. It may be weakened by immersion in watery solutions before use by the surgeon. Faulty tying of knots tends to cause fraying at any acutely kinked point with consequent increased risk of breakage. A most important factor would appear to be the ease with which, unwittingly, a pull is exerted on catgut many times in excess of the pull to which the gut is tested to fulfil minimum B.P. requirements, and, of course, equally many times in excess of the minimum pull needed to occlude a bleeding vessel or to tie a secure knot.

Complaints of faulty material, with their associated implications, can be very distressing to the manufacturers, whose catgut is subjected to rigid tests at all stages of its manufacture. It is unfortunate that such complaints appear in so many cases to be insufficiently well founded, particularly as the manufacturers are precluded by their position from adequate defence in reply.—I am, etc.,

Birmingham, 30.

H. G. V. MENCE.

Herpes Zoster and Chicken-pox

SIR.—I was interested to read the letter of Dr. C. Spencer Whitehouse (*Journal*, May 8, p. 1097). When I was a student in the out-patient clinic of Dr. John Franklin at the Westminster Hospital I was fortunate to see a similar case of the simultaneous eruption of herpes zoster and chicken-pox. The patient was a man who had had girdle pains originating in the lumbar region, followed by a widespread vesicular eruption on face, limbs, and trunk. In the left loin the vesicles were almost confluent and were arranged in a broad stripe extending round on to the anterior abdominal wall. Elsewhere the lesions were identical with the rash of chicken-pox.

This patient was also suffering from monocytic leukaemia, for which he was attending another department of the hospital. I remember the observation being made at the time that an association has been described between leukaemia and this uncommon manifestation of herpes zoster.—I am, etc.,

London, E.8.

JOAN M. CURTIS.

Obituary

F. L. HOPWOOD, D.Sc.

Dr. N. S. FINZI writes: While endorsing every word that Professor A. Wormall has said about Frank Hopwood (*Journal*, May 15, p. 1157) it might not come amiss to add a few personal reminiscences of my dear friend. Soon after the beginning of the first world war he joined us in the x-ray department at Bart's as a clinical assistant, probably the first who was neither a medical student nor a medical man. In this way he acquired a practical knowledge of the difficulties of a radiologist that enabled him to realize our problems more than any other physicist of the time. The early workers in x rays had to pick up their knowledge of radiological physics mainly from books, and it was extraordinarily helpful to myself to have his lucid explanations of difficult problems. After that war he helped me much, on my taking charge of the x-ray department, in designing a considerable extension of it and subsequently as it grew and grew. Very soon after I was appointed in charge of the x-ray department I got the medical council of Bart's to appoint him physicist to the x-ray department, probably the first appointment of this nature in Great Britain. In 1921 and on several later occasions groups of us visited various different clinics abroad, always, I think, with Hopwood accompanying us, and some of these visits had a considerable influence on our work. On one of them we were joined by Stanford Cade, and it had decisive influence on his subsequent work with radium.

Hopwood's help in starting high-voltage x-ray work culminated first of all in our million-volt machine, and now in the linear accelerator of 15 million volts, the construction of which is nearing completion. He was a member of the British delegation at several of the international radiological congresses. One small bit of research work miscarried, although it was the method subsequently used. A jewel merchant was worried about detecting cultured from natural pearls, and Hopwood could have obtained money for the x-ray department if he could have discovered the method. He tried various things but relied most on x-ray diffraction. However, there was no difference in the two pearls supplied, and yet this was the method subsequently used. I have always thought that there was a mistake in the pearls.

In all our long friendship I have never known him in a temper or ever speak a cross word. I valued his friendship more than I can tell.

Dr. T. D. LLEWELLYN, for many years medical officer of health for the borough of Port Talbot, died suddenly on March 29 at Bridgend, where he had been living in retirement. He was 66 years of age. Tudor David Llewellyn was born at Ogmore Vale, Glamorganshire, on May 5, 1887, the son of a chemist, and from Christ College, Brecon, he entered the Cardiff medical school, completing his training at St. Thomas's Hospital, London, and qualifying M.R.C.S., L.R.C.P. in 1918. Three years later he took the D.P.H. of the University of Wales. After qualification he was assistant to Dr. A. W. Anderson at Ogmore Vale for a short time until, in 1919, he was appointed an assistant school medical officer under the Glamorgan County Council. Later, he was medical officer of health for Pontardawe until 1927, when he took up a similar appointment at Port Talbot. He retired in 1945 on account of ill-health. In addition to the duties of his public health appointments, Dr. Llewellyn took an active interest in the work of the Order of St. John of Jerusalem as a lecturer and as an examiner for twenty-five years. He was exceedingly conscientious in all he did and never spared himself, and his death has brought great grief to his colleagues and to a host of friends. For recreation, he enjoyed a round

of golf, and he had the national love of music. He was a member of the Honourable Society of Cymmrodorion and of the Cambrian Archaeological Society, membership of the latter indicating another of his outside interests. He leaves a widow and one daughter.

The sudden death on May 14 of Dr. A. M. D'COTTA at the age of 50 came as a great shock to all his friends and colleagues in Singapore. Adrian Milnes D'Cotta, who was born at Singapore on August 17, 1903, had a brilliant career at the King Edward VII College of Medicine in that city. After qualifying in 1926 he held the appointment of house-surgeon at the College until 1928, when he came to Britain for postgraduate study, taking the Scottish triple qualification in that year and the conjoint diplomas of the English Royal Colleges in the following year. He returned to Singapore in 1930 and became first assistant in the obstetrics and gynaecology department of the King Edward VII College of Medicine, holding a resident post at the Kangand Kerbau maternity hospital, where he rendered good service. He gave up the appointment in 1935 to enter general practice and consequently was one of the first general practitioners in Singapore to possess a sound knowledge of the principles and practice of obstetrics. In 1946 he obtained the D.C.H. of the English Royal Colleges. B.H.S. writes: Few men have ever held the position of high esteem which was Dr. A. M. D'Cotta's these many years, and all of us felt towards "Mills," as he was generally known among his close colleagues and friends, the same respect and admiration in which he was held throughout the medical profession. It was my privilege to know "Mills" through the years from his student days in 1923. He combined with his personal charm and unlimited energy the highest standards of professional ethics. His genial personality, generous instincts, and keen clinical acumen will be missed not only by his colleagues in the profession but by the whole staff of the Catholic Medical Guild, of which he was president at the time of his death. We find a measure of consolation in the fact that he lived a fine, full life, a life enriched by the knowledge that he had the friendship and respect of all who knew him.

The sudden death on May 24 at the early age of 39 of Dr. H. JEFFERSON, consultant anaesthetist to the Belfast City Hospital, came as a profound shock to his many friends. Harold Jefferson was born in 1914 and was educated at Belfast Royal Academy and at Queen's University, Belfast, where he graduated M.B., B.Ch. in 1940. After graduation he held the post of resident medical officer at the Royal Victoria Hospital, Belfast, and then was commissioned in the R.A.F.V.R. early in 1941. Soon afterwards he went overseas, with the rank of flight lieutenant, but already ill-health had begun to dog his footsteps, and in April, 1945, he was flown back from India. J.F.B. writes: When "Jeff," as he was affectionately known, came back to this country he was invalided out of the R.A.F. and underwent a very serious operation. This did not daunt his natural enthusiasm, however, and very soon he was back at work. He began to specialize in anaesthetics, taking the D.A. of the English Royal Colleges in 1947. Early in the following year he was appointed visiting anaesthetist to the Belfast City Hospital and quickly established himself as one of the leading young specialists in the province. His popularity with his colleagues was a just tribute to the excellence of his work. His never-failing good humour and genial manner were well known in many Belfast hospitals, while his tact and courtesy, especially with the junior staff, will long be remembered. In May last year he suffered another serious reverse in health and was off work for some three months. He came back to practise with all his usual verve and energy. Perhaps better than anyone he realized how serious his illness had been; to those of us meeting him frequently in the past nine months it was at times difficult to appreciate how precarious his health was. As recently as January this year he was awarded the Fellowship of the Faculty of Anaesthetists. He was at work on May 23 but collapsed later that day and died the following

morning. His passing is a tragic loss to the profession in Belfast, and he is mourned by all his colleagues, but more particularly by those of us who were privileged to know him as a friend. R. G. V. writes: While convalescent after a severe illness, which developed when stationed in India during the war, Dr. Jefferson took up the study and practice of anaesthetics and quickly became a skilful practitioner in this specialty and was a much-loved figure in the hospital world in Belfast. "Jeff" was possessed of an inimitable sense of humour and comradeship, and many an operating session or surgical emergency ran the smoother for his mere presence in the theatre, to say nothing of his completely unruffled calmness and sure technique. A host of friends in all walks of life delighted in his charm and wit and marvelled at his surpassing courage in the face of serious illness. At the time of his death he was consultant anaesthetist to the Belfast City Hospital, where his gallant and debonair figure will ever be sadly missed by all his colleagues and associates. Deep sympathy will be felt for his widow and three children in their great and untimely loss.

Dr. HENRY ADAMS, who died on May 26 at his home at Bournemouth, where he had been living in retirement, was formerly in practice for many years at North Shields, where he was held in high esteem by all his colleagues. He was 80 years of age. Born on December 3, 1873, Henry Adams was educated at Gordon's College, Aberdeen, and at Aberdeen University, where he took a degree in arts in 1894, graduating in medicine four years later. He then held the appointment of house-surgeon at Aberdeen Royal Infirmary. In 1901 he settled in practice at North Shields, where he remained until 1943, except during the first world war. He then served as a captain in the R.A.M.C. from 1915 to 1918, first in the Mediterranean theatre of war and later in France, where he was a surgical specialist with a casualty clearing station attached to the 59th Division. After demobilization he returned to North Shields, and from 1918 to 1928 was a member of the honorary surgical staff of the Tynemouth Jubilee Infirmary. On his retirement he was elected a life governor of the Infirmary. During the last war, in addition to conducting a busy general practice, he served on medical boards and as medical officer at a first-aid post at Preston Hospital, North Shields, during the air raids. These additional duties, however, served to undermine his strength, with the result that in 1943, at the age of 69, he was forced to retire from practice. Five years later he moved to Bournemouth, but never really recovered his normal health. A member of the British Medical Association for fifty-five years, Dr. Adams was chairman of the Tyneside Division from 1927 to 1936. For many years he was also chairman of the Tynemouth local medical committee and vice-chairman of the Tynemouth local insurance committee. He was a past president of the Newcastle-upon-Tyne and Northern Counties Medical Society. Throughout the forty-two years he worked on Tyneside Dr. Adams gave of his best to his patients. His attention to their needs, provided as it was conscientiously and without stint, earned him their high regard and trust. His colleagues in the medical profession, too, had complete faith in his integrity, a faith they clearly demonstrated by repeatedly re-electing him to the chairs of the local Division and medical committee.

Lieutenant-Colonel H. G. ALEXANDER, I.M.S. (ret.), writes: As late medical superintendent of Mount Vernon Hospital, Northwood, might I be permitted to pay my tribute of great admiration and affection to the memory of one of the most courageous and gallant gentlemen that I have been privileged to know, my friend the late Mr. W. E. SPRINGFORD, whose obituary was printed in the *Journal* of May 29 (p. 1270)? In the face of two of the greatest disabilities to which humans are subjected this gallant gentleman met life and his great responsibilities as a surgeon with the utmost fortitude and resolution. He was a brilliant surgeon who in his short life lived up to the highest traditions of British surgery, and his high ideals remain an inspiration to all of

us who knew, loved, and respected him. He was full of human kindness, humour, and great courage, and his memory will ever remain dear to all of us at Mount Vernon. We extend our deepest sympathy to his widow.

Medico-Legal

THIOUREA ON ORANGES

Six Spanish oranges bought during April at a shop in Nottinghamshire and found to contain thiourea as a preservative were the subject of a hearing at Newark County Magistrates Court on June 2. A firm of wholesale fruit importers were charged under the Food and Drugs Act. They pleaded not guilty. It was the second case of its kind, the first, in Derbyshire, having been dismissed.

The prosecution explained that the only preservative allowed in oranges was sulphur dioxide. Thiourea was a toxic substance used by the medical profession for the treatment of abnormality of the thyroid gland. It was first used as a preservative in America in 1946, but experiments showed that in small concentration the substance was lethal to small animals such as rats, and the public health authorities in America prohibited its use. Thiourea was a poison, but it was because of its use as a preservative that this case was brought.

Mr. Hugh Childs, a public analyst, said that although thiourea had dangerous properties he did not think the amount used for preserving oranges would have any effect on normal human beings.

The manager and secretary of the defendant firm claimed that they had acted as brokers for a Spanish firm. They had no reason to suspect that the oranges contained the preservative. There was no danger of a repetition of this offence, because the Spanish Government had now prohibited the use of thiourea.

The magistrate found the case proved. A fine of £5 was imposed and defendants were ordered to pay £10 towards costs.

Universities and Colleges

UNIVERSITY OF OXFORD

On April 29 the degree of B.M. was conferred on D. R. Wright, M. P. Wright, and E. S. N. Hazel.

The Board of the Faculty of Medicine has re-coopted Dr. A. H. T. Robb-Smith for the statutory period of two years from the first day of Trinity Term, 1954.

Dr. Janet M. Vaughan, Principal of Somerville College, has been reappointed as a delegate of the University Museum for three years from the first day of Michaelmas Term, 1954.

UNIVERSITY OF CAMBRIDGE

On May 1 Professor H. R. Dean, Master of Trinity Hall, was appointed a manager of the Benn W. Levy Fund until December 31, 1957.

The following medical degrees were conferred on May 1:

M.D.—E. K. Westlake.
M.B., B.Chir.—P. O. Jones.
M.B.—J. C. Newell Price, R. J. Blow, J. P. Dickson, Betty Holt, Evelyn J. Mitchell.

The following degrees were conferred on May 15:

M.D.—P. A. Emerson, D. V. Bates, R. J. R. Cureton, A. P. Waterson.
M.Chir.—J. S. W. Whitehead.
M.B.—D. G. Dingle.

*By proxy.

UNIVERSITY OF LONDON

On March 24 the degree of M.D. (Internal) was awarded by the Senate to B. W. Lacey.

The following candidates at the London School of Hygiene and Tropical Medicine have been approved at the examination indicated:

ACADEMIC POSTGRADUATE CERTIFICATE IN PUBLIC HEALTH.—N. J. Al-Chokhachi, M. A. Hamdi, G. H. K. Niazi, A. M. Nur, I. Suliman, Gladys M. Vanniasingham.

The following scholarships at the Royal Free Hospital School of Medicine have been awarded for 1954-5: A. M. Bird Entrance Scholarship, Miss M. Wharf (Chesterfield St. Helena School), Sir Owen Roberts Memorial Scholarship for Women, Miss S. M. V. Jeffery (Royal Free Hospital School of Medicine), Elizabeth Garrett Anderson Scholarship for Women, Miss V. J. Everett (Royal Free Hospital School of Medicine), Elizabeth Bolton Scholarship, Miss M. R. Chaplin (Royal Free Hospital School of Medicine), Florence Hughes Scholarship for Women, Miss N. Bogdan (Royal Free Hospital School of Medicine).

The degree of M.D. was awarded to S. G. Browne and E. C. Turton on April 6.

The following candidates at the Institute of Psychiatry have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—J. E. A. Bartlett, J. L. J. Lumey, Mary M. McQuade, M. J. Rosenthal, Part I: R. W. A. C. Barton, P. H. Connell, P. S. Cook, R. de Alarcon, R. Emery, P. Haden, S. N. R. Pestonjee, B. A. Samarawera, T. A. C. Sirkwardena, A. Sittampalam, A. C. R. Skinner, Nancy I. Swift, J. D. Waldman, J. S. Whiteley, J. K. Wing.

UNIVERSITY OF BIRMINGHAM

At the annual meeting of the Court of Governors of the University held on February 18, the title of emeritus professor was conferred on Humphrey F. Humphreys, Vice-Chancellor of the University in 1952-3, and Professor of Dental Surgery from 1935 to 1952. At a reception in his honour on February 8, Professor Humphreys was presented with a portrait of himself, painted by Waldron Wells.

The title of honorary part-time lecturer in the Department of Experimental Pathology has been given to Dr. W. Weiner, director of the Regional Blood Transfusion Service, and that of University Research Fellow to Dr. Sylvia M. Saddington during the tenure of her present post in the same department.

The following appointments are announced: Dr. F. P. Lisowski, Lecturer in Anatomy; Dr. H. E. Robson, Lecturer in Anatomy; and Mr. A. Gourevitch, Clinical Lecturer in Surgery, as part-time Lecturer in Surgery, in place of Mr. Fauset Welsh, who has resigned.

Professor S. Zuckerman, F.R.S., and Professor T. McKeown will represent the University at the World Population Conference to be held in Rome in September, 1954.

Representatives of the University have been appointed as follows: Professor McKeown on the United Kingdom Committee for World Health Organization of the United Nations; Professor C. F. V. Smout on the Birmingham Regional Medical Recruitment Committee; Professor W. Melville Arnott, Professor E. Brodie C. Hughes, and Emeritus Professor W. H. Wynn on the Standing Joint Committee of the University, the United Birmingham Hospitals, and the Birmingham Regional Hospital Board; Dr. C. G. Parsons on the Regional Advisory Committee on Infectious Diseases; Professor J. W. Orr and Professor J. R. Squire on the Regional Advisory Committee on Pathological Services. Dr. J. W. T. Patterson has been reappointed representative of the University on the governing body of Queen Elizabeth's Grammar School, Hartsbury.

Dr. Margaret Jefferson resigns her appointment as part-time Lecturer in Medical Statistics on July 31, 1954.

UNIVERSITY OF SHEFFIELD

Dr. Joseph Magri has been appointed full-time demonstrator in anatomy.

The following resignations are announced: Dr. R. Wheeler Haines, senior lecturer in anatomy, on his appointment to the Chair of Anatomy in the Royal College of Medicine, Bagdad; and Dr. J. L. A. Grout, honorary lecturer in radiology.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College held on April 29, with the President, Sir Russell Brain, in the chair, Dr. E. R. Boland, Dr. T. C. Hunt, and Dr. J. B. Harman were re-appointed representatives of the College on the Central Medical Recruitment Committee, and Sir Alun Rowlands on the Central Council for District Nursing. Sir Charles Dodds was appointed the College representative on the National Committee on Cancer.

The following, having satisfied the Censor's Board, were elected Members of the College:

K. D. Bagshawe, M.B., Katharine M. Baker, M.B., F. H. Burns, M.B., S. I. Cohen, M.D., J. Colvin, M.B., P. B. Cook, M.B., J. J. Daly, M.B., Lieutenant R.A.M.C., J. R. Edsall, M.B., I. E. Evans, M.B., Yvette A. P. Franklin, M.B., R. G. Gibbs, M.B., A. J. Goble, M.D., J. D. S. Hammond, M.B., P. J. D. Heaf, M.D., Cherry D. Heath, M.D., J. B. Hickie, M.B., Alison Hunter, M.B., J. D. Hunter, M.B., J. Knox, M.B., P. J. Lawther, M.B., D. G. Le Roux, M.B., D. V. Mackenzie, M.D., J. McE. Neilson, M.B., Patience Proby, B.M., A. J. Proust, M.B., P. M. Rooze, L.R.C.P., J. F. Southill, M.B., M. D. Turner, M.B., H. E. Webb, B.M., E. Wilkes, M.B., M. M. Zion, M.B.

Licences to practise were conferred upon 129 candidates (including 36 women) who have passed the final examination in medicine, surgery, and midwifery of the Conjoint Board, and who have complied with the by-laws of the College, as follows:

S. L. Adesuyi, L. N. Allen, T. D. Annear, Diana Austin, Jacqueline E. Banbury, L. Barsey, D. G. Bennett, A. Berry, H. R. Bisson, D. A. S. Blake, Gwyneth, J. D. Botherway, Angela I. Brooks, Jean Brown, D. C. L'E. Burges, Patricia Burne, P. M. C. Camm, Jean Carberry, June M. Cheetham, Brenda A. P. Clark, R. M. Clark, D. Constad, I. J. Cope, I. C. Cree, M. R. Crompton, R. N. Davis, B. Dawson, Jean E. Drake, P. Dromgoole, D. P. Duffield, Lise L. Einerl, R. A. Ellis, P. A. S. Evans, C. D. Farrier, A. S. E. Fowle, J. K. Frost, P. Garmon-Jones, Grace M. Gee, Mary H. Godwin, P. Gortval, R. A. Grande, Brenda Grant, W. B. Hanley, L. Harbin, L. M. Hart, D. Hide, G. M. R. Holliday, P. E. Hoogewerf, A. B. Hugo, L. H. Hurrell, W. M. Huse, I. Ingley, Barbara M. Isles, D. C. Jackson, P. D. C. Jarman, P. Jenkins, A. R. Jones, Erica J. Jones, F. W. Jones, H. D. Jones, J. A. Kay, P. Kellett, C. E. Langham, Diana E. Lathbury, N. A. G. Leadbeater, J. E. Leaney, J. J. Lewis, D. C. Linahan, Patricia J. Lindop, B. A. Lowe, C. Lowson, J. A. McMillan, W. M. Mee, Margaret S. Meyer, H. N. Middleton, K. F. Mole, A. A. D. Moore, Janet E. Morgan, O. Morton, Patricia E. Moul, Sheila M. Mullally, D. D. Munro, T. W. Nicholson, Wendy E. Noble, Patricia Painter, M. S. K. Palmer, A. Pearce, K. I. Pearce, Valerie J. Perkins, J. M. Phillips, C. W. Pook, D. Pownall, J. A. Purcell, J. R. Rawstron, Dorothy S. Read, Kathleen M. Reid, J. E. S. Relton, Corinne J. Richardson, D. F. Rideout, G. D. Ripley, D. Roberts, Margaret Russell, J. G. Sanderson, Count Andrew C. Skarbek, J. C. Smith, R. W. Smith, D. L. Smithson, B. K. Sood, G. P. C. Starck, L. Stimmler, Jane Sweatman, Eileen N. Thomson, T. M. Tibbets, W. R. Tidy, E. E. D. Tomlin, Annie M. N. Tustin, Heather F. A. Vickery, D. Vuckovic, J. G. Wall, D. R. Whitehouse, D. H. Williams, H. R. Willinga, J. H. P. Willis, A. J. Winterston, Joan M. Woodley, Celia B. M. Wooley, Enid M. Wozencroft, R. T. Yip-Choy, C. F. A. Younger, A. Youatt.

Diplomas were conferred, jointly with the Royal College of Surgeons of England, as follows:

DIPLOMA IN ANAESTHETICS.—A. J. Sims.
DIPLOMA IN CHILD HEALTH.—Susanne M. Salvisberg, and to the other successful candidates whose names are printed in the report of the meeting of the Royal College of Surgeons of England on April 8 (see below).
DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—R. M. Ajina, Evelyn C. Cummings, J. S. Dodge, N. D. Gosavi, A. E. Gunders, V. K. Nivarkar, Hla Kyaw Pe, C. E. P. Samarasinghe, S. Sen Gupta, T. K. Sweeney, S. A. Talib, and to the other successful candidates whose names are printed in the report of the meeting of the Royal College of Surgeons of England on April 8 (see below).
Diplomas in Physical Medicine and in Ophthalmology were also conferred, jointly with the Royal College of Surgeons of England, on the successful candidates whose names are printed in the report of the meeting of the Royal College of Surgeons of England on April 8 (see below).

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College, held on March 11, with Sir Cecil Wakeley, President, in the chair, it was reported that Mr. J. Johnson Abraham had been elected a Hunterian Trustee. A Hunterian Lectureship was awarded to Dr. Howard C. Naffziger (San Francisco).

Mr. R. R. Simpson (Hull) was elected to the Fellowship *ad eundem*.

J. E. Gardiner, Ph.D. (Leeds), was appointed Junior Lecturer in the Department of Pharmacology.

Dr. I. K. R. McMillan (St. Thomas's) was reappointed Mackenzie Mackinnon Research Fellow for the year ending June 30, 1955. The Hallett Prize was presented to A. Mitra (Calcutta). The Hancock Prize was presented to Sheila C. Hay (Sheffield) and Margaret S. Meyer (Royal Free).

The Council of the College met on April 8 for the last time in the old council room of the College, in which for over a hundred years their predecessors had held their meetings. The next meeting will be held in the new room in the rebuilt College.

The death of Sir Frank Colyer (Honorary Curator of the Odontological Collection and Hunterian Trustee) was reported and the Council unanimously adopted a resolution of condolence.

The Honorary Fellowship of the College was conferred on Dr. G. Gavin Miller, of Montreal.

The following were elected Fellows of the College without examination as being medical practitioners of at least 20 years' standing: Mr. J. W. H. Grice (Tunbridge Wells), Mr. D. M. E. Thomas (Sully, Glam), Professor G. Hadfield (London), Mr. J. Trueta (Oxford), Mrs. Dorothy R. Campbell (Coventry).

Mr. W. A. Jackman (Bristol) was elected to the Fellowship *ad eundem*, and Mr. R. R. Simpson (Hull) was admitted to the Fellowship.

Dr. W. D. M. Paton (University College Hospital Medical School) was admitted as the first Professor of Pharmacology at the College.

The Jacksonian Prize for 1953 was awarded to Mr. J. H. Peacock (Bristol) for his essay on the pathology and surgery of peripheral vascular occlusion.

The first Mitchiner Medal was awarded to Brevet Colonel H. D. Chalke, and the first Lady Cade Medal to Squadron Leader R. R. L. Pryer. Professor Martin A. Rushton (Guy's) was awarded the John Tomes Prize.

A Hunterian Lectureship was awarded to Professor Milroy A. Paul (Ceylon).

The Council selected diaphragmatic hernia as the subject for the Jacksonian Prize for 1955.

It was decided to institute a badge of office to be affixed to the Fellow's gown to distinguish the Members of Council.

Diplomas in Child Health, in Physical Medicine, in Ophthalmology, and in Tropical Medicine and Hygiene were granted, jointly with the Royal College of Physicians of London, as follows:

DIPLOMA IN CHILD HEALTH.—Dierdre Airey, Enid Atkins, H. Aufrichtig, Doris M. Beaton, Elaine M. Belton, Elizabeth F. Bennett, J. R. Bhatia, Flora M. Bisset-Smith, Audrey M. Bolton, E. M. Broadfoot, J. A. Browne, D. W. Bull, June M. Burger, A. P. Camilleri, Kai Hang Chau, J. A. Cheese, Omara A. Cherlyan, E. Chigier, J. H. Clyde, G. J. Cousins, Mary Crawford, Joan M. St. V. Dawkins, S. R. Deenadayala, J. M. Doyle, Catherine M. Durkin, J. G. Edgar, C. P. E. Elliott-Binns, J. M. Fisk, D. M. Fraser, S. P. Ghosal, Sheila M. Gough, Margaret L. Gladstone, Isobel H. Grant, S. T. Gunewardene, Anne M. Haines, Margaret E. Hall, Mary Hollowell, M. J. T. Hewetson, Sai Kong Ho, Kathleen A. Hockey, K. S. Holt, Megan D. M. Johnson, Jocelyn Johnston, P. Kapur, M. Pathmarani Kathiravelu, R. E. Kotler, Sylvia Lath, J. B. Lewis, M. Lewis, Siew Whye Loh, G. C. Love, Margaret Luig, M. F. McDowall, T. McKendrick, Sheila L. McKinlay, S. S. Manchanda, Cicely J. Millbank, R. A. Morgan, Marion E. Morris, Marion B. Morton, Chitra Rhona E. Morgan, K. A. Muller, N. V. O'Donoghue, R. M. Oliver, Ida S. Mukherjee, B. K. A. Muller, N. V. O'Donoghue, R. M. Oliver, Ida S. Paranjoti, Hawa Patel, G. N. St. J. Penney, Jean Poole, Frances E. Powell, Edith I. Proctor, S. D. Roche, Sonia Rollin, Carol J. Rubidge, H. H. Shawdon, Isabel G. Smith, M. H. Southall, Joyce K. Starkie, Joan V. Staver, K. Stewart, Mary Suggden, Majuree Sundaravell, C. G. W. Sykes, I. G. Thomson, J. N. Urc, D. Vardy, Claudine M. R. Vesey, I. S. Wallman, Ruth M. Walters, M. A. Warley, S. M. Don, G. R. Willegunarte, P. S. W. Wilkins.

DIPLOMA IN PHYSICAL MEDICINE.—D. J. E. Cheshire, P. R. Travers.

DIPLOMA IN OPHTHALMOLOGY.—J. A. Akingbehin, M. R. Ashbridge, M. H. Ashroff, D. J. Bowerman, G. Davidson, M. S. Faridi, K. C. Garg, M. H. Hardy, B. A. E. Harley, S. U. Joshi, A. bin A. Kadir, R. C. K. Loh, Marguerite C. Macdonald, Laurel J. Macintosh, M. H. Malik, D. L. E. Paine, R. A. Quesada-Guardia, J. N. Rohatgi, S. Roy, G. S. Sandhu, G. Singh, K. S. Subramaniam, A. A. Tye, J. H. W. Wessels.
DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—J. C. Aickin, F. L. Ashworth, A. S. Beare, C. Bhambarsuta, N. K. Bharucha, Z. M. A. Cader, A. T. Cook, T. M. Desai, J. K. Gajjar, G. H. K. Gentle, J. E. J. Hurman, L. S. Jainandana, A. C. Kail, A. M. Khatib, Y. J. Kiladlian, A. G. S. Jainandana, W. S. Millar, H. R. Miller, K. P. Milne, A. Muir, I. G. Murray, Leishman, W. S. Millar, H. R. Miller, K. P. Milne, A. Muir, I. G. Murray, L. Noronha, Magdelen K. E. Oberhoffer, M. K. Panikkar, K. H. Patel, H. N. Ray, W. Rollingshoff, P. D. Scheffel, E. K. Tagboto, P. Yates, P. Yoganathan.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a meeting of the Council of the College held on March 27, with the President, Mr. Arthur A. Gemmell, in the chair, Edward Solomons was admitted to the Fellowship.

At a meeting of the Council of the College held on May 22, with the President, Mr. Arthur A. Gemmell, in the chair, the following were admitted to the Fellowship:

H. Agar, A. F. Anderson, A. J. S. L. Boyd, J. C. McC. Browne, J. A. Chalmers, Mary P. John, W. Kearney, O. Lloyd, D. J. Malan, Patricia J. H. Massey, G. P. Milne, R. B. K. Rickford, C. S. Russell, J. M. Scott, Ruby G. Sharp, A. M. Sutherland.

The following were admitted to the Membership:

G. T. D. Barr, E. R. Broadberry, Vivienne A. Croxford, H. F. Daghastany, P. J. Dwyer, A. L. T. Easton, J. R. Elliott, G. A. Humphreys, T. P. Grant, J. Greenwell, K. Greig, R. W. Hughes, G. A. Humphreys, F. D. C. Jackson, K. B. Layton, C. V. Love, A. C. McInnis, P. Manolis, M. Mukerji, F. A. Murray, R. F. O'Donoghue, G. D. Pinker, D. E. M. Savage, S. G. Singh, H. J. Tighe, J. R. D. Tomlinson, A. C. Turnbull, R. Vaish, P. S. Watson, V. T. White.

The Council received a further grant of £3,000 from the Leverhulme Trust Fund for research purposes.

CONJOINT BOARD OF IRELAND

The following candidates were duly admitted Licentiates in Medicine and Midwifery on April 2, having passed the final examination in medicine, surgery, and midwifery of the Conjoint Board of Ireland: Una E. Batt, A. I. Booth, S. A. A. Carson, D. R. Chinoy, Margaret T. Coyle, Laura Cullen, Veronica O. Egbuna, Bridget Finnegan, Patricia J. Finnegan, P. D. N. MacAllister, Grainne McCarthy, P. J. Ward.

The Services

Major-General J. M. Macfie, C.B., C.B.E., M.C., late R.A.M.C., has been appointed Honorary Colonel of a Territorial Army unit.

Captain A. M. Ferrie, R.A.M.C., has been mentioned in dispatches in recognition of gallant and distinguished services whilst a prisoner of war in Korea.

Flight Lieutenant R. R. Macdonald, R.A.F., has been mentioned in dispatches in recognition of gallant and distinguished service in Malaya.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 22 (No. 20) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	22	0	4	0	0	19	2	5	1	2
Dysentery ..	1,104	144	324	6	4	754	123	93	2	2
Encephalitis, acute ..	5	1	0	0	0	7	0	0	0	0
Enteric fever: Typhoid ..	3	0	0	0	0	3	0	0	1	0
Paratyphoid ..	4	0	2	0	0	4	0	0	0	0
Food-poisoning ..	195	20		0		155	15		5	
Infective enteritis or diarrhoea under 2 years ..				16	15				15	25
Measles* ..	1,940	61	187	124	329	10,277	345	403	319	331
Meningococcal infection ..	27	1	10	1	3	31	1	12	1	
Ophthalmia neonatorum ..	37	3	7	0		46	1	6	0	
Pneumonia† ..	520	32	180	8	4	505	34	155	9	5
Poliomyelitis, acute: Paralytic ..	17	0		4	2	22	1		3	2
Non-paralytic ..	9	0				7	0			
Puerperal fever‡ ..	208	27	14	2		267	30	10	0	
Scarlet fever ..	832	42	115	41	32	1,306	88	149	44	66
Tuberculosis: Respiratory ..	933	114	155	35				161	41	
Non-respiratory ..	150	14	33	4				39	10	
Whooping-cough ..	2,419	104	352	29	25	3,103	213	454	53	145

DEATHS In Great Towns	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0			
Encephalitis, acute ..	0	0		0		0	0		0	
Enteric fever ..	0	0	0	0	0	0	0	0		
Infective enteritis or diarrhoea under 2 years ..	9	0	1	0	1	4	0	3	3	1
Influenza ..	16	3	0	0	1	4	0	0	0	2
Measles ..			0	0	0			0	0	0
Meningococcal infection ..			0	0				0	0	
Pneumonia ..	179	21	17	13	4	187	24	14	8	5
Poliomyelitis, acute ..	0	0				4	0		0	
Scarlet fever ..	0	0	0	0	0	0	0	0	0	0
Tuberculosis: Respiratory ..	83	13	12	2	7	103	12	14	1	6
Non-respiratory ..			0	1	0			0	2	1
Whooping-cough ..	1	0	0	0	0	2	1	0	0	0
Deaths 0-1 year ..	223	28	29	9	13	228	26	31	7	16
Deaths (excluding stillbirths) ..	4,734	653	591	123	155	4,935	711	569	111	172
LIVE BIRTHS ..	8,243	1,290	954	202	427	8,349	1,237	948	246	462
STILLBIRTHS ..	200	28	31			211	15	25		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
‡ Includes puerperal pyrexia.

nine years 1945-53 are shown thus -----, the figures for 1954 thus _____. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in April, 1954, was 112, compared with 118 in March and 121 (revised figure) in April, 1953.

The number of cases of industrial diseases in the United Kingdom reported during April was as follows : Lead poisoning 6, other poisoning 0, anthrax 3, epitheliomatous ulceration 7, and chrome ulceration 11; total 27. There were no deaths.—*Ministry of Labour Gazette*, May, 1954.

The notifications of infectious diseases during the week included pneumonia 428, scarlet fever 911, whooping-cough 2,207, diphtheria 13, measles 2,046, dysentery 1,136, acute poliomyelitis 16, paratyphoid fever 2, and typhoid fever 1.

The largest variations in the trends of infectious diseases in England and Wales during the week ending May 22 were increases in the number of notifications of 234 for measles, from 1,706 to 1,940, and 73 for dysentery, from 1,031 to 1,104, and decreases of 241 for whooping-cough, from 2,660 to 2,419, and 66 for scarlet fever, from 898 to 832.

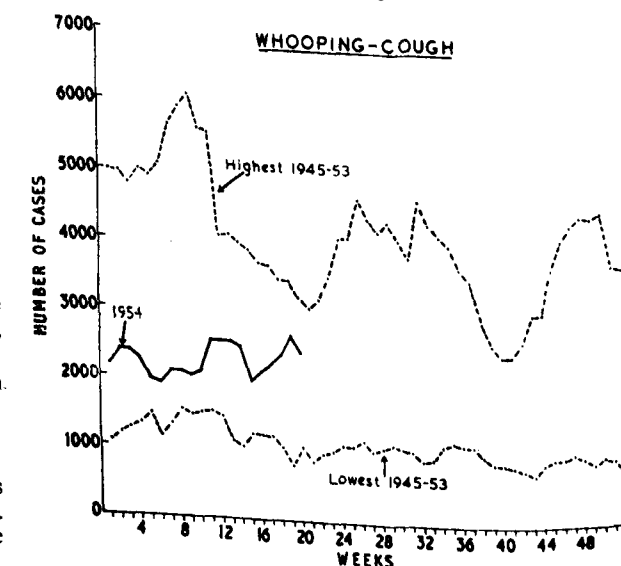
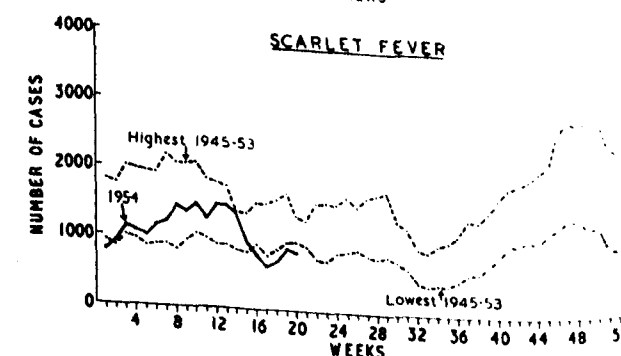
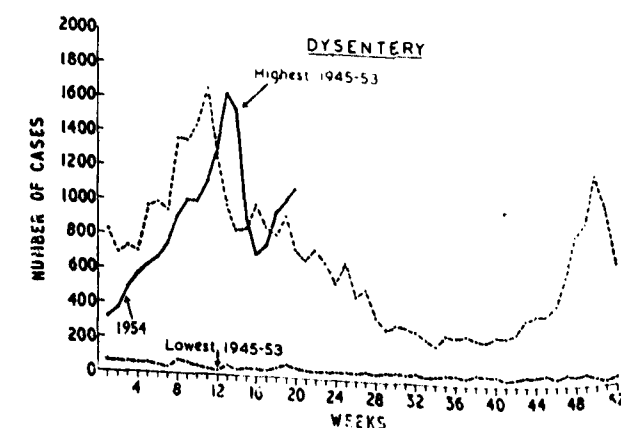
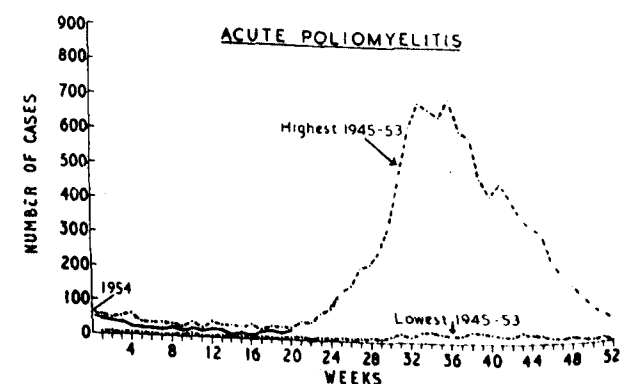
The largest rises in the incidence of measles were 88 in Yorkshire West Riding, from 59 to 147, 48 in Surrey, from 16 to 64, and 41 in Cheshire, from 75 to 116. The largest fluctuation in the trends of whooping-cough was a fall of 51 in Kent, from 188 to 137. Only small variations were reported in the local returns of scarlet fever. 22 cases of diphtheria were notified, being 13 more than in the preceding week. The chief features of the returns of diphtheria were rises from 0 to 4 in Devonshire, 3 to 7 in Lancashire, and 0 to 3 in Glamorganshire. The largest centres of diphtheria were Liverpool C.B. 5 and Plymouth C.B. 4.

26 cases of acute poliomyelitis were notified. These were 3 more for paralytic and 4 more for non-paralytic cases than in the preceding week. Three cases were notified in the counties of Warwickshire (Birmingham C.B. 3), Lancashire, Yorkshire West Riding, and Durham (Sunderland C.B. 2).

The incidence of dysentery this year has been very high, and the number of notifications has risen for the last four weeks. Notifications rose steadily from 322 in the first week of the year to 1,642 in the thirteenth week, then fell to 711 in the sixteenth week, and have risen steadily since. During the first 20 weeks 17,834 cases of dysentery have been notified. The largest centres of infection during the week reviewed were Lancashire 239 (Irlam U.D. 58, Bolton C.B. 20, St. Helens C.B. 17, Manchester C.B. 15, Stretford M.B. 14, Rawtenstall M.B. 14, Liverpool C.B. 12, Salford C.B. 10, Eccles M.B. 10, Farnworth M.B. 10), Yorkshire West Riding 152 (Dewsbury C.B. 69, Sheffield C.B. 24), London 144 (Islington 49, Lewisham 14), Leicestershire 81 (Leicester C.B. 69), Staffordshire 67 (Newcastle-under-Lyme M.B. 31, Cannock U.D. 22), Middlesex 54 (Tottenham M.B. 18, Willesden M.B. 11), Sussex 43 (Brighton C.B. 29), Cheshire 39 (Dukenfield M.B. 21), Surrey 31 (Croydon C.B. 21), Northumberland 27 (Castle Ward R.D. 14), Warwickshire 27 (Birmingham C.B. 16), Kent 22 (Chatham M.B. 10), Nottinghamshire 22, and Essex 21.

The largest returns of dysentery in Scotland were 205 in Glasgow, 44 in Edinburgh, and 15 in Lanark county.

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the



Smoke Abatement.—The National Smoke Abatement Society has published, as a printed booklet, a memorandum of proposals for action that it has submitted to the Government committee on air pollution (the Beaver Committee). The Society considers present legislation on the subject outdated, and calls for a new Act. Provisions that the Society would like to see in the new Act include: more stringent control methods for checking the emission of smoke; prior approval of all new fuel-burning installations (except domestic, for which only approved appliances should be sold); power for local authorities to set up smokeless zones without having to promote private Bills; and, to ensure that the law is respected, the employment of qualified smoke inspectors. The memorandum also makes a number of proposals for immediate action. The memorandum is obtainable for 1s. from the Society, at 30, Grosvenor Place, London, S.W.1.

New Mental Deficiency Hospital.—The picture on this page shows the Minister of Health, Mr. IAIN MACLEOD, laying the foundation stone of Greaves Hall, near Southport, last month. Greaves Hall is the first major hospital



to be started in England and Wales since before the war, and it will be used for mental defectives. Its estimated cost is about £3m., and it will provide beds for over 1,000 patients. The new hospital will be in the area of the Liverpool Regional Hospital Board. Speaking at the foundation ceremony, Mr. Macleod said that more than 2,500 new mental-deficiency hospital beds were expected to be built from centrally financed schemes in the next two years in addition to the schemes in the hospital boards' normal programmes. But new building was not the only way in which it was hoped to improve the mental health services. The services provided by local health authorities for mental defectives living at home were of great importance and had increased considerably in the last few years. But, although in recent years nursing recruitment had made great strides, the mental hospitals had lagged behind the general advance and were still very short of nursing staff. It was not yet sufficiently well known that the whole atmosphere of the mental and mental deficiency hospitals had been revolutionized by modern methods of care and treatment and that these branches of the nursing profession now offered a career with interesting work and excellent prospects. Other speakers at the ceremony included Mr. T. KEELING, chairman of the Liverpool Regional Hospital Board, the BISHOP OF LIVERPOOL, Sir HENRY COHEN, and Mr. C. AVELING, chairman of the Southport and District Hospital Management Committee.

Diabetic Association.—Founded in 1934, the Diabetic Association, which is primarily an association of laymen, has contributed greatly to the welfare of the whole diabetic community. Membership is now about 18,000. Among the association's activities are the financing of research from a fund set up about seven years ago, the organizing of summer holiday camps for children, and the giving of detailed advice to diabetics. Great Britain was the first country to form a diabetic association, and its example has now been followed in nearly all other countries. The association asks medical practitioners to call the attention of their diabetic patients to its aims and achievements, full particulars of which may be obtained from the secretary-general at 152, Harley Street, London, W.1.

Florence Nightingale Centenary Concert.—The United Hospitals Festival Choir presented a concert at the Royal Albert Hall on June 3 to commemorate the 100th anniversary of Florence Nightingale's mission to the Crimea. H.R.H. the PRINCESS ROYAL was present to hear Mendelssohn's Symphony and Hymn of Praise pleasingly interpreted by the London Symphony Orchestra (conductor COLIN RATCLIFFE) and the United Hospitals Festival Choir, with soloists ENA MITCHELL, PAULINE BROCKLESS, and ALEXANDER YOUNG. Earlier Dame MYRA HESS and the orchestra had given a performance of Schumann's Piano Concerto in A Minor. The Choir, of about 300 voices, was formed in 1951 by Colin Ratcliffe, and is drawn from the medical, nursing, administrative, and technical staff, and students of over 50 hospitals in and around London, under the Presidency of Lord Horder. Its purpose is to enable hospital staff to help medical and allied causes while contributing to the field of music. The concert at the Albert Hall was in aid of the National Florence Nightingale Memorial Fund. The Fund was launched with the joint objects of maintaining Florence Nightingale House as a residential home for nurses attending postgraduate courses in London, and of promoting nursing education by the award of scholarships.

Travelling Medical Bookshop.—Hospitals far from teaching centres and well-stocked bookshops are now being visited by a travelling medical book service organized by John Wright and Sons Ltd., of Bristol. A large motor vehicle has been adapted to carry and display a comprehensive range of books, about 1,000 in number, on medical, dental, nursing, and allied subjects. The vehicle will follow an itinerary covering the south-west, South Wales, and the west Midlands, stopping at hospitals for an hour or two so that the staff can have an opportunity to see the latest medical publications.

European Office of W.H.O.—The Executive Board of the World Health Organization has endorsed the choice of Copenhagen as the permanent site for the Regional Office for Europe. Other cities considered were Nice, Frankfurt, The Hague, Vienna, Florence, and three in Switzerland. In the final ballot there were 11 votes in favour of Copenhagen and 10 in favour of Nice.

Study Tours in Europe.—The German Educational Travel Association has arranged four study tours for doctors in connexion with congresses on (1) gynaecology, at Geneva; (2) poliomyelitis, at Rome; (3) orthopaedic surgery, at Berne; (4) tuberculosis, at Madrid. This travel association is a non-profit-making organization. Details from Deutsche Studienreisen-Gesellschaft, Nürnberg, Veilloderstrasse 1.

Consulting Surgeon to the Army.—Sir ARTHUR E. PORRITT has been appointed honorary consulting surgeon to the Army at home in succession to Sir HENEAGE OGILVIE.

Royal Dental Hospital.—Lord WEBB-JOHNSON has been appointed consulting surgeon to the Royal Dental Hospital of London and School of Dental Surgery.

Faculty of Anaesthetists.—Dr. BERNARD JOHNSON has been re-elected dean of the Faculty of Anaesthetists of the Royal College of Surgeons for the ensuing year, and Dr. R. F. WOOLMER has been elected vice-dean.

R.M.B.F.—The annual general meeting of the Royal Medical Benevolent Fund was held on June 4. A report will be given in our next issue.

Queen Charlotte's and Chelsea Hospitals' Research Prizes.—The prizes for 1953 have been awarded to Dr. J. H. GIBSON (£200) for a paper on pyrexia in the puerperium written in conjunction with Dr. R. M. CALMAN, and to Dr. W. E. HUNT (£50) for one on acute oesophagitis in the newborn.

Sheffield Old Students.—The recently formed Sheffield Medical School Old Students Association will hold its inauguration dinner at Sheffield on October 2. Details of this, and of membership, from the secretary of the Pathology Department, The University, Sheffield, 10.

COMING EVENTS

Mackenzie Industrial Health Lecture.—This lecture will take place on July 13, not July 19 as stated in our issue of May 29 (p. 1276). The lecture has been arranged by the B.M.A. in conjunction with the Association of Industrial Medical Officers and will be delivered during the latter's annual provincial meeting in Manchester.

Medical Research Society Lecture for 1954.—This lecture will be delivered by Dr. G. W. THORN, of Harvard, at 5.30 p.m. on June 18 at the London School of Hygiene and Tropical Medicine. His subject is "Adrenal Cortical Response to Stress in Man."

Faculty of Radiologists.—The annual meeting will be held in Dublin on June 18 and 19. Further details from the secretary, 45, Lincoln's Inn Fields, London, W.C.2.

British Association of Urological Surgeons.—The annual meeting will be held in Dublin from June 24 to 26. The main discussion will be on "Irradiation Therapy in Urology," and there will also be short papers. Further information may be obtained from the secretary of the association, 45, Lincoln's Inn Fields, London, W.C.2.

International Congress for Individual Psychology.—The congress will be held in Zurich from July 26-29. Further information from Frau Dr. E. Schmid, 14, Krönleinstrasse, Zurich, Switzerland.

International Congress on Thrombosis and Embolism.—A conference will be held at Basle, Switzerland, from July 20 to 24. Further information may be obtained from the general secretary, Gynaecological Clinic of Basle University, Switzerland.

NEW ISSUES

British Journal of Ophthalmology.—The new issue (Vol. 38, No. 6) is now available. The contents include:

FOVEAL VISION IN AMBLYOPIA. Mary Pugh.
VALUE OF ABNORMAL RETINAL CORRESPONDENCE IN BINOCULAR VISION. M. Levine.

CATARACT SUTURES. W. L. Hughes.
ACRYLIC GONIO-SUBCONJUNCTIVAL PLATES IN GLAUCOMA SURGERY. S. A. Gadeer.

FREE AMINO ACIDS IN THE HUMAN AQUEOUS HUMOUR. C. Wunderly and B. Caglianini.

ACUTE HYPOTONIA. Valdemar Hertz.
INTRA-OCULAR FOREIGN BODIES: REPORT OF 102 CASES. Kazimierz Rubenstein.

EXTRA-CONJUNCTIVAL IMPLANT. M. L. Nairac.

ADENOMA OF THE CONJUNCTIVA. A. J. Borse.
CONGENITAL MEMBRANOUS CATARACT, DENTIGEROUS CYST, AND MULTIPLE FIBROPLASIA. L. P. Agarwal and I. N. Raizada.

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Annals of the Rheumatic Diseases.—The new issue (Vol. 13, No. 3) will be available in a week's time. The contents include:

ON THE MECHANISM THROUGH WHICH OBSTRUCTIVE JAUNDICE INFLUENCES INFLAMMATORY PROCESSES. Hans Selye.
ANKYLOSING SPONDYLITIS AND PROLONGED A.C.T.H. THERAPY. H. F. West and G. R. News.

STUDIES ON THE EFFECT OF PROBENECID ("BENEMID") IN GOUT. R. M. Mason.

EFFECT OF POST-PARTUM PLASMA IN RHEUMATOID ARTHRITIS. David H. Neustadt, Jacob Geiser, and Otto Steinbrocker.

THE ARTHRITIS OF RHEUMATOID ARTHRITIS. Bruce Cruickshank.
OSTEITIS CONDENSANS ILII AND ITS DIFFERENTIATION FROM ANKYLOSING SPONDYLITIS. Malcolm Thompson.

SHOULDER AFFECTIONS IN RHEUMATOID ARTHRITIS. Veikko A. I. Laine.
Kauko I. Valio, and Kalle Pekkanmäki.
REITER'S SYNDROME AND CORTISONE. H. A. Reid.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked *. Application should be made first to the institution concerned.

Monday, June 14

EDINBURGH UNIVERSITY.—At Physiology Class Room, University New Buildings, 5 p.m., Dr. D. J. Guthrie: The Monros and the Edinburgh Medical School.

INSTITUTE OF NEUROLOGY.—5 p.m., Guest Lecture by Dr. E. H. Butterell (Toronto): Management of Spinal Cord Injuries and Studies on Spinal Man.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, (1) 3 p.m., Professor J. Louw (Capetown): Abortions. (2) 4.30 p.m., Professor Bruce Mayes (Sydney): Infertility.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. H. E. Holting: Ballisto-cardiography.

Tuesday, June 15

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. W. N. Goldsmith: Tuberculosis.

INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. Helen E. Dimsdale: Intracranial Vascular Anomalies other than Aneurysms.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. A. M. Cooke: On Writing for a Medical Journal.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Mitchell Lecture by Dr. J. L. Livingstone: Observations on the Treatment of Pulmonary Tuberculosis at the Present Time.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnold Demonstration by Professor M. F. Lucas Keene: Embryological Background of Some Common Abnormalities.

Wednesday, June 16

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. C. D. Culnan: Ringworm Infections and Their Treatment.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 12 noon, Professor Bruce Mayes (Sydney): Could the Chapter on Eclampsia Disappear? (The Present-day Management of Toxaemia in Sydney.)

LIVERPOOL MEDICAL INSTITUTION.—At Warrington General Hospital, clinical demonstration arranged with Warrington Division, B.M.A.

MIDDLESEX COUNTY MEDICAL SOCIETY.—At Shenley Hospital, 3 p.m., Film: A Two-year-old Goes to Hospital. To be introduced by Dr. C. H. A. Wedeles, followed by a discussion.

ROYAL EYE HOSPITAL.—5.30 p.m., Mr. G. C. Pritchard: Visual Fields (2).

Thursday, June 17

EDINBURGH UNIVERSITY.—At Physiology Class Room, University New Buildings, 5 p.m., Dr. D. J. Guthrie: Modern Medical Education in Historical Perspective.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Specific Granulomas.

INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. W. W. Gooddy: Birth Injuries.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Professor Bruce Mayes (Sydney): The Pregnant Diabetic.

LEEDS UNIVERSITY.—At Littlewood Hall, Instructional Block, General Infirmary at Leeds, 4 p.m., First Matthew Stewart Lecture by Professor G. R. Cameron, F.R.S.: The Exploration of the Cell.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., annual general meeting. Short papers by general practitioners.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Baguley Hospital, Wythenshawe, Manchester, 3 p.m., summer meeting.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Sir Stanford Cade: Adrenalectomy.

ROYAL EYE HOSPITAL.—5.30 p.m., Miss I. Kane: Retrolental Fibroplasia.

ROYAL SOCIETY.—4.30 p.m., Bakerian Lecture by Professor A. R. Todd, F.R.S.: Chemistry of the Nucleotides.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., annual general meeting. Dr. C. C. Chesterman: The Training and Employment of African Auxiliary Medical Personnel.

Friday, June 18

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. R. M. B. Mackenna: Tuberculosis and Sarcoid.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 2 p.m., Professor J. Louw (Capetown): Rupture of the Uterus.

KENT AND CANTERBURY HOSPITAL.—8 p.m., clinical meeting.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8.30 p.m., social meeting with music.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—5.30 p.m., Medical Research Society Lecture by Dr. G. W. Thorn (Harvard): Adrenal Cortical Response to Stress in Man.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. J. E. Laing: General Principles of Plastic Repair. 4 p.m., Dr. D. V. Hubble: Investigation of Endocrine Syndromes.

Saturday, June 19

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, Cambridge University, 11 a.m., 330th meeting. Scientific papers will be read.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 11 a.m., Mr. C. W. A. Kimbell: Subtotal, Total, and Vaginal Hysterectomy.

APPOINTMENTS

BRITISH TRANSPORT COMMISSION (BRITISH RAILWAYS): LONDON MIDLAND REGION.—C. R. May, L.M.S.S.A., and H. H. Whincup, M.B., Ch.B., Assistant Medical Officers.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—J. B. Lyon, M.B., B.Chir., M.R.C.P., Consultant Dermatologist, with charge of Venereal Disease Clinics in Ipswich Hospitals Area; W. J. Crawford, M.B., B.Ch., Anaesthetic Registrar, East Suffolk and Ipswich Hospital; Kathleen M.

McNamara, L.R.C.P.&S.I., Anaesthetic Registrar, Newmarket General Hospital; Lucy T. Lee, M.B., B.Ch., Anaesthetic Registrar, United Norwich Hospitals; Marion B. Morton, M.B., B.S., D.C.H., Paediatric Registrar in Peterborough Area.

HARDING, H. E., F.R.C.S., Orthopaedic Surgeon, Hospital of St. John and St. Elizabeth, London, N.W.

KNAPMAN, W. B., M.R.C.S., L.R.C.P., Assistant Psychiatrist, Bowden House, Harrow-on-the-Hill.

JAMIESON, JOHN G., B.M., B.Ch., D.C.H., Senior School Medical Officer, Leeds.

MACTAGGART, DOUGLAS K., M.B., Ch.B., D.P.H., Assistant County Medical Officer, Devon County Council, and Medical Officer of Health to the Borough of Dartmouth, the Urban Districts of Brixham and Paignton, and Brixham Port Health Authority.

MANCHESTER REGIONAL HOSPITAL BOARD.—A. Glass, M.B., Ch.B., F.R.C.S., Consultant Orthopaedic and Accident Surgeon to North Manchester Hospital Centre and Booth Hall Children's Hospital. J. D. Heppleston, M.B., Ch.B., D.C.P., Consultant Group Pathologist to South Cheshire Hospitals.

MENZIES, ALEXANDER, M.B., Ch.B., D.P.H., Medical Superintendent, Inverness Group of Hospitals.

MILLIGAN, H. C., M.B., Ch.B., D.P.H., Deputy Medical Officer of Health, Walsall County Borough.

NEWMAN, NOEL, M.B., B.Ch., D.P.H., Deputy Medical Officer of Health and Deputy Principal School Medical Officer, City of Bath.

NORTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD.—J. B. Enticknap, M.D., D.C.P., Full-time Consultant Pathologist, East Ham Memorial Hospital. H. W. Balme, M.D., M.R.C.P., full or maximum Part-time Consultant Physician, Whipps Cross Hospital. A. Russell, M.D., M.R.C.P.

D.P.H., D.C.H., Part-time Consultant Paediatrician, Harold Wood Hospital. Iford Maternity Hospital, Iford, F.F.A.R.C.S., Part-time Consultant Anaesthetist, King George Hospital, Iford, Iford Isolation Hospital.

G. C. Thick, M.B., B.S., D.A., F.F.A.R.C.S., Part-time Consultant Anaesthetist, Hertford Group of Hospitals.

PRESTON, FRANK S., M.B., Ch.B., D.A., Regional Medical Officer (Eastern), British European Airways.

REYNOLDS, G. MORTON, M.B., B.Ch., D.P.H., Deputy Medical Officer of Health, School Medical Officer, and Deputy Port Medical Officer, County Borough of Great Yarmouth.

WILSON, JOHN GREENWOOD, M.D., F.R.C.P., D.P.H., Medical Officer of Health, Port of London (the appointment will subsequently be amalgamated with that of the City of London).

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Harris.—On May 15, 1954, to Juliette, wife of L. H. Harris, M.B., B.S., of 2, Durrice House, Lyndale, London, N.W., a sister for Adrian and Darrell—Yulanie Cherie.

Henry.—On May 19, 1954, at British Military Hospital, Klagenfurt, Austria, to Hilda (formerly Loble), wife of Captain E. R. Henry, R.A.M.C., a daughter—Alicia Claire.

DEATHS

Aldridge.—On May 15, 1954, Arthur William Aldridge, M.B., B.S., of Basford Avenue Road, Great Malvern, Worcs, late of Thickthorn, Northfield, Worcs, aged 79.

Beesly.—On May 9, 1954, at his home, Newbury, Berks, Lewis Beesly, F.R.C.S.Ed.

Blake.—On May 15, 1954, at Orchard Cottage, Nailsworth, Glos, Anthony Fewster Blake, M.R.C.S., L.R.C.P., formerly of Grays, Essex, aged 84.

Brown.—On May 9, 1954, at Ardeer House, Shankhouse, Cramlington, Northumberland, William Brown, M.B., Ch.B., aged 53.

Butler.—On May 17, 1954, at 53, Charlotte Street, Leith, Edinburgh, James Butler, M.B., C.M.

Chambers.—On May 13, 1954, at 51, Bushey Hall Road, Bushey, Herts, Elsie Blair Chambers, M.B., Ch.B.

Corbett.—On May 19, 1954, at Fairwinds, Kingswear, South Devon, George Holmes Uvedale Corbett, M.B., B.C., aged 75.

Ellis.—On May 5, 1954, John Stanley Ellis, M.R.C.S., L.R.C.P., of 32, Combe Park, Bath.

Fraser.—On May 7, 1954, at Swansea General Hospital, George John Fraser, M.B., Ch.B., of Brynheulog, Mayals, Swansea, late of Glen Urquhart, Inverness-shire.

Garson.—On May 15, 1954, John Ross Garson, M.B., B.S., of 3, Daleham Avenue, Egham, Surrey.

Hardcastle.—On May 17, 1954, in hospital, Douglas Noel Hardcastle, M.R.C.S., L.R.C.P., D.P.M., F.B.Pa.S., of 48, Warwick Road, Bishop's Stortford, Herts, aged 62.

Higgins.—On May 11, 1954, at the Royal Infirmary, Lancaster, James Basil Higgins, M.B., Ch.B., D.M.R.E., aged 62.

Hirson.—On May 18, 1954, Bernard Hirson, L.R.C.P.&S.I. & L.M., of 409, Cheetham Hill Road, Manchester.

MacQuistan.—On April 15, 1954, John Archibald MacQuistan, M.B., Ch.B., of Upper Oldfield Park, Bath, Somerset, formerly of Glasgow.

Plicher.—On May 4, 1954, at Cleveland, Ohio, U.S.A., J. Douglas Plicher, M.D., husband of Jean Lorrain Plicher (formerly Smith), M.B., Ch.B.

Sheddy.—On May 4, 1954, at Yelverton, Devon, Thomas Sheddy, O.B.E., L.R.C.P.&S.I. & L.M.

Slidebotham.—On May 11, 1954, at St. Thomas's Hospital, London, S.E., Francis Nasmyth Slidebotham, M.D., of Bendarroch, Ottery St. Mary, Devon.

Smith.—On May 11, 1954, at Stroud, Glos, Charles Charnock Smith, M.R.C.S., L.R.C.P., J.P., late of Woburn, Beds, and Hastings, Sussex, aged 82.

Wilshire.—On May 16, 1954, at University College Hospital, London, W.C., Basil Hamilton Wilshire, M.R.C.S., L.R.C.P., D.A., L.D.S.R.C.S., of Purley, Surrey.

Yarrow.—On May 14, 1954, at Stamford Hill, London, N., Philip Yarrow, M.R.C.S., L.R.C.P.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Decompression of the Bladder

Q.—What are the rules about decompressing bladders? Chronic retention should be decompressed slowly—how slowly, and what is a fool-proof method? Acute retention can be decompressed rapidly—but what actually constitutes a safe definition of acute retention?

A.—The safest clinical distinction between acute and chronic retention is that the former is painful, the latter relatively or absolutely painless. The pain of acute retention may be relieved by catheterization while arrangements are made for the patient to be admitted to hospital. In chronic retention there is no pain to relieve, and it is wrong to empty the bladder either quickly or slowly until the patient is in hospital, where the obstruction can be removed or drainage continued until the operation is considered safe. In advanced cases of chronic retention where preliminary drainage is thought to be necessary the safest method is the small suprapubic catheter; the initial decompression should take 12 hours.

An Epileptic Relative and Marriage

Q.—What advice should be given to a young couple who want to marry, but there is a history of epilepsy in a near relative on one side (in this instance a brother)? Will an electroencephalographic examination of both partners definitely exclude increased risk of epileptic children if the tracings are normal in both? What should be said if one or both of the tracings are abnormal?

A.—It is assumed that the only history of epilepsy in the family of either partner is the case of the brother mentioned in the question and that neither partner has had any fits. In these circumstances the likelihood of children of the marriage developing idiopathic epilepsy is very small, and this would be strengthened if both partners have normal E.E.G. records. If both partners should have typical epileptic records it is probable that the chance of a child developing epilepsy is considerably increased. Complete dogmatism in answering this question is impossible, as there are still considerable gaps in our knowledge about the inheritance of epilepsy. An important contribution to the subject was published by W. G. Lennox.¹

REFERENCE

¹ J. Amer. med. Ass., 1951, 146, 529.

Dangers of Liquor Arsenicalis

Q.—Is there any evidence that very small doses of arsenic, such as a minim (0.6 ml.) of liquor arsenicalis daily, taken over long periods give rise to cirrhosis of the liver? Doses of this order are sometimes included in sedative mixtures.

A.—There are numerous reports of hepatic damage occurring during prolonged administration of liquor arsenicalis in therapeutic amounts in the treatment of leukaemia, etc.¹ However, there is little information in the literature about the maximum daily dose of inorganic arsenic which may be given without causing toxic effects. I know of no positive evidence that the daily taking of 1 minim of liquor arsenicalis over long periods has given rise to cirrhosis of the liver. Gowers is quoted by Stockman² as saying that the smallest amount of arsenic which he had ever known to give rise to pronounced arsenical pigmentation was equivalent to about 11,000 minims (7.3 g. of arsenic) of liquor arsenicalis during two years. This implies an average daily

intake of some 15 minims, and it is usually believed that in chronic arsenical poisoning skin manifestations precede toxic effects on the liver. After animal experiments prompted by the Manchester "epidemic" of arsenical poisoning in beer drinkers, Delépine³ concluded that a dose of 1/150 to 1/25 gr. (0.4 to 2.6 mg.) daily was capable of producing injurious effects in the ill-fed or weak individual. The 1 minim dose of liquor arsenicalis contains about 0.6 mg. or 1/100 gr. of arsenic trioxide. The development of chronic arsenical poisoning depends on the dose, the form in which the arsenic is taken, the duration of exposure to risk, and any special susceptibility. It may be expected that the effects of alcohol, arsenic, infection, etc., may well be synergistic and lead to changes in the liver which might not occur with one agent alone.

It is difficult to justify the inclusion of liquor arsenicalis in sedative mixtures, and in view of what has been said above it would be wiser not to prescribe for repeated use mixtures containing even such small quantities of a potentially dangerous cumulative poison.

REFERENCES

- ¹ Franklin, M., Bean, W. B., and Hardin, R. C. (1950). *Amer. J. med. Sci.*, 219, 589.
- ² Stockman, R. (1921). *Edinb. med. J.*, 27, 1.
- ³ Delépine (1903). Report of Royal Commission on Arsenical Poisoning, 1, app. 16, p. 185. H.M.S.O., London.

Sudden Loss of Hair

Q.—A healthy man of 42 lost every hair on his body more or less overnight over five years ago, and there was no sign of any regrowth until recently following an emergency gastrectomy for severe haematemesis with transfusion of four pints of blood. What could be the cause of such a sudden loss of hair in the absence of any illness or emotional upset? Is the recent regrowth connected with either the shock following haemorrhage and operation or the blood transfusion?

A.—It seems almost certain that this is a case of alopecia totalis, usually regarded as a severe form of alopecia areata. The cause of this disorder is quite unknown, though if there has been an antecedent illness, stress, or shock it is tempting to attribute the baldness to this. Recovery from alopecia totalis is sometimes complete, but when it has already existed for some years the chances of much hair regrowing recede.

It is less often that regrowth of hair can be attributed to shock or other disturbances. However, Dillaha and Rothman¹ have reported recovery as a result of cortisone treatment, and presumably the recovery in the case mentioned may be related to this mechanism. In Dillaha and Rothman's cases the hair fell out again when cortisone was stopped.

REFERENCE

- ¹ *J. Amer. med. Ass.*, 1952, 150, 546.

Where to Sit for Television Viewing

Q.—Is there any ratio between the size of the television screen and the distance between that screen and the eye for obtaining the optimum clarity of image, yet at the same time freedom from visual discomfort?

A.—Since the number of lines in the structure of television images is fixed, there is a ratio between the size of the screen and the viewing distance at which the lines will be indistinguishable. The value of this ratio will depend on the visual acuity of the viewer. The number of lines in the B.B.C. transmissions is such that persons whose vision is not better than 6/6 will not distinguish the line structure of the picture on a 12-inch (30 cm.) diameter television tube at a viewing distance greater than about 6 feet (1.8 metres). The vision of many people is, however, 6/4.5 or better, and the lines on such a screen will be visible, though not unpleasantly conspicuous, at a viewing distance of 8 feet (2.4 metres) or more. If a receiver having a larger screen is used, it follows that the viewing distance must be proportionately increased if it is desired not to see the lines. However, freedom from visual discomfort when viewing television depends chiefly on other factors than line visibility. It is important to have the viewing room moderately illuminated, though in such a way that viewers

cannot see the light sources directly nor see images of them mirrored by the screen they are watching. If this is done the screen should not prove glaring, nor will the brightness contrasts of which the picture is composed be spoiled. It is also important that the angle subtended by the screen at the viewer's eyes (the angular size of the field of attention) should not be too small, since unwonted restriction of eye movements is a potent cause of feelings of strain and ocular fatigue. For this reason it is better to have a relatively high ratio of screen size to viewing-distance, and accept the consequent visibility of the lines, than to insist on a ratio which is low enough to prevent detection of the lines.

Uric Acid Gravel

Q.—I have a patient, a robust man of 35, who has repeated attacks of renal colic, not confined to one side. He then passes several small calculi about the size of a large pin's head. Analysis of the calculi show them to consist of uric acid and urates. Two complete urological investigations reveal no abnormality; there is apparently no mechanical defect, and his kidney function is excellent. Are there any measures, dietary or therapeutic, which would prevent the formation of these small calculi?

A.—Uric acid gravel can to some extent be prevented by maintaining an alkaline urine and avoiding food rich in purines. The patient should avoid strong tea and black coffee, and the rich protein foods associated in idea with a Lord Mayor's banquet. Liver, kidneys, sweetbreads, and offal in general should be forbidden. The diet should contain an abundance of fruit and vegetables, and a fluid intake of about 5 pints (3 litres) a day should be the aim.

Cloudy Urine after Acetic Acid

Q.—Are all phosphates in a cloudy urine dissolved by dilute acetic acid, or are some not soluble, or is the residual cloudiness due to something else?

A.—All phosphates in a urine are dissolved on the addition of acetic acid. Any residual cloudiness might be due to oxalates or bacteria. If the cloud is due to oxalate it will become soluble on the addition of a little hydrochloric acid.

NOTES AND COMMENTS

Corrections.—In Table II in the medical memorandum on "Extreme Sensitivity to Insulin," by Dr. A. I. Roith (June 5, p. 1306), the amount of insulin given should have been 0.03 unit per kg. body weight, not 0.3 unit.

In the report of Mr. Ivor Lewis's contribution to the luncheon discussion on massive gastro-intestinal haemorrhage, at the recent sectional meeting of the American College of Surgeons in London (May 29, p. 1258), the number of cases on which he had operated personally should have read 96, not 196.

In the report by the Joint Committee of the Medical Research Council and Nuffield Foundation on "A Comparison of Cortisone and Aspirin in the Treatment of Early Cases of Rheumatoid Arthritis" (*Journal*, May 29, p. 1223), under the heading "Allocation to Treatment," "(c) . . . seven to nine months" should have read " . . . six to nine months." Similarly in Table I "Duration of symptoms" should be 6-9 months and not 7-9 months. In Table V under "Week 8 to 1 Year" +0.8 should have been -0.8.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: Aitology, Westcent, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Manager, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: Britmedads, Westcent, London. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association. TELEPHONE: EUSTON 4499. TELEGRAMS: Medisecra, Westcent, London. B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

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GENERAL PRACTICE IN AMERICA AND GREAT BRITAIN
SOME OBSERVATIONS AND COMPARISONS

BY

CHARLES M. FLEMING, M.A., M.D., F.R.C.P.Ed.

Principal Medical Officer, Department of Health for Scotland

In the spring of 1952, through the generosity of the Rockefeller Foundation, I was enabled to make a three-months visit to the United States, the main object of which was to study conditions in general medical practice. The time seemed most opportune to see what range of work was actually undertaken there by the general practitioner, and to find out how the patient fared—the ultimate test—under the conditions of American practice. It was no part of my purpose to try to assess the general standard of American practice. Not only would that have been impossible of achievement in the time, but it was unnecessary. My object was simply to see what opportunities are available to the American doctor and how they are actually utilized.

First-hand knowledge of what happens to the American patient when he consults his doctor seemed to me essential. I had expected difficulty in at least some practices in being present during actual consultations. In the event, my fears were groundless; no doctor or patient showed even hesitancy about my presence, and I was made most welcome. A second requirement was to see what advantages accrued to patients of group practices and other medical-care schemes. From my point of view, only the scope and quality of medical care in these schemes was of special interest, since in Britain we are no longer concerned with questions of contributions, entitlement to medical care, and the many organizational aspects of such schemes. I confined my attention, therefore, mainly to what happened to the patient when he presented himself for treatment. Finally, I was anxious to visit medical schools and other bodies interested in medical education in order to learn about undergraduate and postgraduate training for general practitioners.

The task was a formidable one, and I cannot pretend to have done much more than make a rapid and limited survey. I should like to say at once that I do not claim an exhaustive or a meticulously accurate knowledge either of medical education or of practice conditions in the United States. I am satisfied about the value of what I saw and heard for the purpose I had in view, and of its correctness in principle if not in detail; but I appreciate that there must be many features of practice in the United States about which I am still ignorant. Nothing spectacular or dramatic was expected or discovered. I was able to cover only a very small part of that vast country—though my journey took me long distances by our standards—but I saw both urban and rural practice under widely varying conditions.

At all stages of my tour I was given the greatest possible help, and was enabled to see and hear far more in the time available than I should have thought possible. The simplicity and efficiency of the arrangements made for me by the Rockefeller Foundation contributed very largely to this result. Wherever I went appointments were made in advance with key people in my particular sphere of interest. But ample time was left free for other meetings and visits suggested in the course of discussions. In this way I was able to study, as my journey progressed, what I felt was likely to be of greatest value to me. The broad plan was sketched for me, but I was left completely free to fill in the details.

Places Visited

My tour began in New York, and I returned there at the end. The Health Insurance Plan of Greater New York, a very large and highly organized system of group practice, took up a good deal of my time there and proved of great interest as regards both its headquarters organization and its various group centres. I also saw the work of individual general practitioners. The three medical schools I visited—Columbia, Cornell, and New York Universities—provided a wide range of information of the greatest value, and helped me to get a working knowledge of the general set-up of American health services. During my last days in New York discussions with officials of the American Public Health Association, the Commonwealth Fund, and other bodies enabled me to put into perspective many things I had learned in the course of my visit.

Baltimore, my next stopping-place, afforded a great wealth of experience. The Johns Hopkins School of Hygiene was my temporary spiritual home, and I cannot put too high a value on the privilege of the casual daily contacts there, quite apart from attendance at more formal interviews, seminars, etc. I was able also to see something of the Johns Hopkins University Medical School, the famous Johns Hopkins Hospital, and its diagnostic clinic. In particular, I spent a considerable time studying the work of the Baltimore Medical Care Scheme clinics at Johns Hopkins Hospital, the University of Maryland Hospital, and the Sinai Hospital. This gave me a very close insight into one form of group practice and enabled me to see many general practitioners actually at work. I also attended office consultations and did house calls with private practitioners both in Baltimore and in several rural areas of Maryland. I had numerous discussions with officials of the City Health Department, and also of the State Health Department, including county health officers.

I paid a short but very profitable visit to Washington, where most of my time was spent with officials of the U.S. Public Health Service. From them I received a great deal of background information which was invaluable in assessing much of what I saw and heard during my whole visit. I also saw something there of group practice, and learned from an authoritative source about the work of the American Academy of General Practice.

The next stage of my journey took me to Cleveland, Ohio, where I was privileged to attend the annual meeting of the American College of Physicians. In itself this was a fascinating and instructive experience, but it also proved an enormous saving of time by enabling me to meet teachers from several widely separated American medical schools.

From Cleveland I went to the South, where I spent a week in New Orleans and a week in Jackson, Mississippi, and paid a flying visit to Chattanooga, Tennessee. The officials of the two medical schools whom I met in New Orleans took the greatest pains to help me in every possible way, and my visit there was one of the most useful of the whole tour. I was able to see general practitioners at work in urban and suburban practices. Jackson proved a valuable base for visits to rural doctors, and the State Health Department took endless trouble to provide information and assistance.

Returning to New York, I made short visits to Toronto and Boston. On my way to Canada I saw a very interesting development in group practice, at the Rip Van Winkle Clinic and Foundation in Hudson, N.Y. My stay at Toronto was a brief but intensive introduction to Canadian medicine, made with the help of officials of the School of Public Health, the Medical School, and the Canadian Medical Association. Here also I was able to see general practice at close quarters.

Boston was well up to expectation and I had a short concentrated visit which included the Harvard Medical School and School of Public Health, Boston University, and the New England Medical Center.

In this report I have not attempted to record my experiences in detail. That was done in diary form each day during my trip. While I have found my diary a most valuable personal *aide-memoire*, it is by no means a complete account of all the many interviews and discussions in which I took part. In common with all visitors to the United States, I experienced boundless hospitality, and on these social and semi-social occasions I obtained a great deal of information of high professional interest and value. Indeed, I am tempted to believe that many of the most useful lessons of all were learned in this way. Impressions of American medical practice acquired by either of these methods are insensibly and inevitably modified by all the other experiences packed into such crowded days. What I have written here is based on my experience as a medical officer concerned in the administration of general practice in the National Health Service, modified by my experiences in the United States. I have tried to describe briefly the training and working conditions of the American general practitioner and to make some comparisons with what obtains in Britain. I have then attempted to define the scope of general practice. Finally, I have put forward some suggestions on what might be done for the future development of general practice in Great Britain.

I. THE AMERICAN GENERAL PRACTITIONER

School, College, and Undergraduate Medical Training
In the United States most children go to school at the age of 6, and they are in the primary school for approximately eight years. They then proceed to their secondary education at a high school for about four years.

A prospective medical student, on leaving school, usually takes an arts or science course at college. At least three years, and often four, are spent in this way, and most students graduate with an A.B. or B.S. degree. Certain subjects, such as physics, chemistry, botany, and zoology, are obligatory. English and mathematics are usually taken, and many schools also require a foreign language. Not more than the minimum is required in science, and stress is placed on sociology and philosophy. The intention clearly is to encourage the student in every way to get a good general education.

Undergraduate education at a medical school lasts four years and leads to the M.D. degree. Speaking broadly, the course consists of the subjects which in this country follow the first M.B. examination.

In the United States, as here, it is being appreciated in many quarters that the student who sees only people in hospital beds or who attends out-patient departments is missing a most important section of illness in the community. Moreover, two present-day trends—the smaller number of house visits made by American doctors, with the consequent tendency for the patient to become the sole judge of when he should see his doctor, and the shortened average stay in hospital—result in the medical student seeing even less than formerly of the beginnings and consequences of illness. Some medical schools have therefore made provision for students to gain experience in domiciliary medical practice. Patients are assigned to students, who look after them both in hospital and at home. Guidance is given by a senior, every care being taken to avoid interfering with the rapport established between the student and the patient. The student stands in something of the relationship to the senior that the general practitioner does to the consultant. The value of team-work is emphasized by showing the use that can be made of social workers, health visitors, and the full range of community resources. The importance of such teaching in clinical and social medicine is obvious. The student is given an early opportunity of appreciating the practical value of the concepts of preventive medicine as applied to the individual patient and his family.

The Internship

The next stage consists of one year's training as an intern (H.P. or H.S.). According to Pullen (1952a) about half the States require a doctor to have served an internship before they will grant him a licence to practise. The licensing examinations are, incidentally, quite separate from the degree examinations. An American Medical Association report states that for over 20 years practically every graduate of an American medical school had voluntarily acquired a year of hospital experience and that by the mid-thirties more than 75% were completing two years and more of hospital training before entering on the practice of their profession (Diehl *et al.*, 1950a). The rotating internship, consisting of three months each of internal medicine, surgery, paediatrics, and obstetrics and gynaecology, is the most common type. Great importance is attached to this form of training, and it is an absolute prerequisite to many later appointments and advancement. There are also "straight" internships in these subjects. In a straight internship in surgery, eight months would be spent at general surgery and the remaining four months at surgical specialties. Similarly, the last four months of an internship in internal medicine would be spent in paediatrics, psychiatry, neurology, etc. The American Medical Association controls this training, in so far as it certifies hospitals at which credit may be given for an internship. At present there are many more internships than young graduates of American medical schools. In 1951 there were only 6,135 medical graduates to fill 10,044 internships (Pullen, 1952b). This leads to competition, with the result that some hospitals pay much more attractive salaries than others. It is said that some of these hospitals do not make any great effort to teach.

Graduate Training

Graduate or residency training is intended for the trainee specialist, and may be said to correspond to the period of a registrarship in Britain. It may last from two to five years, according to the specialty. There are over 20 specialty boards in the United States; each lays down what the training for its own specialty should comprise and conducts the examinations. The American Medical Association has begun to certify hospitals which should be approved for specialty training. As with approved internships, there are more residency vacancies than there are trainees, and this has again given rise to unfortunate results. The percentage of failures at the examinations of the specialty boards is considered by many to be unduly high. Actually, it is probably not very different from what obtains in this country in the higher examinations in medicine and surgery. Darley (1952a) put the proportion of failures in 1949 at an even third. In his presidential address to the American College of Physicians in 1952, Pincoffs (1952) attributed the high percentage of failures partly to the inadequate training given by some hospitals.

Some American schools have in recent years provided, in addition to the year of internship, a three-years general practice residency—consisting of one year of internal medicine, one year of surgery, and one year of obstetrics and gynaecology. This is a particularly interesting development in that it places general practice on the same level with regard to length of training as most of the major specialties. Unfortunately, and for various reasons, according to some of those intimately concerned in the promotion of these residencies, they have not been an unqualified success. It is suggested, for example, that the general-practitioner resident takes second place in training to the specialist resident. An alternative—attractive in more than one way—has been put forward whereby, after a period as an ordinary resident, the trainee general practitioner would go to a special hospital where the staff would not be members of a university faculty or medical school, but would, of course, be thoroughly imbued with the spirit of teaching.

Postgraduate Training

At least two agencies in the United States are actively engaged in stimulating postgraduate education with an enthusiasm and energy not equalled in this country. The American Academy of General Practice requires of its members certain minimum amounts of formal and informal instruction, and its local branches arrange to have the necessary courses and other forms of instruction made available. A number of medical schools are concentrating on providing general-practitioner postgraduate training, even to the comparative neglect of specialist training. There are, of course, variations in the courses provided at different medical schools, but the following are the main types:

(1) Short intensive courses of from one to three days are held perhaps every two to four weeks. Lectures, clinical pathological conferences (C.P.C.s), and panel discussions are given. The short length of some of these courses makes it easier for the general practitioner to attend without leaving his practice, a point of great importance in the United States. This type of instruction is very popular and the demand is steadily increasing. One medical school had 1,000 registrations in one year—a most impressive achievement, as the total number of general practitioners in the State is 1,600. The greatest care is taken to appeal to the general practitioners by framing the courses to meet their calculated needs and by employing a number of carefully designed methods of holding their interest.

(2) Through the generosity of the Kellogg Foundation, about 20 medical schools are now providing a most attractive scheme of postgraduate instruction. The essence of it is to bring the doctor to the doctor in his practice. A teaching team of instruction to the doctor in his practice. A morning ward peripheral hospital of perhaps 50 to 80 beds. A morning ward round is made and the doctors see their own patients examined and demonstrated. In the afternoon more of the doctors' patients are seen as out-patients. The evening may be employed for a lecture or talk. Variations of this programme are, of course, used by different teaching schools.

(3) Evening courses once a week for 12 weeks are held by some schools. Each week a different team, usually of two, attends. Patients may or may not be used. These courses are normally built around the local medical society.

Perhaps the most striking feature to the British visitor of all these courses is the care devoted to making them attractive and useful to the general practitioner.

General Practice

Entry into Practice.—The American general practitioner enters practice as a rule straight from an internship and learns his new job by experience. Some doctors, before beginning practice on their own, serve a period as an assistant to an experienced practitioner, though this arrangement seems to be less common than in Britain. Naturally, a certain number of entrants to general practice have had residency training for varying periods. Some of the latter aim at becoming specialists in, for example, internal medicine. To do so, they may seek the Certificate of the Board of Internal Medicine or of one of the other specialty boards; but such doctors can acquire consulting practices solely by gaining the confidence of their fellows.

The "Family Specialist."—It is necessary to consider in relation to American general practice a type of practitioner unknown in Britain—the "family specialist," he might be called. These doctors may be orthodox specialists with the certificate of the appropriate board, or they may merely have taken a long period of hospital training. They do, however, limit their practice to their specialty, which is usually internal medicine or paediatrics; but they are prepared to accept patients direct in the same way as a general practitioner. In addition they may do some consultant work. Such practitioners are still relatively uncommon; but the total number of doctors specializing in internal medicine is growing rapidly in America. The President of the American College of Physicians stated that in 1940 there were roughly 6,400 and in 1950 about 11,600. He predicted that the number would have risen by 1960 to 20,000 or 25,000, and that there would be a growing demand by the public adequate to absorb at least all those who engaged in this form of family practice (Pincoffs, 1952).

Types of Practice.—In urban areas, individual practice is still the usual form seen; but group practice is now quite common and is widely accepted. The object of such groups is to provide practically complete medical care on a prepayment basis, and the staffs comprise both general practitioners and specialists. Individual practices in these areas may be run by general practitioners or by the family type of specialist. In semi-urban areas one or more doctors may endeavour to limit their practice to internal medicine and may combine such a family practice with a limited amount of consulting work. No doubt examples of group practice in these areas are also to be found, though I did not encounter them. I did see, however, in a rural area, an interesting example of group practice, though as a rule in such places the individual general practitioner still reigns supreme. Indeed, the rural practitioner in America commonly goes beyond the usual scope of general practice as we know it; he may do a considerable amount of specialist work—in particular, major surgery.

Accommodation, Equipment, and Staffing

The American practitioner often has professional accommodation and equipment on a scale seldom seen in this country. It is perhaps dangerous to generalize on the basis of such a limited number of doctors' offices as I had the opportunity of seeing, but I can say that I never met any doctor who had less than three rooms and whose equipment was not well above the British average. The three-roomed suite—waiting-room, consulting-room, and examination or treatment room—is gradually appearing here, and is advocated in all reports and articles on health centres or group practice. In the United States it was, in my experience, the basic minimum. More elaborate accommodation, often in *ad hoc* buildings, was quite common. Developments of this

sort were by no means limited to urban areas, and indeed perhaps two of the best *ad hoc* buildings I saw were in small rural practices in Mississippi. While I did see examples in country practices of old-fashioned waiting- and consulting-rooms with well-worn furnishings—to me, not at all unpleasant features—these were uncommon. Even so, they differed from many similar premises in Britain in that they contained all the essential modern diagnostic equipment of general practice.

Equipment was usually elaborate by our standards. Examination couches were of particularly good quality and design and, more important, were not merely for ornamental purposes. It was quite common to find a short-wave diathermy machine, ultra-violet ray lamp, electrocardiograph, and a well-equipped x-ray and dark room. B.M.R. apparatus, surprising to the British visitor, was by no means a rare piece of equipment to encounter. Oxygen and anaesthetic apparatus were sometimes in evidence. Refrigerators for the storage of biologicals, dressings trolleys, and weighing machines with height measures might be said to be standard equipment in most doctors' offices.

Domestic staffing was in keeping with the amount of accommodation. Practitioners made great use of ancillary staff, such as nurses, technicians, and secretaries. I saw only two doctors who did not have a nurse (not necessarily fully trained) to assist them; the wife of one of them, however, did a certain amount of less skilled nursing work. Commonly, the nurse undertook simple laboratory tests and secretarial work, but a separate secretary-receptionist was often employed, and sometimes also a technician. In group practices, furnishing and equipment are on at least as good a scale as in the best type of individual practice. Sometimes a standard is reached which has to be seen to be believed by the visitor from this country. The first experience I had of a waiting-room belonging to a New York group made me feel I was in the lounge of a luxury hotel. Laboratory work in such group practices is sometimes quite complete, and no work has to be sent elsewhere.

Laboratory Facilities

Clearly, many American practitioners are equipped to carry out a considerable number of diagnostic investigations in their own premises. In addition, they seem to have no difficulty in getting more elaborate work done at hospital laboratories or at other laboratories run on a purely commercial basis. Indeed, some city doctors rely almost completely on commercial laboratory investigation, rather than employ a technician or do their own laboratory work. It is a common criticism of American medicine—heard more often, I should say, in America than in Britain—that too many laboratory tests are performed. Hawkins (1952), describing his impressions of postgraduate education in America, remarks that “in Britain the clinical approach and good bedside teaching are characteristic, whereas in America the laboratory aspect is highly developed.” He at once adds that such a generalization does “an injustice to the many outstanding medical men of the U.S.A. whose clinical acumen is beyond reproach.” Arnott (1952) was greatly impressed in America by the emphasis placed on the simple clinical methods of history-taking and physical examination, and saw no tendency whatsoever to rely on esoteric laboratory tests. These British writers refer to hospital practice.

The opposite view, this time in relation to practice outside hospitals, is expressed by McCombs (1950), of Boston, who speaks of certain doctors employing as a means of profit diagnostic tests that they are not qualified to use. My own experience was that the good general practitioners, like the hospital clinicians quoted above, did not abuse laboratory tests. It is a foolish attitude, that is sometimes assumed by critics of American practice, that few of the laboratory tests used are really required. General practitioners in Britain would do well to avail themselves of all useful corroborative diagnostic evidence according to the best standards of modern hospital practice.

Hospital Appointments for General Practitioners

Attitude to the Problem

A large proportion of American general practitioners have some form of hospital appointment. This seems to apply in both town and country practice; almost every doctor whom I met had some form of association with a hospital. A statistical investigation made in Baltimore in the early 'forties showed, I was informed, that approximately 45% of practitioners had really satisfactory attachments to hospitals, that 35% had no attachment, and that the rest had rather slender attachments. A statement that in one large city only 56% of the general practitioners had a recognized hospital affiliation appears in the recent Report by the President's Commission on the Health Needs of the Nation (1952a). The figures for these two cities are quoted as disappointingly low from the American point of view. In Britain such proportions of general practitioners with hospital attachments would be regarded as startlingly high. I am unable to say accurately to what extent hospital appointments for practitioners are available throughout the whole country; but there is ample evidence to show how vastly different is the American attitude to our own in this important question.

For example, the Report of the Hospital Survey for New York (1937), after stressing that the public must be concerned with the relationship of the hospital and the practitioner, goes on to state: “To keep up with the ever-changing methods of diagnosis and treatment, the medical practitioner needs the stimulus provided by association with the organized medical staff of a well-equipped modern hospital.” Similarly, the Hospital Council of Greater New York (1951a) states that not only should a practitioner have the privilege of caring for his own private patients in hospital, but that he must have the opportunity to work under supervision in the wards and out-patient department and to participate in the teaching and training of medical students, members of the house staff, and other physicians. The Subcommittee on Medical Care of the American Public Health Association (1949a) reported: “General elevation of medical standards requires the closest possible contact of all practitioners in the community with the hospital facilities that are available. Good care is impossible to provide in isolation from the consultants, laboratories, equipment, and other facilities of the modern hospital.”

Types of Appointment

In the United States a regular staff appointment gives the opportunity of looking after patients in the wards and out-patient department. The holder is given specific duties and responsibilities towards public patients, and he takes part in all the educational activities of the hospital. Where a practitioner merely has the right to attend his private patients in hospital he is said to have private-patient privileges. Private patients and semi-private patients may be in single rooms or occasionally private wards. In general, patients in wards are those who cannot pay for private care, and they are looked after without charge by a doctor on the staff. The doctor with only “privileges” may, in a well-organized hospital, be subject to certain limitations in the procedures he may carry out; his work is to some extent supervised. But he has no responsibilities in the wards or out-patient department, and he is not required to attend staff conferences or participate either as a learner or teacher in the educational side of the work of the hospital. Where a doctor has both a regular appointment and private-patient privileges he is said to have a combined appointment.

New York City Appointments

In New York City on January 1, 1948, there were 17,703 licensed medical practitioners, of whom 14,850 were doctors in active practice. Doctors in related fields (administration, public health, research, teaching, etc.) and doctors in training (residents, interns, etc.) were excluded in calculating the number in active practice. Over 80% of these doctors,

including specialists and general practitioners, had hospital appointments, as the following figures show:

No. of doctors with hospital appointments:			
Combined or regular appointments	10,602	71%	
Private-patient privileges only	1,770	12%	
	12,372	83%	
No. of doctors with no hospital appointment	2,478	17%	
Total No. of doctors in active practice	14,850	100%	

As there are estimated to be 7,000 specialists in the city, most of whom have hospital appointments, then more than 5,000 general practitioners must have hospital appointments. It is also estimated that most of those 2,478 doctors with no hospital appointments are general practitioners. In other words, two-thirds of the general practitioners have hospital appointments (Hospital Council of Greater New York, 1951b).

A Comparison with Scotland

The Hospital Council makes the claim, which at first sight is quite astonishing to the British reader, that to provide combined appointments for all doctors in active practice in New York City would require no appreciable increase in the existing 32,652 general-care hospital beds. (This number of beds is little short of the 33,600 recommended for 1950 by the Master Plan for Hospitals and Related Facilities. It is said, however, that a redistribution is required in view of the relative shortage of semi-private facilities: there were 12,724 private and semi-private beds.) (Hospital Council of Greater New York, 1951c.)

In Scotland in 1952 there were 2,400 principals and 306 assistants in general practice under the National Health Service, making a total of 2,706; and specialists numbered 826, including those working both part-time and whole-time (registrars, interns, and specialists not engaged in general care excluded). The number of general practitioners not working under the National Health Service is probably less than 50, so that the total number of doctors in active practice seems to be about 3,500. General-care beds are about 27,583 for a population of 5,000,000 (Report of Department of Health for Scotland, 1952).

In New York City there are then, in proportion to the population of 7,888,000, more than two and a half times as many doctors (general practitioners and specialists) in active practice and more than five times as many specialists as in Scotland. Relatively, general practitioners are almost twice as numerous in New York. On the other hand, Scotland has proportionately about four beds for every three in New York. The highly urbanized needs of New York cannot truly be compared with the needs in Scotland either of doctors or of hospital beds, but the ratios are so different that they may well not be completely accounted for by differences in the type of population. Indeed, it could be argued that any difference in needs would serve only to accentuate the differences in the ratios shown above.

At least two points stand out. First, it would be simple, if our Scottish hospitals were run on the American principle, to find hospital appointments for all doctors in practice. Such a revolutionary change, even if desirable, could clearly not quickly be effected. But, at the very least, it is reasonable to argue that no vast modification is required to find useful employment in hospital for a considerable number of general practitioners. Secondly, the question at once poses itself: does the American method of practice not seem to be much more economical in the use of hospital beds?

Conditions for American General Practitioners in Hospitals

Among the recommendations of the Hospital Council of Greater New York (1951d) it is urged: (1) that all hospitals appoint general practitioners to their staffs and, under the jurisdiction of the chiefs of the various services, give them the opportunity of working in different departments; and the educational advantages afforded by the institution; and (2) that general hospitals establish appropriate professional units to guide the activities of general practitioners on their staffs, and work out a programme for each individual practitioner with the various clinical departments. It is under-

stood that the extent of hospital privileges given to a doctor should depend on his training, experience, and competence, and that his work should be supervised.

Departments of General Practice in Hospitals

The American Academy of General Practice has prepared “A Manual on the Establishment and Operation of a Department of General Practice in Hospitals.” In the preparation of the Manual the Academy obtained advice from the American Medical Association, the American College of Surgeons, and the American Hospital Association (Editorial, 1950).

The Manual advocates that the general practitioner as well as the specialist should be able to use the modern hospital to the degree that his training and experience warrant. It is recommended that the medical staff should be organized into at least three departments, consisting of medicine, surgery, and general practice, and that within the last-mentioned section the general practitioner should be given hospital privileges in the practice of internal medicine, paediatrics, obstetrics, and surgery as determined for each applicant by the credentials committee of the staff. It is laid down how the evaluation should be made of the qualifications and ability of those members of the general practice staff who feel that they have had the necessary training and experience to engage in more advanced work within a specialty field.

Scope of General Practice in America

The scope of the general practitioner's work in America is a good deal wider than here. This, at least in part, explains his more elaborate diagnostic and therapeutic equipment, much of which he must find really necessary for his work. It is not entirely a matter of his own choice that he practises a wider range of medical work; his patients expect it of him. This may explain the occasional major surgery by general practitioners which is still done in places like New York and Baltimore, where expert surgical skill abounds. This situation has both its good and its bad features. There is great interest and stimulation for the general practitioner to investigate and treat his patients with a full range of diagnostic and therapeutic facilities, such as is available here only to the hospital specialist. This seems to be accepted practice, for the Subcommittee on Medical Care of the American Public Health Association (1949b) stated: “With the receipt of complete consultation reports, the general practitioner can usually continue with the management of all but the most specialized therapeutic procedures.” Moreover, American general practitioners seem to have a familiarity with the appropriate methods for such work almost unknown among their British colleagues. It is idle to discuss, on my slender experience of American practice, whether the work done is on the whole more efficient than in British practice. What I endeavoured to learn was what the general practitioner could do, given the necessary facilities. I am satisfied that he can and does do a better job in many, but not all, ways than is done by the general practitioner here.

Group Practice in America

Definition of Group Practice.—The term “group practice” has a different meaning in the United States from what is usually implied when it is used in this country. The Medical Group Practice Council (1946a) has laid it down that “in order to be considered a medical group practice unit, an association of physicians of different skills, using medical equipment and nursing, technical, and administrative personnel in common, must have a formal pattern of professional collaboration, a definite relationship as a group with a hospital or hospitals in the community, and a unified administrative and financial organization.” A formal pattern of professional collaboration means that the consultation and co-operation between the different types of doctors in the group are definitely planned so that they are

readily available for the patient's benefit. A unified administrative and financial organization requires the pooling of incomes and that financial relations with patients are handled in the name of the group. It is accepted that three or four doctors sharing accommodation and auxiliary personnel are not engaged in group practice, although they may enjoy some of its advantages.

Types of Group Practice.—This form of organization is, of course, merely an extension to outside practice of what has long obtained in teaching hospitals. As Clark and Clark (1941) put it: "Having been trained in the group method, the medical graduate of to-day is well-fitted to continue his career as a member of a professional group where he can practise the type of medicine he has been taught. It is often difficult, on the other hand, for him to adjust himself to the professional and financial limitations of individual practice." We are not concerned here with reference groups such as the Mayo Clinic, or diagnostic groups like those at Johns Hopkins Hospital and elsewhere. The principal other type is that which provides general family care and specialist services.

Advantages of Group Practice

The doctor is able to do his best work, having readily to hand access to the necessary specialist advice and diagnostic and therapeutic facilities. At the same time economy is effected through sharing of accommodation, equipment, and ancillary personnel. The saving has been estimated at from 15 to 30% (Medical Group Practice Council, 1946b). There is also an economical use of medical manpower in that the young doctor is at once fully employed and has no long period of waiting for patients in a newly established practice. Indeed, the view has been advanced that the United States "cannot afford the wastage entailed in the partial idleness of the solo practitioner while he is building up a practice" (Report by the President's Commission on the Health Needs of the Nation, 1952b). Moreover, the doctor has opportunities for private study and attendance at postgraduate courses, and is enabled more easily to work at any specialty in which he may wish to develop his knowledge. All doctors in group practice have, of course, the benefits of sharing night duty, emergency calls, and so on.

For the patient the advantages are not limited to having the advice of the appropriate specialist: that could be obtained under almost any form of practice. The fundamental justification for group practice is the opportunity it offers for greater efficiency in the key member of the team—the family doctor. He is enabled to continue the best features of his training period throughout his professional life—"the stimulation to keep up with medical progress through constant appraisal by informed colleagues and ready access to consultations and technical assistance" (Report by the President's Commission on the Health Needs of the Nation, 1952c).

Examples of Group Practice

The Health Insurance Plan of Greater New York (HIP) has as its aim to provide comprehensive medical care—preventive, early diagnostic, and curative. The entire cost is covered by combined HIP and some form of hospital insurance such as Blue Cross. It began in March, 1947, and was responsible for the care of almost 400,000 persons by 1953. Medical services are available in the homes of patients, in doctors' offices, in medical group centres, and in hospitals. There are 30 medical groups scattered throughout the city. Each group has a sufficient number of family physicians for its size, the appropriate number of specialists representing the 12 basic specialties, and it has the requisite laboratory, x-ray, and other diagnostic and therapeutic services. Almost a half of the 950 doctors employed in the scheme are diplomates of the American specialty boards.

The medical groups are autonomous and each is a professional partnership. They are required to meet definite professional standards and to provide specified facilities.

The scheme is, of course, a prepayment one, and subscribers may choose any medical group and any one family physician. After deduction of administrative expenses the income is distributed to the groups on a capitation basis.

The family physicians see most of their patients at their own private offices, which are usually nearer the patients' homes; but generally they also have certain office hours at the group centre. The specialists see most of their patients at the centre.

The medical director claims that the maximum amount of diagnostic and therapeutic procedures is carried out on an ambulatory basis and that in consequence many hospital beds are saved. He also claims that in hospitals where members of the staff practise group medicine the family physicians in the scheme become essential members of the hospital group and enjoy all the educational advantages of an intimate hospital relationship. Moreover, the hospital has the advantage of being more intimately related to the medical and socio-medical problems of the community (Baehr, 1953).

Many other schemes in the United States provide in one way or another useful and continuing postgraduate associations with medicine as practised in hospitals. In addition to HIP, I have referred above to the medical care scheme in Baltimore. I was also able to see the Bingham Associates Plan in Boston. It is impossible here to give a detailed description of these schemes. Many of their features are, of course, concerned with means of providing medical care, but they afforded me excellent opportunities of studying certain aspects of general practice in the United States, and particularly the association of the family doctor with the hospital and teaching centre.

Is the Pattern of American General Practice Wholly Satisfactory?

I certainly saw much in the United States that showed me how our own standards could be improved. I realize there may be, as I have been told, general practitioners of poor standard. But I was concerned only with the achievements possible under American conditions, the potentialities of that type of practice. Obviously the American doctor has more time to see his patient: he requires it to practise his wider range of skills. Again, he must give a patient who is paying a high fee a consultation of some length. These things are in his favour and, apart from cost, in favour of the patient. But sufficient time for every patient will probably long remain, even in America, a counsel of perfection. There will always be a need to do what must be done and to leave at least some of the other less necessary things undone. The art of practice—and it is still an art despite modern scientific resources—will consist then in doing for each patient what he or she most requires.

I should hesitate to criticize American general practice on the basis of the small sample of it I saw. It did seem to me, however, that more time might sometimes have been given to consideration of the patient as a person. It may be this is due in some measure to preoccupation with instrumental investigation, laboratory tests, x-ray examinations, etc.—and time, as always, is the enemy. At any rate, the "history" sometimes seemed rather a stereotyped interrogation. It is but fair to say that one of the doctors who best appreciated the importance of establishing rapport with his patient, of considering emotional factors, and of viewing the patient as a person, was the possessor of quite the most elaborate accommodation and equipment I saw anywhere.

It is also difficult on my limited experience properly to assess the value of the American family internist. For some Americans, possibly an increasing number, he takes the place of the general practitioner, within the limits of his restricted form of practice. Possessed of over-average experience in internal medicine, he may surpass the general practitioner in the technicalities of medicine. If the general practitioner neglects what he is best qualified to do—act as

family guide, philosopher, and friend—and enters into competition in another's chosen field, he is destined to defeat. However able the family internist may be, he is bound to be at a disadvantage in the role of family doctor as compared with the general practitioner adequately grounded in internal medicine, who is present when the children are born, who advises the mother about the bringing up of her family, and who is the first to be called in time of illness. The family internist is not, of course, a specialist in the ordinary sense. He seems usually to do at least some very minor surgery, dermatology, eye work, etc. Clearly, it must be well-nigh impossible for him to limit himself rigidly to his specialty, though he will certainly not engage in obstetrics or paediatrics.

The family paediatrician also has no British equivalent. Much of his work is child welfare; and in that he probably has more experience than the paediatric specialist in Britain, who is mainly concerned in the care of sick children. I have discussed the question of the family paediatrician with doctors in that form of practice and with paediatric teachers in medical schools. They agree that a general practitioner who is adequately trained in internal medicine and has a reasonable knowledge of other branches of his work, including paediatrics, can give entirely adequate care to children, well or ill, provided he has access to specialist help when necessary.

If, then, these family specialists have a technical lead in their own sphere over the good general practitioner, it must be reduced by a relative lack of the real basis of general practice—knowledge of the patient, his family, his work, and his background. There are undoubtedly some who consider that the internist is the one who should be concerned chiefly with the very personal type of care which most people require, that he should take over such duties from the general practitioner. Darley's (1949) wise answer is: "If this is to be so, the training of the internist will have to be much different from what it is to-day."

At the beginning of my visit a knowledgeable adviser told me that someone of considerable standing in the profession had recently said to him that the general practitioner in America was a disappearing entity. He added that he did not himself believe the statement but would be interested to hear what conclusions I came to after my survey of general practice. I can answer emphatically that I saw no reason to fear for the future of general practice in America.

Darley (1952b) states that between 1938 and 1949 there was a 19% increase in the total number of doctors, and that specialists increased 98%. Pullen (1951), after quoting the similar figures, says "the pendulum is swinging and the general practitioner is coming into his own." He quotes student polls by the Council on Medical Education and Hospitals of the American Medical Association which indicate that the percentage of students planning to enter practice has increased from 36 to 47%, and that the number planning to specialize has decreased from 36 to 31%. What may be said of these figures, general practitioners still constitute 47.5% of doctors registered in the United States, while specialists form only 27.3%; the remaining 25.2% are interns, residents, Government servants, etc.

I was most impressed, not by figures, but by the standard of work I saw done by certain general practitioners, the reactions of patients, and the refreshing confidence of all in the future of general practice. This confidence was undoubtedly contributed to by the success of the American Academy of General Practice. With its membership of 17,000 it has already done a great deal to enhance the status of the general practitioner.

II. THE BRITISH GENERAL PRACTITIONER School and Undergraduate Medical Education

In Britain, school education begins and ends, generally speaking, at the same ages as in the United States. I have no information on the relative standards of attain-

ment; but, presumably, any balance in favour of one or other country must be a small one. The American medical student has then a rather longer preparation for the study of medical subjects, while his British counterpart devotes a little more time to the medical course proper. Everyone who has written about the place of general cultural studies in the training of doctors agrees about their importance. If the preliminary cultural requirements in the United States are greater than here, we must acknowledge their value and criticize, if at all, only on the grounds of cost and practicability. Whether as much ground is covered in their shorter medical course I cannot say, but most people who have intimate knowledge of American medical schools speak of the great industry of the students. No doubt there will be difference of emphasis in the teaching as between the two countries, but it is enough here to say that in Britain and America the medical student receives a very high standard of training.

As in the United States, some medical schools in this country have made provision for introducing the student to the problems of general practice. Similar developments in association with health centre practice are now being introduced.

Graduate Training and Entry to Practice

In Britain to-day there is so much competition for practice vacancies that the doctor without adequate postgraduate experience in hospital and as an assistant has little chance of becoming a principal. Most informed people agree that entry into practice is at present too difficult, and a good deal of harm has resulted from this state of affairs. On the other hand, one beneficial consequence is that adequate preliminary training is now practically ensured. Other developments are leading in the same direction. From January 1, 1953, a doctor must serve a year as an intern before registration.

A committee under the chairmanship of Sir Henry Cohen produced a report on "General Practice and the Training of the General Practitioner" (British Medical Association, 1950a). The report recommends for general practitioners a three-year period of training after registration—that is, four years after graduation. The first of these three years will be spent under the supervision of a general practitioner, the second year in specially designed hospital appointments, the third year will include a choice of opportunities in hospitals and as an assistant or locum in general practice. The Report of the Working Party on the Distribution of Remuneration among General Practitioners (1952) laid down as a qualification for an Initial Practice Allowance (a grant to assist doctors to set up in practice) that the applicant must have been in general practice for not less than two years or have been registered as a medical practitioner for not less than four years. The trainee assistant scheme under the National Health Service has enabled many specially suitable doctors, not otherwise available as trainers, to have assistants; it has thus provided young doctors with an opportunity of an assistantship under favourable conditions for real instruction in the problems of general practice.

The Registrar Problem

A somewhat special situation, presumably temporary, has arisen as a result of more registrars (trainee specialists) being employed in the hospital service than seem likely to be absorbed by promotion to the rank of full specialist. Some of these doctors have decided to give up their attempt to become specialists and have tried to enter general practice. It is natural that, having been qualified for perhaps three and often more years, they should attempt to obtain a practice without a period of assistantship, but such attempts have not as a rule been successful. These doctors should eventually prove to be valuable recruits to general practice if they have the requisite qualities of personality. Even where their postgraduate training has been of a very special nature it should be by no means wasted. The

In a discussion on "The Future of Public Health" at the Johns Hopkins School of Hygiene, which I was privileged to attend, one of the principal speakers asserted that the future of public health lay in the development of medical care schemes which would ensure for the patients the services of a really good physician who was alive to the preventive aspects of medicine and who would strive hard to educate his patients in health matters. The control of communicable diseases, sewerage problems, and water supplies were all very necessary in their day and were still of paramount importance in certain more backward

of work, and the interest general practice provides to the right kind of doctor. Requisite standards of equipment, accommodation, and staffing should be taught to students by someone of undoubted authority in the field of general practice. If exact information on these topics were known to all young doctors the standard would rise as they entered practice and influenced their seniors.

Health Centres

Experimental health centres such as are now ready and those about to be constructed may well provide useful indications for future policy. It might be worth while at least to experiment with centres designed with the aim of providing practitioners not only with full diagnostic and therapeutic facilities but also with intimate association with specialist work. The diagnostic and therapeutic facilities at present available in health centres are generally speaking of the simplest type. Such a new type of centre might go further towards meeting the needs of the present-day practitioner. Moreover, buildings of the same size as those presently contemplated could serve a much larger number of doctors and thus be more economical. It would seem possible also in this way to bring the benefits of group practice to many rural areas, except where distances are very great. At the Rip Van Winkle Clinic at Hudson, N.Y., for example, two practices, 5 and 10 miles respectively from the centre, form an integral part of the group.

Centres of the type described could be planned somewhat on the lines of the medical group centres of the Health Insurance Plan of Greater New York. Doctors could continue to practise from their existing accommodation and be associated with their group centre. It is unlikely that any financial association between the doctors would at first be possible, but that should not be an insuperable difficulty. Diagnostic and therapeutic facilities would either be available at the centre itself or, where appropriate, they would be readily obtainable through an associated centre or elsewhere. The appropriate staff of specialists would work in the centre on a part-time basis; at least some of the remainder of their time would have to be devoted to hospital ward work. It might be possible to link a number of subsidiary centres of an even less expensive type with a major centre. In some cases major centres could well be established at existing out-patient departments of hospitals; in any case, a link with hospital would be necessary, directly or indirectly, for each centre or group of centres.

This may seem merely to be a plan for building out-patient departments, sometimes in physical isolation from the hospitals themselves. So far as buildings are concerned that is probably true. But the essence of the scheme has yet to be added: it is the presence at these centres of the family doctor. Not only would the family doctor have direct use of diagnostic and therapeutic facilities and specialist advice on request, but he would himself be a member of the staff. He might consult at the centre at certain times, but he would also have a much more intimate relationship with his specialist colleagues than he has at present with out-patient department staff. The specialists would be seeing patients for family doctors in a group—a relatively limited number, since certain specialists would be allocated to each group. Like the family doctors, the specialists would come, as members of a group, to know their patients as persons and to appreciate them against their home background, and would be enabled to take their share of preventive and social medical responsibilities. Such a scheme at least not only holds out promise of providing the family doctor with the opportunity of practising preventive medicine better than he can do at present and of employing to the full for the benefit of his patients the clinical skills he has acquired and could develop, but it would enable the specialist to limit his work to cases of real difficulty and at the same time to see important aspects of medicine not now open to him.

There can be little doubt that in groups of this type the family doctor could deal on an ambulatory basis with many patients who at present are admitted to hospital. And

a further number could be treated in their own homes by the family doctor, backed by specialist facilities and advice. Under present conditions both specialist and family doctor naturally expect the patient to be taken over by the hospital and specialist service if any diagnostic and therapeutic measures of the type now available only in hospital are required. Under the scheme suggested it would be incumbent on both specialist and doctor to use their group resources to the full before seeking to have the patient admitted to hospital. And the family doctor would himself be accustomed to and capable of carrying out a far wider range of work; so that he could do more on his own, apart from what further efforts he could make under specialist direction.

Not only would this method of group practice lessen hospital costs, but it might help to solve the medical manpower difficulties of hospital and family practice. There are to-day too many registrars in hospitals: they do not wish to leave hospital work, and, in any case, cannot easily enter general practice. Some of these doctors might be employed as specialists in such a scheme, while others might be attracted to general practice under group conditions. Lastly, they could have a part in both camps and practise a specialty and general practice. On the family doctor side there would be scope to develop skill in a specialty and eventually, if desired, to practise it partly or exclusively. It is not merely desirable, but essential, if the level of family doctor practice is to be raised, to secure hospital experience for the general practitioner. It will be difficult to achieve and may never be possible for all, but group practice offers a solution that could be a means of providing on a very large scale an association with the methods and practice of specialism outside the actual hospitals.

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ULCERATIVE COLITIS WITH REPORT OF A CASE

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It is the purpose of this paper to review some of the literature on ulcerative colitis, and to present the case report of a patient with this disease in whom a successful outcome was obtained by psychotherapeutic means.

Review of Literature

Murray (1930a) investigated the life histories and mental attitudes of 12 patients suffering from ulcerative colitis, and found a close association in time between the emergence of a difficult emotional situation and the onset of symptoms. Mental conflicts concerned with marriage were more common than other types of situations which might evoke anxiety. Murray felt that the outstanding trait in ulcerative colitis patients, besides fearfulness, was their emotional immaturity, and stressed the childish elements in the make-up of his patients. In his seven male patients the onset of the symptoms was associated with the conflict between the mother attachment and the desire for marriage. Of the five female patients in his series, three were involved in marriages of a significant nature, the husbands being obvious father-substitutes, one was engaged but could not marry on account of her colitis, and the fifth was unapproachable on the subject of marriage. In a later publication Murray (1930b) dealt with the analysis of a patient with ulcerative colitis and pointed to the fact that the character and sexuality of his patient corresponded quite closely to the so-called anal level described by Freud, and the masochistic and sadistic components which are so generally associated with anal temperament were very conspicuous in this patient.

In 1936 Sullivan drew attention to the long-recognized association of emotion and diarrhoea, and pointed out that psychotherapy had been astonishingly successful in the treatment of ulcerative colitis. Bagen et al. (1939) discussed pregnancy associated with ulcerative colitis in a series of 17 women sufferers with colitis who had 18 deliveries and 4 miscarriages among them. They concluded that the effect of pregnancy on ulcerative colitis was variable. In 1942 of Daniels, in a review of 14 cases of ulcerative colitis, was of the opinion that these patients were apt to be too dependent on some member of the family, usually the mother, and conflict developed in situations threatening this dependence, especially engagement and marriage. The emotional conflict in these patients was held responsible for the appearance of colitis symptoms. He found childbirth another frequent precipitating factor.

Lindemann (1945), in a review of 45 patients with ulcerative colitis, maintained that various forms of bereavement were the most important precipitating factors in the illness, and for 26 of the 45 patients a close time relationship existed between the loss of an important person and the onset of the illness. He felt that rewarding patterns of social interaction seemed not to be indigenous to these patients, and that this state of affairs became conspicuous only when a key person on whom the patient was dependent and from whom he had borrowed patterns of interaction was removed from the "social field." He warned against deep exploration in the psychiatric handling of these cases, and recommended a superficial supportive therapy, during which the patient could identify with the therapist, and in fact imitate him in order to achieve new patterns of conduct.

In 1946 West reported three cases of ulcerative colitis in which the symptoms greatly improved after superficial psychotherapy. One of the patients subsequently passed into a psychotic state. Crohn (1947) pointed to the strong

association between the stress of marriage, pregnancy, parturition, and the onset or relapse of ulcerative colitis, and indicated the onerous responsibility borne by the physician whose advice is sought regarding marriage and maternity for those of his patients suffering from ulcerative colitis.

In 1948 Daniels attempted to show how ulcerative colitis fitted into the present concept of psychosomatic disease, and pointed out that it had proved to be amenable to psychotherapy when other treatments had failed to bring results. He maintained that somewhat over 75% of sufferers had emotional conflict as a primary causative factor, but he was of the opinion that the emotional factors did not represent the "whole reason" for the condition. Kirsner et al. (1948) reviewed the clinical course of 100 patients suffering from chronic non-specific ulcerative colitis. They found that emotional stress, infections of the upper respiratory tract, and physical fatigue, in that order, were most often associated with the recurrences of symptoms.

Meyer et al. (1948) presented evidence which could possibly elucidate the psychosomatic link in ulcerative colitis in terms more definite than merely a dysfunction of the sympathetic and parasympathetic systems. In their study of the stools of patients with ulcerative colitis they demonstrated that the enzyme lysozyme was present in a higher concentration than in the stools of normal individuals. They found, too, that concomitant with clinical improvement the lysozyme titre in the stools fell. These facts and the experimental production of ulcerations in the small and large intestines of the dog by oral lysozyme administration suggested to them that lysozyme may be the chemical agent initiating the local lesions of ulcerative colitis. They assumed two stages in the pathogenesis of the disease: (1) removal of the surface mucus with dissolution of the mucous cells, and (2) necrosis of the denuded tissue by proteolytic enzymes presumably furnished by micro-organisms. They felt that the reason for localized overproduction of the enzyme by the mucosal cells, in the disease, was obscure.

In 1949 Lindemann drew attention to the fact that in some patients the disappearance of colitis symptoms is associated with the appearance of a psychotic illness, and that when the psychosis passes the colitis symptoms reappear. Mahoney et al. (1949), in a study of 20 patients with ulcerative colitis, found numerous neurotic traits in their subjects, and indicated that most of these traits existed long before the development of the evidence of ulcerative colitis, and that therefore these individuals were either overtly or potentially neurotic prior to the development of the bowel symptoms. Their study indicated, further, that there was a major abnormal parent-child relationship in the early lives of patients suffering from ulcerative colitis. They maintained that none of the personality traits found in colitis patients, when taken alone, were specific for the disease.

In April, 1949, Stewart also drew attention to the fairly typical history of emotional problems which seem to play a part in the pathogenesis of the disease. He pointed out that in the case histories and psychiatric investigations of patients with ulcerative colitis the precipitating factors and the basic personalities were often found to be similar, and he confirmed the fact that these patients give evidence of the presence of neurotic disturbances before the onset of their somatic illness. In the basic personality pattern he stressed their extreme dependence, emotional immaturity, subservient yet subversive attitude to domination, their overt passivity, and their high intelligence. He advocated a reassuring form of psychotherapy, in which dependence on the therapist is fostered, to be replaced by the gradual development of independence.

Maine and O'Neill (1949) presented the case report of a young girl with ulcerative colitis to show how psychological rehabilitation had been followed by disappearance of symptoms and maintenance of good health. They pointed out that the mother's personality made it inevitable that any aggressive feeling or activity on the part of the patient

would be met not only with maternal suppression but with a strong emotional response from the mother, leading to feelings of guilt in the daughter. Further, they indicated that the mother's possessive attitude fostered the patient's dependence upon her and discouraged any attempt at the establishment of an independent life.

In 1950 Glass, Pugh, Grace, and Wolf published the result of further work on lysozyme, which Meyer *et al.* (1948) had previously felt might be the factor initiating the local lesions of ulcerative colitis. They treated human gastric and colonic mucus with lysozyme, and concluded that lysozyme did not exert a lytic action on human gastric and colonic mucus *in vitro*. They admitted, however, that their experiments did not preclude the fact that lysozyme in physiological concentration may actually be capable of destroying or initiating destruction of mucosal cells.

Later in 1950 Grace, Wolf, and Wolff, from their observations of the large bowel in four fistulous subjects, showed that feeling states characterized by anger and resentment were associated with hyperfunction of the colon. This hyperfunction was manifested by hyperaemia, engorgement, hypermotility, and hypersecretion of mucus and of the enzyme lysozyme. They observed that hyperfunction of the colon resulted in increased fragility of the colonic mucosa, and that sustained feelings of anger and resentment associated with sustained hyperfunction of the colon resulted in submucosal bleeding and ulceration.

Lindemann (1950), in the presentation of a case of ulcerative colitis in a man aged 27, drew attention to the morbid relationship which had developed between the patient and his mother. He felt that in this patient, as in some others having abnormal bowel movements, the transition from an impulse to its execution was blocked, and that the man had a marked poverty of expression.

In September, 1950, Tumen and Cohn reported their experience with six patients regarding the influence of pregnancy on the development and the course of ulcerative colitis. In three patients the disease began during or towards the end of pregnancy, and in each of the other three pregnancy occurred during a remission, but failed to bring about reactivation of colitis. They point out that all had had poor relations with their parents, notably their mothers.

In November, 1950, in a report on 173 cases of ulcerative colitis, Pauley was impressed by a similarity in the case history and personality of many of his patients. He found them to be excessively dependent and parent-controlled, usually in respect of the mother. He found that the precipitating factors in the onset of the disease and in the relapses were almost always to be found in the emotional field and in interpersonal relations inside the family.

In December, 1950, Gray *et al.*, in their studies of lysozyme in the stools of patients with ulcerative colitis, failed to observe clinical improvement following prolonged inhibition of faecal lysozyme by the oral administration of a detergent ("aerosol OT"). These authors believed that this raised some doubt concerning the significance of lysozyme in the pathogenesis of the disease, but they emphasized, however, that the inhibition of lysozyme in the faeces by detergents does not necessarily reflect inactivation of the enzyme within the mucosal cells of the colon.

In January, 1951, Almy, in a report of experimental studies on the irritable colon, demonstrated that when both healthy persons and patients with irritable colon are under stress induced by experimental stimuli the sigmoid colon may show engorgement and disturbances in motility coincident with periods of emotional tension. He concluded that in most instances irritable colon was a bodily change accompanying emotional conflict in response to environmental stress.

In March, 1951, Groen and Bastiaans reported on 29 cases of ulcerative colitis observed during the period from 1939 to 1949 and treated by psychotherapeutic measures alone. They stressed the efficiency of superficial supportive psychotherapy.

In May, 1951, a committee on psychosomatic relationships in gastro-enterology under the chairmanship of Dr. Stewart Wolf (1951) reported that, as in the case of most bodily organs and organ systems, the gastro-intestinal tract showed significant changes in form and function in association with life situations which the individual consciously or unconsciously interpreted as threatening. The committee considered the relevance of these changes to the occurrence of structural disease of the viscera to be still incomplete, but maintained that a gathering body of data indicated that the changes may be of first-grade importance in the pathogenesis of such disorders as peptic ulcer and ulcerative colitis. Although at first altogether functional and transitory, the changes may, when unduly sustained, lead to structural damage and disease.

Grace, Wolf, and Wolff (1951) published a study of direct observations made on exposed segments of colon of four fistulous human subjects, and included indirect measurements made on a variety of intact healthy subjects, on subjects with diarrhoea and constipation, and also on 19 subjects with ulcerative colitis. They concluded that life situations provocative of abject fear and dejection were associated with hypofunction of most of the large intestine, and that life situations provocative of conflict, with feelings of anger, resentment, and hostility, or of anxiety and apprehension, were found to be associated with hyperfunction of the colon. They viewed ulcerative colitis as a stress disorder, and were of the opinion that a constructive physician-patient relationship was of the greatest benefit to the patient receiving treatment, and that favourable results in treatment were not obtained without such a relationship. They found the patient with ulcerative colitis to be characteristically an outwardly calm, superficially peaceful individual of more than usual dependence. On probing beneath this calm exterior it became apparent that this outwardly placid person was "sitting on a powder keg" of intense hostility, resentment, and guilt.

Psychogenetic Features

As can be seen from the above review of some of the recently published work, a distinct personality type in sufferers from ulcerative colitis has not been uncovered, but a few personality facets common to almost all patients with colitis have been revealed. Arising out of their observations, most writers have stressed the following characteristic features in their patients: (1) their immaturity and childishness; (2) their extreme dependence and passiveness; (3) the strong parent- (or substitute-) patient relationship, with its suppressed resentment and guilt; (4) their poverty of expression; and (5) their above-average intelligence.

Likewise in dealing with the precipitating environmental factors there is not unanimity, but workers have emphasized the importance of: (1) the marriage situation, with its demand for maturity and independence from parents, and with its responsibilities; (2) pregnancy and parturition, with their attendant stress; and (3) the loss of security, especially that pertaining to the loss of another person of emotional significance.

Case Report

In this report the psychiatric aspect of a case of ulcerative colitis is presented. The interplay of the major personality features and precipitating environmental factors outlined above are illustrated. The patient responded well to psychotherapy, remained symptom-free for two years despite many stressful situations, and then relapsed to a considerable degree in the wake of a minor incident. After five weeks of psychotherapy her symptoms again disappeared, and at the time of preparation of this report she had been well for 16 months.

A housewife aged 35 was admitted to the medical wards of the Johannesburg General Hospital on November 3, 1949, under the care of Dr. M. M. Suzman, with the complaint of recurrent attacks of diarrhoea with blood and mucus in the stools, of 11 years' duration.

The first attack, which lasted a few weeks, took place in August, 1938. The symptoms reappeared in January, 1939, and lasted for 12 months. During this period she passed between 25 and 30 stools on some days, and at one stage weighed only 65 lb. (29.5 kg.). In 1942 mild symptoms of colitis reappeared, but they lasted only a few weeks. In December, 1947, the symptoms again appeared, and, apart from a few remissions lasting some months, the colitis progressed until the time of admission. At that stage stools were frequent, up to 10 daily, and contained blood and mucus. There were fever, the temperature reaching 101.6° F. (38.7° C.) on occasions, colicky abdominal pains, fatigue, and debility, and a fall in weight from 136 to 105 lb. (61.7 to 47.6 kg.) over a period of three months.

Physical examination was essentially negative, apart from the state of undernutrition and generalized abdominal tenderness. Sigmoidoscopy revealed the presence of two bleeding ulcers in the lower colon. The appearance was consistent with a diagnosis of ulcerative colitis. Repeated stool examinations failed to reveal parasites or pathogenic or aberrant bacteria. A blood count showed: haemoglobin, 12 g.%; erythrocytes, 4,300,000; leucocytes, 8,400 per c.mm. The sedimentation rate was 31 mm. in one hour (Wintrobe). Gastric analysis revealed a low acid curve.

There was no record of the medication given in the months before admission to hospital, but according to the patient it had been extensive. In the hospital, medication consisted of the administration of 15 g. of aureomycin over a period of 10 days, a bismuth mixture, compound vitamin-B tablets, and phenobarbitone, $\frac{1}{2}$ gr. (32 mg.) thrice daily during the same period. As no improvement followed, psychiatric investigation was started.

Psychiatric Investigation

Interviews of an hour each, two or three times a week, began on November 14 and continued for 10 weeks. The patient was born in New Zealand. Her mother was a Jewess, and her father a Gentile. He had been injured during the 1914-18 war, was a nervous and ineffectual person, and died in his early forties when the patient was 11 years old. Her mother, aged 68, was alive and well, and had always been a capable and domineering person, being the main financial support of the family during the patient's childhood; she was a school-teacher by profession. The patient had one sister, seven years her senior, who was a school-teacher in New Zealand.

The patient completed her secondary schooling and became a sales lady. At the age of 21 she migrated to South Africa with her mother, but her sister did not accompany them. Both the patient and her mother obtained employment in the same firm, and both had held senior positions for some years. Until the time of her marriage at the age of 33 she and her mother shared an apartment. Her past medical history was not remarkable.

Stress and Symptoms

Her symptoms of ulcerative colitis first appeared at the age of 24, following a proposal of marriage which she refused, ostensibly on the grounds of religious differences. She now feels that she refused the proposal because she was anxious about leaving her mother. The symptoms lasted about 12 months.

Four years later the symptoms returned. This episode began a few days after the arrival in South Africa of her sister, who came to pay her mother a visit. Within a few days of her sister's departure for New Zealand the symptoms subsided.

Five years later, at the age of 33, the symptoms recurred. This coincided with her husband's proposal of marriage. Many months elapsed before she finally married him, during which time the symptoms were severe. There was a remission during the weeks prior to the marriage, but on the second day of the honeymoon the colitis reappeared.

and necessitated an early return to Johannesburg and her mother. During the next two years, until the time of her admission to hospital in November, 1949, the symptoms of ulcerative colitis had continued, with only short remissions.

She described her marriage as a happy one, and this was confirmed by her husband, who was of the same age and who appeared to be understanding, pleasant, and co-operative. They both claimed that the sexual aspect of the marriage was satisfactory. They devoted a great amount of time to the patient's mother and to the husband's parents, spending each day of the week with either one or the other. The relations between the husband and his mother-in-law were very strained, and he strongly resented her domination of, and interference in, his wife's affairs, but seldom spoke about it for fear of upsetting the patient.

Psychotherapy and Progress

The whole psychotherapeutic approach was one of sympathetic understanding and support. The concepts of psychogenesis and psychosomatic disease were explained to her, and efforts were made to establish a sound rapport and to correlate the onset of symptoms chronologically with stress situations. The aim was to foster emotional dependence upon the therapy situation initially, and then to wean her of that gradually. The central theme of most of the interviews was her hostile-dependent relationship with her mother, and she eventually expressed resentment freely. After about four weeks her symptoms subsided, and there were only minor relapses during the next six weeks, at which time she would herself try to correlate the symptoms with emotional stress.

She was discharged from hospital in January, 1950, 10 weeks after the beginning of the psychiatric investigation. She was then passing one well-formed stool a day, without blood or mucus.

Progress after Discharge

Within the first few weeks after going home the symptoms threatened to return on a few occasions. This was shown by a softer consistency and an increased number of stools. She immediately communicated with me, sometimes by telephone, and after a short discussion of the immediately preceding significant social events the stools returned to normal. These events were wholly concerned with her mother.

From April 7, 1950, until June 13, 1952, she remained completely free of symptoms. During this time she had given birth to her first child, her mother had died of a coronary thrombosis, her father-in-law had died, and her mother-in-law had come to live with her; and in December, 1951, she became pregnant for the second time.

She had seen me at three-monthly intervals at my request, apart from two interviews which she asked for at the time of her mother's death.

The Relapse

On June 13, 1952, when her symptoms had been absent for over two years, and when she was in the last trimester of her second pregnancy, there was a relapse. Initially mild, within two weeks she was having 10 stools a day, accompanied by blood and mucus. Out-patient interviews were resumed for six weeks. By the fifth week of therapy she was again symptom-free, and has remained so for 16 months. Her second child is 15 months old.

During the week prior to the beginning of the symptoms in June, 1952, I had asked the patient to meet another woman suffering from ulcerative colitis, in an attempt to show her that psychotherapy had a place in the treatment of her condition. My patient became too interested and involved in the solving of the other person's difficulties, and, unknown to me, saw her twice more during the same week. The day after the third meeting she received a letter from her sister in New Zealand discussing the proposed wording of the plaque to be erected to the memory

of their mother. The wording suggested was "To live in the hearts of those we love is not to die." This had tremendous emotional significance for the patient, whose feelings of guilt became overwhelming. Next day the symptoms began.

Psychosomatic Assessment

The major personality features in cases of ulcerative colitis described by other authors are easily recognizable in this patient. She was emotionally immature, particularly in her relationship with a dominant and possessive mother, and the keynote of that relationship was the hostile-dependence which evoked a considerable degree of guilt. Her intelligence was well above average.

Environmental stress situations immediately preceded the onset of symptoms on each occasion. The situations were associated with marriage, proposed marriage, or with a threat to the security of her emotional dependence on her mother, such as the visit of her sister in 1942. It was felt that her desire for marriage and emancipation from her mother's domination was in conflict with her basic personality pattern.

The resentment, and emotional tension resulting from her conflict, apparently manifested in disturbances in the function and ultimately the structure of the lower bowel, as has been described by other authors.

This case report seems to strengthen the plea for psychiatric investigation in patients with ulcerative colitis.

Summary

The literature on the psychosomatic aspects of ulcerative colitis has been reviewed.

The report of a case of ulcerative colitis is presented in which the patient displayed disturbances in interpersonal relationships, characterized by emotional immaturity, guilt, dependence, and resentment towards a dominating mother. The stressful situations evoking the disturbances were associated with marriage, proposed marriage, and situations threatening the security of the patient's dependence.

The major personality features and the precipitating environmental factors in the report conform to those stressed by other authors.

It is felt that this case report strengthens the plea for psychiatric investigation in patients with ulcerative colitis.

I wish to record my thanks to Dr. M. M. Suzman, specialist physician on the staff of the Johannesburg General Hospital, for his constant encouragement and guidance, both in the handling of this case and in the preparation of this article, and to Dr. Stanley Cobb, psychiatrist-in-chief, Massachusetts General Hospital, for his most helpful suggestions regarding the review of the literature.

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ELECTROLYTE IMBALANCE IN TUBERCULOUS MENINGITIS

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Mestrezat (1912) first focused attention on the diagnostic value of the chloride content of the cerebrospinal fluid (C.S.F.) in tuberculous meningitis, and he and other workers (Mestrezat, 1924; Greenfield and Carmichael, 1925; Foord and Forsyth, 1933) have all laid great stress on the value of a low C.S.F. chloride in the diagnosis of this disease. Merritt and Fremont-Smith (1937) observed a correlation between the chloride contents of the C.S.F. and plasma, and found a lowered concentration of chloride in the C.S.F. in any condition in which the plasma chloride concentration was low. As a low C.S.F. chloride associated with a low plasma chloride is often found in purulent meningitis, in intracranial disease, and in any condition causing vomiting, the occurrence of a low C.S.F. chloride in tuberculous meningitis cannot be regarded as being specific.

The use of streptomycin in the treatment of tuberculous meningitis has made possible the long-term study of the hypochloreaemia and other electrolyte disturbances, of which a lowered C.S.F. chloride concentration is a manifestation. Rapoport *et al.* (1951) studied three children aged between 2 and 3 years by load-clearance techniques one week, two weeks, and three months respectively before death, when the patients whose food intake was poor were more or less comatose and having mild convulsions, but were not vomiting. The effects of loads of hypertonic saline, ammonium chloride, potassium chloride, and sodium thiosulphate were studied in these three children and one control. These workers concluded that, because the concentration of sodium and chloride in the urine did not fall to minimal amounts when the levels in the plasma were low, there was some "disturbance in renal electrolyte control," probably located in the proximal tubule of the kidney. At post-mortem examination the kidneys of these children were normal macroscopically and microscopically.

Further studies on the electrolyte disturbance in tuberculous meningitis were made by Harrison, Finberg, and Fleishman (1952). They investigated 16 children, finding that plasma concentrations of sodium and chloride were reduced, but that no consistent change in the potassium occurred. They found the sodium concentration in red blood cells and skeletal muscle to be increased, and the potassium to be normal in the former and reduced in the latter. Although they concluded that a disturbance governing ion equilibrium existed in these cases, no definite hypotheses on the causation were advanced.

It is conceivable that successful therapy against these electrolyte disturbances may complement specific therapy in tuberculous meningitis and assist recovery.

In the present investigation the electrolyte patterns of children with tuberculous meningitis have been related to their clinical conditions. Cases showing abnormal patterns have been followed for long periods, and the effects of intravenous injections of hypertonic saline and potassium salts orally have been studied.

Material

Nineteen patients with tuberculous meningitis and two with miliary tuberculosis only have been studied in this investigation. Their ages ranged from 1 to 13 years. Thirteen of these were receiving streptomycin by intrathecal and intramuscular routes, and one of these, who had gross internal hydrocephalus, was also receiving "purified protein derivative" (P.P.D.) intrathecally. Five patients who were improving had finished their course of intrathecal treatment but were still receiving streptomycin intramuscularly, and the two with miliary tuberculosis only were receiving the same. One patient was on the point of discharge and was receiving no treatment. Four, all in a poor general condition with an electrolyte disturbance, were given loading doses of saline intravenously. They were all vomiting at the time and were receiving streptomycin intramuscularly and intrathecally. Two of these who were still in the same condition were given potassium salts orally. All these patients were under treatment in the Streptomycin Unit of this department. Hypertonic saline was given to two cases in the general wards as controls for the saline-loading investigations.

Procedure

Blood was collected from the 21 patients at various stages of the disease, and the plasma CO₂ content, plasma or serum chloride, and serum sodium concentrations were determined. Urine was collected at the same time and the urine chloride content estimated. The estimations of various electrolytes in plasma or serum were repeated in seven children with hypochloreaemia at intervals varying from 6 to 164 days after the initial investigations.

Infusions of hypertonic saline were given to four patients with hypochloreaemia who were in the active stages of the disease. The loading dose of saline was given intravenously as a 15% (w/v) solution in amounts calculated to bring the plasma chloride back within the normal range, assuming that the Cl ion is mainly extracellular and that the extracellular compartment is approximately 25% of the body weight. Two controls received an arbitrary dose of sodium

chloride. Three of the patients and the two controls were given 30-40 ml. of water every half-hour for three to four hours before the load and one and a half to two hours after it. One patient was given N/5 saline by mouth in doses of 30 ml. every half-hour for four and a half hours before the load and for one and a half hours afterwards. Urine was collected for a period before the hypertonic saline injection and for one and a half to two hours afterwards: the volume was noted and the sodium and chloride concentrations were estimated. Samples of blood for estimations were collected before the hypertonic saline injection and at intervals afterwards.

To test the hypothesis that these children might be suffering from a potassium deficiency two children were given potassium orally in amounts equal to an arbitrarily chosen deficit of one-quarter of their total body potassium. The potassium was given in divided doses over a period of five and four days respectively as a mixture of the citrate and chloride in a ratio similar to the ratio of bicarbonate to chloride in the extracellular fluid. This was done to avoid, so far as possible, any secondary effects on the acid-base state. In both these cases the diet was checked so that potassium intake did not suffer large fluctuations. Urine was collected during the four days before administration, during the time potassium was given, and for a period of four days afterwards.

All cases in this study were receiving *para*-aminosalicylic acid in the form of the sodium salt. The dosage was always approximately 0.5 g./kg., and it has been calculated that each case received around 60 mg./kg./day of sodium in this way.

Analytical Methods

Chloride was estimated on 0.2 ml. of plasma by Sendroy's (1937) method. Plasma CO₂ content was estimated on plasma which had been collected and centrifuged under liquid paraffin in either the volumetric or manometric apparatus of Van Slyke (Van Slyke, 1917; Van Slyke and Neill, 1924). Sodium was precipitated from a serum filtrate as sodium zinc uranyl acetate according to the modification of Butterworth (1951). The method of Jacobs and Hoffman (1931) was used for the determination of serum potassium. All the urine potassium determinations and many of the sodium estimations were made on an E.E.L. flame photometer.

Results

1. Electrolyte Patterns in Blood and Urine

Details of 21 cases are given in Table I. The cerebral condition was assessed in most cases by the presence or absence of papilloedema. Although many cases had air

TABLE I.—Data of 19 Cases of Tuberculous Meningitis and 2 Cases of Miliary Tuberculosis

Case No.	Age (Years)	Sex	Blood (mEq/l.)			Urine (mEq/l.)	Duration of Illness from Onset	Cerebral Condition	Vomiting in Preceding Fortnight	Period of Treatment
			Plasma Cl	Plasma CO ₂ Content	Serum Na					
1	9	F	89	30	131	24	13 days	Papilloedema	++	6 days
2	10	F	92	31	135	57	33 "	Normal	++	23 "
3	11	M	82	34	140	18	4 weeks	Papilloedema	+++	4 "
4	5	M	87	29	138	98	4 months	Papilloedema and hydrocephalus	+	3 months (P.P.D.)
5	8	M	92	28	137	—	26 days	Papilloedema	++	5 days
6	11	F	83	31	132	34	15 "	"	++	8 "
7	2	M	80	23	133	123	16 "	Normal	++	2 "
8	5	F	88	27	135	37	15 "	Papilloedema	+	3 "
9	3½	M	89.5	26	124	56	11 "	Normal	+	3 "
10	9½	F	91	20.5	138	55	23 "	"	+	2 "
11	13	M	102	25	142	140	8½ months	Normal	—	7 months (completed for 1½ months)
12	3½	M	101	26	143	98	12 "	"	—	11 months
13	1½	M	98	24	144	—	8 "	"	—	6 months (completed for 2 months)
14	13	M	101	25	150	130	28 "	"	—	25 " (" " 3 weeks)
15	1½	F	101	23	146	116	3½ "	"	—	3 months
16	1½	F	99	24	141	50	3 "	"	—	3½ "
17	10	F	99	28	141	63	4 "	"	—	5 months (completed for 1 month)
18	7½	M	99	25	138	135	5½ "	"	—	6 months (all treatment completed for 2 months)
19	7	M	102	28	146	134	9 "	"	+	3 days
20	6	F	99	23	—	117	6 days	"	+	4 "
21	5	F	97	22	142	137	4 weeks	"	+	"

+ = Occasional vomiting. ++ = Vomiting once or twice a day. +++ = Vomiting more than twice a day.

studies, only one showed definite hydrocephalus, most of the patients with papilloedema being too ill for air studies to be done.

Ten patients (Cases 1-10) had a plasma chloride concentration of 92 mEq/l. or less, whereas nine patients with tuberculous meningitis (Cases 11-19) and two with miliary tuberculosis (Cases 20 and 21) had plasma chloride values within the normal range (95-106 mEq/l.). The serum sodium concentrations also showed a definite difference, although this was not so marked as in the case of the chloride values. Although only one child in the group with hypochloraemia had a serum sodium as high as 140 mEq/l., all but one of the other group had values above this figure. In nine of the children with hypochloraemia the chloride content of one specimen of urine (collected at the same time as the blood) was estimated. In all of them there were more than minimal amounts of chloride (18 mEq/l. or more) in the urine, in the presence of low concentrations of chloride in the plasma. The occurrence of serious vomiting in the fortnight preceding these investigations is confined to the group with an abnormal electrolyte pattern, as is abnormality in the cerebral condition (Cases 1-10). On the other hand, all 11 children with a normal electrolyte pattern had a normal cerebral condition (Cases 11-21). Nine of them had been treated for periods of three months or longer and had no recent vomiting. The remaining two children in this group had been ill for a shorter time. They were vomiting occasionally but had miliary tuberculosis only and no meningitis (Cases 20 and 21).

2. Changes in the Electrolyte Pattern with Changes in Clinical Condition

Table II gives the results of determinations of electrolytes in serum or plasma, together with any changes in cerebral condition and vomiting, in seven cases of hypochloraemia,

TABLE II.—Follow-up Blood Electrolytes in Seven Cases

Case No.	Plasma Cl (mEq/l.)	Plasma CO ₂ Content (mEq/l.)	Serum Na (mEq/l.)	Urine Cl (mEq/l.)	Cerebral Condition	Vomiting in Preceding 2 Weeks	Days between Investigations
1	89 93	30 26	131 140	24 84	Papilloedema Slight papilloedema	++ +	58 106
2	92 95 97	25.5 25 29	147 143 (?) 145	— 35 35	Normal "	++ ++	58 106
3	82 87 97	34 30 25.4	140 143 140	18 59 —	Papilloedema Papilloedema and hydrocephalus	+++ ++	32 120
4	87 89 97	29 31 26	138 137 139	98 100 —	Papilloedema and hydrocephalus "	++ +	41 116
6	83 89 95	31 33 31	132 143 (?) 144	34 24 —	Papilloedema Normal	++ +	6 100
8	88 88	27 34.5	135 137	37 31	Papilloedema "	++ ++	22
9	89.5 88 94	26 27 27	124 141 (?) 140	56 116 —	Normal "	++ ++	14 55

In none of which had there been any persistent attempt to adjust the electrolyte disturbances. The second set of determinations (in Cases 3, 4, and 6) were just prior to the load of hypertonic saline, but this load is unlikely to have affected the subsequent determinations, which were done after intervals of at least 64 days. Similarly, it is unlikely that the third set of determinations (in Case 9) were affected by potassium therapy, which finished 50 days before.

A progressive improvement in the electrolyte values is seen in all children except Case 8. The increase in the concentration of chloride and sodium in the serum or plasma coincided with improvement both in the general condition and in the state of the meningitis, and simul-

taneously there was a diminution in vomiting. Case 3 was developing hydrocephalus during the investigations, but the meningitis healed and his general condition improved and vomiting ceased. Similarly, in Case 4 there was an improvement in the electrolyte pattern at the third estimation, when vomiting had ceased, but hydrocephalus was still present. One patient (Case 8) was extremely ill. She did not respond to treatment, deteriorated rapidly, and died three days after the second set of determinations recorded in Table II.

3. Load of Hypertonic Saline

The injection of hypertonic saline produced a rise in the concentration of plasma chloride and serum sodium in all cases at the second estimation, which was made within one hour of the injection. A third estimation 27-30 hours later was made in two cases of tuberculous meningitis (Cases 6 and 8) and one control. Case 8 was very ill and died a few days later. Homeostasis must have been seriously disturbed, as very little urine was passed through the indwelling catheter for 174 minutes after the injection. In the other two (Cases 6 and Control 2) the serum chemistry returned to the pre-injection levels within 30 hours. Case 6 had a normal serum sodium, but a low plasma chloride, which after a transient rise returned to a low value, indicating an inability to maintain the plasma chloride at a level approaching normal (Table III).

TABLE III.—Results of Sodium Chloride Loads (Electrolyte Levels)

Case No.	Pre-injection Levels (mEq/l.)			Post-injection Levels (mEq/l.)								
	Na	Cl	CO ₂	Time	Na	Cl	CO ₂	Time	Na	Cl	CO ₂	
3	134	93	25	1.0	136	102	23	—	—	—	—	—
4	137	89	31	0.5	143	101	27	—	—	—	—	—
6	143	89	33	0.75	147	96.5	30	30	143	92	31	—
Control 1	137	88	34.5	0.75	139	94	23	—	—	—	—	—
Control 2	149	96	26	0.5	150	105	34	27	139	96	37	—
Control 2	142	99.5	28.5	0.5	144	109	27	29	144	100	29	—

The basic excretion of chloride in mEq/min. during the pre-injection period was assumed to be the same throughout the whole study, and this amount was subtracted from the total excretion in any period. Table IV shows the

TABLE IV.—Results of Sodium Chloride Loads (Excretion)

Case No.	Hydration Prior to Injection	Weight in Kg.	Dose of 15% NaCl in ml.	Time of Study after Injection in Minutes	% Excreted in Period of Study	
					Na	Cl
3	N/5 saline	8.2	17	122	27	4.5
4	Water	15.0	35	162	17	18
6	"	27.7	50	129	17	9
8	"	18.6	30	174	0	0
Control 1	"	24.1	40	228	21	11
" 2	"	22.7	35	177	64	47

percentage of the dose of sodium and chloride that was excreted in the four cases and two controls. The excretion of sodium and chloride during the pre-injection period in Case 3—hydrated with N/5 saline—was much higher than in any other cases, and there was little increase in the excretion of chloride after the hypertonic saline injection. Control 1 showed a response indistinguishable from that of Cases 4 and 6, whereas Control 2 excreted a much greater percentage of the injected dose in 177 minutes. In Case 8 the child was extremely ill and unconscious, and excreted none of the injected dose within 174 minutes. A few days later she became grossly oedematous and died.

4. Administration of Potassium

The effect of potassium administration on the plasma pattern and on the excretion of potassium in the urine of two children with tuberculous meningitis and hypochloraemia is shown in Figs. 1 (Case 6) and 2 (Case 9). Case 6 was given 143 mEq of potassium a day, and

excreted 74% of the ingested potassium during the five days of administration and the subsequent four days. About 26% of the dose was therefore retained, unless it was lost by vomiting.

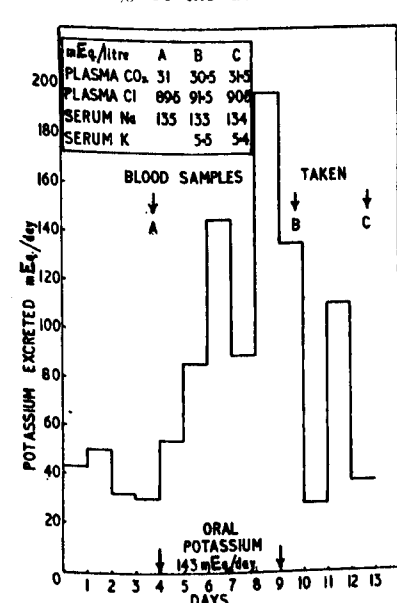


Fig. 1.—Case 6. Effect of potassium administration on the plasma pattern and the excretion of potassium.

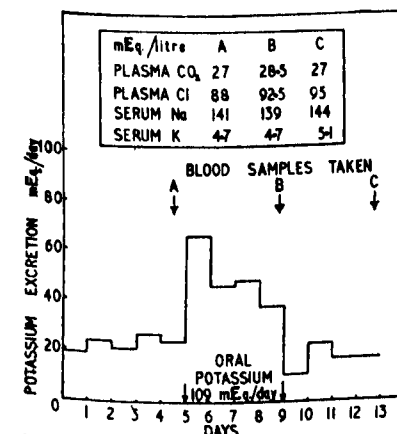


Fig. 2.—Effect of potassium administration in Case 9.

two cases of hypochloraemia resulted in retention of potassium and an improvement in the electrolyte pattern in the case with a normal serum sodium level, while it caused an insignificant retention of potassium and no change in the plasma pattern in the case with a low serum sodium level.

Discussion

This investigation shows, as was to be expected, that the occurrence of an abnormal electrolyte pattern in a group of children suffering from tuberculous meningitis was confined to those in whom the illness was of recent origin or in whom the cerebral condition was abnormal. On the other hand, children who had been under treatment for longer periods or who had miliary tuberculosis only did not show any abnormality in the electrolyte composition of the plasma. The clinical feature, however, which distinguished the two groups in the period preceding the collection of the blood was the food intake and the vomiting. The children with tuberculous meningitis and an abnormal electrolyte pattern had a low food intake and had been vomiting for two or more weeks before the initial estimation of the electrolyte content of the plasma. The importance of vomiting as the immediate cause of the electrolyte disturbance is further demonstrated by the fact that the most marked and most consistent of the changes was the hypochloraemia.

A direct effect of an abnormal cerebral condition on the causation of hyponatraemia and hypochloraemia becomes unlikely in view of the progress of Cases 3 and 4. In both these cases vomiting had ceased, but hydrocephalus was still present at the time that the electrolyte pattern had returned to normal.

In view of the suggestion by Rapoport *et al.* (1951) that defective kidney function accounts for the electrolyte disturbance in tuberculous meningitis, an attempt was made in the present investigation to assess the role of the kidneys. The experiments with the load of hypertonic saline were unfortunately inconclusive because of the different response of the two control cases, one of whom showed no difference from the response of the children with tuberculous meningitis.

Although it is realized that the estimation of the chloride content of one isolated specimen of urine may not give a true picture of the chloride excretion over 24 hours, it is thought that the presence of more than minimal amounts of chloride in the urine on more than one occasion in all the children with hypochloraemia is of significance. Such an occurrence might be due to a hypofunction of the electrolyte-regulating hormones of the adrenal cortex—that is, an Addisonian syndrome. A similar disturbance, however, is observed in potassium-deficient patients, and an experiment with potassium loads orally was planned to test this hypothesis. The retention of 81% of the potassium by a child with hypochloraemia and with a normal serum sodium resulting in a normal electrolyte pattern, and the retention of only 26% of the administered potassium by a child with a low serum sodium, suggests that in some cases at least there is a deficit of potassium and also that large doses of potassium cannot be retained in the presence of a sodium deficit and therefore cannot correct the electrolyte disturbance. It seems that the position is analogous to that in which, in the presence of a deficit of potassium, large amounts of saline do not restore the plasma pattern to normal until potassium is given as well.

Our present study suggests that vomiting and reduced food intake leading to a deficit of the main electrolyte ions Cl, Na, and K can explain the electrolyte disturbance in children with tuberculous meningitis. This study has not excluded the presence of a "disturbance in renal electrolyte control" (Rapoport *et al.*, 1951), neither has it excluded "a disturbance of the mechanisms governing ionic equilibrium between cells and extracellular fluid" (Harrison *et al.*, 1952). We think, however, that it is unnecessary to postulate that such disturbances exist, unless it can be proved that the observed abnormalities in electrolyte metabolism cannot be accounted for by the more simple phenomena of vomiting and reduced food intake.

Although this work is inconclusive, it seems to us that the maintenance of adequate electrolyte intake in the early stages of tuberculous meningitis may be an important factor in assisting these children to recovery.

Summary

The electrolyte disturbance in tuberculous meningitis has been studied. In a group of 19 children with tuberculous meningitis and 2 with miliary tuberculosis only, 10 were found to have an abnormal electrolyte pattern.

A correlation was found between the abnormal electrolyte pattern (hypochloraemia, hyponatraemia, and an increased CO₂-combining power) and the occurrence of serious vomiting.

The abnormal electrolyte pattern was not seen in children who had been treated for long periods, and it disappeared after cessation of vomiting, on improvement in the cerebral condition, and on increase of the oral intake to within normal limits.

Injections of hypertonic saline in four cases did not increase the plasma chloride permanently. Transient rises were noted.

Potassium as a mixture of chloride and citrate was administered to two children by mouth and balance studies were made. In one child with a normal serum sodium 81% of the potassium given was retained. In another child, who had a low serum sodium, only 26% was retained.

It is suggested that the electrolyte disturbances in tuberculous meningitis can be explained by the serious vomiting and prolonged low food intake in the early stages of the disease. The abnormality is not due to a deficiency of any one electrolyte, but is probably due to a combined deficit of sodium, chloride, and potassium. Ensurance of an adequate electrolyte intake may be an important contributory factor to the recovery of patients with tuberculous meningitis.

Thanks are due to Professor R. S. Illingworth for permission to study cases under his care, and to him and Professor H. A. Krebs, F.R.S., for helpful criticism in the preparation of this paper. We are indebted to the staff of the Biochemistry Laboratory, Royal Infirmary, Sheffield, for making many of the urine electrolyte investigations.

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CLINICAL AND CHEMICAL STUDIES IN HUMAN LACTATION

VII. THE EFFECT OF DIFFERENCES IN YIELD AND COMPOSITION OF MILK ON THE INFANT'S WEIGHT GAIN AND THE DURATION OF BREAST-FEEDING

BY

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Although it is recognized that there are individual differences in the yield and composition of milk, the practical effect of these differences in terms of successful breast-feeding has received almost no attention. In Sweden, Sydow (1952) investigated the relationship between the milk yield on the sixth post-partum day and the duration of breast-feeding, and found that if the sixth-day yield was under 300 ml. there was a considerably diminished chance of breast-feeding. This was an insensitive index, however, since only 25% of cases were in this low-yield group. Moreover, under "breast-feeding" were included those who were only partly breast-feeding, so that the overall figure of over 90% still breast-feeding at the end of two months, which is well in excess of any reported in this country, is difficult to interpret.

In an earlier study, Sydow (1944-5) gave an indirect indication of the effect of differences in fat content on the weight gain of the infant. Infants whose mothers donated to a milk bank milk which was stripped from the breast after feeding and therefore contained a high proportion of the fat gained less weight than those

whose mothers gave milk which was removed before the feed and contained relatively little fat. The average weight gains were 765 ± 62 g. and 866 ± 42 g. a month respectively. Sydow states that the material was unsuitable for comparison, since the birth weights and ages of the infants were not taken into account, and claims no significance for the results.

Kon and Mawson (1950) found no relationship between the weight gain of the infant after the eighth week and the fat content of the milk; but the milk yield was not known and, moreover, their technique of manually expressing a single morning sample gives no accurate indication of the daily fat output, and no conclusions can be drawn from it.

Gunther and Stanier (1951) found a significant relationship between the amount by which the baby was below its birth weight on the eighth day, and the eighth-day milk volume, but none with the fat content of the milk. The interpretation of this finding is not simple, since the initial weight loss varies very widely and is not related to food intake.

The terms "lactation" and "breast-feeding" must be differentiated. Lactation is a largely automatic physiological function showing wide individual variation. Successful breast-feeding is obviously dependent in the first instance on adequate lactation, but the efficiency with which this basic capacity is exploited depends on such factors as a desire to breast-feed, social custom, intelligence, and general living conditions. It is, in many ways, a test of the capability and character of the mother.

The various circumstances which determine the difference between the number of women having successful lactation and the number who breast-feed successfully will be discussed in subsequent papers, but, in order that the significance of the figures presented here can be appreciated in their proper context, the "official" attitude towards breast-feeding in this community must be described, since the proportion of women breast-feeding can to some extent be influenced by pressure of opinion from doctors and health visitors.

In Aberdeen, preparation of the breast as recommended by Waller (1946) is not practised, although Waller's shields are sometimes used for the treatment of inverted nipples. In hospital, unless there are definite medical contraindications, or unless a woman has firmly stated her intention to bottle-feed, it is tacitly assumed that all women will breast-feed, and much care is taken and time spent encouraging the mother in the lying-in wards. Excess milk is manually expressed after feeds as a routine during the first four or five days. Engorgement of the breast is treated along orthodox lines, which include the use of oestrogens. If the puerperium is uncomplicated the mother remains in hospital for eight to ten days.

If breast-feeding is not fully established in hospital, and if the woman is anxious to persevere, she may be sent home partly bottle-feeding, but there is an increasing tendency, if lactation is obviously poor, to begin artificial feeding in hospital so that efficiency in this technique can be acquired in the security of the hospital rather than in the general turmoil of failing lactation at home. Complementary feeds are given to breast-fed infants in hospital at the ward sister's discretion. There are no rigid rules governing their use, but they are generally given after the third day if the baby is still losing weight or when, after feeding, it still appears

hungry and test weighing reveals that the intake of milk has been inadequate.

The mother is visited within 24 hours of leaving hospital by a health visitor of the maternity and child welfare service. Further visits are made, at least weekly, for the first four weeks, and less frequently thereafter, although they are made more often when necessary. Breast-feeding is encouraged, but when lactation is clearly inadequate full artificial feeding is usually agreed to be a more practical alternative than prolonged complementary feeding.

It is the general experience that the majority of women who make the change to bottle-feeding do so without consulting a health visitor. The Aberdeen general practitioner is frequently consulted, but is less enthusiastic than the health visitor about breast-feeding.

Method

All the women in this investigation were confined in the Aberdeen Maternity Hospital, and details of the progress of lactation and of the infant were recorded during the lying-in period. They included the birth weight and subsequent daily weights until discharge, and records of any complementary feeds. The weight gain in hospital was taken as the gain from the third to the seventh day, since the weight changes during the first three days are almost wholly unrelated to food intake. Information about subsequent progress until the end of the thirteenth week was obtained from the records kept by health visitors of the Maternity and Child Welfare Department. The follow-up was limited to the first three months, because mixed feeding is often introduced during the course of the fourth month, and the contribution of breast milk to the baby's total food intake is then unknown.

The duration of breast-feeding was taken to be the time, up to a maximum of 13 weeks, during which full breast-feeding was carried on. The addition of any complementary or supplementary feeding was taken to mark the end of breast-feeding.

The reason for the cessation of breast-feeding was obtained from the health visitor concerned. In many cases this rested on the mother's own story, which usually took the form of "the baby cried all night" or "he didn't seem satisfied," and all such instances, together with those where there was definite evidence of inadequate nutrition, such as falling weight, were classified together as "failure of lactation."

Of the 167 women whose milk was sampled on the seventh day of lactation 148 were followed up for 13 weeks, and in all of these information was available about the time full breast-feeding stopped and the reason (or presumed reason) for stopping. For the remaining 19, 16 of whom left Aberdeen, data were available for periods of less than 13 weeks.

Beyond the first month of life accurate weights of infants were available for only 83 who had attended child welfare clinics, and these weighings were often at irregular intervals. In order that weights at fixed intervals could be used for statistical analysis, weight curves were constructed for each infant, and the presumed weights at four weeks, eight weeks, and twelve weeks were read from the curve. Weights were recorded only while full breast-feeding was in progress, so that if, for example, breast-feeding had ceased at six weeks, only the weight at four weeks would be available from the curve. Extrapolation beyond the last recorded weight was not attempted.

The method of collection of the milk samples, and the chemical analyses, have been described in previous papers (Hyttén, 1954a, I, II, III).

Results

In testing the relationship between seventh-day milk and the clinical data on breast-feeding and infant weight gain,

the milk yield and the several constituents were each tested separately. Only the yield and the fat content were related to the clinical findings, and, since these are not related to each other, it seemed logical that a stronger relationship could be found by multiplying them to give the total fat output for 24 hours. In practical terms, a milk with a poor fat content might be clinically satisfactory if it were associated with a high yield, and, conversely, a high fat content might compensate for a low yield. This proved to be so, and total fat output has been used for most of the following results.

Weight Gain of the Infant in Hospital

In assessing the infant's progress in hospital, 10 cases were excluded—five because the weight was not recorded on the third day, and five because artificial feeding was used during the first week, when breast-feeding had been temporarily suspended because of sore or cracked nipples.

Fig. 1 shows, in the remaining 157 infants, the relationship between the seventh-day milk fat output and the weight gain of the infant from the third to the seventh day.

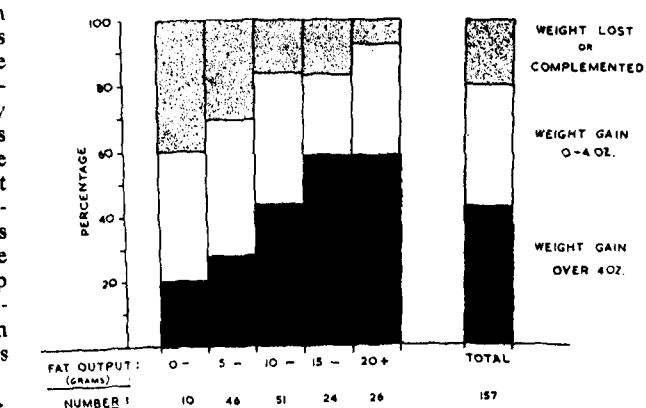


FIG. 1.—The relationship of the fat output in the seventh-day milk to the weight gain of the infant and the need for complementary feeding from the third to the seventh day.

In the group where the fat output was less than 5 g., 40% of the infants either lost weight or required complementary feeding, and only 20% gained more than 4 oz. (113 g.). With higher fat outputs the weight gains were correspondingly better, and in that group in which the fat output was 20 g. or more 58% of the infants gained more than 4 oz. and only 7.5% lost weight or required complementary feeding. There was a statistically significant difference between the amounts of fat in the milk of those infants requiring complementary feeds compared with the rest ($P < 0.01$), but in the infants not having complementary feeds there was no significant correlation between the fat output and the infant's weight gain. This was partly due to the wide range of values for both weight gain and fat output and to the relatively small numbers, but there is also a contributory factor, which is best illustrated by the four cases in which the fat output was over 35 g. In this group one infant lost 2 oz. (57 g.); the other three gained only 1½, 2½, and 4 oz. (43, 71, and 113 g.), for the reason that where there was a gross excess of milk the infant had a full feed well before the breast was empty, and the remaining milk, which contained much of the fat, was expressed for the milk bank.

Weight Gain During the First Three Months

The seventh-day fat output was related to the weight gain of the infant during the first four weeks ($P < 0.01$), but not at later stages.* It must be pointed out, however, that the weight gain at eight and twelve weeks refers only to

*The regression equations were:

Ounces weight gain (3rd day-4 weeks)	$= 25.2 \pm 0.50$ (Fat output ± 0.18 in grammes)	-0.05 (3rd day ± 0.08 weight in oz.)
Ounces weight gain (3rd day-8 weeks)	$= 98.2 \pm 0.14$ " ± 0.34 "	-0.35 " ± 0.16 "
Ounces weight gain (3rd day-12 weeks)	$= 121.4 \pm 0.24$ " ± 0.61 "	-0.22 " ± 0.29 "

those infants who were still breast-feeding at these stages, and by the eighth week the majority of infants whose mothers had a low fat output had ceased breast-feeding.

Duration of Breast-feeding

Of the 148 mothers for whom data are available up to the thirteenth week, 23 were excluded from this part of the study because breast-feeding had been discontinued for reasons clearly unrelated to the adequacy of lactation. Of these 23, 11 had cracked nipples or mastitis, 8 stopped because of vague ill-health, 2 refused to continue breast-feeding after leaving hospital, one wished to return to work, and in one case feeding was abandoned because of an acute illness of the baby.

Of the remaining 125, 64 (51.2%) stopped breast-feeding before the thirteenth week because of "failure of lactation." Fig. 2 shows the percentage of infants still being breast-fed at stages up to 13 weeks, in the five fat-output

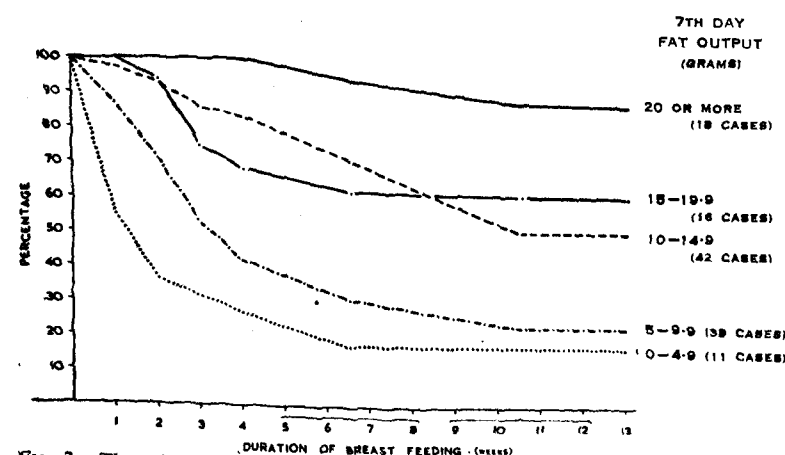


FIG. 2.—The relationship of the fat output in the seventh-day milk to the duration of breast-feeding.

groups. In the group having the highest fat output (20 g. or more), 89% breast-fed for thirteen weeks. With lower fat outputs, correspondingly fewer women succeed in breast-feeding, and in those with the poorest fat output (less than 5 g.) only 18% breast-fed for thirteen weeks. The relationship between fat output and the duration of breast-feeding is statistically significant ($P < 0.01$).

It has been shown in a previous paper that yield and fat content on the seventh day are not related to each other (Hyttén, 1954b, V), and Tables I and II demonstrate that both yield and fat content are associated separately with the duration of breast-feeding.

TABLE I.—Relationship of 7th-Day Milk Yield to Duration of Breast-feeding

No. of cases Proportion breast-feeding at 13 weeks	7th-day Milk Yield (ml.)			
	<300	300-449	450-599	600+
	35 26%	41 46%	31 58%	18 78%

TABLE II.—Relationship of Fat Content of 7th-Day Milk to Duration of Breast-feeding

No. of cases Proportion breast-feeding at 13 weeks	7th-day Milk Fat Content (g./100 ml.)			
	<2.51	2.51-3.25	3.26-4.00	4.01+
	28 36%	50 40%	32 62%	15 80%

Discussion

It has been suggested on somewhat slender evidence that breast-fed infants may suffer from deficiencies of certain amino-acids (Clements, 1949; Albanese, 1951); or of some

vitamins (Jeans and Marriott, 1947; Naish 1948); but in everyday practice the adequacy of milk as an infant food is judged in terms of its calorie content. The baby who cries or who fails to gain weight because of hunger is the practical problem and the subject of this study.

It is held by some enthusiastic advocates of breast-feeding that almost all women can breast-feed if they want to, with the implication that failure is due to an unwillingness of the mother to make the effort. Jeans and Marriott (1947) make the categorical statement that breast-feeding "is possible at least for the first few months in over 85% of cases," and Illingworth (1953) states: "Another diagnosis which is commonly made by doctor, nurse, or mother—particularly the latter—is that the breast milk is too watery. For practical purposes this diagnosis is always wrong. At least, I have not yet seen such a case" (author's italics). In confirmation of this claim, Illingworth quotes the following authors who have published figures showing a very high incidence of breast-feeding. Yung-en Kao (1948) described an incidence of 95% at six months in a series of hospital out-patients at Mukden, and Richardson (1925) an incidence of 92.1% at one month in a district of New York. In neither instance is there any reason to believe that breast milk was necessarily the sole source of nourishment for the child. Read (1949) published a series of 480 women, of whom 98% were discharged from hospital breast-feeding on the twelfth day, but 15% were classified as "breast-feeding—poor," 26% as "breast-feeding—fair," and 46% of the babies had not regained their birth weight. There is no record of the breast-feeding performance after leaving hospital.

A belief in the universal ability to breast-feed is difficult to reconcile with the evidence of deficient lactation presented in this paper. It might be argued that the milk yield can readily be reduced by such emotions as antagonism to, or lack of enthusiasm for, breast-feeding, and to some extent this may be true. However, it has been previously shown (Hyttén, 1954c) that the major source of variation in milk yield is in the gross differences which occur in the development of the breasts during pregnancy, and it is unlikely that such well-marked physical changes in the breast are due to emotional factors. Again, the fat content of the milk is closely associated with breast-feeding success, and there is no evidence that the percentage of fat can be altered at will. In fact, the level of fat content has been previously shown (Hyttén, 1954b) to be remarkably stable after the first week of lactation.

The evidence strongly suggests, then, that "failure of lactation" is a real phenomenon, and that those women who produce less than 10 g. of fat on the seventh day are very unlikely to be able to breast-feed successfully. This group constitutes one-third of the cases in this series.

Although it is necessary to know the fat content of the milk in order to judge fully the adequacy of lactation, it is clear from Table I that yield alone is of considerable prognostic value. The seventh-day yield, calculated from test weighing the baby and measuring strippings from the breast, is a relatively simple clinical test, and of those women in this series who produced a pint (570 ml.) of milk or more on the seventh day 81% breast-fed for three months at least.

However, although the level of lactation is a major underlying influence in the success of breast-feeding, there are clearly other factors involved. For example, all women secreting more than 15 g. of fat on the seventh day probably had an adequate lactation, and yet 26% of them failed to continue breast-feeding for three months. These factors will be discussed in a future publication.

It has been shown previously (Hyttén, 1954b) that such differences as occur in the lactose and protein contents of

the seventh-day milk are due to differences in the speed of maturation, and that in more mature milk the variation in these constituents has practically disappeared. In this study there were no differences in the success of lactation which were associated with the protein content of the seventh-day milk, so that the speed of maturation is apparently of no particular importance in this connexion. That is, milk which is slow to "come in" does not necessarily portend unsuccessful breast-feeding.

The rapidity with which women with poor lactation stop breast-feeding emphasizes the importance of studying human milk composition as early as possible in lactation, if the full range of variation is to be appreciated. Any investigation of human milk secreted after the second or third month of lactation would be carried out on a highly selected population. Those women with poor lactation would, of necessity, have abandoned breast-feeding, and although a considerable variation in milk composition may remain among the rest there will be little or no really poor milk discovered. This may, in part, be the basis for the widely held belief that variations in milk composition are unimportant.

Summary

The success of lactation, judged by the duration of breast-feeding and the weight gain of the baby, is shown for 167 subjects whose milk was analysed on the seventh post-partum day. Both milk yield and fat content were related to the clinical data. The total fat output had a stronger relationship than either.

There was a marked relationship between the seventh-day fat output and the baby's weight gain in hospital.

The breast-feeding history of 148 of these subjects was known until the 13th week. In 23, breast-feeding was terminated for reasons unconnected with the adequacy of lactation. In the remaining 125 there was a marked relationship between fat output on the seventh day and the duration of breast-feeding.

Accurate weights during the first three months of life were known for 83 of the infants, and, although there was a strong relationship between fat output and weight gain during the first month, there was none after this time. This effect is presumably due to the elimination of those infants initially fed on milk of low nutritive value, leaving at the breast only those for whom the milk was at least adequate.

I am grateful to Professor Dugald Baird and the staffs of the Midwifery Department and the Aberdeen Maternity Hospital and to the health visitors of the Maternity and Child Welfare Department for invaluable help; to Professor John Craig, of the Department of Child Health, and Dr. I. Leitch, of the Commonwealth Bureau of Animal Nutrition, Bucksburn, for criticism and advice; and to Mr. J. F. Scott for statistical assistance.

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CARCINOMA OF THE MIDDLE EAR

BY

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This report is concerned with carcinoma arising primarily in the epithelium of the middle-ear cavity or mastoid air cells. The disease is rare. We have been able to find only 120 cases in the literature, and even this figure is only approximate, as the accounts often include cases of growth arising in the external meatus. Risch and Lisa (1938) gave a full account of many previous case reports and a comprehensive bibliography. It is usually impossible to decide clinically whether one is dealing with a carcinoma of the tympanum or of the external meatus, but the former has some distinct features, illustrated by the following six cases.

Case 1

A married woman aged 62 was first seen in July, 1947, complaining of having had right-sided otorrhoea for five months and pain in the right side of the lower jaw for three months. She was found to have an incomplete right facial paralysis of the lower motor neurone type, induration in the inferior portion of the right parotid gland, granulation tissue deep in the meatus, and a blood-stained discharge. Malignant disease was suspected, and was confirmed by biopsy of the aural granulation tissue, which revealed "a well-differentiated squamous-cell carcinoma, almost completely keratinized." It was decided that irradiation should be the first means of treatment, and 8,200 r was given from August 18 to October 9 by tele-radium (5-g. unit) and deep x rays.

On December 19 the temporal bone was explored through a post-aural incision. As the mastoid process and the middle ear were found to be largely replaced by tumour an extensive excision was performed. The facial nerve, although not identified, was removed with the tumour tissue, as the facial paralysis was later found to be complete. The dura and the temporo-mandibular joint were not involved. The pain disappeared after the operation, and the disabilities resulting from the facial paralysis became the patient's chief concern and were to some extent rectified by a right tarsorrhaphy and a fascial sling. There has been no evidence of recurrence.

Case 2

A man aged 44 was seen for the first time in November, 1951. He had suffered from bilateral otorrhoea for twenty years, but came for advice because of increasing deafness. Both middle ears were extensively damaged, but both were dry. A hearing-aid was prescribed. One month later he developed a right facial paralysis. Examination then showed granulations protruding through a large postero-superior perforation in the right drum. He complained of severe pain in the ear, but there was no mastoid tenderness. A right radical mastoidectomy was performed (post-aural approach) in the belief that this was a case of chronic infection with an acute exacerbation. A good deal of granulation tissue was found in the mastoid process and tympanum, together with much erosion and destruction of bone. The horizontal portion of the facial nerve was exposed. The wound was packed with bipp ribbon gauze

and left open, and a fortnight later, as the cavity appeared clean and was covered with healthy granulations, a skin graft was applied and the posterior incision closed.

Shortly after this operation the patient complained of increasingly severe pain in the ear. The cavity was dressed after a week, when much of the graft was found lying free in the cavity, and granulations covered the facial ridge. It was then felt by one of us (R. P.) that the abnormal course of the case was suggestive of a growth, and biopsy confirmed this suspicion, revealing "active squamous-cell carcinoma." The cavity was explored again and all diseased bone and muscle was excised, leaving the sigmoid sinus, jugular bulb, and parts of the membranous labyrinth exposed. The temporo-mandibular joint was opened, as the growth had invaded it and had also spread to the dura overlying the tegmen tympani. Permission to remove the pinna had not been obtained, and it was removed a week later. The material excised at this operation showed "a fairly well differentiated squamous-cell carcinoma with invasion of the temporal muscle, the facial nerve, and the temporal squame." A course of irradiation was given to the open wound, 5,455 r by deep x rays and teleradium (10-g. unit) over 55 days. The cavity appeared to heal well from the bottom, but the pain persisted. By July, 1952, he began to suffer from fits, and he died of an intracranial extension in September, 1952.

Case 3

A man aged 75 was first seen in February, 1952, having had severe left-sided earache and otorrhoea for four months. Both the pain and the discharge, which was blood-stained, had increased steadily and were associated with a recent increase in deafness. The pinna was displaced downwards and outwards by a brawny oedema over the mastoid process, and in the external meatus there was a bloody and foul-smelling discharge, whilst bare bone was palpable in the floor of the canal. A diagnosis of carcinoma of the tympanum was made on clinical grounds, and on March 17 the left mastoid was explored through a post-aural incision. The whole of the temporal bone lateral to the labyrinth capsule had been replaced by a growth, which was also invading the temporo-mandibular joint. A wide excision was performed. The operation was followed by a partial left facial paralysis of the lower motor neurone type. Material removed at operation was sent for microscopical examination and showed, "extensive invasion by squamous-cell carcinoma of the pinna, the parotid gland, and the mastoid process." He was then treated by a combination of deep x rays and teleradium (10-g. unit), and a total dose of 3,855 r over 36 days was given. The pain was unrelieved, although, as in Case 2, the operation cavity was left wide open. He died of coronary occlusion in June, 1952. Post-mortem examination revealed residual carcinoma in the petrous apex.

Case 4

A spinster aged 52 was referred by her doctor with a diagnosis of carcinoma of the right ear, for which a limited local excision had been performed nine months previously. She complained of severe and constant earache, and there had been three recent attacks of bleeding from the ear. The right external auditory canal was very stenosed and contained a thin and foul-smelling blood-stained discharge. There was a complete conductive deafness. In a smear of material taken blindly from the depths of the stenosed meatus carcinoma cells were found.

Accordingly, on February 11, 1952, the right temporal bone was explored through a post-aural incision. The epitympanic space and the posterior meatal wall were replaced by a growth, which was also spreading forwards into and above the temporo-mandibular joint, as well as deeply and anteriorly into the dura of the middle fossa. As much as could be reached of this growth was excised, and the anterior and superior walls of the cavity were coagulated by diathermy. The posterior bony wall of the cavity was

covered with a Thiersch graft, a large meatal opening was fashioned after Ballance's method, and the wound was closed. The material obtained at operation was examined and showed "(1) no neoplastic change in the meatal skin. (2) invasion of the medial end of the meatal skin tube, and (3) active islands of squamous-cell carcinoma in the tegmen tympani." The patient was then treated by irradiation, receiving a total dose of 5,900 r in 69 days by a combination of teleradium (10-g. unit) and deep x rays. She died on November 11, 1952, from intracranial spread of the original lesion. The local pain was unrelieved by treatment.

Case 5

A married woman aged 68 was first seen in February, 1953, with a history of discharge from the left ear for many years. For the past year she had had pain in the left side of the face and head, and the discharge had become blood-stained. Examination showed signs of previous suppuration in the right ear. On the left side there was a partial facial paralysis, and granulations were growing out of the middle ear into the meatus. Because of the history and the clinical findings, some of this granulation tissue was removed for biopsy, and a squamous-cell carcinoma was revealed.

On March 10 the left temporal bone was explored through a post-aural incision. The mastoid portion of the bone and the whole tympanum had been replaced by tumour tissue, which did not, however, appear to have penetrated the dura. So far as possible, the growth was removed, and examination of the material obtained at operation showed: "(1) In one area there is evidence of chronic inflammation with lymphocytes and foam cells. There is an area of hyperplastic squamous epithelium loosely attached to this tissue. (2) Squamous-cell carcinoma with cornification. There are areas of fairly deep infiltration." After operation the patient was treated by a combination of teleradium (10-g. unit) and deep x rays, receiving a total dose of 5,560 r in 39 days. Pain was not a pre-operative feature of importance, and disappeared after treatment. There is still no evidence of recurrence, and the radical cavity is soundly epithelized. A slight facial palsy persists.

Case 6

A married woman aged 55 was first seen on January 12, 1954. She had suffered from left otorrhoea since childhood and from lumps below and anterior to the ear for six months. A fleshy polypus occupied the meatus, and there was a hard nodule the size of a pea in the pre-auricular region and a much larger mass in the subdigastric area. Biopsy of the polypus revealed an early squamous-cell carcinoma developing in granulation tissue. The patient was referred to the Radiotherapeutic Research Unit of the Hammersmith Hospital, and the ear was treated on the 8-million-volt linear accelerator. From February 1 to March 15 a dose of 5,820 r was given. The middle ear became dry and fibrotic in appearance and the pre-auricular gland disappeared. A very extensive block dissection of the left side of the neck was carried out on April 24. Nodes in the subdigastric area and others from behind the mastoid attachment of the sternomastoid muscle contained squamous-cell carcinoma. The patient left hospital on May 7.

Discussion

Clinical Features

Previous writers have emphasized certain points which are to be found in these cases.

1. *Pain*.—This was a feature in all of our cases, and in three of them was unrelieved by treatment. Furstenberg (1924) and Bowman (1940) believed that the pain was due to the pressure of the expanding tumour within a rigid bony framework. However, an expanding lesion like a cholesteatoma does not cause pain by its presence, although pain may occur when an acute infection supervenes. The

pre-operative pain in these cases may well be due to secondary infection, but the persisting post-operative pain, occurring even in a widely laid open cavity, is inexplicable. It cannot be due to direct involvement of the dura, as the dura over the temporal bone is not a site from which painful stimuli can be elicited (Wolff, 1948). Nevertheless, in Cases 2, 3, and 4, in which pain was a dominant symptom, the dura was invaded by the growth, whereas the pain disappeared after operation in Cases 1 and 5, in which there was no dural involvement. We are not prepared to offer any explanation of these observations. Pain is a common symptom in cancer, and its cause is often obscure.

2. *Chronic Suppuration*.—A history of genuine chronic suppuration was obtained in only two of our six cases. In the other cases the otorrhoea could be attributed to the presence of tumour rather than to pre-existing suppuration.

3. *Facial Paralysis*.—This was a presenting symptom in two cases, and was present but unnoticed by the patient in one case.

4. *A Blood-stained Aural Discharge*.—This was present in four out of the five cases.

5. *Sequestration of Bone*.—This was present in one case.

6. *Post-aural Swelling*.—This was present in one case.

7. *Metastasis*.—Neighbouring or distant metastasis has rarely been reported in the literature, but it occurred in Case 6. Whether the method of treatment adopted was the correct one remains to be seen, but the result so far has been satisfactory.

From our experience it seems that pain and the presence of a blood-stained discharge, particularly if there is also a facial palsy, are the most reliable indications of malignant disease in the middle ear. The diagnosis must be clinched by biopsy.

Cause of Death

The cause of death is usually given as malignant cachexia. In some cases invasion of the meninges leads to fatal intracranial complications. In others a fatal haemorrhage occurs from erosion of the jugular bulb or the carotid artery. Death from a distant metastasis has not been recorded.

In our series, one patient died from coronary occlusion and two from direct intracranial spread of the disease.

Treatment

In so far as so rare a disease can be said to have any settled mode of treatment, it would be a combination of surgery and radiotherapy. One of our cases received radiotherapy before surgery, whilst the others were treated by post-operative irradiation (at the Royal Cancer Hospital, London, under the direction of Dr. M. Lederman). The extent of the operation varied with the extent of the disease. As in all cancer surgery, no anatomical boundaries were respected, and no attempt was made to preserve any involved structure which could be excised.

For instance, in most cases the inner ear was removed in whole or in part; in two cases considerable portions of the capsule of the temporo-mandibular joint were excised; the capsule of the temporo-mandibular joint was sacrificed. When the region and in one case the pinna was involved in growth no attempt to preserve the nerve was made at the expense of a skimped excision.

However, in Cases 2, 3, and 4, pursuing the disease anteriorly would have meant excision of the temporo-mandibular joint and the adjacent part of the base of the skull, with no certainty, even then, of reaching the limits of the growth. In the light of subsequent events, this is probably the course which should have been followed to give the patient the best possible chance, as it seems clear that radiotherapy is unavailing in growth so deeply buried in bone. In Case 3 the whole bony meatus and the parotid gland should perhaps also have been excised in order to comply with the essential requirements of tumour surgery. These are speculative suggestions, offered after reflecting

on the clinical course of these few cases, and applying general surgical opinions which are commonly accepted. The tumours are not highly malignant, and distant metastasis is almost unknown. The problem, then, is entirely one of adequate local removal, and this seemingly applies particularly to the bone, as irradiation appears to be effective in controlling the soft-tissue invasion. Before embarking on any case a clear idea must be entertained of the possible directions of spread in the bone and a feasible means of excising these areas. Such excisions are not insurmountable technical problems, provided they are not presented suddenly in the course of an operation conceived in lesser terms.

Prognosis

The prognosis of middle-ear carcinoma is very poor indeed. Only one case is to be found in the literature in which the patient has survived for more than five years. In this series six cases are reported; one patient is alive and well six and a half years after coming under observation, and one other, treated a year ago, was also alive and without any evidence of recurrence at the time of writing. In both these cases the disease did not involve the dura, which is the factor enormously worsening the outlook.

Summary

Six cases of carcinoma of the middle ear are described. Suggestions for more radical surgical excision are offered.

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ANGULAR STOMATITIS AND ITS ASSOCIATION WITH ARTIFICIAL DENTURES

BY

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Angular stomatitis is seen by the general physician as evidence of nutritional (especially vitamin B) deficiency or of anaemia; but such patients rarely visit the dermatologist. Nevertheless, many patients suffering from angular stomatitis are seen in dermatological and dental departments, and few of them are found to be suffering from general nutritional disease. Most of these patients show a local infective cause for the condition or have some dental fault or both.

The series of patients reviewed in this paper were drawn from the dermatology department of the General Infirmary at Leeds, and the work was done in conjunction with the staff of the dental school.

The literature on the subject is vague; but Vickers (1949) made an important contribution, and his approach has been followed.

There appears to be little doubt that there are several aetiological factors, and in some cases more than one of these may be contributory, so that careful consideration of each particular patient is necessary if treatment is to be successful. Generally accepted aetiological factors include: (1) infection; (2) ariboflavinosis; (3) generalized seborrhoeic or flexural eczema; (4) sensitization to dental materials; and (5) malocclusion.

Infection

Angular stomatitis may occur as a manifestation of lues in the secondary or tertiary stages. Other infections, especially of the respiratory or gastro-intestinal tract, may also cause the condition, including moniliasis. In Case 14 attacks of angular stomatitis were coincidental with recurrent tonsillitis, and in Case 16 relapses always followed a common cold.

Ariboflavinosis

Although in this series ariboflavinosis does not seem to be important, this may be explained by the direction of such cases to general medical rather than dermatological clinics. Blood vitamin levels were not undertaken as a routine; but all patients were questioned closely with a view to establishing possible dietetic deficiency or finding evidence of a malabsorptive syndrome: Case 23 proved interesting in this respect. This patient suffered from Crohn's disease for many years, and her stomatitis cleared soon after operation for this condition and has not recurred. Her case was also interesting in that there appeared to be a familial tendency to angular stomatitis, as both her brother and her sister (Case 12) suffered from the condition, though neither gave any similar history suggestive of malabsorption.

Generalized Seborrhoeic or Flexural Eczema

Angular stomatitis often occurs as part of a generalized seborrhoeic or flexural eczema and clears or relapses with the general condition; but it may occur as the sole manifestation.

This condition involves more of the skin adjacent to the angles of the mouth than usual and proves very resistant to treatment and liable to relapse readily. An example of this type is Case 17, which proved extremely resistant to various local measures, including antibiotics, dental treatment, and to x-ray therapy, but cleared on the administration of ung. steroxin and had not relapsed six months later.

Sensitization to Denture Materials

Some patients become sensitized to the material of their dentures, and in such cases the condition usually clears with the substitution of a different denture material. In most instances of sensitivity to denture material an area of hyperaemia, and in some cases actual oedema of the underlying mucous membrane, is present; but in three patients (Cases 1, 6, and 11) there were no mucosal changes, although patch tests to denture material were positive. Further, 12 patients (Cases 4, 8, 12, 18, 21, 26, 28, 32, 36, 41, 43, and 45) with mucosal changes were negative to patch tests. It is noteworthy that acrylic dentures were concerned in all these cases except one. As a control, colleagues at the dental school examined 100 random cases in the prosthetics department, and in only one of these was there any definite mucosal lesion without accompanying angular stomatitis or complaint of soreness of the gums. These people had been wearing dentures for from one year to forty years.

Patch Testing

This means of investigation of the presence of sensitivity was used, the method followed being that of Vickers—namely, the application of scrapings from the patients' own dentures to the skin, held in place by adhesive plaster. In several instances positive patch-test reactions were delayed, and it would seem advisable to retain the material in position for at least 96 hours, with a preliminary reading at 48 hours. Cases 1, 2, 3, 24, 33, and 44 demonstrate this delayed reaction.

It might well be argued that these delayed positive reactions could be due to mechanical friction or chemical

action; but a control series of 20 medical students failed to produce any such mechanical positive reaction even after a week.

Further, all cases were tested at the same time against clear acrylic and other denture materials, and all positive results were very definite, no possible mechanical positive reactions being obtained with the other materials.

There were, as is usual in most series of patch tests, some anomalous results, and one in particular (Case 7) proved interesting. This patient gave a positive patch reaction to vulcanite dentures in January, 1952, at 48 hours. There appears to be little doubt about this, as he was demonstrated to a class of medical students at the time as a good example of a positive reaction. New dentures were made for him in acrylic, and his angular stomatitis cleared rapidly. He happened to have retained his old dentures, and in March, 1953, the patch test was repeated and proved to be negative at 96 hours.

Another patient (Case 3), who gave a delayed positive patch reaction to acrylic scrapings from his own dentures, failed to reproduce this when tested against acrylic applied direct to the skin. (These pieces were specially made and processed for two, four, six, and eight hours respectively.)

Although the evidence here is slender it is possible that some physical or electrochemical factor is concerned with these reactions and that the presence of saliva may in some way be bound up with this.

Nature of the Sensitizing Material

Lain (1932) states that the substance probably responsible for the sensitivity in vulcanite is vermilion, but as this material is rapidly becoming obsolete it was decided to investigate only the newer and more fashionable acrylic materials. Naturally, it was decided first to investigate the colouring material; but the makers were unwilling to disclose its nature or to supply any for patch testing.

All patients were therefore patch-tested against coloured scrapings from their own dentures and clear acrylic scrapings. In only two cases (Nos. 6 and 46) was a positive result obtained to the coloured and a negative to the clear.

It was then decided to investigate a theory that sensitization is due to incomplete polymerization of monomer during the actual process of making the dental plates. This process consists in mixing liquid monomer and polymer powder into a dough, which is then heated in a mould, during which process the monomer polymerizes and the finished article results. This process probably depends on the presence of an organic peroxide or some such substance in the powder which acts as a source of free radicals which can initiate the polymerization of the added monomer. This reaction is slow at room temperature, but is nevertheless appreciable, since the mixture will set into a fairly hard material in a few days.

On heating, polymerization occurs more rapidly, the normal plate being processed at 100° C. for about six hours.

Since polymerization takes place slowly at room temperature it seems unlikely that any monomer would be present, at least on the surface, even in an under-processed plate, after it had been made for a few weeks. However, it is possible that monomer could be trapped in the rigid polymer material in positions remote from initiator molecules, and it might thus be unchanged.

It seemed that the theory might be tenable if the monomer was a primary irritant or sensitizer, or if appreciable differences could be demonstrated in the amount of monomer present in acrylic material processed in different ways.

To test the first point all patients were patch-tested as a routine with monomer when being tested against denture materials, and in addition a control series of students and nursing staff were also tested. In no case did a patch test to monomer give a positive result even after 96 hours. It would therefore seem that liquid monomer is neither a primary irritant nor a potent sensitizer.

TABLE I.—Summary of Results

Case No.	Age (Years)	Duration of Condition (Years)	Past Medical History	Worn at Night	Material of Dentures	Duration of Wearing (Years)	Mucosal Lesions	Patch Test Results	Ultimate Diagnosis	Treatment	Result
1	45	2/12	Nervous dyspepsia 6/12	No	Upper A. (6)	20	No	Delayed + V.	Sensitivity to V.	A. Lowers remade	Improved, but not completely cleared
2	47	3	Cholecystectomy (stomatitis followed almost immediately)	Yes	Lower V. 20	20	Yes	+ A. (96 hrs.)	Sensitivity to A.	Remade V. O.B. 1"	Improved, but relapsed. Had considerable temporomandibular arthritis
3	38	8	P.O.W. in Germany at onset. 7 Vitamin deficiency	No	B.	14	"	+ B., 1952. Delayed + A. (96 hrs.) 1953	Sensitivity to B. and A.	Remade Oralite	Improved; but relapsed
4	31	3	Low-grade hypochromic anaemia	Yes	A.	14 (New, 1)	"	Neg. 96 hrs.	Malocclusion	O.B.	No change
5	72	2/12	Constitutional eczema 2 years	No	A.	2	Very minor only	Doubtful + A. 96 hrs.	Sensitivity and malocclusion	Remade V. O.B. 3/16"	Cleared rapidly
6	59	1/12	Constitutional eczema, 1949. Hysterectomy, 1942. Pruritus ani, 1946	"	A.	17	No	+ A. Neg. clear A. and V.	Sensitivity to A.	Remade V. N.B.	Cleared
7	50	18/12	Nil relevant	Yes	V.	8	Yes	+ 48 hrs., 1952 Neg. 96 hrs., 1953	Sensitivity to V.	Remade A. O.B. 3/16"	"
8	31	2	Perforated gastric ulcer 3 years ago	"	V.	8	Slight only	Neg.	Malocclusion	O.B. 3/16"	"
9	55	2	Nil relevant	No	V. 20, A. 2	20	No	"	"	Remade A. O.B. 3/16"	Improved
10	54	8	" "	"	A.	7	"	"	"	X rays 100 r x 3 x 28	Cleared
11	57	2/12	Psoriasis many years	"	V.	7	"	+ 48 hrs.	Sensitivity	Remade A. N.B.	Improved
12	48	10	Family history of stomatitis (see Case 23)	"	A.	10	Yes	Neg. 96 hrs.	Familial	Several new sets made N. and O.B.	Improved; but relapsed
13	73	2	Nil relevant	"	Some ersatz material. V. 1 yr.	4	"	+ V. 96 hrs.	Sensitivity to V.	Remade A. N.B.	Cleared
14	56	1/12	Recurrent tonsillitis	Yes	V.	25	No	Neg.	Infective	Nil dental	Cleared with tonsillitis. To have tonsillectomy
15	35	6/12	Seborrhoeic sycosis 10 years	No	A.	2	"	"	Malocclusion	O.B. 3/16"	Cleared
16	30	2	Cholecystectomy 5 years ago	"	V.	15	Yes	+ V. 48	Sensitivity and infection	Remade A. O.B. 3/16"	Cleared; but relapses with cold
17	45	3	Nil relevant	"	V. (14) A. (10)	24	No	Neg.	Malocclusion and seborrhoeic Malocclusion	Remade O.B. 3/16"	Cleared; but relapsed. Cleared with ung. steroxin
18	36	1	Malaria, 1922	Yes	A.	10	Minor only	"	"	O.B. 1/16"	Cleared
19	38	1/52	Nil relevant	"	V.	20	No	Doubtful + V. Neg.	Sensitivity Malocclusion	Remade A. O.B. 3/16"	"
20	60	3/12	" "	"	A.	15	No	"	"	Remade A. O.B. 3/16"	Cleared and relapsed
21	62	2/12	Duodenal ulcer, 1943	"	A.—upper. V.—lower	40	Yes	Neg. 96	"	Remade A. O.B. 3/16"	No change, including mouth lesions
22	68	10	Congenital web in throat. Operation, 1943	"	V.	40	"	+ V. 72	Sensitivity	Remade A. N.B.	"
23	47	20	Crohn's disease at 38	No	V. A.	19 3	No	Neg.	Malabsorption	N.B.	Cleared after operation for Crohn's disease
24	61	4/12	Nil relevant	Yes	V.	15	Yes	Delayed + V. 96	Sensitivity	Remade A. O.B. 3/16"	Improved
25	60	6/12	Constitutional eczema 6/12	"	V.	40	No	Neg.	Part of constitutional eczema	Remade A. N.B.	No change
26	43	2	Hysterectomy 10 years ago	"	A.	12	Yes	"	Malocclusion	O.B. 3/16"	Cleared
27	22	8/12	Perleche in childhood	—	"	"	"	"	"	Local only	Cleared and relapsed
28	57	4	Hysterectomy, 1931. Thyroidectomy, 1930. Lupus erythematosus, 1934	Yes	A.	5	Yes	Neg. 96	? Sensitivity	Remade V. N.B.	" "
29	47	4/12	Nil relevant	No	A.	8	No	Neg.	Malocclusion	Remade O.B.	Improved
30	36	2	Recurrent subluxation temporomandibular joint	Yes	V.	17	Yes	+ V. 96	Sensitivity	Remade A. N.B.	Cleared
31	73	6/12	Nil relevant	Variable	V.	40	No	Neg.	? Sensitivity	Remade A. N.B.	Cleared. Occasional minor relapse
32	46	2	Chronic paronychia 13 years	No	V.	23	Yes	"	Malocclusion	O.B. 3/16"	Improved
33	77	1	Lichen planus	"	V.	20	"	Delayed + V. 96	Sensitivity	Remade A. N.B.	Cleared (no mucosal change)
34	82	3/12	Seborrhoeic dermatitis 10 years	"	V.	30	No	Neg.	Part of seb. derm.	Nil dental	Cleared with general condition
35	52	3	Psoriasis 25 years. Arthritis 4 years	"	V.	12	Yes (patchy)	"	Malocclusion	O.B. 3/16"	No change
36	73	2/12	Constitutional eczema 3/12	"	V.	4	Minor only	"	Part of constitutional eczema	Nil dental	Cleared with general condition
37	56	4	Nil relevant	Yes	V.	30	No	"	Malocclusion	Remade O.B. 3/16"	Cleared and relapsed
38	46	1	" "	"	A.	2	"	"	Infective	Nil dental	Cleared with ung. quinolor co.
39	56	2	" "	"	V.	38	Yes	+ V. 48	Sensitivity	Remade A. Remade V.	Cleared
40	31	18/12	Pleurisy with effusion	No	A.	4	Yes (L.P.-like)	Delayed + A. 96	"	"	No change. Not a case of angular stomatitis, but included because of positive patch test

A. = Acrylic. B. = Bakelite. V. = Vulcanite. N.B. = Normal Bite. O.B. = Opened Bite.

TABLE I.—Summary of Results—continued

Case No.	Age (Years)	Duration of Condition (Years)	Past Medical History	Worn at Night	Material of Dentures	Duration of Wearing (Years)	Mucosal Lesions	Patch Test Results	Ultimate Diagnosis	Treatment	Result
41	43	2	Parapsoriasis en plaque 10 years	Yes	A.	2	Yes	Neg.	Malocclusion	Remade. O.B. 3/16"	Cleared
42	61	7	Thyroidectomy 10 years ago	No	V.	20	No	"	? Sensitivity	Remade A. N.B.	"
43	45	4	Nil relevant	Yes	V.	11	Yes	"	? Sensitivity	Remade V. N.B.	Improved
44	48	2½	" "	No	A.	4	Slight	Delayed + V. 96	Sensitivity	Remade A. N.B.	"
45	65	3/12	Pernicious anaemia since 49	"	V.	32	Yes	Neg.	Malocclusion	Remade. O.B. 3/16"	Cleared
46	55	3	Nil relevant	"	V.	27	"	? + A. (coloured)	? Sensitivity	Remade V.	Cleared. N.B.

A.—Acrylic. B.—Bakelite. V.—Vulcanite. N.B.—Normal bite. O.B.—Opened bite.

Secondly, investigation of the presence of monomer in denture material was carried out by submitting to a vacuum for several hours finely shaved particles of material made under varying conditions. Any loss of weight was taken to indicate loss of free monomer in the material.

Investigation of Denture Material

Sample I: Material processed at 100° C. for two hours, and brought to 100° C. slowly; age, several days. Sample II: Material brought to 100° C. slowly and chilled suddenly without processing. Sample III: Material processed at 100° C. for four hours; age, two days. Sample IV: As for Sample III, but aged five days.

TABLE II.—Results

	Sample I	Sample II	Sample III	Sample IV
Initial weight of sample (g.)	0.0862	0.4277	0.2375	0.2592
Loss of weight (g.)	0.0000	0.0200	0.0021	0.0016
Percentage loss	0	5	0.9	0.6

The conclusions drawn from these results after allowance had been made for experimental error and other factors which might influence them were that, while it seems likely that some monomer is present in extreme cases of under-processed material, it is impossible to say whether there is any in normally processed and aged material; but if any is present at all it is probably only a fraction of 1%.

Malocclusion

Apparently, because it prevents discomfort when dentures are fitted, it is standard dental practice to close a patient's normal bite. This causes sagging of the mouth with accentuation of the angular creases. These tend to retain saliva and form an excellent nidus for organisms, increasing the likelihood of angular stomatitis. There is no doubt that this is a contributory factor in some cases; but many edentulous people never develop the condition.

In these series, results of opening the bite to remove the mechanical sagging proved rather conflicting. Some cases rapidly cleared completely, others cleared temporarily and relapsed, and one (Case 35) showed no improvement whatever.

The standard procedure here was to open the bite 3/16 in. (4.8 mm.), but in many instances this proved impracticable, mainly because of resultant discomfort in the nature of temporo-mandibular joint arthritis. To obviate this, it was decided to open the bite gradually 1/16 in. (1.6 mm.) at a time every few months; but as yet there has not been time to assess the value of this technique.

It is to be noted that only one patient in this series (Case 29) did not wear dentures, and in this instance there was some malocclusion and apparently no other contributory cause, although the patient admitted to having had

the habit of licking his lips in childhood. There was usually a quick response to any mild antiseptic applied locally, so that there was probably an infective cause.

Results

Table I gives the relevant findings in 46 cases. The nature of the study did not lend itself well to statistical analysis, and it was not thought profitable to pursue this line of investigation.

Of the 46 cases treated, 22 cleared completely, 9 cleared but relapsed, 10 improved, and in 5 there was no change. Of those that were cleared, 18 had new dentures and 4 were given only local treatment.

Summary and Conclusions

A series of 46 cases of angular stomatitis associated with artificial dentures have been investigated.

There are several aetiological factors concerned in the production of angular stomatitis, and a full investigation of each case is necessary.

Patch tests to denture materials may be delayed, and patches should be left *in situ* for at least 96 hours.

The nature of the sensitizing material remains obscure, but may be connected with the colouring material.

Opening of the dental bite will result in the cure of some cases, but cannot be guaranteed to be permanent.

My thanks are due especially to Dr. J. T. Ingram for his helpful criticism and permission to use his cases in this investigation; to Drs. F. F. Helier and S. T. Anning, who also permitted me to use their cases; and to the staff of the dental school, without whose co-operation the practical work could not possibly have been carried out. Mr. McNaughton, of the chemistry department of the University of Leeds, also helped considerably in connexion with the investigation of incomplete polymerization of dental plates.

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According to a report in the *Manchester Guardian*, it was made known at the Annual Conference of the National Institute of Houseworkers on May 18 that the Institute is now operating a programme for training hospital domestic workers. This scheme is being carried out in conjunction with the Leeds General Infirmary and the London Hospital. Domestic workers already employed in the hospital will receive a short part-time training, while a longer period of training is available for new employees between the ages of 15 and 18. A diploma will be awarded. The programme of training is being financed by grants from the Nuffield Provincial Hospitals Trust and the London Hospital free endowment funds.

KATAYAMA DISEASE, EARLY TOXAEMIC STAGE OF BILHARZIASIS

WITH A REPORT ON A CASE SHOWING PULMONARY INFILTRATION

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It may be many months after the bilharzial parasite has entered the body that the disease becomes recognized. However, in a small number of cases symptoms and signs develop after the first month, and these manifestations are referred to as the Katayama syndrome or the early stage of toxæmia. Though reported as occurring more commonly in patients infested with *Schistosoma japonicum*, this syndrome is seen in *S. mansoni* but only occasionally in *S. haematobium* infection.

We have had occasion to treat a child soon after initial exposure to bilharzial infestation. He displayed the classical signs of the Katayama syndrome. We record this case as the literature on the subject is extremely sparse, particularly concerning the pulmonary changes. The pathogenesis and clinical features of this interesting condition are also reviewed.

Case Report

A boy aged 7½ years paddled on a single occasion (December 8, 1952) in a river known to be infested with bilharzial snails. He could not recall any itching of the skin at that time and remained in good health until January 3, 1953. On that day he felt tired and had no appetite; his temperature was 100° F. (37.8° C.). During the following five days his temperature ranged from 100 to 104° F. (37.8 to 40° C.), but, apart from recurrent vomiting attacks, he did not complain of any specific symptoms.

Physical examination was entirely negative. A blood slide showed no malaria parasites, but revealed a marked increase of eosinophils. He was thereupon admitted to hospital for further investigation. Soon after admission he developed a persistent dry cough and became slightly cyanosed and breathless. Examination showed coarse rales scattered over both lungs, but no other physical signs. Without any specific treatment his temperature fell by lysis to normal ten days after the onset of illness. The cough and vomiting rapidly improved, and apart from loss of weight and a pallid complexion he appeared perfectly normal.

Laboratory Investigations.—On January 9 the white blood cells numbered 36,100 (neutrophils 42%, lymphocytes 11%, monocytes 3%, eosinophils 44%), and on January 12 27,400 (neutrophils 42%, lymphocytes 8%, monocytes 1%, eosinophils 49%). Repeated urine tests revealed no abnormalities. No pathogenic cysts, ova, or parasites were seen in numerous tests of the faeces. X-ray examination of the chest on January 10 showed a diffuse miliary type of lesion confined mainly to the middle and lower zones of both lungs, especially the left, where the lesions appeared to be almost confluent. A cercarial skin test was negative.

A diagnosis of probable Katayama disease was made and the patient was discharged and kept under observation.

He was examined again on February 8. He complained of feeling tired, his appetite was poor, and his mother expressed concern at his listlessness and pallor. His cough had disappeared. A further chest x-ray film showed complete clearing of the focal pulmonary consolidation. On

February 10 the white blood cells numbered 16,900 (neutrophils 38%, lymphocytes 23%, monocytes 2%, eosinophils 37%). Examination of the urine and faeces was again negative.

On February 24 he again became pyrexial and complained of severe abdominal pain and diarrhoea. The spleen was now palpable and he was very tender over the liver area. On the following day diarrhoea persisted and the lateral spined ova of *S. mansoni* were found in the faeces. Treatment with "anthiomaline" was started, and within two weeks he showed a marked improvement. A follow-up examination four months later showed complete restoration of health.

Discussion

The clinical picture of the toxæmic stage in Southern Rhodesia is very variable. It may be mild or severe (Gelfand, 1942; Gelfand and Osburn, 1943). In many it may simply be labelled "urticaria due to food allergy"; in others the picture may cause undue alarm and the diagnosis of acute miliary tuberculosis may even be considered. The essential features comprising this syndrome are:

Age.—In our experience the toxæmic stage is seen in the child and not in the adult, and only a small proportion of infected children are so affected.

Pyrexia.—This may be prolonged over many days, but more often is characterized by periodic rises with long afebrile intervals. In most cases, despite a high temperature, the child does not seem to be seriously disturbed.

Symptomatology.—General malaise, loss of appetite, and frequent vomiting are usually the only symptoms. With lung involvement a cough is characteristic, and in the later stages tenderness over the liver area is a frequent finding.

Loss of Weight.—This is often a noticeable feature, and appears to be mainly related to the frequent vomiting and poor appetite.

Urticarial Eruptions.—These often appear in crops and at times assume the features of angioneurotic oedema affecting the orbits, face, penis, and scrotum.

Splenomegaly.—Splenic enlargement is usually noted towards the end of the toxæmic stage, and subsides even though no antibilharzial treatment is given.

A High Blood Eosinophilia.—This is constantly present in all cases, and is the one feature which is maintained throughout the course of the disease. The actual count is usually between 20 and 60%. It is probable that the eosinophil count remains elevated until active treatment is started.

Lung Involvement with Radiological Changes.—It is probable, because of failure to examine the lungs radiologically and owing to the transitory nature of the radiological features, that these are rarely demonstrated. In the above case extensive miliary changes were shown, and it is probable that these reveal the severest degree of pulmonary involvement.

Pathogenesis

In view of the non-fatal nature of the early toxæmic stage of bilharziasis, there are no pathological data available. However, the general symptomatology and major signs such as urticaria, eosinophilia, and transient pulmonary infiltration suggest an allergic reaction to the developing schistosome.

In the case reported the toxæmic stage appeared 35 days after exposure. It is known that mature female schistosomes with fully developed ova in their uterine canals are found in the portal vein four to six weeks after the cercariae have pierced the skin or mucous membrane. It is therefore probable that 35 days after exposure the fully matured female has found her way via the mesenteric vessels to the small venules of the large intestine, and that ova deposition has begun. It is therefore suggested that the early bilharzial toxæmia is an intense allergic reaction towards this stage of the life cycle of the schistosome. This reaction occurs usually in children, and often, as in the present case, in a child known to suffer from other allergic conditions.

This concept of the nature of Katayama disease has received much confirmation in recent years by work done on closely

related subjects. Crofton *et al.* (1952) reviewed the entire subject of pulmonary eosinophilia. The latter they define as a condition in which pulmonary infiltration on the radiograph is accompanied by blood eosinophilia, but in which any of four conditions (the resolving stage of pneumonia, hydatid disease of the lung, Hodgkin's disease, and sarcoidosis) can be excluded. According to their classification of pulmonary eosinophilia, the Katayama syndrome would be grouped under that of simple pulmonary eosinophilia (Loeffler's syndrome).

The pathology in simple pulmonary eosinophilia has not been studied, as the condition is not fatal. However, Von Meyenburg (quoted by Crofton *et al.*) described changes which he considered to be those of Loeffler's syndrome in three soldiers who died from trauma. Irregular bronchopneumonic foci were noted which were seen microscopically to consist of small areas of alveolar exudate with many eosinophils. In one there was an eosinophilic infiltration of the interstitial tissue. In two cases ascarides were found in the intestine. Crofton *et al.* conclude that the entire group of pulmonary eosinophilias represent a hypersensitivity reaction of the body to various stimuli. When the hypersensitive reaction is brief and involves only the alveoli the manifestation is a simple pulmonary eosinophilia.

The breakdown of normal, abnormal, or foreign protein in the body tissues results in the release of histamine. Vaughn (1953), by injecting extracts of ascaris and of histamine into guinea-pigs, was able to demonstrate a great concentration of eosinophils in the pulmonary tissue. Twelve hours after the injection widespread thickened areas with a patchy consolidation were a common finding, and microscopical study showed a gross eosinophilic infiltration of the perivascular and peribronchial connective tissue. The changes, though similar, were more extensive after ascaris extract than after histamine injection. In Vaughn's opinion the biological purpose of this eosinophilic infiltration lies in the fact that the eosinophil, being in effect a carrier of histamine, is performing its function in delivering a substance to the lung, where it is inactivated by histaminase or another related enzyme.

In 1949 Sprent (quoted by Crofton *et al.*, 1952) sensitized mice to various ascaris extracts by parental injection and also produced striking pulmonary changes, including an eosinophilic infiltration. In a case of ascariasis it is known that the life cycle includes a stage of pulmonary migration, but as the result of Sprent's and Vaughn's experiments it is probable that the transitory pulmonary shadows seen in that condition are also better explained as an allergic phenomenon than as a reaction to the migrating larvae.

Further evidence of the allergic nature of this group of diseases is recorded by Wright and Gold (1945), who describe nine cases of pulmonary eosinophilia associated with creeping eruption, a local condition of the skin caused by the filariform larvae of *Ancylostoma braziliense*. Furthermore, in view of the similarity of the lung changes associated with eosinophilia which occurs in other parasitic diseases such as ascariasis, trichiniasis, cutaneous helminthiasis, amoebiasis, and liver-fluke infestation, the pulmonary changes seen in Katayama disease can best be accounted for on an allergic basis.

At this stage attention should be brought to the recent interest shown in the eosinophilia hepatomegaly syndrome of young infants and children caused by infestation with the larvae of *Taxocara canis*, a dog roundworm.

Beaver *et al.* (1952) and Milburn and Ernst (1953) have demonstrated the larvae in the liver of affected patients. The latter authors suggest that other diseases, such as Loeffler's syndrome and tropical eosinophilia, may also be due to visceral nematode larvae migrations. In this connexion Muhleisen (1953) demonstrated filariform hookworm larvae in a patient who developed asthmatic symptoms one week after the onset of creeping eruption. Such symptoms had previously been regarded as being of allergic origin.

To our knowledge, no sputum studies have been done on patients in the toxæmic stage of bilharziasis, but it is

thought most unlikely that the transient pulmonary infiltrations and other symptoms of the Katayama syndrome could be accounted for by cercariae trapped in the capillary bed of the lung or by migrating schistosomes. There is no evidence that the mature schistosome migrates anywhere but to the vesical and intestinal venous plexuses. All extra-urinary and intestinal forms of bilharziasis are due to embolization of ova from the above sources.

If the syndrome was due to cercariae trapped in the lung capillaries, symptoms would be expected soon after infestation, and would not appear three to four weeks later.

Summary

A case of Katayama disease caused by *Schistosoma mansoni* is reported. Symptoms developed 26 days after a single exposure to infected water.

In addition to the well-known symptoms and signs of this condition, a marked transient pulmonary infiltration is demonstrated.

The pathogenesis of pulmonary eosinophilia in schistosomiasis is briefly discussed, and it is thought that the symptoms are best explained on an allergic basis.

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Medical Memoranda

Use of the Hodge Pessary in the Sling Operation

The use of a Hodge pessary in assisting diagnosis and as a test of the desirability, or otherwise, of carrying out a sling operation in cases of retroversion with symptoms is too well known to warrant further consideration here.

Its employment, however, as an instrument in the technique of the Baldy-Webster sling operation has never come to my notice, and I have not been able to find any such reference in the literature, nor have the many colleagues whom I have questioned. During the past 18 months I have used the pessary in 12 cases in which the Baldy-Webster sling operation has been carried out.

On the evening before operation the vagina is cleansed in the usual way and a Hodge pessary of suitable size inserted, or insertion may be left until the following day, when, with the patient anaesthetized and ready for operation, the pessary is introduced with adequate antiseptic precautions. At operation it is found that the uterus is maintained in good position, and the actual sling procedure is facilitated and simplified. In some of the cases the pessary has been removed 24 hours post-operatively, whilst in others it has been kept *in situ* for five days. In no instance has there been any indication of infection or other untoward effects, and the immediate results have been excellent. So far as can be judged at present by follow-up examination at the gynaecology post-operative clinic, the relatively long-term results leave nothing to be desired.

COMMENT

The use of a vulsellum forceps or a catgut traction suture in the fundus of the uterus to hold this organ forward in a reasonable position whilst operating is largely condemned, as damage may be done to the myometrium, and the punctures and knots may form points to which adhesions may attach, with possible unhappy results, especially for a woman of child-bearing age. An assistant's hand may support the uterus, but frequently this is found to be a doubtful

benefit, as it is often cumbersome, it obscures the field of operation, and it interferes with manipulation. With the use of a Hodge pessary to support the uterus in a normal position from below, through the vagina, damage is not done to the uterine fundus, the field of operation is left clear, and an assistant is hardly necessary.

Further, if a pessary of correct size has been used for diagnostic purposes and has relieved the symptoms, it is reasonable to assume that it has maintained the uterus in the optimum position, and that a similar pessary should be in position during the operation. Without its use the uterus may be supported too loosely, in which case the operation may fail in its purpose, or the uterus may be supported too tightly, with the possible substitution of symptoms such as dragging or pain in the iliac fossae and groins. Either of these contingencies is not unknown. Viewed in this light, the Hodge pessary should serve a useful purpose in other operations for correction of retroversion, such as the Gilliam procedure.

I thank Dr. Hugh Stirling, obstetrician and gynaecologist, Eastern District Hospital, Glasgow, for his interest and for permission to publish.

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Treatment of Actinomycosis with Aureomycin

Reported cases of actinomycosis treated with aureomycin are few. As clinical trial is the only effective guide to dosage with this therapy a case is reported and the literature is reviewed.

CASE REPORT

A farmer aged 31 was admitted to hospital complaining of a lump in the neck which had been present five weeks.

Cases of Actinomycosis treated with Aureomycin

Authority	Site	Length of History	Period of Treatment in Days	Total Dose in G. *
Glahn (1952)	Cervico-facial	(?) 6 months	21	42
Grant (1951)	"	3 months	26	52
			(21 days' interval)	
			40	Not stated
Kelly (1951)	Intestinal	14 "	107	116.5
	Cervico-facial	5 "	28	99 + local irrigation
	"	6 "	28	66 + local irrigation
	"	3 "	28	66
McVay <i>et al.</i> (1950, 1951)	"	2 years	58	21 intravenously; 158 by mouth; + local irrigation
	Hepatic	22 months	Not stated	Not stated
Ten Berg (1950)	Ileo-caecal	3 "	29	42
Thompson and Wax (1950)	Tibia	3 "	Not stated	Not stated
Wright and Lowen (1950)	Cervico-facial	22 years	Not stated	Not stated
Zoeckler (1951)	Chest wall	3 months	13	26

* Administered by mouth unless otherwise stated.

Examination disclosed a lump 2.5 cm. in diameter in the skin of the right side of the neck. It was spherical, smooth, ill-defined, firm, and fluctuant. The skin over it was indurated and reddened but not warm, and no sinuses were present. There were no other abnormal physical signs. Blood counts and x-ray films of the jaw, spine, and chest were all normal. The Wassermann reaction was negative. Aspiration of the lump produced pus which showed *Actinomyces israeli* on anaerobic culture.

Aureomycin was given: 3 g. daily for two days, 2 g. daily for eight days, and 1 g. daily for 23 days. It was administered six-hourly, to a total of 45 g., together with vitamin-B complex. The lump subsided rapidly and was no longer visible within one week of the beginning of treatment, although on palpation the skin was fibrosed, and this persisted.

Within a month of cessation of treatment, however, the lump had recurred and the presence of *A. israeli* was again confirmed bacteriologically. Aureomycin was recommenced, 3 g. daily being given for 28 days, in divided doses, together with vitamin-B complex. Once again there was the same rapid subsidence of signs, only a nodule of fibrous tissue

remaining. Four months later there had been no recurrence. The only toxic reaction noted throughout both courses was occasional vomiting.

DISCUSSION

In vitro tests of sensitivity of actinomycetes to aureomycin have been carried out by Hager *et al.* (1949), Strauss *et al.* (1951), and Garrod (1952), but conditions necessary for the growth of actinomycetes are highly unfavourable to the action of aureomycin.

Cases of actinomycosis treated with aureomycin are reviewed in the accompanying Table, but two need further comment. The case treated by Grant (1951) was associated with a fractured mandible. Treatment was interrupted by the patient taking his own discharge and the condition recurred, but was cured by a second course of aureomycin. A case of actinomycosis of the chest wall with clinical pericarditis was reported by Zoeckler (1951). Only 26 g. of aureomycin was given over the course of 13 days, but there was no recurrence three months later.

In all the cases reported *A. israeli* was isolated by culture. All were regarded as cured, and in most cases other methods of treatment had already been tried without notable success. Rapid improvement followed administration of aureomycin in all cases, and indurated tissues with draining sinuses healed, leaving only minimal scarring. Surgical drainage was thought to be unnecessary in all cases except one of a hepatic actinomycotic lesion. Comparable results have not been reported with any other form of therapy.

Although Zoeckler's case was cured with only 26 g. of aureomycin, the table shows that a course of aureomycin 3 g. daily for ten days, followed by 2 g. daily for a further 18 days in divided doses, as used by McVay *et al.* (1950,

1951), to be indicated for most cases, although some—for example, abdominal actinomycosis—will need a heavier dose.

Aureomycin must be regarded as the treatment of choice in actinomycosis, but adequate treatment is necessary if relapse is to be avoided.

I should like to thank Mr. C. J. Cellan Jones, under whose care this patient was admitted, for permission to publish this case.

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Reviews

A COMPLETE GUIDE TO INFLUENZA

Influenza and Other Virus Infections of the Respiratory Tract. By C. H. Stuart-Harris, M.D., F.R.C.P. Foreword by C. H. Andrewes, M.D., F.R.C.P., F.R.S. (Pp. 235; 98 figures. 30s.) London: Edward Arnold, 1953.

Although the virus of influenza was discovered only 21 years ago, it has now been more extensively studied than any other. It has been adapted to ferrets, mice, and to growth in eggs, classified into several varieties, purified, analysed, "re-combined," and made into several kinds of vaccine; and the phenomenon of erythrocyte agglutination by it has been examined from every conceivable point of view. One practical result of this study has been to make it possible to diagnose an attack of influenza by any of several different laboratory methods: this in its turn has been the basis of a world-wide survey of epidemiology, the headquarters of which are in this country. Very little information about all this work has yet found its way into textbooks, but after the appearance of this monograph their authors will have no further excuse for dealing with the subject inadequately. The latter part includes chapters on psittacosis, primary atypical pneumonia, Q fever, the common cold, and "febrile catarrh" and pharyngitis of unknown aetiology; concluding chapters discuss prevention by hygienic measures and immunization, and treatment—whether by chemotherapy or mere rest in bed, a steam kettle, and some aspirin and codeine.

The author is that unusual combination in this country—though a more familiar figure in the U.S.A.—the clinician-cum-laboratory worker. He can describe not only the pathology of these diseases and the laboratory methods used in connexion with them but their clinical features, of which indeed he has made a special study throughout a career largely devoted to this subject. He therefore writes with unusual authority, and another book dealing in this way on the one hand with aetiology, laboratory diagnosis, and epidemiology, and on the other with symptomatology, clinical diagnosis, and treatment, would be hard to find. The analyses of symptoms and signs in different varieties of acute respiratory disease and the well-illustrated discussions of radiological diagnosis are a valuable feature. There are also many well-produced illustrations of the histology of influenza lesions in the ferret and man: the latter show the consequences of secondary staphylococcal infection, and the implication in the text that a pure influenza virus infection is non-destructive of the mucosa and indeed is not known to produce any characteristic lesion may occasion some surprise. The distinction drawn between terramycin and aureomycin as anti-staphylococcal drugs is contrary to the general experience that cross-resistance between them is almost invariable.

Different parts of this work will appeal to a variety of readers. To the investigator it performs a valuable service in throwing into relief two apparently distinct and fairly well characterized diseases of which the causes are still unknown. Of these the acute angina which is not streptococcal seems particularly to deserve rescue from its comparative neglect.

L. P. GARROD.

CLINICAL SURGERY

Progress in Clinical Surgery. By various authors. Edited by Rodney Smith, M.S., F.R.C.S. (Pp. 414; 112 illustrations. 36s.) London: J. and A. Churchill, 1954.

The science and art of surgery continue to advance, and no one nowadays will be rash enough to say that the end of achievement is in sight. It is impossible for textbooks to keep quite up to date, and there is need for such a book as this which is "intended to supplement, and not to re-

place, the standard surgical textbooks." The volume is designed to give help "particularly to the postgraduate student working for his final F.R.C.S. examination and the younger surgeon with a recent hospital appointment." We have no doubt that it will adequately fulfil those functions, though in some chapters the young surgeon might look for greater detail in technique. The various sections are written by experts of acknowledged authority, and throughout the book the editor has maintained unity and balance.

The volume opens with a startling sentence: "It is possible that nearly as many patients are killed by fluid replacement as are cured by it." Can it be so? As one looks back one remembers patients who did not improve as they should have done by fluid replacement, and it may have been due to the fact that the past generation did not know so much about electrolytes and the equivalents of sodium and potassium. Anyway, the young surgeon now has the opportunity to learn all about them.

Throughout the volume the recent advances in surgery are well set forth and a judicious clinical attitude maintained. During the past five years the most spectacular advances have been in the surgery of the heart and great blood vessels, and there are excellent chapters summarizing the new work. Yet even while this book must have been in preparation further remarkable advances took place, for it is within the past two years that large aneurysms involving the descending aorta or its main branches have been extirpated and the excised length of aorta replaced by a graft.

One of the most valuable chapters, and the best illustrated, is that dealing with the injured hand. Let the young surgeon learn and apply the principles laid down in this chapter and the earning capacity of thousands of injured workmen will in future be greatly increased. A useful book.

ZACHARY COPE.

NUTRITION IN INDIA

Nutrition in India. By Dr. V. N. Patwardhan. (Overseas Ed. Pp. vi and 345; 27 illustrations. Rupees 15.8.) Bombay: The Indian Journal of Medical Sciences, 1953.

Dr. Patwardhan, who is director of the well-known Nutrition Research Laboratories at Coonoor, appears to have had two reasons for writing this interesting book. Doubtless his first concern was to draw further attention to the defective diets on which many Indians have to subsist, and to describe the forms of ill-health caused by this malnutrition. His second desire has been to review the research on nutrition that has taken place in India during the last forty years, both on points of local interest and on more fundamental problems. He observes that research workers in other countries must often have difficulty in obtaining access to Indian publications on nutrition. The present volume will help to make good this deficiency.

The topics covered include Indian foodstuffs, rice, wheat, and other cereals, pulses and legumes, milk and milk products, proteins, fats, minerals, vitamins, basal metabolism, nutrition surveys, deficiency diseases, and nutrition in relation to public health. British readers will perhaps be most interested, however, by accounts of the widespread poisoning which can be caused by certain common Indian foods. Thus when poverty necessitates the consumption of certain easily grown pulses the condition known as lathyrism often develops and leaves the victim permanently crippled by paralysis of the legs. Another form of poisoning, epidemic dropsy, is caused by the contamination of mustard seeds by the weed *Argemone mexicana*. The author acknowledges the debt of India to McCarrison for the initiation of nutritional research early in the present century. For its literary clarity and for the excellent arrangement of its subject matter this book may be warmly recommended to all who are interested either in nutrition or in India.

T. MOORE.

MEDICAL ELECTRONICS

Medical Electronics. By G. E. Donovan, M.D., M.Sc., D.P.H. (Pp. 215; 36 figures. 30s.) London: Butterworth and Co., 1953.

In his preface the author says that the literature on the applications of electronics in medicine is no longer a stream but a river in full flood. It is a river in which one feels that most doctors would be likely to drown. The reviewer is a radiotherapist and therefore probably has a more ready acquaintance with the subject matter of the book than most doctors, and yet, after reading it, his first symptoms were those of mental congestion.

The technique of electronics and the technicalities are all so new that only a nodding acquaintance with the numerous applications of the subject resulted from reading about it in this book. The difficulty is in the vastness of the subject, and lack of insight of the reader into the procedures used, and the fact that the language is different from what one usually reads. For instance, few doctors, of whom the reviewer is not one, could understand the following: "The apparatus uses a scanning technique known as the intercept length method and consists essentially of a Muirhead facsimile transmitter and a pulse width analyser counter circuit incorporating dekatron scaling tubes." Such statements abound.

There is no doubt that the author is a master of his subject, and there is equally no doubt that the subject offers to the medical profession new methods of investigation and recording of the very existence of which most of us are ignorant. If he is writing for a medical public the author should leave out most of the technicalities, simple and essential as they might be to him, and concentrate on a few more examples showing the value of the methods in medicine. If the technicalities are to stay they should be explained and defined better—for instance, by an early simple chapter on the physics of the subject associated with a glossary of terms to be used. As an indication of the wonderful possibilities open to us in accurate quantitative work carried out with minimal trouble to the doctor the book should be read by all medical students and by all those working in hospitals. The obvious way to make use of the facilities offered seems to be to appoint each hospital someone like the author in a place easily accessible to all members of the staff so that each may ask the electronics expert to produce the particular apparatus he is interested in.

FRANK ELLIS.

ADMINISTRATIVE MEDICINE

Administrative Medicine: Transactions of the First Conference March 9, 10 and 11, 1953. New York. Edited by George S. Stevenson, M.D. Foreword by Willard C. Rappleye, President, Josiah Macy Jr. Foundation. (Pp. 176. 53s.) New York: Josiah Macy Jr. Foundation, 1953.

This is a verbatim report of an interesting discussion by some 20 experts representative of every aspect of medicine and sociology of how best to integrate all concerned in an ideal system of medical care. No resolutions were submitted, discussion was quite free, and many differences of opinion emerged; but team-work was declared to be essential in any system aiming to be complete. The team must include not only the obvious medical elements but representatives of every branch of social service, with those of labour. The question of a State medical service was carefully avoided, but strong support was given to the numerous voluntary medical aid schemes now in operation, though all were deemed incomplete. The medical curriculum came in for severe criticism as ignoring the social sciences and as a consequence turning out doctors ignorant of these vital elements in civilization, and, therefore, essential to any form of medical practice. Such emphasis was laid on this criticism that one participant in the conference asked if it was intended that the social as well as the natural sciences should be a prerequisite to the study of medicine. He was not alone in thinking that if this was the case the future doctor might be a more learned man but possibly a less useful one to the average patient.

The book left on me certain definite impressions. (1) Of the great difficulty of establishing a national medical service in a country constituted as is the U.S.A.; (2) of the obvious sincerity of the conference in advocating group practice; (3) of the risk, if the idealists had their way, of the medical profession being organized to death; and (4) that no conference of this kind is complete without the presence of some ordinary potential patients who might be able to keep the feet of the idealists on the ground.

ALFRED COX.

PHYSICAL MEDICINE AND REHABILITATION

Physical Medicine and Rehabilitation. Edited by Basil Kiernander, M.B., B.S., M.R.C.P., D.M.R.E., D.Phys.Med. Introduction by the Rt. Hon. Lord Horder, G.C.V.O., M.D., F.R.C.P. (Pp. 610+xiv; illustrated. 63s.) Oxford: Blackwell Scientific Publications, 1953.

There have been many developments both in physical medicine and in rehabilitation in the past decade. Good textbooks are badly needed, but few are available and none are entirely satisfactory. The main reason for the shortage is that both subjects, to a greater or less extent, find their application in all branches of clinical practice, and few authors are willing to tackle such a wide field. Dr. Kiernander has tried to produce a combined textbook with the help of 25 contributors on both sides of the Atlantic, and credit must go to him for attempting a difficult task which so many have shunned. As Lord Horder points out in the introduction, the justification for combining the two subjects in a single book is that so much of physical medicine deals with the restoration of function after illness, while rehabilitation, of concern to all branches of medicine and surgery, depends, perhaps above all else, upon efficient physical medicine.

There is much to commend in this book. Many excellent chapters are contributed by leading experts and should be studied by everyone interested in the theme. But some chapters are so indifferent that they spoil the rest of the volume and should be omitted from future editions or given to authors better fitted for these tasks. Some authors, who have previously written books on their subjects, have tried to compress so much into a single chapter that they have sacrificed important detail in an attempt to be comprehensive. Others have included, apparently as padding, unnecessary details of treatment programmes in use in their hospitals. There are too many spelling and printing errors in the text and the indexing is quite inadequate; but, in spite of the many criticisms that can be made, this book has achieved much of its objective. As it stands it can be recommended for the excellent material it contains, much of which is not readily available elsewhere; but substantial re-writing and a great deal of editing must be undertaken before a second edition appears.

F. S. COOKSEY.
D. A. BREWERTON.

STEREOSCOPIC RADIOSCOPY

Die Objektive Stereoskopie an Röntgenbildern: Eine Diagnostische Methode. By Professor Dr. A. Hasselwander. (Pp. 187; 125 illustrations. D.M.27.) Stuttgart: Georg Thieme (Verlag), 1954.

This is a monograph on stereoscopic radiology in which the advantages, uses, and difficulties of the method are very fully discussed. New apparatus invented by the author is described by means of which exact measurements may be taken in the third dimension, and even solid models produced from a study of stereoscopic radiographs. The author has devoted his life to the study of three-dimensional anatomy, especially from the point of view of the radiologist, who may find many ideas of use in this special field. Of great practical value to every anatomist is a series of drawings on a reduced scale of the famous coloured lithographs by Wilhelm Braune of frozen sections of the human body. The originals are not always accessible, and these perfect reproductions should be very welcome.

HENRY SOUTTAR.

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DRUG TREATMENT OF HYPERTENSION

The bewildering number of drugs which are said to lower blood pressure has not only made the selection of the best form of medical treatment for hypertension a matter of some difficulty but has underlined the necessity for a knowledge of the natural history of the disease and of its clinical types. Women appear to tolerate high levels of blood pressure better than men, except when hypertension is in the malignant phase¹; and in elderly persons surprisingly high pressures are often compatible with good health for many years.² This is specially noticeable when the blood pressure has risen slowly over many years. By contrast, a rapid increase in blood pressure in young persons is a grave sign and often associated with arteriolar necrosis, which ushers in malignant hypertension. The diastolic blood pressure is a far more important guide to severity than the systolic.

For purposes of treatment patients with essential hypertension—a term used to describe high blood pressure not attributable to any other disease—may be considered in three groups based on McMichael's³ classification of the condition: first, those with labile hypertension whose diastolic pressure is below 120 mm. Hg and who show no signs of complications; secondly, those with sustained hypertension, with a diastolic pressure around or over 120 mm. and with developing or established complications (encephalopathic attacks, cardiac enlargement, and retinitis) but normal renal function; and, thirdly, patients with hypertension in the pre-malignant or malignant phases, with diastolic pressure rising to 130 mm. Hg or even higher. In the first group the prognosis is good, and the only treatment needed is reassurance and mild sedation. These patients are often obese, and they should be encouraged to lose weight: they often complain of headaches, which are more likely to be due to anxiety—sometimes caused by an injudicious remark about high blood pressure in the consulting-room⁴—than to hypertension.⁴ The patient rather than his blood pressure should be treated, and there is no place for powerful hypotensive drugs, which themselves carry a risk.

Treatment of patients in the second group is a different matter, for they may suffer from vascular damage and other hypertensive complications, and effective reduction of blood pressure is obviously desirable; while in the third group control of hypertension is a matter of vital importance and great urgency.

For patients in the pre-malignant or malignant stages of the disease the methonium drugs offer the best prospect of relief: they cause vasodilatation and hypotension by blocking transmission of nerve impulses in autonomic ganglia, and several recent reports have shown that they are a useful addition to therapy.⁵⁻⁷ A single subcutaneous injection of an adequate dose will reduce the blood pressure towards normal for two to three hours—an effect which the upright position helps to increase. It is possible to obtain a longer action by using a similar compound (M & B 2050 A or "ansolysen") dissolved in 25% polyvinyl pyrrolidone to which 0.1% ephedrine has been added.⁸ In a recent issue of this *Journal* Professor F. H. Smirk⁹ has described his results in a series of 250 cases treated with methonium compounds for periods up to 3½ years. In his experience this form of treatment has improved the prognosis in severe hypertension, and this is borne out by the fact that, out of 28 of his patients with malignant hypertension, 21 are still living—an average survival time of 22.8 months. Professor Smirk has also noted that an attack of hypertensive left ventricular failure can be terminated by fractional intravenous injection of hexamethonium. Among the notable results of reduction in blood pressure are the disappearance of papilloedema—a finding also noted by Morrison⁷—a decrease in the size of the heart, improvement in the electrocardiogram, and an easing of headaches.

Treatment with the methonium compounds is far from easy: oral administration is unsatisfactory, and may be dangerous, since absorption is irregular and control difficult.¹⁻¹⁰ The drug has to be given by subcutaneous injection two or three times daily, and

careful observation is essential in the first weeks of treatment, since tolerance quickly develops.⁷⁻⁹ Side effects—such as giddiness and faintness on standing due to postural hypotension, dry mouth, difficulty of micturition, constipation, and visual disturbances caused by vagal inhibition—are unfortunately common, although they can be mitigated by careful control of the dosage and by lying down for half an hour after the injection. Patients should always be admitted to hospital for initial treatment with hexamethonium bromide, and they have to be watched carefully after discharge, although they can, like diabetics, be taught to give their own injections. When renal function is impaired the excretion of hexamethonium bromide is retarded, and therefore injections are required less often. McMichael¹ has noted no tendency for moderately increased blood urea to rise during therapy. Dyspnoea, associated with organized fibrinous pulmonary oedema, has been observed in three patients with severe hypertension who were having hexamethonium therapy.¹¹ This lung change was attributed to some modified sequel of left ventricular failure and to prolongation of survival by treatment: it is not a contraindication to continued therapy.

In spite of the encouraging results achieved with methonium compounds there is clearly a need for a safer hypotensive drug which is easier to use and can be given by mouth. Thiocyanates have largely been abandoned owing to their inefficient hypotensive action, the need for controlling the concentration of drug in the blood, and their unpleasant side effects. The alkaloids of *veratrum viride*, which cause a reflex vasodilatation, have been reported on recently by Kauntze and Trounce,¹² who obtained good results in only 20% of their cases. The frequent occurrence of vomiting, sweating, and other side effects greatly limits the usefulness of these drugs. The dihydrogenated alkaloids of ergot, which have a sympatholytic action, have a slight hypotensive effect, and a mixture of three such alkaloids ("hydergine") can be given by mouth, although the results are not striking.¹³ Hydralazine hydrochloride (1-hydrazino-phthalazine) lowers blood pressure by a central action and by inhibiting the action of histaminase, and is widely used in the U.S.A.¹⁴⁻¹⁶ According to Schroeder¹⁷ it has a synergistic action with methonium, and the use of the two drugs together has been advocated. Unfortunately, hydralazine causes severe headache, tachycardia, and an increase in cardiac output; moreover, a syndrome resembling disseminated lupus erythematosus has been observed in patients taking the drug.¹⁸ Many clinicians believe that these complications make hydralazine an undesirable drug for the purpose of reducing blood pressure.

Alkaloids extracted from *Rauwolfia serpentina* ("rauwiloid," "serpasil") have mild hypotensive and sedative properties and reduce the pulse rate.¹⁹⁻²⁰ They can be given by mouth for long periods and apparently have no serious toxic action. Their effectiveness still remains to be assessed, but they may prove useful in the treatment of anxious patients with tachycardia,²¹ or of patients with uncomplicated sustained hypertension whose diastolic blood pressure is below 120 mm. Hg. The practice of using two or even three different hypotensive agents together has some vogue, but is generally undesirable, since assessment of the hypotensive, or toxic, effects of one of the drugs becomes difficult, and the patient is likely to be bewildered by the variety of tablets he is receiving. Finally, the use of a low sodium diet, although not strictly a drug treatment, is worth considering in the treatment of hypertension.²² Restriction of sodium is the basis of the rice diet introduced by Kempner,²³ but to be effective the daily intake of sodium must not exceed 0.5 g. (or 1 g. NaCl). This makes food very unpalatable, and the diet can be strictly maintained only in hospital, although the use of ion exchange resins may permit the patient to take meals with a higher salt content. Too rigid salt restriction, however, may precipitate uraemia in patients with impaired renal function, so that a low salt diet, like most other forms of therapy for hypertension, also has its limitations.

THE AGED SICK AND INFIRM

The care of old people, and the problems which it raises, command an ever-increasing share of public attention. This is not entirely due to the fact that there are more old people in the community nowadays. It is partly the result of the altered social circumstances in which we live, with fewer children able and willing to look after their aged relatives; partly of medical advance, especially antibiotic therapy, which is reducing deaths among the elderly from pneumonia—in other days a quickly fatal disease (this has increased the number of potential victims to cardiovascular degenerations or malignancy, both of which are apt to cause prolonged illnesses necessitating nursing care); and partly of the difficulty of securing admission to hospital for those old men and women who require it, and particularly for those suffering from chronic disease. While it has become increasingly important to make hospital accommodation available for those old people for whom there is no alternative, at the same time it is essential to do everything possible to assist those who are able, with help, to continue to live in their own

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- ²⁰ Wilkins, R. W., *et al.*, *ibid.*, 1954, 250, 477.
- ²¹ Wilkins, R. W., *Mod. Conc. cardiovas. Dis.*, 1953, 22, 198.
- ²² Corcoran, A. C., Taylor, R. D., and Page, I. H., *Circulation (N.Y.)*, 1951, 3, 1.
- ²³ *Amer. J. Med.*, 1948, 4, 545.

homes. As things are, there are many old people, gravely ill, living at home under conditions almost unbelievably bad. Many of them have no hope of full restoration to health, for one of the important lessons emphasized again in a book by Professor T. Ferguson and Dr. A. N. MacPhail,¹ published last month, is that the patient's health may owe far more to his home conditions than to the disease he suffers from or the treatment he receives for it. The plight of these seriously disabled and elderly people, many of them lying in dreary squalor, is the most compelling of all the problems of old age. Recent articles in the lay press have drawn attention to the urgency of their need, a need painfully well known to medical men and often described in this *Journal*. Six years ago, just before the National Health Service came into operation, Ferguson² described the condition of 300 old persons, 62 men and 238 women, who were being treated in their own homes in Glasgow by district nurses, often under shockingly bad conditions. The large majority had been ill for more than six months. Of the 300 patients, 27 suffered from heart disease, 40 from cerebral haemorrhage and hemiplegia, 52 from diabetes, 21 from rheumatism, 17 from cancer; and 52 were described as cases of "senility." Fifty-two were incontinent, and 107 were wholly bed-ridden. Apart from the ministrations of the district nurse, 78 of the 300 old people looked after themselves without any other assistance, though by no means all of this group could care for themselves in any satisfactory way.

Many old people suffering from chronic sickness of this kind can be treated satisfactorily only in hospital, but there is often great difficulty and long delay in securing their admission to hospital, a difficulty which existed even before the new order of 1948 and not likely to be adequately met by the restoration of relieving-officer powers. The report³ of the British Medical Association's Committee on the Care and Treatment of the Elderly and Infirm directed particular attention to patients not able to fend for themselves. There is need not only for additional beds for these cases and for their sorting and energetic treatment, but for the development of accommodation of the "half-way" type, since lack of home care on discharge from hospital is a common cause of early breakdown, calling for readmission to hospital. The concept of the "day hospital" is being developed at Oxford,⁴ and the results of the experiment there will be watched with interest all over the

country. During the past five years the National Corporation for the Care of Old People has had encouraging results from a scheme which enables old people who have been patients in certain hospitals to go away to convalescent homes for periods up to eight weeks. Payment is made by the regional hospital boards.

In these days any kind of institutional care is relatively expensive; and sometimes old people are unwilling to go to hospital, however great their need, fearing that to do so will entail the irretrievable disruption of what home is left to them. Sheldon⁵ found that the great majority of the old people whom he studied in Wolverhampton were able to lead independent lives, though some of them required a measure of help which they could not always reasonably obtain from members of their own family. Many efforts have been directed to making life easier for old people, the provision of "meals on wheels," laundry services, and chiropody among them. But, apart from medical and nursing care, what most old people who live in their own homes want is help that will enable them to carry through the ordinary routine of independent living. Sometimes this help can be provided by members of the family circle; sometimes the elderly are dependent for it on the good offices of neighbours. For others a home-help service is essential; many aged invalids at present dependent on neighbourly help place on their neighbours a load which it is unreasonable to expect them to bear. That is not to say that there is not a great place for voluntary effort and voluntary service, but the care of an elderly patient should not be allowed to develop into an intolerable burden. The nursing of these old people by district nurses affords a notable example of what can be achieved under unpromising conditions, given an organization—such as the Queen's Institute—imbued with the spirit of service. The amount of call on home-help services will obviously depend on individual circumstances; for some patients help with the weekly washing may suffice, for others help on two or three days a week, or for an hour or two daily. Obviously no home-help scheme can provide a 24-hour service; but old people who require such a service should not be left in their own homes. The clubs for old people which are being so widely developed might be encouraged to function not merely as centres in which old people could gather for social intercourse and recreation, but as centres from which a voluntary service might radiate to the homes of those who are unable to visit the club premises.

As a long-term policy, the approach to the welfare of old people must be along much more positive lines,

directed to the promotion of healthy living, the conservation of active interest, and the prevention of invalidism. But in the meantime the wretchedness of many decrepit old men and women is unworthy of a civilized society. When the matter was raised in the House of Commons recently the Minister of Health⁶ referred to this as perhaps the most baffling problem in the whole of the National Health Service. He thought the solution lay rather in the home than in the hospital. "Let us by all means ask if the State has failed," he said, "but let us also ask if the family and the neighbours are doing all they can . . . the local authorities, the voluntary bodies, and the Church." Although it is certainly true that few facets of the social service offer greater scope for voluntary effort than the care of old people, it is equally true that there has not always been that clear lead from official sources so essential to overcoming a problem of such magnitude.

ANAESTHESIA FOR CHILDREN

Clinical medicine demands a clear memory, the ability to correlate disjointed stories, and sound judgment. Surgery demands, in addition, good eyesight and manual dexterity. Joining all these qualities should be one on which greater stress should be laid—namely, kindness. Lacking it, no boy or girl should start a medical career with any intention of practising clinical medicine. Without kindness and gentleness the exercise of the highest technical skill will bring little reward either to the doctor or to his patients. The need for these humane qualities is most clearly seen in the preparation of children for surgery and the management of their anaesthesia. Attention has been directed to these aspects of the surgery of childhood in recent years. Eckenhoff reports an investigation into the effect of premedication or its absence on the post-operative mental state of young patients.¹ Over a period of eighteen months questionnaires were sent to the parents of all children admitted to the Hospital of the University of Pennsylvania for an otolaryngological operation. Eckenhoff found that 17% of the replies indicated a personality alteration which might be traced to anaesthesia or to the hospital experience. The changes reported were night terrors, temper tantrums, fear phenomena, and bed-wetting. The incidence of personality change was highest in the youngest children—that is, aged 2 or 3 years—but study of children in all age groups showed that if there was crying and struggling during induction then one of these personality changes was more likely to occur. In this series premedication consisted of pentobarbitone and scopolamine and usually morphine in a dosage recommended

by Leigh and Belton.² Anaesthesia was administered by resident or staff anaesthetists, or medical students or interns under supervision. It should be noted here that the dosage of oral pentobarbitone recommended by Leigh and Belton and other American workers is far lighter than that normally used by British anaesthetists, who find that 0.6 gr. per stone (6 mg. per kg.) is satisfactory.

Commenting on his report Eckenhoff writes: "A previous report has demonstrated a clear-cut relationship between the type of pre-anaesthetic medication and the incidence of crying prior to induction of anaesthesia. It was shown that 35 to 40% of children 5 years of age or less who received only atropine or scopolamine cried. It was further shown that the use of a barbiturate with the belladonna drug, plus careful attention to the time of administration of the drugs, significantly reduced the incidence of crying. In this respect it was reasoned that the crying child might be the one in whom personality changes were most likely to develop. Obviously, skill of administration of anaesthetics remains of prime importance." In a survey of the subject of children in hospital Mac Keith³ does not describe any personal follow-up of surgical cases from his own department but states that a "considerable number, chiefly among those under 5, show changes in behaviour for a shorter or longer period after [hospital admission]." He believes that "the three main anxieties which centre round an admission to hospital are the separation from home, the anaesthesia, and the operation," and he gives the sound advice that, "when a child does not have a pre-operative sedative, he should be carried to the anaesthetic room by a familiar nurse, or accompanied by a nurse if a porter carries him, and that this nurse should stay with him until he is unconscious. Certainly being trundled in a trolley lying flat, so that one cannot see where one is going, is alarming."

Children are characteristically highly responsive to the power of suggestion, and by its kindly application anaesthetists are constantly rewarded with a peaceful phase of induction of anaesthesia. This approach to a child patient combined with a careful intravenous induction with thiopentone after adequate sedation with morphine and scopolamine must guard the child's mind from any harmful fears, either real or imaginary. Sheila Anderson⁴ has described the details of this method of premedication in detail. More recently H. E. Pooler, of Chesterfield Royal Hospital, has made a short colour film which beautifully shows the value of care and consideration by nurses, orderlies, and anaesthetists towards children undergoing tonsillectomy. There are others who consider their child patients are better protected by the use of narcotics given to the child in its own bed. These drugs usually consist of rectal thiopentone or of one of the oral barbiturates. All have their advocates, and it is impossible to dogmatize on the most successful procedure. The details of the actions of these and other powerful drugs are important to understand, but, having learnt them, let the anaesthetist mingle kindness with his pharmacology. Then no more may be heard of personality changes after operation.

¹ *Hospital and Community*. Oxford University Press. (Geoffrey Cumberlege) for the Nuffield Provincial Hospitals Trust, 1954.

² *Lancet*, 1948, 1, 417.

³ *The Care and Treatment of the Elderly and Infirm*, 1947, B.M.A., London.

⁴ *Coastal, L., Practitioner*, 1954, 172, 552.

⁵ Sheldon, J. M., *The Social Medicine of Old Age*. London, 1948.

⁶ See *British Medical Journal*, 1953, 2, 1436.

¹ *Amer. J. Dis. Child.*, 1953, 88, 587.

² *Anesthesiology*, 1946, 7, 611.

³ *Lancet*, 1953, 2, 843.

⁴ *Ibid.*, 1951, 2, 965.

FRACTURES COMPLICATING E.C.T.

Violent involuntary muscular contractions are apt to cause fractures and dislocations, and such injuries have been encountered in particular in cases of tetanus and idiopathic epilepsy. When convulsions are induced in psychiatric treatment the incidence of these complications is high. The most frequent of such injuries complicating convulsive therapy is compression fracture of one or more vertebrae, though humeral fracture and dislocation of the shoulder and temporomandibular joints have been reported also.

When convulsions are induced with metrazol the recorded incidence of vertebral fracture has varied from less than 1% to 47%. In a careful investigation of 800 patients in whom convulsions were thus induced, and in whom radiographs of the spine were taken before and after treatment, Easton and Sommers¹ record an incidence of fracture of 26.1%—the figure being 37.2% for men and 16.8% for women. In the presence of osteoporosis the incidence of fracture was doubled, and it was found that the 4th, 5th, and 6th thoracic vertebrae were those commonly injured. With electrically induced convulsions Lingley and Robbins² report a fracture incidence of 23% in 230 patients. In this series fractures occurred almost three times more frequently in men than in women, and the incidence was doubled in the group of patients showing osteoporosis. Meschan and others³ report on the incidence of fractures in a group of 212 male patients, in whom a careful radiological examination was made before and during the course of electroconvulsive therapy. The incidence was 35.4%—the 3rd, 4th, and 5th thoracic vertebrae being most commonly affected; 80% of these fractures occurred during the first five treatments. They state that the fracture is often symptomless and that when back pain does occur after therapy fracture is likely to be the cause. These authors also found that the incidence of vertebral fracture was reduced to 19.5% when curare was administered. Dewald and others⁴ investigated this complication in a group of 263 cases. When treatment was carried out with the muscle-relaxant drugs the incidence of fracture was 20.8%, 42% in the male and 14% in the female; when decamethonium bromide was used the fracture incidence fell to 1.9%. They find that the fracture incidence with the direct and Glissando techniques is the same and confirm the greatly increased risk of fracture in the presence of osteoporosis. Fracture usually occurred during the first three treatments, and the 4th, 5th, and 6th thoracic vertebrae were those commonly affected; all the fractures were in the dorsal region, their number in individual cases varying from 1 to 6, with an average of 2.2. Usually the fracture was a minimal compression, and in only two of 49 cases with fracture did the degree of compression exceed one-third of the original height of the vertebral body. Fracture caused no symptoms in 30.6% of the cases, and of the patients complaining of back pain after treatment 75.6% had fractures.

¹ *J. nerv. ment. Dis.*, 1944, 99, 256.

² *Radiology*, 1947, 48, 124.

³ *Ibid.*, 1950, 54, 180.

⁴ *J. Amer. med. Ass.*, 1954, 154, 981.

The high incidence of vertebral fracture as a complication of convulsive therapy is clear from these studies. While the skeletal injury is usually slight and frequently not productive of symptoms, its prevention is desirable, and the use of muscle relaxants is of proved value here. Since fracture usually occurs early in treatment and the injury may become more severe with subsequent treatment, the value of prophylaxis by means of relaxants from the beginning of therapy is obvious. The greater incidence of fractures in the male would appear to be due to his more powerful muscles. It is also of interest that the vertebrae commonly injured are the 4th, 5th, and 6th dorsal. The position of these vertebrae at the height of the dorsal kyphosis, the normal slight anterior wedging of thoracic vertebral bodies, and the relatively small degree of movement normally occurring here perhaps account for the site of these fractures.

NEUROLOGICAL COMPLICATIONS OF INOCULATION

That neurological complications occasionally follow a prophylactic inoculation has been recognized for many years, and some of the more dramatic, such as post-vaccinal encephalitis, are well known. Miller and Stanton¹ have recently provided an excellent review of this subject and contribute some further detailed examples of their own. As they point out, these cases "lie in a neglected borderland between the fields of neurology, preventive medicine and paediatrics and have been the subject of many isolated case reports but of little systematic study." Their paper confirms the impression that, although uncommon, such cases are not very rare. When neurological complications do ensue, a variety of reactions can occur to any one type of inoculation, although there is a tendency for one clinical picture to be commoner than others. Thus, after serum injections such as A.T.S. a brachial radiculitis is the common pattern, while after T.A.B. it is cerebral involvement, and with pertussis inoculation convulsions are the usual type of neurological complication.

Interest in this subject has been more widespread of late because of the observation that poliomyelitis may apparently be evoked by pertussis and diphtheria inoculations. This association is specifically excluded from Miller and Stanton's review. However, the possibility that an allergic reaction may upset a symptomless symbiosis between a host-cell and an already indwelling virus will occur to many. The authors dismiss this as highly improbable, though the occurrence of differences in the clinical picture between one type of inoculation and another could as well argue for as against such a view. In deciding the point it would be helpful to know more than we do at present of the intracellular changes associated with "immunity." In general, the authors incline to the opinion that all the manifestations discussed are examples of hypersensitivity, and they marshal the evidence for this well. It may be, however, that the various neurological syndromes which occur

¹ *Quart. J. Med.*, 1954, 23, 1.

are produced in different ways, even though allergy in the broadest sense is a common link. The wider suggestion that certain "spontaneous" neurological diseases may be similarly conditioned is certainly an interesting speculation. From the practical point of view the implications of these views for treatment are clear. The antihistamines and cortisone and A.C.T.H. should evidently be given a trial. They may serve both as treatment and as a test of the hypothesis. Here the beneficial results of cortisone in post-exanthematous encephalitis are relevant and encouraging.

This review of a somewhat neglected subject has a twofold merit. The authors bring together compendiously much scattered clinical observation, and, in interpreting it, put forward a hypothesis in a form which already suggests ways of clinical and even experimental confirmation. This is a methodological advantage often overlooked in reporting clinical observations.

FAT EMBOLISM

Fat embolism is one of the most serious complications of fractures, and also, occasionally, of operative procedures on bones. It is probably more common than is generally realized, and the less severe cases must often escape recognition. It occurs most commonly in young adults after fractures of the tibia and femur. The first symptoms, which usually present 36–48 hours after the fracture, are heralded by a sudden change in the patient's general condition. Cyanosis, dyspnoea, and pain in the chest are common, and the patient rapidly becomes restless, drowsy, or irrational, or he may pass into a deep coma. This last symptom indicates massive involvement of the cerebrum, and implies a bad prognosis. These early symptoms are usually accompanied by an equally rapid rise in temperature, pulse rate, and respiration. The sudden development of incontinence of urine was reported by Alldred¹ in six patients of a series of nine studied by him. Of the physical signs the most striking is the petechial rash which may develop over the upper chest, neck, and shoulders, sometimes spreading to the arms and lower part of the trunk. It fades quickly, but is usually present for several days. In the chest the signs are those of acute pulmonary oedema: there will be moist sounds and scattered areas of consolidation. In some cases the symptoms and physical signs are confined to the chest, and the correct diagnosis may be overlooked. Alldred reported spasticity of the limbs in one patient and hemiplegia in another, evidence that the central nervous system was affected. The diagnosis may be confirmed by the presence of fat in the sputum and urine and by radiological examination of the chest.

The treatment of fat embolism is entirely symptomatic, there being no specific measures available. Cyanosed patients should be given oxygen, which may be life-saving. It can be administered by nasal catheter, B.L.B. mask, or by placing the patient in an oxygen tent. Pulmonary infection should be controlled by antibiotics. Fluids should be administered, either by mouth or intra-

¹ *Brit. J. Surg.*, 1953, 41, 82.

venously, and the restless patient will require sedation. Newman has suggested tying the profunda femoris vein, but it is doubtful if this procedure is of any value once embolism has occurred.

BIRTHDAY HONOURS

The conferment of a baronetcy on Sir Russell Brain, who was knighted in 1952, is a further recognition of his great services to medicine and of the importance of his high office as President of the Royal College of Physicians of London. It is an honour which will be warmly welcomed by his friends and colleagues as a tribute to a man of many gifts and attainments who in achievement and personality upholds the traditions of the great profession he serves so unstintingly in so many ways. Mr. R. C. Brock, who is made Knight Bachelor, is known throughout the world for his remarkable contributions to the surgery of the heart and so to the relief of cardiac cripples. The report on his first six successful cases of valvulotomy, for mitral stenosis was published in the *British Medical Journal* four years ago, written in a style that was a delight to read. Mr. Brock has brought renown to British surgery. As editor of the *Guy's Hospital Reports* and author of *The Life and Work of Astley Cooper*, he has taken his place in a distinguished line of scholar-surgeons. The profession in this country will acclaim the honour done to their Australian colleagues by the conferment of a knighthood on Dr. A. P. Murphy, President of the Royal Australasian College of Physicians, and on Mr. H. H. Schlink, who is consulting gynaecological surgeon to the Royal Prince Alfred Hospital, Sydney. Australia has also been honoured in the awards of C.B.E. to Dr. A. J. Metcalfe, director-general of health and director of quarantine, Canberra, and to Dr. C. J. M. Walker, member of the Medical Board and of the Board of Health, New South Wales. Dr. P. P. Lynch, a member of the Dental Council and of the Medical Research Council of New Zealand, has been appointed C.B.E. Dr. R. S. F. Hennessey, Director of Medical Services in Uganda, and Dr. Andrew Topping, Dean of the London School of Hygiene and Tropical Medicine, both receive the C.M.G. Among other medical men honoured his old colleagues will note with interest the award of the O.B.E. to Dr. E. A. Cockayne "for services to entomology," and recall his classical contribution to medical genetics: *Inherited Abnormalities of the Skin and Its Appendages*, published in 1933.

Medicine has a special affection for her "stickit" doctors, among whom Mr. Somerset Maugham, now admitted as a Companion of Honour, is *facile princeps*. Mr. Maugham entered St. Thomas's in 1892 and qualified M.R.C.S., L.R.C.P. The medical profession will wish, too, to congratulate Mr. Alfred Chester Beatty upon his knighthood. An American who became a naturalized Briton, Mr. Beatty has been a great benefactor to medicine. In 1937 he bought the old Freemasons' Hospital in Fulham and presented it to the Royal Cancer Hospital to house the well-known Chester Beatty Research Institute.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

INVESTIGATION OF HAEMOLYTIC ANAEMIA

BY

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Red cells are normally removed from the circulation within 120 days, a process which involves the daily destruction of some 2.7×10^{11} erythrocytes in a man with a blood volume of 5 litres. An equivalent number of newly formed cells are provided by the bone marrow, which is able within certain limits to increase its rate of red-cell production as required. Thus, the marrow can cope with sudden extra demands caused by abnormal red-cell destruction or loss, and the presence of a mild haemolysis may be obscured; when red-cell destruction becomes too great for full replacement to be achieved by marrow hyperplasia, then a haemolytic anaemia becomes manifest.

Clinical Types

Haemolytic anaemias form a group of blood diseases, not easy to classify, caused by a variety of intrinsic and extrinsic factors producing excessive red-cell destruction. In general, the acute or subacute haemolytic anaemias are due primarily to extrinsic factors, while most of the chronic types have familial or hereditary features and the red cells themselves may be abnormal; in the latter group we find, among others, acholuric jaundice and familial haemolytic spherocytic anaemia (with spherocytes), sickle-cell anaemia (with sickle cells), thalassaemia or Cooley's anaemia (with leptocytes or target cells).

The acute haemolytic anaemias may be caused by the toxic or haemolytic effects on the normal red cells of severe bacterial or protozoal infections—for example, septicaemia, malaria—many chemical poisons such as compounds of arsenic, lead, bismuth, silver, and phosphorus; chlorates and methyl chloride; derivatives of benzene and toluene (aniline, phenylhydrazine, acetanilide, sulphonamides); haemolytic agents such as saponin, lysolecithin, snake venom, and *Vicia fava*, the broad bean. Severe acute haemolytic anaemias also arise following incompatible blood transfusions (α and β agglutinins), the production of anti-Rh agglutinins causing, for example, erythroblastosis foetalis, and in the presence of cold iso-haemolysins. Acute or subacute haemolytic anaemia may also be a secondary feature to other conditions such as Hodgkin's disease, carcinomatosis, hypersplenism, and leukaemias among others.

While the severity of the haemolytic process may modify the symptoms, in general all these haemolytic anaemias clinically show a varying degree of jaundice and evidence of excessive red-cell destruction; there will be the usual general symptoms associated with, and proportionate to the degree of, anaemia; haemorrhagic or haemolytic manifestations may occur, and pigment gall-stones are common. Pyrexia, malaise, headaches, and haemoglobinuria may be noted; the spleen is often enlarged, the liver less often, and occasionally also the lymph nodes. Glossitis, neurological symptoms and signs, and flatulent dyspepsia are not seen, in contrast to their occurrence in pernicious anaemia, although sometimes there are other gastro-intestinal disturbances. In mild cases, on superficial clinical examination, the patient may appear to be suffering from pernicious anaemia or cholecystitis until blood and other examinations have disclosed the true condition.

The essential laboratory investigations in a case of haemolytic anaemia include a full blood count with estimation of daily reticulocytes, estimation of the osmotic fragility of the red cells, bone-marrow biopsy, examination of the gastric juice, and a search for abnormal agglutinins in the blood. Subsidiary tests may include estimations of faecal and urinary urobilinogen, and special tests for specific agglutinins or other haemolytic factors.

Blood Count and Osmotic Fragility

It is important to make a full blood examination, including reticulocyte and differential white-cell counts and an estimation of the osmotic fragility of the red cells. The anaemia, which is usually macrocytic but may be normocytic or less commonly microcytic, may be severe (R.B.C. 1,000,000 to 2,000,000, and Hb 2.3 to 5.9 g. per 100 ml.). The severity varies with intermittent remissions and frequent crises. One of the most striking and diagnostic features is the notable reticulocytosis (10 to 80%) that may persist with varying severity for many months or years. Reticulocytosis with anaemia, in the absence of haemorrhage or treatment with liver, iron, etc., and persisting for weeks or months despite treatment, is almost pathognomonic of a haemolytic anaemia. It is common to find normoblasts, but rarely megaloblasts, in the peripheral blood. Many of the red cells have a bluish tinge (polychromasia) reflecting their immaturity. Small darkly staining red cells (microspherocytes) are often seen in acholuric jaundice.

The osmotic fragility of the red cells varies in different patients, and the sizes and shapes of the cells depend on the particular type of anaemia. An accurate quantitative fragility test is necessary to detect the mild forms of chronic haemolytic anaemia (acholuric jaundice). The old method of reading the haemolysis visually is inaccurate and has been replaced by the quantitative method of estimating the liberated haemoglobin in the various hypotonic solutions by means of a photoelectric colorimeter. While a significant increase in the red-cell osmotic fragility is pathognomonic of a haemolytic anaemia it does not indicate the particular type other than a spherocytic haemolytic anaemia; a variable increase is found in many but not in all haemolytic anaemias of acquired type, as well as in the classical familial chronic type.

A slight leucocytosis or occasionally a leucopenia with a few immature white cells (myelocytes and myeloblasts) may be seen, perhaps occasioning some difficulty in differentiating the condition from acute leukaemia. The marrow picture in these cases is of great value, for the absence of a significant number of "blast" or "stem" cells excludes an acute leukaemia. The platelets are usually normal in number but may be decreased in patients in whom haemorrhages are occurring.

To demonstrate sickle cells it is necessary to reduce the oxygen tension of the blood by sealing a drop under a cover-slip; sickle-cell haemoglobin becomes crystalline with deoxygenation, loses water during the process of crystallization, and so changes its shape and becomes sickle-shaped. A person in whose blood sickle cells can be demonstrated, but who shows no obvious signs of haemolysis, is said to have the sickle-cell trait. In thalassaemia (Cooley's anaemia) many of the red cells have a "target appearance" (target

cells); adults usually exhibit mild or symptomless forms known as thalassaemia minor; the complete major disease is usually fatal in childhood.

Bone-marrow Biopsy

Examination of the marrow is a necessary step in the diagnosis of many of the haemolytic anaemias, for it helps to exclude leukaemia, pernicious anaemia, and other conditions having similar clinical and blood findings. In haemolytic anaemia there is a marked hyperplastic marrow reaction with large numbers of early basophilic, intermediate, and late normoblasts. Proerythroblasts may also be increased in number. In the long-standing haemolytic anaemias the normoblasts may show changes in nucleus and cytoplasmic details that differ somewhat from those seen in other macrocytic anaemias, for there may be many mitoses present in the prematurely haemoglobinized cells. The myeloid-erythroid ratio is often less than unity, the total nucleated red cells constituting 60 to 80% of the total nucleated count. Megaloblasts are rarely found. Activity in the ated count. Granulocytic and megakaryocytic series may be observed, although there may be a total reduction in their number.

Blood Pigments

A normal serum does not give a direct van den Bergh reaction and contains not more than 1 mg. of bilirubin per 100 ml. In haemolytic diseases, jaundice is due to the liver cells being unable to excrete fast enough the increased bilirubin formed from the excessive breakdown of haemoglobin. The van den Bergh reaction is based on the hypothesis that bilirubin reacts differently with the diazo-reagent according to whether or not it has been excreted by the liver cells. Bilirubin formed from haemoglobin has been termed *indirect* bilirubin, since it does not give an immediate direct reaction. Bilirubin which has been excreted by the liver cells (as is found in the blood in obstructive jaundice) gives an immediate direct reaction and has been termed *direct* bilirubin. In haemolytic jaundice there is an increase in *indirect* bilirubin so that indirect reactions or direct delayed reactions are obtained. In some forms of haemolytic disease the agent acting on the red cells may also have a toxic action on the liver cells, in which case a biphasic reaction may be reported.

In acholuric jaundice the serum bilirubin may rise as high as 16 mg. per 100 ml., and in some forms of acute haemolytic anaemia similar or higher values may be obtained. The quantitative estimation of serum bilirubin is useful in subclinical jaundice, the demonstration of small increases in serum bilirubin to between 1 and 2 mg. per 100 ml. is usually of diagnostic value. When intravascular haemolysis is rapid, haemoglobin and methaemalbumin are found in the peripheral blood. This occurs in some severe haemolytic anaemias (blackwater fever, septicaemia, incompatible transfusion) and in the paroxysmal haemoglobinurias.

Haemoglobin appears in the urine when the plasma level is over about 130 mg. per 100 ml. Haemoglobin liberated in the plasma is partly excreted as haemoglobin in the urine, and some is converted into methaemalbumin. The presence of methaemalbumin in the serum shows that intravascular haemolysis has occurred. Methaemalbumin does not appear to be formed when there is increased breakdown of haemoglobin in the reticulo-endothelial system. It is found in the plasma in malaria, and in many of the acute haemolytic anaemias in which the haemolysis is intravascular, but not in acholuric jaundice and such conditions in which the haemolysis is non-vascular. Methaemalbumin has a large molecule and is excreted by the liver as coproporphyrin III.

Urinary and Faecal Urobilinogen

Urobilinogen is formed in the intestines by the reduction of bilirubin, and thus the amount of faecal urobilinogen depends on the amount of bilirubin entering the intestines.

Faecal urobilinogen (normal 40–280 mg. a day) is increased in haemolytic anaemias in which there is

increased breakdown of haemoglobin to bilirubin. In acholuric jaundice and chronic haemolytic anaemias values of 500 to 1,500 mg. may be obtained. The dark colour of the faeces in these conditions is due to the large amount of pigment present.

Urinary urobilinogen (normal 0.5–2 mg. a day) is derived from the urobilinogen absorbed from the intestines and not excreted by the liver. The amount depends both on the quantity of bilirubin entering the intestines and on the capacity of the liver to excrete the urobilinogen coming to it from the intestines. In haemolytic diseases the urinary urobilinogen tends to be a little raised, since the liver is unable completely to excrete the increased amounts of urobilinogen absorbed from the intestines. Values up to 10 mg. a day are usually found.

Whenever there is active blood regeneration in the haemolytic anaemias coproporphyrin I appears in the faeces. In compensated haemolytic disease in which there is no appreciable anaemia an increased excretion of faecal urobilinogen may be the only confirmatory evidence of a haemolytic process.

The *haemolytic index* (normal 11–20) is sometimes determined in children, in whom the total circulating haemoglobin is less than in adults. The index is found from the following equation:

$$\frac{\text{Average daily output of faecal urobilinogen} \times 100}{\text{Total Hb (g. per 100 ml.)} \times \frac{\text{Total blood volume}}{100}}$$

It is a time-consuming investigation and is seldom used for routine clinical work.

Auto-immunization

The cause of the haemolytic state in a variety of diseases is the production of antibodies against the patient's own red cells (auto-antibodies). In many of these cases no reason for this can be demonstrated, but in others an associated disease is found and in these the condition is symptomatic. Many of the reticuloses, chronic lymphatic leukaemia, Hodgkin's disease, periarteritis nodosa, and disseminated lupus erythematosus are primary causes of auto-immune haemolytic disease.

The way in which antibodies bring about haemolysis is not certain. In some cases haemolysins appear which produce haemolysis in the presence of complement. In others, with a high concentration of cold haemagglutinins, haemolysis occurs after cooling. The abnormal antibody in most cases of acquired haemolytic disease is a haemagglutinin which can be demonstrated by the Coombs test or by suspending the sensitized cells in a protein medium (bovine albumin). The nature of these antibodies is such that agglutination will not take place if saline is used as the medium for suspending the red cells.

The Coombs test is used to detect the presence of incomplete antibodies* in the serum and to help in the diagnosis of haemolytic disease of the newborn by demonstrating that the infant's corpuscles have absorbed the antibody. To identify such antibodies Coombs prepared an anti-human globulin serum by injecting human globulin into rabbits. When red cells sensitized by a non-agglutinating antibody are washed in saline and then suspended in the antiglobulin serum they become agglutinated.

In most cases of idiopathic acquired haemolytic anaemia the Coombs test is positive, indicating the presence of globulin antibodies adsorbed to the surface of the red cells, and in these cases no agglutination occurs in saline-serum suspensions. Agglutination may also be demonstrated by suspending the cells in a colloid such as bovine albumin, but the Coombs test is thought to be more sensitive and is more commonly employed.

Trypsinized red cells were found to be good indicators of incomplete antibodies, and do not require a protein medium

*An antibody that agglutinates red cells only in the presence of albumin or plasma and in the absence of sodium chloride.

for suspending the cells. Many of the abnormal incomplete agglutinins are haemolytic when incubated with complement against trypanized red cells.

Haemoglobinuria

Patients with haemoglobinuria have a haemolytic disease and present many of the features associated with the haemolytic syndrome. Several varieties of paroxysmal cold haemoglobinuria are recognized.

With a Cold Auto-haemolysis.—This type occurs most frequently as a complication of syphilis, either congenital or acquired. It is characterized by haemoglobinuria following exposure to cold. The Donath-Landsteiner test is diagnostic of cold haemoglobinuria. In this test, red cells suspended in the patient's serum are exposed to a low temperature so that the cold haemolysin may be absorbed, and then to a higher temperature so that haemolysis may be completed by the action of the serum complement. Normal red cells can be used in this test. In life the haemolysin becomes fixed to the red-cell surface during exposure to low temperatures, and when the blood circulates and becomes warmer haemolysis occurs.

With Cold Agglutinins.—Raynaud's syndrome, with acrocyanosis and pain in the extremities, may occur in paroxysmal cold haemoglobinuria associated with cold agglutinins. When titrated, the cold haemagglutinin may exceed 1/1,000 and rarely be demonstrated at up to 1/100,000. Cold haemagglutinins have been found in a number of conditions not necessarily associated with demonstrable haemolytic disease. In atypical pneumonia, for instance, they are often reported to be present.

Paroxysmal Nocturnal Haemoglobinuria

In this chronic haemolytic disease, haemolysis becomes intensified during sleep and nocturnal haemoglobinuria occurs. The patient's corpuscles are sensitive to thermolabile components of normal serum, but acidification is necessary to bring the pH of the cell-serum suspension to about pH 6.8 before the serum factors will act. This is the principle of the Ham test which is employed to diagnose this condition. Acidification is necessary because defibrinated blood becomes slightly alkaline owing to loss of carbon dioxide. Clinically, patients with nocturnal haemoglobinuria show an abnormal sensitivity to minor changes in blood pH. This may also be a factor in other haemolytic mechanisms.

Next Article on Clinical Pathology.—"Polycythaemia, Leukaemia, and Cytopenia," by Dr. Ronald Bodley Scott.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

According to the Eighth Annual Report of the Institute of Child Health, the number of full-time students in 1953 was just under one hundred and there were also 40 part-time students. While most of the students attending were from the Commonwealth, it is interesting to note that 14 full-time students were from countries outside the British Empire. This perhaps signifies the growing importance of London as a postgraduate centre. More emphasis was laid in 1953 on clinical instruction. The number of lectures was reduced and opportunities were provided for increased ward teaching. Arrangements were made for small groups of two or three students to "sit in" with registrars during the out-patient sessions.

BEDSIDE MANNERS

BY

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A dermatologist told the following story. A patient came to him with eczema in one axilla. A previous doctor had told the patient that the eczema was due to sweating. "I sweat here and I sweat there," the patient argued, pointing to his two axillae; "how can the eczema be due to sweating?" "What do you think it is due to?" the dermatologist asked. "I believe," the patient said, "that it is due to sugar diabetes." "You would have sugar diabetes here and there," the doctor said, pointing to the patient's two axillae, hence you can't have sugar diabetes." Subsequently the patient felt greatly relieved, and incidentally the eczema disappeared. The patient was extremely grateful.

This story serves to introduce the subject of this paper—"bedside manners" and psychotherapy. Bedside manners may be defined as an unsystematized understanding of a patient's emotional needs, whereas psychotherapy is their conscious systematized counterpart.

Systematic psychotherapy is predominantly the domain of the psychiatrist; bedside manners is a term applied to the intuitive approach used by general practitioners and specialists not specifically trained in psychiatry. Both bedside manners and psychotherapy are based on interaction between patient and doctor. It is proposed to discuss some of the more common psychological problems of patients and doctors, and some principles governing reciprocal physician-patient relationships.

The Patient

A patient is a person who seeks the help of a physician because he deviates in mental or physical health from the norm. He is not necessarily a sufferer as the word patient connotes. In view of his sickness a patient has to assume a role which imposes on him in many cases the necessity of forgoing his usual activities, of retiring to bed, and of accepting another person's help to restore him to his previous state of health. If he is very sick he may have to abandon his functional status of an adult and perhaps be attended to in a baby-like fashion.

Research in psychosomatic medicine has shown that emotional factors often play an important part in the aetiology of so-called "organic" diseases. Be this as it may, in any given patient illness as such, and the change in mode of living which it comprises, leads to a backward movement towards earlier stages of emotional development and behaviour. This state of regression, as it is called, manifested by changed attitude and feelings, is particularly significant in chronic illness. It may have the following interrelated effects: (1) patients may become childish in their behaviour; (2) they may, and usually do, become selfish; (3) they may invest the interest which they withdraw from the external world on the affected part of the body and consequently develop superadded hysterical or hypochondriacal formations; (4) they may distort reality

in other ways—for example, by wishful self-deception about their own unmistakable condition; and (5) they may manifest towards the physician positive or negative feelings of great intensity patterned after those experienced towards their parents, particularly their fathers. This mechanism is often operative in patients who show apparently irrational awe, subservience, hostility, panic, anxiety, dependence, or affection towards their physicians. If the unconscious sources of these reactions are not recognized the physician may respond inappropriately and trammel up rather than facilitate the physician-patient relationship.

Illness of necessity affects a person's mood. Dependent on the nature, site, and severity of the illness, on his previous personality and past experience, feelings of depression and of anxiety are commonly experienced. These emotions may be appropriate responses; or they may be inappropriate or at least disproportionate to the actual condition. In the latter case, feelings of badness and of unworthiness which previously existed may be subjectively experienced by the presence and "badness" of the illness; or fear of punishment for previous misdemeanour may disproportionately intensify justifiable fear regarding the outcome of the illness. Psychological defences against feelings of depression and of anxiety are denial and projection. Denial may take the form of unreasonable—and often foolhardy—denial of obvious handicaps, or it may find expression in false optimism or jocularly, so commonly encountered in incurable illness or in the terminal stages of illness. Patients may project resentment at their own condition or their environment, or they may fasten their internal anxieties on some external event such as an impending operation. The word "complaint," not only in its colloquial but also in its medical usage, signifies dissatisfaction. Consciously or unconsciously, patients may complain about their suffering, their pain, their fate, or about the lack of attention or affection which they sorely need.

Illness mobilizes aggressiveness, which may be due to inability to accept dependency or any imposed restrictions or frustrations. No longer is the patient able to discharge his duties, to earn his wages, or to enjoy sports and other pleasures. He may be restricted in body movement or debarred from items of food which he previously relished. No wonder that many a patient becomes irritable and irritable. Whether or not he freely expresses or checks aggressiveness engendered in this way depends on patterns of behaviour established in the past and proved to be useful. The patient who pathetically appeals to us for sympathy may achieve his ends just as successfully as the old arthritic lady who angrily thumps a stick on the floor if her wishes are not immediately fulfilled.

The patient's environment responds to his moods, anxieties, needs, demands, and reactive aggressiveness, and as these responses are fed back to the patient a vicious circle may well be established. Usually people feel sorry for a person afflicted by illness; after all, it could happen to them, and should it happen to them they would like to be cared for tenderly. But as the illness drags on, and the demands of the patient continue, and the economic strain makes itself felt, the patient feels a burden and is felt as such by others. Members of his family and good friends may still cover up their resentment and hostility by lavish gifts and apparent over-kindness, but, especially if previous bonds had not been close, the veneer may wear thin and crack. Unfortunate are the marriages which have been broken up by the serious prolonged illness of husband or wife.

The Physician

Are doctors always fully aware of their patients' needs and anxieties and of the many problems and conflictual situations which exist in their patients' families and may be produced or developed by their illness?

Let us look for a moment at the doctor's problems and "dilemma." There are many reasons why a person becomes a doctor—for example, a doctor is highly respected in the community, and, provided that he is competent, he earns a

reasonable income. Hidden behind conscious altruistic wishes to serve his fellow men, four psychological factors seem to play a part in the choice of the medical profession: (1) identification, (2) sublimated infantile curiosity, (3) sublimated and/or overcompensated aggression, and (4) persistence of infantile omnipotence fantasies.

Identification may be positive or negative. A person may become a doctor because he wants to emulate his father, who is a doctor, or because he wants to rise in the social scale above his father, who is a tradesman or owns a small business. We all played the doctor's game as children. Instinctual trends operative then may have been carried over into adult life and canalized into professional interests. Sadistic trends dating back to childhood may find sublimated expression in surgical skill or may be warded off and overcompensated by concentration and devotion to healing.

Most doctors derive much satisfaction from helping suffering humanity, but little do many doctors realize that beyond reasonable ambitiousness their wish to score success, especially where others have failed, is based on a perpetuation of infantile omnipotence fantasies.

Each of the factors mentioned may give rise to difficulties. For instance, we all know doctors whose attempts to identify with a successful father or older brother have miscarried or who could not allow themselves to outstrip their father's modest achievements or live up to their mother's over-ambitious expectations. There are doctors who had to give up surgical interests or even a promising career as a surgeon because of their inability to inflict pain or to be held responsible for the death of some of their patients. How commonly are doctors afraid of giving bad news to their patients when telling the truth and nothing but the truth would obviously be right? Why do we sometimes act in this manner? We act in this manner because cultural pressures do not allow us to tolerate free display of emotion in ourselves and in others, because we tend to identify ourselves with our incurable patients, because we are averse to inflicting pain, and because our vanity makes it difficult to admit failure. Let us admit—at least to ourselves—our limitations instead of reaching out for and taking on tasks beyond our capacities, and instead of basking in the glory of our therapeutic successes.

Some Problems

There are other problems which beset the medical practitioner.

(1) The doctor, analogous to the patient's closest kin and friends, is a person who can be trusted with the most private and intimate affairs and feelings of the patient. But at the same time the doctor does not admit his patients to intimacies with himself, does not "reveal" himself to the patient, physically or mentally. If he happens to be a personal friend of the patient he will be well advised to segregate the two roles.

(2) The doctor's "trustworthiness" and authority are based on his assumed technical competence. This technical competence, in accordance with the patient's wish to be cured and in keeping with his regressive state, is exaggerated out of proportion. Any situation or occasion which shatters the patient's primitive belief in the doctor's magic powers accentuates previously hidden negative feelings and doubts and may lead to change of doctor in the partly rational and partly irrational hope of finding someone who can repair what perhaps cannot be repaired.

(3) The doctor is an authority and wields authority as a technical expert. He can give "orders" but is in no position to enforce them or to penalize a patient for not carrying them out. His authority is strictly segmental in nature: it is confined exclusively to matters concerning the patient's health. He can impose restrictions in diet and on physical activities. He can sometimes justifiably counsel a change in occupation, but he trespasses on his legitimate rights and does more harm than good by telling a patient that all she needs is a husband, a child, or sexual intercourse.

(4) A doctor should treat his patients equally, regardless of colour, creed, nationality, social and economic status, or other distinctive features. But who of us has not been influenced at one time or another by the appearance and manners of his patients, or by their social status in the community? And who of us has not been guilty at times of giving more careful attention to a wealthy patient than to an indigent one?

(5) A doctor is supposed to assist the needy irrespective of monetary gains; but we also have to live and support our families. Moreover, living as we do in an acquisitive society with keen and often unscrupulous competitiveness, monetary gain is frequently regarded as a sign of success and as a means of much-needed recognition. Consequently the temptation is often great to place self-interest before the interest of the patients, to promise "miracle cures" against better knowledge, to prescribe injections which are not needed, or to play up to the patient's requests for gadgets which may not be required. Perhaps there is more than a grain of truth in the charge that the Hippocratic oath is in danger of being replaced by salesmanship based on the "get-rich-quick" principle.

(6) The doctor, like his patients, has unconscious conflicts which may interfere with his capacity to understand and treat his patients. For example, doctors unable to recognize their own shortcomings may be unable to tolerate similar inadequacies in their patients. Detached, aloof physicians may be threatened by patients' attempts to form close, dependent relationships with them. Other physicians may become unduly attached to or over-identified with patients whose problems are similar to their own, or whose personalities resemble those of relatives with whom they have intense relationships.

Physician-Patient Relationships

From this background discussion of patients and physicians we may return now to the principal topic—bedside manners. The points which we have been trying to make are: (a) that the practice of medicine not only consists in the application of biological knowledge but also demands considerable degrees of social and psychological understanding, described as bedside manners and psychotherapy; (b) that certain definable principles can be identified and are operative in bedside manners; and (c) that, analogous to systematic psychotherapy, bedside manners require an intimate knowledge and understanding of the emotional, social, and economic problems of the patients and their families as well as those of the doctors themselves. The classic dictum "know thyself" is an essential prerequisite for the knowing of others. From time immemorial good doctors have always paid attention to the emotional aspects and the environmental stresses of their patients. To do so, general practitioners are in a better position than consultants, who, in view of their special functions, do not see their patients over prolonged periods in their home environments. Few doctors would fail to listen to a patient's chest in a case of prolonged coughing, but many doctors fail to listen to their patients' words, which may reveal more than auscultation ever can.

Rather than speak to their clergymen, in whose presence they may feel embarrassed, patients often take their troubles and worries to the general practitioner, who is well advised to listen patiently and benevolently without taking sides, showing disapproval, or giving advice. The very fact that the patient can "get it off his chest" relieves feelings of tension and anxiety.

Psychological examination and assessment require skill and time. Yet the time factor is often overrated. Just as the beginner spends more time on a physical examination than an experienced physician, psychiatric appraisal takes less time as experience grows. One may listen for hours to a person who speaks Chinese, but would not understand a word unless one had learned the language. Symptoms are the language of disease, and behaviour is even more specifically the language of psychological disorder. Physicians can familiarize themselves with the varying ways in which patients communicate their emotional discomfort and indicate their need for help. Not infrequently the presenting complaint is only a plausible excuse couched in the language of somatic symptoms, to indicate the patient's general distress. The source of this distress—that is, its emotional and conflictual origin—may be confused readily with its somatic localization.

Time, money, and effort could be saved if patients suffering from psychosomatic and psychoneurotic illness would not again and again be submitted to elaborate laboratory examinations. Overemphasis on minor organic lesions fosters

iatrogenic illness and may by-pass the real cause of the patient's suffering. The presence of emotional conflicts whose aetiological relevance to the illness may be all-important can be revealed only by direct examination. Familiarity with the basic principles of psychopathology is essential if one wants to understand one's patients' needs, anxieties, misconceptions, faulty attitudes, and psychological defences. A patient's heroic or stoic attitude towards his illness may be most impressive but may conceal a great deal of anxiety.

In keeping with their regressive states and wishes for recovery, patients suffering from prolonged and serious illnesses are apt to elevate their doctor to the position of a god. Doctors are well advised not to be taken in by the flattery and to behave as such. Doctors should realize their limitations but need not admit them to their patients. A pose of omnipotence and omniscience, if recognized as such, may be appropriate in the case of emotionally immature, anxious, or severely regressed patients, but would obviously be out of place with mature individuals who like to know where they stand.

Methods of approach naturally have to vary from patient to patient. By and large, it is true that the "don't worry," "take-it-easy," "pull-yourself-together," or "cheer-up-old-man" approaches are ineffectual. Patients may have plenty to worry about, and if they could pull themselves together they certainly would. Equally, the general practitioner may defeat his objectives by telling psychoneurotic patients that there is "nothing the matter," or that "it is all imagination." If there were "nothing the matter" the patient would hardly consult him. Nor can much benefit be expected from vacations, sedatives, or placebos, which obviously do not solve the patient's conflicts.

Constructive help can be offered by an understanding of the family situation. As has been stated before, the patient's illness affects his family, and their conscious and unconscious responses reverberate in the patient's physical and mental condition. In this respect, a thorough knowledge of community resources through which changes may be effected is obviously essential.

Conclusion

Another story may give added emphasis to the principal points of this paper. Some time ago the charming young wife of a doctor sought help for severe and intractable vomiting. Her case had puzzled many doctors. She had been submitted to elaborate examinations of her stomach, of her gall-bladder, and of her pancreas; chronic pancreatitis had been suspected. She had spent many months in bed and had been placed on a very rigid diet, all without benefit.

Had one of her physicians spent 10 minutes talking to the patient he would have found out that this young woman felt neglected by her husband. She entered marriage knowing full well that much of her husband's time would be taken up by his flourishing practice. But she had failed to realize that he would devote himself, almost to the exclusion of everything else, to his patients. She was frankly jealous of his patients. If she wanted to attract his interest and attention there was nothing left but to be a patient herself, and an interesting patient at that. When this unconscious mechanism was made conscious to her she recovered rapidly. Needless to say, when her husband recognized her motivation his attitude towards her changed.

The annual competition of the Manchester and District Medical Golfers' Association was held on the course at Wilmslow on May 19. There were 57 competitors. The challenge cup was won by Dr. J. J. MANNING (Warrington) with a net score of 70. The Walter gold medal was awarded to Dr. R. W. FAIRBROTHER (Wilmslow) with the best gross score of 77, and Dr. D. C. ATTWOOD (Bolton) secured the Captain's prize for the second best net score of 73.

MEDICAL BIRTHDAY HONOURS

The names of the following members of the medical profession were included in a Birthday Honours List published in *Supplements to the London Gazette* on June 10:

Baronetcy

Sir WALTER RUSSELL BRAIN, D.M. President of the Royal College of Physicians of London. Physician to the London Hospital and the Maida Vale Hospital for Nervous Diseases.

Companion of Honour

WILLIAM SOMERSET MAUGHAM, Hon.D.Litt., M.R.C.S., L.R.C.P. Author and dramatist.

Knighthood

RUSSELL CLAUDE BROCK, M.S., F.R.C.S. Surgeon, Guy's Hospital and Brompton Hospital.

ALEXANDER PATERSON MURPHY, M.C., M.D. President of the Royal Australasian College of Physicians.
HERBERT HENRY SCHLINK, M.B., Ch.M., F.R.A.C.S., F.R.C.O.G. Consulting Gynaecological Surgeon, Royal Prince Alfred Hospital, Sydney, New South Wales.

C.B. (Military Division)

WILLIAM ALEXANDER DUNCAN DRUMMOND, C.B.E., F.R.C.S., D.L.O. Major-General (temporary), late R.A.M.C.
RICHARD MURPHY, C.B.E., M.B., B.Ch. Major-General, late R.A.M.C. Honorary Surgeon to the Queen.

C.M.G.

ROBERT SAMUEL FLEMING HENNESSEY, M.D., F.R.C.P.I., D.T.M.&H., Dip. Bact. Director of Medical Services, Uganda, Colonial Medical Service.
ANDREW TOPPING, M.D., F.R.C.P., D.P.H. Dean of the London School of Hygiene and Tropical Medicine.

C.B.E. (Civil Division)

CHEWYND JOHN PERSHALL GROSVENOR, M.B., B.Chir. Principal Medical Officer, Ministry of Pensions and National Insurance.
JOHN LEWIS ANDERTON GROUT, M.C., F.R.C.S.Ed., F.F.R., D.M.R.E. Senior Consultant Radiologist to the Sheffield United Hospitals.
MAXWELL SHAW JONES, M.D., M.R.C.P.Ed., D.P.M. Director, Social Rehabilitation Unit, Belmont Hospital, Sutton, Surrey.
NEVILLE LANGDON LLOYD, M.B., B.S., M.R.C.P. Chief Medical Officer, Ministry of Supply.
PHILIP PATRICK LYNCH, M.D., F.R.A.C.P. A member of the Dental Council and of the Medical Research Council of New Zealand.
ARTHUR JOHN METCALFE, M.B., Ch.M. Director-General of Health and Director of Quarantine, Canberra, Australia.
CECIL JULIAN MANNING WALTERS, M.B., Ch.M., F.R.A.C.S. Member of the Medical Board and of the Board of Health, State of New South Wales.

O.B.E. (Military Division)

GEORGE LUSH FOSS, V.R.D., M.D. Surgeon Commander, R.N.V.R.
MARK JOHN LINDSEY, M.C., T.D., M.B., B.S. Brevet Colonel, R.A.M.C., T.A. (now T.A.R.O.)
HERBERT CLIFFORD SERASINGHE, E.D., L.M.S. Lieutenant-Colonel, Ceylon Army Medical Corps.
ROBERT ALEXANDER STEPHEN, M.D., F.R.C.S. Lieutenant-Colonel, R.A.M.C.

O.B.E. (Civil Division)

RICHARD FRANK BOLT, M.R.C.S., L.R.C.P. Chairman, Willesden (No. 4) Medical Recruiting Board.
NOEL HAWLEY MICHAEL BURKE, M.R.C.S., L.R.C.P., D.P.M., D.M.R.E. Lately Medical Superintendent, Cell Barnes Hospital, St. Albans.
EDWARD ALFRED COCKAYNE, D.M., F.R.C.P. For services to entomology.
JOHN EDGAR DAVIES, M.C., M.R.C.S., L.R.C.P., L.D.S.R.C.S. Senior Medical Officer (Wales), Ministry of Pensions and National Insurance.
MICHAEL GELFAND, M.D., F.R.C.P., D.P.H., D.M.R. For services to medicine in Southern Rhodesia.
DESMOND GEORGE McCULLY, M.B., B.Ch. Lieutenant-Colonel, I.M.S. (ret.). Medical Officer for the Trucial Coast, Persian Gulf.

IAN GREGOR MACGREGOR, M.B., Ch.B., F.R.C.S.Ed., D.T.M.&H. Senior Specialist, Nigeria, Colonial Medical Service.
EUGENE PIERRE LARNACH MASSON, M.B., Ch.B., D.P.M. Superintending Medical Officer (Specialist), St. Ann's Memorial Hospital, Port of Spain, Trinidad.

EVERARD ARNOLD MILLS, M.B., Ch.B. Professor of Bacteriology in the Royal College of Medicine, Bagdad.

DOUGLAS WILLIAM LEIGH PARKER, M.Ch.Orth., F.R.C.S.Ed., F.R.A.C.S. Director of Orthopaedic Services, State of Tasmania.
BERNARD THOMAS SQUIRES, D.M. Medical Officer, Bechuanaland Protectorate.

ROBERT STANLEY STEEL, M.B., Ch.M., F.R.A.C.P., M.R.C.P. Commissioner of the St. John Ambulance Brigade, State of New South Wales.

JAMES TAYLOR, M.B., Ch.B., D.P.H., D.T.M.&H. Director of Medical Services, Seychelles, Colonial Medical Service.

ARTHUR WAI-TAK WOO, M.B., B.S., F.R.C.S. For public services in Hong Kong.

M.B.E. (Military Division)

STANLEY GEOFFREY FOX LINTON, M.R.C.S., L.R.C.P. Surgeon Lieutenant-Commander, R.N.

JOHN FOSTER FENTON ROONEY, M.B., B.Chir. Major (temporary), R.A.M.C. In recognition of services in Korea during the period July 28, 1953, to January 31, 1954.

M.B.E. (Civil Division)

GERALD HENRY COORAY, M.D., D.T.M.&H. Professor of Pathology in the University of Ceylon.

ISABEL MARY AGNES DOBO, M.B., Ch.B. Lady Medical Officer, Bahrain Government.

GOPAL KONDOPANT JOSHI, L.C.P.S. Senior Sub-assistant Surgeon, Medical Department, Nyasaland.

ROYAL MEDICAL BENEVOLENT FUND

The annual general meeting of the Royal Medical Benevolent Fund was held on June 4, with Lord WEBB-JOHNSON in the chair. Dr. R. COVE-SMITH, the honorary secretary, said that during 1953 the total charitable distribution of the Fund amounted to £46,897. No appeal for money was made to the general public. The income of the Fund was derived entirely from the medical profession itself by way of subscriptions, covenant deeds, donations, and legacies, and from interest on the capital which the Fund had succeeded over the years in building up. The overhead or administrative expenses were down to 6%, which excellent result was due to the efficiency of the staff.

On the proposition of Sir ZACHARY COPE the officers nominated by the committee of management were elected—namely, Lord Webb-Johnson as President, Mr. F. A. Juler as Honorary Treasurer, and Dr. R. Cove-Smith as Honorary Secretary. The retiring members of the committee of management were also re-elected.

A Subscribers' List

Lord WEBB-JOHNSON made certain suggestions for the study of the management committee. One was that, if possible and not too expensive, a list of subscribers should be published, partly with the object of going after those whose names were not on the list. Members of hospital staffs—especially teaching hospitals—should be written to, if they were not already subscribers, suggesting that they should become such. He had himself done this to some extent, with very good results, including three covenants from new people in one medical school only.

A vote of thanks was accorded to Mrs. Rayner, who is retiring from work at Westmoreland Lodge, Wimbledon Common—a home for doctors' widows or daughters who were not infirm, which was established in 1946 by the generosity of the late Dr. Arthur Holdsworth, the first benefactor. Mrs. Rayner, said Lord Webb-Johnson, had done wonderful work and would be greatly missed.

Other recipients of votes of thanks were the B.M.A. Charities Committee, the honorary auditors and solicitors, and the Ladies' Guild. The Guild, said Lord Webb-Johnson, did personal work that could not be done by letter and made the Benevolent Fund a live body. Bene-

ficiaries felt that there was a personal link between them and the ladies who had helped them so much.

The brief proceedings concluded with a vote of thanks to Lord Webb-Johnson for his great services as president.

MEDICAL SERVICE ON WINGS

THE AUSTRALIAN "FLYING DOCTOR"

[FROM OUR OWN REPORTER]

Dr. Allan Vickers, senior medical officer of the Australian Flying Doctor Service, is on an extended visit to this country, undertaking postgraduate study with the aid of a Nuffield Foundation grant, and also seeking to make known the facts of the Flying Doctor organization for the benefit of other parts of the British Commonwealth where a similar medical service might usefully be provided. He sees no reason why there should not be autonomous services on the Australian pattern, with co-ordinating headquarters in London, for territories where stretches of continent or intervening seas make it difficult to bring prompt medical aid. Dr. Vickers, who has been on the service for 24 years, during the last 10 of which he has operated from Charleville in south-central Queensland, says that for some time past inquiries have been reaching Australia from other countries.

Australia, with its immense territories sparsely populated, is the pioneer in this field. Its experience goes back for a quarter of a century, and it is still virtually the only country to have a service where the doctor systematically goes out by plane to see patients.

The progenitor of the service was a Presbyterian minister, John Flynn, who died three years ago. He had no more than a layman's knowledge of medicine, aviation, or radio—the tripod on which the service rests—but he had a knack of choosing doctors and engineers who translated his vision into reality. Only after the first world war did aeroplanes of a suitable type, containing a cabin in which a patient on a stretcher could be carried, become available, and even then there remained the problem of communication of messages. The telephone was not the answer; it would have been hopelessly expensive and subject to accident. A radio engineer, A. H. Traeger, of Adelaide, developed a portable transmitting-receiving set, the power being supplied by a treadle dynamo, simple enough for people in the bush to operate, and sturdy enough to stand up to its job. The man or woman at the outpost has only to use the pedal set to have a two-way talk with the doctor at the base station hundreds of miles away.

Medical advice is now given on the radio on more than 5,000 occasions in a year. The first actual flight was made from Cloncurry, Queensland, in 1928. In that year 50 flights were made, each averaging 400 miles, 255 patients were seen, and the first radio "mother" station was established, the first link in an aerial service which now covers two-thirds of the continent. The number of Flying Doctor bases is now 9, and with them are connected many hundreds of outposts (926 is the latest figure).

Control and Cost of the Service

The service was at first under the control of the Australian Inland Mission of the Presbyterian Church, but as it developed the Mission relinquished its control (though not its interest), and in 1933 in the capital of each State there was set up an executive council, consisting of persons in public and commercial life who serve in an honorary capacity. The co-operation of many bodies, such as chambers of commerce and women's institutes, and including the Federal Council of the British Medical Association in Australia, has been warmly forthcoming. Each section has been formed into a non-profit-making company, with articles of association, identical in every State, the first

of which recites the objective "to foster, develop, and safeguard the health of residents in the sparsely populated areas of the Commonwealth of Australia, its dependencies and mandated territories, by ensuring readily available medical and nursing facilities. . . ." In Western Australia, in addition to the section based on Perth, there is another, serving the eastern goldfields, based on Kalgoorlie. The smallest State, Victoria, which is no more than the size of Great Britain, is too closely settled to need this type of medical aid, and it takes under its wing, literally, the service of the Kimberley area, Western Australia, 1,800 miles from Melbourne. A federal meeting of representatives of the State councils is held once a year.

The annual expenditure on the service is about £130,000, of which £75,000 is contributed by the people for whom the service is rendered. No charge is made, but they give according to their means. They are people of all income levels, but, of course, the operating costs are heavy—a single flight may cost £80—so that a patient's contribution can often be only a token payment. A Government subsidy (which in no way implies Government control) varies from State to State, but totals about £30,000, and the remainder is raised by voluntary contributions and bequests.

Remote Diagnosis

A series of small communal hospitals or nursing-homes have been established and are visited by the flying doctors on routine inspection once a month. Every effort is made to carry out preventive treatment. Immunization of children against diphtheria, whooping-cough, and other infections is instituted. Antenatal clinics are set up. The doctor on his flight may on occasion be accompanied by an ophthalmic or other specialist or by a nursing sister. But this complex radio network is not used merely for summoning the doctor in emergency. The doctor at the base is called up constantly to make remote diagnosis and give advice and treatment over the radio. Here is a mother, 200 miles from hospital and perhaps 50 from her nearest woman neighbour, anxious about her baby. One can imagine the reassurance given by the doctor's voice on her radio set. A standard medicine chest is made available at every outpost. It contains the more usual medicines, palliatives, appliances, and accessories, all of them not only named but numbered. Patients or their relatives are encouraged to describe symptoms and appearances over the radio. They are given time to tell the story in their own words. Many of these outback settlers are well-educated people; and, even if not, they are more than usually intelligent, as one would expect, and accustomed to make keen observation. Dr. Vickers strongly insists that this is not a makeshift. The people know, too, that, if necessary, no matter how far away they may be, the doctor will visit them after an interval scarcely longer than an urban practitioner takes to answer a call from another part of the town in a busy practice, and that, again if necessary, they will have air ambulance transport and hospital care. The flying doctors themselves are highly trained men, often with special qualifications in addition to a thorough experience of general practice, and specialists in the cities are also available if need be.

It is computed that in the Flying Doctor service last year over 300,000 miles were flown, the individual flights numbering 1,100. Ten thousand patients were seen, of whom about 400 were transferred to hospital, and in addition 6,000 patients were given medical advice by wireless. Until last October there had not been a fatal accident, and there has never been an accident involving a patient. The educational possibilities of the radio system are also opening up, and it may expand in the direction of other communal amenities. But its first object is to cast, as it has done, a mantle of safety over these vast spaces, to break the dreadful silence for the lonely peoples, to bridge the gulf of geographical isolation, to make medical succour a matter of minutes or hours whereas it formerly meant days or weeks. But this is to be "glamorous," and that is what Dr. Vickers dislikes.

Correspondence

Cortisone and Aspirin in Rheumatoid Arthritis

SIR,—Dr. J. H. Glyn writes (*Journal*, June 12, p. 1376) that statisticians prefer to answer a single question at a time—that is, "If to a defined type of patient Y gr. of drug X are given daily by one particular route in so many divided doses, what happens?" He appeals to them to modify this "rigid approach" and to make the question asked of a trial read: "Does drug X, given under optimum conditions (as judged by experienced, reliable, and unbiased clinicians), give better results than drug Y?"—leaving the clinicians to select both the patients and to adjust the dosage schedules to individual requirements. Dr. Glyn quotes from a paper I published in 1952, and yet he seems to have ignored the fact that I fully answered his appeal in that paper of two years ago. This is what I wrote:

"In testing a new form of treatment knowledge at first is necessarily scanty, being usually based upon laboratory work and a few scattered clinical observations. In Medical Research Council trials we have thought it proper, therefore, to choose such a regimen as promised to reveal the potentialities (and often the dangers) of the drug (or whatever may be concerned). Thus we have a tidy question—for example, if to a defined type of patient 2 gr. of drug X are given daily in four divided doses by intramuscular injection and for three months, what happens?"

"But perhaps the question is too tidy. We can, of course, extend it after its answer has been reached by experimenting with variations upon the original theme. It may, however, be argued, and sometimes, I think, legitimately, that allowance should have been made during the basic trial for individual idiosyncrasies, that the clinician should have been free to vary the dosage according to his own judgment of the patient's needs as shown by the latter's responses. Statistically, I see no reason why that should not be done. . . . The question asked of the trial . . . now runs 'if competent clinicians in charge of defined types of patients use drug X in such varying amounts and for such varying durations of time, and so forth, as they think advisable for each patient, what happens?' The moot point is which question, in given circumstances, is the better one to ask."

Dr. Glyn also accuses statisticians of "choosing certain highly inaccurate assessments (such as joint tenderness and whilst range of movement) as a means of overall assessment, whilst ignoring entirely such imponderable but important clinical features as the degree of stiffness and the patient's sense of well-being." Personally, I have repeatedly said and written how important it is to bring the "imponderable" features into clinical trials, particularly when that can be achieved in such a way that bias in the observer (or patient) can be discounted. There is nothing new in that idea. Where Dr. Glyn goes particularly astray, in my view, is in his odd ideas of the part statisticians play in these trials. He seems to regard them as dictators and the "experienced, reliable, and unbiased clinicians" as their puppets. That, fortunately, has not been my experience. I have spent many hours, as a co-worker in a trial, listening to clinicians framing the questions, deciding on the dosages, determining diagnostic criteria and arguing about means of measuring the results. It is clearly their job to do so and mine to collaborate in determining the appropriate "experiment" that flows from their desires and views. It is entirely collaborative work. If "highly inaccurate assessments" are introduced at that time, then the clinicians must take the major part of the blame—after all, it is their field of knowledge. If during the trial clinicians admit wholly unsuitable patients to it—that is, they ignore the rules they themselves framed—then they are wholly to blame. But in working with clinicians I have always found them more than anxious to abide by their own rules.

I am not here concerned with the particular trial which has moved Dr. Glyn to these criticisms but with the general issues that he has raised. In brief, the statistical rigidity against which he tilts is far less than he imagines and the

statistical dictatorship is a myth. If it should ever cease to be a myth I would be happy to enlist under his flag and to join in the attack.—I am, etc.,

London. W.C.1.

A. BRADFORD HILL.

Fitness, Fertility, and Blood Group

SIR,—Your annotation under this heading (*Journal*, May 22, p. 1197) ends by referring to the need for studies of blood group distribution in (amongst other populations) children of different ages and sexes. It has recently come to my notice that the material for one such study is available from data obtained by Vuori¹ in an effort to find a relation between the ABO groups and the weight, height, and intelligence of healthy Finnish State and high school children. Having found that samples of group B individuals give consistently different results from samples of A and O individuals in investigations relating to viability and fertility—a fact which might be thought to lend some support to established phylogenetic belief—I have found it useful, on occasion, to consider A and O as a single group. When this is done with Vuori's data (table I) it is seen

TABLE I.—Distribution of ABO Blood Groups in Finnish Children and Adolescents

Total No. of Children	Ratio of B to A + O Children		Age of Children	Age of Adolescents	Ratio of B to A + O Adolescents		Total No. of Adolescents
	Male	Female			Male	Female	
178	0.27	0.18	8, 9	13	0.24	0.21	825
447	0.24	0.24	10	14	0.23	0.22	646
705	0.21	0.22	11	15	0.25	0.23	418
841	0.21	0.26	12	16	0.23	0.27	341
				17	0.31	0.28	246
				18	0.18	0.35	142

that, in later childhood and again in adolescence, the incidence of B in this sample, relative to that of A plus O, shows, for the most part, a fall in males and a rise in females as age increases.

The only other relevant data known to me is that provided by ten of the twelve samples making up Waterhouse and Hogben's² series of 1,239 families with 4,139 children of unstated age but stated birth-rank. Here, omitting the families with twins or only one child, the ratio of male to female children is 1.24 (63:51) for the B youngest children and 1.08 (57:53) for the B oldest children, whilst it is 0.97 both for the A and O youngest children together (365:377) and for the A and O oldest children together (370:381); and there are slightly fewer B's and slightly more A's and O's in the oldest than in the youngest children. It may be recalled that in Sanghvi's³ sample of newborn infants of unstated birth-rank, the ratio of males to females is 1.33 (281:212) for B and 1.12 (827:739) for A and O together. Certain findings on the sex-ratio of well and ill adults—that is, British blood donors and Finnish hospital patients—will appear elsewhere.

Your annotation also refers to my analysis of the Waterhouse-Hogben series from the standpoint of fertility, but this analysis can be taken a further step in view of the circumstance that the Waterhouse-Hogben series is made up of six samples with an average of 2.69 children per family and six with an average of 4.16 per family. The possible importance of this variation in family size is seen from the fact that while in the smaller-family samples as a whole the descending order of fertility of fathers is B-O-A, in the larger-family samples as a whole it is O-A-B, whether the father's group is the same as, or different from, the mother's (table II). Should such differences prove to be real, one of their possible explanations, or part explanations, would be that fertility in B males may decline with age more quickly, from a higher level, than fertility in A or O males (see Hirsfeld's⁴ heterogeneous series of 7,700 families with only 2.13 children per family, and also the work of Kirk, Kirk, and Stenhouse⁵ on fertility in mothers).

TABLE II.—Comparative Fertility of Fathers (White)

Samples with an Average of 2.69 Children per Family			Samples with an Average of 4.16 Children per Family		
Father's Group, and Average Family Size, when Mother's Group the Same	Father's Group, and Average Family Size, when Father's Group Different from Mother's	Father's Group, and Average Family Size, when Mother's Group the Same	Father's Group, and Average Family Size, when Father's Group Different from Mother's	Father's Group, and Average Family Size, when Mother's Group the Same	Father's Group, and Average Family Size, when Father's Group Different from Mother's
B 3.20 O 2.82 A 2.62	B 2.94 O 2.65 A 2.58	4.23 4.21 4.16	O 4.27 A 3.87 B 3.83	O 4.27 A 3.87 B 3.83	O 4.27 A 3.87 B 3.83

In the Waterhouse-Hogben series the descending order of fertility of mothers of a different group from their husband is A-O-B in both the smaller-family and larger-family samples as a whole—a fact which gives interest to Vuori's small-scale material on abortion. In Vuori's series of 348 matings the incidence of abortion was nearly twice as high in the B mothers as in the A or O mothers—this finding has lately been repeated both by Sjöstedt, Grubb, and Linell¹ and by Allan²—and when one omits the matings where husband and wife have the same group, the incidence of abortion in the remaining B mothers rises to more than twice that of the A and O mothers (table III).

TABLE III.—Incidence of Abortion in Finnish Families with Father and Mother of Different ABO Groups

No. of Families	No. of Abortions	Group of Father	Ratio of Families to Abortions	Group of Mother	No. of Abortions	No. of Families
86	7	A	12.3	A	7	92
84	9	O	9.3	O	7	84
53	7	B	7.6	B	8	45

In addition there are slightly more A mothers than A fathers in Vuori's sample, and considerably fewer B mothers than B fathers. Vuori also ascertained the menarche-age of 244 schoolgirls, and, while the average age at menarche was 14.3 years for both the A and O girls, it was 14.7 years for the B girls.—I am, etc.,

Aberdeen

T. M. ALLAN.

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Insulin Resistance

SIR,—The stimulating paper by Dr. J. Beattie (*Journal*, June 5, p. 1287) raises many points of interest, but I would like to be allowed to criticize his interpretation of the results. The author's view that insulin resistance in adrenal-medullectomized animals with hypothalamic lesions is due to increased amounts of growth hormone and adrenal cortical steroids appears to be untenable. The most striking findings in these animals are the hypoglycaemia and the low glycogen content of liver and muscles. Both growth hormone and adrenal corticoids have been shown to increase blood sugar and glycogen stores. Moreover, the author has already shown that the hypothalamic lesions probably do not interfere with pituitary function,¹ and it seems strange that a procedure designed to disturb autonomic control should result in such profound changes in hormonal balance.

It has long been suspected that the autonomic pathways are concerned in the emergency response of the organism to hyperglycaemia and excess insulin. In the present experiments, interruption of the hypothalamic-adrenal system resulted in a complete unresponsiveness to glucose and insulin. This is certainly what one would expect in the case of glucose, though it is difficult to explain why these animals were not more, instead of less, sensitive to insulin. Is it possible that the adrenal response to insulin is not due to

hypoglycaemia, but occurs earlier as a direct effect of insulin on the autonomic nervous system? This is, of course, highly speculative, but it seems that some alternative explanation for the present findings must be sought, since there is little evidence of true insulin resistance.—I am, etc.,

London, S.E.1.

A. PATON.

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Undergraduate Education

SIR,—In reference to Mr. Aleck Bourne's letter (*Journal*, June 5, p. 1321) on undergraduate education, I feel that "what have been the opinions of many of us for years" need re-emphasis, and now more so than ever, since we seem in medicine to be entering a period when the call on the laboratory, the ancillary aids, and the physicist is growing.

I will not agree that it is wrong for students to be told what can be done in rare, major, or obscure cases, but I feel that the primary function of teaching in medicine is to turn out general practitioners who can use their tongues to ask the patient questions, their ears to hear their replies, and their fingers to feel the lesion. This, I am sure, is not forgotten, but, as one who is not connected with a teaching school and who frequently has a new product to deal with, one undoubtedly gets the impression that the present-day student is taught more about the various forms of gastrectomy, pneumonectomy, and cardiovascular surgery, and laboratory diagnosis than was the case in the past and that this, unfortunately, seems to mean a sacrifice in the type of knowledge which is needed in practice—for example, the diagnosis of strangulated hernia, the reduction of dislocated shoulder, the treatment of varicose ulcer, and the recognition of the acute abdomen and the knowledge of when a patient is ill. I am quite sure that many of the very best general practitioners know little or nothing of the techniques of major surgical or laboratory procedures and would be wasting their time to learn, and that emphasis should be on the common things in practice, and attaining enough knowledge to deal with them or refer their difficulties to the correct place if necessary. I cannot help feeling that giving the student sound and definite teaching on what to do with the type of cases he is likely to meet would result in the young practitioner having greater confidence and make the hospital out-patient department less necessary to him. Less of the academic and more of the realities of medicine must be kept before the student, and for this reason there is much to be said for him doing a period of work with a general practitioner.

I feel sure that the good student of to-day is as good as in the past, and the worst no worse, but that the emphasis on what is important is tending to be misplaced. Could it be that now in the teaching schools the house-surgeon has less responsibility than in the past, since registrars and others have increased in number and the duties of house-surgeons now were largely the duties of students in the past, and the student of to-day does little of a practical nature in the ward as part of the team?

With regard to the teaching of psychology, I have no suggestions to offer. The *sine qua non* of this subject I feel is that the doctor must not "lose the common touch." For a doctor to regard his case as a "chest," a "heart," a "gastric," or anything else, and to carry out treatment, however correct, without reference to the patient's thoughts, feelings, or fears, stamps that doctor as one on whom no amount of teaching of psychology will have any effect. The rest of us have, perhaps, learnt a little psychology through force of circumstance. The height of my own knowledge of mental disease was that I once thought that I knew when a patient was mad, though not perhaps the medical term to put on his particular madness. Now, I am not so sure that I even know madness when I meet it.—I am, etc.,

Ballymena, Eire.

W. S. HANNA.

Blood Groups and Gynaecological Cancer

SIR,—The data on blood groups of patients with gynaecological cancer given in the article by Drs. Erik Krokfors and Olavi Kinnunen (*Journal*, June 5, p. 1305) do not bear the interpretation which the authors place on them. Deviations from expectation equal to or greater than those reported would be expected in 15% of similar series even were there no difference between the groups.

Group	A Control	B Total Cancer Patients	C Cancer Patients Under 45 years
O	98	113	42
A	139	110	33
B	48	57	17
AB	25	20	8
Total	310	300	100

The analysis of two 2×4 tables gives values of χ^2 (for 3 degrees of freedom) of 5.609 for the comparison of A with B, and 5.025 for the comparison of A with C; both values correspond to a probability of about 0.15.—I am, etc.,

London, N.W.10.

GEORGE DISCOMBE.

Syme's Amputation

SIR,—In your brief report of Mr. J. H. Shelswell's remarks on Syme's amputation at the annual meeting of the British Orthopaedic Association (*Journal*, May 29, p. 1258) the point is made that the necessary prosthesis is bulky, and therefore this amputation "was seldom indicated in women." Yet there is an important consideration in favour of this level of amputation from a long-term "cosmetic" point of view.

Unfortunately, the very young sometimes suffer grave foot injuries from run-over accidents. When foot amputation in these young people is necessary, a Syme's amputation allows constant weight-bearing and an early fitting prosthesis that has not to be changed at frequent intervals as growth proceeds. With such constant weight-bearing the lower limb grows to its normal length. When growth is ended the choice of a higher level of amputation can be made by the lady herself. Yet I have a patient who in her first decade of life had a Syme's amputation and now, 65 years later, she has a leg equal in length and, with its prosthesis, apparently equal in function to its normal fellow. I doubt if she would at any stage have appreciated the attention of a "cosmetician."—I am, etc.,

Birmingham, 15.

WILLIAM GISSANE.

Restriction on Aureomycin

SIR,—I was astonished to see on sale to the public a veterinary preparation containing 3.6 g. of aureomycin. Surely it is time that the ludicrous situation in regard to this valuable drug was ended. Aureomycin has been extensively used in this country for six years. Its attributes and limitations are widely known. Judging from reports in medical journals, it is lavishly used in hospitals, perhaps too lavishly. A general practitioner, however, can only obtain it on application to a recognized centre, for the treatment of a few uncommon diseases.

Aureomycin has been manufactured in this country for at least four years. It is available in a poultry food. Why is it being withheld for general practice? Erythromycin, a drug with fewer applications, is freely available. The discovery that aureomycin and terramycin are practically identical makes the ruling even more difficult to understand. Aureomycin is a well-established drug, and it seems absurd that its use should still be monopolized by hospitals. It is hoped that the practice of withholding drugs from general practitioners will end with the early release of aureomycin.—I am, etc.,

Wells.

J. PINCHING.

Geriatric Nursing Annexes

SIR,—It is clear from the survey of the geriatric unit in St. Alfege's Hospital for 1952 by Dr. A. J. Mester (*Journal*, June 5, p. 1317) that this unit is doing most valuable work, but I do not think that his advocacy of "nursing annexes" should pass unchallenged. Such annexes when established would soon become veritable homes of the unwanted dying and perpetuate the depressing hopelessness of such institutions. Admission to them would be worse than a death sentence and would have a most unhappy reaction on patient and relatives alike. It is possible that the very dread of them might stir up some to undertake the care of their aged relations, but there are other more humane ways of teaching the duty to provide for parents in their old age. Let us rather mix the cases for whom treatment may be of avail to relieve if not to cure with the less hopeful who need only nursing, so that by their improvement or recovery hope may pervade and stimulate the minds of the sick and their kin, and the work of the attendants on them, whether professional or lay.—I am, etc.,

London, E.C.1.

C. O. S. BLYTH BROOKE.

Chloramphenicol for Athlete's Foot

SIR,—May I ask Dr. Francis J. Evans (*Journal*, May 29, p. 1267) if he had an opportunity of confirming the diagnosis and cure of his cases of epidermophytosis by direct or cultural investigation? Also, what type of fungi were found to be present?—I am, etc.,

Leicester.

JAMES OVERTON.

An Unusual Case of Acute Retention in Women

SIR,—Recently a lady of 67 years of age was admitted to hospital complaining of lower abdominal pain of 12 hours' duration and the inability to pass urine for 24 hours. On examination the bladder was found to be almost as high as the umbilicus. The vagina showed signs of a senile vaginitis, and its upper part had been obliterated, presumably by these changes. Examination per rectum revealed a large, tense, uniform swelling anterior to the rectum. A tentative diagnosis of impaction of a fibroid was made and laparotomy was decided upon. At operation the uterus was exposed through a lower midline incision. The swelling was seen deep down on the posterior aspect of the uterus. Hysterectomy was considered the treatment of choice. During the freeing of the "fibroid" it burst, releasing a large quantity of dark viscid blood. On examination the "fibroid" was revealed as a large haematocolpos. The uterus was removed and a drain was made to pass through the obliterated vagina.

Later it was found that she had been treated for a stenosing senile vaginitis with tab. stilboestrol, 1 mg. every day, some two months before (menopause occurred at 47 years of age). Apparently uterine bleeding had occurred into the upper portion of the obliterated vagina to produce this haematocolpos which led to acute retention.—I am, etc.,

London, N.18.

EDWARD T. R. HOLT.

Alcohol

SIR,—I often think that the attitude of our profession to the use of alcohol might be more clearly defined. G. K. Chesterton in his book *Heretics* says: "There is only one legitimate use of alcohol and that is to get drunk on it." I believe this to be a perfectly true statement. By getting drunk he means that its use is to make a man merry and of a glad countenance when he is in cheery company. Few will deny that a dinner or a dance goes with more swing and fun when champagne goes round. This is probably due to the fact that it lessens one's powers of self-criticism and makes one have a better opinion of oneself. I do not deny the scientific fact that alcohol is ultimately a depressant and that it lengthens one's time of reaction to stimuli. But, and it is a very big but, there are many who do not use alcohol for its legitimate purpose. They use it to fulfil a

physical or mental need either to relieve a pain or because they are tired, or because they have a job in front of them which will tax all their energies and they hardly feel up to it, or because they are afraid. Worst, and most unsocial, of these is the man who has a long cold drive in front of him and takes "one for the road." These people are walking on the edge of a precipice. In my young and unregenerate days I have to confess that I often drank more than was good for me, but it was always in good cheery company, and I was never a bit the worse except for an occasional "head" and a rise in my mess bill. I am now well into my 85th year and can put in a 10-hour day's work seven days a week.

When I was in India and had a very large and hard practice in a somewhat trying climate, often when I paid one of my visits at the end of the day someone would say: "Oh, you are looking tired. Have a whisky and soda." I always answered: "Yes, I am tired and that is why I won't have a whisky; a cup of coffee if you have it. When I have had a bath and a change and get to the club and meet a few cheery friends I will have a drink, perhaps even two." When I commanded a hospital in Mesopotamia I used always to say to my youngsters: "The Old Man shuts his eyes on a guest night, but if I see you taking short drinks through the day to help you get through your work—well, I don't like it and I shan't like you," and their response was excellent. We should preach this doctrine far and wide: "Never, never take alcohol to fulfil a physical need."—I am, etc.,

Taymilt, Argyll.

P. F. CHAPMAN.

Sickle-cell Anaemia in Uganda

SIR.—It is time to correct the impression, several times referred to in your columns, that sickle-cell anaemia is rare in Uganda; rare, that is, in comparison with its expected frequency on the supposition that it is the expression of the homozygous state for the sickling gene in children. Since one of us was partly responsible for this impression as regards Africa as a whole, it is appropriate that we should record our denial of it as far as Uganda is concerned. The original statement was made after a comparison of the published reports up to 1949, from America and Africa respectively. At that time the information about African children in this respect was meagre in the extreme, and the idea of the homozygous basis of the anaemia was only being formulated. Having noted a difference in the reports of the incidence of anaemia in sickling persons from the two continents, Raper¹ concluded: "Any deductions drawn from this difference must of course be treated as subject to revision if more accurate information should be obtained." No conclusions were drawn as to the frequency of the anaemia in Uganda.

In subsequent years more accurate information rapidly accumulated, notably in the excellent study by J. and C. Lambotte-Légrand² from the Belgian Congo, which showed the anaemia to be as frequent as expected around Leopoldville. These authors insisted that one should look for the anaemia amongst very young children, a notion that did not appear even by implication in the American literature before the days of the homozygous theory. Foy and others³ reached similar conclusions in Kenya. In Uganda, Hutton⁴ has analysed the admissions to the children's ward of Mulago Hospital, Kampala, and concluded that the anaemia occurred with about the expected frequency. We have examined haematologically a series of children under 10 years of age, attending (for whatever cause) the out-patient clinic at the same hospital. Amongst 350 children, 4 definite cases of sickle-cell anaemia were detected, and 2 others were recorded in whom this was the probable diagnosis, though not yet confirmed. The expected frequency is in the region of 1% of all children born.

The above figures refer to children selected by their attendance at hospital. However, for some years we have been making clinical and pathological observations on children under 5 years of age attending child welfare clinics

around Kampala. In the last two years, 422 new entrants to the clinics were Baganda, and 237 were Nilotics. In the former the gross sickling rate was 18.5%, and in the latter 20%. Amongst these 659 children there should have been (if the parents exhibited a similar sickling rate) about 7 homozygous for the sickling gene. In fact we observed 12 unrelated cases of sickle-cell anaemia amongst them. Though less selected than hospital cases, children attending the clinics would present a somewhat higher proportion of the sick than exists in the general population. We therefore consider that sickle-cell anaemia is at least as common in this part of Africa as would be expected on genetic grounds.—We are, etc.,

Kampala, Uganda.

HEBE WELBOURN.
ALAN B. RAPER.

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- 4 *Ibid.*, 1953, 30, 75.

Diagnostic Difficulties in Conservative Treatment of Perforated Ulcers

SIR.—In his article (*Journal*, February 13, p. 374) Mr. T. G. Crombie is right to suppose that conservative treatment will stand or fall by the number of errors of diagnosis and their results. It is a pity, however, that his criticism is based, not on practical experience, but on the theoretical results of what he imagines would have happened if his own patients, treated by operation, were treated by the alternative method; and it is a pity also that he deliberately refrains from considering the results of mistakes of the operation policy—that is, operating on wrongly diagnosed coronary thrombosis for example. Finally, he is mistaken in supposing that the surgeon, having decided on treatment by aspiration, is bound to follow the method according to rigid rules instead of altering his treatment according to the progress of the case.

It is possible to illustrate these points by taking the last two years at this hospital. There have been 64 actual perforations and many more cases of "widespread peritoneal irritation" due to other causes. Four of the latter were erroneously considered to be perforated ulcers and were treated initially by aspiration. In fact two cases were appendicitis and two were internal strangulations. The error in each case soon became apparent by the clinical progress; operation was undertaken and all four cases made a satisfactory recovery. Of the 64 actual perforations, the diagnosis was uncertain in five; laparotomy was performed and the ulcer was sutured. In another five cases conservative treatment was not satisfactory and operation was performed. All these ten patients recovered. The remainder were treated without operation. Four patients were moribund on admission and died. They were not at any time suitable for operation. There were no deaths in the series other than these. It is difficult to refrain from suggesting that Mr. Crombie should follow John Hunter and "try the experiment," but, if he does, let him please not omit the x-ray. The exact position of the tube and the amount of gas under the diaphragm and in the stomach are crucial points in the management of these cases.—I am, etc.,

Ilford, Essex.

R. P. WARREN.

Infectious Mononucleosis

SIR.—Dr. Peter Wolf's attempt (*Journal*, May 29, p. 1265) to identify infectious mononucleosis with a positive Paul-Bunnell test is deprecated. It is well known, even to haematologists, that a few other conditions may sometimes give rise to a blood-count similar to that found in infectious mononucleosis. It should be emphasized here that one or two odd "glandular fever cells" are not diagnostic and that a repeat blood-count will help in either confirming or excluding the diagnosis. In a case with sufficient clinical (or laboratory) evidence of some other disease, and with a typical blood-count of infectious mononucleosis, I would

not hesitate to declare a mixed infection, even in the absence of a positive Paul-Bunnell test. While it is true that a positive Paul-Bunnell test is probably diagnostic of infectious mononucleosis, it is equally true that a negative test does not exclude this condition, and I feel confident that it is not dishonest to base a diagnosis of infectious mononucleosis either on haematological or on clinical and haematological grounds in spite of a negative Paul-Bunnell test.—I am, etc.,

Sheffield.

S. VARADI.

Dangers of E.C.T. in Cerebral Arteriosclerosis

SIR.—Dr. G. I. Tewfik (*Journal*, April 10, p. 876) refuted the concept of arteriosclerotic dementia in order to replace it by the term "post-apoplectic dementia." There already exists the general term "cerebral arteriosclerosis," which comprises all those cerebrovascular conditions with focal neurological signs which are not associated with dementia. Within this wide group we find a percentage of cases correctly labelled arteriosclerotic dementia, differentiated by psychometric tests¹ which correlate with psychometric findings. Whether the dementia remains static for a number of years between strokes or is progressive is beside the point. To state, as Dr. Tewfik did in his second letter point, that "the dementia, if it occurs, is related to the apoplexy, and not the arterial lesion," is illogical, as both apoplexy and dementia are caused by arterial lesions; it all depends on the site and extent of the lesions and the degree of compensation of remaining healthy brain.

To treat such cases with E.C.T. is risky. The following case illustrates this: Retired bricklayer, aged 66. Complained of breathlessness on exertion, and stiffness in calves on walking 300 yards (0.27 km.), relieved by stopping. Depression one month: believed he had sinned by retiring, that he hadn't a friend in the world, and that the police would arrest him for drawing N.H.I. money without being entitled to it. His memory was markedly impaired, he thought the year was 1935, didn't know his year of birth, and couldn't give the dates of the last war. He knew the correct day and month and knew he was in a hospital. He had partial insight. He was clean and tidy and his behaviour was not very distinguishable from that of a patient in a general hospital. He was orthopaedic and showed marked left heart failure with a blood pressure of 210/115. Blood urea = 37 mg.%. Marked peripheral and retinal arteriosclerosis. Exaggerated deep reflexes, especially left knee jerk. E.C.G. showed left ventricular strain. He had treatment for four weeks with rest, digoxin, and hexamethonium which reduced his blood pressure to 155/85 and lessened his myocardial decompensation. Mentally he became worse, was more depressed and refused food, arguing that he was depriving other patients of what belonged to them. His memory was bad and he admitted it. In view of his refusing food it was decided to give him E.C.T. modified by succinylcholine. He made a satisfactory recovery from the first treatment, but died a few minutes after the second treatment (0.1 g. thiopentone 5% with succinylcholine 0.4 ml., patient weighing 121 lb. (55 kg.)) a week later.

An inquest was held and necropsy carried out. Findings were: Cerebral arteries atheromatous and narrowed, popliteal vessels atheromatous and calcified; left heart much enlarged and myocardium very fatty. Coronaries atheromatous. Mitral and aortic valves and aorta atheromatous. Verdict: "Death by misadventure accelerated by electric convulsion therapy." This case illustrates the risk involved in treating a man with generalized arteriosclerosis and cerebral ischaemia by E.C.T.

Another case illustrates how cerebral ischaemia was produced by E.C.T. and gallamine triethiodide with a resultant permanent hemiplegia. A lady aged 52 was admitted suffering from depression and dizziness. Blood pressure 110/80. History of asthma since childhood. Heart, nothing abnormal discovered. C.N.S., nothing abnormal discovered. W.R. and Kahn negative. X-ray chest normal. X-ray lumbar spine: osteoarthritic changes. Commenced course of E.C.T. with gallamine triethiodide, all went well until the sixth treatment, given exactly one month after the first (0.8 mg. gallamine triethiodide, plus 0.25 g. thiopentone intravenously). There was some coughing after the treatment. Appeared normal till 3 p.m., when vomited greenish material, became cyanosed with rales and rhonchi in left chest. Quite clear mentally till an hour later when vomited again and became semicomatose: colour then good, heart sounds normal. Right face

and leg paralysed next day with right Babinski. Speech affected. Albumin and hyaline casts present in urine. Nine months later she still had little use in her right hand, though her speech was much better. She remained depressed on discharge 11 months after admission.

I feel sure that this patient had had either a cerebral embolism following sudden right heart failure due to chronic asthma, or cerebral thrombosis, in either case resulting from E.C.T. with secondary fall in blood pressure. It follows that in a case of cerebral arteriosclerosis (which may remain latent till a sudden stress arises) one must curb one's natural enthusiasm for E.C.T. till all the pros and cons have been discussed, and the responsibility for any serious consequences shared with another colleague.—I am, etc.,

Wallerby, Yorks.

REFERENCES

- 1 Hopkins, B., and Roth, M. (1953). *J. ment. Sci.*, 99, 451.
- 2 Pinkerton, P., and Kelly, J. (1952). *Ibid.*, 98, 244.

Chromobacterium Prodigiosum

SIR.—With regard to the rare infectivity of this saprophyte, and to the case reported by Drs. A. J. Hawe and M. H. Hughes (*Journal*, April 24, p. 968), I would like to draw your attention to a case of purulent meningitis, caused by *Chr. prodigiosum*. Papers about its medical and bacteriological aspects were published in *Harefuah*¹ and later abstracted in *Schweizerische Medizinische Wochenschrift*.²

An infant suddenly showed symptoms of nervous irritation. On a slide made of the purulent cerebrospinal fluid were found, between the leucocytes, Gram-negative bacilli, morphologically and biochemically resembling *Serratia marcescens*. This strain proved *in vitro* to be resistant to sulphaguanidine, sulphadiazine, penicillin, and streptomycin, but sensitive to aureomycin and chloramphenicol. It was also pathogenic to mice.—I am, etc.,

Tel Aviv, Israel.

REFERENCES

- 1 *Harefuah*, 1952, 42, 87; 89.
- 2 *Schweiz. med. Wschr.*, 1953, 83, 70 and 115.

SIR.—Drs. A. J. Hawe and M. H. Hughes (*Journal*, April 24, p. 968) might like this story, which is true. A middle-aged man arrived in my panel surgery about 20 years ago. He was the forty-fifth patient that evening, and I was getting slightly shy. He began with preamble of apology for wasting my time. When it had lasted for five minutes or so, I suggested that he should come to the point. Taking a long breath, he said: "Well, doctor, not to put too fine a point on it, as you might say, I'm sweating blood." So I said, "Oh, God, so am I. Do go away, there's a good fellow. There are still twenty of you outside." So he said, "S'welp me, doctor, it's true," and took off his shirt, and his axillae were all clotted up with what looked like blood clot, only there wasn't any wound. So I cut off his axillary hair and put it in an envelope and took it to that great man Alexander George Gibson, and next day he said (in the language of those days): "It's *Bacillus prodigiosus*. It's what the crooked priests used to use for doing miracles with." Unfortunately, I had given him a mercurial lotion to wash with and it cured him, so I couldn't demonstrate his case to the Section of Ecclesiastical Medicine at the R.S.M.—I am, etc.,

London, W.1.

RAYMOND GREENE.

Weight-lifting

SIR.—Some years before the war, and before qualification, I held a commission in the Royal Corps of Signals. The rigging of airline poles was by means of a hole in the ground sunk with a 14-lb. (6.4-kg.) sledge and a 36-lb. (16.3-kg.) "jumper." The latter is like a vast cold chisel some 2½ in. (6.4 cm.) in diameter, which is driven into the ground for about a foot (30 cm.). It is loosened by a few side blows, and is then pulled out. A regular part of the instruction for pulling it out was that the signalman should straddle the instrument, with his feet together and his knees bent, and then straighten his knees; arms were to be kept

straight all the time, acting merely as linkages. Drs. Cyriax and Herford may be interested to know of this teaching, which was certainly standard twenty years ago.—I am, etc.,

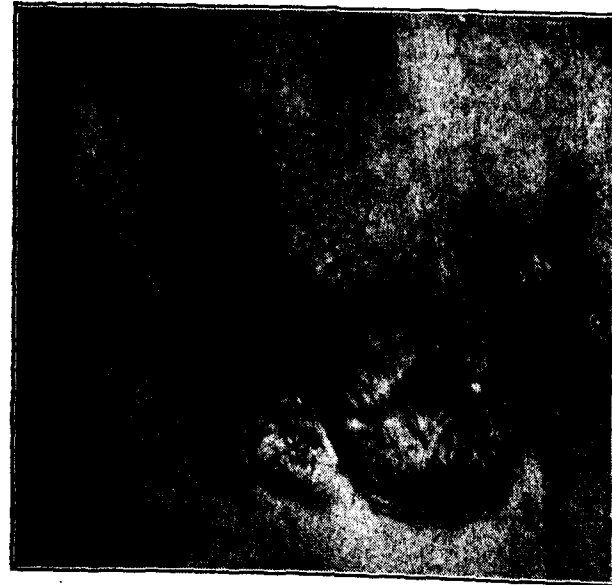
Manchester, 23.

ROBERT OLLERENSHAW.

Apocrine Gland Infection

SIR,—Concerning the annotation on apocrine gland infection (*Journal*, May 22, p. 1198), I saw such a case in 1951, with chronic inflammation of both axillae, much more severe on the left than the right.

At operation on July 3, 1951, the whole of the scarred area of the left axilla was excised and a free graft inserted. The pathological report was as follows: "Chronic purulent inflammation surrounding epidermal inclusions (probably from old scarring) in axilla; dilatation of apocrine sweat glands conspicuous; little inflammation around follicles except in area of epidermal inclusions."



The inflammation of the right axilla was not so severe in degree but later became worse and the patient requested me to operate, which I did on December 8, 1953, again excising the inflamed area and grafting (in both cases a thin razor graft was used). The pathological report on this specimen showed chronic purulent inflammation surrounding partly epithelial-lined cavities.

The stay in hospital on the first occasion was 17 days, and on the second occasion 12 days. This shows the benefit of excision and immediate grafting.—I am, etc.,

London, E.1.

CHARLES L. HEANLEY.

Doctors and Clergy

SIR,—Owing to increasing interest in the relationship of medicine and religion, a meeting has been arranged at Glasgow on July 3 at 8.15 p.m. in the ballroom of the Central Hotel to discuss the subject. The chair will be taken by the Rev. Dr. Nevile Davidson, Minister of Glasgow Cathedral, and the speakers will be Dr. Arthur Pool, previously Medical Superintendent of the Retreat, and the Rev. J. A. C. Murray, Minister of Tolbooth-St. John's Church, Edinburgh. The general title of the discussion will be "The Spiritual Factor in Therapy." All doctors in Glasgow and members of the Association attending the Annual Meeting are invited.

The Churches' Council of Healing, whose President is His Grace the Lord Archbishop of Canterbury, exists to promote co-operation between medicine and the church, and to co-ordinate the various bodies working in the field of the ministry of healing. With the exception of the Roman Catholic Church, practically all Christian denominations are represented; and the British Medical Association

has recently added to its existing representation. The Archbishops of Canterbury and York have recently appointed a Commission to consider "the theological, medical, psychological, and pastoral aspects of 'divine healing,'" and to increase understanding and co-operation between clergy and the medical profession. The British Medical Association is considering evidence which it has been asked to give to the Commission.

We hope that this meeting in Glasgow will stimulate interest in this matter, and direct it along sound and useful lines. Health, in the full sense of the word, is the specific business of both professions or ministries. They have an equal interest in its promotion and an equal responsibility for the tasks which this entails, health of body and soul being one of the ultimate demands of the human spirit. We wish to discuss and study the implications of the matter in loyalty to scientific method, and with minds open to whatever is revealed through men and women inspired by the spirit of truth. In this way, we believe that we can help to make more effective the work of clergy, doctors, and all who realize that health is God's will for us, and that its achievement is something to be claimed and demonstrated.—I am, etc.,

London, W.1.

J. BURNETT RAE,
Chairman, Executive Committee,
Churches' Council of Healing

SIR,—The correspondence initiated by the Rev. Tony Clemens (*Journal*, April 24, p. 983) has shown the interest there is in the profession in the symbiosis between clergy and doctors, but I would go further than Dr. S. F. Gilbert (*Journal*, May 22, p. 1209), who clearly recognizes that spiritual balm is of more value than phenobarbitone. This catharsis he recommends (I use the technical term) is of value, but if the conception behind his use of the word "balm" is that of soothing or finding solace then this is quite inadequate. It is of such an attitude Karl Marx speaks when he refers to religion as the opiate of the masses.

We must as a profession realize that we are merely the attendants at birth, sickness, and death. It is the man of God who can tell us whence we came and whither we are going, and what is the purpose of life, and, though as a profession we are usually sadly guilty of keeping our patients ignorant concerning life and death, we ought to feel that no matter what our personal religion is we should not keep them in ignorance, if they want to know, of the likelihood of their leaving Time for Eternity in the foreseeable future. It is not spiritual balm we mainly need but courage and faith. As Studdert Kennedy so well put it: "We offer too much the comfort of the cushion and not that of the Cross."—I am, etc.,

Southampton.

A. OAKLEY JOHN.

Homosexuality

SIR,—I am sorry that Dr. C. G. Learoyd (*Journal*, June 5, p. 1326) has written such a letter on homosexuality; just as it seemed to me that the article which he recently published in *The Practitioner*¹ was singularly unfortunate. I wonder why he feels competent to write so dogmatically when I can find no record of him having performed any research on this condition. Dr. Learoyd paints a terrible picture of the dreadful results which must follow any alteration of the law. Surely this must be due to ignorance on his part. The Napoleonic Code which has influenced Continental law, and still rules France, makes homosexuality a crime only when committed with a child, a soldier, or in public so as to cause offence. I have not noticed in my visits to France that the French are more homosexual than we are in England—the reverse seems very much the case. One would like to know upon what facts Dr. Learoyd makes his gloomy prophesies.

My own view is that homosexuality is an illness. Naturally the young must be protected from the abnormal, just as the public must be protected from the dangerous schizophrenic. I think that the homosexual who has urges to

interfere with children and youths should be treated, but if he does not respond he should be confined—not necessarily in prison—for the rest of his life where he can do no harm: not given a sentence of a few years and then released more dangerous than he was before. Homosexuality should always be discouraged, since many young men who think that they are abnormal are really only immature. They are balanced on the razor's edge and often can easily be tipped on the right side into normality. However, surely there is a difference between discouragement—possibly by means of a fine and consequent publicity—and sending a man to prison for 15 years because he has indulged in a sexual act with another man with the other man's consent. This is the present state of the law.

The crux of the whole matter is that greater facilities for treatment should be set up, and these would automatically lead to wider research. We shall cure this illness only as we cure other illnesses, by increasing our knowledge and by applying what we have learned—not by bludgeoning the sufferers, no matter how much we disapprove of them.—I am, etc.,

London, W.1.

CLIFFORD ALLEN.

REFERENCE

¹ *Practitioner*, 1954, 172, 355.

SIR,—While we will all honour Dr. C. G. Learoyd's letter on homosexuality (*Journal*, June 5, p. 1326) for its simple honesty of feeling and expression, I suggest that we should refrain from expressing our "confidence that the committee will report" in any particular way. When we make such statements as this it is because we fear that the contrary may be the case, which may reflect on the competence or trustworthiness of the committee and may prejudice their findings. We all, Dr. Learoyd no less than any of us, are in favour of the proposed investigation, as we are only too aware that the present legislation regarding sexual crime is totally inadequate: instead of protecting any victim from assault or illness it invites the potential blackmailer to commit the darkest crimes. As Christians and physicians all our aim and interest is centred in love and healing, neither in condemnation nor punishment.

In my psychiatric practice I have witnessed at first hand the terrible sufferings of the homosexual patient. Analytical psychotherapy has often helped these patients to a considerable degree, and I hope that it will be possible to make such treatment available to all these sufferers. May the committee, under God's guidance, lay the corner stone to a new and more effective attitude towards homosexuality among the people of this nation and their leaders.—I am, etc.,

Edinburgh.

W. P. KRAEMER.

Herpes Zoster and Chicken-pox

SIR,—The letters of Dr. C. Spencer Whitehouse (*Journal*, May 8, p. 1097) and other contributors on herpes zoster and chicken-pox occurring together prompt me to record the following unusual case which might be termed herpes zoster sine herpes with chicken-pox, or chicken-pox producing a focal nerve cell lesion.

A man aged 69 was first seen on March 22, 1954, complaining of three days' continuous pain in the right upper chest and general malaise. The pain had become progressively more severe. On examination the area of pain corresponded roughly with the cutaneous distribution of the first three thoracic nerves on the right. Skin temperature 99° F. (37.2° C.), pulse 80 per min. He had a right Horner's syndrome of which he was unaware, and a few scattered papules and vesicles on the chest, back, and face. No other abnormality of the nervous system was found. Heart and lungs N.A.D. There was no history of contact with either herpes zoster or chicken-pox.

By March 25 there were lesions scattered over the chest, back, and abdomen, with a few on legs, arms, face, and scalp, and a single vesicle on the soft palate. The lesions included macules, papules, vesicles, and pustules, and in character and distribution the rash was indistinguishable from that of chicken-pox. The chest pain, malaise, and Horner's syndrome were I.S.Q. By

March 29 the pustules were all dry and the rest of the rash was aborting; malaise no longer present, chest pain much less severe and Horner's syndrome unaltered. Seen on April 16 he was free from pain and rash and felt well; the Horner's syndrome was still present but less marked. Chest x-ray, differential white cell count, and B.S.R. were all normal. At no time was there any sign of a herpetic eruption in the painful area.

This patient would appear to have had a viraemia producing a rash indistinguishable from that of chicken-pox together with a focal lesion involving posterior-root ganglia and lateral horn cells in the upper thoracic region.—I am, etc.,

Leeds.

G. W. LEWIS.

Relief for Entropion Sufferers

SIR,—Crutch spectacles for both ptosis and entropion have been known to ophthalmologists for more than 50 years,¹ and, although I am unable to supply references, I think it is probable that sight-testing and dispensing opticians have been making them since the introduction of the curl side spectacles. The use of a crutch spectacle in the treatment of entropion has become less popular during the last few decades because the surgical treatment on the whole is simple and effective.

Dr. Cecil W. C. Robinson's letter (*Journal*, May 1, p. 1037) serves to emphasize that the classical "skin and muscle" operation for senile spastic entropion gives little more than 60% success, even in the best hands. Both the term senile spastic entropion and the principle underlying the "skin and muscle" operation are based upon a misconception. The condition is due not to a spasm of the marginal fibres of the orbicularis oculi muscle, as was believed, but to loss of tone and thinning of the part of the orbicularis supporting the lower border of the tarsus of the lower lid. Stretching of the skin and tarsus appear to be contributory factors. The lower lid is kept in snug apposition with the eyeball by a balance in the tone of two groups of fibres of the orbicularis—namely, the fibres along the margin of the lower lid and those in relation to the lower border of the tarsus. If the marginal fibres become lax, the lid margin falls away from the eye and ectropion occurs. If the fibres supporting the lower border of the tarsus are affected, the lower border falls away from the eye and entropion is the result.

The removal of the marginal fibres, as in the skin and muscle operation, may relieve the condition, but operations designed to increase the support to the lower border of the tarsus are more effective. Wheeler² has designed two such operations, and both are simple to perform and most effective. Severer cases of senile entropion or recurrences, in which the lower lid is very lax, are best treated by shortening it as in the Kuhnt-Szymanowski operation for ectropion.³ The principles of treatment are ably discussed in an article by Kirby.⁴—I am, etc.,

Winnipeg, Canada.

HOWARD REED.

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- ¹ Oppenheimer, Eugene (1901). *Disch. med. Wschr.*, 27, 827.
- ² *Amer. J. Ophthalm.*, 1939, 22, 477.
- ³ Stallard, H. B. (1950). *Eye Surgery*, 2nd ed., p. 152. John Wright and Sons, Bristol.
- ⁴ *Amer. J. Ophthalm.*, 1953, 36, 1372.

POINTS FROM LETTERS

Prostatic Obstruction

Mr. D. M. O'CONNOR (Launceston, Cornwall) writes: Some time before the war I wrote a letter which you published describing a case in which a male patient had complained of retention of urine after taking amphetamine ("benzedrine"), then a relatively new drug (*British Medical Journal*, 1937, 1, 43). Someone more knowledgeable than I am pointed out (*British Medical Journal*, 1937, 1, 93) that this effect was to be expected because of the similarity of its action with that of ephedrine. As the only reference given in your correspondence on May 1 (*Journal*, May 1, p. 1036) is to a book published two years ago (Hale-White, *Materia Medica*, revised by A. H. Douthwaite, 1952, London), others may be as unaware as he that this topic was at least mentioned 15 or 16 years ago.

Obituary

A. O. FERGUSON ROSS, M.D., D.P.H.

The death occurred at Birkenhead on June 3 of Dr. A. O. Fergusson Ross, director of the venereal diseases clinics of the city and port of Liverpool and adviser in venereal diseases to the Liverpool Regional Hospital Board. He was 59 years of age.

Andrew Oliver Fergusson Ross was born at Scone, Perthshire, on January 21, 1895, and was educated at George Watson's College and at Edinburgh University, graduating M.B., Ch.B. in 1917. He proceeded to the M.D. four years later. After graduation he held house appointments at Edinburgh Royal Infirmary, where he was surgeon to the out-patients department, and at Monkwearmouth and Southwick Hospital, Sunderland. He served in the first world war as a surgeon-probationer in the Royal Navy, later becoming a specialist in genito-urinary surgery and venereal diseases at the Royal Naval Hospital, Haslar. After the war he entered a partnership at Manchester, but soon gave up general practice to become a consultant in Glasgow.

Dr. Fergusson Ross was appointed venereal diseases officer for the city and port of Liverpool in 1926, the year in which he took the Liverpool D.P.H. He also became lecturer in specific diseases in the University and consultant to the Royal Liverpool United Hospitals and the Liverpool Seamen's Dispensary. Soon after the inception of the National Health Service he was appointed adviser in venereal diseases for the Liverpool region. He was a member of the British Medical Association's Venereologists Group Committee from 1951 until his death, and when the Association held its Annual Meeting at Southport and Liverpool in 1950 he served as a vice-president of the Section of Dermatology.

R. J. M. writes: The many learned papers Dr. Fergusson Ross has contributed to the literature showed his brilliant brain, his fearless refusal to edit other men's opinions, and his absolute integrity. Though a man of world-wide repute, he always retained the humility of the true student, and in the art and practice of his profession his own financial interests and personal comforts were matters of least moment. Though struggling through the shallows of the mortal illness which finally engulfed him, his stern sense of duty caused him to prepare and deliver six brilliant lectures for the World Health Organization at Rotterdam. Indeed, he never lost the urge to question, to seek, and to verify, so that all his teaching bore these hallmarks. I think it no exaggeration to say that all who met him were impressed by his deep love of humanity, by his unfailing courtesy, and by his forgetfulness of self. No man ever loved the quiet things of life more than he did—his family, his friends, his garden, the way of the countryside, the thrust and parry of good conversation, and the story that was apposite. He was a true Scot, proud of Scottish virtues and achievements, full of pawky humour, jealous for the reputation of his brother Scot; a man of great probity and judgment who found it more blessed to give than to receive. All his life a sincere Christian, he was received into the Catholic church in 1950. Our sympathy goes out to her who knew the secret places of his heart, to his three sons and only daughter, and to all those who are mindful of

"That best portion of a good man's life,
His little, nameless, unremembered acts
Of kindness and of love."

E. E. P. writes: By the death of A. O. F. Ross we have lost not only one of the most distinguished venereologists of the

day but a man possessed of an exceptionally broad background of knowledge. He was keenly interested in the welfare of seafarers, and generations of them have reason to be grateful for his care and attention. Our friendship, begun in 1926, ripened as the years went on, and my association with him, professionally and socially, tended ever to increase my admiration. He was a great doctor and a delightful host. He had unfailing sympathy and understanding and a great sense of humour, the latter making him a most amusing correspondent. His enthusiasm and burning zeal were contagious. He shone as a teacher and never spared himself on behalf of his students, endearing himself to all. Our hearts are heavy at his going.

KATHLEEN L. PRENDERGAST, Ph.D., B.Sc. M.R.C.S.

The death of Major Kathleen L. Prendergast, R.A.M.C., at Glasgow on June 1 has left an empty place, which will be hard to fill, in the small band of medical women who so faithfully serve the Army. Kathleen Laura Prendergast was born in South Australia on November 17, 1910. She graduated B.Sc., with honours in geology, at the University of Western Australia in 1936, taking the Diploma in Education later in the same year. At first she made a special study of palaeontology and had published work on the subject. After a year as palaeontologist to an oil company she continued her work at Newnham College, Cambridge, on a Hackett Research Studentship, and took the Ph.D. in 1939. She then turned to medicine, studied at King's College Hospital, and qualified M.R.C.S., L.R.C.P. in 1944. After holding house appointments at King's and at Horton Hospital, where she was house-surgeon to Sir William Gilliatt, she was commissioned in the R.A.M.C. and went to Germany in 1945. From 1946 to 1951 "Mick" Prendergast, as she was affectionately known, was medical officer to the 1st Battalion the Black Watch, a most unusual appointment for a woman, and one which she filled with great distinction. It was in this position that she was able to give full scope not only to her undoubted talents as a physician but also to her truly remarkable qualities of character and personality. She threw herself heart and soul into the life of the regiment, and was respected and beloved by all ranks and by their families. In the art of medicine she excelled, for her clinical skill and judgment were built on a sure foundation of sound common sense and deep humanity. She was never guilty of treating the disease rather than the patient, and soldiers—not always the most articulate of mortals—would always confide in her. Her greatest attribute was her absolute integrity both of character and of purpose; never did she deviate by one fraction from the line of conduct she believed to be right. In manner she was decisive, outspoken, and often critical, for she demanded of others her own high standards of conduct. She strode through life without fear, and her bravery in her last long illness was in keeping with the rest of her courageous life. Her funeral took place at Glasgow with full military honours. In addition to the traditional pipe-music laments at the graveside, the tune "Australian Ladies" was played as her coffin was borne from the church on the shoulders of the men of the Black Watch—the regiment she served so faithfully and loved so well.—P. C. M.

The Rt. Hon. ARTHUR GREENWOOD, M.P.
Mr. Arthur Greenwood, who died on June 11, was Minister of Health in the short-lived Labour Government of 1929-31. In the earlier Labour Government

of 1924 he had had a brief experience as Parliamentary Secretary to the Ministry. He brought to the task a sound training in economics, in which subject he had been lecturer in the University of Leeds. His tenure of ministerial office was marked chiefly by his zeal for post-war housing, which was then within the scope of his department. At that time the Ministry of Health seemed to be tenanted by flitting figures, and Greenwood himself was the seventh Minister in 10 years. His place in the niche of fame will not be due to anything he did as Minister of Health, but rather to his initiative as one of the progenitors of the Welfare State, for it fell to him as Minister without Portfolio in the Churchill Government during the last war to appoint what is officially known as the Interdepartmental Committee on Social Insurance and Allied Services, which sat in 1941-2. Thus he briefed the then Sir William Beveridge to work out in detail the plan which has had such momentous consequences in the social life of this country. Greenwood, who had been in Parliament with one short interruption since 1922, had a likeable personality. One of his Labour colleagues, the late Harold Laski, writing of him when he was Minister of Health, described him as an idealist but also as a hard-headed Yorkshireman who would be ashamed if any stranger suspected it. He was an excellent chairman of committees, able to reconcile conflicting views, and he secured in an unusual degree the affection of his party and of very many outside it.

Dr. WILLIAM GORDON, a well-known and highly respected general practitioner of Birmingham, died at his home at Moseley on May 19 at the age of 87. William Gordon was born at Banbridge, Co. Down, on March 15, 1867, and was educated at the former Queen's College, Belfast, taking the Scottish triple qualification in 1897. Just before the turn of the century he settled in Birmingham, when he soon built up one of the largest practices in the Sparkhill district. He was most painstaking in his work and never spared himself where the interests of his patients were concerned, many of whom will always be grateful for his kindness and for the fatherly advice which he was ever willing to give when they were in trouble or ill. He was very popular, too, with his colleagues in the medical profession. Dr. Gordon took a keen interest in public affairs. He entered the city council in 1934 and remained on it for 16 years, during which time he served on the public health committee, and he was chairman of the maternity and child welfare committee. He was also a member of the Birmingham Executive Council. A man of perfect integrity, loyal to his many friends, and always co-operative, the sympathy of all who knew him will go out to his widow and his son, Dr. W. L. Gordon.—W. McM.

Dr. C. CHARNOCK SMITH, who was a well-known and highly respected general practitioner at Hastings for a quarter of a century, died at Stroud, Gloucestershire, on May 11, at the age of 82. Charles Charnock Smith was born at Hulcote, Bedfordshire, on November 25, 1871, the sixth son of the Rev. Boteler Charnock Smith—the spelling of the second name was changed later—and was educated at Bedford and at the Middlesex Hospital, where he was captain of the rowing club. After qualifying M.R.C.S., and, later, senior house-surgeon at the County Hospital, York, from 1900 to 1902. A brief period in practice at York followed before he returned to the south of England in 1904, to Steyning, in Sussex. In 1908 he moved to Woburn, Bedfordshire, where he was in practice for the next twelve years. At Woburn, as later at Hastings, he

was held in high esteem, and he was appointed a justice of the peace for Bedfordshire. During the first world war he served as an anaesthetist at the Duchess of Bedford's base hospital. In 1920 Dr. Charnock Smith finally settled in practice at Hastings, where he soon began to take an active interest in the affairs of the British Medical Association. He was honorary secretary of the Hastings Division from 1922 to 1926 and assistant secretary in 1926-7, re-assuming the duties of the honorary secretary during the last war. He was also chairman of the Division in 1927-8, president of the Sussex Branch in 1930-1, and on two occasions he represented his constituency at the Annual Representative Meeting. It was chiefly owing to the energy and enthusiasm that he brought to the work of honorary secretary that the Hastings Division became such an active unit within the Association. A man of fine presence and with the courteous manner of his generation, Dr. Charnock Smith was deservedly popular with his colleagues and patients, both at Woburn and at Hastings. He left Hastings soon after the end of the last war, during which he carried on the practice single-handed while his two partners were on active service, and he went to live in retirement at Stroud. He is survived by his widow, formerly Miss Hermione Pearson.

Medico-Legal

MINISTER'S DECISION FINAL

COURT POWERLESS TO INTERFERE

A case of some importance in a matter of principle was the subject of a considered judgment by Mr. Justice Cassels in the Queen's Bench Division on June 4. Mr. T. J. Healey, a shoemaker, of Bridgend, Glamorgan, employed by the Morgannwg Hospital Management Committee, in an action against the Minister of Health contested the Minister's decision that Mr. Healey was not a mental health officer within the meaning of the National Health Service (Superannuation) Regulations, 1950.

For Mr. Healey it was contended that the Ministry had designated as a mental health officer all who were employed partly or wholly in mental hospitals, and that as Mr. Healey, in his capacity of shoemaker, instructed mental patients in hospital he therefore came within the Ministry's definition. For the Minister it was submitted that under the Regulations and the National Health Service Act, 1946, his decision was final and therefore the court had no jurisdiction to grant the plaintiff any relief.

The Judgment

Mr. Justice Cassels, giving judgment, said that the case raised a question of considerable importance regarding the rights of a citizen to seek redress in the High Court and to contend that a determination of the Minister was wrong, and the powers of the court to review the determination of a Minister made under an Act of Parliament and statutory regulations. The plaintiff by his action was in effect saying that the Minister had determined wrongly, and was appealing notwithstanding that no appeal was provided for in the Act or the Regulations. His lordship said that, in the light of the authorities and the plain words of the regulations, he was precluded from exercising such discretion as he had in favour of Mr. Healey. "I hope," concluded Mr. Justice Cassels, "that Mr. Healey has derived adequate satisfaction in the knowledge that for this departmental decision against him the Minister is answerable to Parliament." There would be judgment for the Ministry of Health on the preliminary issue, with costs.

Leave to appeal was granted.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 29 (No. 21) and corresponding week 1953.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	13	0	9	0	0	21	2	10	1	1
Dysentery ..	1,136	142	321	6	2	505	65	115	11	
Encephalitis, acute	6	1	0	0		3	0	0	0	1
Enteric fever:										
Typhoid ..	1	0	0	0	0	2	0	1	0	1
Paratyphoid ..	2	0	1	0	0	8	0	0	0	1
Food-poisoning ..	173	20		0		147	17		2	
Infective enteritis or diarrhoea under 2 years ..					17					16
Measles*	2,046	42	218	175	314	9,012	269	455	283	301
Meningococcal infection ..	32	0	16	0	0	41	5	21	2	1
Ophthalmia neonatorum ..	50	4	9	1		41	5	8	0	
Pneumonia†	428	21	162	5	0	446	22	168	9	2
Poliomyelitis, acute:										
Paralytic ..	10	2				30	5			
Non-paralytic ..	6	1	3	0	2	22	2		2	2
Puerperal fever‡	229	29	14	2		283	48	10	1	
Scarlet fever ..	911	60	135	37	51	1,084	72	175	33	56
Tuberculosis:										
Respiratory ..	862	99	213	31						
Non-respiratory ..	128	7	25	7						
Whooping-cough ..	2,207	81	304	36	27	2,476	228	451	54	124

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0	0	0		0	0			
Encephalitis, acute										
Enteric fever ..	0	0	0	0		0	0			
Infective enteritis or diarrhoea under 2 years ..	9	1	2	1	1	11		1	4	0
Influenza ..	5	0	0	1	0	8	0	2	0	1
Measles ..										
Meningococcal infection ..			1			1	0			
Pneumonia ..	210	34	20	8	6	178	26	15	8	3
Poliomyelitis, acute	0	0	1		0	3	0			0
Scarlet fever ..		0	0	0	0		0	0		0
Tuberculosis:										
Respiratory ..	81	11	12	5	7	81	4	10	0	6
Non-respiratory ..			2	2	0		2	1	0	2
Whooping-cough ..	0	0	1	0	0	1	0	1	1	0
Deaths 0-1 year ..	233	24	26	8	9	211	18	26	11	11
Deaths (excluding stillbirths) ..	5,108	679	595	115	185	4,353	644	487	109	154
LIVE BIRTHS ..	7,942	1,116	901	239	520	7,380	1,088	945	237	464
STILLBIRTHS ..	188	17	21			194	35	14		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Vital Statistics

Food-poisoning at Brighton

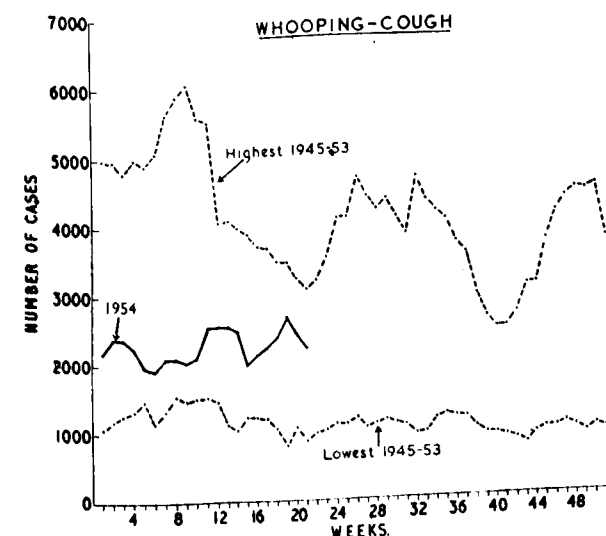
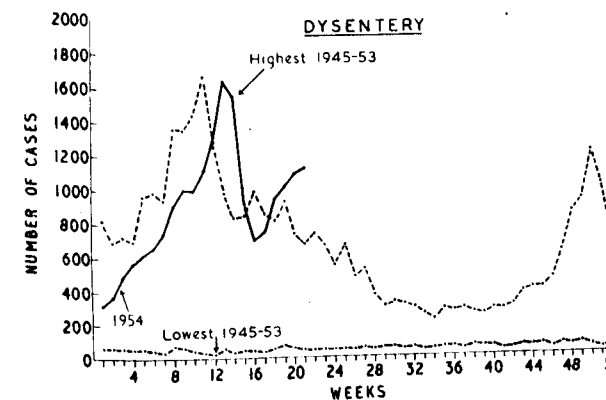
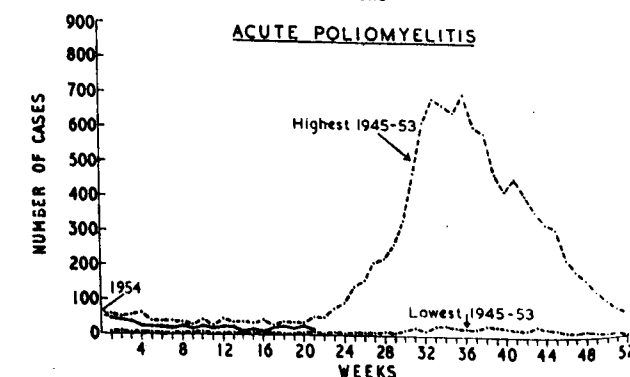
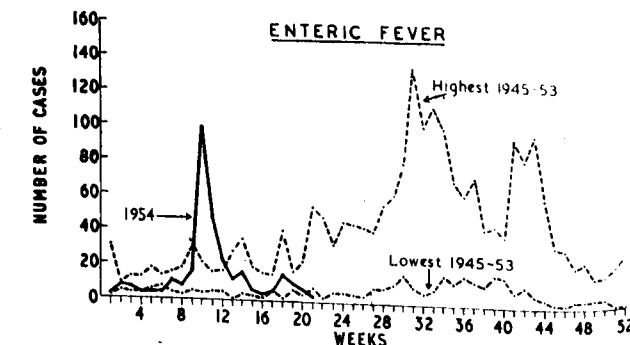
Fifteen of a group of 22 campers spending the Whitsun week-end (June 5-7) at Brighton were taken ill with symptoms of nausea, headache, shivering, drowsiness, photophobia, and in one case delirium. Gastro-intestinal symptoms were not prominent: vague abdominal pain has been common, but diarrhoea occurred in only one case and vomiting was almost absent. The diagnosis appears to be a true poisoning as opposed to acute infection of the gastro-intestinal tract. The differential diagnoses are botulism (or a mild variant of it), an unrecognized bacterial exotoxin, or a chemical poison such as tri-ortho-cresyl-phosphate. The symptoms suggest some form of neurotoxin. The time of onset of symptoms has been variable, and, in view of there being no common latent period or period of incubation, it seems that the same toxic agent has been ingested at varying times rather than that a single common meal has caused the upset. No cases are known to have occurred outside the group of campers, so the implication is that the toxic agent was restricted to the confines of the camp. There was no common food other than tea or coffee, which limits the extent of the investigation. Three girl guides from East Grinstead and one boy scout from Horley who were ill at the same time were not associated with the above episode and were not, in fact, suffering from food-poisoning.

Week Ending June 5

The notifications of infectious diseases during the week included pneumonia 417, scarlet fever 793, whooping-cough 1,989, diphtheria 18, measles 2,834, dysentery 1,017, acute poliomyelitis 34, paratyphoid fever 6, and typhoid fever 3.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus -----. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest variations in the returns for infectious diseases in England and Wales during the week ending May 29 were increases of 106 for measles, from 1,940 to 2,046, 79 for scarlet fever, from 832 to 911, and decreases of 212 for whooping-cough, from 2,419 to 2,207, and 92 for acute pneumonia, from 520 to 428.

The largest increase in the local returns of measles was 118 in Yorkshire West Riding, from 137 to 255; this was due to a rise in Thorne R.D. from 27 to 116. The other large variations in the trends of measles were a decrease of 64 in Yorkshire North Riding, from 147 to 83, and an increase of 67 in Lancashire, from 397 to 464. Only small fluctuations were reported in the local trends of scarlet fever. The chief features of the returns of the preceding week. The chief features of the returns of the preceding week. The chief features of the returns of the preceding week. The only large fluctuation in the trends of the notifications of whooping-cough was a fall of 83 in Lancashire, from 294 to 211.

16 cases of acute poliomyelitis were notified and these were 7 fewer for paralytic and 3 fewer for non-paralytic cases than in the preceding week. The largest returns were Kent 3, London 3 (Westminster 2), Devonshire 2, Lancashire 2.

1,136 cases of dysentery were notified, an increase of 32 on the total of the preceding week. The largest returns were Yorkshire West Riding 193 (Dewsbury C.B. 46, Otley U.D. 33, Sheffield C.B. 28, Leeds C.B. 16), Lancashire 164 (Bolton C.B. 15, Salford C.B. 15, Liverpool C.B. 11, Manchester C.B. 11, St. Helens C.B. 11, Kearsley U.D. 10), London 142 (Islington 58), Staffordshire 104 (Cannock U.D. 35, New-castle-under-Lyme M.B. 37, West Bromwich C.B. 11), Leicestershire 68 (Leicester C.B. 55), Essex 62 (Burnham-on-Crouch U.D. 26, West Ham C.B. 10), Middlesex 46

(Ealing M.B. 11, Tottenham M.B. 10), Cheshire 43 (Dukinfield M.B. 24, Ellesmere Port U.D. 16), Gloucestershire 42 (Sodbury R.D. 33), Sussex 37 (Brighton C.B. 16), Warwickshire 30 (Birmingham C.B. 14, Coventry C.B. 13), Durham 28 (Blaydon U.D. 17), Surrey 28, and Nottinghamshire 24 (Beeston and Stapleford U.D. 11).

In Scotland the largest returns of dysentery were 207 in Glasgow and 37 in Edinburgh.

Medical News

B.M.A. Library.—The Library will be closed and the library service suspended from July 30 to August 16 while redecorating is being done.

British Association of Paediatric Surgeons.—The inaugural meeting of this newly formed association will be held in London from June 30 to July 2 inclusive. The association was founded at the end of last year, when an invitation to join as foundation members was issued to all British surgeons engaged exclusively in the practice of paediatric surgery. In addition, an invitation to join as associate members was given to the members of the Surgical Section of the American Academy of Pediatrics and to 20 other foreign paediatric surgeons. The president is Mr. DENIS BROWNE (London). The inaugural meeting will include lectures and discussions, clinical demonstrations, operating sessions, an exhibition, and films. There will also be a dinner at the Apothecaries Hall. The morning sessions, which are to be held at the Royal College of Surgeons, Lincoln's Inn Fields, will be open to any doctor, without fee or ticket; anyone wishing to attend the afternoon sessions at the Hospital for Sick Children, Great Ormond Street, is asked to write to the secretary, Mr. DAVID WATERSTON, at Great Ormond Street. The programme of the meeting is as follows:

June 30.—Morning: Discussions on "Congenital Malformations of the Rectum and Anus" (opener, Mr. DENIS BROWNE), and "Acute Intussusception in Childhood" (opener, Mr. R. B. ZACHARY). **Afternoon:** Exhibitions of diagrams, photographs, radiographs, and pathological specimens.

July 1.—Morning: Discussion on "Cardio-oesophageal Syndrome in Childhood" (opener, Miss ISABELLA FORSHALL) and "Hiatus Hernia in Childhood" (opener, Mr. DAVID WATERSTON). **Afternoon:** Exhibition and demonstration of operations. Lecture and film, "Surgery of Conjoined Twins" (Professor IAN AIRD).

July 2.—Morning: Discussions on "Intestinal Obstruction in the Neonatal Period" (opener, Mr. H. H. NIXON) and "Peritonitis in the Neonatal Period" (opener, Mr. P. P. RICKHAM). **Afternoon:** Clinical demonstration on the correction of talipes, congenital dislocation of the hip, scoliosis, and torticollis by controlled movement (Mr. DENIS BROWNE).

British Rheumatic Association.—At a luncheon in London on June 10 an appeal was launched by the British Rheumatic Association for the "British Rheumatic Association Fund." It is estimated that rheumatism in one or other of its forms costs the country £250 million a year in production losses, sickness benefits, and medical care, and that three million working weeks a year are lost from the same cause. The object of the fund is to bridge the gap between advances in medical knowledge and the two or three million rheumatic sufferers by promoting services not yet included in official schemes. One of the chief objects is to provide hostels for early diagnosis and treatment and to interest industry in these hostels, and to help rheumatic patients to do useful jobs in home or factory despite their disability. The chairman of the British Rheumatic Association, the Right Hon. TOM WILLIAMS, M.P., presided at the luncheon, and the speakers were Lord HORDER, who emphasized the need to mobilize public opinion, as often it was only public opinion that could open doors; Sir WALTER PUCKEY, a prominent industrialist, who stressed the vital interest of industry in health; and Dr. FRANCIS BACH. The president, Lord NUFFIELD, was unable to be present.

Canadian Medical Association.—Dr. T. CLARENCE ROUTLEY retired on June 15 from the office of general secretary of the Canadian Medical Association, a position he has held for 31 years. He is succeeded by Dr. ARTHUR D. KELLY, formerly deputy secretary.

Dutch Siamese Twins.—On June 12 Dr. H. L. STRAAT, the leader of a team of Dutch surgeons, successfully separated 7-months-old girl Siamese twins at Leeuwarden in Holland. The twins were joined by an abdominal bridge of rather less extent than that connecting the Kano twins (see *Journal*, April 10, p. 831). Before the operation Professor IAN AIRD showed the Dutch surgeons his film of the operation on the Kano twins.

Medical Insurance Agency.—The annual meeting was held at B.M.A. House on June 3, with Dr. JAMES FENTON in the chair. The report presented by the committee of management showed that 1953 had been another year of record progress, in new business, in premiums, and in service to the medical and dental professions in every field of insurance. Correspondingly, the net profit was also greater than ever before: this is distributable solely to the medical and dental charities, which will benefit by £24,550. The total rebates of premiums granted to clients during the year also reached the highest peak hitherto—namely, £18,900. Retiring members of the committee re-elected were Dr. J. A. BROWN, Dr. J. T. INGRAM, Dr. G. ROCHE LYNCH, Sir HENRY SOUTTAR, and Professor R. J. WILLAN. New members elected were Professor ALAN KEKWICK, of the Middlesex Hospital, and Professor G. A. WISHART, of Glasgow. The engagement of additional staff and the leasing of additional premises to cope with the great expansion of business were recommended and adopted. Dr. JAMES FENTON was re-elected to the office of chairman for the ensuing year, and Dr. HENRY ROBINSON was re-elected as honorary secretary. The proceedings terminated with a hearty vote of thanks to the chairman for his services.

Rajkumari Amrit Kaur.—The High Commissioner for India held a reception in London on June 11 in honour of the Minister for Health for India, Rajkumari Amrit Kaur, who is visiting Britain. The reception was attended by British and Indian doctors. The Rajkumari became Minister for Health in the first Dominion Cabinet in 1947, and in 1950 was President of the Third World Health Assembly. She was for 16 years secretary to Mahatma Gandhi.

Royal College of Surgeons.—The medical directors general of the three armed Services attended the meeting of council on June 10 and presented medals for meritorious work in the medical field. Surgeon Commander J. L. S. COULTER, author of *R.N. Medical History of the War*, received the Sir Gilbert Blane Medal, Brevet Colonel H. D. CHALKE the Mitchiner Medal, and Squadron Leader R. R. L. PRYER the Lady Cade Medal (see also *Journal*, May 1, p. 1047). The following were co-opted to the Council for the year 1953-4 as representatives of various branches of medical practice: *General Practice*, Dr. O. C. CARTER; *Gynaecology and Obstetrics*, Professor A. M. CLAYE; *Otolaryngology*, Mr. MYLES L. FORMBY; *Anaesthetics*, Dr. BERNARD JOHNSON; *Ophthalmology*, Mr. A. B. NUTT; and *Radiology*, Dr. E. ROHAN WILLIAMS. Professor F. C. WILKINSON was invited to act as the representative of *Dental Surgery* on the Council.

Royal College of Surgeons in Ireland.—At a meeting of the College on June 7 Mr. IAN FRASER was elected president, and Mr. A. B. CLERY vice-president. Nineteen others were elected to the Council of the College.

Wellcome Research Laboratories.—Colonel H. W. MULLIGAN has been appointed head of the biological division of the Wellcome Research Laboratories, Beckenham, in succession to Dr. J. W. TREVAN, F.R.S. He will

take up his duties there on September 1. Colonel Mulligan was in the Indian Medical Service from 1923 to 1947, for most of the time in the medical research department. During the war he became consultant malarialogist, Persia and Iraq Command. In 1947 he went to West Africa, where he established the West African Institute for Trypanosomiasis Research. During his last three years there Colonel Mulligan was engaged in planning the co-ordination of medical research activities, and his efforts did much to pave the way for the inauguration of the West African Council for Medical Research which was established by Ordinance a few months ago.

Lady Tata Research Awards.—The Trustees of the Lady Tata Memorial Fund announce that, on the recommendation of the (European) Scientific Advisory Committee, they have made the following awards for research on leukaemia and allied diseases in the academic year beginning October 1, 1954:

Grants for research expenses: Dr. Astrid Fagraeus and Dr. Bo Thorell (Sweden), Dr. Jo Nordmann (France), and Dr. Arunachala Sreenivasan (India) (new award). **Senior Research Fellowships:** Dr. Jørgen Kieler (Denmark). **Scholarships (whole-time or part-time):** Dr. Ragna Rask-Nielsen (Denmark), Dr. Roger Robineaux (France), Dr. Flemming Kissmeyer-Nielsen (Denmark), Dr. Niels Aksel Stenderup (Denmark), Dr. Jørgen Ringsted (Denmark) (new award) and Dr. Jørgen Rygaard (Denmark) (new award). **Part-time Scholarship and grant for research expenses:** Dr. Maxime Seligmann (France) (new award). In addition, the period of tenure of a special scholarship awarded earlier this year to Dr. Gavino Negroni (Italy), for work at the Imperial Cancer Research Fund Laboratories, Mill Hill, will continue until April, 1955.

Royal Commission on Mental Illness and Deficiency.—The evidence given by the Ministry of Health and the Board of Control to the Royal Commission on the Law Relating to Mental Illness and Mental Deficiency has now been published as a pamphlet by Her Majesty's Stationery Office, from which it may be obtained, price 3s. net. This evidence was given on the first day of the Commission's hearings, May 4. Other evidence is to follow.

"Family Doctor."—The Trustees of the Medical Society of Victoria, which is amalgamated with the Victorian Branch of the B.M.A., are using part of the money of a bequest for promoting preventive medicine and healthy living to provide *Family Doctor* to 36 public libraries in Victoria.

Mr. Peyton Beale, honorary consulting surgeon to King's College Hospital, will celebrate his 90th birthday on June 20.

Sir Charles Dodds, F.R.S., received the honorary degree of Doctor of Science at the May Week ceremony at Cambridge.

Sir Rudolph Peters, F.R.S., will receive the honorary degree of Doctor of Science at the Foundation Day ceremony at Oxford on November 26.

Professor J. Trueta was invested with the medal of Chevalier of the Legion of Honour by the French Ambassador at a garden party at Oxford on June 9. The award is for his services to France during the war.

Dr. C. B. B. Downman has been appointed to the University readership in physiology tenable at the Royal Free Hospital School of Medicine, London.

Mr. D. J. Tibbs has been appointed to the post of Reader in Surgery tenable in the Newcastle division of Durham University.

Dr. G. Fitzgerald O'Connor has been elected Mayor of Abingdon, Berkshire.

COMING EVENTS

St. Cyres Lecture.—Dr. GRAHAM HAYWARD will deliver the lecture of the Institute of Cardiology in the Barnes Hall of the Royal Society of Medicine, 1, Wimpole Street, London, W.1, on June 25 at 5 p.m. The subject is "Pulmonary Oedema."

Postgraduate Course in Industrial Ophthalmology.—A course will be held at the Birmingham and Midland Eye Hospital from July 19 to 23. Further information may be obtained from the secretary, Department of Research, Birmingham and Midland Eye Hospital, Church Street, Birmingham, 3.

International Association of Gerontology.—The third congress will be held in London from July 19 to 23. Further information may be obtained from the honorary organizing secretary, Mrs. ANNE HUMPAGE, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, June 21

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 2 p.m., Professor J. Low (Capetown): Pelvic Inflammation. LONDON UNIVERSITY.—At University College Hospital Medical School, 5 p.m., Special University Lecture by Professor B. T. Mayes (University of Sydney): Post-partum Haemorrhage.

Tuesday, June 22

● INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. S. P. Meadows: Intracranial Aneurysms. ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnold Demonstration by Professor R. J. East: The Pectoral Girdle.

Wednesday, June 23

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At St. Matthew's Hospital, Burnwood, near Lichfield, 4 p.m., visit, followed by clinical meeting at 5.30 p.m. INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Acantholysis.

Thursday, June 24

HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Mr. D. L. Savill: Ankylosing Spondylitis. ● INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. M. J. F. McArdle: Plexus and Peripheral Nerves. OXFORD UNIVERSITY.—At Nuffield Orthopaedic Centre, 8.30 p.m., Professor C. G. Robt: Present Status of Blood Vessel Grafting. ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., psychiatry demonstration by Dr. M. A. Partridge.

Friday, June 25

CAMBRIDGE MEDICAL SOCIETY.—3 p.m., clinical meeting. INSTITUTE OF CARDIOLOGY.—At Royal Society of Medicine, 5 p.m., St. Cyres Lecture by Dr. Graham W. Hayward: Pulmonary Oedema. INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—3.30 p.m., Mr. Kenneth G. Rutter: Otitis Media in Children and Infants. Clinical meeting for general practitioners. POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. T. McW. Millar: Surgical Experiences in the Treatment of Obstructive Jaundice. 4 p.m., Dr. E. G. L. Bywaters: The Collagen Diseases.

Saturday, June 26

LONDON COUNTY MEDICAL SOCIETY.—At Ministry of Health Spinal Injuries Centre, Stoke Mandeville Hospital, Aylesbury, 11 a.m., clinical meeting.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Henderson.—On June 7, 1954, at York Maternity Hospital, to Joan, wife of Dr. Walter Henderson, of The Cedars, Huntington, York, a daughter. Kennedy.—On June 5, 1954, in Belfast, to Ismene (formerly More), wife of Dr. C. Cotton Kennedy, of Lisnalea, Craigavad, Co. Down, twin sons. Levy.—On June 6, 1954, to Enid (formerly Glynn), wife of Dr. Basil Levy, a son. Moos.—On June 3, 1954, at Hammersmith Hospital, London, W., to Perin (formerly Jungalwalla), M.B., B.S., D.T.M.&H., wife of Jamshed S. Moos, M.D., M.R.C.P., a daughter—Dena.

DEATHS

Ryrd.—On May 23, 1954, at 7, Cecil Avenue, Sale, Cheshire, Elizabeth Caroline Ryrd (formerly Powell), M.B., Ch.B., M.Sc. Forrester.—On May 28, 1954, Mrs. Gertrude Forrester, M.B., B.S., of Polsteads Farm, Bures, Suffolk, late of Enfield, Middlesex. Frost.—On May 26, 1954, at Tenbury, Worcs, George Hewitt Frost, M.B., B.Ch., Lieutenant-Colonel, I.M.S., retired, aged 87. Leslie.—On May 22, 1954, at "Bellevue," Passage West, Co. Cork, Thomas Christie Cyprus Leslie, O.B.E., L.R.C.P.&S.I. & L.M., Colonel, A.M.S., retired. Midgley.—On May 28, 1954, at "Penhurst," Hale, Cheshire, Patrick Haworth Midgley, M.B., Ch.B., aged 64. Ross.—On May 29, 1954, at Brackens, Dormans Park, East Grinstead, Sussex, Thomas Spinks Ross, L.R.C.P.&S.Ed., L.R.F.P.S., D.P.H., Lieutenant-Colonel, I.M.S., retired, aged 81. Silvera.—On May 19, 1954, at Ibadan, Nigeria, Walter D'Aguilar Silvera, M.B., F.R.C.P.E.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Inheritance of Asthma

Q.—A young married couple are anxious to adopt a baby, and have been told that the mother of one child in whom they are interested suffers greatly from asthma. They want to know the chances of the child developing asthma. The mother has three other children, but by a different husband. Unfortunately I have not been given the medical history of the siblings.

A.—There is, of course, a definite risk of the child of an asthmatic mother developing asthma. The most recent work on the subject is by Schwartz,¹ who writes: "Supposing, for instance, that one of the parents has asthma while the other one is healthy, 50% of the children will be carriers of the gene, but only 40% of the latter—that is, about 20% of the children—will acquire manifest disease. Of these 20% about 13% will develop asthma, while the remaining 7% develop vasomotor rhinitis, Besnier's prurigo, or hay fever. If both parents are asthmatics, 75 to 100% of the children will be carriers of the gene, and 30 to 40% will manifest the disease—as asthma in 20 to 25%." (The remaining 10 to 15% would develop vasomotor rhinitis, Besnier's prurigo, or hay fever.)

REFERENCE

¹ Schwartz, M. (1952). *Acta allerg. (Kbh.)*, 5, Suppl. 2, p. 254.

Bone Development in Treated Cretins

Q.—In cretinism, bone development is often retarded, as indicated by an abnormally low number of epiphyses visible on x-ray examination—for example, of the wrist. How soon after the institution of thyroid treatment may one expect the normal number of epiphyses to be visible on radiography?

A.—Lawson Wilkins¹ studied the development of six cretins who came under observation between the ages of 11 and 28 months. In four cases the bone age was at the newborn level, in one case (aged 24 months) the bone age was that of 3 months, and in another (aged 28 months) 9 months. In 2 to 4 months after treatment with thyroid, 1-3 gr. (65-200 mg.) daily, centres of ossification appeared, and the bone age rose rapidly towards the normal developmental level and sometimes exceeded it.

REFERENCE

¹ *J. Pediatr.*, 1938, 12, 429.

T.B. in House Dust

Q.—I have heard of several instances of tuberculosis occurring in families occupying houses previously lived in by tuberculous patients. Is the explanation of this that the bacilli persist in the dust and infect the new arrivals? If so, what disinfection should be carried out to make a house safe after a case of open tuberculosis?

A.—Dried tubercle bacilli can survive in the dark up to four or five months, but in unfiltered north room light only for a matter of days.¹ Dust from room surfaces has been said to be an important source of infection,² but Cruickshank³ has been unsuccessful in isolating tubercle bacilli from the dust in two sanatoria and from tuberculosis wards in a general hospital. He estimates that under conditions of desiccation only 1 to 5% of bacilli remain alive after one to three days. It seems improbable that, with ordinary household standards of cleanliness and hygiene, the occupation of a house previously lived in by tuberculosis patients

The real risk of cycling to such a patient is that of injury from the pedals, etc., to the lower parts of the legs, especially the shins. Such injuries might be serious in the presence of a marked degree of skin congestion. For this reason such patients are advised to wear either elastic stockings, crêpe bandages, or even shin guards for cycling.

Q.—*In what order and at what ages do the functions of a baby's eyes develop? Is a premature baby deficient in its powers of vision?*

A.—Babies begin to appreciate a light within a few days of birth, and then a few weeks later they are usually capable of keeping both eyes directed upon moving objects. As the macula has not nearly completed its development by the time of birth it is impossible for babies to discriminate detail until they are a few months old. The higher grades of binocular vision (including stereoscopic vision) take several years to develop. There is wide variation between different subjects. The vision of a premature baby is less acute than that of a full-term baby because the development of a premature baby's macula is behindhand.

Q.—Recent American literature contains several articles upholding the efficacy of oestrogenic injections in the treatment of acne. What are your views on this form of treatment?

A.—The use of ointments containing oestrogens is neither necessary nor desirable in the treatment of acne under ordinary circumstances. It is sometimes employed with advantage in older patients or very resistant cases, but it is an uncertain measure. There is ready absorption of oestrogens through the skin which may have disturbing systemic effects unless care is taken. The normal proprietary ointments contain 2.5% of oestrogen and should be used only for one week in four or upon some such plan.

Rosehip Syrup.—Dr. C. ALLAN BIRCH (Enfield) writes: The method of preparing syrup from rose hips described in "Any Questions?" (May 29, p. 1277) is a rather laborious way of preserving some of their vitamin C. That boiling was detrimental to some virtuous property (vitamin C) in rose hips was evidently known to our forefathers, as shown in an ancient recipe for rosehip conserve which I came across some years ago. It consisted simply in cutting up the hips (minus seeds) and pounding them with an equal weight of sugar or honey. No heat was used. I made some and was interested to find that the vitamin-C content remained the same a year later.

Correction.—Dr. C. L. COPE writes: "In the paper by myself and Dr. J. García-Llaurado which appeared in the *Journal* of June 5 (p. 1290) we wrongly attributed the adrenal cortical extract 'eucortone' to Burroughs Wellcome and Co. Eucortone has, of course, been made by Allen and Hanburys Ltd. for more than twenty years, and we apologize to the firm for any embarrassment we have caused them by this mistake."

Q.—Is it wise for a man of 69 with bad varicose veins to cycle in moderation? Does not exercise without putting weight on to the limb help to strengthen the muscles and improve the circulation?

A.—In the absence of any other contraindication there would appear to be no objection to a man of 69 with bad varicose veins cycling in moderation. Any form of rhythmical activity of the lower limbs, such as walking, dancing, cycling, etc., tends to diminish the venous congestion caused by varicose veins. For these reasons patients are often much more comfortable when performing these rhythmical activities than when standing, sitting, or walking slowly and un rhythmically. In this way cycling in moderation could be described as "improving the circulation." In addition the improvement in muscle tone would probably increase the subjective comfort of the limbs.

REFERENCES

- ¹ Smith, C. R. (1942). *Amer. Rev. Tuberc.*, 45, 334; 46, 549.
² Augustine, A. E. (1929). *J. prev. Med.*, 3, 121.
³ Cruickshank, R. (1948). *N.A.P.T. Bull.*, 11, 136.

LONDON SATURDAY JUNE 26 1954

A PRELIMINARY REPORT

BY

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AND

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In the last five years a number of studies have been made of the smoking habits of patients with and without lung cancer (Doll and Hill, 1950, 1952; Levin, Goldstein, and Gerhardt, 1950; Mills and Porter, 1950; Schrek, Baker, Ballard, and Dolgoff, 1950; Wynder and Graham, 1950; McConnell, Gordon, and Jones, 1952; Koulumies, 1953; Sadowsky, Gilliam, and Cornfield, 1953; Wynder and Cornfield, 1953; Breslow, Hoaglin, Rasmussen, and Abrams, 1954; Watson and Conte, 1954). All these studies agree in showing that there are more heavy smokers and fewer non-smokers among patients with lung cancer than among patients with other diseases. With one exception (the difference between the proportions of non-smokers found by McConnell, Gordon, and Jones) these differences are large enough to be important. While, therefore, the various authors have all shown that there is an "association" between lung cancer and the amount of tobacco smoked, they have differed in their interpretation. Some have considered that the only reasonable explanation is that smoking is a factor in the production of the disease; others have not been prepared to deduce causation and have left the association unexplained.

Further retrospective studies of that same kind would seem to us unlikely to advance our knowledge materially or to throw any new light upon the nature of the association. If, too, there were any undetected flaw in the evidence that such studies have produced, it would be exposed only by some entirely new approach. That approach we considered should be "prospective."^{*} It should determine the frequency with which the disease appeared, in the future, among groups of persons whose smoking habits were already known.

To derive such groups of persons with different smoking habits we wrote in October, 1951, to the members of the medical profession in the United Kingdom and asked them to fill in a simple ques-

*O.E.D. Characterized by looking forward into the future.
(Leigh Hunt: "He was a retrospective rather than a prospective man")

tionary. In addition to giving their name, address, and age, the doctors were asked to classify themselves into one of three groups—namely, (a) whether they were, at that time, smoking; (b) whether they had smoked but had given up; or (c) whether they had never smoked regularly (that is, had never smoked as much as one cigarette a day, or its equivalent in pipe tobacco, for as long as one year). All present smokers and ex-smokers were asked additional questions. The former were asked the ages at which they had started smoking and the amount of tobacco that they were smoking, and the method by which it was consumed, at the time of replying to the questionnaire. The ex-smokers were asked similar questions but relating to the time at which they had last given up smoking.

The questionnaire was intentionally kept short and simple in the hope of encouraging a high proportion of replies, without which the inquiry must have failed. In a covering letter the doctors were invited to give any information on their smoking habits or history which might be of interest, but, apart from that, no information was asked for about previous changes in habit (other than the amount smoked prior to last giving up, if smoking had been abandoned). It was, of course, realized that the habits of early adult life might well be more relevant to the development of a disease with a long induction period than the most recent habits. On the other hand, we regarded the procedure adopted as justified, not only because of the extreme difficulty of obtaining sufficiently accurate records of past smoking habits, but also because of the experience of our previous retrospective investigation (Doll and Hill, 1952). This investigation, in which nearly 5,000 patients were interviewed, had shown that the classification of smokers according to the amount that they had most recently smoked gave almost as sharp a differentiation between the groups of patients with and without lung cancer as the use of smoking histories over many years—theoretically more relevant statistics, but clearly based on less accurate data.

From their replies to the questionnaire the doctors were classified into broad groups according to age, the amount

of tobacco smoked, the method of smoking, and whether smoking had been continued or abandoned. These groups, based upon smoking habits at the end of 1951, form the "exposed to risk."

To complete the investigation it was necessary to obtain information about the causes of death of all those doctors who had replied to the questionnaire and who subsequently died. Through the courtesy of the Registrars-General in the United Kingdom a form showing particulars of the cause of death has been provided for every death of a doctor registered since the questionnaire was sent out. Each form relating to a doctor who had completed the questionnaire has been extracted and allocated to the smoking group in which that doctor had previously been placed. Hence it has been possible to calculate the death rates from different causes within each of the main smoking categories.

The Exposed to Risk

The questionnaire was sent out on October 31, 1951, to 59,600 men and women on the *Medical Register*. Of the 41,024 replies received, 40,564 were sufficiently complete to be utilized. Of this total, however, 10,017 related to men under the age of 35 and 6,158 to women of all ages. Since lung cancer is relatively uncommon in women and rare in men under 35, useful figures are unlikely to be obtained in these groups for some years to come. In this preliminary report we have therefore confined our attention to men aged 35 and above. The numbers of them who had (a) never smoked regularly, (b) smoked greater or less amounts of tobacco, or (c) smoked cigarettes or pipes or both cigarettes and pipes are shown in Tables I and II. It will be seen that in this population the distribution of

TABLE I.—Amount of Tobacco Smoked. Male Doctors Aged 35 Years and Above

Age in Years	No. of Non-smokers	No. of Men Smoking† a Daily Average of:			Total No. of Men
		1 g.—	15 g.—	25 g.—	
35-44	1,457	2,864	2,888	1,716	8,925
	(16.3%)	(32.1%)	(32.4%)	(19.2%)	(100.0%)
45-54	835	2,087	2,332	1,886	7,140
	(11.7%)	(29.2%)	(32.7%)	(26.4%)	(100.0%)
55-64	377	1,376	1,283	1,027	4,063
	(9.3%)	(33.9%)	(31.6%)	(25.3%)	(100.0%)
65-74	231	1,218	807	438	2,694
	(8.6%)	(45.2%)	(30.0%)	(16.3%)	(100.0%)
75-84	164	768	326	132	1,390
	(11.8%)	(55.3%)	(23.5%)	(9.5%)	(100.0%)
85 and above	29	118	26	4	177
	(16.4%)	(66.7%)	(14.7%)	(2.3%)	(100.0%)
All ages (Crude %)	3,093	8,431	7,662	5,203	24,389
	(12.7%)	(34.6%)	(31.4%)	(21.3%)	(100.0%)

† The figures include (a) men smoking the given amounts at the end of 1951, and (b) ex-smokers smoking the given amounts at the time they gave up smoking.

‡ 1 cigarette equals 1 g.; 1 oz. of tobacco a week taken to equal 4 g. a day.

TABLE II.—Method of Smoking. Male Doctors Aged 35 Years and Above

Age in Years	No. of Men Smoking			Total No. of Smokers
	Pipes	Pipes and Cigarettes‡	Cigarettes	
35-44	1,001 (13.4%)	1,240 (16.6%)	5,227 (70.0%)	7,468 (100.0%)
45-54	843 (13.4%)	1,301 (20.6%)	4,161 (66.0%)	6,305 (100.0%)
55-64	630 (17.1%)	991 (26.9%)	2,065 (56.0%)	3,686 (100.0%)
65-74	601 (24.4%)	661 (26.8%)	1,201 (48.8%)	2,463 (100.0%)
75-84	411 (33.5%)	288 (23.5%)	527 (43.0%)	1,226 (100.0%)
85 and above	72 (48.6%)	23 (15.5%)	53 (35.8%)	148 (99.9%)
All ages (Crude %)	3,558 (16.7%)	4,504 (21.2%)	13,234 (62.1%)	21,296 (100.0%)

‡ The few men who smoked cigars have been classed as mixed pipe and cigarette smokers.

*The Registrars-General of England and Wales, Scotland, Northern Ireland, the Isle of Man, Jersey, and Guernsey.

smoking habits varies considerably with age. Since cancer incidence also varies greatly with age it will be necessary to use death rates at specific ages, or a rate standardized for age, when comparing the mortality among the men in the different smoking categories.

It may well be that the smoking habits of the 40,564 doctors who replied to us are not representative of the smoking habits of all doctors. One category may have tended to reply more readily than another. We shall not, however, need to use the replies in total but always separately within the four smoking divisions. All that we require are sufficient numbers within each of those divisions.

The Deaths

In the 29 months that have elapsed since the questionnaires were sent out (November, 1951, to March, 1954, inclusive), 789 deaths have been reported among the male doctors who were aged 35 years and above at the time that they completed the questionnaire. Of these deaths, 35 were certified as due to lung cancer; in one further case lung cancer was reported as contributing to death without being the direct cause. We wrote to the doctor certifying the cause of death in each of these 36 cases and asked him to tell us the nature of the evidence upon which his diagnosis was based. The information received is analysed in Table III. There were firm grounds for the diagnosis in at least 33 of the cases, and in only three was the evidence limited to clinical examination.

TABLE III.—Criteria on Which Diagnosis of Primary Lung Cancer was Established

Diagnostic Criteria	No. of Cases	% of Total
I. Histological evidence of carcinoma, plus evidence of the site of the primary tumour from necropsy, operation, bronchoscopy, or radiological examination	21*	58
II. Evidence of the site of the primary tumour from operation (2), bronchoscopy (3), or radiological examination (7), without histological evidence	12	33
III. Evidence from clinical examination only	3	9
All cases	36	100

* 7 squamous-cell carcinoma, 9 oat-cell and anaplastic carcinoma, 3 adenocarcinoma, and 2 cell type undetermined.

Preliminary Results

Amount of Smoking

Death rates from six groups of diseases have been calculated for each of the categories of men classified as non-smokers or as having smoked greater or smaller amounts of tobacco. The rates have been standardized for age (by the direct method), using the total male population of the United Kingdom on December 31, 1951, as the standard population.† The resulting annual rates for each smoking category from all causes of death and from six causes separately are shown in Table IV. It will be seen that the death rate from lung cancer increased steadily from 0.00 per 1,000 in non-smokers to 1.14 per 1,000 among the men daily. A similar but less steep rise is also seen in the death rate from coronary thrombosis (from 3.89 per 1,000 in non-smokers to 5.15 in the heaviest smokers). In the other disease groups the changes in mortality are irregular and, for the most part, small.

The statistical significance of these differences in the death rates can be more easily assessed from the actual numbers of deaths recorded; that is, by comparing them with the numbers which would have been expected to occur in each smoking category if smoking were quite unrelated to the chance of dying of lung cancer. For example, 13 men aged

† Thus for each of the four smoking categories in Table I death rates were separately calculated, for each age group. These age rates were then applied to the corresponding U.K. population in 1951 to reach the death rate at all ages that would have prevailed in the U.K. population if it had experienced the various rates at ages of a particular smoking group.

TABLE IV.—Standardized Death Rate Per Annum Per 1,000 Men Aged 35 Years and Above in Relation to the Most Recent Amount of Tobacco Smoked

Cause of Death	No. of Deaths Recorded	Death Rates of Non-smokers	Death Rates of Men Smoking a Daily Average of			Death Rate of All Men
			1 g.—	15 g.—	25 g.—	
Lung cancer	36*	0.00	0.48	0.67	1.14	0.66
Other cancers	92	2.32	1.41	1.50	1.91	1.65
Respiratory disease (other than cancer)	54	0.86	0.88	1.01	0.77	0.94
Coronary thrombosis	235	3.89	3.91	4.71	5.15	4.27
Other cardiovascular diseases	126*	2.23	2.07	1.58	2.78	2.14
Other diseases	247	4.27	4.67	3.91	4.52	4.36
All causes	789	13.61	13.42	13.38	16.30	14.00

* 1 case in which lung cancer was recorded as a contributory but not a direct cause of death has been entered in both groups.

55-64 when the questionnaire was completed subsequently died of lung cancer. The proportions of all the men in this age group who were non-smokers, smoked 1-14 g. a day, 15-24 g. a day, or 25 or more g. a day were 9.3%, 33.9%, 31.6%, and 25.3%. If the mortality from lung cancer is unrelated to smoking, then the 13 deaths should be distributed to the smoking groups in these ratios. Similar calculations have been made for the numbers of men dying of lung cancer in the other age groups—namely, 1 at ages 35-44, 8 at ages 45-54, 6 at ages 65-74, and 8 at ages 75-84. The total numbers of deaths expected in each smoking category were then obtained by adding the numbers for the separate age groups. The results were as follows:

	Non-smokers	Smokers of a daily average of			Total
		1 g.—	15 g.—	25 g.—	
Observed deaths	0	12	11	13	36
Expected deaths	3.77	14.20	10.73	7.33	36.03

These differences between the observed and expected deaths are statistically significant ($\chi^2 = 8.5$, $n = 3$, $P = 0.04$). We may note, too, that the ordinary χ^2 test of significance fails to take into account the biologically important finding that there is a continuous increase in the proportion of observed to expected deaths as the amount of tobacco smoked increases—a finding which makes it possible to attach a simple interpretation to the results.†

In none of the other disease groups are the differences between the observed and expected number of deaths found to be significant. The continuous change in the ratio between the observed and expected deaths from coronary thrombosis is, however, suggestive.‡ For all causes of death taken together, there is an excess mortality among smokers of 25 or more g. a day and a corresponding deficiency of deaths, almost equally divided, among the non-smokers and the men in the less heavy smoking categories. The differences are statistically significant ($\chi^2 = 8.8$, $n = 3$, $P = 0.03$). When, however, the lung cancer deaths are omitted, the differences are no longer significant ($\chi^2 = 6.5$, $n = 3$, $P = 0.09$).

The distinction between the systematic variation in the mortality from lung cancer with the amount smoked and the irregular (or small) variation observed in the other disease groups studied is perhaps shown more clearly in the Chart.

Method of Smoking

With the very simple form of questionnaire that we deliberately employed we can distinguish the different types of smokers only according to whether they were smokers of a cigarettes, of pipes, or of both cigarettes and pipes, at a given point of time—that is, for smokers at the time they

† The present data provide a special case of the general problem of assessing the significance of a trend, considered by Yates (1948). By his method we obtain $\chi^2 = 7.7$, $n = 1$, $P < 0.01$.

‡ By Yates's method it is statistically significant. $\chi^2 = 4.6$, $n = 1$, $P = 0.03$.

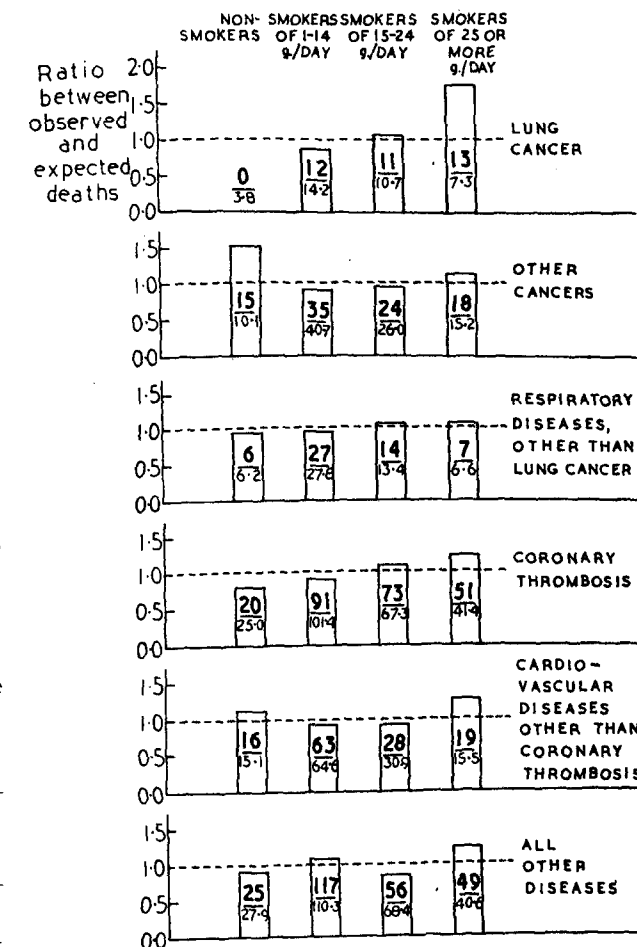


Chart showing variation in mortality with amount smoked. The ordinate shows the ratio between the number of deaths observed and the number expected (as entered in each column).

filled in the questionnaire and for ex-smokers at the time that they had previously given up smoking. It is clear, therefore, that the real numbers of "pure" cigarette smokers and of "pure" pipe smokers must be less, and, almost certainly, appreciably less, than those we have allocated to those groups. Evidence of this was, in fact, provided by some doctors who volunteered additional information that they had in previous years smoked their tobacco by different methods and in different amounts. Any real difference between the risks associated with cigarette and with pipe smoking must therefore be blurred in our figures, since each group will contain men who have also been exposed, in part, to whatever risks may be associated with the other type of smoking.

With that very material proviso in mind, we note that, of the 36 men with lung cancer, 25 had reported themselves as cigarette smokers, 4 as pipe smokers, and 7 as smokers of both cigarettes and pipes. If the method of smoking were entirely unassociated with the risks of lung cancer we would have expected (by the method of calculation described above) these 36 cases to be subdivided in the following proportions: 19.6 cigarette smokers, 7.6 pipe smokers, 8.8 cigarette and pipe smokers. While there is an observed excess of cigarette smokers and a deficit of pipe smokers amongst the deaths, the differences are not statistically significant ($\chi^2 = 3.5$, $n = 2$, $P > 0.10$), and with the present number of deaths it has not been possible to allow adequately for differences in the amount smoked.

In none of the other five disease groups studied was there a significant difference between the observed and expected deaths for the different types of smokers, and the actual differences were, in fact, smaller than those we have reported above for the deaths from lung cancer.

Comparison Between the Results of the Retrospective and Prospective Inquiries

The relative excess of cigarette smokers and the corresponding deficit of pipe smokers in the 36 cancer of the lung deaths amongst the doctors, though not formally significant, at least does not run counter to the tentative conclusion of a lower risk to pipe smokers that we drew from the data obtained from hospital patients. More striking, however, is the similarity we find in the two inquiries in the upward trend of the death rate from cancer of the lung that accompanies increased amount of smoking. In our previous "backward" inquiry we made estimates of the death rates among residents in Greater London in 1950 who had smoked different quantities of tobacco. These estimates we have now recalculated to bring them into line with the slightly different methodology of our present analysis—that is, we have limited the rates to ages 45–74, we have standardized them on the total male population of the U.K. at December 31, 1951, and we have based them upon the most recent smoking history of the patient instead of upon a longer-term history. The results, together with the corresponding figures for doctors, are set out in Table V.

TABLE V.—Standardized Death Rates from Cancer of the Lung Per 1,000 Men Aged 45–74 Years in Relation to the Most Recent Amount of Tobacco Smoked, Estimated from (a) the "Backward" Inquiry into the Histories of Patients with Cancer of the Lung and Other Diseases in London (1952), and (b) from the Present "Forward" Inquiry into the Mortality of Doctors (1954)

	Non-smokers	Smokers of:			All Groups*
		1–14 g./day	15–24 g./day	25 g. +/day	
Standardized rates					
"Backward" study of patients' histories	0.11	1.56	2.20	4.00	1.97
"Forward" study of mortality of doctors	0.00	0.50	0.97	1.45	0.73
Each rate as % of the rate for all groups					
"Backward" study of patients' histories	6%	79%	112%	203%	100%
"Forward" study of mortality of doctors	0%	68%	133%	199%	100%

* The unweighted average of the four rates.

The actual rates for the doctors are, it will be seen, very materially less than those we have estimated for the males of Greater London. On the other hand, there is a remarkable similarity in the increases in mortality from non-smokers to "light" smokers, from "light" smokers to "medium" smokers, and, finally, from "medium" smokers to "heavy" smokers. In the "backward" group the percentages of the average rate are 6, 79, 112, and 203; in the "forward" group they are 0, 68, 133, and 199. Remembering that at these ages we have only 27 deaths of doctors to analyse, the similarity is perhaps too good to be true; it may well be due partly to chance. We would, however, suggest that it is at least reasonable to conclude that there is no incompatibility between the results of the two inquiries in their measurements of the increase of mortality from lung cancer in relation to the increases in smoking.

The incompatibility lies, as observed above, in the actual level of the rates in the two inquiries. Why should the rates for the doctors be so much lower? One important reason—and one which applies to all causes of death and not only to lung cancer—is, we believe, that doctors who were already ill of a disease likely to prove fatal within a short space of time would have been disinclined, or indeed unable, to answer our inquiries. In other words, we should learn of their deaths, but we would have no corresponding completed questionnaire on our files. That this may well be true is shown (a) by the relatively low death rate from all causes that we have recorded—namely, 14.0 per 1,000 per annum, against 24.6 per 1,000 for men of all social classes in the same age group in the U.K. in 1951, and (b) by the

fact that over the 29 months of the investigation there has been a rise in the proportion of the deaths sent to us by the Registrars-General for which we have been able to find a completed questionnaire. If persons sick of a fatal illness were unwilling to reply, or, indeed, never saw our communication, that bias would tend to wear off with the passage of time—as it shows signs of doing.

The question is whether such a bias would differentially affect the mortality of the smoking group. Could it artificially produce the gradient that we have observed with cancer of the lung, and probably with coronary thrombosis, whilst not producing any gradient with other causes of death? For such an effect we should have to suppose that the heavier smokers who already knew that they had cancer of the lung tended to reply more often than non-smokers, or lighter smokers, in a similar situation. That would not seem probable to us. As evidence to the contrary we would also add (a) that, although the numbers of deaths are admittedly very small, we have not seen any obvious change in the lung cancer gradient over the 29 months of the inquiry, and (b) that it would be surprising if a gradient produced in this way so closely resembled the gradient we obtained in our retrospective inquiry.

Other factors than this may have contributed to the lower death rates from cancer of the lung recorded for the doctors. There may well be differences between them and our male London patients in methods of smoking (use of pipes as against cigarettes), and there may be differences in the age of starting to smoke. The London rates are, too, we know, higher than the rates for the country as a whole, and it was from the latter that the doctors were drawn.

The Diagnoses

It might perhaps be argued that physicians in reaching a diagnosis of cancer of the lung have been biased by the patient's smoking history. We have, however, already shown in Table III that there was little doubt of the diagnosis in the great majority of the deaths. That would not, of course, meet the point that the physician might take more active steps to make a diagnosis in a heavy smoker than in a light or non-smoker, but, if that were the case, deaths from other causes would have to be proportionately less in the groups of heavier smokers. There is certainly no sign of that in our present figures, and the steadiness of the upward gradient among smokers would seem to make such a bias very unlikely.

Conclusion

If, as we think, the association between smoking and the disease is real and not due to some such bias as we have discussed, it is likely that the increase in mortality with the amount smoked is, in fact, greater than that indicated by our present figures. The rates we give were calculated from the limited data obtained in reply to a simple questionnaire, and related (apart from non-smokers) to smoking habits at a single point of time. No attention was paid to the changes in smoking history that many men experience—even when we had evidence of such changes. Consequently the group of doctors classified by us as light smokers (smokers of 1–14 g. a day) may well contain an appreciable proportion of persons who have for many years—and possibly for the more relevant years—smoked larger amounts of tobacco; and (perhaps to a less extent) the group of heavy smokers (smokers of 25 or more g. a day) may contain men who for the most part of their lives have smoked much less.

Evidence of these changes was provided, as pointed out previously in relation to the relative risks of cigarette and pipe smoking, by some doctors who volunteered statements on their forms that they had previously smoked different amounts of tobacco. We know, for instance, that among those who subsequently developed lung cancer one had been smoking 25 cigarettes a day and 1 oz. of pipe tobacco a week until he cut down to 12 cigarettes a day on his retirement in 1945. Another had changed from 25 to 30 cigarettes a day to 5 oz. of pipe tobacco a week (equivalent

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ORAL CORTISONE THERAPY IN PERIARTHRITIS OF THE SHOULDER

A CONTROLLED TRIAL*

BY

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Periarthritis or capsulitis of the shoulder is a fairly well defined clinical entity characterized by pain in the shoulder region, often extending down the arm, with limitation of all movements at the shoulder-joint, producing in severe cases the "frozen shoulder." One or both shoulders may be affected. There are neither clinical nor radiological signs of arthritis and there is no constitutional disturbance.

The onset of the shoulder lesion is usually spontaneous, but it may sometimes follow trivial trauma, coronary thrombosis, or cerebral vascular lesions. The condition tends to be self-limiting, recovery taking place in six months to three years, but during this period pain may be severe and disability considerable.

Simmonds (1949) found minimal inflammatory changes in the fibrous capsule of the shoulder-joint in cases of this type, and Coventry (1953) believes that the syndrome results from the interaction of pain, disuse, and what he calls the periarthritic personality, but little is really known about the pathogenesis of this condition. It is, however, generally agreed that active movement of the stiff shoulder may expedite recovery, but that it is difficult to persuade the patient to exercise the shoulder adequately, so that adjuvants such as various forms of physiotherapy or x-ray therapy are widely employed. If the shoulder movements are not rapidly regained the stiff shoulder is often manipulated under general anaesthesia.

Sigler and Ensign (1951) and Solomon *et al.* (1951) claimed that short courses of cortisone or A.C.T.H. expedited recovery and reduced the need for manipulation in cases of periarthritis of the shoulder. More recently, Coventry (1953) claimed that a few weeks' treatment with oral cortisone gave most satisfactory

*Based upon a report to the Medical Research Council and Nuffield Foundation Joint Committee on Clinical Trials of Cortisone, A.C.T.H., and Other Therapeutic Measures in Chronic Rheumatic Diseases.

to 20 cigarettes a day) in September, 1951. In another instance, the doctor had described himself as smoking 3½ oz. of pipe tobacco a week, but a friend, who signed the death certificate and had known him for 25 years, stated he had previously been one of the heaviest smokers of both cigarettes and pipe he had ever known. Such factors not only could not produce an exaggeration of the true relationship but must lead to an understatement of it by inflating the mortality among light smokers and reducing the mortality among heavy smokers.

The investigation has not, as yet, continued long enough to show whether there is a relationship between smoking and the mortality from any other disease, but from the preliminary figures it would seem unlikely that there is any as close as that observed with lung cancer. The numbers of deaths, however, from some potentially interesting diseases are as yet small (for example, from cancer of the buccal cavity and larynx and from duodenal ulcer). There have, on the other hand, been a large number of deaths attributable to coronary thrombosis. It seems clear that smoking cannot be a major factor in their production, but the steady increase in mortality with the amount of tobacco smoked recorded suggests that there is a subgroup of these cases in which tobacco has a significant adjuvant effect.

Summary

At the end of 1951 some 40,000 men and women on the British Medical Register replied to a simple questionnaire relating to their smoking habits. On that basis they were divided into non-smokers and three groups of smokers (including ex-smokers) according to the amount they smoked at that time (or when they gave up).

The certified causes of death of those men and women who have since died have been supplied by the Registrars-General of the U.K. over the ensuing 29 months. This preliminary report is confined to the deaths among the 24,389 men over the age of 35.

Though the numbers of deaths at present available are small the resulting rates reveal a significant and steadily rising mortality from deaths due to cancer of the lung as the amount of tobacco smoked increases. There is also a rise in the mortality from deaths attributed to coronary thrombosis as the amount smoked increases, but the gradient is much less steep than that revealed by cancer of the lung. The other groups of deaths so far analysed reveal no gradient (other forms of cancer, other forms of cardiovascular disease, respiratory diseases, all other causes).

The figures for cancer of the lung are in conformity with those found previously in an extensive inquiry into the smoking histories of patients with cancer of the lung and with other diseases.

The death rates of doctors here reported are, almost certainly, artificially low. There is evidence that this is due to a reluctance, or inability, of persons suffering from a fatal illness to reply to the questionnaire. In spite of this defect and the present small numbers of deaths, we thought it necessary, in view of the nature of the results, to lay these preliminary observations before the survivors of the 40,000 men and women who made them possible.

We are most grateful to the British Medical Association for having dispatched the questionnaires and letters to the doctors on our behalf; to the individual doctors for having completed the questionnaires; and to those practitioners and consultants to whom we wrote for details of the evidence on which the diagnosis of lung cancer was made. We are deeply indebted to the Registrars-General of the United Kingdom for information about the deaths of doctors. We also offer our thanks to Dr. P. Armitage, who suggested the use of Yates's method of assessing the significance of a trend, and to Mrs. Joan Bodington, Miss Muriel Greening, and Miss Keena Jones for the onerous work of filing, coding, and enumerating the questionnaires.

results and reduced the frequency of manipulation under anaesthesia. In view of these claims it seems desirable to report the results of a blind trial in which cortisone was compared with an inert substance in a series of 32 cases.

Selection of Patients

For inclusion in the trial a patient had to have periarthritis of one or both shoulders, be over 20 and under 70 years of age, and have no symptoms or signs of disease in other joints. Radiographs of the shoulder had to show no evidence of arthritis or bone disease, the blood sedimentation rate (Wintrobe) had to be under 20 mm. in the first hour, and the chest radiograph had to be within normal limits. Any patient with a history suggesting coronary disease was excluded.

The patients were allocated to two treatment groups, A or B, on a prearranged random order devised separately for those with symptoms of over and under six months' duration, to ensure that cases of short duration would be evenly distributed between the two groups. The treatment register was held by the hospital pharmacist, and the two surgeons admitting patients to the trial and assessing their progress did not know which patients were receiving cortisone until after the whole trial had been completed.

Method of Treatment

Patients allocated to Group B received cortisone acetate suspension made up in syrup to a concentration of 12.5 mg. per ml. The drug was taken orally in four divided doses during the day, and the daily dose was 200 mg. for the first three days, and 100 mg. thereafter until the fourteenth day. The daily dose was then tailed off in decrements of 12.5 mg. every two days, the complete dosage for one four-weeks course being 2.5 g.

Patients allocated to Group A received an inert suspension in similar dosage. This was made from magnesium hydroxide, syrup, and concentrated infusion of quassia. In both appearance and taste it was indistinguishable from the cortisone suspension.

All patients were observed for one week, during which the preliminary investigations were completed; they were then started on the treatment and instructed to exercise their shoulders vigorously, but they were not referred to the department of physiotherapy. At the end of four weeks the patients who had not progressed satisfactorily had their shoulders manipulated under general anaesthesia, the object of the manipulation being to obtain a full range of motion. This manipulation was followed by a second four-weeks course of cortisone or inert suspension, and all cases were followed, where possible, for 18 weeks.

Assessment

The assessment of progress was exclusively clinical and was concerned with pain, range of shoulder movement, and employment status. Both spontaneous pain and pain on movement were recorded in four grades: none (0), slight (1), moderate (2), and severe (3). Range of motion was recorded separately for total abduction, scapulo-humeral abduction, and rotation at the shoulder-joint.

The first assessment was made when the patient was first seen, the second immediately before treatment was started (week 0), and subsequently at the end of the first and fourth weeks of treatment and at the end of the fifth and eighth weeks, and finally at 18 weeks.

Comparability of Treatment Groups

The treatment and control groups were reasonably similar on entry into the trial; thus the 16 patients in the control group comprised 11 males and 5 females whose ages ranged from 45 to 60, with a mean of 52 years; whereas the 16 patients in the cortisone group comprised 7 males and 9 females whose ages ranged from 45 to 70, with a mean of 58 years. The disease duration was not very different.

Thus 15 patients in both groups had a duration of symptoms of one year or less, the mean duration in these 15 patients being 5.1 months in the cortisone group and 6.1 months in the control group. One patient in the cortisone group with a disease duration of nine years made a good recovery, and one patient in the control group with a disease duration of two years made a partial recovery. The mean ratings for pain in the two groups and the mean ranges of shoulder movement both before treatment and on subsequent assessment are shown in Tables I and II, and it will be seen that before treatment the two groups were very similar.

TABLE I.—Mean Grading for Pain

Week:	0	1	4	18
Control group	1.4	1.3	0.8	0.5
Cortisone "	1.4	0.9	0.5	0.6

TABLE II.—Mean Range of Motion in Degrees

Week:	0	1	4	18
Control group:				
Total abduction	75	+14	+17	+48
Shoulder-joint abduction	36	+7	+3	+33
" " rotation	40	+7	+10	+53
Cortisone group:				
Total abduction	82	+21	+22	+28
Shoulder-joint abduction	42	+12	+9	+13
" " rotation	54	+17	+19	+28

lar with regard to pain, but that the cortisone group had by chance a slightly greater range of shoulder movement. Only two patients were completely unable to follow their normal occupation, so that employment status had to be abandoned as a method of assessing progress.

Two patients, both in the cortisone group, were lost to the trial. The first was a man of 69 years with a two and a half months' history of periarthritis who died suddenly from coronary occlusion during the third week of treatment. The second was a woman of 53 years who developed follicular dermatitis during the fourth week of treatment and became a defaulter. As a result of these losses the figures for the cortisone group are based on only 15 cases at the end of the fourth week and 14 cases at the eighteenth week.

Results

At the end of the fourth week 11 of the 16 patients in the control group were not progressing satisfactorily and therefore their shoulders were manipulated. Only 6 out of 15 patients in the cortisone group were thought to require manipulation. In one of these patients manipulation was not carried out as she was found to have mitral stenosis. Thus the total number of patients who had their shoulders manipulated and were given a second course of treatment was 16, of which 11 were from the control group.

The behaviour of the two treatment groups in respect of pain was somewhat different. Both started with an identical rating of 1.4, and both ended with a similar rating at eighteen weeks—0.5 as against 0.6. At week 1, the control group showed little change, the reduction in pain being spread throughout the whole period of observation, while in the cortisone group the main reduction in pain occurred between week 0 and week 1, and although there was a further improvement between week 1 and week 4, there was actually a slight deterioration between week 4 and week 18—that is, after treatment had been stopped. Thus, cortisone appears to produce a reduction of pain during the first week of treatment.

In considering the changes in the range of shoulder movement it must be remembered that the cortisone group started with some advantage. Again the end-result at 18 weeks is extraordinarily similar in the control and cortisone groups, but, as with pain, the two groups behave differently during the earlier periods of observation. Thus, in the cortisone group the ranges of movement showed a greater

increase during the first four weeks than between the 4th and 18th weeks, while in the control group the main increase of range occurred during the later weeks.

Thus, a four-weeks course of oral cortisone would seem to have expedited the relief of pain and the recovery of mobility in the shoulder and decreased the number of patients requiring manipulation.

The behaviour of individual patients differed greatly. Although several patients in the cortisone group appeared to improve remarkably during the first week of treatment, at least one patient was completely unrelieved by cortisone; and in the control group at least one patient improved remarkably, although there were several others who remained unrelieved. Because of this great individual variability none of the separate differences between the cortisone and the control groups reach conventional levels of statistical significance. The apparent differences between the two treatment groups might have been related to their differing sex composition, but it has never been suggested that periarthritis behaves differently in the two sexes, and an analysis of the male and female patients separately showed that their shoulders behaved in a like manner.

Tables III and IV show the effect of manipulation and subsequent re-treatment with cortisone and control suspensions. The control group of 11 patients showed a

TABLE III.—Mean Grading for Pain Following Manipulation

Relation to Manipulation:	Before	After	
		1 Week	4 Weeks
Control group (11 cases)	0.8	1.6	1.0
Cortisone group (5 cases)	0.9	1.1	0.7

TABLE IV.—Mean Range of Motion in Degrees Following Manipulation

Relation to Manipulation:	Before	After	
		1 Week	4 Weeks
Control group (11 cases):			
Total abduction	95	+5	+23
Shoulder-joint abduction	36	+14	+2
" " rotation	38	+7	+16
Cortisone group (5 cases):			
Total abduction	92	+9	+13
Shoulder-joint abduction	53	+5	+13
" " rotation	78	+2	+28

marked increase of pain in the first week after manipulation, which in many cases had not subsided completely by the fourth week following manipulation; whereas the cortisone group of five patients showed only slight or negligible increase of pain in the first week after manipulation. In spite of these marked differences in pain, the range of movement following manipulation continued to increase slowly and equally in both groups.

Discussion

The findings of this trial would seem to confirm previous clinical impressions that a four-weeks course of cortisone may expedite the relief of pain and the recovery of shoulder-joint mobility in cases of periarthritis of the shoulder, and that its use may reduce the number of patients subsequently requiring manipulation under anaesthesia. Furthermore, in patients who have their shoulders manipulated, cortisone therapy appears to reduce the amount of pain experienced during the first few weeks after manipulation. However, some patients appeared to derive no benefit from cortisone therapy in the dosage used in this trial, and, since none of the separate differences between the control and cortisone groups reached conventional levels of statistical significance, the value of cortisone therapy in periarthritis of the shoulder still remains to be proved. In considering the possible advantages of cortisone therapy in this condition it must be remembered that in the present trial cortisone was compared with an inert medicine, whereas in other recent trials (Medical Research Council

and Nuffield Foundation, 1954) cortisone has been compared with simple analgesics such as aspirin or tab. codein. co.

The one death from coronary occlusion is probably not attributable to cortisone therapy, since there is a known association between periarthritis of the shoulder and coronary disease; and in a recent three-year study of 78 patients with periarthritis of the shoulder who did not receive cortisone, Meulengracht and Schwartz (1952) report seven deaths, though not all of these were due to coronary disease.

Summary

In a series of 32 cases of periarthritis of the shoulder the effects of a four-weeks course of oral cortisone have been compared with those of an inert control medicine.

Cortisone therapy appeared to expedite the relief of pain and the recovery of shoulder motion and to reduce the number of patients requiring manipulation, but there was great individual variation in response to treatment, so that none of the differences between the two treatment groups reached conventional levels of statistical significance.

We wish to thank Mr. John Charnley for help in initiating this trial and for referring many of the patients.

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CARCINOMA OF THE CARDIA

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The diagnosis of carcinoma of the cardiac end of the stomach is notoriously difficult in the early stages and, now that surgical resection via a transthoracic approach is a feasible proposition, it is one which it is more than ever important to make. The chief reason for this difficulty is that patients seldom present themselves until they complain of dysphagia, a state of affairs which signifies that there has been involvement of the entry of the oesophagus into the stomach, or that there is spasm of the sphincter secondary to the lesion. True, the lesion may arise at or very near the cardiac orifice and thus cause the patient symptoms at an early stage, but the diagnosis even then can be extremely difficult to establish by such means as oesophagoscopy and barium x-ray films.

Review of the Literature

Most papers concerning carcinoma of the cardia deal with the radiological aspects and the difficulties in arriving at a diagnosis. Garlock (1941) reiterates these and stresses the frequency of dysphagia, often painful, as the presenting symptom, occurring at whatever stage the cardiac orifice is involved. In addition there may be vague indigestion and loss of weight. He mentions persistent back pain, situated to the left of the spine at about the level of the eleventh or twelfth thoracic vertebra as a late symptom. This was not a feature of the cases in the present series. He presents 15 of his own cases, 13 of which had dysphagia.

Oesophagoscopy definitely established the diagnosis in 14. All 15 cases came to operation, but only five proved to be operable by resection with intrathoracic oesophago-gastrostomy. Two of the five died within a few days of operation, and the other three improved symptomatically but had not been followed up long enough to assess their ultimate outcome.

With regard to the x-ray diagnosis of this condition, Garlock states that in most instances the presence of a tumour will be clearly demonstrated by the usual methods of examination, and that persistence on the part of the radiologist will in most cases demonstrate the growth. This has quite definitely not been our experience, and there is no reason to suppose that the diligence of the radiologists was any less than it should have been.

Numerous other authors discuss the radiological difficulties. They make various points, to be remembered when attempting to detect the presence of a carcinoma at the cardia, but most of them apparent only when the growth has reached a considerable size. These points include, for instance, increase in the distance between the upper pole of the stomach and the diaphragm, a mass visible in the gastric air bubble, dilatation of the lower oesophagus, rigidity of the lesser curvature side of the cardia, etc.

Kinsella (1949) reviewed 10 cases, of which only one had been recognized radiologically. Some of the others had repeated barium meals which were reported as normal. He gives details of his radiological technique and stresses the importance of examination in the supine position, in the anterior, posterior, and lateral planes.

Allison and Borrie (1949) reviewed from the point of view of treatment and prognosis a series of 310 patients with malignant obstruction at the gastro-oesophageal junction who had been treated at Leeds. They condemn gastrostomy and jejunostomy on the ground that they do not relieve the patient's distress, and consider dilatation of the stricture and insertion of a Souttar tube to be much more satisfactory. They suggest that carcinoma of the stomach should be treated by total gastrectomy and block dissection of the lymphatic bed, including the spleen and the tail of the pancreas. Radical removal was practised only after June, 1942, and 108 of their patients had been subjected to an operation since then. Of these only 24 were suitable for radical resection. Seven of them died post-operatively, and a further three from metastases within seven months of operation. The remaining 14, alive at the time the paper was written, had survived for periods varying up to 25 months, but the average was only eight months.

Present Investigation

The course of 26 cases of carcinoma of the cardia at St. Thomas's Hospital during the past few years is reviewed, and the very high incidence of dysphagia as a presenting symptom is noted, in addition to the difficulties involved in establishing the diagnosis at a stage early enough for complete and successful surgical resection. Nearly all the cases were proved histologically to be adenocarcinoma. Cases which proved to be squamous-cell carcinoma have been excluded, as they were thought to be primarily oesophageal.

Age and Sex.—The 26 cases comprise 15 men and 11 women. There was a difference in the average ages for the two groups, that for men being lower than for women—57 against 65. The age spread for men was 40 to 73, and that for women 43 to 73.

Symptoms.—The duration of symptoms before attending hospital was very variable, ranging from seven weeks to one year, but was most often between two and six months. We would stress that a history of many months is by no means uncommon, as in Case 1. The relative frequency of the main symptoms on first attendance was as follows: dysphagia, 24 cases; regurgitation, 21; pain on swallowing, 12; constant pain, 4; loss of weight, 23; frank haemorrhage, 1 (but 2 more later had haematemesis).

Dysphagia (Cases 2 and 3).—Of the 26 patients, 24 complained of food sticking in the lower sternal region; the disability was worse for solids than for liquids. Often pain was felt at the same time, and regurgitation gave immediate relief. In three patients the dysphagia was curious in that it was related to posture; in two of these food stuck more completely in the erect posture or when leaning forwards, whereas it was greatly relieved when they were lying on their backs; and, indeed, one patient (Case 6) had adopted this position for his meals. In the third patient dysphagia was relieved by leaning forwards. In our view postural dysphagia is pathognomonic of a neoplasm of the fundus of the stomach.

Pain.—The commonest type of pain is one which is felt on swallowing in the xiphisternal or retrosternal regions (Case 4), and may radiate to the right or left costal margins, the left breast, or either scapular region. It is not felt apart from swallowing. This pain seems to be identical to the pain so commonly felt by patients with hiatus hernia and free-reflux oesophagitis, and we would ascribe its origin to a similar cause—that is, lower oesophageal inflammation. In some cases an entirely different pain is present, as in Case 5. It is constant and unrelated to meals or swallowing, and may be quite continuous, though in one case it was felt only at night. Its situation is similar to the foregoing pain. In our experience it is very suggestive of a neoplasm involving the lower oesophagus. Three of the four patients who complained of this pain had at operation undoubtedly involvement of the mediastinal structures adjacent to the lower oesophagus. Garlock stated that pain which was felt in the back to the left of the eleventh and twelfth thoracic vertebrae was a not uncommon symptom in his cases, but we have not met it in any of ours.

Indigestion.—Although in a large number of cases the lesion must have been present for many months before involving the cardiac orifice, with consequent dysphagia, it was unusual for there to be any preceding history of indigestion.

Appetite.—Appetite was generally well maintained, and several complained of hunger but were afraid to eat because of painful dysphagia.

Examination.—Findings on clinical examination were generally very few, other than some evidence of loss of weight. A mass was palpable in the epigastrium in only six cases.

Radiology.—Before discussing the radiological diagnosis it would be well to consider certain points. Firstly, the obstruction at the cardia may be complete enough to prevent barium from entering the stomach in sufficient quantity to outline the fundus satisfactorily, and this may be present when the neoplasm is still small, so that, although the fundus is filled, no satisfactory proof of a filling defect is obtained. The obstruction may produce an appearance identical to that seen in primary achalasia (Cases 3 and 6, and Figs. 4 and 5), or even "corkscrew" lower oesophagus—for example, Case 1 and Fig. 2. Thus in the absence of any other demonstrable abnormality the true diagnosis may be missed. Secondly, as there is a partial obstruction at the cardia the "hun-



FIG. 1.—Carcinoma of the cardia, showing narrowed segment eccentrically placed in relation to the oesophagus, with irregularity of the stream of barium beyond.

gry" stomach may pass the barium through the pylorus into the upper intestine so rapidly that a sufficient residue is not obtained to get an adequate outline of the fundus.

If these difficulties are taken into account, the main findings at a barium meal which will suggest the diagnosis of a neoplasm of the fundus involving the cardia are: (1) An irregular filling defect at the oesophago-gastric junction, which may, however, be indistinguishable from a primary lower oesophageal growth. (2) Deformation of the fundus gas shadow by a large neoplasm, but it must be remembered that the outline of this gas shadow is often irregular, especially where the rugal folds are heavy. (3) An irregularity or splitting of the stream of barium as it passes through the cardia, or a narrowed segment at the cardia which may be placed eccentrically in relation to the distended oesophagus (Fig. 1). This may produce the appearance of a "fixed shelf" in this region. (4) "Half shadowing" at the shoulder of the narrowed segment.

Radiological investigation with barium revealed the true cause of the obstruction in 18 patients, in the others (except for one, who was not x-rayed) there was obstruction at the lower end of the oesophagus, but the appearances were reported as those of achalasia of the cardia or just "narrowing" rather than neoplasm.

Oesophagoscopy.—Oesophagoscopy was at times equally misleading or uninformative, as in Case 7. It was performed in only 16 of the cases, and showed a carcinomatous obstruction at the lower end of the oesophagus in 11 of them; in these biopsy confirmed the diagnosis. In one of the other five oesophagoscopy was performed twice with an interval of 11 weeks, and appeared quite normal on each occasion, despite the fact that the patient complained of continued dysphagia. In another the oesophagus and cardia appeared normal, but bougies passed through the cardia were gripped by some obstructing lesion beyond. In three others an obstruction was found at the lower end of the oesophagus, but no definite evidence of carcinoma was seen, and it was thought more likely to be due to achalasia than to a neoplasm. It is interesting to compare these results with those of Garlock's series, in which oesophagoscopy definitely established the diagnosis in 14 out of 15 cases. Estimation of the gastric acidity was attempted in only a few cases, and usually the obstruction made it impossible.

Case 1

An electrical engineer aged 49 attended hospital on July 31, 1950, complaining of increasing difficulty in swallowing for one year. Food seemed to stick in the suprasternal notch. There was no pain and the difficulty was greater for solids than for fluids. He had lost a few pounds in weight, and had recently regurgitated his food. There were no relevant findings on clinical examination.



FIG. 2.—Case 1. "Corkscrew" lower oesophagus with a filling defect in the fundus.

Barium x-ray examination showed obstruction in the lower third of the oesophagus, with dilatation above this level. This part had a "corkscrew" outline, and the appearance of the mucosal folds suggested the presence of

stomach above the diaphragm. In the fundus of the stomach there was an irregular filling defect, the appearances of which suggested a neoplasm (Fig. 2).

He was put on a semi-solid diet and was observed as an out-patient. He improved symptomatically to a great extent, but when seen on December 4 he appeared to be extremely pale and was admitted the same day. He had suffered a head injury at work three weeks previously, following which he had lost three pints (1.7 litres) of blood or more (his estimation) from the scalp laceration. Apart from this he had spat up a mouthful of blood on two occasions a week previously. He denied frank melaena.

His haemoglobin was 20%. No abdominal mass was palpable. Following blood transfusion, oesophagoscopy was carried out. At 35 cm. an ulcerated stricture was seen, the lumen of which was 2 mm. in diameter. On the posterior wall just above the stricture was an area of erosion which bled easily. Gastric contents were seen to regurgitate, and the macroscopic appearances were reported as being those of reflux oesophagitis with stricture formation. Histological examination of the biopsy specimen obtained, however, showed the appearances of a moderately well differentiated adenocarcinoma.

The patient was found to have a histamine-fast achlorhydria. He was advised to continue with his semi-solid diet, and so long as he did so his dysphagia hardly troubled him. Observation was continued on him as an out-patient, but recurrent haematemesis necessitated his admission on two occasions for blood transfusion.

On March 29, 1951, thoracotomy was carried out. He was found to have pleural secondaries from a large growth involving the lower 4 in. (10 cm.) of the oesophagus and the fundus of the stomach. Even a palliative operation was regarded as out of the question.

He recovered fairly well from the operation, and was discharged again. He was finally admitted on June 3, 1951, with complete oesophageal obstruction and a left pleural effusion. He died on June 25.

At post-mortem examination there was a mass of growth filling the upper third of the stomach, spreading up the oesophagus. A mass of secondary growth surrounded the aorta and oesophagus just above the diaphragm. The liver contained numerous metastases, and a mass of growth had infiltrated the wall of the portal vein in the middle of the gastro-hepatic omentum and had extended along its lumen to its bifurcation.

Case 2

A housewife aged 43 was admitted in October, 1950, complaining of epigastric pain for four months which had

gradually become worse. It came on any time, and was unrelated to meals or swallowing. It was aggravated by stooping and relieved by lying down. She also noticed that food, particularly solids, seemed to stick in the xiphisternal region, and she complained of vomiting. She had lost weight.

On examination there was a slight tenderness in the epigastrium, but no mass was palpable. A barium swallow showed some hold-up at the lower end of



FIG. 3.—Case 2. Obvious filling defect at the lower end of the oesophagus and cardia.

the oesophagus, and a filling defect at the cardia was visible (Fig. 3). She was found to have a histamine-fast achlorhydria. No oesophagoscopy was performed.

At thoracotomy the oesophagus appeared normal, but a hard mass was palpable through the diaphragm in the stomach. It occupied the lesser curvature and was fixed posteriorly. The growth was considered irremovable, but the fundus of the stomach was brought up through the diaphragm and anastomosed to the side of the oesophagus. After operation her swallowing was much improved, but her convalescence was interrupted by a recurrent left pneumothorax.

She was discharged four weeks after operation, but was admitted to another hospital following a haematemesis. She was reported to have metastases in the liver. She went steadily downhill and died on April 3, 1951, nine months after the onset of symptoms and five months after operation. No post-mortem examination was made, and thus the histology of the tumour was not determined.

Case 3

A photographic mechanic aged 46 was admitted on October 1, 1951, complaining of having had for ten weeks a burning pain under the lower end of his sternum on swallowing. This became progressively worse, and food seemed to stick in this region. The difficulty was eased slightly by leaning forwards. He did not regurgitate his food, but he would sometimes bring up some watery material after swallowing. He had lost about 14 lb. (6.4 kg.) in weight in three months.

Examination was unrevealing except that some weight loss was apparent. No abdominal mass was palpable and there was no tenderness. A barium swallow, repeated on three occasions, showed only the appearance of achalasia of the cardia, unaffected by octyl nitrite but slightly relaxed by leaning the patient forwards (Fig. 4).



FIG. 4.—Case 3. Obstruction in the lower oesophagus originally reported as showing the appearance of achalasia only.

On operation, oesophago-gastrostomy was performed. A large carcinoma was found to involve the lower part of the oesophagus and aorta, fundus, and posterior wall of the stomach, and was too extensive for removal. No biopsy was taken as it was thought that this would lead to haemorrhage or spread to the pleural cavity.

The immediate post-operative period was satisfactory, but he died at home on January 9, 1952. Necropsy was not performed.

Case 4

A police constable aged 40 was admitted to another hospital on August 25, 1952. He had for about three years been troubled with indigestion, which had consisted mainly of belching, but three months before admission he began to notice a high retrosternal pain on swallowing which would be immediately relieved by vomiting all the food he had just eaten.

A barium swallow showed dilatation of the lower third of the oesophagus, with a large irregular filling defect at

its lower end. The appearances were those of a carcinoma which appeared to be involving the fundus as well.

Oesophagoscopy showed a bleeding ulcer at the level of the diaphragm. Biopsy proved this to be an adenocarcinoma of the stomach. He was transferred to St. Thomas's Hospital on September 12 for radical resection of the growth. This was performed on September 22, and almost the entire stomach from just proximal to the pylorus and the lower part of the oesophagus to a point well above the growth, including the adjacent diaphragm, spleen, and tail of the pancreas were removed. The gut was reconstituted with an end-to-side oesophago-jejunostomy.

The growth arose from the fundus of the stomach and ulcerated out the posterior wall of the lower part of the oesophagus. On microscopy it was seen to be a well-differentiated tubular columnar-cell carcinoma. No carcinoma was seen in any of the lymph nodes removed.

He made an uneventful recovery from the operation and was discharged in good general condition on October 24, and he was still alive at the time of writing, one year later.

Case 5

A labourer aged 60 was admitted on June 10, 1949, having for two months vomited immediately after eating. He noticed difficulty with swallowing and complained of an aching lower sternal pain, which occurred any time and was not related to food. It radiated to the interscapular region. He could manage fluids better than solids. He had lost about 28 lb. (12.7 kg.) in weight.

Apart from his thinness, there were no abnormal physical signs and no mass was palpable in his abdomen. A barium swallow showed no hold-up in the oesophagus, but the cardia did not look normal, and the radiologist was suspicious of the presence of a carcinoma.

At oesophagoscopy a friable growth was seen at 40 cm. A bougie was passed without difficulty. No biopsy was taken.

Operation was then performed. Through a thoraco-abdominal approach the growth, about the size of a tangerine, was identified in the fundus of the stomach near the cardia. The oesophagus up to 2 in. (5 cm.) above the growth, the entire stomach, and the spleen were removed and oesophago-jejunostomy was performed. On opening the stomach a thick ulcer 4.5 cm. in diameter was found at the cardia and spreading up in the lumen of the oesophagus. On section it proved to be a well-differentiated cuboidal and columnar-cell carcinoma.

The patient recovered uneventfully from the operation and was discharged from hospital three weeks later. His swallowing was normal, and he was symptom-free except that he had to eat small meals. A barium swallow showed a satisfactory anastomosis.

He remained well for a further three months, when he began to get various pains, mostly in relation to the lower part of his spine. He continued to swallow well. X-ray examination of his spine showed no bony abnormality, but he was given a course of radiotherapy to the sacral region. He was only slightly improved as a result of this, and went steadily downhill. His swallowing was unsatisfactory, and a barium swallow showed no evidence of local recurrence. He died at home on February 9, 1950. Necropsy was not performed.

Case 6

A butcher aged 56 was admitted on July 21, 1952. He complained that for ten weeks he had noticed food sticking in the xiphisternal region. The dysphagia had increased and at the time of admission the obstruction was almost complete. The difficulty was lessened if he lay on his back, so that he had adopted this position for his meals; it was much worse if he leaned forwards. He had been regurgitating most of his food, and had lost about 42 to 56 lb. (19 to 25.4 kg.) in weight.

He was slightly tender in the epigastrium, but no mass was palpable. A barium swallow showed what appeared

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to be a spasm at the lower end of the oesophagus. It was not possible to examine the stomach, as not enough barium entered it (Fig. 5).

Oesophagoscopy showed an obstruction at 40 cm. which had the appearances of achalasia, though the possibility of carcinoma of the



FIG. 5.—Case 6. Carcinoma of cardia. X-ray appearances reported as being those of spasm.

the operation it seemed that the anastomosis was leaking. His condition deteriorated, and he died on August 6.

A post-mortem examination was not carried out, but the microscopic appearances of the tumour removed at operation were those of a well-differentiated adenocarcinoma.

Case 7

A man of 62 was admitted on September 3, 1951. He complained of dysphagia for 10 weeks and of the loss of 28 lb. (12.7 kg.) in weight.

No abnormality was found on clinical examination and oesophagoscopy on September 5 was normal to 40 cm. A barium swallow showed a hold-up at the cardia, the appearances of which were those of spasm rather than new growth.

He was discharged, but was readmitted for further oesophagoscopy on November 23. Again the oesophagus appeared normal, though possibly slightly dilated. The oesophagoscope passed into the stomach without hindrance, and no lesion was seen in the first 1½ in. (3.8 cm.) of stomach. A further barium swallow again showed obstruction at the cardia, and it was thought that the appearances were those of a neoplasm of the fundus involving the cardiac orifice. A histamine test showed complete gastric achlorhydria.

On December 12 a laparotomy was carried out. A large neoplasm of the cardiac end of the stomach, which was invading the diaphragm, was found. It was not considered operable, and a gastrostomy was performed.

He was discharged from hospital on January 10, 1952, and was seen as an out-patient two weeks later. Though asked to return after a month he did not do so.

Discussion

It is not part of our intention to discuss treatment or prognosis, as these are fully dealt with in other reviews, but we concur with the uniformly depressing picture these present. However, we wish, by considering the clinical and radiological aspects of the disease, to stress important diagnostic features, close attention to which will suggest the diagnosis earlier in the course of the illness. Unfortunately, the growth is usually completely silent until dys-

phagia occurs and indicates that the gastro-oesophageal junction has been involved. Even then it is quite a step from this presenting symptom to ultimate diagnosis and one with many pitfalls, as both radiology and oesophagoscopy can be misleading.

It is essential not to attach too much weight to a negative x-ray report, as even with the utmost perseverance the radiologist may be unable to demonstrate the growth. There is, unfortunately, no secret of success. The physician must from the history suspect the diagnosis and inform the radiologist of his suspicions, and the radiologist must always bear in mind the possibility when investigating any case of dysphagia resulting from an obstruction at the lower end of the oesophagus, where there is no apparent cause for it. "Achalasia" in anyone past middle life must be especially suspect. The smaller the lesion the harder it will be to diagnose.

Summary

A series of 26 cases of carcinoma of the cardiac end of the stomach is presented. Symptoms, radiology, and results of oesophagoscopy are discussed.

The prominence of dysphagia as the presenting symptom is due to the fact that the growth is usually silent until the gastro-oesophageal junction is involved.

Even the most careful radiology may fail to reveal the stomach carcinoma as the cause of the obstruction at the lower end of the oesophagus, and oesophagoscopy may at times be misleading.

Largely as a result of this tardiness of the lesion to declare itself, and partly because the significance of the symptoms in middle-aged patients is still not clearly recognized, the results of surgical treatment are extremely bad.

We are indebted to the members of the staff of St. Thomas's Hospital for allowing us to include their cases in this series; to Dr. J. W. Pierce for advice about radiology; and to Mr. K. G. Moreman for the x-ray photographs.

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As part of its policy of studying the needs of old people, the Nuffield Foundation has asked Mr. F. LE GROS CLARK to make studies of the factors affecting continued employment of elderly workers. By permission of the London County Council, the first study was carried out in the maintenance depots of its Housing and Valuation Department, and a report has been published on the findings in 320 of the department's ageing maintenance workers. It is hoped to follow this with a series of inquiries in other industries. The purpose is to find out, if possible, what actually happens to men as they age under various industrial conditions—in building, transport, mines, etc. In the study now reported the conditions were very favourable for the retention of elderly craftsmen and labourers, because in the immediate post-war years many of the local authorities had some difficulty in securing young labour for their building staffs. Most of the 320 men studied were traced from the age of 60 down to the end of their working lives as building employees, though some of them may possibly have found further employment. They were all on maintenance and repair work; and this is usually to the advantage of an elderly man. They were all apparently quite fit for the job as they approached their sixties. But of every hundred men who were fit at 60, not many more than seventy were still fit as building workers by 66 years. After that the decline in numbers through age or ill-health was steady and continuous, so that at 70 years only about thirty of the original hundred men were still in the labour force. Most of the men who remained after their mid-sixties could probably not have stood the pace of work in modern housing construction.

CARCINOMA OF THE OESOPHAGUS

A REVIEW OF FIFTY CASES

BY

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Fifty patients with malignant disease of the oesophagus were referred to the Thoracic Surgical Unit of St. Thomas's Hospital during 1951 and 1952. All the patients referred are included in this analysis, so it is an unselected series, except for the fact that they were sent to a surgeon. In one-third of the cases the involvement of the oesophagus was secondary. These are included because from the point of view of symptoms, treatment, and all clinical aspects the lesion was essentially oesophageal.

The lethal nature of this disease and its normally rapid progress are indicated by the fact that at the time of writing (January, 1954) only six of these patients are alive. It is some consolation that five of these have been treated by radical surgery and the sixth by radiotherapy. The various palliative treatments attempted were often successful in relieving the most distressing symptom, inability to swallow, and probably in prolonging life by a few months. They were, however, accompanied by a very high mortality, justified only by the imminence of death from starvation, cachexia, or secondary bronchopneumonia.

There were 29 men and 21 women affected. Over half of them were over 60 years of age; three were under 40. The youngest patient was 37 when her first symptoms appeared. This series shows the same high incidence in old age as does the longer one reported by Raven (1948), but not such a preponderance of males as his did. No patient gave a family history of oesophageal cancer or a past history suggesting oesophageal trauma.

Symptoms

The commonest symptom of oesophageal cancer is difficulty in swallowing, which nearly all patients eventually develop. Forty-four of these patients complained of dysphagia when they were first seen, and this was usually the symptom which had led them to seek advice. The dysphagia is persistent and progressive but may fluctuate, though remissions are short-lived, and seldom complete. Typically, difficulty is first noticed with a poorly masticated piece of meat or a dry biscuit. Dysphagia gradually advances until only thin fluids can be swallowed; finally it becomes complete and even saliva must be regurgitated. The patient may locate the level of the obstruction accurately, but this cannot be relied on, as he will often point to a spot higher than his lesion, probably because distension of the oesophagus occurs here. In no case did the patient point to a lower level. Dysphagia is usually due to narrowing of the lumen of the oesophagus by the growth, which most commonly results from scirrhous infiltration of the wall, but sometimes from internal obstruction by a proliferative lesion or occasionally from external pressure. Dysphagia may also occur before there is appreciable narrowing, when it is due to interference with the normal muscular action.

Almost as common a symptom as dysphagia is loss of weight, of which 42 patients complained when first seen. It is primarily due to malnutrition; although four patients who had lost weight did not complain of dysphagia, they were all found on investigation to have oesophageal obstruction.

Thirty-five patients complained of regurgitation of food or of vomiting. Although patients might say they vomited, careful questioning usually confirmed that they were in fact regurgitating undigested food from the oesophagus above the obstruction. The regurgitation often caused coughing. Mild or occasional cough on swallowing is due to overflow of saliva or food particles into the trachea. Severe and persistent cough on swallowing usually indicates a fistula between oesophagus and trachea or bronchus, but it may also be due to incompetence of the glottis from paralysis of one or even both vocal cords caused by invasion of the recurrent laryngeal nerves by the growth, or to invasion of the larynx itself. Either complication indicates that radical operation is impossible.

Twenty-five patients complained of pain, usually felt only on or after swallowing, but sometimes as a dull ache in the back and beneath the sternum. The site of pain was an accurate indication of the level of the lesion. In no case was pain severe when the patient was first seen. Although segmental pain indicating involvement of spinal nerve roots and invasion of the vertebral column may occur in oesophageal cancer, it was not met with in this series. Oesophageal pain carried no such sinister import; six of the seven patients in whom radical resection was possible complained of pain, and in none of these was there involvement of the parietes by the growth nor was there visible peri-oesophagitis at operation.

The history was short in nearly all these patients. From onset of symptoms until attendance at hospital it was three months or less in 26, four to six months in 17, seven to twelve months in 4, and over twelve months in 3. Many patients were wasted and anaemic and some were obviously dehydrated. Only the upper oesophagus is accessible to palpation, so that local physical signs are unusual. In none of these cases did physical examination reveal any abnormality of the gullet. Only one patient showed any clinical evidence of metastases—a stony gland above the right clavicle.

Several patients when first seen had clinical or radiological evidence of pulmonary lesions: bronchopneumonia, 5; emphysema, 4; atelectasis, 3; broncho-oesophageal fistula, 1; pulmonary tuberculosis, 1; fibrosis after radiotherapy, 1. Most of the cases of bronchopneumonia and of atelectasis were probably due to bronchial aspiration of particles of food or stagnant saliva with secondary infection. Usually, in cases of malignant oesophageal obstruction there is not time for the development of the destructive and suppurative changes in the lungs sometimes seen complicating achalasia (Belcher, 1949).

Barium Swallow and Oesophagoscopy

Two special investigations are all-important in diagnosis—barium swallow and oesophagoscopy. If necessary, both can be conducted on out-patients. No special preparation is needed for the barium swallow. If a plain chest radiograph has not already been taken this should be done. The barium investigation should include films as well as fluoroscopy. Firm reliance should seldom be placed on this investigation alone, but it usually gives an accurate indication of the level of the lesion, and, if the typical appearances of an unchanging and irregular filling defect are seen, carcinoma can be confidently diagnosed. In the present cases the report of the radiologist was never dogmatic, and in only four was a suggested diagnosis subsequently proved incorrect.

Results of Barium Swallow.—The following were the diagnoses made in the 50 cases: suggestive of carcinoma, 36; stricture or obstruction, without indicating nature, 5; suggestive of extrinsic mass, 4; suggestive of achalasia, 3; suggestive of oesophagitis, 1; investigation not done (patient too ill), 1.

The results were most accurate in middle-third growths. Upper-third lesions, especially post-cricoid cancer, are difficult to visualize unless large, as the barium passes so

quickly. A plain lateral soft-tissue film may sometimes show a suggestive forward displacement of the larynx or trachea. A small growth at the cardia may give exactly the same appearances as achalasia because it also results in spasm of the muscle of the cardia; the malignant infiltration may be too limited to detect or may be mainly in the fundus of the stomach, which is difficult to outline. Marked dilatation of the oesophagus is unusual.

Oesophagoscopy confirms the level of the lesion. If a growth is seen the upward extent of mucosal involvement can be estimated, but microscopic invasion may be higher, as emphasized by Churchill and Sweet (1942). The nature of the lesion can be surmised by observation, and more valuably determined by biopsy. There were no complications following diagnostic oesophagoscopy in these cases.

Findings at Oesophagoscopy.—These were: appearances suggesting carcinoma, 39; benign lesion suggested, 2*; no abnormality detected, 2; appearances of extrinsic glandular mass, 1. Oesophagoscopy not done, 6.

Of the 44 cases in which oesophagoscopy was carried out the biopsy was positive in 39 and negative in 4; in one case a biopsy specimen was not taken. As well as a method of investigation, the same oesophagoscopy in many cases provided a means of treatment by dilatation or intubation.

If the growth lies in the upper or middle third, oesophagoscopy should be followed by bronchoscopy to examine the posterior wall of the trachea and left main bronchus. In one case ulceration of the trachea was seen; another had a deformity, contraindicating operation.

Pathology

The growth occurred in the upper third in 4 cases, in the middle third in 24, and in the lower third in 22. Thirty-two growths arose primarily in the oesophagus. In 17 it was involved secondarily in direct extension of a neoplasm arising in an adjacent viscus—the bronchus in one case and the stomach in the others. In the fiftieth case the oesophageal lesion was a metastasis from a carcinoma of the rectum.

The primary lesions all showed the histological picture of a squamous-celled carcinoma. With growths at the lower end of the oesophagus, a biopsy report of a squamous-celled carcinoma always implied that the neoplasm originated in the mucosa of the oesophagus itself (five cases). A report of a carcinoma of a different cellular pattern, such as adenocarcinoma, polygonal-celled carcinoma, or mucoid carcinoma, indicated a neoplasm originating in the gastric mucosa (17 cases). The difference is probably not of great practical importance, as in either case spread to lymph nodes and to other tissues can occur both upwards to pleura and mediastinum, and downwards to coeliac glands and peritoneum (Allison and Borrie, 1949). One patient had a sarcoma of the stomach.

The spread of the primary oesophageal growths was first by direct invasion of adjacent structures, particularly trachea or bronchus, pleura, and pericardium, and by the lymphatics to the peri-oesophageal glands in the mediastinum. Subsequent glandular spread occurred both upwards and downwards, so that abdominal glands near the diaphragmatic hiatus, in the small omentum, and around the coeliac axis might become involved. Finally, spread to other organs occurred by the blood stream and sometimes by transpleural and transperitoneal migration. Post-mortem examinations were carried out on nine patients with primary oesophageal carcinoma who died of their disease or its effects; in only three were distant metastases found—in one case in the heart and ribs, in another in the stomach, and in a third in many organs, including bones. Widespread dissemination is unusual, because the patient usually dies of starvation or of bronchopneumonia before it takes place. Raven (1948) found no metastases in nearly half the necropsies done in his series.

*In one of these biopsy was positive.

Treatment

The policy adopted in the treatment of these patients was that a radical operation should be done when possible, and that when it was not possible an attempt should be made to relieve the patient's dysphagia. When the diagnosis had been established, and no evidence of spread beyond surgical limits found, an exploratory operation was advised if the patient's general condition permitted this major undertaking. If radical resection was found to be impossible, a palliative resection or an anastomosis without resection was done if feasible. Table I shows the treatments carried out.

When major surgery was contraindicated two methods of palliative treatment were considered—oesophagoscopic dilatation and intubation, and radiotherapy. Gastrostomy was not usually advised, as it was felt that it prolonged the patient's life in misery without relieving his main symptom of dysphagia; when obstruction becomes complete even saliva must be regurgitated, and tube feeds give little satisfaction.

In two patients in whom repeated intubation had been unsuccessful and who were about to die, an experimental operation was carried out, resecting the major part of the growth and bridging the gap in the oesophagus with a plastic tube—a method which has proved successful in healthy dogs (Berman, 1952). These operations failed, both patients dying from leakage.

TABLE I.—Treatment Carried Out

		Deaths in Hospital
Major operation	26	8
Radical resection	7	2
Palliative resection	6	2
Palliative anastomosis	5	1
Exploration only	6	1
Reconstruction with tube	2	2
Minor operation	12	3
Intubation by oesophagoscopy*	21	3
Gastrostomy	1	0
Jejunostomy	1	0
Radiotherapy	8	0
No treatment given	4	3

*Some of these were also treated by other methods.

After preparation, as described by Franklin (1952), an exploratory operation was done on 24 patients. In only seven was radical resection possible. In one the growth involved the cervical oesophagus; it was possible to bring the mobilized stomach up into the neck and perform a satisfactory anastomosis above the clavicles as described by Nissen (1949) but the patient, doing well, died suddenly from a pulmonary embolus. Another patient, with a middle-third growth, treated by right thoracotomy and anastomosis to the stomach (Lewis, 1946), is well. In five patients the lesion lay in the lower third. In three it originated in gastric mucosa. In these patients a total gastrectomy was done by a thoraco-abdominal approach, removing the spleen and lymphatic fields with the stomach, and restoring alimentary continuity by anastomosing oesophagus to a Roux-en-Y loop of jejunum within the thorax (Yudin, 1944). One of these patients died from pericardial haemorrhage following anticoagulant therapy; the others are alive and well. In the other two patients the carcinoma originated in the oesophagus. One was treated similarly, and remains well; the other, also well, by oesophago-gastrostomy (Sweet, 1947).

At the exploratory operation, if a radical resection was impossible, an attempt was usually made to by-pass the obstruction. The simplest and safest way used was to bring a pouch of stomach through the diaphragm and anastomose it to the oesophagus above the growth. This was not possible, however, when the stomach was extensively involved or when the growth lay in the middle third. In these cases a palliative resection was done, with anastomosis to the gastric stump, or else an oesophago-jejunostomy (Allison, 1946). In six cases even such procedures were considered unwise, as the growth appeared too advanced or the patient's condition too poor.

into another as growth proceeds. The classification which we have adopted and the percentage incidence are as follows: (1) ulcerative, 69.2%; (2) papular, 7.7%; (3) cystic, 5.3%; (4) plaque, 10.5%; (5) superficial, 5.3%; (6) pigmented, 1.4%. There was no significant sex difference in the type incidence.

Size of Lesions at Beginning of Treatment.—These are shown in Table V. Some rodent ulcers penetrated fairly deeply, but none had apparently invaded cartilage or bone; those that did, being unsuitable for radiotherapy, were treated surgically. An attempt was made to correlate the extent of the lesions with their duration. No direct relationship, however, could be found, and in fact many of the patients with the smallest lesions gave the longest histories. Contrary to what one might expect, women did not seem to seek treatment earlier than men.

TABLE V.—Size of Lesions at Beginning of Treatment

Size of Lesions in cm. ²	<1	1-	2-	3-	4-	5-	10-20	>20	
No.	364	185	43	41	24	39	10	5	711
%	51.1	26.0	6.0	5.8	3.4	5.5	1.4	0.7	99.9

Biopsies.—Clinical diagnosis of rodent ulcers is usually accurate in radiotherapeutic centres where large numbers of skin cancers are seen. A biopsy was therefore thought to be unnecessary in all cases. In this series 228 lesions (32%) were confirmed by biopsies, including a few cases in which the clinical diagnosis was in doubt.

Methods of Treatment

X-ray therapy was used in 703 (98.9%) lesions. The type of apparatus used—that is, low-, medium-, or high-voltage units with the range of 45–220 kV—varied with the estimated penetration of the lesion. The majority (595 lesions) were treated with a 60-kV unit. Radium or radon in the form of an applicator or implant was used in only 8 cases, which were technically difficult to treat with x rays.

All X-ray treatments were classified into the following three groups:

(I) **Single Dose.**—This method was used only in small and very superficial lesions, the prescribed dose being given in a single application; 171 lesions were so treated, 159 at doses between 2,000 and 3,000 r.

(II) **Fractionated into one or two treatments a week** over a period of one to three weeks. The lesions included in this group were all superficial and small to medium in size; the total number treated was 150, of which the majority received a total dose of between 3,500 and 5,000 r.

(III) **Fractionated into three to five treatments a week** over a period of one to three weeks. Most of the earlier cases in the series were treated by this method irrespective of their size or penetration; but since 1948 it has been our policy to reduce the number of treatments so as to minimize the inconvenience to the patient. This form of treatment has therefore been reserved for the larger and/or more penetrating lesions. In the vast majority the treatment was given over two weeks, and the total dose varied between 4,500 and 6,500 r.

The dosage and fractionation used from 1948 onwards are summarized in Table VI.

TABLE VI.—Dosage and Fractionation in Use Since 1948

Diameter of Treatment Area	Degree of Penetration of Lesion		
	Superficial	Moderate	Deep
	Low-voltage Therapy	Medium-voltage Therapy	High-voltage Therapy
<2.5 cm.	3,600 r, 3T, 14D or 2,300–2,500 r, single dose	3,300 r, 3T, 14D	4,000 r, 15T, 21D
2.5–5 cm.	3,600 r, 3T, 14D	4,000 r, 10T, 14D	4,000 r, 15T, 21D
5–10 cm.			4,000 r, 20T, 28D
>10 cm.			

T=Treatments. D=Overall time in days.

Results of Treatment

In expressing these results it was decided to use a net cure percentage (as being the most accurate method in this disease, in which there is such a high rate of cure). This is usually estimated by subtracting those who have died and disappeared free of cancer symptoms from the total number of lesions treated, and calculating the symptom-free rate from the remainder. Table VII shows, however, that we have also deducted from the total 14 cases (3 in women, 11 in men) which underwent little or no regression following maximum dosage. We are aware that these cases would be classified as recurrences in some centres; but, since we define recurrence as the reappearance of evidence of disease after a period of complete apparent tumour regression, in our opinion they should be classified separately as primary radiation failures in that they are for all practical purposes completely resistant to radiation. In this series they formed 1.9% of the total number of lesions.

TABLE VII.—Results of Radiotherapy in 711 New Basal-cell Carcinomata in Both Sexes, 1939–50

No. of Years Since Treatment	No. of Lesions Treated	Cases of No Regression	Died of Inter-current Disease Cancer-free	Un-traced	Recurrences	Symptom free	
						No.	%
2½–3	95	2	9	5	5	74	93.6
>3	616	12	62	51	21	470	95.7
>5	309	9	38	31	17	214	92.6

Table VII shows the results of radiotherapy in 711 previously untreated basal-cell carcinomata—366 in men and 345 in women. There was little difference in the symptom-free rate in men and women treated more than three and five years ago. The combined three-year symptom-free rate is 95.7% and that for five years is 92.6%. The symptom-free cases include seven of incomplete regression which required a second course of treatment before healing occurred.

Recurrences

Out of the total of 711 rodent ulcers there were 26 known recurrences, of which 8 were cured with further radiotherapy—4 of them for periods of over five years—and all 8 were symptom-free when last seen. Recurrence of basal-cell carcinoma following radiotherapy therefore does not always indicate incurability by radiotherapy, and second courses of treatment may cure; but it must be emphasized that this is possible only in recurrences which are small, and provided that the original dose was moderate and marked skin changes have not resulted, otherwise there is a serious risk of producing radionecrosis. The aim in radical irradiation, however, is and has been for many years to cure with one course of treatment and one only.

In an attempt to discover if recurrences had a predilection for any site, their distribution was compared with that of the primary lesions. The actual figures of recurrences at the various sites, however, were too small to be of any statistical significance.

Time of Appearance of Recurrences.—Most analyses show that the majority of recurrences appear within the first five years after irradiation and in diminishing numbers from the first to the fifth years. In those cases treated more than five years ago 17 recurrences were discovered, and, of these, 6 were found in the first year after treatment, 2 in the second year, 5 in the third, 1 in the fourth and the fifth years, and 2 in the sixth. Thus 76.4% of these recurrences were in the first three years and 88% in the first five years.

Recurrences Related to Size of Lesions.—Since difficulty is often experienced in assessing the depth of medium-sized lesions, it was decided not to attempt to make a division into superficial and infiltrating groups, but to show only

TABLE VIII.—Results Related to Sizes of Lesions

Size of Lesion in cm. ²	No. Treated	No. response	Died of Inter-current Disease Cancer-free	Un-traced	Recurrences	Symptom-free	
						No.	%
<1	364	2	30	26	14	292	95.4
1–	185	3	9	13	5	155	96.8
2–	43	5	7	6	1	24	96.0
3–	41	0	9	2	1	29	96.6
4–	24	1	4	4	1	14	93.3
5–	39	3	5	3	1	26	92.8
10–20	10	0	4	2	1	3	75.0
>20	5	0	3	0	1	1	50.0

the relationship between the number of recurrences and the surface extent of the primary lesions. Table VIII shows the results. It is interesting to note that 14 (53.8%) of the recurrences occurred in the first and the smallest group, indicating clearly that smallness of size is not the sole criterion of success in treatment. The recurrence-free rate is highest (96.8%) in the second group (1–2 cm.²), thereafter remains remarkably uniform until over 10 cm.², when it drops; but the figures for the last two groups are too small for comparison.

Causes of Recurrence.—We have analysed the treatment details of all the lesions which have recurred to see whether any technical reason for the failure could be found. Nine cases were without doubt due to failure to irradiate a wide enough margin of apparently healthy tissue round the lesion, and one case was due to inadequate dosage. For the remaining 16 recurrences there was no obvious technical reason, but included among them were two advanced lesions.

Radionecrosis

There were seven cases of radionecrosis—one acute and six late. The acute case followed a moderate dose to a scalp lesion, and can only be ascribed to idiosyncrasy to radiation. It was successfully excised. The six late cases appeared five months to three and a half years after treatment. Four followed minimal trauma to the irradiated area, one followed sunburn, and one followed infection of the adjacent eye. In only two of the cases could the dose given be regarded as slightly excessive. No case had followed the retreatment of a recurrence. Three cases had to be excised; the other three, however, amounted only to slight but persistent scabbing, and expectant treatment was adopted with success.

Cosmetic Results

The results obtained in 664 lesions treated by all methods are listed in Table IX. Cases of recurrence, necrosis, or no response are excluded. They may present a rather too optimistic picture, as there is a tendency for the cosmetic result to worsen slightly as time goes by. There was no evidence that the quality of radiation, dose (provided it is within the therapeutic range and not excessive), fractionation, or type of lesion has any direct relation to the cosmetic result which may be expected. Factors, however, which did appear to influence it were: (a) the penetration of the lesion—a deeply penetrating lesion never gave better than a fair cosmetic result; and (b) size of lesion—no excellent cosmetic results were obtained in lesions over 5 cm.² in area.

TABLE IX.—Cosmetic Results

Result	Both Sexes	
	No.	%
Excellent (no scar visible with normal inspection)	105	15.8
Good (pale scar with no pitting, pigmentation, telangiectasia, or contraction deformity)	508	76.5
Fair (slight pitting, pigmentation, telangiectasia, or contraction deformity)	39	5.8
Poor (marked changes as above)	12	1.8
Total	664	99.9

Comparison of Different Methods of Treatment

Any comparison of different treatment methods must take into account the extent of the tumours, and is thereby made the more difficult.

TABLE X.—Comparison of Results of Different Methods of Treatment

Method of Treatment	No. treated	No. re-sponse	Died of Inter-current Disease Cancer-free	Un-traced	Recurrences	Symptom free	
						No.	%
X rays:							
Group I, single dose	171	3	16	10	5	137	96.4
Group II, 1–2 doses a week	150	1	15	9	2	123	98.4
Group III, 3–5 doses a week	382	10	38	37	18	279	93.9
Radium	8	0	2	0	1	5	83.3

It will be seen in Table X that the lowest x-ray results (93.9%) are in Group III, as one would expect, since it contains all the more advanced lesions. The highest x-ray results (98.4%) are in Group II, these being 2% better than those in Group I. The difference of 2% is statistically not significant, but the advantage of the Group II method is possibly more apparent when one considers that in many cases it was used for larger tumours than Group I. Nevertheless, it will be seen that the single-dose technique has proved a very satisfactory method for treating early lesions, thus confirming the results of Mallender (1950). It will also be seen that to date there has been no deterioration of results due to our policy of reducing the fractionation of the treatments in all but the large and/or penetrating lesions.

Finally, the results of the eight lesions treated by radium are shown, but it must be emphasized that the number is too small for fair comparison.

Summary

An analysis is made of 711 lesions treated by radiotherapy during the years 1939–50 inclusive. The sex, age, and site incidence are discussed and the sizes of tumours at the beginning of treatment are given.

Of the lesions 98.9% were treated by three x-ray techniques, the remaining eight by radium. Our policy in reducing the number of treatments over which the x-ray dosage is given, and the effect of this as regards both cure and cosmetic results, are discussed.

The cure rate for all lesions treated over three years ago is 95.7% and for all those treated over five years ago 92.6%. The results have been related both to sizes of tumours and to different treatment techniques. The cosmetic results obtained are given.

The incidence, cause, treatment, etc., of recurrence and radionecrosis are given and discussed.

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INTRAVENOUS ACETYLCHOLINE IN TREATMENT OF THE NEUROSES

BY

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A great deal is known about the actions of acetylcholine, but little has been written about its value as a therapeutic agent. It is known that cholinesterase rapidly destroys acetylcholine *in vivo*. Hence in using the drug intravenously the chief difficulty lay in choosing the optimum dose which would avoid the lesser danger of too rapid destruction and the greater danger of arresting the heart's action (Carmichael and Fraser, 1933). In spite of the handicaps a number of uses have been found for the drug, given as an intravenous injection. It has been considered an effective method of treating paroxysmal tachycardia (Martindale, 1952), and Williams (1941) found it helpful in the diagnosis of epilepsy, since it could provoke epileptic discharges in the E.E.G. records of certain epileptic patients. It was used first in the treatment of psychiatric patients by Fiamberti (1940, 1950), who gave intravenous doses of 600 mg., by which he produced syncope, unconsciousness, and often a convulsion. This approach was considered to be of value in treating the early stages of schizophrenia, and a recovery rate of 80% was reported. The basis for this form of treatment was the apparent similarity to the convulsive shock produced by leptazol or E.C.T. Poort and Stigaard (1944) found that doses of up to 1,000 mg. could be injected safely. However, it did not gain wide repute, and unsatisfactory results were obtained by several workers, notably Harris and Pacella (1943).

A more modified form of treatment, using an intravenous dose of up to 200 mg. of acetylcholine chloride, was introduced in Spain by Lopez Ibor (1950, 1952), who found this approach useful in the treatment of certain neuroses and particularly of patients suffering from recurrent attacks of tension. Following a visit to Spain, Sargent (1952) introduced the treatment at St. Thomas's Hospital and reported on the initial findings.

The present paper describes a series of 211 patients who have been treated over a period of two and a half years at the same hospital.

Method

The Roche preparation of crystalline acetylcholine chloride was found to be the most reliable form of the drug. It was freshly prepared as a 10% solution in dis-

tilled water, usually as 200 mg. in 2 ml. The patients were given the injection intravenously, at least one hour after a meal, and initially a dose of 50 mg. was injected very slowly to test the sensitivity of the patient. This initial dose was then generally increased during subsequent treatments by 50 mg. to the total amount of 200 mg. A reaction usually occurred after the rapid injection of 50 mg. of acetylcholine chloride, but the remainder of the 200 mg. could then be given more slowly to prolong the reaction. Extra care has to be taken in those very sensitive to doses as small as 25 mg. The response took two forms: one showed coughing, flushing, salivation, lacrimation, sweating, etc., and was accompanied by momentary slowing of the heart; the other was primarily syncopal in form and was associated with prolonged cardiac arrest, unconsciousness, and convulsive movements. Physiological observations on these effects, including a description of a syncopal attack of 28 seconds, have been reported elsewhere (Phillips *et al.*, 1952). Barlow and Howarth (1953) have shown that the second, more severe reaction is similar to a Stokes-Adams attack. However, the aim of the treatment was to produce the first, milder reaction, and this could be achieved by gauging the rate of injection to suit the individual patient. There was little in the way of after-effects, and most patients were able to leave hospital five minutes after the injection, although the more elderly benefited from resting for 20 to 30 minutes afterwards.

Before a course of injections was begun the cardiovascular system was examined particularly, and in middle-aged patients a routine E.C.G. was done. It was also found possible to control attacks of spontaneous auricular fibrillation, which occurred in four patients, by giving a prophylactic dose of quinidine sulphate, 5 gr. (0.32 g.), half an hour before injections, and treatment could be continued. No fatalities occurred in over 6,000 injections when care was taken to gauge the dose correctly by gradually increasing speed and amount, especially in the sensitive patient.

The usual course of treatment consisted of 30 injections given over a period of six to ten weeks, depending on how often the patient was able to attend for treatment. Daily clinics have been held at St. Thomas's, and most patients found it possible to continue at work at the same time.

Results

The 211 patients consisted of 125 men and 86 women. The majority of patients who had this treatment, and incidentally the group which was helped most, suffered from symptoms which we have chosen to call "obsessive" (Sargent, 1952) or obsessional. These may result from exposure to stress, either psychological or physical, such as an acute debilitating illness, may start abruptly, and can often become self-perpetuating. The obsessional aspect of the condition commonly takes the form of a recurrent thought of an unpleasant nature or a particular phobia which is associated with a great deal of tension. This tension is experienced inwardly, and there is little or no overt evidence of its existence except the complaints of the patient. The reason why care has been taken to define this condition is because the drug proved to be of little value in the treatment of the classical obsessional neurosis, often dating from early childhood or accompanied by compulsive ritualistic behaviour.

Until it became clear that this particular obsessional group reacted best to this treatment, a wide selection of patients with anxiety symptoms were treated, including some in all of the following diagnostic categories: obsessional states as defined above, conversion hysteria, varied types of depression, schizophrenia, anxiety hysteria, classical obsessional neuroses, psychopathy, and chronic eczema.

Obsessional or Obsessive Tension States.—This category comprised 104 patients (Table I), of whom the surprisingly large number of 73 (70.2%) were improved by the treatment (Table II). Many were people who experienced the inner sense of tension already described, and they often

TABLE I

		O.S.	A.H.(M.)	A.H.(Po)	S.	O.N.	P.
Male	No. of patients	71	19	16	6	2	8
	Average No. of injections	34.8	25.9	8.25	20	30.5	20
Female	No. of patients	33	15	30	2	3	2
	Average No. of injections	28	29.6	6.16	88	71	23

O.S. = Obsessional state. A.H.(M.) = Conversion hysteria (monosymptomatic). S. = Schizophrenia. A.H.(Po) = Anxiety hysteria (polysymptomatic). O.N. = Obsessional neurosis. P. = Psychopathy.

Note:—Four skin cases are not included in Tables I and II: none derived any benefit from acetylcholine injections.

TABLE II

	O.S.	A.H.(M.)	A.H.(Po)	S.	O.N.	P.
	M F	M F	M F	M F	M F	M F
Improved	52 21	7 7	2 1	1 2	— —	— —
	70%	41%	6.5%	37.5%	—	—
Unchanged	18 12	9 6	9 10	4 —	2 3	6 2
	29%	45%	41.3%	50%	100%	80%
Worse	1 —	3 2	5 19	1 —	— —	2 —
	1%	15%	52.2%	12.5%	—	20%

had fears of insanity or of dying. One such patient, who had fought through the Burma campaign without significant upset, was debilitated by dysentery, helminthic infection, and orchitis complicating mumps. He suddenly developed an irrational fear of insanity, became tense and anxious about travelling, and had had panic attacks of fluctuating intensity over a subsequent period of six years. However, he carried on with his work so far as was possible. These patients often gave a history of previous attacks or a periodic course in which attacks might partially lift, and then got worse again. Others showed phobic states which were monosymptomatic in nature—for example, a woman with a single obsessive fear of killing her child. The phobia could be replaced by rumination over a single thought—for example, a word such as syphilis. These conditions must be distinguished, however, from those in which, for instance, fear of syphilis might be only part of a chronic generalized anxious and hypochondriacal state.

Anxiety Hysteria.—The classical symptoms of this condition did not respond to the treatment—most patients were made worse. This point is referred to below. Sometimes, however, a conversion symptom presented itself as a single fixed persistent pain, and then some improvement occurred, probably because of an obsessive component to the condition. Of such patients 34 were treated; 14 (41%) were helped, while 5 (15%) complained that they felt worse. An example of this was a patient who developed a pain in his leg after the diagnosis of disseminated sclerosis had been made in his brother, and this symptom had persisted for 15 years. Others helped were a group of patients complaining of bitemporal headache. Gross hysterical states were certainly never helped, although these patients are a group normally improved by treatments with a high degree of suggestive value.

Depressive States.—In general, acetylcholine injections seemed to increase the depth of an endogenous depressive illness. It was a matter of clinical observation that this was an effect it shared with modified insulin therapy. Therefore it was contraindicated in the treatment of depressions showing retardation, etc. However, there was a place for it in the treatment of patients suffering from mixed states of depression and obsessional tension. Such mixed states were generally reactive in nature, but a few depressions were generally reactive in nature, but a few were in the involutional group. These patients usually had one E.C.T. each week, and acetylcholine injections were given throughout the week. This combination of treat-

ments appeared to be efficacious in resolving the illness more rapidly than E.C.T. would have done alone, and can be combined on an out-patient basis. Six patients responded to this combined treatment, and these have been included in the obsessional group described above.

Schizophrenia.—Eight patients were treated, of whom three recovered from their particular attack under treatment. All three were, however, subject to recurrent illnesses of schizophrenic type, and showed obsessive traits in their pre-morbid personalities. They had previously had courses of insulin coma or E.C.T., and two of them had had modified leucotomies. The acetylcholine, however, seemed to help only the tension component to the total picture. These patients had full courses of acetylcholine injections and seemed to derive more benefit from syncopal reactions produced by the rapid injection of 200 mg. intravenously, which were less easily tolerated by the other groups of patients.

Other Conditions.—It will be realized that the term "anxiety state" is not used in this series. The reason is that it became apparent that a distinction had to be made between anxious patients of obsessive personality, who were able to contain their tension, and those with more hysterical trends, who tended to project their anxiety. The former are included in the obsessional group and the latter in the category of anxiety hysteria. Five patients, however, who showed numerous obsessional compulsive phenomena received courses of treatment, and no change for the better occurred. Some cases of psychopathy and eczema were also treated; for, as is usual in all fresh therapeutic ventures, many patients in these difficult categories tend to get referred for treatment. On the whole they were not helped by acetylcholine injections.

Use in In-patients

In addition to the above examples of its use in out-patients, acetylcholine was found to be of value as an adjunct to the standard in-patient treatments. It could be used as a further sedative measure to reinforce the action of modified insulin and, if necessary, could be given twice daily. Its use with E.C.T. was confined to the mixed states of obsessional anxiety and depression, and here its action lay in taking the edge off the tension experienced by such patients after E.C.T. had removed the depressive component. It was of use, too, in clarifying the diagnosis of mixed states of depression and anxiety. Often only a few injections tended to increase depression if this was the most important factor, and E.C.T. could then be substituted. In states of acute tension that can follow abortive treatments in wrongly selected patients, repeated acetylcholine injections were often found better than the barbiturates in damping these down again, because they achieved rapid sedation without producing an added mental confusion. It was also found useful in the follow-up treatment of alcoholics who had had emetine aversion treatment, were now off alcohol, and still had symptoms of residual tension.

Discussion

Early in the investigation some difficulty was experienced in finding the type of patient who might benefit most from the treatment. At first, most of the patients treated were chronic hospital attenders suffering from anxiety hysteria, and the injections served only to increase their fears. At this stage the investigation was nearly given up, but it was continued because of the response of one woman who had been referred for consideration of leucotomy. She was suffering from a monosymptomatic obsession that she might harm her child; this was accompanied by great tension and had lasted for over two years. The (28) injections gradually relieved her symptoms, and the operation of leucotomy was thus avoided; she has remained well for over two years. Another early patient who showed a good response was also noted to be suffering from a recurrent tension state with obsessional features. Then other patients were selected for treatment because mostly

they had single fixed symptoms, the illness showing a fluctuating intensity, and because there was evidence of a good basic personality, as shown by their ability to carry on with their work despite their illness.

With the final analysis of the results it has been possible to distinguish further prognostic criteria. Those helped most were frequently between 30 and 50 years of age. Body-build seemed particularly important. By far the best results were obtained in those of athletic build. These tolerated the treatment well, while the asthenic and the pyknic, especially the young obese patient, were not helped. They proved particularly sensitive to the injections and became easily frightened.

The treatment was certainly contraindicated in patients whose anxiety was overt in nature. Such people complained of palpitations, breathlessness, diarrhoea, vomiting, and frequency of micturition. Many of them showed a marked emotional immaturity, and a tendency to project their symptoms typical of so many of those suffering from anxiety hysteria. Table II shows the poor results obtained in this group.

The chief response noted when treatment was successful was a gradual lessening of tension—the emotional component of the phobia or obsessive thought decreased, and it became less troublesome. Schizoid patients showed an improvement in rapport and sometimes reported an increased clarity of thought.

The benefit alcoholic patients derived from the treatment was in keeping with the fact that they often have an obsessive personality; indeed, their drinking is often of a compulsive nature. They are usually tense individuals experiencing a great deal of subjective anxiety.

It might be argued that the typical patient who has shown a good response to treatment is basically the person of good personality and body build who does well with any form of non-specific therapy. Such patients have good driving personalities; they have mastered various stresses successfully, and they are able to contain their anxiety. But many of them present notoriously difficult problems from the point of view of treatment, and their illnesses may last a long time. It has been our experience that these patients are usually untouched by psychotherapy, E.C.T. makes them worse, and the use of sedatives may result in a build-up to undesirably high and prolonged dosages. A small number of such patients were given injections of normal saline in the same way as other patients were given acetylcholine. No response occurred until acetylcholine was substituted for normal saline. It seemed, in fact, that acetylcholine was often able either to shorten the attack or to produce a more complete remission of symptoms. Our results in this respect were therefore found to confirm those reported by Lopez Ibor (1952).

Summary and Conclusions

An investigation has been described in which intravenous acetylcholine was used in the treatment of varied forms of neurosis. The patients who were helped most fell within a specialized group of obsessive or obsessional tension states, which have been defined. Of 104 patients in this group, 70.2% were improved by the treatment.

It has also been found useful in certain patients as a treatment complementary to E.C.T., modified insulin, and the emetine aversion treatment for alcoholism.

Over 6,000 intravenous injections of acetylcholine have so far been given. The treatment, with the precautions described above, has been found to be a safe one, and is relatively simple to use on an out-patient basis.

Our thanks are due to Dr. William Sargent and many other members of the department who referred patients for treatment and helped us in this investigation. It was initiated by a grant from the endowment funds of St. Thomas's Hospital.

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THE PREVENTION OF CONGENITAL SYPHILIS

BY

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The incidence of early acquired syphilis reached its peak in England and Wales in 1947. This was followed by a rise in the incidence of congenital syphilis in the years 1948 and 1949, since when there has been a fall in the number of reported cases. The Ministry of Health report for 1951 revealed, however, that during that year 1,127 cases of congenital syphilis were seen for the first time at venereal disease clinics in England and Wales. The figure for 1952 was 946. Since congenital syphilis is now regarded as an almost 100% preventable disease (Aron *et al.*, 1947; Cole *et al.*, 1950; MacFarlane, 1950; Marinkovitch, 1951), these figures are alarmingly high. The more especially is this so when they are compared with 699 (1951) and 375 (1952) notifications for diphtheria, a comparably controllable infection.

No data are available to allow an estimate to be made of the number of congenital syphilitics born in the years 1951 and 1952 in whom the disease is as yet undetected, nor are there figures to show the number of abortions and miscarriages in which syphilis played a primary or contributory part.

Early infectious syphilis is now comparatively rare in adults, but many untreated or inadequately treated infections acquired during and after the late war are at present in the latent stage. Many of the females in this category are of child-bearing age, and while their syphilis is not contagious it is transmissible to the foetus. Kampmeier (1946) estimated that, irrespective of the stage of syphilis, 70% of foetuses born of syphilitic mothers are infected. The best hope, therefore, of prevention and ultimate eradication of congenital syphilis depends on detection and treatment of such women during the antenatal period.

Latent syphilitic infections can be adequately diagnosed only by the Wassermann or similar serological test.

MacFarlane found 515 (0.7%) of 71,645 antenatal Wassermann tests to be positive during the years 1944-9. Even with the apparent decline in early syphilis he was still able to detect 45 (0.28%) cases among 15,812 antenatal Wassermann tests made during 1952 (personal communication).

While antenatal Wassermann testing (and, where omitted, post-natal Wassermann testing) has become the established routine in almost every hospital and local authority obstetric practice, the Report of the Venereologists Group of the British Medical Association

(1952), which analyses the figures from 200 venereal diseases clinics in the United Kingdom, shows that routine antenatal Wassermann testing was uncommon in other than organized antenatal services. This fact has been underlined by MacFarlane, who has applied himself to this problem in the Tyneside area. He found that in 1952 (personal communication), when the estimated Tyneside birth rate (including stillbirths) was 31,705, of 15,812 (50%) antenatal Wassermann tests performed only 491 (3%) were made by general practitioners, who according to the local executive councils were remunerated for the care of 15,178 pregnancies.

Conditions in Stockport County Borough

Arrangements have been sought, by the closest possible liaison between all branches of the medical services, to improve the local rate of antenatal Wassermann testing. Such success as can be claimed (see Table I) is largely due to the co-operation between general practitioners and municipal midwives, the midwives with the medical officers staffing the borough antenatal clinics, and these latter in turn with the venereologist at the venereal diseases clinic of the hospital service. Direct liaison exists between the maternity department of the local hospital and the venereal diseases unit.

TABLE I.—Incidence of Serological Tests for Syphilis (S.T.S.) in Stockport County Borough Residents

Year	Birth Rate, including Stillbirths	S.T.S. Performed at Local Authority Clinics	S.T.S. Performed at Hospital Antenatal Clinics	Total S.T.S.	Detected Syphills Cases
1951	2,019	1,102	600 (approx.)	1,702 (85%)	11 (0.54%)
1952	2,101	1,002	700 (approx.)	1,702 (81%)	11 (0.52%)

It has been the practice to make antenatal clinic services available to all practitioners even if only for the purpose of taking a sample of the patient's blood. The busy practitioner, especially during the winter, is relieved of the time-consuming task of preparing for, taking, and dispatching single samples of blood. An increasing number of general practitioners undertaking care of antenatal cases now use this service as a routine—the practitioner himself, or, in most cases now, the midwife "booked" for the confinement, arranging the appointment at the antenatal clinic. This single sample of blood is also available for rhesus determination and estimation of the haemoglobin content.

Cases are usually referred to the venereal diseases clinic as soon as a routine Wassermann or Kahn reaction has been found "positive" or "doubtful." In all cases in which clinical signs are absent it is the practice to confirm the positive result before starting treatment. This precaution eliminates the possibility of clerical error and places the diagnosis beyond reasonable doubt.

During a five-year period covering 1947-52, 42 cases of previously undetected antenatal syphilis were referred. The stage of infection in these cases was: seropositive primary, 4; secondary, 8; latent syphilis, 25; congenital syphilis, 5.

The average age of the women was 25.6 years, with extremes of 17 and 37. The average duration of pregnancy at the time of first attendance at the venereal diseases clinic was 5.14 months, with extremes of 2 and 8½ months.

Management of Antenatal Syphilis

The aim of treatment is not only to protect the foetus but to continue treatment after parturition, with a view to curing the mother. The first problem is the patient's anxiety regarding the diagnosis. The patient has been told the undisputed facts in words best suited to her intelligence and educational standard. It is important that she should fully understand the terms "V.D.," "venereal disease," and

"syphilis," and what they imply. Reassurance is given that if she attends regularly a healthy baby may be expected. The need for the baby to attend later is stressed. The rapport established at these early interviews and examinations is important in securing co-operation in treatment during the months that lie ahead.

The majority of the cases have been treated with penicillin, arsenicals, and bismuth. Penicillin, as the oil-wax preparation and more recently as the procaine salt in suspension, was given in 4 to 6 mega-unit courses spread over eight to ten consecutive days. Two cases developed generalized urticaria and another had weals at the injection site. All three were readily controlled with antihistamine drugs. One patient had a "terror" reaction like that described by Batchelor *et al.* (1951). In spite of this reaction, penicillin was continued and the patient completed the prescribed course uneventfully. The earlier cases were admitted to hospital for daily penicillin therapy, but this is now rarely thought necessary, and no apparent complications have occurred from such practice. No patient attending daily at the venereal diseases clinic defaulted from the prescribed course. If arsenicals were given it was as neoarsphenamine or arsphenamine, 0.45 g. intravenously at weekly intervals. One course consisted of 10 injections. Two cases of neoarsphenamine dermatitis, readily controlled by dimercaprol, were the only complications seen. Bismuth was given as bismuth oxychloride in suspension in 0.2-g. doses deep intramuscularly at weekly intervals, a course consisting of 10 injections.

Of the 42 cases, 29 received penicillin, arsenicals, and bismuth, 15 of them completing one course of each drug or more. Of the 14 who did not complete a full course of each, two developed neoarsphenamine dermatitis, two defaulted, and 10 came to treatment in the last 10 weeks of pregnancy. Of the remaining 13, 2 received arsenicals and bismuth only, and one defaulted before treatment was begun. Seven others, the most recent in the series, received penicillin and bismuth alone.

If the patient was referred early in pregnancy treatment was continued right up to the expected date of confinement. Expectant mothers attended regularly and the opportunity was used to give as much antisyphilitic treatment as time permitted. Earlier experience showed that once the baby arrived domestic problems ensued and these were frequently used as excuses for non-attendance. If the puerperium was spent in hospital it was therefore arranged for the patient to have a further course of penicillin. This meant that the mother need attend the venereal diseases clinic only weekly at the most for the first two to three months after she returned home with the baby.

Twenty patients of the series had 25 subsequent pregnancies. Many of these occurred while the patients were still under treatment. The aim in such cases was to give the mothers at least one course each of penicillin, arsenic, and bismuth, and more recently one course at least of penicillin and bismuth only. If the patient became pregnant after completing adequate treatment for her syphilis, but before she had completed two years' satisfactory surveillance, an "insurance course" of penicillin only was given. Those mothers who had completed treatment and two years' satisfactory surveillance received no further treatment, but were kept under Wassermann review throughout the pregnancy. The babies were examined routinely in all these cases (see below).

When patients defaulted they were persuaded to return to treatment or surveillance by letter, or, if this failed, by visits by the municipal health visitor. Such visits were arranged through the medical officer of health, who has a statutory responsibility for venereal diseases cases much the same as he has for the tuberculous.

Investigation of the Family

The question of following up the patient's family is the task of the venereologist. Stokes *et al.* (1944) estimated that up to 40% of the members of such families may be

found to be infected. The discovery of unsuspected syphilis causes an immediate stir in the family, and as little delay as possible should be allowed before all the other members are examined. Irrespective of the clinical findings, a specimen of blood was taken from each member of the family who attended. It was noted that delay appears to give husbands time to rationalize their position, and when it has been necessary to visit such men they say in effect, "I feel nothing wrong. Therefore there is nothing wrong. Therefore there is no need for a blood test." The position is often rendered more difficult as a wife's diagnosis of syphilis may not be revealed to her husband without her prior consent.

Altogether 27 husbands were examined: there was a history or finding of syphilis in 13, while 14 gave no history and were serologically negative. Of the 15 not examined, five refused to attend, three were separated from their wives and could not be located, while four were consorts of single women and could not be traced. The remaining three were husbands of congenitally syphilitic wives. Once the husband's co-operation was obtained little difficulty stood in the way of examination of children of the marriages concerned (see below).

Outcome of the Pregnancies

Of the 42 pregnancies, 41 ended in live births. There was one miscarriage. Twenty-seven infants were found Wassermann-negative at 3 months of age or older; 12 were not seen at 3 months of age or older, either because the parents refused to bring the children or because the family moved to another locality. Two infants were diagnosed as having congenital syphilis.

The diagnosis of infantile congenital syphilis often seems to present difficulties. It is not generally appreciated that many pregnant women reach confinement with a strongly positive Wassermann reaction in spite of antisyphilitic treatment. In these cases there is often a "carry over" of the mother's reagin into the infant's blood. Thus cord blood or venous blood taken from the infant in the first few weeks of life may well give a positive Wassermann result in spite of the absence of congenital syphilitic infection. The Wassermann titre in such cases usually falls to negativity in four to six weeks. Only when a Wassermann reaction remains strongly positive beyond 12 weeks of age can it be taken as a sure sign of congenital infection. The presence of definite clinical or radiological evidence of congenital syphilis of course makes a diagnosis possible irrespective of the infant's age or the Wassermann titre.

The practice here has been to take a specimen of blood from the babies at 1 month and at 3 months of age. As indicated, the test at 1 month is of little value. It is felt, however, to be important for the mother to bring the child for clinical examination at this age. Experience has shown that if the baby is left until it is 3 months old difficulty may be experienced in persuading the parents of the need to bring along their apparently healthy child.

In regard to the two cases in this series diagnosed as congenital syphilis, one was diagnosed elsewhere on serological evidence only at 6 weeks of age. In the other case the mother completed a 4-mega-unit course of penicillin a few days before her confinement. This baby was first seen at 1 month of age with mucocutaneous syphilis.

Previous and Subsequent Pregnancies

Kampmeier (1946) noted the high morbidity and mortality in untreated syphilitic women. He found 24% of pregnancies ending in miscarriage or stillbirth; 56% of the infants were born with syphilitic infection, and about a quarter of these died within the first month of life.

Wammock *et al.* (1950) pointed out that women treated for syphilis have a better chance in pregnancy than non-syphilitic women. He found an unsatisfactory outcome in 12.4% of 5,596 infants born to non-syphilitic mothers, but in only 3.8% of 271 infants born to 267 treated syphilitic

mothers. It is of some interest, therefore, to compare the outcome of previous and subsequent pregnancies in this series. Eighteen of the women had had 40 previous pregnancies and 20 had 25 subsequent pregnancies (Table II).

TABLE II.—Outcome of Previous and Subsequent Pregnancies

Outcome of Pregnancies	Previous Pregnancies	Subsequent Pregnancies
Miscarriages	4	Nil
Stillbirths	2	Nil
Premature baby (died)	1	Nil
Wassermann-negative at 3 months of age or later	21	21
Not examined	11	3
Diagnosed congenital syphilis	1	1
	40	25

Although the series is small, the high miscarriage and stillbirth rates in the previous as compared with the subsequent pregnancies seem in line with the findings of others. The case of congenital syphilis among the subsequent pregnancies was due to failure, in spite of letters and visits, to persuade the expectant mother to attend for continuation of treatment.

Summary

Although almost 100% preventable, congenital syphilis is still very much with us.

Antenatal Wassermann-testing offers the best hope of early eradication of this infection.

The management of antenatal syphilis is illustrated by a series of 42 cases.

The need is emphasized for close co-operation by all concerned in antenatal care if a high percentage of antenatal Wassermann tests are to be performed.

Thanks are due to the nurses and doctors working in all the branches of medical services in the County Borough of Stockport. Their day-to-day co-operation has made this study possible. I am especially indebted to Dr. Marion W. Davies, assistant medical officer of health, who assisted with the treatment of many of these cases.

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The War Office has published a report of the first five years' work of the Army Tumour Registry at the Royal Army Medical College, Millbank. The Registry was established in April, 1948, thanks to the foresight of the late Lieutenant-Colonel J. MANIFOLD, at the pathology department of the College, under Major (now Lieutenant-Colonel) D. W. BELL. For many years this department has been regarded as the Army histological reference laboratory, and it receives specimens from medical officers serving in many parts of the world. The Registry has three primary objects: (1) To ensure accuracy of diagnosis; (2) to assist in the follow-up of cases of malignant disease; and (3) to act as a scientific record of the types of tumour encountered by Army pathologists. A fourth object, which is held out as a hope for the future, is to supply medical officers with sets of representative sections as does the Armed Forces Institute of Pathology in Washington. Unfortunately, incompleteness of registration, lack of detailed information, and small numbers greatly limit the statistical usefulness of the collection.

PILOCARPINE AS AN ANTAGONIST TO THE UNDESIRABLE EFFECTS OF GANGLION-BLOCKING AGENTS IN THE TREATMENT OF HYPERTENSION

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A disadvantage in the use of ganglion-blocking agents for the reduction of hypertension is that they block conduction not only through sympathetic but also through parasympathetic ganglia. The desired lowering of blood pressure is due to the action on the former, the undesirable effects mainly to the action on the latter. It would be a clear advantage if the effects on parasympathetic ganglia could be neutralized.

It seemed to us that this ought to be readily done by the use of pilocarpine. This drug acts peripherally on the post-ganglionic terminals, and its action should not be prevented by simultaneous paralysis of the pre-ganglionic fibres to the ganglia. In medicinal doses it has no action on the post-ganglionic sympathetic terminals, so that it should not diminish the hypotensive action for which the ganglion-blocking drug is given. A preliminary trial on a suitable patient has confirmed this anticipation.

Case Report

The patient, a woman aged 45, had been treated since March, 1953, first with hexamethonium bromide intramuscularly, and later, for the past five months, with pentolinium tartrate ("ansolysen") orally. Both treatments gave very satisfactory results in reducing the hypertension and concomitant symptoms, but in doses sufficient to maintain an adequate reduction of blood pressure the side-effects were distressing. These were of the usual type: dryness of the mouth, leading to interference with speaking and swallowing; constipation and loss of appetite; dryness of the eyes and loss of accommodation; and, especially with hexamethonium, difficulty with micturition.

The patient was given orally a tablet containing 1/10 gr. (6.5 mg.) of pilocarpine nitrate. Within half an hour she reported that "instead of my mouth being parched, I can do nothing but spit." As the salivation was unnecessarily copious, half a tablet was next given. This produced slight moistening of the mouth, but not enough. A dose of about 1/13 gr. (5 mg.) (three-quarters of a tablet) has subsequently proved adequate for keeping the mouth in a satisfactory state of moistness. On this dosage the side-effects of pentolinium tartrate have largely disappeared. Certainly the dryness of the mouth and eyes is relieved, and appetite and digestion have improved. This has made a great difference to the patient's sense of well-being, which has been maintained for five weeks on a dose of pilocarpine of 1/10 to 1/13 gr. (6.5 to 5 mg.), during which time she has led a normally active life. The dryness of the mouth, an effect easily appreciated, disappears regularly within half an hour of swallowing the pilocarpine and returns in six to ten hours, depending on the dose. The patient has also remarked, without questioning, that the constipation has been less.

Comment

Pilocarpine, by stimulating all parasympathetic nerve-endings (or by some action equivalent to this), has a wide-

spread action on involuntary muscle and on secreting glands, and is a potential antagonist to all the effects which result from paralysis of parasympathetic ganglia. It would presumably have this effect in the case of any ganglion-blocking agent. In smaller doses it acts more on glands than on muscle, and might therefore be expected to antagonize the effects of ganglion-blocking agents on secretions more readily than those on muscle.

The loss of tone and of contractions of the alimentary tract which often occurs with ganglion-blocking agents is no doubt mainly due to blockage of the motor impulses to the muscle, but the diminution of salivary, gastric, and intestinal secretions can hardly fail to aggravate the constipating effect. Some improvement of this condition may therefore occur even if the dosage of pilocarpine is only high enough to act on secretions. In larger doses it powerfully stimulates intestinal muscle. It has also some action on ganglia, but this could hardly occur with medicinal doses. To what extent it could be safely used to antagonize the various muscular and glandular effects resulting from parasympathetic ganglion-block would require detailed exploration. It would be a question not only of dosage but probably to some extent also of individual variations in quantitative response. Fortunately, medicinal overdosage with pilocarpine can be readily antagonized with atropine should need arise.

We have not encountered in the literature any mention of pilocarpine having been tried for the purpose we have indicated, other than a passing reference by Smirk (1953). Our object in submitting this note is to suggest that it may prove of value for counteracting some at least of the undesirable side-effects which often mar the desired depressor effects of ganglion-blocking agents.

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THE ROLE OF SMOKING IN BRONCHITIS

BY

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Many factors which are responsible for the development or aggravation of bronchitis, such as climate, atmospheric impurities, hereditary predisposition (Oswald *et al.*, 1953), and infection (Stuart-Harris *et al.*, 1953), are difficult to control or eradicate. It is important, therefore, to assess the role of factors, such as smoking, which are more easily controlled. This investigation was undertaken to assess the incidence of bronchitis in a group of smokers compared with a similar group of controls who were non-smokers.

The patients studied consisted of a consecutive group of 422 males who were admitted to the Middlesex Hospital during the period from September, 1950, to September, 1952, for elective repair of inguinal hernia or a partial gastrectomy for chronic peptic ulcer. There were 310 smokers and 112 non-smokers.

Method

I examined each patient before the operation, and a postero-anterior radiograph of the chest was taken. The age, the place of residence, and a past history of diseases likely to predispose to the development of bronchitis were noted. Table I shows the distribution of these factors in the groups.

TABLE I.—Comparison of Groups of Smokers and Non-smokers

	No.	Average Age (Years)	Place of Residence			Past History			
			Urban	Sub-urban	Rural	Hay-fever	Asthma	Nasal Catarrh	Pneumonia
Smokers	310	47	152	138	20	12	5	31	33
		S.D. 12	49.0%	44.5%	6.5%	3.9%	1.6%	10.0%	10.6%
Non-smokers	112	48	51	55	6	3	3	10	12
		S.D. 12	45.5%	49.1%	5.4%	2.7%	2.7%	8.9%	10.7%

The patients' smoking habits were classified as follows: heavy, 20 or more cigarettes a day; moderate, 10–19 cigarettes a day; light, fewer than 10 cigarettes a day.

There were fewer than 10 pipe smokers. In these, 1 oz. (28 g.) of tobacco was taken as roughly equivalent to 30 cigarettes.

Patients were classified as non-smokers if they had never smoked, or if they had given up smoking for a year or more before admission. Ten patients had given up smoking more recently, and these were excluded from the series.

Diagnosis of Bronchitis

This was considered under three headings: a history of bronchitis, clinical evidence of bronchitis, and radiological evidence of bronchitis. It is well known that the principal symptom of bronchitis is cough, productive of a variable amount of expectoration. The common history is that the symptoms start in the winter, often following a cold. In succeeding winters the duration of the cough after each attack progressively increases. This phase gradually gives place to a constant cough and expectoration with winter exacerbations (Scadding, 1952). Quite marked winter bronchitis is quiescent in the summer, when some of these cases were interviewed. Thus if the patient admitted to a productive cough which had lasted a fortnight or more during two preceding winters he was deemed to have a positive history of bronchitis. A dry cough, due to pharyngitis, for example, was not considered such a reliable indication of bronchitis, and patients with a dry cough only were not included.

Bronchitis was diagnosed clinically when rhonchi or numerous coarse rales were found on examination of the chest. Minimal fine rales at the lung bases which cleared readily on coughing were not considered to justify a diagnosis of bronchitis, as this is a common finding in patients who are in bed.

The radiological changes of bronchitis are not distinctive. Bronchitic changes were considered to be present radiologically when there was an increase in the density of the bronchovascular markings in the outer two-thirds of the lung fields. These changes were seen only in the more severe cases of bronchitis, and were usually associated with some degree of emphysema. No cases of pulmonary congestion due to heart disease were seen in this series.

Of the 422 patients, 47.4% gave a positive history of bronchitis, 28.4% showed clinical evidence of bronchitis, and radiological changes were present in 14.2%.

Results

In Table II the incidence of bronchitis in the group of smokers is compared with that in the non-smoker group. It can be seen that the incidence was definitely higher in the smokers than in the non-smokers. The incidence

TABLE II.—Incidence of Bronchitis in Smokers and Non-smokers

	No.	History of Bronchitis	Clinical Evidence of Bronchitis	Radiological Evidence of Bronchitis
Smokers	310	166 (53.5%)	100 (32.2%)	53 (17.1%)
Non-smokers	112	34 (30.4%)	20 (17.9%)	7 (6.2%)
Difference		23.1% (S.E. 5.19)	14.3% (S.E. 4.49)	10.9% (S.E. 3.13)

of bronchitis in the groups, moreover, differed by more than twice the standard error, so that these differences are unlikely to have arisen by chance.

The main factors other than smoking which are likely to predispose to a history of bronchitis are satisfactorily distributed between the groups (Table I), so that the higher incidence of bronchitis in the smokers may be reasonably considered to be associated with smoking.

In Table III the incidence of bronchitis is compared with the amount smoked. It is apparent that the incidence of bronchitis increases markedly with increased smoking.

TABLE III.—Incidence of Bronchitis Compared with Amount Smoked

	No.	History of Bronchitis	Clinical Evidence of Bronchitis	Radiological Evidence of Bronchitis
Heavy smokers	42	31 (73.8%)	29 (69.0%)	16 (38.1%)
Moderate "	127	73 (57.5%)	39 (30.7%)	23 (18.1%)
Light "	141	62 (44.0%)	32 (22.7%)	14 (9.9%)
		$\chi^2 = 12.91$ n = 2 P < 0.01	$\chi^2 = 32.05$ n = 2 P < 0.01	$\chi^2 = 18.27$ n = 2 P < 0.01

This trend is very unlikely to have arisen by chance (P < 0.01).

Older people are more likely to have a history of bronchitis than younger ones, but this is unlikely to be the reason for this trend as the average age for the heavy smokers was 45.4 years, for the moderate smokers 48.0 years, and for the light smokers 47.6 years.

Discussion

In this series of adult male patients, bronchitis, based on clinical and radiological findings, was significantly commoner in smokers than in non-smokers. The incidence of bronchitis, moreover, increased significantly with the amount smoked.

Of 1,000 patients with chronic bronchitis studied by Oswald and his colleagues at the Brompton Hospital, only 5% were non-smokers. They also found that there were appreciably fewer non-smokers among 300 patients with bronchitis than among a comparable control group without bronchitis. Moreover, these authors found that half the smokers felt that smoking aggravated their bronchitis, and that a large number had abandoned the habit with benefit.

In a disease with so many aetiological factors as bronchitis, smoking is obviously unlikely to be the only factor concerned. The incidence of a history of bronchitis, for example, was as high as 30% in the non-smoking group in this series, and 26% of the heavy smokers gave no history of bronchitis. Nevertheless, these results suggest that smoking is of considerable importance in the aggravation of bronchitis, and it follows that in the management of these cases, in addition to the usual measures, they should be encouraged to give up smoking.

Summary

In a group of 422 males there were 310 smokers and 112 non-smokers.

The incidence of bronchitis was significantly higher in the smokers than in the non-smokers.

The incidence of bronchitis increased with the amount smoked.

My thanks are due to the Research Grants Committee of the Middlesex Hospital, to the surgeons who allowed me to examine their cases, and to the radiologists who reported on the chest radiographs.

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Medical Memoranda

Treatment of Status Asthmaticus with Nitrogen Mustard

Professor C. Jiménez Díaz and his associates (1950, 1951) have reported encouraging results with nitrogen mustard in the treatment of status asthmaticus. The value of cortisone and A.C.T.H. in alleviation, temporarily at least, of severe and exhausting symptoms of the asthmatic state now seems to be definitely established (Bordley *et al.*, 1949; Randolph *et al.*, 1950; Friedlaender and Friedlaender, 1951). A certain relationship seems to exist between these hormones and nitrogen mustard. During the administration of nitrogen mustard there occurs progressive lymphopenia and eosinopenia. The same results can be obtained with A.C.T.H. and cortisone (Dougherty and White, 1943; Thorn *et al.*, 1949). Noting the close relationship that exists between A.C.T.H. and cortisone on the one hand, and nitrogen mustard on the other, Díaz and his associates decided to try nitrogen mustard in asthma. Their extremely encouraging results prompted the use of nitrogen mustard in the following case.

CASE REPORT

A girl aged 13 had been having attacks of bronchial asthma for the past two years. In the beginning these occurred at infrequent intervals and were quickly relieved by the administration of adrenaline. During the second year the frequency and severity of the attacks had gradually increased, but they could still be terminated by adrenaline. On February 1, 1951, the patient had another severe attack. She was given an injection of adrenaline, which brought only slight relief lasting for about one hour. Repeated injections of adrenaline and ephedrine failed to give her any further relief.

On the morning of February 2 she was given an intravenous injection of 0.25 g. of aminophylline. She had prompt relief of her symptoms, which, however, lasted for only about eight hours. In the evening she was given a further 0.25 g. The relief produced this time, however, was not so dramatic and lasted for a shorter time. During the next two days she had repeated injections of adrenaline, next two days she had repeated injections of adrenaline, and khellin with minimal response. Her aminophylline, and khellin with minimal response. Her general condition during the past four days had deteriorated considerably. She was unable to lie down in bed and was completely exhausted. At this stage it was decided to administer nitrogen mustard intravenously. Her white blood cell count at this stage was 10,328 per c.mm. (polymorphs 45%, lymphocytes 39%, eosinophils 14%, monocytes 2%).

Nitrogen mustard, 2.5 mg. dissolved in 2.5 ml. of normal saline, was administered intravenously very slowly. No precautions were taken to prevent the vomiting which usually occurs a few hours after the intravenous administration of the nitrogen mustard, since it was thought that by liquefying the tenacious bronchial secretions the vomiting might further benefit the patient. One hour after the injection the condition of the patient began to improve. Vomiting started two hours after the injection; anything by mouth provoked it. In the next six hours she vomited about 15 to 20 times. As anticipated, the bronchial secretions were to a great extent liquefied, and she was able to expectorate with great ease. Eight hours after the first injection her clinical condition was much improved. There was no more respiratory discomfort, and on examination her chest was much clearer. She was now able to lie down in bed without discomfort. Vomiting, however, was still occurring, and at this stage she was given phenobarbitone, 1½ gr. (0.1 g.), after which the vomiting gradually stopped and she slept an uneventful night. Next morning she had no asthmatic symptoms and no foreign sounds could be heard in the chest. All anti-asthmatic treatment was suspended. Her white blood cell count at this stage was 11,240 per c.mm. (polymorphs 66%, lymphocytes 29%, eosinophils 5%, monocytes 0%).

Further injections of 2.5 mg. of nitrogen mustard were given intravenously on alternate days to a total of four injections. She was given 1½ gr. (0.1 g.) of phenobarbitone immediately after the injections to diminish vomiting, the severity and frequency of which was much diminished by this procedure.

Since her last injection of nitrogen mustard the patient has been seen and examined repeatedly till the time of writing (about three and a half months), and she has remained completely symptom-free.

COMMENT

The management of status asthmaticus often becomes a serious medical problem. It taxes the skill, patience, and experience of all physicians. Rigorous methods of treatment may sometimes be justified in an occasional case. The advent of A.C.T.H. and cortisone in the field of therapeutics is a real advance in the management of severe intractable cases of status asthmaticus; indeed, their use may be a life-saving procedure in certain cases. But the prohibitive cost of these drugs often precludes their use in a really deserving case. Nitrogen mustard, which is a comparatively cheap drug, has given very encouraging results in the hands of Continental workers. The case reported above confirms its versatility. The benefit produced by it parallels the fall in the eosinophil count. But nitrogen mustard is a potentially toxic drug, and it is essential that blood counts be carried out at regular intervals to prevent a serious depression of the bone marrow.

As yet it is too early to draw any conclusions on the therapeutic efficacy of nitrogen mustard in asthma, but the response obtained in the above case and by Continental workers warrants further clinical trials.

ADDENDUM.—Since this case report was written three further cases of chronic bronchial asthma have been treated with nitrogen mustard with encouraging results.

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Isolation of Bact. Coli O.26.B.6 from a Child with Recurrent Diarrhoea

Specific serological types of *Bact. coli* are now fairly widely recognized as a factor in the aetiology of infantile gastroenteritis. So far, however, there are few reports of such organisms playing a pathogenic part in the later age groups.

CASE REPORT

In October, 1952, a mother brought her daughter, aged 12, to me suffering from diarrhoea. The girl had been quite well until eight days previously, when her stools became watery and yellow, and she had frequent bouts of abdominal colic. These symptoms lasted two days, and the girl was free from symptoms until the night before seeing me, when again she had abdominal pain followed by diarrhoea.

Asked whether anyone else in the family had had a similar illness, the mother said that her son, aged 1 year, had had stomach trouble for the previous three months. The baby seemed well, but about once a week had had frequent loose stools. She had attributed this to teething.

I requested a pathological examination of the faeces of both these children. A report on the infant stated that *Bact. coli* type O.26.B.6 was present and that no other intestinal pathogens or parasites were found.

I then asked for an examination of the older child's stool, with special reference to the presence of this type

of *Bact. coli*. The organism was found to be present. Both strains were found sensitive to sulphathiazole and chloramphenicol.

Treatment.—While investigations were being made, both patients were treated symptomatically with kaolin. This had no effect, for the condition recurred under my observation—that is, normal bowel action for five days was followed by pain and loose discoloured stools for two days.

I gave a seven-day course of sulphathiazole. During this treatment symptoms were absent, but at the end of treatment the specific strain of *Bact. coli* was still present, and a week later the condition relapsed. Chloramphenicol was then given, diarrhoea ceased at first but returned after five days' treatment (possibly due to the drug). I then instituted a combined course of chloramphenicol and sulphathiazole extending over ten days. Diarrhoea stopped and pains ceased. A week after the end of this treatment, specimens from both children were negative. Further specimens remained negative. After three months both children were well.

COMMENT

Two children, aged 2 years and 1 year respectively, suffered from recurrent diarrhoea and colic. Repeated faeces examinations revealed none of the usual intestinal parasites or pathogens, but a sero-specific strain of *Bact. coli*, Type O.26.B.6, known to be associated with infantile gastro-enteritis, was repeatedly isolated from the faeces of both children, and not until the organism had disappeared from the stools after a course of sulphathiazole and chloramphenicol did clinical recovery take place. Specimens examined from the unaffected members of the household were consistently negative for *Bact. coli* O.26.B.6.

It therefore seems worth while to consider such organisms when investigating cases of diarrhoea even after the age of infancy.

I am grateful to Dr. M. Thomas, of the Public Health Laboratory, Edmonton, for examining the faeces specimens from these cases.

R. L. MACQUEEN, M.R.C.S., L.R.C.P.,
General Practitioner, Edmonton.

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Acute Psychotic Reaction after Inhaling Methylamphetamine

The following case is reported because of its unusual psychiatric interest and also to indicate a possible danger in the indiscriminate use of the amphetamine group of drugs by inhalation of the vapours.

There appear to have been no similar cases reported in the literature or known to the manufacturers of these inhalers. There have, of course, been many cases of addiction and even of psychosis associated with ingestion of amphetamines, and in this connexion inhalers are often used as a ready source of the solid drug.

CASE REPORT

A man aged 41 was admitted on July 8, 1951, to a mental hospital on an urgency order. Physical examination revealed a robust healthy man. He was rather flushed and sweated readily; pulse 100; blood pressure 150/92. There were a few rhonchi in both lung fields. Further investigations showed him to have nasal polypi and chronic maxillary antritis. The urine contained traces of sugar and acetone. The Wassermann reaction and Kahn test were negative. Mentally he was well orientated, but acutely hallucinated both visually and aurally. He was anxious and had severe insomnia. His pockets contained five "methedrine" inhalers, which before use had each contained 250 mg. of methylamphetamine base.

On July 11, after rest and sedation, he was much improved and able to give the following history. He was an Irish unskilled worker who had been separated from

his wife and living alone in this country for many years. He denied alcoholism and any previous mental illness in himself or his relatives. On the evening before admission he had felt unwell and had used his inhalers to relieve his nasal congestion. He often used them three or four times an hour, and thought that on this occasion he may have inhaled as often as every five or ten minutes. He admitted that they gave him a pleasant feeling, described as a "lift" with something sexual about it. After a few hours he had noticed that he "saw" women and animals in the room, although he realized they were unreal.

These hallucinations were in bright colours and were rather diminutive. He also described an illusion in which a coat over a chair "turned into a woman." He had the feeling that these happenings were supernatural, and seeing some shadows at the window of a house opposite he got the idea that he was being hypnotized. He went over the road to investigate and called in the police. It was this that led to his admission to hospital.

By July 15 he had completely remitted, but voluntarily remained in hospital in order that certain tests could be carried out. He appeared intelligent and informative, if not garrulous, but gave the impression of being a rather unreliable witness. His affect was cheerful and congruous, but a little shallow. The hallucinations had gradually disappeared over four to five days.

A Rorschach test was carried out on July 26. With full co-operation the patient could produce only 13 responses. His intelligence was tested on a shortened Wechsler verbal scale; it gave an I.Q. of 120. It seemed likely that his meagre and constricted Rorschach record was due to an "accuracy compulsion" so powerful as to inhibit his ability to make anything of the ink-blots.

On July 27 he was given 30 mg. of methylamphetamine intravenously. He became flushed, his pulse rose to 120, and his blood pressure to 190/120. He expressed a feeling of well-being and a desire to "get up and do things." He stated that marks on the ceiling became more conspicuous and that when he looked up at a certain object he felt as if it looked back at him. Colours appeared to change and he had erotic sensations. He later remarked on the similarity of these feelings to those following methedrine inhalation.

In 30 minutes he appeared to have recovered and was subjected to a second Rorschach test. The number of responses had risen to 47, considerably more than is usual, in spite of the compulsiveness being still very marked. He left hospital the next day, but later claimed that the injection test had produced hallucinations lasting for several days, which he had kept quiet about.

Six weeks later he had a third acute hallucinatory episode following the further use of inhalers. He then underwent an operation for removal of his nasal polypi and has apparently remained well since.

COMMENT

There seems to have been established in this case a causal relationship between methylamphetamine absorbed by inhalation and an acute psychotic reaction. The drug was, of course, used in excess of the recommended dose. Also it appeared that the man's previous personality was such as to predispose to psychotic breakdown and possibly to addiction. The illness was at first thought to be an acute schizophrenic episode, but was subsequently diagnosed as an acute organic confusion, although confusion in the sense of severe disorientation was singularly lacking. However, the overactivity and the paranoid element were fairly typical of previously described amphetamine psychoses. It is thought possible, in view of the time lag of a few hours after injection before the occurrence of definite hallucinations, and their persistence for several days, that the psychotic reaction may not have been directly due to the action of the drug on the higher centres, but to a withdrawal or exhaustion phenomenon.

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Reviews

A BOOK FOR GENERAL PRACTITIONERS

Refresher Course for General Practitioners: specially commissioned articles from the British Medical Journal. Second collection: January, 1951, to March, 1952. Fully revised. (Pp. 570; illustrated. £1 5s.) London: B.M.A. 1954.

In these hurrying times when textbooks are out of date before they are printed, it might be thought that a collection of articles from the *British Medical Journal*, first published between January, 1951, and March, 1952, would be stale. That this book seems fresh is no doubt owing to the care with which the editor has chosen his authors. The teaching of the good physician remains true, although he may be a little behind the latest phase or craze of advancing medicine.

With all this variety of refreshment, from which sort of article will the general practitioner derive most benefit? Revision lectures are apt to be dull unless, as in "Malaria" by Sir Gordon Covell, the latest treatments are described, or unless the expert by his very enthusiasm for his specialty provokes controversy, as does Dr. C. J. C. Britton in "Allergy" or Professor Arnold Sorsby in "Infections of the Eye." Many will like the dogmatic approach of Professor R. S. Pilcher, who says in effect that general practitioners should treat common acute infections of the fingers and hand and that this is the way to do it. This at least is a challenge which it is hard to ignore. Others will enjoy the thrilling description of Dr. Desmond Cugran removing the boots from his acute mental case before administering the sedative by injection. Fortunately most general practitioners are conversant with the legal complications of assault. Others, again, will appreciate the balanced argument on the potentialities of "Physical Methods of Treatment in Psychiatry" by Drs. William Sargent and Eliot Slater, and "The Pros and Cons of Immunization" by Professor Robert Cruickshank.

As well as refreshment and provocation and balanced argument there is the sting. How many practitioners examine an eye as Mr. B. W. Rycroft advises? How many think of leukaemia when they see a gingivitis? (Sir Lionel Whitby). Here perhaps is the true worth of this volume. When an author can show that the general practitioner is failing in the very thing that is his specialty, the general health or illness of his patient as opposed to the particular symptom or sign which brings the patient to him, then he gets under the guard of the practitioner's complacency and it hurts. There is no doubt whatever that it does us good to get hurt at times. This book should find a place in every practitioner's library for the good of his soul as well as his mind.

C. W. WALKER.

LEEDS UNIVERSITY

The University of Leeds: The First Half-century. By A. N. Shimmin, C.B.E., M.A. Drawings by Maurice de Sausmarez. (Pp. 229+xv; 28 illustrations. 21s.) Cambridge: University Press for University of Leeds. 1954.

The founding of nine universities or university colleges during the past 50 years is a remarkable achievement in the development of higher education, but perhaps the real interest to educationists and to sociologists is the varied way in which the different localities have each fostered the development of their own "Redbrick" university. The contrasts are particularly striking between the three sister colleges of the old Victoria University—Manchester, Liverpool, and Leeds.

When the Yorkshire College of Science was founded in 1874 the first three chairs were experimental physics and mathematics, geology and mining, and chemistry. It was almost inevitable with a succession of distinguished clinicians such as the Heys, the Teales, McGill, Wheelhouse, Thackrah, and Clifford Allbutt that a strong medical school existed when the College was founded, and that the Royal

Commission of 1894-5 concluded that little work of university standard was being done in the Yorkshire College outside the medical school. Despite the initial limited but essentially practical approach to educational problems, the Yorkshire College attained its charter in 1904, and, with the support of many local worthies, of the Clothworkers Company and of generous benefactors, such as Lord Brotherton and Parkinson, has developed into the flourishing university of to-day. The University has never lost contact with its environment. The technological departments are thus both numerous and strong, but Arts is now the largest faculty, and the establishment of a chair of music, an appointment in fine arts, and the generous bequest of the Gregory Fellowships have more than balanced the developments in engineering, textiles, and metallurgy.

Much of Professor Shimmin's account refers to personalities, both academic and lay, who have played such a prominent part in the development of the University of Leeds, information of great interest to all graduates. Of wider interest are the chapters on "Recurrent Issues," "Student Welfare," and "Town and Gown." The perennial problems of accommodation and of standards, not only for entrance to the University but also for degrees, and the significance of honours, together with the place, if any, of diploma courses, have been, and still are, important issues. The value to the corporate life of the students of being able to organize their own union is emphasized, and has resulted in the encouragement of a wide range of activities—for example, the dramatic societies, which have established a unique tradition within the past 15 years. The study of the development of hostels and the student health service will be of interest to all university teachers and administrators. The relationship of "Town and Gown" has been most happy, and, though the University of Leeds is not merely a civic university, the city is proud of the University and the latter stands high in the esteem of the citizens.

Professor Shimmin has succeeded in capturing for the reader something of the spirit and atmosphere of the University as well as of its struggles and its problems. It is interesting to note that the motto of the University, *Et augebitur scientia*, was the one Evelyn proposed for the Royal Society. The standing of the University of Leeds to-day may be said to justify its motto, and suggests that it may in due course attain the stature of that society which selected for its motto *Nullius in verba* instead of "And knowledge shall increase."

R. E. TUNBRIDGE.

SURGICAL PATHOLOGY

Surgical Pathology. By Lauren V. Ackerman, M.D. (Pp. 836; 913 illustrations. £5 10s.) London: Henry Kimpton. 1953.

This book is "an introduction to the vast field of surgical pathology" and "does not pretend to replace in any way the textbooks of general pathology, its purpose being merely to supplement them, assuming that the reader has a background or access to those texts." The author is professor of surgical pathology of Washington University School of Medicine, and in a clearly written introductory chapter he defines the scope of his subject and the attributes of the perfect surgical pathologist. Antibiotics, modern anaesthesia, biopsies, immediate frozen sections, and exfoliative cytology are responsible for an enormous increase in the volume of diagnostic clinical histology coming to hospital laboratories, and in his introduction Professor Ackerman almost makes a case for regarding a career limited to surgical pathology as being not only satisfying and rewarding to the pathologist but a fully justifiable whole-time activity in the interests of the surgeon and his patient.

Professor Ackerman has written a very sound account of modern surgical pathology, and one of the several merits of his book is that it is based to a large extent on his own experience. Almost all the numerous and remarkably good photomicrographs are from cases he has investigated. He lays considerable emphasis on naked-eye appearances, and with few exceptions deals with common lesions and avoids the rare and curious. Full and clear accounts of the

pathology of diseases of the skin and skeletal tissues will be appreciated by the practising pathologist, and the chapters on the thyroid and male reproductive system are outstanding.

The volume can be recommended to surgeons and radiologists, and will serve as a safe guide to the young pathologist. It is distressing that the high quality of its binding, paper, and illustrations has made the book so costly.

GEOFFREY HADFIELD.

ECZEMATOUS REACTIONS

The Eczemas. A Symposium by Ten Authors. Edited by L. J. A. Loewenthal, M.D., M.R.C.P., D.T.M.&H. (Pp. 267; 77 figures. 35s.) Edinburgh and London: E. and S. Livingstone Ltd.

This is a useful publication to the dermatologist in that it brings together the views of numerous authorities from different parts of the world on various aspects of approach to the complex eczematous reactions.

The main clinical presentations—the contact, allergic, atopic, infective, and seborrhoeic eczematous reactions—are clearly expounded by outstanding teachers of the British, American, and Continental schools. The significance of patch test and of more elaborate investigations, as that of resistance to alkalis, acids, and solvents, is discussed in detail, and a chapter by Haxthausen on theoretical considerations of the allergic mechanism involved is of great interest. Dr. Storck discusses the place of pyogenic organisms in relation to some types of eczema and in the dissemination of eczema by sensitization. There are useful chapters on differential diagnosis and on treatment which will be much appreciated by the practitioner. The illustrations are mostly good and explain much in the text. There are useful lists of appropriate concentrations to be employed for patch-testing and prescriptions for topical application.

It is to be regretted that, with contributions from various centres and climates dealing with patients of different races, including black and white, no more is made of the relative incidence and of the differing characters of eczema in these subjects. It is perhaps not sufficiently stressed that eczema is not a disease entity but a pattern of reaction, and that underlying its protean manifestations there are certain essential and fundamental similarities. However, it is important and valuable to have this body of knowledge on so hotly disputed a subject collected together for reference, and Dr. Loewenthal is to be congratulated upon this service he has done his colleagues.

J. T. INGRAM.

GENERAL VIROLOGY

General Virology. By S. E. Luria. (Pp. 427+xiii; illustrated. 68s.) New York: John Wiley and Sons Inc. London: Chapman and Hall. 1953.

Interest in viruses was first aroused by the recognition of their importance as the causal agents in diseases of animals or plants, and, indeed, many of the books dealing with viruses are concerned with their pathogenic role. The more extensive works are mostly joint efforts by specialists in various aspects of the virus field. This book is the most comprehensive work by a single author that has yet appeared on virology treated as a biological science. In consequence the treatment is more uniform than in larger works with multiple authorship, though the examples chosen from the whole field to illustrate general principles naturally reflect the author's particular interest. In the chapters on virus-host interaction the bacterial viruses are discussed at considerably greater length than are plant and animal viruses. The bacteriophage-bacterium system has yielded more readily to intensive study by biochemists and biologists, and the author's original contributions in the bacteriophage field have been very considerable. Nevertheless, throughout most of the book animal and plant viruses have been considered in parallel with the bacterial viruses, and the uniformity of mechanisms stressed where the data seem to warrant it.

This excellent book is stated to be an outgrowth of a course on viruses for graduate and advanced undergraduate students in biology and biochemistry, but specialists in various fields of virology, including those whose interests are mainly in virus infections of man, will find it stimulating and informative.

A. W. DOWNIE.

CONGENITAL HEART DISEASE

Traité des Cardiopathies Congénitales. Sous la direction de E. Donzelot et F. D'Allaines. Par R. Heim de Balsac, C. Metianu, M. Durand, et C. Dubost. (Pp. 1,118; 1,155 figures. 13,800 fr.) Paris: Masson. 1954.

This treatise on congenital heart disease is based on the work at the Broussais Hospital in Paris over the five years from 1947 to 1952. There the authors have studied some 1,110 patients, of whom about 600 have received surgical treatment. This is a large experience, and rivals in number that of Maude Abbott's Atlas in 1936. But all the cases described here have been investigated by modern methods and by the authors themselves. As a result the documentation is full and exceedingly well set out. The classification adopted is clinical and should be practical. The authors attach great importance to the ether test as an indicator for a veno-arterial shunt, for in these a positive reaction in the superficial vessels of the skin of the face is obtained. The teratology is dealt with shortly; in fact the part on embryology might have been fuller. There is a good chapter on the pathological physiology. The methods of examination include all the modern techniques; the authors indicate well their limits and their advantages, believing that wide experience will show many of the more elaborate to be superfluous. For the most part the skiagrams are good, but some of the angiograms might be better. The cardiograms are clear; it would be easier to follow them if the 12 or 15 (or more) complexes which are usually shown were always arranged in a standard pattern. The diagrams throughout are excellent, and there are many good illustrations of morbid specimens. It is interesting to read that the authors seek to distinguish between the hypertrophy from obstruction and that due to overfilling, and think that the cardiogram may help to show which is present—an idea which goes back to the early days of Corvisart and Bouillaud in their discussion of concentric and eccentric hypertrophy. This is indeed an amazing work, all the personal experience of the authors. There are full lists of references at the end of each chapter. The index is most efficient. This fine work has everything to recommend it, but alas, at what a price!

TERENCE EAST.

POPULAR MEDICAL HISTORY

Bouquet for the Doctor. By Dorothy Fisk. Preface by Sir Alexander Fleming, F.R.S. (Pp. 241+xii; 17 illustrations. 18s.) London, Melbourne, and Toronto: William Heinemann Ltd. 1954.

The publishers of this book well describe it as a "panorama of the progress of medical science—the achievement of a truly international company." It is an attempt to write a popular "History of Medicine," which Sir Alexander Fleming in a preface, with characteristic understatement, calls "a difficult task." I thoroughly enjoyed reading the result. The sketches of the men responsible for marking the epochs described are brilliant, but we are never allowed to forget the labours of the lesser, sometimes unknown, men who made the discoveries possible. The life stories of Harvey, Sydenham, Jenner, Lister, Pasteur, to mention only a few of those commemorated, are told with a sure hand and with an unflinching sense of proportion, as well as with a refreshing sense of humour. One is tempted to quote, but I will limit myself to the author's summary of the amazing career of John of Gaddesden: "His was a well-to-do practice but there is no record that he sent the poor away empty-handed—if they succeeded in approaching him." Though the book is eminently light-hearted there is ample evidence of the trouble taken by the author to get her facts right. The illustrations are excellent and worthy of the text. In short, the book is a credit to all concerned in its production.

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REHABILITATION

Though rehabilitation is a relatively new term in medicine, those in medical practice have always striven, so far as circumstances allowed, to achieve "the fullest possible restoration to normal life and working efficiency of a person incapacitated by disease or injury."¹ Often, however, especially in the case of severely disabled industrial workers, circumstances were not favourable: medical facilities were sometimes inadequate, means of providing on a large scale such requisites as suitable living accommodation and transport did not exist, and jobs compatible with the patient's disability were unavailable. In times of economic crisis no jobs, either compatible or incompatible with disability, were to be had.

The present differs from the past in two important respects. First, as a result of extensive legislation, including the Disabled Persons (Employment) Act of 1944 and the National Health Service Act of 1946, elaborate machinery now exists for reablement, resettlement, and, if necessary, retraining of the handicapped. Secondly, and of equal importance, there is now almost full employment in this country, so that jobs for the disabled are more readily available. In consequence immense progress has been made during the past ten years in industrial rehabilitation and resettlement. A more recent development is in the field of social resettlement. Under Section 29 of the National Assistance Act of 1948, local authorities can provide for the disabled such facilities as social and occupational centres, hostels, structural adaptations to the home, and transport from home to places of worship and recreation. Social resettlement has a special application in helping the disabled housewife² to lead a more useful and constructive existence; it may also result in freeing for productive work able-bodied men and women previously tied to looking after sick relatives at home. That social resettlement has not developed to the same extent as industrial rehabilitation is partly due to its more recent introduction, but chiefly because local authorities are only now beginning to exercise the powers given to them under the National Assistance Act.

Rehabilitation may be an exceedingly complicated process, its success depending on enlightened team-

work and good administrative integration. The case of a man with loss of function of both lower limbs as a result of anterior poliomyelitis will illustrate what is involved. He lives, perhaps, in an old-fashioned house with steps up to the front door, and it can be assumed that wherever he lives he is some distance from a place of work. His various requirements, together with the bodies charged with providing them, can be listed as follows: (1) a period of reablement in hospital, where he receives physical treatment and occupational therapy, and is provided with callipers and elbow crutches (Ministry of Health through the hospital services); (2) ground-floor living accommodation (local authority); (3) a mechanically propelled tricycle (Ministry of Health); (4) a garage for the tricycle (Ministry of Health); (5) the construction of a special gate and runway between the road and the garage (local authority); and (6) a job suitable for his disability (Ministry of Labour through the disablement resettlement officer). Retraining may be necessary at a Government training centre, possibly after a period of convalescence at an industrial rehabilitation unit (Ministry of Labour). Admittedly the above example is an extreme and fortunately an uncommon one, but in such a case a long period of delay and frustration is inevitable and interdepartmental bickerings likely unless all the officials concerned work closely together. But this is not always so at the present time.

To survey the whole field of rehabilitation an inter-departmental committee was set up over a year ago under the chairmanship of Lord Piercy. Evidence has been given before this committee by many bodies, including the Council of the British Medical Association. The written evidence submitted by the B.M.A. was prepared by a special committee under the chairmanship of Professor R. E. Tunbridge. The committee's report³ is published this week and a short summary appears on page 1490. The report—a most comprehensive document and the fifth on rehabilitation that the Association has produced since 1912—deals with many aspects of the problem, particularly on the industrial side. Much of it is concerned with ways and means of improving administrative integration. One of the most important recommendations is that the duties of each Ministry concerned in rehabilitation should be clarified. At the moment it is often impossible to determine where any of the three Ministries concerned—Health, Labour and National Service, Pensions and National Insurance—

¹ "Report on Rehabilitation," by a Special Committee of the B.M.A., *British Medical Journal Supplement*, 1946, 1, 187.

² See annotation, *British Medical Journal*, 1953, 1, 323.

³ *The Rehabilitation and Resettlement of Disabled Persons*, 1954, British Medical Association, London.

ance—as well as the various local authority committees, should assume full responsibility and where responsibility should be shared. Another important recommendation is that the present series of D.P. (disabled person) forms be replaced by a new, single (and more simple) type. Most of the existing forms are too complex and often impossible to fill up correctly. Moreover, even when completed they serve little useful purpose, since no corresponding data concerning job analysis in industry exist.

The report also recommends that the disablement resettlement officer (D.R.O.) should have more extensive and appropriate training; his office should be a specialized appointment with its own grades, and the practice stopped whereby for the administrative convenience of his Ministry he is transferred from one place to another, often when the work he is doing is most fruitful. It is suggested that far more use should be made of resettlement clinics; these should be an integral part of all major hospitals or groups of hospitals, the clinic being available for general practitioners and D.R.O.s, as well as for the hospital staffs. Finally, the report re-emphasizes that the initial drive as well as the responsibility for the continuation of a rehabilitation service must come from the medical profession.

This leads to a most important question—the place of the doctor in rehabilitation. On this the Council of the Association has definite views:

“Continuous medical supervision of the patient is necessary throughout all stages of rehabilitation. By this the Council means that the patient is always under the close personal care of the medical practitioner appropriate to the particular stage of rehabilitation, confidential information about the patient being passed on as one medical practitioner takes over the responsibility from another.”

As so many non-medical persons and official bodies are concerned in rehabilitation the role of the medical practitioner is apt to be overlooked, hence the importance of the Council's statement: “Indeed, there is no stage short of complete recovery at which the doctor could hand over all responsibility to non-medical personnel.”

SMOKING AND LUNG CANCER

Further evidence that tobacco smoking plays some part in causing lung cancer is given in the opening pages of the *Journal* this week by Dr. Richard Doll and Professor A. Bradford Hill, F.R.S. Gained by means of a different approach from that hitherto taken, it confirms in two important respects the conclusions already drawn.¹⁻³ These are, first, that the death rate from lung cancer is higher among smokers

(particularly of cigarettes) than among non-smokers, and, secondly, that the death rate from lung cancer among smokers increases with the amount smoked.

Previous studies of this problem were carried out by comparing the smoking history of lung-cancer patients with that of patients suffering from other diseases. The present study is distinct in that the subjects—members of the medical profession in the United Kingdom—were first sorted by smoking history, and the occurrence or not of lung cancer in the various groups of smokers and non-smokers was and is still being investigated. In October, 1951, Doll and Bradford Hill sent a short questionnaire to doctors in the United Kingdom asking them to give certain replies about their smoking habits. By this means sufficient information was obtained to classify into non-smoking or various smoking categories about 40,000 of the nearly 60,000 medical men and women to whom the questionnaire was sent. Since the questionnaire was issued the Registrars-General have informed Doll and Bradford Hill of the cause of death of every doctor. Thus it has been possible to compare the cause with the smoking history, the comparison being restricted to male doctors aged 35 and over, since lung cancer is uncommon in women and rare in young men. Of the 789 deaths considered, 36 were due to lung cancer. The death rate from this cause among non-smokers was nil, for smokers 0.66 per thousand. The death rates in the three smoking groups defined were as follows: 1-14 g. daily (1 cigarette=1 g. of tobacco), 0.48; 15-24 g. daily, 0.67; 25 g. or more daily, 1.14. The number of deaths from lung cancer in the last group, the heavy smokers, is twice the number expected if the deaths had been distributed evenly among all categories of smokers and non-smokers. There is also some confirmatory evidence, though not technically significant, that cigarette smoking is a greater hazard than pipe smoking. Among the other causes of death which Doll and Bradford Hill have studied in relation to smoking category only coronary thrombosis shows a notably increasing death rate with increase of amount smoked. But the upward trend is not so marked as that for lung cancer, and these workers conclude merely that there may be some causative relation between smoking and a subgroup of the coronary-thrombosis cases.

The figures are rather surprising in showing no considerable increase in deaths from respiratory diseases (other than cancer) with increase of smoking. It might have been supposed that the

¹ Doll, R., and Hill, A. B., *British Medical Journal*, 1950, 2, 739.
² *Ibid.*, 1952, 2, 1271.

³ Wynder, E. L., and Graham, E. A., *J. Amer. med. Ass.*, 1950, 143, 329

severe “smoker's cough”—which the smoker so often attempts to palliate by lighting another cigarette—would predispose to fatal respiratory conditions, but this inquiry has shown no evidence of it yet. In an article on p. 1473, however, Dr. K. N. V. Palmer records that bronchitis was found to be significantly commoner in adult male smokers than non-smokers. He too found not only that the incidence of bronchitis was higher among the smokers than among the non-smokers in his group of patients, but that among smokers the incidence increased with the amount smoked. He found clinical evidence of bronchitis in 32% of the smokers as compared with 18% of the non-smokers. When the smokers were classified into light, moderate, and heavy, the percentages in each group showing clinical evidence of bronchitis were respectively 23, 31, and 69. The figures for history of bronchitis and radiological evidence of it point the same way.

According to a report in the *Manchester Guardian* of June 23 Dr. Cuyler Hammond, of Yale, has just given a preliminary account of an investigation on similar lines to that of Doll and Hill. Some of the conclusions reported are that after the age of 50 cigarette smokers have almost twice as high a death rate as non-smokers from all causes, that coronary disease is higher in cigarette smokers than in non-smokers, and—what Dr. Hammond describes as “a most unexpected discovery”—that there is a “cause and effect relationship between cigarette smoking and all kinds of cancer.” Cigar and pipe smokers come out of his survey unscathed. We await with interest the publication of Dr. Hammond's findings.

THE GLASGOW MEETING

The 122nd Annual Meeting of the British Medical Association will be held in Glasgow next week, and from the programme published in last week's *Supplement* it is evident that our hosts of the Glasgow Division have spared no effort to give members of the Association a real Scottish welcome to one of the principal cities and university towns of Britain. According to precedent the first part will be devoted to the business of the Annual Representative Meeting, “the doctors' Parliament,” as it has been so aptly described. The A.R.M. is the policy-making body of the Association, and this is a prerogative that can be assumed by no other unit within the B.M.A. The A.R.M. has proved itself over many years as the sound testing ground for the policies advocated by the various committees through the Council of the

Association, and the assembled Representatives have invariably shown a shrewd appreciation of the facts of any situation presented to it.

The agenda, published in the *Supplement* of June 19, shows that the Divisions have scrutinized carefully the Annual Report of Council and its Supplementary Report. The large number of motions and amendments under “Hospital and Consultant Services” is a sufficient reminder, if any were needed, that the A.R.M. is not principally concerned with matters relating to general practice—a reminder, too, that we are one profession and not two, three, or more professions with conflicting interests. It was said by some in the time preceding the N.H.S. Act and the appointed day of 1948 that the N.H.S. was something that chiefly affected general practitioners. But events have shown that the hospital and consultant world has equally been caught up in the machinery of the State, and, with little precedent to guide it, has had to carry out negotiations of extreme complexity. If some consultants are sensitive in detecting a critical note in the motions and amendments on the agenda they may yet reflect that open argument is their greatest safeguard now and in the future, and that the A.R.M. is a most fair-minded body with a traditional respect for facts and an Anglo-Saxon distaste for theory. If there is some disquiet over the remuneration of consultants, specialists, and hospital medical staff, this necessary aspect of professional life is also of much concern to our colleagues in the Public Health Service, whose interests the Association has always done its best to promote. General practitioners will watch with interest and sympathy the debate on the scheme for the restoration of the right to buy and sell goodwill, and the motions under “General Medical Services” show how closely Divisions follow the wide-ranging activities conducted for general practitioners by the G.M.S. Committee. Among other matters may be noted the progressively important work of the Occupational Health Committee, and the first account of work in progress by the Constitution Committee.

The B.M.A., coming to the end of another successful year's work under the continued guidance of Dr. E. A. Gregg, the Chairman of Council, moulds and is moulded by the varied scientific and professional forces of a great profession which by its nature can never remain static. The interests of the Association are the interests of the whole profession, and the unity of the whole must accommodate within it diversity if the unity is to be other than a dull unison. And as a meeting place for diverse and critical minds the A.R.M. is a remarkable illustration of how diversity with unity can be maintained in a spirit of free inquiry.

DESENSITIZATION TO ANTIBIOTICS

When a person develops cutaneous hypersensitivity to a substance he uses at work the easiest course is to remove him from the hazard and to prevent re-exposure. This is the usual practice when the work is unskilled and when the worker does not lose much in prospects or wages through being moved to another job. It is more serious when a person who is highly trained and in specialized work becomes sensitized to some substance that must be handled every day in the course of the work. Avoiding the hazard may entail wrecking a career after years of training: for instance, a nurse trained in the treatment of venereal diseases may find it impossible to continue with this work if she develops cutaneous sensitivity to penicillin; or a nurse wishing to specialize in the treatment of tuberculosis may find her ambition thwarted if she becomes sensitive to streptomycin. Similar difficulties arise with doctors and veterinary surgeons. It is no use continuing to expose the sensitized individual to the hazard in the hope that "hardening" may occur. Hardening may seem to occur in some cases of acquired general hypersensitivity, but in many of these cases the hypersensitivity is linked with some temporary lowering of psychophysical well-being. Hardening does not occur in cases of specific hypersensitivity, including the forms due to penicillin or streptomycin: on the contrary, repeated exposure to the sensitizer leads to an ever-increasing degree of hypersensitivity, and in the end the sufferer finds that it is impossible to continue in the work.

A recent report from the Ministry of Health¹ has emphasized the extent of the problem. It has been shown that the wearing of gloves, masks, and gowns does not prevent reactions in people sensitive to streptomycin, though scrupulous attention to the avoidance of mist-production by all streptomycin handlers may reduce the incidence. Contamination may occur when preparing or giving injections, or when cleaning used syringes. The vigorous ejection against the side of a sink of the water used to clean a syringe may produce enough mist to cause a reaction.² Can these people be desensitized to penicillin and to streptomycin? Recent papers by Alexander³ and Crofton⁴ suggest that they can be and that the procedure is not unduly tedious, causing little or no distress. Alexander describes the desensitization of a nurse whose duties entailed giving injections of penicillin to patients suffering from syphilis. The nurse suffered from dermatitis of the hands, and patch tests with penicillin were positive. The initial dose used was 50 units of aqueous penicillin given every three hours, the dose being doubled every day, unless reactions occurred, until a dose of 200,000 units per injection could be taken without reaction. The dermatitis of the hands healed during the desensitizing course, except for minor exacerbations, which necessitated temporary reductions of the doses. The whole course lasted twenty days, the nurse being able to continue at work all the time. Alexander used the intramuscular route, regarding this as logical because penicillin is given therapeutically in this way. Peck *et al.*⁵ described desensitization of seven people to penicillin by the subcutaneous route and one by the oral route. So long ago as 1946 O'Donovan and Klorfajn⁶ reported complete desensitization of a penicillin-sensitive patient by oral administration of penicillin. Actinic sensitivity which was also present faded with the penicillin sensitivity.

Sensitization to streptomycin is often much more intense than sensitization to penicillin. Sometimes a nurse is unable to enter a room where streptomycin is handled without developing redness and itching of the eyelids, a phenomenon usually regarded as indicating air-borne transference of the sensitizer. Wheeler⁷ described the desensitization of a nurse by a course of injections, at first subcutaneous, later intramuscular, starting with 50 µg. and rising to 0.8 g. of streptomycin. The dose was doubled every other day when possible. Crofton reported⁴ the desensitization to streptomycin of a nursing sister by a course of intramuscular injections lasting thirty-five days; the dosage began at 10 µg. and rose to 1 g. A course of injections of dihydrostreptomycin, from 50 µg. to 0.5 g. over a period of fifteen weeks, failed to desensitize another nurse against streptomycin, but a subsequent course of streptomycin, from 50 µg. to 1 g. over another period of eight weeks, was successful, intradermal and patch tests to streptomycin becoming negative. Russell⁸ reported partial desensitization of a nurse to streptomycin following the intradermal injection of streptomycin in doses from 0.1 mg. to 2.2 mg. over a period of twenty-six days.

It seems from these observations that desensitization to penicillin or streptomycin can be carried out in a few weeks without much difficulty and that the intramuscular, subcutaneous, intradermal, or (with penicillin) the oral route can be used. Whether the immunity so induced is permanent remains to be seen.

PROTEIN SYNTHESIS

Our early training in chemistry impressed on us the importance of the elements constituting a substance: sulphuric acid was different from hydrochloric acid because it was H_2SO_4 and not HCl . But as we proceeded to organic chemistry elementary constitution lost its importance, most of the substances that we learnt of being built up from three or four elements only. Instead, we were impressed with the importance of the arrangements of atoms to form specific groupings, and it was these groupings that determined the peculiar characteristics of any compound. Organic chemistry was bewildering because of the multiplicity of the

possible groupings of just a few elements. In the field of protein chemistry we are presented with enormous possibilities of variation; a single molecule may be built up of chains of thousands of amino-acid residues of a dozen or more types; the possibilities of varying the sequence of amino-acid residues along the chains are immense; different sequences will impose different physical and chemical properties on the molecule and will determine the manner in which it is possible to fold the chains into specific configurations. Hence, although the number of different atom species on which we can ring the changes is small, we are at no loss to explain the number of proteins that must exist—a very great number indeed, as is clearly shown by species specificity. For human serum albumin differs from bovine albumin, which differs from rabbit albumin, and so on. Thus, individuality in the protein components of an organism is apparently determined by a pattern of amino-acids condensed to form polypeptide chains. The living organism reproduces itself, so that the species characteristics are retained in the offspring. It would be absurd to suggest that all the different proteins in the organism are represented in the reproductive cells, like so many animals in Noah's Ark, and that these reproduce themselves; instead, it seems probable that the power to synthesize these proteins, and to develop the various other species and individual characteristics, is bound up in the nucleus and possibly also in the distinct regions of the cytoplasm, the plasmagones. The substance of the chromosomes and plasmagones must therefore be such as to permit of a very wide range of variation in its physical and chemical properties. It is here that the nucleic acids become of interest, first, in being essential components of the gene substance, and secondly by their close connexion with the synthesis of protein—the dominant feature in cell multiplication.

Deoxyribonucleic acid (D.N.A.) is found exclusively in the nucleus and is almost certainly a fundamental constituent of the gene substance. Ribonucleic acid is found in both the nucleus and the cytoplasm and becomes prominent during phases of protein synthesis. Both of these nucleic acids, therefore, because of their special functions, must exist in a wide variety of forms. Like the proteins, they are built up of long chains, not of amino-acids, however, but of alternating molecules of sugar, purine base, and phosphate. Variations in chemical and physical properties could doubtless be achieved by variation in the order in which the different purine bases are built into the chains, but the difficulty in establishing experimentally whether this is indeed the case lies in the problem of separating the different nucleic acids from each other. In a recent paper¹ an ingenious application of chromatography to the problem has been described; with its aid several fractions have been separated from a preparation of nucleic acid, and there is good reason to believe that these fractions represent only a gross separation, so that ultimately it may be shown that "the deoxyribonucleic acid of a particular species consists of a continuous distribution of molecular species with varying ratios of the purine bases."

The synthesis of protein may be observed in its most pronounced form in the multiplication of a virus. The tobacco mosaic virus is apparently no more than a protein linked to nucleic acid. Rob the virus of its nucleic acid and it can no longer multiply; hence it is the presence of nucleic acid that determines the power of the organism to reproduce itself. Moreover, if the modern viewpoint is correct, it is the peculiar arrangement of the purine bases in the nucleic acid which determines that the virus will reproduce itself and not synthesize some new type of protein. How the nucleic acids can exert their influence is not known; presumably they enter into the synthetic reactions as catalysts, influencing, by virtue of their own structure, the sequence in which amino-acids are condensed to form polypeptide chains.

THE MINISTER ON GENERAL PRACTICE

The Minister of Health, opening extensions to the East Ham Chest Clinic on June 21, gave his views about the future of general practice in an important speech which is reported in this week's *Supplement* (p. 358). Many of those working in the Health Service may be tired of hearing pleas for improved co-operation, but Mr. Macleod's sensible, well-informed, and friendly remarks will surely be welcomed by all general practitioners. He said that in his two years of office he had not introduced a single health Bill, for he was convinced that it was more important to make existing legislation work than to introduce new Acts. In what he called "good" areas there was excellent co-operation between all branches of the Service, but that sort of co-operation could not be achieved by circular or regulation. "What I want to see," he said, "is the spirit of team-work in general practice devoted to the service of the patient such as we have already in hospital." The Minister agreed that the same pattern of general practice would not do for every area: health centres and group practice might be suitable for some areas but not for all. The soundness of the links between the general practitioner and the hospital was of the first importance. Not only should ordinary hospital facilities be open to him, but he should be welcome and know that he was welcome in all the local hospitals. The Minister emphasized that hospital reports on patients should not be regarded as routine form-filling, but should be considered statements from a senior member of the staff. If the link between the general practitioner at the hospital was continued through the work of the health visitor, then we might be getting somewhere near the ideal of the general practitioner as the head of a clinical team as diverse in its own way as the team which looked after the patients in hospital. Mr. Macleod also spoke about improving co-operation between the general practitioner and the medical officer of health. Because of the great demands on the curative medical services it might be difficult at present to concentrate on the preventive side, but, he concluded, the National Health Service ought to be designed to promote health.

¹ *British Medical Journal*, 1953, 2, 39.
² Whitwell, G. P. B., *Lancet*, 1953, 2, 139.
³ *Arch. Derm. Syph. (Chicago)*, 1953, 68, 323.
⁴ *British Medical Journal*, 1953, 2, 1014.
⁵ *J. Amer. med. Ass.*, 1948, 138, 631.
⁶ *Lancet*, 1946, 2, 444.
⁷ *British Medical Journal*, 1953, 2, 149.
⁸ *Ibid.*, 1953, 2, 1322.

¹ Brown, G. L., and Watson, M., *Nature*, 1953, 172, 339.

CLINICAL PATHOLOGY IN GENERAL PRACTICE POLYCYTHAEMIA, LEUKAEMIA, AND CYTOPENIA

BY

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In most branches of medicine the excellent advice to "define one's terms" is neglected, but in haematology the necessity is inescapable, more particularly because the meaning of a term cannot always be derived from a study of its etymology. "Polycythaemia" is an example of this difficulty; it might well be expected to indicate an increase in number of all the cells in the blood, but by accepted usage its meaning is restricted to an increase above normal in the number of erythrocytes per cubic millimetre. It is qualified sometimes by the adjective "rubra," an illicit union of Greek and Latin, which, if distasteful to the classicist, gives it greater precision.

By derivation the word "leukaemia" means white blood, and this was exactly what Virchow intended to indicate when he devised it in 1845. The morbid anatomists have since shown us that its basis is an unexplained and uncontrolled proliferation of primitive leucocytes throughout the haemopoietic organs; leukaemia in the sense of white blood is an inconstant epiphenomenon, but the term is too well established to be replaced by one more logical.

"Cytopenia" means a reduction below the normal in the number of cells per cubic millimetre of blood; it is used in a non-specific sense and is applicable to erythrocytes, leucocytes, or platelets. Sometimes it is qualified by the prefix "pan," when it indicates a simultaneous reduction in all three of these elements.

POLYCYTHAEMIA

The significance of an erythrocyte count cannot be appreciated without knowledge of the limits of normal. Discombe, in an earlier article in this series,* has given the normal ranges as follows: erythrocytes 4,300,000-6,400,000 per c.mm.; haemoglobin 12-17 g. per 100 ml. (100% Haldane=14.8 g. per 100 ml.); and the packed red cell volume 42-48%. Polycythaemia rubra, therefore, may be defined as a state in which the erythrocyte count exceeds 6,400,000 per c.mm. This increase is almost invariably accompanied by a parallel increase in the packed cell volume and usually by a rise in the haemoglobin level.

Relative Polycythaemia

An increase in the erythrocyte count does not necessarily indicate an increase in the total number of circulating erythrocytes. It may be due to a reduction in the plasma volume and is then to be observed when dehydration occurs from a reduced intake of fluid, diarrhoea, vomiting, or profuse sweating; or when there is a sudden effusion of plasma into damaged tissues as in the shock of thermal burns and the crush syndrome. In all these conditions the increase in the erythrocyte count is transient and the cause evident; diagnosis is not in doubt, but blood examination often affords a useful index of the degree of blood concentration and thus of the reduction in plasma volume. This type of disturbance is sometimes described as "relative polycythaemia."

One variety demands special mention because it is often confused with polycythaemia vera. It is commonly seen

*British Medical Journal, 1954, 1, 326.

in middle-aged males in whom anxiety symptoms are salient; hypertension is present in at least half the patients and splenomegaly never occurs. The erythrocyte count is moderately raised, seldom exceeding 7,000,000 per c.mm.; the leucocyte count is below 10,000 per c.mm., and no immature forms are seen. Recent observations on the blood volume of such patients by J. H. Lawrence and his colleagues* have shown that the plasma volume is reduced and the total erythrocyte mass is not increased. The recognition of this disorder is important because treatment aimed at reducing the total erythrocyte volume is likely to be harmful. The condition is probably that described by Gaisbock in 1922 as polycythaemia hypertonica, although an attempt has been made to rename it, in the fashionable idiom, "stress erythrocytosis."

Secondary Polycythaemia

Polycythaemia, often termed secondary, occurs in anoxic states whatever their cause. The most striking examples are met with in cyanotic congenital heart disease in which the erythrocyte count may exceed 9,000,000 per c.mm. with a parallel elevation in the haemoglobin level. It is rare, but has occasionally been noted, in acquired (rheumatic) heart disease. In lesser degree it is common in pulmonary disease, particularly emphysema and fibrosis of the lung; it is a feature of diffuse atheroma of the pulmonary vessels. Its occurrence at high altitudes is well known, and it is seen when anoxia is due to decrease of the oxygen-carrying capacity of the blood in sulphaemoglobinemia and occasionally with cerebral tumour its occurrence is well attested but ill understood. In all these varieties of secondary polycythaemia there is an increase in the total erythrocyte mass, but the plasma volume is usually somewhat reduced; splenomegaly does not occur, unless for some unrelated reason, and the leucocyte and platelet counts are normal.

Polycythaemia Rubra Vera

Polycythaemia rubra vera is a disorder of the haemopoietic tissues characterized by a marked and persistent increase in the total erythrocyte count. It is, however, a disease in which all the elements of the bone marrow proliferate, and leucocytosis with thrombocytosis is the rule. The clinical features are a cyanosis, plum-coloured in winter and brick-red in summer, with splenomegaly. The erythrocyte count may be as high as 12,000,000 per c.mm., and in about 10% of patients normoblasts are observed. The haemoglobin reading may exceed 20 g. per 100 ml. The packed cell volume (haematocrit) is constantly above 50% and may reach 75%. Three-quarters of the patients have a leucocyte count above 10,000 per c.mm. Blood volume studies have shown the total mass of circulating erythrocytes to be increased, sometimes to three times normal; the plasma volume is normal or somewhat reduced.

Diagnosis requires a persistently raised erythrocyte count without other cause for its elevation; in the absence of blood volume estimations a diagnosis of polycythaemia vera should not be entertained when the figure is below 7,000,000 per c.mm. It is made likely by an increase in

*Lawrence, J. H., Berlin, N. I., and Huff, R. L., *Medicine*, 1953, 32, 323.

the leucocyte count, due to an excess of myeloid cells, particularly when immature forms are present, by a raised platelet count, and by splenomegaly.

LEUKAEMIA

The cellular proliferation of leukaemia "breeds true," and thus three cytological types—myeloid, lymphatic, and monocytic—can be recognized. The process may be acute or chronic; however, only three well-defined clinical varieties exist because the acute forms, in the main, differ only cytologically and chronic monocytic leukaemia is of extreme rarity. These clinical forms are acute leukaemia, chronic myeloid leukaemia, and chronic lymphatic leukaemia.

The proliferative process affects the blood in three ways. First, the proliferated cells may overflow into the circulation, causing alterations in the peripheral leucocyte count which may be qualitative or both quantitative and qualitative; when the total leucocyte count is not increased the unfortunate epithet "aleukaemic" is applied. Secondly, by a process of crowding out or by differentiation of primitive cells to the leukaemic type, the other elements in the bone marrow are reduced in number, and anaemia, thrombocytopenia, and leucopenia ensue. Thirdly, secondary effects, probably related to splenomegaly, may occur; of these the haemolytic anaemia, which sometimes complicates chronic lymphatic leukaemia, is the most important.

Acute Leukaemia

The patient with acute leukaemia usually comes under observation because of anaemia or a haemorrhagic state. The degree of anaemia is variable, but often intense, haemoglobin levels of 3-5 g. per 100 ml. being common; the erythrocytes are commonly of normal size and well filled with haemoglobin; thus the mean corpuscular volume (M.C.V.) and mean corpuscular haemoglobin concentration (M.C.H.C.) are normal. Occasionally some macrocytosis is noted but the M.C.V. seldom exceeds 110 μ^3 . In most instances regenerative phenomena, such as reticulocytosis, polychromasia, and normoblastosis are lacking. In the more acute varieties the platelet count is reduced when the patient is first seen; in all it falls progressively as the disease advances. Haemorrhagic phenomena, a prolonged bleeding time, diminished clot retraction, and a positive tourniquet test usually accompany its reduction.

The leucocyte count varies. It is probably true to say that normal or low figures are more common than high, particularly in the myeloid form. There may be a profound leucopenia of 500 cells per c.mm. or less or an extreme leucocytosis of 250,000 per c.mm. or more. The predominant cell varies with the type of leukaemia. In the acute myeloid form it is the myeloblast, and these cells may form 95% of the circulating leucocytes. In the leucopenic cases, however, the proportion of myeloblasts may be as low as 5%. It is noteworthy that the myeloid cells show no regular gradation from the most primitive to the most mature and that a "hiatus leukaemicus" (Naegeli) often separates the myeloblasts from the granulocytes (see Fig. 1). In acute lymphatic leukaemia again the total leucocytes count varies, but it is the rule for lymphoid elements to be present in obvious excess; in some cases these are easily classifiable as lymphoblasts, but frequently less primitive cells predominate. In monocytic leukaemia there is almost always a leucocytosis, although it is seldom above 30,000-40,000 per c.mm. Monoblasts and promonocytes predominate and usually form a high proportion of the total.

In the leucopenic forms, particularly when the proportion of primitive cells is low, firm diagnosis is impossible without examination of the bone marrow. The findings are usually characteristic; the marrow is richly cellular and 80-90% of the cells are primitive myeloid, lymphoid, or monocytic elements. In acute myeloid leukaemia the changes are sometimes less clear-cut, particularly when the

disease is not rapidly progressive; here the proliferation may be mainly at the level of the promyelocyte or less commonly affecting equally promyelocytes and myelocytes.

The diagnosis of acute leukaemia is not usually difficult when the results of blood and bone-marrow examinations are available. Aplastic anaemia may be suggested by the blood count; the leucoerythroblastic anaemia of skeletal carcinomatosis should not cause confusion, for the hiatus leukaemicus is lacking (Fig. 1). Leukaemoid reactions to infection or acute haemolysis seldom give rise to the preponderance of primitive cells seen in acute leukaemia. An exception to this is the myeloblastic response occasionally seen with generalized tuberculosis; it may be impossible on haematological grounds alone to distinguish this from acute myeloid leukaemia.

Chronic Myeloid Leukaemia

In chronic myeloid leukaemia there is seldom any difficulty in diagnosis. By the time the patient seeks advice the changes in the blood are usually fully developed and characteristic. Anaemia of moderate severity is the rule, the haemoglobin level lying most often between 6.5 and 7.5 g. per 100 ml.; the erythrocyte count is reduced in proportion, the anaemia being normocytic and normochromic; occasional normoblasts may be seen. The platelet count is normal or raised, sometimes to figures above 750,000 per c.mm. The striking alteration is, however, in the leucocytes: the total number is increased, most often perhaps to about 250,000 per c.mm., but counts of above 1,000,000 per c.mm. are sometimes seen. These high figures are due entirely to a great excess of myeloid cells; fully segmented neutrophils usually predominate, and if the cells are placed in grades it will be found that the numbers in each diminish with decreasing maturity. This dispersion is shown in Fig. 2, where the maturity of the myeloid cells of blood and bone marrow in a case of chronic myeloid leukaemia is compared.

Deviations from the picture described are rarely seen, except after treatment, when the blood may be indistinguishable from normal. Occasionally, however, chance

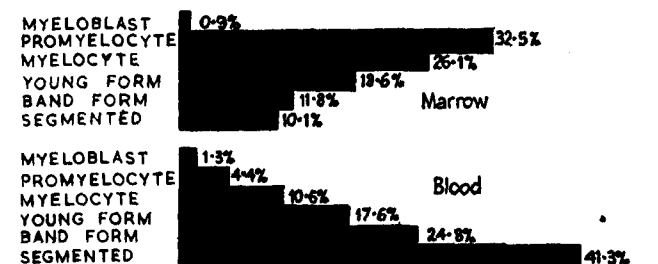


FIG. 2.—Histograms showing maturity dispersion of myeloid cells in marrow and blood in a case of chronic myeloid leukaemia. (Reproduced by permission of the editor of the *Quarterly Journal of Medicine*.)

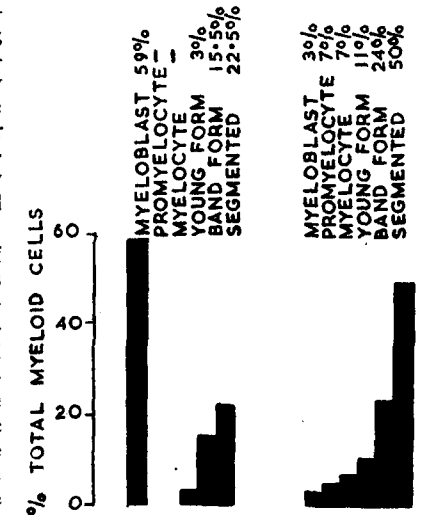


FIG. 1.—Histograms showing maturity dispersion of myeloid cells in the blood in aleukaemic myeloid leukaemia (left) and erythroblastic anaemia (right). Note the "hiatus leukaemicus" in the left-hand histogram. (Reproduced by permission of the editor of the *Proceedings of the Royal Society of Medicine*.)

directs that the blood count shall be made before the characteristic changes have developed, and in such instances a persistent and unexplained neutrophil leucocytosis is discovered; when such patients are followed the typical haematological features of the disease are found gradually to appear. It is unlikely that a true leucopenic, or aleukaemic, chronic myeloid leukaemia ever occurs. Such a label has often been attached in the past to patients now recognized as suffering from myelosclerosis in whom the blood changes are those of leuco-erythroblastic anaemia.

In many typical cases of chronic myeloid leukaemia increase in the eosinophil and basophil granulocytes is to be noted; rarely eosinophils, and much more rarely basophils, predominate; these varieties are spoken of as chronic eosinophilic or basophilic leukaemia. More common is a form in which the features of polycythaemia rubra vera and chronic myeloid leukaemia both exist; in such cases neither the erythrocyte nor the leucocyte counts usually reach the high levels which occur in typical examples of either disease. This disorder has been given the name "chronic erythromyelosis."

Chronic Lymphatic Leukaemia

In chronic lymphatic leukaemia the only constant feature of the blood count is a relative, and usually also an absolute, increase in lymphocytes. In the early stages the total leucocyte count is often below 20,000 per c.mm., with lymphocytes making up perhaps 60-80% of the total. As the disease progresses the total leucocyte count rises and may reach figures in excess of 300,000 per c.mm.; with this increase there is a parallel rise in the number of lymphocytes, which may surpass 99%. The type of cell varies: in the more chronic form it is the small lymphocyte; in others a larger cell with more abundant cytoplasm and an indented nucleus—"the lymphosarcoma cell" of some authors—may occur. In all a characteristic feature is the uniformity of cell type. Lymphocytes are more fragile than other leucocytes and often fragment when films are made, to leave numerous "basket cells," "smear cells," or "Gumprecht's shadows." This is particularly true of the less mature varieties.

In the earlier stages of many cases of chronic lymphatic leukaemia anaemia is absent and the platelet count unaffected. After months or years lymphoid infiltration of the bone marrow makes its appearance and there is a progressive fall in erythrocyte and platelet counts. Terminally, profound anaemia and thrombocytopenia are common.

In a proportion of patients with this disease a symptomatic haemolytic anaemia supervenes, imposing upon the haematological features of chronic lymphatic leukaemia those of excessive blood destruction. A rise in the serum bilirubin, urobilinuria, a sudden aggravation of anaemia with reticulocytosis, and a positive Coombs test mark this complication.

Bone-marrow puncture biopsy is of limited value in diagnosis because lymphoid infiltration of the marrow is seldom intense in the early stages, when extreme peripheral lymphocytosis is lacking and anaemia slight.

CYTOPENIA

Cytopenia has already been defined as a non-specific term indicating a reduction in some or all of the types of cell of the circulating blood. In the present discussion it is used in the restricted sense of leucopenia or reduction in the number of leucocytes per cubic millimetre; erythrocytopenia and thrombocytopenia are considered only when associated with it.

The lower limit of the leucocyte count in health is about 3,100 per c.mm. (Discombe), although it is rare to meet figures below 3,600 per c.mm. Leucopenia may therefore be said to exist when the count falls below 3,000 per c.mm. It will be appreciated that this figure refers to the sum total of the leucocytes, a term which embraces all five varieties of normal white blood cell. In the present con-

nexion the neutrophils are of outstanding importance, because leucopenia is virtually synonymous with neutropenia. Lymphopenia occurs rarely and in practical haematology is most frequently the result of radiotherapy. The lower limit of the normal neutrophil count may be taken as 2,500 per c.mm. and of the lymphocyte count as 1,000 per c.mm. When leucopenia is profound the neutrophils are most affected, but all other varieties of leucocyte are also greatly diminished in number.

Ex hypothesi neutropenia or any other cytopenia might be brought about by defective formation of the cells in question, by their excessive destruction, or by some impediment to their emigration from the bone marrow. Little practical help is gained by attempting to compress the causes of neutropenia into these categories, because in many instances the operative mechanism is not understood. The following classification does little more than group together the neutropenias by the disorders with which they are associated.

Infections

There are certain infections in which leucopenia is commonly stated to be a characteristic or even a diagnostic feature. These are the enteric group of fevers, brucellosis, virus infections such as influenza and sandfly fever, and the typhus fevers. Application of the criteria proposed by Discombe shows that these infections are marked rather by absence of leucocytosis than by leucopenia. It is relatively uncommon for the leucocyte count to fall below 3,000 per c.mm. in any of them. In the differential count neutropenia with "shift to the left" is the main feature, usually with an absence of eosinophils.

Leucopenia is the rule in malaria and kala-azar; in the latter it may be extreme and associated with necrotic angina or other secondary infection. In both these disorders it is possible that the neutropenia is "splenic" in the sense considered below.

Infections of overwhelming severity, particularly some examples of septicaemia and generalized miliary tuberculosis, may be accompanied by neutropenia. It is difficult to distinguish infections, the severity of which is enhanced by pre-existing neutropenia, from those intense enough to paralyse leucopoiesis.

Bone-marrow Failure

When the haemopoietic functions of the bone marrow are destroyed by physical or chemical agents, pancytopenia results. There is a normocytic normochromic anaemia without evidence of blood regeneration; the leucocyte count falls, perhaps to a few hundreds per c.mm., with disappearance of granular cells; the platelet count is similarly reduced. Such damage may result from exposure to radioactive substances or may be caused by a rapidly increasing number of drugs and other chemical products. The same picture is sometimes seen without apparent extrinsic cause, when it is termed "idiopathic aplastic anaemia."

It is more common for damage to the bone marrow, whether physical or chemical in nature, to be less overwhelming and to affect predominantly one cytological series, often the leucocytes. This sequence is well seen with therapeutic irradiation and after such drugs as the nitrogen mustards and triethylene melamine. There is an initial slow fall in lymphocytes which is followed by a sudden and precipitous drop in the neutrophil count when large doses are used.

Cytopenia is a sequel of bone-marrow failure due to other causes. Leucopenia is the rule with the functional disturbance of leucopoiesis which accompanies the erythroblastic hyperplasia both of pernicious and of hypochromic anaemia. It is common when the bone marrow is invaded or replaced by abnormal cellular proliferations as in leukaemia, myelomatosis, carcinomatosis, and myelosclerosis. The blood changes in leukaemia have already been considered. In the three last disorders pancytopenia with-

out qualitative changes may occur; in carcinomatosis, but especially in myelosclerosis, a leuco-erythroblastic anaemia is common. This is marked by a normochromic normocytic anaemia with a moderate reticulocytosis and normoblastosis; the leucocytes are commonly reduced in numbers, but the differential count shows a "shift to the left" of the granular cells from a high percentage of segmented neutrophils to an occasional myeloblast with a regular reduction in the proportions of the intermediate classes as their maturity diminishes (see Fig. 1); there is thrombocytopenia. Leuco-erythroblastic anaemia is considerably less common in myelomatosis; in this disease the leucopenia is often more striking than the anaemia or the thrombocytopenia, but occasionally the blood is flooded with the proliferating cells to cause a "plasma-cell leukaemia."

Associated with Splenomegaly

Leucopenia, often with thrombocytopenia, marks many diseases in which there is massive splenomegaly. Examples in which this association is common are congestive splenomegaly (Banti's syndrome), Felty's syndrome, and Gaucher's disease. It is occasionally observed in Hodgkin's disease, Boeck's sarcoidosis, and various forms of reticulosis and reticulosarcoma causing outstanding enlargement of the spleen. This symptom-complex is sometimes termed secondary splenic neutropenia; a primary variety has been recorded in which the excised spleen shows only non-specific reactive hyperplasia.

Although splenectomy is usually followed by restoration of the blood count to normal, the exact connexion between the spleen and the leucopenia is uncertain. Examination of the bone marrow shows hyperplasia of the myeloid series, and thus distinguishes these cases from those in which leucopenia is due to aplasia. It has been suggested that the spleen exerts some inhibitory influence upon discharge of leucocytes from the bone marrow.

Immuno-neutropenia

This ungainly term describes a variety of neutropenia apparently due to antineutrophil substances of the immune-body type. Moeschlin and Wagner established this mechanism as operative in agranulocytosis due to amidopyrine*; the leucocyte antibody acts in the presence of antigen as an agglutinin, and destruction of agglutinated neutrophils is thought to proceed in the lungs. In agranulocytosis of this type the leucocyte count falls precipitously within an hour or two of taking the causative drug; figures of 200-300 per c.mm. with absence of granular cells are not rare. Bone-marrow changes vary with the duration and the intensity of the leucopenia; when short and mild most of the myeloid series, except the mature granulocytes, are well represented; with increasing severity and duration there is progressive disappearance of this series, starting with the most mature elements and finally leaving the bone marrow depleted. These changes, formerly attributed to maturation-arrest, are now thought to be due to active depletion of the bone marrow by the intense peripheral destruction of granulocytes.

The importance of this cause of neutropenia is not yet known. It may well be responsible in acute diffuse lupus erythematosus in which pancytopenia is the rule; it has been recorded in primary atypical pneumonia. It seems probable that it explains the common agranulocytosis of explosive onset seen not only after amidopyrine but with sulphonamide, thiouracil, troxidone, tripeleminamine, and many other drugs.

Cyclical or Periodic Neutropenia

This is a rare disorder, often starting in infancy, in which periods of extreme neutropenia alternate with periods in which the leucocyte count is within normal limits. There is no anaemia or thrombocytopenia, and bone-marrow

*Acta haematol., Basel, 1952, 8, 29.

examination shows normal granulopoiesis. The leucocyte count will often show a pure neutropenia, sometimes with an absolute increase in lymphocytes and eosinophils. During the neutropenic phases infective phenomena are common. The cause is unknown and the course extends over many years; in some instances spontaneous recovery occurs.

Next article on Clinical Pathology.—"Post-mortem Technique for the Occasional Performer," by Dr. T. V. Cooper.

Refresher Course Book.—The first collection of articles in the Refresher Course for General Practitioners (fully revised) are available as a book containing 55 chapters, price 25s. Copies can be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

PAEDIATRICS AND CHILD HEALTH IN FRANCE

BY

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In France, children's diseases occur against a background which is in most respects similar to that in this country, but there are certain differences of climate, race, and distribution of population, while social and economic factors are of even greater importance. The area of France is more than twice that of Great Britain, but the population is only 42 millions, of whom a considerably smaller proportion live in towns and suburbs; so the problems of rural medicine are important. Nevertheless, the highest infant mortality rates occur in the industrial and densely populated regions of the Nord and the Pas-de-Calais. Until 1941 the population had been declining, as a result of the low birth rate, for nearly a century, but this tendency has now been reversed by the generous maternity benefits and family allowances under social security, and in 1951 the birth rate was 19.4 and the natural increase in population 6.1 per 1,000. There is, in addition, a certain amount of immigration, and at present about two million foreigners are in the country, of whom the Algerians (400,000) form the largest group.

Wages are low, and the cost of living is higher than in this country, but wage-earners with children are greatly helped by the "allocations familiales," which often exceed the father's wages. There is a fixed payment for a child born within two years of marriage, a monthly allowance which reaches its maximum for the second and third children, and an additional payment if the father is the only wage-earner in the family. Examples of the family allowances are:

No. of Children	Mother Working	Mother at Home
1	—	1,725 fr. per month
2	4,385 fr. per month	11,285 " " "
3	11,000 " " "	19,625 " " "
4	17,610 " " "	26,235 " " "

Nutrition and Diet

Since the war food has been plentiful, and a high proportion of the family income is spent on it, so that malnutrition and deficiency diseases are uncommon, but the French children are shorter and considerably lighter than British children of the same age (see Table I). No doubt racial

TABLE I.—Average Heights and Weights of Boys and Girls

Age	Height (cm.)		Weight (kg.)	
	French	British	French	British
3 years ..	87	92	12.6	15.0
6 " ..	106	113	17.0	20.3
10 " ..	129	135	25.2	29.6
15 " ..	151	161	44.4	51.0

factors account in part for these differences, at least in height, but the figures suggest that either British children are unduly fat or there is a considerable amount of sub-optimal nutrition in France. If this is so, it may be because children of school age spend more time indoors and less on games, because the national dietary (with a high proportion of bread and meat, and large infrequent meals) is not so suitable for children, and because the consumption of milk is lower in France. Milk is not provided free in schools, and its hygienic quality leaves much to be desired in many districts, so that it is customarily made safe by boiling, with consequent loss of palatability. It has recently been made compulsory in towns of more than 20,000 inhabitants for milk to be pasteurized and sold in sealed bottles.

Social Factors

The standard of housing accommodation is generally lower than in this country, and serious overcrowding exists. This and alcoholism are the greatest social problems in France to-day, and they lead to a large number of broken homes and a high incidence of psychiatric disorders.

Education is compulsory between the ages of 6 and 14, and school subjects are similar to those taught in this country, but there is less physical education, and no milk or subsidized meals are provided. Children go to school on Saturdays, but have a half-holiday on Thursdays, because it is thought that a break in the middle of the week is better for them than a long week-end.

Incidence of Disease

It is difficult to judge the relative incidence of disease in the two countries in the absence of morbidity figures, but it is the impression of clinicians who have worked in both countries that the general pattern is the same. However, it seems that juvenile rheumatism and coeliac disease are more frequent in Great Britain, as are respiratory infections of all kinds. The latter are no doubt due largely to climatic and atmospheric differences, but the better heating of buildings in France may also be a factor. Tuberculosis, on the other hand, is more frequent in France, where, in 1951, the death rate was 60 per 100,000, compared with 31.5 here. Although it is difficult to be certain, because tuberculosis is not notifiable in France, the morbidity rate is probably higher also, and this and overcrowded living conditions account for the higher death rates from tuberculosis among children (Table II).

TABLE II.—Death Rates from Tuberculosis in 1951, per 100,000

Age	France	England and Wales
0-1 year ..	65	14.7
1-5 years ..	25	15
5-10 " ..	8	4.7
10-15 " ..	7.5	4.4

The infant mortality was 41.5 per 1,000 live births in 1951, compared with 29.7 in England and Wales, and analysis of the causes shows that "prematurity" takes first place in both countries and pneumonia comes second, but congenital malformations account for 4.34 per 1,000 in England and Wales and only 2.89 per 1,000 in France.

Another interesting comparison is given by the figures for fatal accidents in 1950 (Table III). The much higher road

TABLE III.—Fatal Accidents in 1950

Cause	France (Population 42 m.)			England and Wales (Population 44 m.)		
	0-1 Year	2-5 Years	6-15 Years	0-1 Year	2-5 Years	Years
Motor vehicle ..	5	47	77	3	265	430
Poisoning ..	15	21	19	8	53	15
Other accidents ..	307	937	551	750	565	464
Total ..	327	1,005	647	761	883	909
		1,979			2,553	

deaths in this country are no doubt due largely to the fact that a greater proportion of children live in built-up areas, but straighter roads and the absence of ribbon development in France are contributory factors.

Medical Arrangements

Sick children are first treated either by the family doctor or by a paediatrician, to whom the family have direct access and of whom there is one in most towns of 20,000 or more inhabitants. There are approved scales of fees, and patients insured under the social security scheme can claim back 80% of these fees and the same proportion of the cost of medicines; but the fees actually charged are usually somewhat higher than those approved. Also 80% of the cost of hospital treatment is reimbursed, except in case of maternity, infectious diseases, and illnesses lasting more than six months, when it is 100%. People who are not insured pay according to their means, assessed by the hospital's social service, up to the full cost, which is between £2 and £3 a day in the public hospitals. This figure includes drugs and operations, but laboratory and radiological examinations and consultations are extra. Children's hospitals and the children's services of general hospitals provide 0.24 bed per 1,000 of the population, and private clinics 0.019; the main differences from the hospitals of this country are that they admit children up to the age of 16, and that a greater proportion of the accommodation is in children's hospitals, many general hospitals having no children's wards. Daily visiting is the rule.

The hospitals have for many years ceased to depend on voluntary contributions, but they have not been "nationalized" and are not controlled in any way by the Ministry of Health. Instead, they are administered by the "Assistance Publique" of each town or département, and are generally self-supporting by virtue of the contributions they receive from their patients, though in some cases they may be subsidized by the municipality. The medical staff are unpaid, or receive only a small honorarium, and they attend in the mornings only, except for one or more "internes de garde," who are on duty all day and sleep in the hospital. Nurses are already trained and have obtained their State diploma when they come to work in a children's hospital, but the training lasts for only two years and the course is the same as for general nursing. There is, however, an additional "Diplôme d'Etat de Puéricultrice," instituted in 1947, which may be taken for a further year's study. Hospital nurses are usually non-resident, and their duties are arranged not in two shifts but in three. Otherwise, the personnel of a hospital is much the same as in this country, except that there is perhaps a smaller proportion of auxiliary workers such as physiotherapists, speech therapists, orthopodists, and clerical staff.

Convalescent homes number 300, with more than 9,000 places, and there are nearly 34,000 beds in establishments concerned with the fight against tuberculosis. Provision for chronic sick and handicapped children is not as good as in this country, and only a few of them, in institutions like the Hôpital Raymond-Poincaré, at Garches, Seine-et-Oise, receive formal education.

Preventive Services

The preventive and public health services, which have been greatly extended since the war, include antenatal, postnatal, and infant welfare clinics; additional maternity bene-

fits are paid to those who attend regularly and to mothers who breast-feed their babies. There are, however, no dietary supplements provided free or at reduced prices. Expectant fathers may attend antenatal clinics in many areas, to undergo chest fluoroscopy and a blood test; the same investigations are included in prenuptial medical examinations, which are compulsory throughout the country.

To combat further the infant mortality, of which prematurity is such an important cause, a network of premature-baby units, with a total of more than 1,800 cots and possessing 720 incubators, has been set up to cover the whole country. Transport arrangements are such that a premature baby may be quickly taken in a portable incubator, from wherever it may have been born, to one of these centres. The principal centre, at the École de Puériculture de Paris, has 55 cots, and in 1951 achieved the remarkable result of rearing 152 out of 198 babies weighing between 2½ and 4 lb. (1.2 and 1.8 kg.) at birth.

Infant welfare clinics now number 8,200 and fulfil much the same functions as in this country, but there is no distribution of welfare foods. The clinics are taken mainly by doctors who are also in practice locally, but there are 45 full-time medical officers, who are mainly occupied travelling with mobile "consultations itinérantes," which visit villages where it may be difficult to have a fixed centre. Corresponding to not large enough to have a fixed centre. Corresponding to health visitors are the "assistantes sociales," whose training consists of one year's medical study (unless they are already trained nurses) and two years' social study. Preventive inoculations are given at these clinics, and also by private doctors and at hospitals, against smallpox, diphtheria, tetanus, typhoid, pertussis, and tuberculosis. The first three are obligatory, and B.C.G. vaccination is now compulsory for the following categories: (1) All children born in 1938 and 1939 who are still tuberculin-negative. (2) Children admitted to residential or day nurseries. (3) Those exposed to infection in the home (where the source of infection is receiving sickness benefit). (4) Teachers and other persons employed in schools. (5) Medical and dental students, nurses, and all other hospital personnel. (6) Entrants to the armed Forces.

It is intended gradually to extend the age groups for compulsory B.C.G. vaccination until in 1957 all children will be vaccinated in the year in which they reach their sixth birthday. Removal from infectious surroundings to a foster-home or to a "préventorium" or "aérium" is arranged two months before vaccination, and the children remain away until the tuberculin test becomes positive, or until after they have been vaccinated a second time if it is still negative after three months.

The vaccine is prepared at the Institut Pasteur in Paris, where Dr. Guérin is happily still living.

Homeless Children

In consequence of the housing shortage, alcoholism, and other causes, there are a large number of broken homes, and many children are abandoned by their parents, either permanently or temporarily, and have to be taken into care by the State. In 1951, in the Département de la Seine alone, there were 27,263 such children, of whom 12,591 had been abandoned permanently (Lelong, 1953). Homeless children are received first at a "dispensaire de triage," where they undergo a full medical and psychiatric examination (the latter is particularly important, for many of the children are abandoned at a relatively late age, consequently there is difficulty in readaptation). Those who are not adopted privately are boarded out, where possible, under a "centre de placement familial surveillé," which is a group of foster-mothers, usually in a country district, round a centre of supervision. Foster-mothers are, in any case, subject to close surveillance by "assistantes sociales," who visit them at intervals of from one to six months, according to the age of the children.

Medical Education and Training

There are a number of important differences between the training of doctors in France and in this country. There is

not so much competition to enter medical schools, and in consequence less selection on entry, but about 50% fail the examinations in anatomy and physiology. Clinical subjects are studied from the beginning, and the minimum duration of the course is six years. After the end of their third year, students are eligible to compete for posts as "externes," when they are responsible for keeping the case-notes and carrying out such procedures as lumbar puncture in the wards of one of the teaching hospitals. From among the "externes," "internes" are chosen by competitive examination, and the duration of internship is four years. These posts are highly valued, and to have held one almost counts as a higher qualification, but their number is such that, at least in Paris, only 4% of students achieve internship. The time is divided into eight periods of six months each, which may be spent in as many different hospitals, and in as many different specialties, but students who have already decided to follow a special subject usually spend at least two years of their internship in that specialty. The duties of "internes" are similar to those of senior residents in this country, but they do not necessarily live in hospital, except when it is their turn to act as "interne de garde." There are no compulsory hospital appointments, and most students qualify without having been either an "interne" or an "externe," but all have to write a thesis. They are then granted the degree of "Docteur en Médecine"; the abbreviation Dr. is used, but not the letters M.D.

All the students spend six months studying paediatrics, followed by an examination, in their third clinical year, and there is a further optional term in the sixth year. Those who wish to specialize in paediatrics take a postgraduate course lasting four years which leads to the "Certificat d'Études Spéciales de Pédiatrie et Puériculture"; but those who have been "internes" or "chefs de clinique" (a higher hospital post corresponding to registrar) in an approved paediatric service are allowed to count that time towards the four years.

There are paediatric teaching departments in nine of the Paris hospitals, the principal ones being at the Enfants Malades, Trousseau, and St. Vincent de Paul. They are attended by students of the Paris Faculty of Medicine, and also by postgraduates from many European countries, as well as from the French colonies. The main provincial teaching centres are at Lille, Lyons, and Strasbourg. In Paris there is also the École de Puériculture, which trains doctors, nurses, students, and "assistantes sociales" in the various aspects of child health, has a large premature-baby unit and a breast-milk bank, and a ward for babies who are "feeding problems."

The International Children's Centre, founded in 1949 and supported by Unicef, is concerned with "all the problems pertaining to childhood with the exception of education." It holds conferences and postgraduate courses; conducts research into growth, vaccination, and immunization; has an excellent library; and publishes a monthly journal, the *Courrier*. There are six other paediatric journals published in France, and flourishing paediatric societies, which meet once a month, in Paris and other large centres, while the "Association des Pédiatres de la Langue Française" holds a congress every two years.

History

France has played a large part in the development of paediatrics, perhaps the greatest of any country. The Hôpital des Enfants Malades, Paris, founded in 1676, was the first children's hospital in the world, and now has 1,200 beds. The infant welfare movement is attributed to Budin, Professor of Obstetrics in Paris, who held his first clinic in 1892. The discoveries of Louis Pasteur led to the prevention of infectious diseases, and the principle of preventive isolation was established by Grancher. In the present century, perhaps the greatest advance has been the preparation of B.C.G. vaccine by Calmette and Guérin. France lagged behind other European countries in some aspects of public health between the two wars, but since 1945 great efforts have been made by the Ministry of Health and Population,

and the results are shown in the greatly improved infant and child mortality figures.

We acknowledge with pleasure the help we have received from Professors Debré and Lelong and members of their staffs, from Drs. Alison and Lotte, of the Institut National d'Hygiène, Dr. Frank Falkner, and the Librarian of the Centre International de l'Enfance. Above all, we are grateful to Dr. J. J. Kempton, who first suggested this study to us, for his constant help and encouragement. One of us (K. W. L.) wishes to thank the staff of the Hôpital des Enfants Malades for all the kindness shown to him during the tenure of his bursary, given by the Ciba Foundation and the Institut National d'Hygiène; and the Board of Governors of the Hospital for Sick Children, Great Ormond Street, for granting him leave of absence.

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REHABILITATING THE DISABLED

A B.M.A. REVIEW OF THE POSITION

At the invitation of the Interdepartmental Committee on Rehabilitation and Resettlement of Disabled Persons, the Council of the British Medical Association set up a special committee to prepare a memorandum of evidence. The committee of 17 members, under the chairmanship of Professor R. E. Tunbridge, of Leeds, was a highly expert body, including orthopaedic surgeons, directors of university or hospital departments of industrial health, medical officers to industrial rehabilitation units, a medical officer of health, medical officers to large industrial concerns, a regional psychiatrist, and four general practitioners from industrial areas. The committee also had the assistance of certain experts from specialized fields. The result of the committee's labours is now published as a report of Council. It is a thesis of 80 pages covering the whole subject and with many recommendations.¹

The Nature of Rehabilitation

The size of the problem cannot be gauged, but it is assumed in the memorandum that 25% of the patients passing through acute general hospitals could be helped by planned rehabilitation. Rehabilitation is an indivisible process; the whole man must be rehabilitated, including his emotional life and moral values. It is a question of team-work, involving not only medical but industrial and social skills, and especially the co-operation of the patient himself. The stages of acute illness, convalescence, and resettlement merge into one another. Nor can there be any real distinction between medical and industrial rehabilitation.

"In the opinion of the Council it is a special medical responsibility to ensure that the degree of invalidism during and after the illness, accident, or operation is minimal, and that the final degree of functional capacity attained should match the full potentialities of the individual. . . . Medical supervision continues to be necessary after active medical treatment has been completed. Indeed, there is no stage, short of complete recovery, at which the doctor could hand over all responsibility to non-medical personnel."

In the stage of acute illness the doctor will undertake active treatment; in the industrial rehabilitation unit he will supervise the patient's progress and advise on medical matters while other members of the team carry out their technical procedures. Social rehabilitation of the patient

¹ *The Rehabilitation and Resettlement of Disabled Persons*. London: British Medical Association. Free to members of the B.M.A. Price 1s. 6d. (inclusive of postage) to others.

also is important, and this is a medical responsibility, though the help of a social worker is invaluable.

The Resettlement Clinic

A comprehensive system in which the existing facilities are integrated is set out in the memorandum. The hospital or general practitioner may refer the patient to a resettlement clinic, through which the patient will proceed either to the industrial rehabilitation unit or some form of convalescence and back to his own work, or to different work, or to sheltered employment, or, if he remains seriously incapacitated, to home work. This resettlement clinic, within the N.H.S., should be an integral part of all major hospitals or hospital groups, and available alike to general practitioner or hospital staff. Its main function would be as a point of co-ordination for rehabilitation services and agencies inside and outside the hospital, a medico-social sorting centre, and a clinic for reference of cases. It would be staffed by a consultant, a general practitioner, an almoner, and a disablement officer, and the patient's doctor would be invited to attend the review of patients he had referred to the clinic.

Medical supervision is essential for giving purpose to convalescence. It is believed that some form of planned convalescence is needed by some 50,000 individuals every year. Planned convalescence will have a background of discipline. A patient normally engaged in heavy physical employment should receive during his convalescence a gradual reorientation of his outlook from that of an invalid to that of a responsible worker. At the resettlement clinic psychiatric advice should be available, as well as physical treatment, which must embrace medical gymnastics at this stage. The patient who needed still more specific post-operative measures would be prescribed a course at the industrial rehabilitation unit. "If the patient's rehabilitation has been satisfactory, he will be eager for resettlement."

The Return to Work

The assessment of the patient's ability to work must be a medical responsibility, undertaken in consultation with technical experts. Resettlement becomes more difficult with the segregation of industries in particular areas, so that there is no suitable alternative employment in the patient's neighbourhood; also with the increase in mechanization, which compels the individual to proceed at the pace of the machine. It is often found that a man can return to his old work if some readjustment of machinery is made. More imagination and initiative might be shown in this respect. Some account is given of sheltered employment, such as the Papworth Village Settlement, the Bargoed factory set up by Austin Motors for disabled ex-miners, and the Scottish enterprise "Haven Products," a socio-medical experiment in industry. Day-occupation centres are also desirable for severely disabled persons too handicapped to be employed in sheltered industry. Work for the home-bound has two aspects, diversionary and productive, both of therapeutic value. A word is said about the disabled housewife who could be assisted through the welfare services of the local authority on a medical practitioner's recommendation.

The memorandum also deals with the special problems of resettlement in cases of tuberculosis, dermatitis, rheumatism, epilepsy, blindness, and deafness. Certain recommendations are made concerning certification. There should be a certificate of partial fitness. The D.P. forms might be simplified. The disabled persons register should be constantly reviewed. More disablement resettlement officers should be employed. The role of the physiotherapist, the occupational therapist, and the social worker is discussed. On the question of incentives it is recommended that the receipt of statutory benefits should be dependent on regular attendance for whatever form of treatment may be prescribed. Research is called for into methods of follow-up, classification of disabilities, and the like, as well as education for doctors (in the form of special courses), industrialists, and the general public. "Rehabilitation is not merely physical treatment but a regeneration of the spirit."

In man the morning drop in eosinophils was associated with a fall in lymphocytes, but because of a concomitant neutrophilia the total white cell count usually rose during the morning.

The daily changes in the circulating eosinophils in rats and mice appeared largely to be related to light. If the lighting rhythm were reversed, and the rats were kept in the dark during the daytime but exposed to light at night, the eosinophil cycle became reversed in about nine days, irrespective of any dietary changes. Under conditions of restricted diet the daily feeding time could also influence the eosinophil cycle. However, even if there were no periodic synchronizers of the eosinophil cycle, and both lighting and feeding times were irregular, a cycle was present. Moreover, in blinded mice a new and shorter cycle might become apparent, with reversal of rhythm, after 20 to 30 days. Observations on the effects of adrenalectomy, both in man and in animals, suggested that the adrenals were an important part of the mechanism which controlled the daily eosinophil cycle, and possibly other functions with a periodicity of 24 hours. The adrenal cycle developed earlier in life than the sex cycle, and might persist under some circumstances which abolished the latter.

Dr. HOWARD R. BIERMAN (Medical Centre, Duarte, California) then described investigations in man upon the sequestration of leucocytes. He pointed out that eight sites had been shown in man to play a part in the mechanism of leucocyte sequestration—that is, withdrawal from the circulation for a varying period of time. These sites were the lungs, not lymphocytes. Dr. Bierman concluded the in the lungs, not lymphocytes. Dr. Bierman concluded the in the lungs, not lymphocytes. Dr. Bierman concluded the in the lungs, not lymphocytes.

The pulmonary circulation in particular had shown a remarkable capacity for the rapid removal from the blood, over prolonged periods, of transfused leucocytes. On the other hand, the administration of adrenaline resulted in the rapid discharge of leucocytes into the circulation. It was predominantly granulocytes which underwent sequestration in the lungs, not lymphocytes. Dr. Bierman concluded the in the lungs, not lymphocytes. Dr. Bierman concluded the in the lungs, not lymphocytes.

Dr. KENNETH M. RICHTER (University of Oklahoma School of Medicine) showed a film illustrating the formation of droplets in leucocytes, and their subsequent discharge into the surrounding medium.

Leucopenia and Hormone Control

Dr. F. J. HECK (Mayo Clinic) discussed the different ways in which depression of leucocytes might occur. One type of leucopenia was that which was produced by benzene or irradiation, in which the leucopenia could be of gradual onset, with slow and prolonged recovery. On the other hand, there was the agranulocytic angina first noted by Schultz in 1922, in which in so many cases there was an acute febrile response, with angina and ulceration of mucous membranes. The leucopenia in these cases was usually precipitous, and recovery depended upon the removal of the cause, which might be one of 50 or more drugs, of which amidopyrine was the first to be noted in 1934.

Dr. ALBERT S. GORDON (New York University) reviewed the influence of hormones upon the numbers, fate, and distribution of leucocytes. The secretions of the pituitary and adrenal were those most concerned, and in the intact animal either the administration of adrenal cortical hormones (11-oxysteroids) or A.C.T.H., or exposure to stress, induced a characteristic blood picture in the intact animal, the main features being lymphopenia, eosinopenia, and neutrophilia. Eosinopenia occurring within a few hours was not due to diminished formation in the bone marrow, though when it followed the prolonged administration of cortical steroids the total number of marrow eosinophils was reduced. A method was described for the determination of the number of cells in the marrow of a single long bone.

Professor J. M. YOFFEY then gave an account of the quantitative studies of the nucleated cells of the bone marrow which were being made by a group of workers at Bristol. After describing the technique employed, he said that in the guinea-pigs employed the bone marrow as a whole contained (a) 10–20 times the number of lymphocytes present in the blood, and (b) something like 100 times the number of the circulating granulocytes. He reported the observations of Dr. R. S. Harris upon the effects of anoxia on the marrow content of erythroid cells and lymphocytes, and of Dr. R. J. Ancill on the quantitative changes in the marrow following the administration of bacteria. He also cited experiments by Dr. F. J. Ensell which showed that splenectomy was followed by a marked increase in the nucleated cell content of the marrow.

Chemotaxis and the Inflammatory Response

Dr. MORTON MCCUTCHEON (University of Pennsylvania) discussed the chemotactic properties of leucocytes. He first described the general phenomena of chemotaxis, and noted that the lymphocytes alone among the white cells showed no chemotactic properties. The granulocytes, on the other hand, displayed the most marked chemotaxis, both positive (moving towards) and negative (moving away). The mechanism of chemotaxis was still in many cases obscure. Quite strong chemotaxis could occur in the apparent absence of diffusible material, and other possible explanations involved either electrical forces or the differential absorption of plasma constituents to the test particles.

Dr. VALY MENKIN (Temple University School of Medicine, Philadelphia) reviewed some of the factors concerned with the mobilization of leucocytes during inflammation. Leucotaxine was concerned largely with the local migration of leucocytes. The cytological picture in inflammation depended to a large extent on changes in the hydrogen-ion concentration. From alkaline exudates a leucocytosis-promoting factor (LPF) could be isolated, and its active principle appeared to be a polypeptide. Its effect upon the bone marrow was to cause a discharge of immature granulocytes into the circulation, and also to stimulate hyperplasia of the remaining granulocytic elements. In acid exudates, on the other hand, a thermostable leucocytosis-promoting factor could be identified. Similarly, two leucopenic factors had been isolated, one from acid and one from alkaline exudates. Compound F (hydrocortisone) inhibited the formation both of leucotaxine and of the leucocytosis-promoting factor by injured cells.

Dr. ALBERT H. COONS (Harvard Medical School) gave a brief review of the evidence he had obtained, with the aid of fluorescent media, on the cells concerned in antibody formation. A large part of the antibody was formed by young and multiplying cells, of which the plasma cell was a mature end-form. Lymphocytes as such played a very small part if any in antibody formation, except in so far as the immature antibody-forming cells were closely related to the reticular lymphocytes or their precursors.

In Vitro Cell Differentiation

On the last day of the Conference the morning session was devoted to a consideration of the enzymes and other chemical constituents of leucocytes both in health and in disease. The final session in the afternoon took the form of a round-table discussion. Dr. O. A. TROWELL introduced the discussion with an account of his recent findings concerning the growth of lymphoid tissue in a synthetic culture medium, which contained Tyrode solution, glucose, 19 amino-acids, 2 of the B vitamins, co-carboxylase, and para-aminobenzoic acid. This gave much better results than serum. In this synthetic medium cell differentiation occurred, and small lymphocytes hypertrophied to become monocytes and macrophages. This change consistently occurred, and on a large scale, in every culture. The reticulum cells also grew more actively, the nucleus enlarging and the cytoplasm becoming basophilic. Many of the reticulum cells became phagocytic, but even these could transform into lymphocytes.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Drinking Sea-water

SIR,—I should like to reply to Dr. R. A. McIlraith's letter (*Journal*, May 29, p. 1264), which calls for an explanation of the present teaching that castaways should not drink sea-water. The reasons why they should not are as follows.^{1,2,3} A man deprived of an adequate intake of water continues to lose water through his skin, lungs, and kidneys. As a consequence the osmotic pressure of his body fluids rises, and this, rather than the change in their volume, eventually causes death. Ingestion of salt, or of fluids such as sea-water which contain salt in a concentration higher than is found in human urine, increases the hypertonicity and so hastens death. This is so whether the salt is retained in the body or excreted with expenditure of body water. Sea-water also causes water to move from the cells to the extracellular compartment. This probably explains the apparent benefit which has been reported after sea-water drinking for periods of up to four days,⁴ since most of the signs of dehydration actually depend on the state of the extracellular compartment only. Intracellular dehydration is, however, the cause of death and of the signs of failure of the central nervous system which apparently precede death.⁵

Dr. McIlraith's contention that salt lost in sweat should be replaced is not relevant to castaways. Sweat is a very dilute solution, and its loss leaves the body hypertonic. Only if the water lost is replaced by copious drinking can the concentration of body fluids fall below normal, and only then is salt beneficial. Unlike the crew of the *Kon-Tiki*, castaways would seldom have adequate supplies of fresh water. The foregoing account is based on a substantial weight of evidence, and Dr. Bombard has produced no evidence which casts doubt on it, either in his book⁶ or his technical report.⁴ He has based his argument simply on statements that a certain quantity of salt is "permissible," and that the effects of giving sea-water early or late in water deprivation are different (experimentally no difference has been found). No one wishes to discredit his achievement of crossing the Atlantic, but as scientific evidence it must be seen in its context. A number of other long voyages have been made in similar latitudes with little in the way of equipment or rations. The testimony of survivors in the past has been overwhelmingly against sea-water drinking. Moreover, a study of information collected from survivors of sinkings during the war shows a much higher death rate, under otherwise comparable conditions, in boats in which sea-water is known to have been drunk.⁷ As would be expected, this is most marked where the supplies of fresh water were smallest. That Dr. Bombard should have been able to survive for as long as 23 days drinking only sea-water and fluid obtained from fish is certainly remarkable, but we have no information as to how he was able to do this, and his voyage is at best an observation by one subject on himself, without "controls" or detailed measurements.

The Services' recommendations for castaways are based on a careful study of all the available practical information and on thorough laboratory trials. They can hardly be reversed on account of the teaching of one man, however sincere and enthusiastic, when this is not supported by any comparable evidence.—I am, etc.,

Cambridge.

G. R. HERVEY.

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Iodide in Goitre Due to P.A.S.

SIR.—We were interested to read the article by Dr. J. A. Balint and his colleagues (*Journal*, May 29, p. 1234) on the results of radio-iodine tests of thyroid function in patients receiving para-amino salicylic acid (P.A.S.). Four of their patients developed a goitre, and after P.A.S. had been withdrawn the goitre subsided in two of them, an effect ascribed to the potassium iodide given for a period of a week. It is not clear from their text whether any change occurred in the goitre of the other two patients, who were presumably also given iodide, although the radio-iodine tests were not subsequently repeated.

No evidence has been adduced in support of the assertion that a weekly dose of iodide is sufficient to counteract the antithyroid effect of P.A.S. We have studied over 30 cases of goitre following the use of P.A.S., six of the patients being markedly hypothyroid. In our experience, and in that of most other workers, there is a spontaneous regression of the goitre as soon as the P.A.S. is withdrawn, a regression which is accelerated by the administration of thyroid extract. If a patient continues to take P.A.S., remission of the goitre, and of symptoms of hypothyroidism, occurs if thyroid is given. One of our cases failed to respond in any way to the use of iodide in large doses, but the goitre disappeared as soon as thyroid was given instead. It is of interest that Brinkman and Coates¹ also found that iodide is quite ineffective in preventing the antithyroid effect of P.A.S.

The statement that iodide is effective implies that the antithyroid action of P.A.S. is upon the iodine-concentrating, rather than the iodine-binding, function of the thyroid gland. Such an effect would be similar to that of thiocyanate or perchlorate, and can be readily overcome by large doses of iodide. The efficacy of potassium iodide in these circumstances can only be proven by showing the effect while the P.A.S. is still being administered. The restoration of a normal radio-iodine excretion pattern only indicates that the previously existing iodine depletion of the gland has been abolished by the iodide. This is an effect which is demonstrable when iodide is given following the use of any goitrogenic agent, and does not imply any therapeutic result due to the iodide.—We are, etc.,

A. G. MACGREGOR.
A. R. SOMNER.

Edinburgh.

REFERENCE

- Amer. Rev. Tuberc.*, 1954, 69, 458.

Vaporizing Fluids Containing Phenols in the Treatment of Whooping-cough

SIR.—A recent tragic experience has reminded us that vaporizing fluids containing phenols are still being used in the home for the treatment of whooping-cough.

A child aged 20 months had had the disease for a fortnight when, on the recommendation of a friend, the parents bought a vaporizer. This consisted of a perforated metal cylinder which supported a shallow pan containing the vaporizing fluid. The latter contained 98% cresol and was warmed by a night light placed within the metal cylinder. The fluid was supplied in a fluted bottle which plainly stated that the contents were capable of producing severe burns if they came into contact with the skin. On the morning in question the child, who had been sleeping with her parents, climbed out of bed, pulled the vaporizer off the adjoining dressing-table, spilling the remaining cold undevaporized fluid over herself. Although admitted to hospital within half an hour she was already deeply unconscious. Whitish-brown burns covered the lower face, neck, upper part of the chest, and the front of both arms—about 20% of the body surface. The mouth was normal, but there was already alarming oedema of the larynx and widespread pulmonary oedema as well. In spite of immediate tracheotomy and careful resuscitation with intravenous fluids the child never regained consciousness and died suddenly, apparently from central respiratory failure, 26 hours after the accident.

The vaporizer on this occasion was obtained without the knowledge of the family doctor, but we know of occasions where it has apparently been used with his consent. It is perhaps not so well known as it should be that severe and fatal poisoning can occur from the absorption of phenol

through quite small areas of unbroken skin. On the other hand, there is not, so far as we know, any reliable evidence that cresol inhalations, or indeed inhalations of any kind, have the slightest effect on the course or outcome of whooping-cough. We realize that the treatment of whooping-cough is often tedious and unrewarding, but it is surely desirable that the dangerous and useless procedure described in this letter should be rejected by the profession and ultimately discarded by the public.—We are, etc.,

MARION BETHUNE.
DONALD COURT.

Newcastle-upon-Tyne.

Simple Thyroid Retractors

SIR.—With reference to Sir Heneage Ogilvie's description of a pair of thyroid retractors (*Journal*, June 5, p. 1319), Sloan's goitre retractors are even more useful when the retracting arms are made of unequal length, as the elbow of the appliance then falls more easily to the side of the neck. Sloan's own retractors have arms 5 in. and 6 in. (12.7 cm. and 15.2 cm.) long. A mirror-image pair is required. Sloan himself gave a pair to Mr. H. Frankling, who in turn gave them to me in 1932, and this pair has been in use ever since.

In Harrogate and Ripon we have used a set of similar equal-armed spreaders of differing sizes and strengths of spring in all sorts of operations for 22 years.—I am, etc.,

Harrogate.

T. V. PEARCE.

Cytodiagnosis of Bronchial Carcinoma

SIR.—Dr. Raymond Whitehead's remarks (*Journal*, May 29, p. 1254) about the place of exfoliative cytology in the diagnosis of bronchial cancer cannot be allowed to go unchallenged. He gives a most misleading impression of its value in this field, and his statement that he is unable to make positive diagnosis with confidence is hard to understand. I commenced the examination of sputum and bronchial washings for malignant cells by the Papanicolaou technique in 1952 after spending some months in Dr. Papanicolaou's laboratory. I have examined 875 specimens of sputum or bronchial washings by this technique and of 58 of them as malignant. In no case, so far as I am aware, has a false positive result been given; in one case which was reported as suspicious the lesion was finally proved to be non-malignant. False negatives there have been and always will be: a negative result is to be regarded as without significance; but false positive results should not occur. The method has proved its value to clinicians earlier diagnosis than would otherwise have been the case. In a few proved positive cases, cytological evidence was the only positive laboratory evidence of malignancy, and in more than one case the finding of malignant cells in sputum provided the first grounds for suspicion in cases where the possibility of malignancy had not been seriously considered.

Many tumours are beyond the reach of the bronchoscope, but such cases will be just as likely as the more accessible ones to give positive cytological preparations. I would go so far as to state that examination of sputum and bronchial washings by cytological methods will provide more positive results in cancer cases than will bronchoscopy. It is relevant to quote here the findings presented by two speakers at a symposium on exfoliative cytology held in New York City in October, 1951.¹ Herbut, of Philadelphia, referred to 500 malignant cases in 29% of which cytology provided the only positive laboratory evidence of malignancy, and Benioff, of San Francisco, reported on 162 proved cases in 24% of which cytology alone gave positive laboratory findings. The latter speaker stressed the value of the method in increasing the clinician's awareness of the possibilities of early diagnosis in lung cancer. The method is simplicity itself so far as the patient is concerned, and repeated examinations are easily arranged. Much tedious laboratory work is involved in negative cases, but surely this should not weigh against the proved value of the

method. It would be a great pity if Dr. Whitehead's remarks should deter clinicians from seeking the aid of a method of diagnosis which is long past the experimental stage and which has proved its usefulness in many parts of the world.—I am, etc.,

Grimsby.

F. HAMPSON.

REFERENCE

- Symposium on Exfoliative Cytology*, October, 1951, Abstracts of Papers and Discussions, unpublished.

Psychiatry and General Medicine

SIR.—I was greatly interested in the article entitled "Psychiatry and General Medicine" by Sir David Henderson (*Journal*, April 17, p. 889), which has just reached me. I am glad that he mentions malarial infection and anaemia as possible causes of personality disturbances, since I once had the unfortunate experience of suffering from both of these and becoming suspicious, irritable, aggressive, and acutely fear-stricken as he describes, and of being rendered incapable of treating myself. The purpose of this letter, however, is to draw Sir David's attention to his statement under "The Art of Case-Taking": "Very modestly it is suggested that our psychiatric case-taking methods may be of considerable value to our general medical colleagues. They will help them to remember that physical symptoms are often purely a face-saving device to maintain the *amour propre* of the patient. If this is forgotten, then examinations and treatments are introduced which often obscure the clinical picture."

Sometimes I think it can be the other way about. My own general medical colleague who first called in the alienist was "more psychiatric than the psychiatrist." True, in my case, on first examination in West Africa, no malaria parasites were found in my blood, and my temperature was only very slightly elevated, perhaps because I was still on suppressive doses of proguanil. However that may be, after examination by a psychiatrist colleague I was flown back to England with a diagnosis of schizophrenia, which stuck firmly even when about three weeks later, while I was a voluntary patient at a mental hospital, I developed a pyrexia of 105° F. (40.6° C.) and a *P. falciparum* parasitaemia (it seemed to be nobody's business to ensure that my prophylactic antimalarial was continued), and despite the fact that the admitting doctor who carried out a routine general examination said: "We are getting a lot of mental cases from the Tropics." Useless for my sister to inform the psychiatrists that I had always been mentally normal before and that there was no history of mental illness in our family, and useless for me to protest against being given quinine because of the possible danger of blackwater fever (I think they thought I was just being difficult).

So far from physical "examinations and treatments being introduced which often obscure the clinical picture," the staff doggedly attempted psychological examinations and treatments of just such a nature. My wife was told that I might have to be certified, psychotherapy was begun, and they tried unsuccessfully to persuade me to undergo a long course of insulin therapy. I thought that perhaps a proper course of antimalarial treatment would be better, gave three days' notice, and took my discharge against advice. I have never ceased to be thankful that I did. At home severe parasitaemia and anaemia were confirmed by the pathologist at the local hospital, and so I entered an institution where they knew all about the peculiarly virulent falciparum malaria that occurs in West Africa, but no more about psychiatry than any general hospital. Within two days I began to feel mentally normal again, and after about ten days I returned home perfectly fit.

The staff of the mental hospital contended that the malarial infection had little to do with the mental condition, and, like Sir David Henderson, probably think that the various bizarre physical symptoms that I produced were "a face-saving device to preserve my *amour propre*." They may be right, but such a theory must account for the facts that (a) I received virtually no psychiatric treatment, yet (b) my symptoms, both mental and physical, cleared

serious? Journalists have enough responsibilities of their own to bear without the burden of the sin-eater.

You, Sir, have in your leader columns encouraged the hope of better understanding between the medical and journalistic professions. It is earnestly to be hoped that this unfortunate affair—in which, I respectfully suggest, the fault was primarily Mr. Dickson Wright's—will not discourage this understanding.—I am, etc.,

RITCHIE CALDER,
Chairman of the Association of
British Science Writers.
Sutton, Surrey.

SIR,—I feel sure that Mr. Dickson Wright is right (*Journal*, June 12, p. 1350). If the heart goes into asystole, or the ventricles start to fibrillate during an operation, then each minute's delay in rectifying the defect must lessen the patient's chances of survival very greatly. The important thing is to know the precise moment at which the heart stops. To rely upon an occasional examination of the temporal pulse for this information strikes me as being completely archaic.

Therefore, I would say, anaesthetists should rely more on machines, not less, for have not machines proved themselves more accurate and reliable observers than men in many spheres? Being interested in the design of such a machine, I hope that Mr. Wright's requirements may soon be met.—I am, etc.,

Newcastle-upon-Tyne.

P. HEX VENN.

Varicocele and Male Subfertility

SIR,—The correspondence in the *Journal* (May 29, p. 1231, and June 12, p. 1378) reminds me of the violent change of surgical opinion about varicocele which has occurred in my lifetime. Formerly operation was obligatory for the Indian Civil Service, the Colonial Service, and was strongly recommended for the fighting Forces. Now it is generally condemned because in many cases atrophy follows. But there were excellent clinical reasons why it should have been recommended in the Services, for varicocele can be a most painful condition in tropical countries.

It must be admitted, however, that atrophy can occur after the usual operation, and the reason is mainly anatomical. If the spermatic artery is carefully isolated and the veins of the pampiniform plexus clamped and divided, what follows is that the arterial supply is undiminished but the venous return is heavily impeded. In consequence the testis swells at first, but eventually it atrophies. If a few veins are retained undivided around the artery this generally does not happen, but it is a matter of luck. If, however, a surgeon has the courage to ligature and excise the artery with the veins the congestion of the testis does not occur, but what does happen is that the artery to the vas rapidly hypertrophies and takes the place of the spermatic. The testis is not congested primarily, and in consequence no atrophy occurs as a sequela.—I am, etc.,

London, W.1.

J. JOHNSTON ABRAHAM.

Pancreatico-duodenectomy

SIR,—We have read with interest Mr. Gordon Ferguson's article (*Journal*, May 29, p. 1243) in which he describes two successful cases of pancreatico-duodenectomy. While agreeing with much that he says, and in particular with his enthusiastic attitude to the radical operation and his condemnation of the so-called palliative procedures in operable cases, there are two comments which we would like to make.

The first of these concerns age. In our recently published series¹ the age incidence in 49 cases was: 30–40, 2 cases; 40–50, 2; 50–60, 6; 60–70, 22; 70–80, 14; 80–90 3. Thus, one-third of our cases were over 70, and two of our patients over 80 both survived the radical operation. Age alone does not seem to be an important factor.

The second and much more important comment concerns early diagnosis, and this, we believe, can and should be reached in almost all cases long before the "month of painless jaundice" suggested by Dodd.² We believe that

all cases of jaundice over 30, whether painless or not, should be investigated by all clinical and laboratory methods, and a diagnosis reached within at most a fortnight. Once the diagnosis of obstructive jaundice is made, operation is indicated as a matter of urgency. Cattell and Warren state in their recent book³ that they, and most other American surgeons, now favour a one-stage operation, but that they feel that a two-stage operation is necessary in any patient who has a severe obstructive jaundice, "particularly if it has been present for several weeks." A two-stage operation means a delay of several weeks before the actual resection is done, and operability is further reduced thereby.—We are, etc.,

R. G. MOORE.

J. D. YOUNGHUSBAND.

Portsmouth.

REFERENCES

- ¹ *Brit. J. Surg.*, 1954, 41, 562.
- ² *British Medical Journal*, 1949, 2, 1509.
- ³ *Surgery of the Pancreas*, 1953, Saunders, Philadelphia.

Origin of Pilonidal Sinus

SIR,—The present trend of opinion towards regarding pilonidal sinus as acquired rather than congenital in origin is leading to the usual searches in the literature for earlier expressions of this view. Aird in your columns¹ has recently called attention to an important paper by Hodges, of Boston, written in 1880² as well as other earlier papers. The question arises whether John of Arderne possibly recognized the condition, but there is no real evidence in his writings that he did. It is interesting to note, however, that the late Sir D'Arcy Power, in the foreword to his collection of Arderne transcripts in the library of the Royal College of Surgeons of England, wrote (vol. 1, p. 8): "Arderne's attention was no doubt called to the subject of fistula by the actual cases which came to him for relief. . . . Wet, cold, long hours in the saddle weighted down by the heavy armour of the time would readily lead to this condition in the knightly class."

If D'Arcy Power's historical interpretation be accepted, it is tempting to speculate that John of Arderne in his extensive experience of suppuration around the anus may have seen many cases of pilonidal sinus; and that what may be called the "knight's bottom" of the fourteenth century was the direct historical precursor of the "jeep disease" of the twentieth. If so, the theory of the acquired origin of the pilonidal sinus has a long and distinguished ancestry, and the condition may even have come to England with the cavalry of the Conqueror.—I am, etc.,

London, W.1.

DAVID H. PATEY.

REFERENCES

- ¹ *British Medical Journal*, 1952, 1, 902.
- ² *Boston med. surg. J.*, 1880, 103, 485.

The Sensitivity of the Respiratory and Circulatory Centres

SIR,—When one is present at a patient's death it is not uncommon to hear the heart sounds by auscultation for some minutes after the termination of respiration. A patient died recently and the heart continued to beat for over an hour after respiration had ceased.

A woman aged 38 was admitted under certificate on May 16, 1954. The patient exhibited some confusion and cerebral tumour was considered, but there was no confirmatory evidence nor any localizing signs. About 5 p.m. on May 24 she quietly went into coma after being restless during the earlier part of the day. Methods were instituted to bring her round—i.e., intravenous glucose 33%, picrotoxin intravenously and intramuscularly—with no response. Picrotoxin was later repeated up to a total of 48 mg. and shortly before midnight an intravenous drip was set up. The patient's breathing for the two or three hours preceding her decease was alternately cog-wheel and Cheyne-Stokes. About 10 minutes after midnight respirations ceased and she gradually became cyanosed, but the carotid pulse was observed to be beating strongly and regularly. Artificial respiration was applied by gentle rhythmical pressure on the epigastrium and the lower part of the chest and gradually the patient's colour became normal. Oxygen was then delivered by a face mask while no spontaneous breathing occurred the patient's colour remained good and the heart sounds normal in quality and regular at 70/80:

per minute; blood pressure was not measured. The patient continued in this state for about an hour, when the heart began to fail, the pulse weakened in quality and volume and finally ceased at 1.20 a.m. on May 25. Examination at this stage revealed the heart to be silent—that is, a little over an hour after respiration had terminated completely.

At necropsy there was one large and three small cerebral tumours not yet identified.—I am, etc.,

Bromsgrove.

MICHAEL G. MCCOLL.

Cortisone and Aspirin in Rheumatoid Arthritis

SIR,—It is unfortunate that the clinical trial conducted by the Medical Research Council and Nuffield Foundation comparing cortisone and aspirin in the treatment of early cases of rheumatoid arthritis (*Journal*, May 29, p. 1223) has been interpreted in the press as meaning that cortisone is no better than aspirin, as the trial does not prove this. Insensitive trials improperly analysed will always tend to confirm the null hypothesis. The null hypothesis in this trial was, "Cortisone is no better than aspirin." Such trials do not prove and cannot prove the null hypothesis to be true. The results of clinical trials are only useful and worth reporting when they destroy the null hypothesis. "Every experiment may be said to exist only in order to give the facts a chance of disproving the null hypothesis."¹

In this trial the tests of function cannot be regarded as sensitive and the analysis of the figures is fallacious. We have shown by experiment that the grip test is insensitive compared with measurements of joint range and speed of joint movement (if accurately measured), and given reasons for thinking that such tests of dexterity as tying knots and climbing steps are insensitive, unless they can be and are related to arbitrary standards of normality.² The faulty analysis has made these tests still more insensitive and so given the trial little chance of demonstrating any difference there might be between treatment with cortisone and aspirin.

The error in analysis should be obvious to anyone with an elementary knowledge of arithmetic. It is easily illustrated by an example. The average range of wrist movement with cortisone treatment increased from 99° to 120° and with aspirin from 78° to 103°, which is erroneously interpreted in the report as a 21% improvement with cortisone and a 32% improvement with aspirin. The absurdity of this conclusion becomes obvious if one exaggerates the discrepancies between the cortisone and aspirin averages. Let us suppose that the average range of wrist movement of the cortisone-treated cases at the outset was 120°, and of the cortisone-treated cases at the outset was 125°—i.e., an that after a year's treatment it improved to 125°—i.e., an improvement of 5/120 × 100 = 4.2%, and let us also suppose that the change with aspirin was from 60° to 120°—i.e., 100%. This gives aspirin an apparently enormous advantage over cortisone. This means that for the change with cortisone to be the same as that with aspirin it would have had to have been from 120° to 240°, which, as the normal range of movement of the wrist joint is 130°, is clearly absurd. As long ago as June, 1952, we pointed out that this difficulty can largely be overcome by expressing results as a percentage of that possible up to an arbitrary standard of normality.²

We will now examine the figures quoted in Tables III and IV of the report from this more realistic and less erroneous point of view. They show that the range of wrist movement improved by 68% with cortisone and 48% with aspirin, taking the average normal range of wrist movement as 130°; the improvement in grip of the left hand with cortisone was 57% and with aspirin 38%; the improvement in grip of the right hand with cortisone was 46% and with aspirin was 37%; assuming that the normal average grip is 250 mm. of mercury; on the knot-tying test the improvement with cortisone was 50% and on aspirin was 33%, assuming that the average normal time for tying six knots is 20 seconds, which we have found to be roughly true by experiment; and that the improvement with corti-

sone in the stepping test was 75% and on aspirin was 63%, assuming that the average normal time to go up and down ten steps is approximately 10 seconds, which we have shown to be roughly true by experiment. It is clear that in all five tests cortisone showed an improvement greater than that of aspirin. It is a thankless task to subject the results of insensitive and ill-planned experiments to a statistical analysis; but we have subjected the mean of the differences between these figures to Student's test, and find the mean to represent a significant difference between cortisone and aspirin in favour of cortisone ($P < 0.01$).

If this trial had been properly planned, using sensitive tests, which could quite easily have been done with a little thought, and properly analysed, the conclusion that for practical purposes there is little to choose between cortisone and aspirin might have been acceptable; but this conclusion is clearly invalid, and it seems that the exactly opposite conclusion should have been drawn.—We are, etc.,

GEOFFREY E. LOXTON.

DAVID LE VAY.

Brook Hospital, S.E.18.

REFERENCES

- ¹ Fisher, R. A. (1949). *The Design of Experiments*, Edinburgh.
- ² *Lancet*, 1952, 1, 1280.

Gorleston Holiday Camp for the Physically Handicapped

SIR,—I should like to thank the 78 doctors who kindly sent me medical details of their patients attending our holiday camp at Gorleston last week, in answer to my circular letter and for the benefit of the camp doctor. Most of the letters were very helpful and courteous, and some even contained words of appreciation of our efforts which were most encouraging. As there were nearly 240 disabled guests altogether, it was disappointing to get no response from the rest of the family doctors concerned. Possibly the patients mislaid my circulars and they never reached the doctor's hands. Curiously enough, the only guests needing medical attention during the week were among the group about whom we had no clinical information. Our gallant general practitioner was therefore manfully working in the dark and we are very grateful to him for his devoted services.

The camp was organized by the Norfolk Voluntary Association for the Care of the Physically Handicapped and open to all handicapped people who can be got there from anywhere in the country. This year we had large contingents from Yorkshire, Essex, Norwich and Norfolk, and smaller groups from as far away as Bedford, Carlisle, Tyneside, and London. It was an unqualified success, and everyone seemed happy in spite of many forms of severe disability. Indeed, one man walked for the first time for 20 years and several carried out manoeuvres they had never tried before, fired by the example of equally disabled people. All types of disability were seen, including rheumatoid arthritis, poliomyelitis, disseminated sclerosis, paraplegias, Friedreich's ataxia, and tuberculosis of bones and joints, to mention only a few. At least 34 were helpless and had to be washed, dressed, taken to the toilet, and pushed in chairs, and all this work was carried out by volunteers either resident or part-time.

The camp itself is used by ordinary holiday-makers from Whitsun to October, but, through the courtesy of the directors and management, has opened a week earlier these last two years in order to cater for these special guests. We should be glad to have comments or suggestions from doctors whose patients attended this year, and specially to know whether they feel that the camp fulfilled its purpose in giving a really happy holiday to those whose disability normally prevents them from enjoying such a luxury. We hope to make this an annual event, and we should be glad to send details of how it was organized and run to interested people who may be considering similar ventures.—I am, etc.,

Norwich.

IRENE B. M. GREEN,
Vice-chairman, Norfolk Voluntary
Association for the Care of the
Physically Handicapped.

Obituary

Dr. A. L. P. PEENEY, M.R.C.S., L.R.C.P.

Dr. A. L. P. Peeney, Director of the Clinical Pathological Services of the Queen Elizabeth Hospital and General Hospital, Birmingham, died on June 11 at the age of 50, after a short illness.

Angelo Louis Peter Peeney was born on May 7, 1904, a son of the late John Peeney, of Blackpool, and was educated privately. He received his medical training at Manchester University, and qualified M.R.C.S., L.R.C.P. in 1928. After being house-physician to Professor F. E. Tylecote at the Manchester Royal Infirmary, and for 18 months in a similar post at the Brompton Hospital, London, he became assistant director of the clinical laboratory at the Manchester Royal Infirmary. In 1934 he was invited to join the staff of the Public Health Laboratory in Manchester, where he remained until 1936, when he was appointed clinical pathologist to the Queen's Hospital, Birmingham. With the closing of this hospital he became the first clinical pathologist at the Queen Elizabeth Hospital and, with the retirement of Dr. Hillier, the director of the clinical pathological services of the General Hospital in addition. He was elected an honorary lecturer in bacteriology of Birmingham University in 1946.

In the 18 years in Birmingham, Dr. Peeney built up a bacteriological and haematological service which can hardly be surpassed in the United Kingdom. His standards were high and he was able to impart them to his staff. It was not surprising that his laboratory gradually became the most important unit in the hospital; and the volume of work demanded from it continually increased, but it never fell from the high standard he demanded. Dr. Peeney never spared himself, putting in very long hours and frequently returning to the laboratory in the evening. The increasing complexity of antibiotic therapy led to his advice being sought by all members of the hospital staff; again, this was so willingly and effectively given that many will feel keenly the loss of his guiding hand in their clinical problems.

In many respects haematology was his most favoured subject and his opinion was much sought throughout the region. His interpretation of the morphology of the red cell and diagnostic suggestions often appeared uncanny in a decade where morphology does not claim the eminence it once held. He was one of the first adequately to describe the haematological changes in the steatorrhoea syndrome, and his accurate interpretations of blood films were often the first clue to the eventual diagnosis of this condition. Though he had no hospital beds under his direct responsibility, such was his clinical judgment and such the esteem in which he was held by his colleagues that large numbers of patients could attribute their treatment to his care; he brought the services of the laboratory right to the bedside.

It is not perhaps surprising that in view of the great demands upon his services he published relatively little in comparison with his great knowledge of the specialty. Beyond his clinical and scientific ability will stand his character. He became the repository of everybody's troubles and the advice he dispensed was good and sound. "The onlooker sees most of the game" was his oft-quoted remark, and he applied his observations

as a beneficent catalyst in all the problems that arise in an active hospital and medical school.

His friendliness and charm will not be forgotten. He has set a high standard for his successors to emulate. To his widow and son we extend our sympathy.

W. M. A. writes: In this harsh competitive age it can be said of few that they were loved by all; of such was A. L. P. Peeney. Others have borne eloquent testimony to his high qualities as a physician and a pathologist, to his devotion to duty, and his gentle unobtrusive guidance which so often led us to the solution of a clinical problem. But it was memories of Peeney the man that overwhelmed me on the evening of the day we bade him farewell. We went to him not only for professional help but for administrative advice and for comfort when perplexed and dispirited. Although he must often have been desperately tired, for he worked long hours, he was never too busy to listen patiently. Houseman or senior consultant all alike were received with the same friendly courtesy and left with renewed hope. Completely unselfish himself, he never imputed base motives to others. We will not see his like again, but we can best serve his memory by trying to emulate his chivalrous charity.

W. D'A. SILVERA, M.B., F.R.C.P.Ed.

Dr. W. D'A. Silvera, senior lecturer and head of the department of pathology of University College, Ibadan, Nigeria, died at Ibadan on May 19 at the age of 40.

Walter D'Aguilar Silvera was born in Jamaica on August 2, 1913, and was educated at Edinburgh University, where he graduated M.B., Ch.B. in 1937. He was elected a Member of the Royal College of Physicians of Edinburgh in 1941, becoming a Fellow four years later. After graduation he was appointed to the pathology department at Edinburgh Royal Infirmary and Leith Hospital. In 1945 he entered the Colonial Medical Service and was posted to Jamaica, where he remained until 1949, when he accepted the appointment of senior lecturer in pathology at Ibadan.

We are indebted to Sir KOFO ABAYOMI for the following appreciation: The death of Dr. W. D'A. Silvera has created a gap which will be very difficult indeed to fill. I first met him at Edinburgh in 1941, when he was working under a great friend of mine, Dr. R. F. Ogilvie, in the pathology department. One day I suggested that, should there ever be a university college in Nigeria, he might like to join the staff. He at once said that should such an opportunity occur he would willingly accept the offer. This promise was later fulfilled when Dr. Kenneth Mellanby approached him in Jamaica, and he came to Ibadan as one of the earliest pioneers at the University College. At first he had many difficult problems to overcome, for lack of materials, men, and money made the project seem one of making "bricks without straw." However, he faced the problems very cheerfully, working almost round the clock to build up the department which to-day reflects great credit on the College. It was a great pleasure to Dr. Silvera when all of the first group of medical students sent to the United Kingdom to complete their course did well in the pathology examinations, one student succeeding in winning the coveted first prize in pathology at his hospital in London. At Edinburgh Dr. Silvera's house was thrown open to all Colonial students, whom he entertained with lavish hospitality. Gentle and affable, he acted as an inspiration to those students who tended to neglect their studies, and as a great scholar himself always stressed the value of hard work. Although taciturn in committee or at board meetings, his views carried weight and were to the point when he did speak. He was convinced that Nigeria had a wealth of material for research work, on which he intended to concentrate, and he had a profound faith in the future of the country. In spite of a very busy life, he found time to play cricket occasionally. A congenial companion, we mourn deeply one who did much to help lay a solid foundation to

our College, and we give a "great salute" to his revered memory. Deep sympathy goes to his devoted wife, formerly Miss Betty MacEwan, of Kinross, and his children, and to his family in Jamaica.

ROBERT AITKEN, M.D., F.R.C.P.Ed.

Dr. HUGH C. W. STRINGER writes from New Zealand: Dr. Aitken's passing, recorded in the *Journal* of April 3 (p. 822), will leave a gap in the memories of those who worked in the skin department of the Royal Infirmary, Edinburgh. A clinician of the older school, he was an Edinburgh "identity," notably kind to scholars from the Dominions. On tuberculosis of the skin he held tenacious views, which derived from much sound experience gained over the years. Few understood the disease better, and he insisted that new remedies be severely tested. Robert Aitken was a keen yachtsman who did his own cruising, even in bad weather. No cardiac ever faced an exercise machine to equal the old Kelvin engine in his cabin cruiser when it declined to start, and he fought a guerrilla campaign with it over years. Our sympathy goes to his family in their loss.

The death of Dr. ADAM GILCHRIST on April 9 at the age of 68 has deprived Burslem of one of its oldest and most respected general practitioners. Born at Wells, Aberdeenshire, on November 4, 1885, Adam Gilchrist received his early education at Badenscoth Public School and Aberdeen Grammar School, from which he entered Aberdeen University as a medical student. After graduating M.B., Ch.B. in 1908, he held resident posts at Aberdeen Royal Infirmary before settling in practice at Burslem in 1909. During the war of 1914-18 he served in the R.A.M.C., first as a recruiting medical officer in this country and then in East Africa from 1917 to 1919. After the war he returned to his former practice, in which he found the surgical work of particular interest. For many years he was a member of the honorary staff of the Burslem, Haywood, and Tunstall War Memorial Hospital, and he acted as police surgeon, Admiralty surgeon and agent, medical adviser to the Post Office and the Treasury, and medical adviser to the Pottery Manufactory Federation. Much of his spare time was devoted to the British Red Cross Society, and the enthusiasm for its work shown by the local detachments was largely due to his efforts; he became assistant county director of the society for North Staffordshire, and was also a divisional surgeon of the St. John Ambulance Brigade. An early member of the North Staffordshire Caledonian Society, he was its honorary piper and president in 1921 and again this year. A member of the British Medical Association for forty-four years, Dr. Gilchrist was chairman of the North Staffordshire Division in 1935-6. Until recently he enjoyed a game of golf, but the work of his profession held his main interest, and he continued in practice, as he would have wished, to the end. He married Dr. Mary Sampson in 1927, and she survives him together with two sons, one of whom is also in the medical profession.

Dr. A. O. M. FEHRSEN, for many years surgeon for the Potgietersrust district of the Northern Transvaal, died at his home on the Zoedveld Estates in that province on April 20 at the age of 79. Alexander Olof Malcolm Fehrser was born at Cradock, Cape Province, on February 9, 1875, and had a medical background, both his father and grandfather being doctors. His grandfather had attended President Kruger when the President was a boy. From Bishops College, Rondebosch, he entered Cambridge University, where he graduated B.A. with honours, in 1897. Proceeding to the study of medicine, he qualified M.R.C.S., L.R.C.P. in 1901, having received his clinical training at St. George's Hospital. Two years later he obtained the degrees of M.B., B.Chir., and in 1905 the Cambridge D.P.H. While a student

at Cambridge he played Rugby football for the Barbarians, and for the rest of his life never neglected an opportunity to show his club colours to visitors, so proud was he of having played for such a famous club. After qualification, he held the appointments of house-physician and house-surgeon at Birmingham General Hospital. Returning to South Africa in due course, he became surgeon to the Potgietersrust district in 1912, and there he was the only doctor in an area of thousands of square miles, embracing practically the whole of the Northern Transvaal. In those days visits to patients at a distance had to be made on horseback, or by mule-cart or ox-wagon, with the fording of flooded rivers an added excitement; and he would frequently sleep in the veld. Life in a town held no attractions for Dr. Fehrser, for he loved the wild country in which he lived and worked. He became a well-known figure in that vast territory and was soon recognized as a highly capable all-round physician and surgeon, greatly loved by his patients. The profession is the poorer for the loss of a fine personality and his death is mourned by all who knew him. He is survived by a widow.

Dr. T. J. JENKINS died at his home, Vron Iago, Henllan, Cardiganshire, on May 20 at the age of 75. His long illness had already deprived the West Wales family and hospital practitioners of a most colourful personality. Thomas Jones Jenkins was the son of a sea captain, and was born at Cwrcoed, Henllan, in 1879. He received his medical education at the University College, Cardiff, and at St. Mary's Hospital. After qualifying with the conjoint diploma in 1906 he became a resident at the Cardiff Royal Infirmary. He soon made up his mind to return to his native Cardiganshire, and started in general practice in Henllan. The practice was truly rural. His patients came from the farming community in the middle reaches of the beautiful Teify Valley and from the hill farms on the Cardiganshire-Carmarthenshire border. His reputation as a first-class family doctor was quickly established, and it was not long before he found himself deliberately limiting the extent of his practice. His patients appreciated his intense and sincere interest in all their troubles. They loved his keen sense of humour. His complete honesty sometimes perplexed them, but they always trusted him. In any profession a man's true value is assessed by his colleagues rather than by the lay public. "Jenkins Henllan" was a name respected by the whole profession in West Wales. In the group of practitioners in and around the Teify Valley he had a profound influence in maintaining a happy spirit of comradeship. Nobody in any medical community could have done more in this respect than he did. Jenkins was in 1908 one of the four founders of the Vale of Teify Medical Society. The other three (who had long predeceased him) were Sir John Lynn Thomas, Dr. J. Powell, of Newcastle Emlyn, and Dr. J. W. Stephens, of Cardigan. T. J. Jenkins was secretary of the society for years, and later became its chairman. He was an active member of the B.M.A. Although he could not raise any enthusiasm for medical politics he was always present at the clinical meetings. Until the last war he would surprise his younger colleagues by going off on a postgraduate course every few years. His passion for new books (especially in general medicine and obstetrics) kept him well informed over the years. He liked to talk of new ideas and advances in medicine, and took great pride in applying new methods and drugs in his practice. He held several appointments, and greatly esteemed his attachment to the Cardigan and District Memorial Hospital and the coronership of South Cardiganshire, which he held for many years. Outside medicine he had many interests. He was particularly keen on perpetuating the Welsh language and its culture. He was a first-class shot and at one time a very keen angler. Seldom would he miss a home Rugby international match, where he would be unashamedly partisan. He shunned the footlights of public life, but he did a great deal for his fellow men, aside from his work; his public service was unheralded and unsung.

Vital Statistics

Psittacosis in Kent

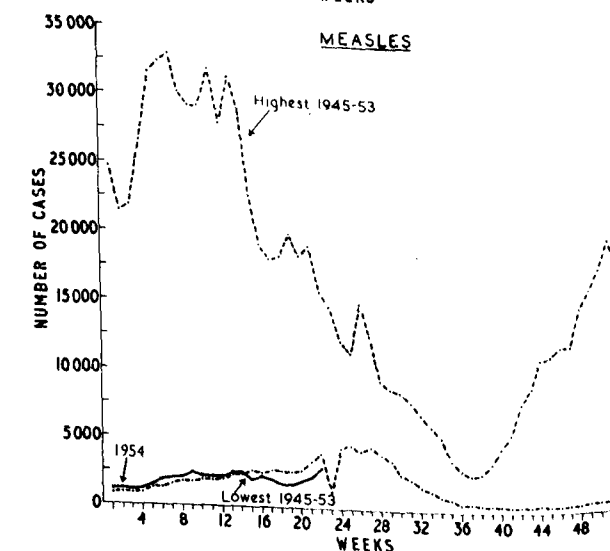
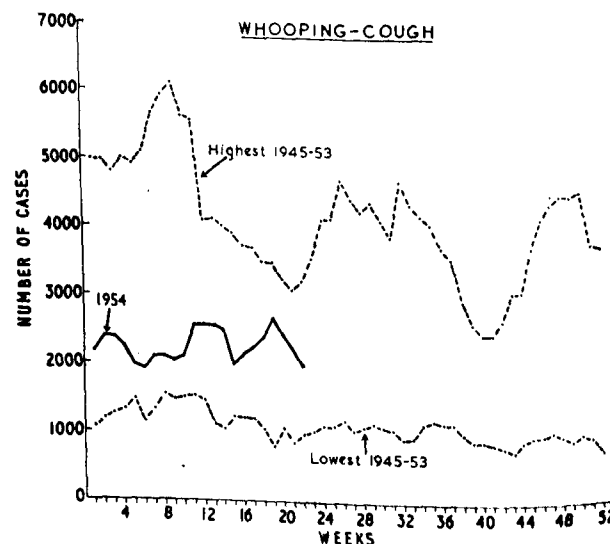
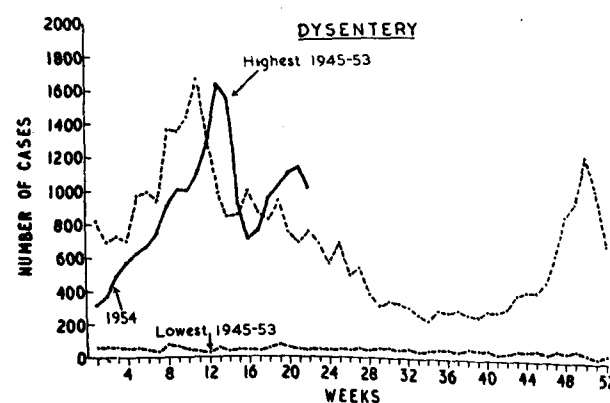
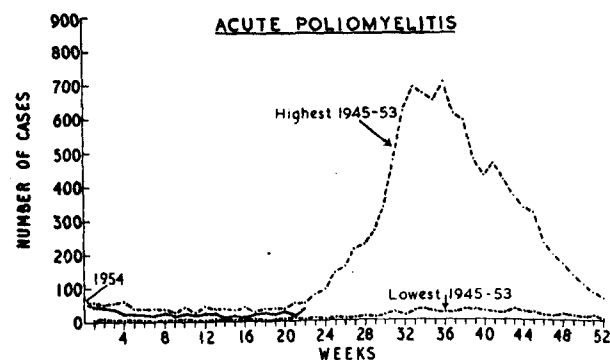
In March this year a man of 34 was admitted to the Southern Hospital, Dartford, suffering from chest symptoms. On investigation it was found that his blood gave a positive complement-fixation test with psittacosis antigen to a titre of more than 1:128. Inquiry revealed that in his back garden, near Dartford, the patient kept about 80 budgerigars for breeding. He made a special hobby of buying sick birds and treating them, but some had died. A detaining notice under the Psittacosis Order, 1953, was served by the Ministry of Agriculture and Fisheries on the owner, who allowed five apparently healthy birds to be killed and sent to the Virus Reference Laboratory, Colindale, for examination. However, virus was not isolated from the birds and the detaining order was subsequently lifted. The remaining five members of the patient's family were symptom-free. Complement-fixation tests were carried out on them; two gave negative results, but the remaining three showed results positive in the following titres:

April 14, 1954	April 30, 1954
1:64 (wife)	1:64
1:32 (child)	1:16
1:32 (child)	1:16

In addition, the patient's general practitioner, who was admitted to hospital a few weeks after the patient, showed a complement-fixation test positive to a titre of 1:64, and later to 1:32. A complement-fixation test on the bird-breeder done on June 3 gave a positive result at 1:320.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945-53 are shown thus -----, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

In England and Wales during the week ending June 5 the number of notifications declined by 218 for whooping-cough, from 2,207 to 1,989, 119 for dysentery, from 1,136 to 1,017, and 118 for scarlet fever, from 911 to 793, while the only large increase was 788 for measles, from 2,046 to 2,834.

A rise in the incidence of measles occurred in every region of the country except the south-west, though it was the experience of the northern section of the country that was mainly responsible for the large rise. The largest increases in the number of notifications of measles were 95 in Cheshire, from 132 to 227, 90 in Yorkshire North Riding, from 83 to 173, 89 in Lancashire, from 464 to 553, 86 in Norfolk, from 167 to 253, 73 in Durham, from 176 to 249. The largest declines in the incidence of whooping-cough were 50 in Staffordshire, from 120 to 70, and 47 in Yorkshire West Riding, from 156 to 109. A small decline in the incidence of scarlet fever occurred throughout the country. The largest fall was 33 in Lancashire, from 138 to 105. 18 cases of diphtheria were notified, being 5 more than in the preceding week. The largest centres of infection were Warwickshire (Birmingham C.B. 4), Lancashire (Huyton with Roby U.D. 4), and Devonshire (Plymouth C.B. 3).

34 cases of acute poliomyelitis were notified. These were 15 more for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were Staffordshire 7 (Walsall C.B. 4, Smethwick C.B. 2), Lancashire 5 (Walton-le-Dale U.D. 2), Yorkshire West Riding 4 (Ripon and Pateley Bridge R.D. 2), and Durham 4 (Sunderland C.B. 4).

The largest returns of dysentery were Lancashire 187 (Haydock U.D. 22, Bolton C.B. 18, Liverpool C.B. 18, Farnworth M.B. 15, Kearsley U.D. 13, Manchester C.B. 12, Irlam U.D. 12, Middleton M.B. 11), Yorkshire West Riding (Sheffield C.B. 51, Leeds C.B. 47, Dewsbury C.B. 15, Bingley U.D. 11, Otley U.D. 11), London 112 (Islington 35, St. Pancras 12), Leicestershire 64 (Leicester C.B. 63), Sussex 51 (Brighton C.B. 32), Surrey 49 (Croydon C.B. 37), Middlesex 47 (Southgate M.B. 10), Staffordshire 42 (Cannock U.D. 14, Newcastle-under-Lyme 10), Kent 41 (Penge U.D. 11), Essex 34 (Burnham-on-Crouch U.D. 15), Cheshire 28 (Dukinfield M.B. 12), Durham 25, and Nottinghamshire 22 (Beeston and Stapleford U.D. 14).

Quarterly Return for Scotland

The birth rate for the March quarter of 1954 was 18.6 per 1,000 population, being 0.5 above the rate for the corresponding quarter of 1953 and 0.1 above the average of the five preceding first quarters. The infant mortality rate was 38 per 1,000 registered live births, and was 4 above the rate for the preceding March quarter. The stillbirth rate was 25 per 1,000 total births, and was the lowest rate recorded in a first quarter. The death rate was 14.3 per 1,000 population, an increase of 0.6 upon the rate for the first quarter of 1953 but 0.8 below the average rate for the five preceding March quarters.

The death rate was 31 per 100,000 for all forms of tuberculosis and 28 for respiratory tuberculosis; the former was 1 below and the latter 1 above the rate for the preceding first quarter, but they were respectively 25 and 21 below the five-years average. Only 91 deaths were attributed to the principal epidemic diseases. These were 64 from influenza, 14 from meningococcal infections, and 13 from whooping-cough. No deaths were due to scarlet fever, diphtheria, or measles. 719 deaths were attributed to violence; of these, 133 were due to road transport accidents; these deaths were respectively 18 fewer and 3 more than the number recorded in the corresponding period of last year.

Week Ending June 12

The notifications of infectious diseases during the week included pneumonia 335, scarlet fever 731, whooping-cough 1,686, diphtheria 8, measles 2,801, dysentery 772, acute poliomyelitis 26, paratyphoid fever 12, and typhoid fever 6.

Medical News

Nuffield Chair of Surgery at Oxford.—Mr. PHILIP ALLISON, the Leeds thoracic surgeon, has been appointed to the Nuffield field professorship of surgery made vacant by the death of Sir Hugh Cairns two years ago. In the interval Professor POMFRET KILNER, Nuffield Professor of Plastic Surgery, has been carrying out the duties of the Chair. Mr. Allison's appointment is from October 1.

Welfare Foods.—On June 21, at a press conference, Dr. CHARLES HILL, M.P., parliamentary secretary to the Ministry of Food, explained the new arrangements for the distribution of Welfare Foods which come into force on June 28. The arrangements were announced jointly by the Ministries of Food and Health and the Department of Health for Scotland. Liquid milk will continue to be supplied by the retail dairies, but National Dried Milk, orange juice, cod-liver oil, and vitamin A and D tablets will be distributed by local health authorities. Maternity and child-welfare clinics will be used for distribution more than in the past, but in some areas it will be necessary to establish new distribution centres in place of the Food Offices, which will cease distribution on July 14. Addresses of the new centres can be obtained from Food Offices (until they close), agency offices of the Ministry of Labour and National Service and the Ministry of Pensions and National Insurance, and from

local welfare clinics or their council offices. Documents of entitlement to welfare foods will be obtainable from offices of either the Ministry of Labour and National Service or the Ministry of Pensions and National Insurance. From November 1 the latter Ministry will be the only issuing authority for documents of entitlement. The present arrangements for the supply of liquid milk under the Welfare Foods Service will continue until October 30, when books of "Tokens for Welfare Milk" will be supplied to beneficiaries. Application forms for these books will be sent by post to existing beneficiaries in time for applications to be made before the scheme starts.

"Recovery Homes" and "Special Diets."—The King Edward's Hospital Fund for London continues to place the profession in its debt. Its latest pamphlets, "Recovery Homes: A report of an inquiry into the working of Recovery Homes and their value to the Hospital Service" and "Memorandum on Special Diets," will be warmly welcomed. The first describes the actual working of certain recovery homes, their functions, possibilities, and limitations. A recovery home is defined as a place "for patients in whom the disease has definitely begun to abate, or the risk of complications after operation is only slight, so that with proper care and nursing the patient is likely to progress to recovery," in contrast with a convalescent home which is for patients who need only rest before returning to normal work. The report is intended as a guide to hospital authorities which may be planning such homes. The memorandum on special diets is written with the needs of the smaller hospital without a dietitian particularly in mind. It starts by describing the essentials of a balanced diet, and then goes on to give details of the various special diets that may be ordered in hospital. Both pamphlets are obtainable from the Fund's offices, 10, Old Jewry, London, E.C.2 (price 1s. each, post free).

British Association of Plastic Surgeons.—The summer meeting was held on May 27, 28, and 29, at the Royal College of Surgeons and the Hospital for Sick Children, Great Ormond Street, London. Papers were read on "Experimental Approaches in Plastic Surgery," "Storage and Use of Arterial Grafts," "Prognathism," "Repair of Palate Defects with Pedicle Flaps," and "Problems of Maxillary and Mandibular Deformities." The social programme included a cocktail party given by the president of the association, Mr. D. N. MATTHEWS, and Mrs. MATTHEWS, a luncheon at Great Ormond Street by the Board of Governors, and a dinner at the Royal College of Surgeons.

Association of Sea and Air Port Authorities.—The 55th annual meeting of the Association of Sea and Air Port Authorities of the British Isles was held at Kingston-upon-Hull on June 9, 10, and 11, under the presidency of Councillor E. G. BRINT, of Hull. In his presidential address Councillor Brint reviewed the activities of the association during his year of office. Papers read at the meeting included "The Reconditioning of Food" (Dr. STUART I. A. LAIDLAW), "A Quarter Century of Port Health Work" (Professor R. H. PARRY), "The Hull Deep Sea Trawling Industry and Some of its Health and Medical Problems" (Dr. J. BURNS), and "Some Aspects of the Health of Trawl Fishermen" (Dr. P. A. G. MACQUEEN). Mr. DONALD E. ERLEBACH, representing the Port of London Authority, was elected president for 1954-5.

Scottish Society of Anaesthetists.—At the annual meeting in April Dr. I. M. CAMPBELL DEWAR (Glasgow) was elected president, Dr. F. G. GIBBS (Edinburgh) vice-president, and Dr. A. G. MILLER (Glasgow) hon. secretary. Dr. Campbell Dewar's presidential address was entitled "Wells, Morton, *et al.*," and in it he discussed the many problems and responsibilities of the anaesthetist in the National Health Service. Professor R. R. MACINTOSH, of Oxford, was a guest of the Society and gave a talk entitled "Experiences Abroad." The prize which the Society awards annually for the best paper submitted by an anaesthetist of or below the grade of senior registrar was won by Dr. J. B. STIRLING (Glasgow).

Memorial to William Smellie.—The William Smellie Maternity Hospital at Lanark will be the scene of a memorial celebration on August 18 in honour of the great obstetrician after whom it is named. At 3 p.m. Professor MILES PHILLIPS, emeritus professor of obstetrics of Sheffield University, will deliver an address on William Smellie's achievements. This will be followed by the unveiling of a statue of Smellie by Dr. T. HONEYMAN, Lord Rector of the University of Glasgow. The statue, designed by DENIS PEPLIE, is a gift from Professor S. J. CAMERON, emeritus professor of midwifery of Glasgow University, to the townspeople of the Royal Borough of Lanark. It was at Lanark that Smellie was born in 1697, and he practised there for 19 years before going to London, where he gained fame as a teacher of midwifery. He died at Lanark in the year 1763.

"Vox Sanguinis," now in its fourth year, is a bi-monthly journal published from the Central Laboratory of the Netherlands Red Cross Blood Transfusion Service, and edited by Dr. J. J. VAN LOGHEM, jun., and others. Its papers, which are of a high standard and come from all parts of the world, appear in English or French, and cover all aspects of blood transfusion and immuno-haematology. They are a striking reflection of the development of these subjects since the discovery of the Rh factor and the war-time needs of blood-transfusion services. The contributors include haematologists of international standing. Subscription costs 5.50 florins per annum (10s. 6d.), and the journal may be obtained from the Central Laboratory, Binnen-gasthuis, Amsterdam C.

Treacher Collins Prize.—Dr. ROBERT LEISHMAN, of Glasgow, has been awarded the 1954 Treacher Collins Prize by the Ophthalmological Society of the United Kingdom for his essay on "The Eye in General Vascular Disease: Hypertension and Arteriosclerosis." This is a triennial prize valued at £100.

Frances Wood Memorial Prize.—A prize of £40 is offered by the council of the Royal Statistical Society for the "best investigation, on statistical lines, of any problem chosen by the competitor, which bears directly or indirectly upon economic or social conditions." This includes problems of health or nutrition. The competition is open to anyone under the age of 35 on October 1, whether a Fellow of the Society or not. Entries should be sent to the honorary secretaries of the Royal Statistical Society, 21, Bentineck Street, London, W.1, not later than September 30.

Chair of Psychiatry at Leeds.—As a temporary measure the Council of Leeds University are instituting a part-time Chair of Psychiatry to which Professor D. R. MACCALMAN, the present Nuffield Professor of Psychiatry, is to be appointed. This change is in deference to medical advice given to Professor MacCalman, and will relieve him of much administrative responsibility. It is hoped to appoint a successor to Professor MacCalman in the whole-time Chair, but in the interval Dr. MARY BURBURY, the senior lecturer in child psychiatry, will act as head of the department.

Honorary Degrees at Glasgow.—Among the recipients of the honorary degree of Doctor of Laws of Glasgow University on June 16 were Professor J. A. G. BURTON, formerly St. Mungo Professor of Surgery at Glasgow; Professor J. H. DIBLE, Professor of Pathology at the Postgraduate Medical School of London; Sir JOHN MCNEE, formerly Regius Professor of Practice of Medicine at Glasgow; and Professor G. I. STRACHAN, Professor of Obstetrics and Gynaecology at the Welsh National School of Medicine, Cardiff.

Captain D. R. Boyns, R.A.M.C., has been awarded the M.B.E. for gallantry in Malaya. After a parachute descent in which he sustained a fractured spine he continued his duties without food or rest until ordered to stop work.

Dr. B. F. Martin has been appointed senior lecturer in anatomy at Sheffield University.

S.M.A. Library.—The Library will be closed and the library service suspended from July 30 to August 16 while redecorating is being done.

COMING EVENTS

Polio on Television.—At 10 p.m. on Monday, June 28, there will be a half-hour programme on infantile paralysis, presented by Jeanne Heal. It has been arranged in association with the Ministry of Health, the Infantile Paralysis Fellowship, the National Federation for Polio Research, and the British Red Cross Society, and is concerned with the danger signs that parents should look for.

Courage Laboratory of Ophthalmology.—The Duchess of Gloucester will open the Courage Laboratory of Ophthalmology at the Royal Eye Hospital, St. George's Circus, London, S.E.1, on July 6 at 3 p.m.

The Handicapped at School.—London County Council is organizing an exhibition of the work of London's special schools for handicapped children. It will be open daily from July 6 to 10, admission free, from 1 to 7 p.m. on July 6, and from 11.30 a.m. to 7 p.m. on other days, at the County Hall, Westminster Bridge, S.E.1.

Bertram Louis Abrahams Lecture.—Professor E. B. S. VERNEY, F.R.S., will speak on "Some Aspects of the Renal Excretion of Water and Salt" at the Royal College of Physicians on July 8 at 5 p.m.

Silver Jubilee of R.C.O.G.—The Royal College of Obstetricians and Gynaecologists will celebrate its silver jubilee on July 13, 14, and 15. On July 14 Sir WILLIAM FLETCHER SHAW will deliver the William Meredith Fletcher Shaw Memorial Lecture on "The College: its Past, Present, and Future," and on July 15 Professor BRUCE T. MAYES, Sims-Black Professor, will deliver the William Blair-Bell Memorial Lecture on "The Making of an Obstetrician." These lectures, which will be delivered at 11.30 a.m. in the Barnes Hall of the Royal Society of Medicine, are open to non-members of the College.

Joint Services Medical Surgical Diagnostic and Therapeutic Conference.—The U.S. Third Air Force is sponsoring a medical conference at the U.S. Embassy Theatre, 5, Grosvenor Square, London, from July 22 to 24 (9 a.m. to 5 p.m. each day). Speakers will be drawn from the Medical Services of the American and British armed Services, and will also include several British civilian surgeons and physicians. The conference is open to all members of the profession who would care to attend. Further information may be obtained from the Office of the Surgeon, Headquarters Third Air Force, Victoria Park Estates, South Ruislip, Middlesex (Telephone: Waxlow 4300, Ext. 206).

Claude Monet Exhibition.—An exhibition in aid of the British Empire Cancer Campaign is being held until July 30 at the Marlborough Gallery, Old Bond Street, London, W.1.

NEW ISSUES

British Journal of Venereal Diseases.—The new issue (Vol. 30, No. 2) is now available. The contents include:

NON-GONOCOCCAL URETHRITIS. P. Durel, V. Roiron-Ratner, A. Siboulet, and C. Sorel.
SYSTEMIC DONOVANIASIS. R. V. Rajam, P. N. Rangiah, and V. C. Anguli.
NON-SPECIFIC URETHRITIS: IS MYCOTIC INFECTION IMPORTANT? G. Auckland and W. J. Preston.
DISSECTING ANEURYSM OF THE AORTA. DIFFERENTIAL DIAGNOSIS FROM SYPHILIS. G. O. Horne.
PREVALENCE OF SYPHILIS IN CEYLON: REPORT BASED ON THE RESULTS OF SEROLOGICAL SURVEYS MADE BY THE W.H.O. V.D. CONTROL TEAM. Sydney M. Laird.
TRYPSIN DIGESTING MEDIUM ADDED WITH HORSE PLASMA FOR THE CULTURE OF THE GONOCOCCUS. V. Roiron-Ratner.
RECENT CHANGES IN FRENCH POLICY ON VENEREAL DISEASES AND PROSTITUTION. Cicely Watson.

Issued quarterly; annual subscription £2 2s., single copy 12s. 6d. Obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

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SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, June 28

●WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Apothecaries' Hall, Blackfriars Lane, E.C., 7.30 for 8 p.m., annual banquet.

Tuesday, June 29

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. J. Wallace: Endocrine Disorders Affecting the Skin.

●INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. E. A. Blake Pritchard: Spontaneous Intracranial Haemorrhage.

Wednesday, June 30

BRITISH ASSOCIATION OF PAEDIATRIC SURGEONS.—At Hospital for Sick Children, Great Ormond Street, London, W.C.1, 5 p.m., Simpson-Smith Lecture by Dr. O. Swenson (Boston, U.S.A.): Congenital Defects in the Pelvic Sympathetic System.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. O. Oliver: Mycobacteria in Skin Disease.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor T. F. Hewer: Gastritis.

Thursday, July 1

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—At Royal College of Surgeons of England, 5.30 p.m., Mr. J. E. Piercy: Diseases of the Thyroid, Parathyroid, and Thymus Glands.

●INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. P. H. Sandifer: Traumatic Paraplegia (1).

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4.30 p.m., Dr. R. I. S. Bayliss: Adrenal Function in Health and Disease.

Friday, July 2

INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. T. Ehrenpreis (Stockholm): Hirschsprung's Disease.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor C. G. Robt: Present Status of Blood Vessel Grafting.

Saturday, July 3

SOCIETY OF ANAESTHETISTS OF SOUTH WALES.—At Plastic Surgery Centre, St. Lawrence Hospital, Chepstow, 9.30 a.m. to 4 p.m., clinical meeting.

APPOINTMENTS

MACFARLANE, DAVID A., M.B., B.Ch., F.R.C.S., Research Fellow in Surgery, Harvard Medical School, and Assistant in Surgery, Peter Bent Brigham Hospital, Boston.

MCGRATH, S. DESMOND, M.R.C.P.I., D.P.M., Physician in Charge of Clinical Research, St. Patrick's Hospital, Dublin.

NEWCOMBE, JOHN, M.B., B.S., D.P.M., Whole-time Consultant in Psychiatry for the Mental Deficiency Hospitals and Associated Hostels in the Hull and East Riding areas.

TAYLOR, ELLIS, M.B., Ch.B., D.P.H., Divisional Medical Officer, Lancashire County Council, Health Division No. 11, and Medical Officer of Health, Leigh Municipal Borough, and Urban District Councils of Atherton, Horwich, Tyldesley, and Westhoughton.

WOOD-WILSON, JAMES, M.D., D.P.H., County Medical Officer, West Riding of Yorkshire.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Barlas.—On June 11, 1954, at Queen Victoria Cottage Hospital, Tonbridge, Kent, to Pam (formerly Coutanche), wife of Dr. John Barlas, of Tudely Hale House, Tonbridge, a sister for Jane—Shena Rozel.

Gordon.—On June 16, 1954, at Chase Farm Hospital, Enfield, Middlesex, son, to Nonette (Dr. Harris-Wright), wife of Dr. Ian J. Gordon, a second son.

Jones.—On June 7, 1954, at Edinburgh, to Dr. Elizabeth (formerly Hislop), wife of Dr. James Jones, a daughter—Sheila Margaret.

Pavillard.—On June 8, 1954, at Singapore, to Irene, wife of Dr. Stanley S. Pavillard, a daughter, Anita June. Sister for Linda.

Pilcher.—On June 17, 1954, at the Military Hospital, Catterick Camp, to Elizabeth Margaret (formerly Smedley), wife of Major R. K. Pilcher, R.A.M.C., a brother (Richard) for Anne.

Turner.—On June 9, 1954, at Berkeley, California, U.S.A., to Joan, wife of Robert G. Turner, M.D., F.R.C.S., a son—John Edward.

DEATHS

Brown.—On June 11, 1954, at Newton Abbot Hospital, Thomas Brown, M.D., D.P.H., of 3, South Road, Newton Abbot, Devon.

Butter.—On June 3, 1954, at his home, 139, Palmerston Road, London, N., Andrew James Moyes Butter, M.M., M.D.

Challenor.—On June 4, 1954, at 40, Ripon Road, Harrogate, Yorks, Lionel Thomas Challenor, M.R.C.S., L.R.C.P.

Cooke.—On June 10, 1954, at Putney Hospital, London, S.W., John Bow-Cooke, of 400, Upper Richmond Road, London, S.W., aged 75.

Cooke.—On June 7, 1954, Richard Alphonso Cooke, M.R.C.S., L.R.C.P., of Ashfield House, Aspull, near Wigan, Lancs, aged 59.

Cosham.—On June 4, 1954, at Jersey, Channel Islands, William Lorymer Cosham, M.B., Ch.B., of Bristol.

Davidson.—On June 11, 1954, at the Duke of York Home, Bradford, Yorks, Richard Davidson (senior), M.B., Ch.B., of Woodgate, King Cross, Halifax, Yorks.

Fergusson.—On June 5, 1954, at Barn House, Eltham, London, S.E., Norman Mello Fergusson, O.B.E., T.D., M.B., B.Ch.

Fothergill.—On June 5, 1954, Leopold Fothergill, M.B., B.S., of 41, Grosvenor Place, Jesmond, Newcastle-upon-Tyne, aged 88.

Freeman.—On June 9, 1954, Sidney Lionel Freeman, M.R.C.S., L.R.C.P., of 572, Green Lane, London, N.

Hickey.—On June 4, 1954, in a nursing-home, Dublin, William Hickey, M.C., M.B., B.Ch., B.A.O., of Fort William Cottage, Black Rock, Dublin, Eire, formerly of Bombay, India.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Cholinergic Urticaria

Q.—A boy of 16 years gets urticaria every time he takes part in the cross-country run at school. Is this phenomenon known and what is the explanation? What treatment is advised?

A.—The urticaria appears on exertion, and it suggests the type known as "cholinergic." Cholinergic urticaria is provoked by exercise and by strong emotion. It can also be produced experimentally by the injection of carbachol. It is intensely itchy and can often be distinguished from other types of urticaria by the fact that the individual lesions are quite small—a fraction of an inch in diameter.

No satisfactory treatment for cholinergic urticaria is known. There is sometimes some response to antihistamines, but in most cases this response is not sufficient to prevent the eruption or to give a satisfactory degree of relief.

Inguinal Hernia and Fitness for Work

Q.—As a factory medical officer I often come across candidates for employment who suffer from a more or less severe degree of inguinal hernia. Often they make no complaint of it and have thought of no treatment by truss or operation. Can you give me any guidance on the following problems? What type of work are these men capable of? Is there any foundation for the statement that increase in size or strangulation may follow exertion? What proportion and what types of hernia are likely to develop complications? It has been my impression that, in the past, we have perhaps laid too much stress on suggesting treatment, or alternatively light work, for a man who is not complaining in any way, nor incapacitated by this condition.

A.—It is difficult to give a comprehensive answer to the first question and much will depend on the type of work done. While strangulation of an inguinal hernia may occur in a patient at rest there is no doubt whatever that irreducibility and strangulation often follow some violent exertion. Most hernias grow bigger relatively slowly, but the constant increase of intra-abdominal pressure in a heavy occupation certainly accelerates this process.

Direct hernias due to diffuse bulging of the posterior wall of the inguinal canal rarely, if ever, give rise to complications. The funicular direct variety, in which there is a small defect in the posterior wall of the canal, does occasionally become obstructed.

Indirect inguinal hernia is much more liable to complications. In general those with broad necks are less likely to become obstructed than those with narrow ones. There are so many variable factors to be taken into consideration that any reliable statistics are lacking. It is, however, doubtful whether such figures would really help in persuading a reluctant patient to accept operation. The advice a doctor gives must depend on the type of hernia, its size, the size of the defect through which it emerges, its rate of growth, and the occupation of the sufferer. It is quite unnecessary to persuade the majority of patients with direct hernias to have something done. To those with indirect ones the examiner can truthfully say that the risks of an untreated hernia are far greater than those of operation.

Most surgeons would agree that those conducting routine medical examination tend to be over-cautious in advising the patient. The facts should be simply explained and coercion avoided. It is regrettable that certain firms and organizations do compel a man to have an operation as

a condition of his employment. Those who do their work without complaint or apparent incapacity should be allowed to continue as they are. In the writer's experience it is best to give such men an explanation on the lines outlined above and to tell them to report back in the event of any worries or difficulties.

Air-locks During Transfusion

Q.—What is the best way of preventing and removing air-locks during a drip transfusion?

A.—Air-locks are prevented by expelling all the air from the transfusion apparatus before setting up the transfusion. After the giving set has been inserted, the clamp is tightly closed and the bottle suspended at a height of 3 to 4 ft. (1 metre) above the site selected for venepuncture. The set is then hung full length and the distal length of the rubber tubing held up in a "U" so that the needle tip comes just below the level of the drip counter. The clip is slowly opened, and not closed again until the blood has expelled all the air from the distal tubing. When the air has been expelled it is important that the drip chamber should remain vertical, particularly when inserting the set into another bottle, otherwise air may enter the distal tubing and create an air-lock.

Once an air-lock has developed the only satisfactory procedure is to disconnect the apparatus and expel the air by the method outlined above. Disconnecting the set or changing to a fresh one is greatly simplified, and carries no risk of dislodging the needle, if the transfusionist has taken the precaution of using, between the needle and the giving set proper, the short length of rubber tubing included with every giving set prepared by the National Transfusion Service.

Trichlorethylene in Industry

Q.—What are the toxic effects of trichlorethylene ("trilene") when used in industry? In my experience, inhalation of the vapour produces a feeling of sleepiness which quickly passes off on exposure to fresh air after leaving work. Some workers complain of an embarrassing flushing of the face when enjoying the evening pint of beer. Can this flush be prevented?

A.—An excellent account of the toxic effects of trichlorethylene in industry can be obtained in *Toxicity of Industrial Organic Solvents*, by Ethel Browning.¹ Degreasing operations are the most frequent cause of industrial intoxication in this country, and cases of acute poisoning usually arise during the cleaning of the apparatus. Acute poisoning is manifested by sudden loss of consciousness without any profound effect on the respiratory or vascular system. Recovery without after effect is usual if the sufferer is removed soon enough from the fumes, but death occasionally occurs when suitable precautions are not taken.

Chronic exposure to sublethal concentrations of trichlorethylene produces drowsiness and consequently a loss of alertness which may render the worker more liable to accidents. Not infrequently this drowsiness is not appreciated and may persist for some time after leaving work. Instances have been encountered of workers falling asleep in the 'bus and going on long past their stop, and of falling off their bicycles on the way home. This drowsiness during the working day is often associated with an inability to sleep at night. Vague nervous symptoms of a neurotic type are often encountered. Headaches, dyspepsia, ill-defined aches, and sometimes paraesthesiae are common.

It seems likely that trichlorethylene is fixed in some organ where it is metabolized into trichloroacetic acid, which is slowly excreted for several days after exposure.² This forms the basis of a test of exposure to trichlorethylene by the measurement of the trichloroacetic acid excretion in the urine.³

It is recognized that alcohol and trichlorethylene have a synergistic effect and that workers who have been exposed to trichlorethylene find that they become easily drunk if they indulge in alcohol in the evening. The symptom of

face flushing comes into this category. There is apparently no way of avoiding this effect except by reducing the exposure to trichlorethylene.

REFERENCES

- ¹ *Rep. Industr. Hlth Res. Board (Lond.)*, No. 80, revised ed., 1953.
- ² Barrett, H. M., Cunningham, J. G., and Johnston, J. H. (1939). *J. Industr. Hyg.*, 21, 479.
- ³ Powell, J. F. (1945). *Brit. J. Industr. Med.*, 2, 142.

NOTES AND COMMENTS

Treatment of Leukoplakia of the Tongue.—Mr. P. A. LANE-ROBERTS (London, S.E.1) writes: I would suggest with deference that the answer to the question on treatment of leukoplakia of the tongue ("Any Questions?" June 5, p. 1336) is more optimistic in its tone than the facts justify. The patch has been steadily progressing in size from being "quite a small area to being almost the size of a halfpenny." Although the age of the patient is not stated, the suspicion arises that this may already be neoplastic and not merely hyperplastic; and this suspicion would be stronger if the patient were over the age of 45. In a recent short study of the records of Guy's Hospital 22 cases were found in which leukoplakia buccalis was associated with carcinoma of the oral cavity. Of these cases 6 had only recently (within 12 months) developed a patch or patches of leukoplakia, of which one was proved to be carcinomatous on examination by biopsy. It seemed that their leukoplakia was cancerous from the first. Of these cases none had a positive Wassermann reaction. The size of the lesion is of importance. A halfpenny measures 2.5 cm. Sturgis and Lund¹ found that 16 (22%) of 71 cases with lesions of more than 2.1 cm. in diameter developed cancer in the course of five years. Surely in a case of this nature biopsy is obligatory, and diathermy removal is justifiable.

OUR EXPERT writes: This criticism certainly demonstrates the truth of the statement in the answer that "some surgeons have always been inclined to more radical measures than others." With the great decrease in the numbers of late syphilitic lesions of the tongue, leukoplakia is nowadays nearly always due to other causes, but, apart from impressions, I do not know that there is any definite evidence that this either increases or diminishes the incidence of malignant change. One can "play for safety" and submit all cases to biopsy or adopt a more discriminating attitude, with, of course, the precautions mentioned in the answer. So many cases followed over the years have turned out to be benign (even sometimes despite a pathological report to the contrary) that I still think the more conservative attitude is justified.

REFERENCE

- ¹ Sturgis, S. H., and Lund, C. C. (1935). *New Engl. J. Med.*, 212, 7.

Corrections

At the end of Mr. W. S. Hanna's letter on undergraduate education (*Journal*, June 19, p. 1438) his address was given as Ballymena, Eire. This should, of course, have read Ballymena, N. Ireland.

The honorary degree which Sir Rudolph Peters, F.R.S., is to receive on November 26 is that of Doctor of Science of London University, not of Oxford (*Journal*, June 19, p. 1448).

"Any Questions?" Book.—The second book of selected "Any Questions?" is available, price 7s. 6d. (postage 6d.). Copies may be obtained either direct from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or from booksellers.

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Service Appointments

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GENERAL MEDICAL SERVICES COMMITTEE REMUNERATION QUESTIONS

A meeting of the General Medical Services Committee was held on December 17, with Dr. A. TALBOT ROGERS in the chair. The business occupied the whole day, from 10.30 a.m. to 5.15 p.m.

A communication from the Ministry of Health was placed before the Committee relating to the precise calculation of the central pool 1952-3. One of the matters at issue was the ascertainment of receipts from private practice. The Ministry expressed disappointment that the Committee had not found it possible to agree to the forthcoming Inland Revenue inquiry being used to ascertain private-practice income, but was willing to discuss alternative methods; in the meantime it agreed to the provisional figure of £2m. (the figure taken by Mr. Justice Danckwerts) in the calculation of the central pool, subject to adjustment for under- or over-payment in the following year.

The CHAIRMAN said that it had been pointed out to the Ministry that income from private practice was a diminishing and not an increasing amount. They had been willing to accept the figure mentioned, which was agreed at the time of the Danckwerts award, and if it should be subsequently shown that the figure should have been higher or lower they would consent to adjustment.

The question of monthly payments of capitation-fee remuneration to general practitioners (which was provided for in certain circumstances in the distribution scheme) was another matter which had been discussed with the Ministry. It was stated that in Middlesex, if a monthly payment system were adopted, it would entail, with 1,600 doctors on the list, the permanent employment of two extra clerks by the executive council. On the other hand, Sheffield has been following the system for some time.

The DEPUTY SECRETARY said that the Ministry had carried out its undertaking and in a letter to executive councils had suggested that requests for monthly payment should be interpreted in a reasonable way without insistence on detailed proof of the nature of a practitioner's difficulty. He thought that the Ministry had gone a long way to meet the Committee's view.

Responsibility of Partners

A matter to which the Committee had drawn the Minister's attention was the anomalous position which arose under the terms of service whereby a general practitioner was responsible for all acts or omissions of his deputy or assistant. Whilst this provision was equitable in the cases of assistants and locumtenents, in the case of members of a firm each partner should be held responsible for his own acts. A suggestion from the Ministry was that partners should be held jointly responsible, and that where both

agreed that the deputy should accept responsibility then the practitioner on whose list the patient's name appeared would take no further part in any proceedings.

It was pointed out that under the Ministry's scheme it would be possible for a medical services committee, having had one of the partners before it and finding no case against him, to call upon the other. Dr. GORSKY said that it was possible for the partnership agreement to contain certain clauses respecting indemnity which would be rendered null and void in these circumstances. There were certain dangerous implications in all this, and he suggested that it would be well to consult with the secretaries of the defence societies.

Dr. DAIN said that not only should a partner be covered, but any deputy should take his responsibility for what he did. It ought to be ensured that a doctor should not be proceeded against when either a partner or a deputy had acted for him.

It was agreed that the Chairman, with Dr. Dain, Dr. GORSKY, and Dr. J. T. Baldwin (representing Scotland), should discuss this matter with the defence societies.

General Practitioners on Regional Hospital Boards

The CHAIRMAN said that it had been pointed out by the Ministry that in composing the regional hospital boards it was necessary to have regard not only to the type of persons nominated and their experience but also to certain geographical conditions so as to ensure an appropriate distribution of representatives. Therefore it was suggested that when submitting nominations more than one name should be put forward, to avoid the possibility of the rejection of the single nominee purely on geographical grounds. This was agreed to as a general procedure, but it was felt that it would be inappropriate to put forward additional names when a representative who had served already and was eligible was prepared for re-nomination.

Clinical Research in Relation to the N.H.S.

The White Paper on clinical research in relation to the N.H.S., issued by the Medical Research Council, was the subject of some comment. Dr. B. CARDEW strongly impressed on the Committee that, in co-operation with the College of General Practitioners, it should urge at once that general-practitioner research should be undertaken. This should be done before the new Clinical Research Board had laid down its plans, which otherwise might not adequately cover general-practitioner aspects. Dr. F. M. ROSE thought that the Committee and the College would be in a stronger position if it had actual representation on the Board. It was also urged that some part of the fund of £250,000 should be allocated directly to general-practitioner research, otherwise it might be devoted entirely to hospital research projects. It was agreed that the College should be invited to make joint representations to the Research Board.

Student Entry and General Practice

A report was presented by a subcommittee which has been studying how medical manpower is related to the present intake of students into medical schools. The subcommittee had arrived at the conclusion that the Council should be asked to invite the Ministry to co-operate in the setting up of a working party to examine on a long-term basis and with the widest possible terms of reference the future number of general practitioners likely to be required in all branches of the profession and to relate these needs to the intake of students (see leading article at p. 83).

The CHAIRMAN said that many aspects had to be considered, including the diversion of medical manpower to the colonial services, the armed Forces, public health, and industrial medicine. Some figures had been worked out and were presented to the Committee in the form of tables and graphs, showing that as the years went on a certain number of qualified people would be looking for posts over and above those required to fill the vacancies which occurred through death or retirement in the different sections of the profession. With a more or less fixed establishment in the hospital and other services, the only big field open to absorb those who were otherwise redundant was general practice, into which more and more students would go.

Dr. P. J. GIBBONS suggested that a factor on the other side might be the growing disinclination of parents to encourage their children to enter medicine. The number of posts in the higher ranks was more or less fixed, and this alone prevented many able people from entering the profession. The DEPUTY SECRETARY pointed out that there had been a consistent rise (except for the immediate post-war years) in the numbers on the *Medical Register* over the last quarter of a century. The conclusion was inescapable that more and more doctors would be coming into the field of general practice every year.

The recommendation for the setting up of a Working Party was agreed to unanimously.

Geriatric Units

The Liaison Committee (of consultants and specialists and general practitioners) recommended that a joint subcommittee should be appointed forthwith to give further study to the establishment of an integrated service for the treatment and rehabilitation of those chronically disabled by age or illness. Several members gave their experience of the work of geriatric units and of the conditions for the treatment and accommodation of the elderly. Dr. C. F. R. KILLICK referred to the tendency to look upon old age itself as a disease, and to deny the use of general hospitals to old persons suffering from some disease and to consign them to special hospitals for the aged. Other members also deplored the modern tendency on the part of many young people to waive their responsibilities to aged relatives. Dr. SORSBY considered that the teaching hospitals and their schools should take over some of the responsibility for looking after ageing people. It would be useful for students who intended entering general practice to learn something in hospital about the treatment of the aged, and this was one of the ends to which also nursing training should be directed.

After some further discussion it was agreed that the suggestion of a special subcommittee should be supported and that there should be four representatives of each of the committees concerned—General Medical Services, Consultants and Specialists, and Public Health.

Guillebaud Evidence

The Committee devoted considerable time to a draft memorandum on aspects of the National Health Service from the point of view of general practice to which it considered that reference should be made in the Association's evidence to the Guillebaud Committee. The memorandum dealt with general administration, finance, pharmaceutical services, and other matters of important policy.

The views submitted by local medical committees were carefully considered and a number of them were incorporated in the memorandum of evidence.

Vacant Practice: Acceptance of Patients

Dr. ROBERT FORBES and Dr. ANNIS GILLIE attended as representatives of the Central Ethical Committee to discuss further the fixing of a time limit after which an acting practitioner in the case of death or retirement of a doctor would be freed from any obligation not to accept as his patient anyone to whom he had been introduced or with whom he had been in professional relationship while acting as locumtenent until the successor in the practice was appointed.

Dr. FORBES said that this arose out of a previous discussion between the two committees, which had appeared to be in agreement except for the time limit attaching to the bar they were seeking to impose. The Central Ethical Committee had suggested that a local practitioner who acted in the interval between the vacation of a practice through death or retirement and the appointment of a successor should refrain during that period and for 12 months thereafter from accepting as his patient any patient of the practice with whom he had been in professional relationship, except, of course, with the consent of the successor. Further, that a whole-time locumtenent specially engaged for the purpose of keeping the practice in being should similarly refrain for five years from setting up in the area. It was pointed out that the practitioner in possession during the interval was in a position of peculiar advantage in his access to patients.

The difficulties of the situation were discussed at length and various possibilities were envisaged. The feeling of the Committee was that it would be impossible to lay down any rule to satisfy all parties. One member said that the Ethical Committee was trying to maintain a ruling made for entirely different circumstances that is to say, for the pre-N.H.S. period when goodwill in a practice still existed.

A form of words was suggested by the Secretary of the Association and approved for the consideration of the Ethical Committee at its next meeting.

Other Business

Dr. CATHERINE HARROWER presented a report from a joint subcommittee which, with representatives of the Public Health Committee, had been considering ways and means of effecting better co-operation between the general practitioner and the health visitor. A short statement on the subject was agreed to for submission to the Council, and subsequently with the Council's approval for issue to divisional secretaries, secretaries of local medical committees, and medical officers of health, and for publication in the *Supplement*.

Some criticism was expressed concerning a draft leaflet on whooping-cough prepared by the Central Council for Health Education. The criticism was on the ground that it was likely to cause unnecessary worry for the doctor. It was agreed to ask the representative of the Committee on the Central Council to draw attention to the points of objection.

A brief report was made on a meeting of representatives of the pharmaceutical industry and the National Pharmaceutical Union to discuss the differential rate of discount allowed by manufacturers to dispensing doctors and to retail pharmacists. The matter was referred to the Rural Practices Subcommittee.

An alleged increase of suicides due to the ingestion of barbiturates and other sedatives was brought forward in a letter from the East Sussex Local Medical Committee, which suggested the advisability of urging the Minister to make regulations restricting the quantity of drugs and preparations ordered by doctors on N.H.S. prescriptions. The proposal, however, was not considered acceptable.

Several matters on the agenda were deferred until the next meeting.

EXCHANGE VISITS WITH CANADA AND THE U.S.A.

The scheme for exchange visits between members of the American, British, and Canadian Medical Associations, which has the approval of the Bank of England, will be continued this year.

Procedure

Three doctors from Britain may visit Canada in exchange for three doctors from Canada. Each doctor from Britain will be required to make all his own travel arrangements, and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in Canada he will receive the equivalent in Canadian dollars. Similarly, each Canadian doctor on arrival in Britain will receive the sum deposited in sterling.

Three doctors from Britain may visit the U.S.A. in exchange for three doctors from the U.S.A. Each doctor from Britain will be required to make all his own travel arrangements, and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in the U.S.A. he will receive the equivalent in U.S. dollars. Similarly, each U.S. doctor on arrival in Britain will receive the sum deposited in sterling.

Duration of Visits

The duration of the visits is left to the discretion of the doctors concerned. The American, British, and Canadian Medical Associations cannot accept any responsibility for a doctor who allows his visit to outlast the money placed at his disposal.

Applications are invited from members of the B.M.A. to take part in such exchanges during the next financial year—i.e., April 1, 1954, to March 31, 1955. Each applicant must state the object of his visit. Medical practitioners in all branches of the profession, including general practice and public health, are eligible. Applicants should also give approximate dates of the visit desired. (Successful applicants will in due course be required to furnish exact dates and details of travel.) Applications must be received by the Secretary of the Association by March 1, 1954.

**RECIPROCITY OF PRACTICE
AUSTRALIAN STATE'S LEGISLATION**

The Victorian Legislative Assembly has passed a Bill which will allow graduates of medical schools from Britain and in other countries of the British Commonwealth to practise in the State of Victoria. The New South Wales Parliament introduced similar legislation several months ago.

A Legal Difficulty

Introducing the Bill, the Minister for Health explained that the British Government had amended its own medical legislation to allow Commonwealth graduates to practise in England without doing a postgraduate course there. The Victorian Bill was a reciprocal arrangement with the British Act. It was not contemplated at present, he said, to make any change in the requirements for the registration of medical graduates from countries outside the British Commonwealth. They would still have to pass a medical course at an Australian university.

The difficulty, a purely legal one, about reciprocal recognition of registration first arose when Britain introduced the compulsory pre-registration year into the medical curriculum.

U.S. COMMITTEE'S STUDY OF MEDICAL SERVICES

Mr. Charles A. Wolberton, chairman of the U.S. Congress Committee on Interstate and Foreign Commerce, during his visit to Australia in the course of a world tour of inspection, said that he and other members of his committee had

recently examined the British health services. He had been surprised to find that "the opposition to the British scheme, evident at its introduction four years ago, had now disappeared. There was splendid co-operation between the doctors and the public health authorities, and many early problems had been overcome."

Mr. Wolberton's committee deals with legislation on such matters as public health and medical and scientific research. It examined health schemes in France, Sweden, and Spain as well as Britain.

OCCUPATIONAL HEALTH**FITNESS OF TRANSPORT DRIVERS**

The Occupational Health Committee of the Association held an all-day meeting on December 16, with Dr. J. A. L. Vaughan Jones in the chair. It was announced that Drs. G. E. Graves Peirce, J. M. Rogan, and J. S. Spickett had accepted co-option.

The Future of the Services

A report was made on the Council's reception of the Committee's memorandum on "The Future of Occupational Health Services"—a report to which more than one meeting of the Committee has been devoted. The Council had found itself unable to accept the wording of two paragraphs, and amendments of these had been agreed to by the Chairman of the Committee with the Chairmen of the Council and the Representative Body, and the amended memorandum submitted to the Ministry of Labour and National Service.

List of Industrial Medical Officers

The Committee again considered the practicability of compiling a list of all industrial medical officers. The Association maintains a list of whole-time officers, but no list of part-time officers at present exists. The difficulties of obtaining a complete list were explained. A suggestion was made that the help of local medical committees might be enlisted for this purpose, also that information might be available through divisional secretaries.

It was agreed to ask the General Medical Services Committee whether in its view the information would be available through local medical committees, perhaps in collaboration with executive councils.

Medical Standards for Road Transport

The Committee devoted more than two hours to a memorandum prepared by a subcommittee under the chairmanship of Dr. L. G. Norman on medical standards for road transport. The original terms of reference of the subcommittee included rail and air transport, but Dr. Norman said that as yet only brief consideration had been given to these two groups, and both railways and airlines had their own medical services. Moreover, so far as airlines were concerned the medical standards for aircrew were laid down by international agreement and were constantly under review. The subcommittee therefore felt it desirable without delaying to complete its reference to put forward at once the conclusions reached with regard to road transport.

The report, which will be published in due course, presents information concerning present visual and hearing standards, physique, general medical condition, including emotional stability, and frequency of examinations, and includes a long series of recommendations (which were accepted) for the examination of public service and heavy goods vehicle drivers and private car drivers, and also a revised draft form of medical report.

Remuneration of Industrial Medical Officers

A report from the Remuneration Subcommittee expressed the view on a preliminary consideration that the existing recommendations for the remuneration of industrial medical

officers were too rigid. Many large industries did not wish to be tied to an incremental scale of 6% per annum. In some instances they preferred to give an industrial medical officer with two to three years' experience an increase amounting perhaps to the total of his probable increments for the ensuing five years and then to keep him at that higher salary for several further years. But it was essential to ensure that there were reasonable increments leading to a maximum within the range laid down by the Association. A revised draft of the existing recommendations will be submitted to the Committee at its next meeting.

Occupational Dermatitis

A report was presented by Dr. H. Alexander on behalf of the Occupational Dermatitis Subcommittee. Two films on industrial dermatitis were seen, one by Imperial Chemical Industries for professional audiences and the other by the Ministry of Labour and National Service for lay audiences. The latter came in for some criticism in that it gave the impression that occupational dermatitis was normally cleared up in 10 days, that whilst the patient was on the sick list the treatment was given at the factory, and that insufficient emphasis was laid on the desirability of changing the man's job inside the factory to avoid absence from work altogether—in the words of one member of the Committee, "the film gave a general impression that industrial dermatitis was just the easiest thing in the world to deal with."

New Approach about Notification

It was also reported by the subcommittee that discussions on the possibility of making occupational dermatitis a notifiable disease and attempts to secure that employers were notified in all cases where an employee was receiving industrial injury benefit had so far proved unsuccessful. The subcommittee felt that a completely new approach should be made to the Ministry of Pensions and National Insurance on this subject and a memorandum was being prepared for the next meeting. It was realized that the problem was bristling with difficulties. Dr. A. Meiklejohn suggested that something should be done on the lines of the memorandum on medical standards for road transport which had just been considered—a memorandum which could go to the Ministry of Pensions and National Insurance.

A suggestion was made that the preparation of advisory notes on the treatment of acute skin inflammations in the initial stages might prove useful to a number of general practitioners in avoiding the use of substances likely to aggravate skin diseases. The Chairman suggested seeking the views of the Dermatologists Group Committee.

The draft proposals for legislation in connexion with the Gowers Committee report on health, welfare, and safety in non-industrial employment were deferred for consideration to a later meeting.

REMOVAL FROM THE MEDICAL REGISTER ADDRESS NOT KNOWN

In the course of discussion of a matter put before the General Medical Services Committee at its meeting on December 17 by Dr. Bruce Cardew it was mentioned by him that 1,692 names were removed from the *Medical Register* in 1952. This large number represented the periodical purge of the *Register*, which the G.M.C. is bound by statute to carry out, of the accumulation of names of doctors who cannot be traced.

Doctors who change their permanent address should always notify the G.M.C. Those who have changed their address and have not notified the G.M.C. should find out if they are still registered practitioners, because their legal status depends upon the fact that their name is included in the *Register*.

THE PRIVATE PATIENT

SECTIONS OF HEALTH SERVICE AVAILABLE

Some patients believe that they are bound to obtain their family doctor service through the National Health Service to qualify for National Insurance benefit, or to have the use of other sections of the National Health Service.

There is no foundation in this belief, and, in view of inquiries received, the Private Practice Committee has considered it wise to set out the present position.

Open to Choice

The National Health Service is available voluntarily in full or in part to all the population of this country excluding the armed Forces. It is thus possible to obtain separately the benefits of any of the following sections of the Service:

(1) Family Doctor Service; (2) Specialist and Hospital Service; (3) Dental Service; (4) Supplementary Ophthalmic Service; and (5) certain services provided by the local authority, as, for example, ambulances, school clinics, and home helps.

At present selection within a section of the Service is not permitted. For example, despite repeated representations to the Ministry, a patient receiving attention from his family doctor under private arrangements cannot obtain his medicines under the National Health Service. He can, however, take advantage of any other part of the Service.

National Insurance Separate

National Insurance is obligatory for very many of the population, and the benefits are not contingent in any way on participation in the arrangements of the National Health Service. These benefits of National Insurance, where applicable, include unemployment benefit, sickness benefit, retirement pension, widow's benefit, guardian's allowance, maternity benefit, death grant, and industrial injury benefit.

JOINT COMMITTEE ON PRESCRIBING MINISTRY'S REASSURANCE ABOUT COSTS INVESTIGATIONS

The publication of lists of preparations classified in categories 5 and 6 by the Joint Committee on Prescribing has raised doubts in the minds of some practitioners about their liability to surcharge in the event of preparations in these categories being ordered for National Health Service patients. The letter from the Chief Medical Officer to the Ministry of Health, which was enclosed with the copy of the Joint Committee's classifications sent to every medical practitioner, stated that, while doctors were asked not to prescribe articles in categories 5 and 6, this request was without prejudice to the individual practitioner's right to prescribe whatever drugs he considered necessary for any particular patient, though he might subsequently be called upon to justify his action before his colleagues on the local medical committee.

The General Medical Services Committee has now taken this point up with the Ministry of Health. As a result of the Committee's intervention, and to remove any possible misunderstanding, the Ministry has given a categorical assurance that those drugs listed in categories 5 and 6 will not be referred by the Pricing Bureau for investigation merely because they come within these categories. Indeed, the Regulations themselves do not permit of investigations on this count. Only where the individual practitioner's prescribing costs are substantially above the average for his area and are the subject of an inquiry on those grounds will the prescribing of drugs in categories 5 and 6 be one of the factors which may be taken into account. In such circumstances the frequency of prescriptions for substances in the two categories will also be considered.

B.M.A. LIAISON MACHINERY

PUBLIC HEALTH REPRESENTATION

The Consultants and General Practitioners Liaison Committee was originally appointed, as its name suggests, to discuss matters of common interest to consultants and general practitioners. At its last meeting on November 11 the chairman suggested, and the Committee agreed, that it would be advantageous to include in its membership representatives of the Public Health Committee. The Committee therefore recommended the proposal to its parent committees, the Central Consultants and Specialists Committee and the General Medical Services Committee, both of which approved the recommendation.

The Public Health Committee has accepted the invitation and has appointed the following to the Liaison Committee: Dr. K. Cowan (chairman of the Public Health Committee), Drs. H. D. Chalke, S. C. Gawne, J. Kelman, Lilywelyn Roberts, and J. B. Tilley.

OPHTHALMIC GROUP COMMITTEE

The meeting of the Ophthalmic Group Committee, held at the Association Headquarters on December 11, was mostly occupied with two matters still largely in the confidential stage. One of these was the statutory registration of opticians following the recommendations of the Crook Committee, and the other the preparation of evidence for the Guillebaud Committee. Mr. O. Gayer Morgan occupied the chair.

Statutory Registration of Opticians

It was reported to the Committee that a joint deputation appointed by the Faculty of Ophthalmologists and the Group Committee had attended at the Ministry to discuss the action to be taken following the report of the Crook Committee. It is hoped to have further discussions with the Ministry at a later stage, after which the Group Committee's representatives will report again.

The Guillebaud Committee

The Group Committee then considered the draft memorandum of evidence prepared for presentation to the Guillebaud Committee by the joint subcommittee with the Faculty of Ophthalmologists. The problem was considered under two of Ophthalmologists. The problem was considered under two main headings: (1) "Would the replacement of the present per capita Supplementary Eye Service by a sessional clinic service under hospital authorities lead to a more economical use of public funds, as well as allow for the integration of the work of ophthalmologists, opticians, and orthoptists?" and, if such should be the case, (2) "What steps can be taken to provide more eye clinics with suitable staff?"

The DEPUTY SECRETARY pointed out that some members wished to see an extension of the hospital service whereas others desired an extension of the supplementary ophthalmic service. Was there not scope for a middle course? He thought the draft memorandum of evidence took the middle line. It hinged on one recommendation, that the financial control and administration of all ophthalmic services should be brought under the hospital and specialist service. Perhaps it had not been sufficiently stressed that if the ophthalmic medical practitioner was working in the clinic he would enjoy an enhanced status, would be permitted to undertake treatment, and have opportunities for promotion and advancement in the hospital service. The supplementary ophthalmic service would, however, continue side by side with the hospital service.

Dr. J. N. TENNENT was asked briefly to present certain points he had suggested on the ground of economy. These suggestions were mainly concerned with improvements in the supplementary ophthalmic service, and a number of them were agreed for inclusion in the memorandum of evidence.

Eventually it was agreed that the report be revised by the Deputy Secretary in the light of the views expressed in the discussion, that any figures of cost, etc., given as examples, should be the result of expert scrutiny, and that the revised memorandum should be submitted to the chairman of the Group Committee (Mr. Gayer Morgan) and the chairman of the Faculty of Ophthalmologists (Mr. J. H. Daggart), after which it could go forward to the Council of the Association as an agreed document.

Spectacle Frames for Schoolchildren

Dr. I. LLOYD JOHNSTONE brought forward the matter of the free range of spectacles for schoolchildren. He said that Worcester Ophthalmic Services Committee had resolved to urge upon the Minister that a serviceable frame strong enough and suitable for children could not be manufactured from the white metal material at present in use for frames C.221 and C.223, and that rolled gold frames should preferably be made available in the free range for children, or, alternatively, that frames of basic material similar to the hospital steel frame in use before the war, but suitably covered, should be substituted. The Ministry, however, felt that there was no evidence that nickel frames were not strong enough for children, nor that gold-filled frames were more serviceable than nickel.

Dr. Lloyd Johnstone demonstrated to the Committee a pair of child spectacles with cylinders in the region of +4.00 D, in which the frames were very easily bent and the child was wearing the glasses with the axes of each cylinder roughly 20° out of position. Even when straightened they could not be expected to stay in the position for long.

The Committee agreed to look into the problem.

"Reminders" by Opticians

A letter from the Guild of Dispensing Opticians concerning the sending out of "reminders" was read. The Group Committee's view was that "reminders" were unethical and unprofessional. Some ophthalmic opticians had alleged that "reminders" were sent out by dispensing opticians which indirectly resulted in sight-testing appointments being made for ophthalmic medical practitioners, and the Guild of Dispensing Opticians had been asked to recommend their members not to solicit their clients in any way for sight-testing appointments. The Guild had replied that it was emphatically against the issue of any communications by dispensing opticians which related to sight-testing. This was the exclusive province of the ophthalmologist; but there was nothing unethical, improper, or provocative in the issue of communications offering adjustments to the spectacles of former patients. By this means dispensers provided a useful after-service, and would much resent being asked to discontinue such a long-standing practice.

Mr. G. W. BLACK said that he was gravely perturbed about this question, and thought the Group Committee should reaffirm its opinion that the sending out of circulars of any kind should be discouraged.

This was the general feeling of the Committee, and the matter is to be reopened with the Guild.

Service Opticians

It was reported that after a meeting with representatives of the Service departments and the Ministry of Health which was attended by the chairman of the Group Committee and other members the proposals made by the Committee concerning sight-testing of dependants of Service personnel appeared to be favourably received—namely, that Service ophthalmologists should have complete responsibility for the work of the Service eye centres, including responsibility for scrutinizing and signing prescription forms for glasses. In reply to a recommendation on these lines the War Office now stated that the recommendations of the Group Committee were already in operation in the Army, opticians carrying out refraction work only under supervision, and the

A. ROBINSON THOMAS.

B.M.A. LIBRARY

The following books have been added to the Library:

- Anderson, D. J.: *Physiology for Dental Students*. 1952.
 Bantug, J. P.: *Short History of Medicine in the Philippines during the Spanish Regime, 1563-1898*. 1953.
 Bowley, A. H., and Townroe, M.: *Spiritual Development of the Child*. 1953.
 Boyd, W.: *Textbook of Pathology*. Sixth edition. 1953.
 Bundesen, H. N.: *Towards Manhood*. 1952.
 Charnley, J.: *Compression Arthrodesis*. 1953.
 Chesser, E.: *Marriage and Freedom*. Revised edition. 1952.
 Clare, N. T.: *Photosensitization in Diseases of Domestic Animals: A Review*. 1952.
 Compere, E. L., and Banks, S. W.: *Pictorial Handbook of Fracture Treatment*. Third edition. 1952.
 Coruzzi, C.: *Il Tabagismo e le Altre Intossicazioni Voluttuarie*. 1953.
 Craddock, D.: *Introduction to General Practice*. 1953.
 Dickson, F. D., and Diveley, R. L.: *Functional Disorders of the Foot*. Third edition. 1953.
 Eyles, L.: *Sex for the Engaged*. 1952.
 Fairbrother, R. W.: *Textbook of Bacteriology*. Seventh edition. 1953.
 Field, M.: *Patients Are People: A Medico-social Approach to Prolonged Illness*. 1953.
 Hayek, F. A.: *The Sensory Order: An Inquiry Into the Foundations of Theoretical Psychology*. 1952.
 Houston, W. V., *et al.*: *The Scientists Look at Our World*. 1952.
 Jackson, O. M.: *Handbook of Paediatrics for Nurses in General Training*. 1952.
 Krause, M. V.: *Nutrition and Diet Therapy in Relation to Nursing*. 1952.
 Kris, E.: *Psychoanalytic Explorations in Art*. 1953.
 Lindner, R.: *Prescription for Rebellion*. 1953.
 Litzberg, J. C.: *Synopsis of Obstetrics*. Fourth edition, revised by C. E. McLennan. 1952.
 Lowman, C. L., and Roen, S. G.: *Therapeutic Use of Pools and Tanks*. 1952.
 McCord, J. B., and Douglas, J. S.: *My Patients Were Zulus*. 1952.
 McKellar, P.: *Textbook of Human Psychology*. 1952.
 McKenzie, W.: *Ear, Nose, and Throat Diseases for Medical Students*. 1953.
 Moench, L. G.: *Office Psychiatry*. 1952.
 Osborn, L. A.: *Psychiatry and Medicine: An Introduction to Personalized Medicine*. 1952.
 Piaget, J.: *The Child's Conception of Number*. 1952.
 Pinsent, R. J. F. H.: *Approach to General Practice*. 1953.
 Portmann, A.: *Animal Forms and Patterns: A Study of the Appearance of Animals*. 1952.
 Poynting, Thomson and Awbery's *University Textbook of Physics*. Volume III. Heat. Eleventh edition. 1952.
 Rennie, T. A. C., and Bozeman, M. F.: *Vocational Services for Psychiatric Clinic Patients*. 1952.
 Reynolds, S. R. M.: *Physiological Bases of Gynecology and Obstetrics*. 1952.
 Rybins' *Medical Licensure Examinations: Topical Summaries and Questions*. Seventh edition by Walter L. Bierring. 1952.
 Sava, G.: *Patients' Progress*. 1952.
 Scott, J. H., and Symons, N. B. B.: *Introduction to Dental Anatomy*. 1952.
 South African Institute for Medical Research, Biochemical Department: *Scope and Interpretation of the Commoner Biochemical Tests*. 1952.
 Symposium on Radiobiology: *Basic Aspects of Radiation Effects on Living Systems*, Oberlin College, June 14-18, 1950. 1952.
 Ver Bruggen, A.: *Neurosurgery in General Practice*. 1952.
 Wallace, J. S.: *Newer Knowledge of Hygiene in Diet*. 1952.
 Warren, S., and LeCompte, P. M.: *Pathology of Diabetes Mellitus*. Third edition. 1952.
 Wartenberg, R.: *Hemifacial Spasm*. 1952.
 White, F. D., and Delory, G. E.: *Course in Practical Biochemistry for Students of Medicine*. 1952.
 Widdowson, T. W.: *Special or Dental Anatomy and Physiology and Dental Histology: Human and Comparative*. Volume I. Eighth edition. 1952.
 Wittkower, E., and Russell, B.: *Emotional Factors in Skin Disease*. 1953.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

- Metropolitan Borough Councils*.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

Association Notices

Diary of Central Meetings

JANUARY

- 4 Mon. Hospital Junior Staffing Subcommittee, Central Consultants and Specialists Committee. 11.30 a.m.
 5 Tues. Staff Side, Committee "B," 11 a.m.
 5 Tues. War Memorial Committee, 12 noon.
 5 Tues. Building Committee, 2 p.m.
 5 Tues. Full Committee "B" (at 14, Russell Square, London, W.C.), 2.30 p.m.
 7 Thurs. Rural Practices Committee, G.M.S. Committee. 2 p.m.
 7 Thurs. Central Consultants and Specialists Committee Executive, 2.30 p.m.
 8 Fri. Industrial Injuries Evidence Subcommittee. Occupational Health Committee, 2 p.m.
 12 Tues. Central Ethical Committee, 12 noon.
 12 Tues. Amending Acts Committee, 2 p.m.
 13 Wed. Council, 10 a.m.
 14 Thurs. Central Consultants and Specialists Organization Subcommittee, 10 a.m.
 14 Thurs. Staff Side, Committee "C," Medical Whitley Council (at 14, Russell Square, London, W.C.). 2 p.m.
 14 Thurs. Full Committee "C," Medical Whitley Council (at 14, Russell Square, London, W.C.). 3 p.m.
 15 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.
 15 Fri. Scientific Exhibition Subcommittee, Arrangements Committee (at Glasgow Regional Office, 234, St. Vincent Street, Glasgow), 7.45 p.m.
 18 Mon. Armed Forces Committee, 2 p.m.
 19 Tues. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
 20 Wed. Committee on the Rehabilitation of Disabled Persons, 10.15 a.m.
 20 Wed. Joint Health Visitors Subcommittee, G.M.S. and Public Health Committees, 2.30 p.m.
 20 Wed. Transport Medical Standards Subcommittee. Occupational Health Committee, 2.30 p.m.
 22 Fri. Complaints Procedure Subcommittee, Central Consultants and Specialists Committee. 2.30 p.m. (Date changed from January 14.)
 25 Mon. Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.), 10.30 a.m.
 25 Mon. Full General Whitley Council (at 14, Russell Square, London, W.C.), 2.30 p.m.

FEBRUARY

- 3 Wed. Committee on the Rehabilitation of Disabled Persons, 10.15 a.m.

Branch and Division Meetings to be Held

- CHESTERFIELD DIVISION.—At Walton Sanatorium, Chesterfield. Friday, January 8, 8.45 p.m., meeting. Mr. Jonathan Hanaghan will speak on some psychological subjects.
 EAST KENT DIVISION.—At Winter Gardens, Margate, Friday, January 8, 8.30 p.m. to 2 a.m., annual supper and ball.
 GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, January 7, 8.30 p.m., Divisional meeting. Lecture by Mr. A. Lawrence Abel: "Common Diseases of the Rectum and Anal Canal"; colour film: "Resection of Rectum".
 SWANSEA DIVISION.—At Osborne Hotel, Swansea, Thursday, January 7, symposium by general practitioners.
 WEST HERTS DIVISION.—At Large Town Hall, Watford, Wednesday, January 6, 8.30 p.m. to 1.30 a.m., annual ball.

Meetings of Branches and Divisions

- CHELSEA AND FULHAM DIVISION
 A general meeting was held at St. Stephen's Hospital, London, S.W.10, on December 4, 1953. The Mayors of Chelsea and Fulham were present, together with an audience of 90, to hear Colonel W. L. Harnett, I.M.S. (retd.), give a lecture, illustrated by lantern slides, entitled "Journey into Tibet."

SOUTH MIDDLESEX DIVISION

- At the annual general meeting on December 7, 1953, the following officers were elected for 1954:

- Chairman.—Dr. H. Bergh.
 Vice-chairman.—Dr. Mortimer O'Sullivan.
 Honorary Secretary.—Dr. G. C. L. Woodroffe.
 Representatives on the Representative Body.—Mr. C. D. Meadowcroft and Dr. G. C. L. Woodroffe.

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SCOTTISH MEDICAL PRACTICES
COMMITTEE
FIFTH REPORT

In its report for the year ending June 30, 1953, the Scottish Medical Practices Committee states that its aim has been to secure as far as practicable a distribution of doctors in accordance with the needs of the people. The Committee is aware that, even in districts where the numbers on established doctors' lists are unduly high, the introduction of a new doctor does not always bring about any rapid reduction of these lists: but it anticipates that in course of time a more rational distribution may thus be achieved.

Size of Lists

Generally speaking, the report says, the slight tendency previously observed towards a more balanced ratio of patients to doctors throughout the country has been maintained, although in the cities, large towns, and industrial areas notable variations remain. The average number of patients on doctors' lists throughout the country is slightly over 2,000. In the district of areas listed as needing additional doctors (see below) the figure is approximately 2,900.

At June 30, 1953, there were 2,505 practitioners undertaking to provide general medical services in Scotland, compared with 2,424 at the corresponding date in 1952 and 2,339 at the inception of the National Health Service, since when the number of persons on the lists of doctors has increased by approximately 244,000. At October 1, 1952, there were 138 single-handed doctors with fewer than 500 patients on their list and there were 72 with over 4,000.

Number of Principals

At October 1, 1952, the number of practitioners practising as principals providing general medical services and maternity medical services was 2,137. The number providing general medical services, excluding maternity medical services, was 245—a grand total of 2,382 principals. The number of assistants was 305, and trainee assistants 98. There were 1,269 principals in partnership and 1,100 were single-handed, and of these single-handed practitioners 896 had no assistant.

It is the Committee's view that entry into practice by way of partnership will continue to be favoured by young doctors and others anxious to become principals. It appears to it doubtful whether there will be any considerable

immediate redistribution of patients as a result of the reduction of maximum numbers on lists from 4,000 to 3,500, and that entry into an existing partnership, with the use of partnership premises and a guaranteed share of the profits, will prove more attractive to many doctors than an attempt to build up a single-handed practice.

The New Distribution Scheme

During the year, the report states, the tendency towards a more even distribution received an impetus from the effects of the new arrangements for the distribution of doctors' remuneration which came into operation on April 1, 1953. The most significant feature has been the increase in the number of partners, encouraged by the "notional list" payments to partnerships. In many cases existing partnerships have assumed an additional partner; in an even greater number of cases, however, new partnerships have been formed, frequently by taking an assistant into partnership. There were 61 new partnerships in March and April of 1953 as compared with 19 in the same period of 1952.

New Applicants

The Committee has maintained a record of the number of applicants for the various types of vacancies advertised and of the respective ages of applicants and of the doctors selected as successors. It has again been impressed by the consistently high average number of applicants. During the year over 500 applications were received by executive councils for the 22 advertised vacancies. This does not, of course, accurately reflect the number of doctors seeking to be established, since many doctors were applicants for more than one vacancy.

The Committee has noted that it is becoming increasingly difficult for a doctor already established in one practice to move to another, should he so wish. One possible method, which has been little used, is by arranging an exchange with another established doctor. Provided that the executive council in each area was satisfied with the proposed arrangements, the Committee would normally raise no objection and would grant the applications by the two doctors for inclusion in the respective medical lists.

Comparatively few applications for the Initial Practice Allowances have yet been made, and it would appear to the Committee that even with the encouragement of an Initial Practice Allowance there is still reluctance on the part of many to face the hazards involved in setting up in single-handed practice.

SIR,—May I congratulate your correspondent Dr. E. Snell on his excellent suggestion (*Supplement*, December 19, 1953, p. 237) of the B.M.A. taking up the question of remuneration of hospital medical staff?

C. C. COOKSON.

Surgeon Captain J. G. Holmes, O.B.E., has retired.
Surgeon Commanders H. H. Fisher, G. S. Rutherford, and
T. McCarty have retired.
Acting Interim Surgeon Lieutenant-Commanders G. R.
Wheldon and J. S. Ritchie to be Surgeon Lieutenant-Commanders.
Surgeon Lieutenants P. D. A. Durham and H. R. Mallows to
be Surgeon Lieutenant-Commanders.

Majors R. M. Hector, D. W. Bell, T. G. A. L. Warrington, and A. Crook, M.C., to be Lieutenant-Colonels.
Captains M. A. C. Dowling and I. McC. Carmichael to be Majors.

REGULAR ARMY RESERVE OF OFFICERS

Colonel T. H. Twigg, late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

ROYAL ARMY MEDICAL CORPS

Captain (War Substantive Major) N. R. Murdoch has ceased to belong to the R.A.R.O.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonels R. W. Raven, O.B.E., J. D. Finlayson, T.D., J. H. Prain, J. Smith, O.B.E., T.D., R. J. S. Doherty, T.D., and R. Passmore to be Colonels.

Majors C. K. D. Edwards and F. H. Blackburn, T.D., to be Colonels.

Majors R. R. Davies, T.D., J. Baxter, H. B. Lee, T.D., A. C. Houghton, J. G. Waugh, R. C. Webster, and H. A. Mullen to be Lieutenant-Colonels.

Major R. W. Biagi, M.B.E., has been granted the acting rank of Lieutenant-Colonel.

Captains G. Gregg and J. Petrie to be Lieutenant-Colonels. Captains J. Attenborough, A. T. H. Glanville, and H. Walker to be Majors.

Major R. McL. Archibald has ceased to hold a commission. Captains J. H. H. Oliver and H. I. Jory have been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel F. Heywood-Jones, O.B.E., T.D., from Active List, to be Colonel.

Lieutenant-Colonel R. R. Davies, T.D., from Active List, to be Lieutenant-Colonel.

Majors G. K. Thornton, T.D., and H. McE. Morris, T.D., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O.

REGULAR ARMY: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

Lieutenants (War Substantive Majors) A. W. Johnson and N. L. Corkill have relinquished their commissions and have been granted the honorary rank of Lieutenant-Colonel.

Lieutenants (War Substantive Captains) R. D. K. Levy, R. H. Bowie, C. Kirk, and P. Shubik have relinquished their commissions and have been granted the honorary rank of Major.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: E. Akwei, M.B., Ch.B., D.P.H., and C. H. Bannerman, M.B., Ch.B., D.T.M.&H., Principal Medical Officers, Gold Coast; S. M. Adu-Appiah, L.R.C.P.&S.I., R. Y. Taylor, M.R.C.S., L.R.C.P., and F. D. Burgess, M.R.C.S., L.R.C.P., Medical Officers, Kenya; B. C. Fisher, M.B., B.S., Medical Officer (Leprosy), Nigeria; J. G. Hayes, M.B., B.Ch., Medical Officer, Northern Rhodesia; L. R. Taylor, F.R.C.S., Senior Assistant Surgeon, Singapore; Mavis E. Eva, M.B., B.S., Lady Medical Officer, Aden; G. Lynch, M.B., B.Ch., Radiologist, Federation of Malaya; J. R. Naudi, M.D., Medical Officer, Federation of Malaya; C. L. Schormar, M.B., Ch.B., Superintending Medical Officer, Windward Islands; L. T. Scott, B.M., B.Ch., Specialist Anaesthetist, Federation of Malaya; G. J. A. Searson, M.B., Ch.B., Medical Officer, Barbados; R. L. Huckstep, M.B., B.Ch., Resident Medical Officer (Intense), Kenya; J. Kolcan, M.B., Ch.B., District Medical Officer, Windward Islands.

Association Notices

Diary of Central Meetings

JANUARY

- 12 Tues. Central Ethical Committee, 12 noon.
12 Tues. Amending Acts Committee, 2 p.m.
13 Wed. Council, 10 a.m.
14 Thurs. Central Consultants and Specialists Organization Subcommittee, 10 a.m.
14 Thurs. Exchange of Practices Subcommittee, G.M.S. Committee, 2 p.m.
14 Thurs. Staff Side, Committee "C," Medical Whitley Council (at 14, Russell Square, London, W.C.), 2 p.m.
14 Thurs. Full Committee "C," Medical Whitley Council (at 14, Russell Square, London, W.C.), 3 p.m.
15 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.
15 Fri. Scientific Exhibition Subcommittee, Arrangements Committee (at Glasgow Regional Office, 234, St. Vincent Street, Glasgow), 7.45 p.m.
18 Mon. Armed Forces Committee, 2 p.m.
19 Tues. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.

- 20 Wed. Committee on the Rehabilitation of Disabled Persons, 10.15 a.m.
20 Wed. Joint Health Visitors Subcommittee, G.M.S. and Public Health Committees, 2.30 p.m.
20 Wed. Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.
21 Thurs. G.M.S. Committee, 10.30 a.m.
22 Fri. Complaints Procedure Subcommittee, Central Consultants and Specialists Committee, 2.30 p.m. (Date changed from January 14.)
25 Mon. Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.), 10.30 a.m.
25 Mon. Full General Whitley Council (at 14, Russell Square, London, W.C.), 2.30 p.m.
26 Tues. Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.

Branch and Division Meetings to be Held

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, Queens Drive, Blackpool, Wednesday, January 13, 7.15 p.m., dinner; 8.30 p.m., Mr. J. H. Kellgren: "Rheumatoid Arthritis and its Treatment."

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, January 12, 8.30 p.m., general meeting. Address by Dr. J. H. Cyriax: "The Painful Shoulder."

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, January 14, 7.30 p.m., dinner; 8.45 p.m., Mr. P. R. Wright: "The Treatment of Bone and Joint Tuberculosis."

EAST NORFOLK DIVISION.—At Norfolk and Norwich Hospital, Norwich, Saturday, January 16, 3 p.m., meeting. Discussion on salaried service.

ENFIELD AND POTTERS BAR DIVISION.—At Firs Hall Ballroom, Green Lanes, Winchmore Hill, N., Saturday, January 16, 7 for 7.30 p.m., annual dinner. Principal guest, Sir Henric Ogilvie, K.B.E.

HASTINGS DIVISION.—At Lecture Hall, Nurses Home, Royal East Sussex Hospital, Hastings, Tuesday, January 12, 8.15 p.m., meeting with Hastings and District Law Society. Address by Dr. W. Bentley Purchase: "Thirty Years' Experience at the Bar."

HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, January 12, 8.45 p.m., meeting. Mr. R. Vaughan Hudson: "Thyrototoxicosis."

LAMBETH AND SOUTHWARK DIVISION.—At Lambeth Hospital, Brook Drive, Kennington Road, S.E., Sunday, January 10, 11 a.m., clinical meeting.

LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, S.E., Friday, January 15, 8.30 p.m., meeting. Dr. B. Gans: "Variations on a Theme of Bed-wetting."

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, January 12, 5 p.m., "Brains Trust" for senior students. All recently qualified practitioners are invited.

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, January 14, 7.45 p.m., clinical meeting, followed by a film.

SHROPSHIRE AND MID-WALES BRANCH.—Wednesday, January 13, 8 p.m., meeting of Clinical and Pathological Section. Programme of sound films: "Minor Anaesthetics."

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Friday, January 15, 8.30 p.m., meeting. Address by Mr. C. S. Savage: "Otitis Media."

SOUTH ESSEX DIVISION.—At Harold Wood Hospital, Sunday, January 10, 10.15 a.m., clinical meeting.

SOUTH WALES AND MONMOUTHSHIRE BRANCH.—At Royal Gwent Hospital, Newport, Thursday, January 14, 3 p.m., joint clinical meeting with Newport Division.

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, January 15, 8 p.m., meeting. Address by Professor Alexander Kennedy: "Medical Aspects of Boxing."

SUTTON COLDFIELD DIVISION.—At Town Hall, Sutton Coldfield, Thursday, January 14, 9 p.m. to 1 a.m., 5th annual dance.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Tuesday, January 12, 8.30 p.m., general practitioners' evening. Cases will be shown and discussed by local general practitioners.

WEST MIDDLESEX DIVISION.—At Ealing Chest Clinic, Green Man Passage, West Ealing, W., Wednesday, January 13, 3.30 to 5.30 p.m., Dr. Hugh Clinie: "At Home."

WEST SOMERSET DIVISION.—At Out-patients' Department, Yeovil Hospital, Thursday, January 14, 8 for 8.30 p.m., meeting. Address by Miss Beryl D. Corner: "Pitfalls in Diagnosis of Disease in Childhood."

Meetings of Branches and Divisions

SWINDON DIVISION

The annual general meeting was held at the Victoria Hospital, Swindon, on October 23, 1953. There were 13 members present. The following officers were elected:

Chairman.—Dr. James Urquhart.
Vice-chairman.—Dr. F. Robinson.
Hon. Secretary and Treasurer.—Dr. Elwyn Evans.

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British Medical Association

ANNUAL MEETING—GLASGOW, JULY 1-9, 1954

President-Elect: EMERITUS PROFESSOR SIR JOHN MCNEE, D.S.O., M.D., D.Sc., F.R.C.P., F.R.F.P.S.

PROVISIONAL PROGRAMME

The 122nd Annual Meeting of the British Medical Association will be held in Glasgow from Thursday, July 1, to Friday, July 9, 1954, inclusive.

On the evening of Wednesday, June 30, there will be a Cocktail Party for Representatives and their Ladies, arranged by the Glasgow Division.

The Annual Representative Meeting will begin on Thursday, July 1, and continue on Friday, Saturday, and Monday, July 2, 3, and 5.

The Representatives' Dinner and Ladies' Dinner will take place on Thursday, July 1, followed by a dance.

The Overseas Luncheon has been arranged for Friday, July 2.

On Sunday, July 4, an all-day sail on the Firth of Clyde has been arranged, and this will be followed by a concert in the evening.

The Adjourned Annual General Meeting and President's Address will take place in the Kelvin Hall on the evening of Monday, July 5, and the President's Reception, which follows, will be held in the Bute Hall, at the University.

The Annual Scientific Meeting and associated functions will occupy the period from Tuesday morning, July 6, to the evening of Friday, July 9.

The Official Religious Service will be held in Glasgow Cathedral on the afternoon of Tuesday, July 6, and arrangements for a Roman Catholic Service, on the same day, are also being made.

The Annual Dinner of the Association will be held in the Central Hotel on Thursday, July 8.

A full social programme is being arranged, including a Civic Reception on Tuesday evening, July 6, and a University Reception on Wednesday evening, July 7. There will also be a dance on Friday evening, July 9.

Several special functions have been arranged for ladies accompanying the members, including visits to Loch Lomond, Lake of Menteith and Stirling, the Burns Country, and Edinburgh. Also included among these is an all-day excursion to Loch Katrine and the Trossachs—the area of the water supply of the City of Glasgow.

The usual golf competitions will take place. The Overseas Conference will be held on the afternoon of Wednesday, July 7, and there will also be an "At Home" for Overseas Visitors given by the Empire Medical Advisory Bureau on a day yet to be fixed.

The Reception Room for Registration will be open in the Kelvin Hall on Monday, July 5, at 9 a.m.

Three Plenary Scientific Sessions have been arranged as follows: Tuesday, July 6, at 9.30 a.m., subject "The Problem

of Sleep"; Wednesday, July 7, at 3 p.m., subject "Food and Disease"; Thursday, July 8, at 9.30 a.m., subject "The Problem of Pulmonary Tuberculosis To-day."

Seventeen Scientific Sections have been arranged, the meetings to take place on Wednesday morning, July 7, Thursday afternoon, July 8, and Friday morning and afternoon, July 9. The arrangements, so far, are as follows:

Medicine	July 7 (a.m.), July 8 (p.m.)
Surgery	July 7 (a.m.), July 8 (p.m.)
Obstetrics and Gynaecology	July 7 (a.m.), July 8 (p.m.)
Pathology and Microbiology	July 7 (a.m.), July 8 (p.m.)
Child Health	July 7 (a.m.), July 8 (p.m.)
Preventive Medicine and Infectious Diseases	July 8 (p.m.), July 9 (a.m.)
Occupational Health	July 9 (a.m.)
Orthopaedics	July 9 (a.m.)
Psychiatry	July 9 (a.m.)
Dermatology	July 9 (a.m.)
Cardiology	July 9 (p.m.)
Radiology	July 9 (p.m.)
Neurology	July 9 (p.m.)
Forensic Medicine	July 9 (p.m.)
Anaesthetics	July 9 (p.m.)
Ophthalmology	July 9 (p.m.)
Physical Medicine	July 9 (p.m.)

Individual programmes for these Sections will be published in a later issue of the *Journal*.

The Scientific Exhibition will be held in the Kelvin Hall, and will be open daily from July 5 to 9. Demonstrations will be given at fixed advertised times and a wide field of medical interests will be covered. Further details will be published in a later issue of the *Journal*.

The Annual Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications will also be housed in the Kelvin Hall. The Exhibition will be open from 9 a.m. to 6 p.m. from July 5 to 9 inclusive.

The Ladies' Club will be situated in the College Club, University, and will be open throughout the Meeting.

HOTEL ACCOMMODATION

The following hotel accommodation will be available in Glasgow and adjoining districts. Members wishing to reserve accommodation are asked to write direct to the hotel, stating that they are attending the B.M.A. Meeting. The Association cannot accept responsibility for any of the prices stated below. These are the tariffs ruling at the moment and are subject to alteration without notice. Applicants should therefore verify the tariffs when making their reservations.

In view of the demands of the tourist traffic to the Western Highlands of Scotland, members who desire hotel accommodation are advised to make their wishes known to the hotel concerned as early as possible.

Name and Address of Hotel	Tel. No.	Distance from University	Rooms Available	Tariff, 1953 B/B
*Green's Hotel, 22/24, Woodlands Ter., Glasgow, C.3	Douglas 4976	½ mile	4 Single 5 Double	25/- p.p.
Belhaven Hotel, 23, Belhaven Ter., Glasgow, W.2	Western 7307	½ "	15 Single 15 Double	24/- p.p.
*Ivanhoe Hotel, 185, Buchanan Str., Glasgow, C.2	Douglas 7284	1½ miles	8 Single 12 Double	25/- 40/-
*Royal Hotel, 106, Sauchiehall Str., Glasgow, C.2	Douglas 3416	1½ "	10 Single 16 Double	23/- p.p.
*Buchanan Str. Station Hotel, Buchanan Str., Glasgow, C.2	Douglas 9016	1½ "	8 Single 14 Double	24/- p.p.
*North British Hotel, 40, George Sq., Glasgow, C.2	Douglas 6711	1½ "	20 Single 23 Double	35/- 60/-
*St. Enoch Hotel, St. Enoch Sq. Glasgow, C.1	Central 7033	1½ "	40 Single 35 Double	35/- 60/-
*Buchanan Arms Hotel, Drymen, Stirlingshire	Drymen 310	15 "	8 Double	37/- p.p.
Y.M.C.A. Club, 100, Bothwell Str., Glasgow, C.2	City 0388	1½ "	63 Single (Men)	12/6
Hostel Accommodation				
MacLay Hall, 17, Park Ter., C.3	Douglas 5056	½ mile	15 persons (Men)	12/6
McBrayne Hall, 11, Park Circus Pl., C.3	Douglas 5626	½ "	35 persons (Men)	12/6
Queen Margaret Hall, Bute Gardens, W.2	Western 1622	400 yards	35 persons (Women or married couples)	14/6 p.p.
Douglas House, Jordanhill College, Southbrae Drive, W.3	Scotstoun 2694	2½ miles	50 persons	14/6

* Licensed hotels.

Members who desire private accommodation—that is, not in hotels or hostels—should communicate with the *Lodgings Officer, University of Glasgow, 4, University Gardens, Glasgow, W.2*, stating their requirements. The telephone number of this office is *Kelvin 2231*.

Accommodation in hostels may be either of single rooms or rooms with two beds.

PROVISIONAL TIME-TABLE

Wednesday, June 30

8.30 to 10.30 p.m.—Cocktail Party (by invitation of the Glasgow Division), Trades House, Glassford Street, Glasgow, C.1.

Thursday, July 1

9.00 a.m.—Annual Representative Meeting Inquiry Office opens at Bute Hall, University.
9.00 a.m.—Ladies' Club opens, the College Club, University.
9.30 a.m.—Annual Representative Meeting starts, Bute Hall, University.
11.00 a.m.—Welcome by the Lord Provost of Glasgow to A.R.M.
7.30 p.m.—Representatives' Dinner, Central Hotel.
8.00 p.m.—Representatives' Ladies' Dinner, Central Hotel.
9.30 p.m.—Representatives' Dance, Central Hotel.

Friday, July 2

9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Annual Representative Meeting.
1.00 p.m.—Overseas Luncheon, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, C.2.
5.00 p.m.—Cocktail Party for Women Representatives and medical women accompanying Representatives, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, C.2 (by invitation of the Medical Women's Federation, Scottish Western Association).
8.00 p.m.—Reception and Demonstration by Director and Staff at Glasgow Art Gallery, Kelvingrove.

Saturday, July 3

8.00 a.m.—Annual Breakfast of the Christian Medical Fellowship, the Union, University Avenue.
9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.00 a.m.—Council Meeting, Forehall, University.
9.30 a.m.—Ladies' Club open.
10.00 a.m.—Annual Representative Meeting.

7.30 p.m.—Glasgow Graduates' Dinner, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, C.2.

7.30 p.m.—Aberdeen Graduates' Dinner, North British Hotel, George Square, C.2.

7.30 p.m.—Welsh Graduates' Dinner (accommodation being arranged).
p.m.—Theatre "Party."

Sunday, July 4

a.m.—All-day sail on the Firth of Clyde with luncheon and afternoon tea.
p.m.—Concert, Kelvin Hall.

Monday, July 5

9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.00 a.m.—Scientific Exhibition opens at the Kelvin Hall.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications opens at the Kelvin Hall.
9.00 a.m.—Reception Room for Registration opens at Kelvin Hall.
9.30 a.m.—Ladies' Club open.
10.00 a.m.—Annual Representative Meeting.
12.30 p.m.—Annual General Meeting, Bute Hall, University.
p.m.—Council Meeting, Forehall, University (on conclusion of A.R.M.).
8.15 p.m.—Adjourned Annual General Meeting and President's Address, Kelvin Hall.
9.30 p.m.—President's Reception, Bute Hall, University.

Tuesday, July 6

9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 12 noon.—Scientific Plenary Session, Kelvin Hall—"The Problem of Sleep."
2.30 p.m.—Robing for Religious Service, Royal Infirmary.
3.00 p.m.—Official Religious Service, Glasgow Cathedral.
3.00 p.m.—Roman Catholic Service, St. Andrew's Cathedral.
8.00 p.m.—Reception by the Lord Provost of Glasgow and Magistrates, at City Chambers, George Square, C.2.

Wednesday, July 7

9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 12.30 p.m.—Scientific Sections.
10.00 a.m.—Leinster and Childs Cup Golf Competition.
2.00 to 3.00 p.m.—President and Party, Official Tour of Scientific Exhibition.
3.00 p.m.—Overseas Conference, Forehall, University.
3.00 to 5.30 p.m.—Scientific Plenary Session, Kelvin Hall—"Food and Disease."
8.00 p.m.—Reception in the Bute Hall by invitation of the University of Glasgow.

Thursday, July 8

9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 12 noon.—Scientific Plenary Session, Kelvin Hall—"The Problem of Pulmonary Tuberculosis To-day."
10.00 a.m.—Treasurers' Cup Golf Competition.
2.30 to 5.30 p.m.—Scientific Sections.
3.00 p.m.—Garden Party in the grounds of the Glasgow Royal Mental Hospital, Gartnavel, 1055, Great Western Road, W.2 (by invitation of the Medical Superintendent and the Board of Management).
7.30 p.m.—Annual Dinner, Central Hotel, Gordon Street, C.1.

Friday, July 9

9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 12.30 p.m.—Scientific Sections.
2.00 to 5.00 p.m.—Scientific Sections.
p.m.—Dance, the Union, University Avenue, Glasgow.

LINES OF COMMUNICATION

DISCUSSIONS WITH G.P.O.

The telephone is indispensable to the vast majority of medical practitioners in this country, though on occasion the doctor and his household may seem to be tyrannized by the summons of the telephone bell. At B.M.A. Headquarters a steady flow of correspondence is received concerning problems experienced by doctors in connexion with their telephones. Hardly a Representative Meeting passes without at least one resolution on the agenda on this subject. Last year was no exception and the following was resolved:

"That even stronger pressure be brought to bear on the G.P.O. in order that a satisfactory solution may be found speedily for the problem of the unattended telephone."

Co-operation of G.P.O.

With the willing co-operation of the authorities of the G.P.O., who are sympathetic to the difficulties experienced by doctors, a great number of the problems have been happily resolved. In view, however, of the misunderstandings and difficulties which still exist, it seemed advisable to review the whole position, and as a result of a meeting with representatives of the Post Office the following statement, which has the agreement of the G.P.O. authorities, is offered as an explanation of some of the remaining difficulties though not necessarily a solution.

The Present Position

Owing to continued restrictions on capital expenditure the G.P.O. is still faced with a shortage mainly of lines and exchange equipment, and to a less extent of labour. The demand for telephones is 50% greater than before the war, and, despite the connexion of 350,000 new telephones a year, there are still nearly 400,000 applicants waiting for the telephone, many of whom have been on the list for a number of years. The situation varies from one place to another, but the general position is improving.

The Shared Line

In order to provide telephone lines for as many as possible it is now an obligation on all new and removing subscribers at the residence rate to share a line if necessary. Sharing is not always enforced at the outset except when it is necessary to connect another person in the same locality who is on the waiting-list.

The telephone needs of doctors are well appreciated by the authorities. A doctor is given top priority for his consulting room and is entitled to a single line which is paid for at the business rate, and he is not required to share. The home telephone of a doctor who does not practise from there comes under the rules for an ordinary residential line and may be shared if necessary to provide service for another subscriber. Sharing will not be enforced where a considerable number of telephone calls are made and received at the private address from which the practitioner transacts a substantial portion of the business of his practice, particularly those of an exceptionally urgent type; in this event the telephone authorities will not accept the confidential nature of calls as a bar to the sharing of a telephone line, as they are not prepared to accept that a telephone line is at any time a suitable medium for the transmission of truly confidential matter.

It is of interest that, though doctors have misgivings on the sharing of a line, of the several thousand doctors who have had this type of telephone service during the last few years only one has so far complained to the Association as a result of his experience. This is the general experience of the Post Office authorities, who get little complaint from the 700,000 people who are now sharing their lines.

The Unattended Telephone

The need always to have someone ready to answer the telephone in a doctor's house frequently becomes an intoler-

able burden on the doctor, his wife and family, and his staff, and many arrangements have been suggested to overcome this modern problem.

In a partnership where the members live reasonably close together it may be possible to use extension lines. Where the G.P.O. has the necessary equipment in its exchanges it will arrange at reasonable notice for the transfer of a doctor's call to another member of a partnership or rota for regular periods or on occasion. The G.P.O. points out that the demand for this facility is very high in many places and asks doctors to assist colleagues and the G.P.O. by making use of the service only when essential to fulfil professional obligations. It should also be made quite clear that the Post Office can only accept straightforward instructions for the transfer or reference of calls to another number and can at no time accept any outside responsibility. A very simple alternative is the publication in the telephone directory of an alternative number, and this may be all the G.P.O. can do in country districts.

In view of the increased demands on the services of the doctor since the inception of the National Health Service and the increased salaries of staff, this problem has prompted the invention of a number of devices. At the present moment there is only one recording and answering device which has the approval of the G.P.O. for attachment to its telephone lines; the G.P.O. does not supply such devices.

Answering Bureaux

In larger centres it has been possible to make special arrangements for calls to be handled by special organizations of this type. These may be organized on a commercial basis or a private co-operative basis amongst a number of doctors, and in certain large centres the regional hospital board or the ambulance service have put their facilities at the disposal of the local doctors. The G.P.O. is anxious to assist, as far as it can, where a number of doctors desire to establish such arrangements, and telephone managers are ready to give advice.

Radio Telephones

A modern development has been the use of portable radio-telephones for "mobile" communication (e.g., between a doctor's car and his house or surgery). A G.P.O. licence is necessary. The application of these is strictly limited, as there are very few radio frequencies available, and conversations can be overheard by anybody tuning in to the appropriate wavelength. It is, however, appreciated that in special types of practices, especially in the country, private radio-telephone services can be of great value.

Doctors who have individual telephone problems are advised to discuss them with the local telephone manager or his representative, who is ready to give advice on the best method according to local circumstances of meeting the problem of the unattended telephone. If there are difficulties which cannot be resolved in that way doctors are advised to bring them to the notice of B.M.A. Headquarters, who will seek the co-operation of the G.P.O. to find an acceptable solution wherever it is possible.

UNDERGRADUATE INSTRUCTION IN THE SOUTH-WEST

Bristol University has arranged with about 25 general practitioners to give a fortnight's training course to students. Each doctor has agreed to take two students, one in March and one in April. Students will stay with the G.P.s or lodge near by.

General-practitioner Research

The South-western Regional Faculty Board of the College of General Practitioners reports in a newsletter that some 20 members in the region have volunteered to partake in research. It is suggested that the subject might be "The Present Scope of General-practitioner Obstetric Practice, with Special Reference to Future Undergraduate Teaching."

AMERICAN MEDICAL ASSOCIATION AND ETHICS

REPORT OF JUDICIAL COUNCIL

The Judicial Council of the American Medical Association, in which is vested the "judicial power" of the association in ethical matters, was among the committees which reported to the House of Delegates of the A.M.A. at its meeting at St. Louis from December 1 to 4, 1953. The following is an extract from the report of the council (*Journal of the American Medical Association*, December 26, 1953).

"In closing this report to the House of Delegates, your Judicial Council solicits the most careful consideration by the members of the House and their constituency of 140,000 physicians to the loss of public confidence in the integrity of the medical profession that follows each publicized expression of personal opinion regarding unethical conduct alleged to be currently prevalent in considerable segments of the nation. We have the constitutional processes by which charges of unethical conduct may be tried in an atmosphere of equity and fair play. Why not invite formal charges of misconduct among members, and thereby ensure each alleged offender trial by his peers rather than by sources that lead no further than to sensationalism and loss to our profession of the precious good will of the public?"

FEWER FORMS IN 1954

NATIONAL INSURANCE BENEFITS CLAIMS

About 4½ million fewer forms will be filled up in 1954 by people claiming sickness and injury benefits under the national insurance schemes. According to a statement by the Ministry of Pensions and National Insurance, the procedure has been simplified and claimants without dependants, who represent nearly two-thirds of all those claiming, will not have to fill up an extra inquiry form. The back of the new type of first medical certificate has been redesigned and now includes questions which hitherto had to be asked on a separate form.

When the new type of first medical certificate is in use anyone not claiming for dependants as well as for himself will not receive the separate form. These claimants will not hear from the Ministry of Pensions and National Insurance, therefore, until they send in their second certificate.

"Weekly" Certificates

The Ministry circular goes on to say that all claimants should send in their second certificate as soon as they get it from the doctor, and, as there are time limits for claiming benefit, subsequent certificates should be sent in weekly. Delay may lead to loss of benefit.

The Ministry's instructions might be taken by patients to mean that intermediate certificates must be supplied by the doctor at precisely seven-day intervals, and the Secretary of the B.M.A. states that the reference to weekly certificates in the Ministry circular in no way modifies the present position. That is to say, the initial intermediate certificate should still be issued not later than seven days after the first certificate, but subsequent intermediate certificates can be given at any time during each following week, as distinct from strict weekly intervals.

TRAINING OF DISTRICT NURSES

WORKING PARTY APPOINTED

The Minister of Health and the Secretary of State for Scotland have appointed a working party on the training of district nurses. Its terms of reference are: "To consider what training it is desirable that registered nurses and enrolled assistant nurses, respectively, should undertake prior to their employment on home nursing duties, and the means by which such training should be provided."

The Chairman will be Mr. I. F. Armer, Deputy Secretary to the Ministry of Health, and the members: Alderman Major G. Canty

(Lincolnshire); Miss M. F. Carpenter (Royal College of Nursing); Miss E. Cockayne (Chief Nursing Officer, Ministry of Health); Miss M. H. Cook (Public Health Nursing Officer, Ministry of Health); Dr. T. M. Clayton (Medical Officer of Health, Coventry); Dr. A. R. Culley (Principal Medical Officer, Welsh Board of Health); Dr. G. Matthew Fyfe (Medical Officer of Health, Fife County Council); Miss E. J. Merry (General Superintendent, Queen's Institute of District Nursing); Miss M. O. Robinson (Chief Nursing Officer, Department of Health for Scotland); Dr. Dorothy Egan (Principal Medical Officer for Maternity and Child Welfare, London County Council); Councillor Mrs. W. Shutt (Leeds); Alderman T. O. Steventon (Shropshire); Dr. J. A. Struthers (Medical Officer of Health, Holborn and Westminster); Dr. J. Stanley Thomas (General Practitioner, East Ham); Miss J. E. Treleven (Senior Superintendent, Ranyard Nurses); and Dr. W. S. Walton (Medical Officer of Health, Newcastle-upon-Tyne). The secretary is Miss J. E. Chapple, of the Ministry of Health.

About half the district nurses now employed have received special domiciliary training, mainly under the auspices of the Queen's Institute of District Nursing (or, in certain parts of London, the Ranyard Nurses), after completing their general training in hospital. The task of the Working Party will be to consider whether some minimum measure of special domiciliary training should be generally recommended for adoption by the local health authorities responsible for the home nursing service. Between 8,000 and 9,000 nurses are engaged either full-time or part-time in district nursing in England and Wales, and about 1,300 nurses are so engaged in Scotland.

CONSULTANTS DINNER

The Central Consultants and Specialists Committee is holding a dinner in the Great Hall of B.M.A. House on Wednesday, February 3, to celebrate the fifth year of its establishment by the British Medical Association. The Minister of Health and the representatives of the Royal Colleges of England and Scotland and of the Royal Faculty of Physicians and Surgeons of Glasgow will be present as guests.

Consultants and senior hospital medical officers who would like to be present should apply for tickets to the Secretary, British Medical Association, price £2 10s. (including cocktails but exclusive of wine), and can apply for a ticket in addition for a medical guest if they so desire.

N.H.S. SUPERANNUATION SCHEME

In *The Times* of December 29 and 30, 1953, Professor R. Titmuss discussed pensions in relation to the medical and other professions. Mr. J. Pringle, Public Relations Officer of the B.M.A., accordingly addressed a letter to *The Times*, with the following passage relevant to the medical profession:

"I am concerned to point out one or two errors of fact in Professor Titmuss's references to the medical profession. He may be right in saying that the National Health Service superannuation schemes are 'probably the most generous yet provided.' They are certainly the latest and therefore presumably the most up-to-date. They apply similar principles to everyone in the Service, hospital nurses and clerks as well as hospital doctors, though Professor Titmuss omitted to say so. Allowances to cover expenses, including car mileage, do not, however, as Professor Titmuss supposes, rank for superannuation, any more than they would in any other business or profession. Contributions are based on all professional earnings from National Health Service sources. The 'part-time' fees referred to by Professor Titmuss are part of the doctor's remuneration under contract, and as such are very rightly included in his total remuneration as assessed for pension purposes.

"Again, Professor Titmuss is inaccurate in saying that the superannuation benefits for National Health Service doctors were left out of account when settling the 'betterment' in their income compared with that in other comparable callings. When the Government gave consultants a 20% 'betterment' over their estimated 1939 remuneration, it was recognized that consultants in the Health Service do not now have

to provide for their own old age, as was obligatory in 1939. Consequently, the 20% was regarded as the gross 'betterment,' and from it was deducted a sum equivalent to the Government's 8% of salary contribution to superannuation, as well as the consultant's own contribution of 6% of salary. Similar provisions were made in the general-practitioner field. In other words, the level of 'betterment' expressly took into account the benefits of State superannuation."

Correspondence

Assistant with a View

SIR,—There have been so many letters from young doctors complaining of inability to enter into partnership that a recent experience of ours may be worth relating as indicating a difficulty which we had not foreseen.

We are a three-handed practice in the country and this practice has had three partners for over 50 years. There is no doctor in between us and our hospital town 17 miles to the west. Our neighbours to the east are four doctors 13 miles away. There is one doctor four miles to the N.E., and a partnership of two is 10 miles to the N.W. To the south our practice peters out in fell country. Before the war there was a doctor seven miles to the west of us and another one nine miles to the east. These practices have now been discontinued and are absorbed by the neighbouring doctors. Since the Danckwerts award and the arrangements of the new distribution scheme we felt that we could afford to have a fourth doctor in with us, thereby giving ourselves some leisure and time for study and at the same time absorbing some of the work of the young doctors for whom we ultimately as a principal one of the young doctors for whom we felt sorry. We therefore decided to look for an assistant whom we could take into partnership in about 18 months' time and we found a suitable man. We wrote to the executive council to obtain its permission to employ him as assistant with a view to partnership, and then followed some correspondence, the relevant extracts from which are as follows:

From the Executive Council in Reply to Our Application.—"I have to inform you that your application for permission to employ an assistant was approved on Friday 4th instant. I shall be obliged if you will inform me when Dr. E. actually commences his duties. Regarding the fact that at some later date Dr. E. may be admitted to the partnership, I have to state that, in view of the fact that X, which is included in Y district, is classified by the Medical Practices Committee, London, as a restricted area, any application for admission to the medical list will be considered according to the circumstances obtaining at the time of the application."

Our Reply to the Above.—"We are concerned that Dr. E. may be refused permission to enter into partnership with us when he applies in 18 months' time. We understood that the idea behind the new distribution scheme was to encourage principals to take in new partners. The journals have frequent correspondence from young doctors complaining that established principals will not admit them to partnership and saying that they are dissatisfied with the prospect of remaining as assistants. If the committee has sanctioned the employment of an assistant, what is the difference to the medical personnel of the district and to the Medical Practices Committee, London, between continuing as an assistant and being admitted a partner in 18 months' time? Or are we right in assuming that, if his application for admission to partnership is refused, permission to employ him as an assistant will be automatically withdrawn? This makes our arrangement with Dr. E. very uncertain. Naturally the best of the young doctors will only come with a promise of partnership. . . . He may not want to come here as an assistant 'with a hope' and we cannot see that we can offer him any other terms."

From the Executive Council.—"With reference to your letter of September 10, I have to draw your attention to the fact that the admission of medical practitioners to the Medical List for the purpose of practising as principals, either in partnership or otherwise, is the function of the Medical Practices Committee in wise, is the function of the Medical Practices Committee in London, and for this purpose they classify the various areas throughout the country, and therefore throughout the county area, according to the number of medical practitioners at present in practice in the areas concerned. Each application for admission to the list has, therefore, of necessity, to be considered in relation to the conditions and circumstances applying at the time of the application. It is, therefore, not possible for a decision on such a matter to be given in advance. As you will readily appreciate, between the date of such a decision and the date of a doctor's

actual entry into partnership, further applications might be received for immediate admission, thus bringing about a radical change in circumstances and availability of practitioners. I regret, therefore, that the executive council is not able to give any decision on the point you raise regarding your proposed assistant, Dr. E."

We then wrote.—"Thank you for your last letter. We understand now that permission to employ Dr. E. as assistant will not be withdrawn if his application to enter into partnership is refused. We really do want to know the difference to medical personnel between three principals and one assistant on the one hand, and four principals on the other."

"You mention the possibility of some person making application for inclusion on the council's list between now and April, 1955. As you now have knowledge of our intentions we shall expect to be informed if anybody does make application to practise in this area, before their application is considered by the committee, so that we can safeguard Dr. E.'s position."

Throughout the whole of this correspondence the clerk of the executive council has been most helpful and patient, but there the situation is. Dr. E. has come and is installed as assistant with a promise from us that we shall take him into partnership, but there is no certainty from the executive council that he will be allowed to do so, and we still have not been able to get a satisfactory answer to our question asking the difference between three partners and one assistant, and four partners. In case there are others who are similarly placed, we publish this correspondence, with the permission of the clerk of the executive council, in order that they may be forewarned of the difficulties which might arise.—We are, etc.,

D. D. & W.

Remuneration of Hospital Medical Staff

SIR,—Your correspondents Dr. E. Snell (*Supplement*, December 19, 1953, p. 237) and Dr. Bernard Sugden (*Supplement*, January 2, p. 7) may be interested to know that about nine months ago the Member of Parliament for the area in which I was then living asked, after I had been in touch with him, in the Commons if the Minister of Health could explain why there was delay in settling negotiations. The reply was phrased in such a manner as to indicate that the cause of the delay was because the matter was being negotiated before the Whitley Council. A further approach to the Minister made some two months ago produced the same reply.—I am, etc.,

A. W. ANDERSON.

Hastings.

SIR,—I wholeheartedly endorse Dr. B. Sugden's letter (*Supplement*, January 2, p. 7). It is fantastic that the full-time consultant and many of the part-timers should find their incomes less than that of a recently qualified general practitioner who has a large N.H.S. list. One realizes the present sociological trend to reduce the higher incomes and raise the lower, but for the raw recruit to be able to earn more than the general is hardly calculated to produce the best army to fight disease.—I am, etc.,

PAUL F. B. GILLET.

Hove, 3.

Mildmay Memorial Hospital Maternity Unit

SIR,—For 30 years the Maternity Unit at the Mildmay Memorial Hospital has served a useful function in the Islington, Hackney, and Stoke Newington areas. Four weeks ago the unit was closed at 48 hours' notice and 230 bookings were informed that they would have to be transferred to other hospitals. During this 30 years general practitioners have been able to attend their own patients in this hospital, and closure removes the only opportunity for such liaison in this district.

On the appointed day the hospital was taken over by the Ministry of Health, and Nos. 2, 3, 4, 9, and 10, Newington Green—owned by the Mildmay Trust but occupied, No. 2 by the medical superintendent, 3 and 4 by the obstetrical unit, and 9 and 10 as a nurses' home—continued to be used by verbal licence of the directors of the Trust, and no rent was charged subsequent to the appointed day under the National Health Service Act. A dangerous-structure notice was served on the Trustees in

August, 1952, and notice thereof was given to the Ministry's solicitor on August 27, 1952. No reply to this communication was received. A copy of the notice was served on the Trustees in April, 1953, and notice thereof was given to the Archway Group Management Committee on April 22, 1953. To this communication also no reply was received. A summons was issued returnable at the Old Street Police Court on December 10, and on that same day a letter was received from the solicitor to the Ministry determining at two days' notice the licence under which the premises were held by the Ministry and refusing to accept any liability. The premises Nos. 2, 3, and 4, Newington Green were also, and since the appointed day had been, occupied by the Minister as a tenant at will, and as presumably no rent would be paid, nor liability accepted for repairs, the directors of the Midmay Trust Ltd., as trustees, had no option but to determine this licence.

The closing of Nos. 2, 3, and 4 as a maternity institution is a tragedy. It was opened some 30 years ago by the Trust, by whom all the furniture and equipment was provided, and it was found that the patients preferred accommodation where their husbands could visit them at any time, and their own doctors attend them. The Ministry gave instructions that no more patients were to be admitted after 48 hours. The hospital continues to operate—only the obstetrical unit being closed. Of the 230 patients booked, about one-third were to be attended by general practitioners.

A year ago the Ministry asked the Trust to meet the district valuer to agree on a price for Nos. 2, 3, and 4, Newington Green as the Ministry were desirous of purchasing them, Nos. 3 and 4 being the obstetrical unit. This was done, and an agreed price arrived at, but no further action was taken by the Ministry.

Surely this is the solution to the problem.—We are, etc.,

W. COHEN-ANDRE. P. A. M. SOUTTER.
J. C. MCGREGOR. C. F. STOTT.
M. E. MORTON. M. O. THORPE.

London, N.4.

Care of the Aged Sick

SIR,—I was amazed to read in the "Medical Notes in Parliament—Care of the Aged Sick" (*Journal*, December 26, 1953, p. 1436) that the Minister felt that "it would be the final irony of the Welfare State if all they could find to solve this immensely difficult problem was to bring back the relieving officer and rebuild, in whatever form, the work-houses."

As a practitioner with 30 years' experience as district medical officer, and hospital medical officer under the Poor Law, and later the Public Assistance, I think that the most retrograde step in the N.H.S. was the discontinuance of the relieving officer. It does not always follow that because an old person is sick he is in need of hospital treatment—far from it. If better use were made of home helps, by "grants in aid," the aged sick would be dealt with in a far kinder fashion in their own homes, and their relations would be only too pleased to co-operate, if in these hard times they were not asked to undertake responsibilities they could ill afford.

The present N.H.S. presupposes that the whole community is of average intelligence, and is able to make use of the vast benefits at its disposal, but this is not the case. There may be many, although affluent, who are in reality in need. Many of them have not the energy, the desire, or the "savvy" to implement their pensions, grants, etc., to their advantage. It was for such as these, "the poor in spirit" from whatever cause, that the kindly relieving officer proved such a blessing when he relieved them in their several necessities "in kind." Who has the time to do that now?

In my humble opinion there is as great a necessity for the relieving officer, and the workhouse, as ever, and with due respect I prophesy they will return, but probably under another name. Apart from the fact that in the hierarchy of the Health Service the almoner must be based on a hospital, what is the actual difference in function between her and the relieving officer, except that the latter was so much closer to those in need?—I am, etc.,

Ruthin.

TREVOR HUGHES.

Association Notices

Diary of Central Meetings

JANUARY	
15 Fri.	Meeting of Chairman and Speakers, Plenary Session—"The Problem of Pulmonary Tuberculosis To-day" (at 234, St. Vincent Street, Glasgow), 2.15 p.m.
18 Mon.	Armed Forces Committee, 2 p.m.
19 Tues.	Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
20 Wed.	Committee on the Rehabilitation of Disabled Persons, 10.15 a.m.
20 Wed.	Joint Health Visitors Subcommittee, Central Consultants and Specialists, G.M.S., and Public Health Committees, 2.30 p.m.
20 Wed.	Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.
21 Thurs.	G.M.S. Committee, 10.30 a.m.
22 Fri.	Meeting of Chairman and Speakers, Plenary Session—"Food and Disease," 11.30 a.m.
22 Fri.	Complaints Procedure Subcommittee, Central Consultants and Specialists Committee, 2.30 p.m. (Date changed from January 14.)
25 Mon.	Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.), 10.30 a.m.
25 Mon.	Pharmacopoeia Subcommittee, Science Committee, 2 p.m.
25 Mon.	Full General Whitley Council (at 14, Russell Square, London, W.C.), 2.30 p.m.
26 Tues.	Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.
27 Wed.	Planning Subcommittee, Occupational Health Committee, 10.30 a.m.
27 Wed.	Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
27 Wed.	Psychological Medicine Group Committee, 2 p.m.
28 Thurs.	Meeting of Chairman and Speakers, Plenary Session—"Problem of Sleep" (at 234, St. Vincent Street, Glasgow), 2.30 p.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Farnham Hospital, Wednesday, January 20, 8.30 p.m., clinical meeting.

BIRKENHEAD AND WIRRAL DIVISION.—At Arrow Park Hotel, Woodchurch, Saturday, January 23, 7.30 for 8 p.m., dinner; 9 p.m., Sir Heneage Ogilvie: "Practice—Yesterday, To-day, and To-morrow."

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, January 19, 8.30 p.m., meeting. Address by Mr. Oliver T. Mansfield.

BROMLEY DIVISION.—At Royal Bell Hotel, Bromley, Tuesday, January 19, 8 p.m., business meeting. 8.30 p.m., symposium: "The Care of Old People." Speakers include Dr. E. G. Pringle, Dr. A. Elliott, Dr. G. S. Stamp, Mr. Tom Brown, Mrs. Busbridge, and Dr. H. L. Glyn Hughes.

ENFIELD AND POTTERS BAR DIVISION.—At Firs Hall Ballroom, Green Lanes, N., Saturday, January 16, 7 for 7.30 p.m., annual dinner and dance. Members of North Middlesex Division are invited.

FINCHLEY DIVISION.—At Finchley Memorial Hospital, Bow Lane, N., Friday, January 22, 8.45 p.m., meeting. Mr. A. J. Wrigley: "Changes in Obstetrics in the Last 25 Years, and the Lessons to be Learned Therefrom."

HARROW DIVISION.—At Rayners Hotel, Rayners Lane, Tuesday, January 19, 8.30 p.m., clinical meeting. Dr. H. J. V. Morton: "Some Recent Advances in Anaesthetics" (with demonstrations and effects).

MARYLEBONE DIVISION.—At Medical Society of London, Thursday, February 4, 8.30 p.m., meeting. B.M.A. Lecture by Mr. J. E. A. O'Connell: "Surgical Treatment of Disk Lesions." Members of the St. Pancras Division are invited.

MID-HERTS DIVISION.—At Red Lion Hotel, St. Albans, Friday, January 22, 8.45 p.m., meeting.

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, January 19, 8.45 p.m., meeting. Dr. C. A. Birch: "Air Embolism and Other Medical Hazards." A short discussion will follow.

OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Oldham, Monday, January 18, 9 p.m., meeting. Lecture by Dr. P. B. Mumford.

PADDINGTON DIVISION.—At St. Mary's Hospital, W., Thursday, January 21, 9 p.m., Mr. A. Dickson Wright: "Hypertension." Film: "The Surgical Treatment of Hypertension."

ROCHDALE DIVISION.—At Turner Hall, Birch Hill Hospital, Rochdale, Sunday, January 17, 11 a.m., clinical meeting.

SOUTHAMPTON DIVISION.—At Conference Room, Civic Centre, Southampton, Wednesday, January 20, 8 p.m., ordinary meeting. Lecture by Dr. O. Parkes: "Some Experience in M.I.S." A social meeting will follow. Members are invited to bring their ladies.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 23 1954

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British Medical Association PROCEEDINGS OF COUNCIL

A meeting of the Council of the British Medical Association was held at B.M.A. House on Wednesday, January 13, at 10 a.m., with Dr. E. A. GREGG in the chair. The Chairman at the outset referred to the extremely heavy agenda, comprising reports from 24 committees and some 30 other items, as well as the draft interim memorandum of evidence proposed to be given by the Association to the Guillebaud Committee. He asked chairmen of committees to assume that members of Council had read the documents and to content themselves with moving recommendations without speaking unnecessarily on matters reported under the heading of "action taken."

Preliminary Business

The Chairman was authorized to convey the congratulations of the Council to the 39 members of the Association whose names appeared in the New Year Honours List.

It was reported that arrangements had been made for the President of the Association, Mr. Tudor Thomas, with Mrs. Tudor Thomas, to visit the Far Eastern Branches—namely, Borneo, Ceylon, Hong Kong, Malaya, and the Middle East—during March and April. The Council expressed its good wishes to them on their journey.

Arrangements for the three plenary sessions, the scientific sections, and the scientific exhibition at the Annual Meeting in Glasgow were completed. Concerning the Joint Annual Meeting at Toronto in 1955, it was stated that the Bank of England had agreed to allow an amount of Canadian dollars for a small dinner party in Toronto in honour of Dr. T. C. Routley on the occasion of his installation as President.

The CHAIRMAN reported that he had authorized the Secretary to express to Dr. Sen, Secretary of the Indian Medical Association, the regret of the Council that it had not been possible to find any suitable representative to attend the annual meeting of his Association at Hyderabad. Dr. Sen was also asked to convey the cordial greetings and congratulations of the British Medical Association on the twenty-fifth anniversary of his organization.

The Council considered nominations to the Central Health Services Council and its standing advisory committees. Representatives of the Association were also appointed or reappointed on certain other outside bodies.

It was reported that, on the President's suggestion, the Cardiff Division Executive Committee had decided unanimously to accept responsibility for the cost of the Welsh

concert held during the Annual Meeting in Cardiff, and for the flowers for the Annual Dinner, and a cheque for £229 had been received from the honorary secretary of the Division. The Chairman said that this was yet a further example of the continuing kindness of their hosts at Cardiff.

A letter was read from the honorary secretary of the Medical War Relief Fund expressing warm thanks on behalf of the committee of the Fund for the sum of about £330 transferred to the fund by the Council, being the amount earmarked for charitable purposes by subscribers to the War Memorial Fund.

Certain recommendations received from the World Medical Association General Assembly, 1953, were considered. One of these was that each member national medical association should appoint a committee to study the proceedings of the First World Conference on Medical Education, held in London in August last. The W.M.A. Council was of opinion that those best qualified to study the Conference were those who had been most concerned in arranging its programme—namely, Sir Lionel Whitby, the President, and Dr. Hugh Clegg, the Secretary—and had appointed them as a committee with power to co-opt other members as might be needed. It was pointed out that the national medical associations could not be given any material until the proceedings of the Conference were published, probably at some time in the spring of 1954.

The CHAIRMAN reminded the Council that at its meeting in November, 1952, it had resolved that a comprehensive report on general practice should be prepared and submitted at a later date for approval by the Representative Body and by the Conference of Local Medical Committees. He said that he was anxious that this work should proceed as soon as possible, but he thought the matter might be postponed to the next meeting of the Council, when definite proposals would be brought forward.

Coat of Arms for the Association

A letter was read from Dr. S. F. L. Dahne, member of the Council, urging the adoption of a coat of arms, properly blazoned, to symbolize the origin, foundation, work, and ideals of the Association. He said that this would entitle the Association to fly its own banner or standard on all appropriate occasions, and the arms could properly be used on the Association's seal and on the covers of its publications and the like. Dr. Dahne suggested that should the

principle be accepted each member of the Council should subscribe 2 guineas, and the coat of arms would then be the gift of the Council to the Association to mark Coronation year. He moved that a committee be set up with instructions to work out the details in time for the next Council meeting.

It was agreed to leave the matter in the hands of the Office Committee, to which Dr. Dahne and any other member having special knowledge should be co-opted.

The Office Committee was also instructed to plan the arrangements for the autumn Council Dinner.

Salaries of Civil Service Medical Officers

The SECRETARY (Dr. Macrae) gave an account of the latest discussions which had taken place with the Treasury on the salaries of Civil Service medical officers. After a good deal of negotiation the Treasury had put forward certain proposals, and there was now a prospect of an interim settlement (pending publication of the report of the Royal Commission on the Civil Service) acceptable to the Civil Service Medical Officers Joint Committee.

The Council agreed that, subject to acceptance by the Treasury of the conditions of the proposed settlement, as approved by the Joint Committee, it would afford the normal facilities for advertisement in the *British Medical Journal* of Civil Service medical officer posts.

Dr. R. P. LISTON asked whether the medical officers in the Civil Service understood what the B.M.A. had done in this matter.

The CHAIRMAN: They understand it up to the hilt. The rock of salvation in this whole matter has been the B.M.A.

The Constitution Committee

At its previous meeting the Council began to set up a new Constitution Committee in accordance with the resolution of the Representative Body. The Council then appointed 12 of its own members, and deferred the appointment of a further 13 non-Council members, providing for regional representation. The following were now appointed as the 13 additional members: Mr. J. L. Gilks, Dr. J. T. Baldwin, Dr. M. G. Williams, Dr. H. J. Cronhelm, Dr. A. B. Davies, Dr. P. Lyle, Dr. F. Lishman, Dr. J. H. E. Moore, Mr. J. R. Nicholson-Lailey, Dr. D. F. Whitaker, Dr. D. C. Gullick, Dr. Jean Chappell, and Dr. R. Cove-Smith. The Council also appointed Dr. Dain, feeling that he had an outstanding claim to go on to this committee in view of his great experience of the work of the Association. His inclusion as an additional member brought the total membership to 26, but still did not give the Council more than a 50% share of the total. Actually 13 members of the committee are members of the Council, and 13 non-members.

Some demur was made by Dr. ROSE that only three of the Committee members were from the North of England, and by Dr. CHALKE at the lack of public health representation. As regards the latter point, it was explained that it was not the intention that sectional interests should be represented on the Constitution Committee. It was agreed also that the terms of reference of the Committee should be "To examine and report on the present structure and constitution of the Association, with special reference to the reorganization of the Representative Body."

Medical Standards for Drivers of Vehicles

Dr. J. A. L. VAUGHAN JONES introduced the report of the Occupational Health Committee, to which was appended a memorandum on medical standards for road, rail, and air transport. He drew attention to one particular suggestion in the memorandum, that in a case where a driving licence had been suspended the court before its restoration was approved should have power to require a medical certificate to the effect that the applicant was medically fit to drive and that such certificate should normally be required as a routine. He said that he was bound to bring this proposal to the notice of the Council; he felt that it was a serious step to take, but it represented the feeling of the majority of the members of his committee.

The Council approved the memorandum for submission to the Ministry of Transport.

Association Finance

Mr. A. M. A. MOORE (Treasurer) said that the financial position of the Association on December 31, 1953, showed a surplus available for debt redemption considerably in excess of the sum anticipated. He moved a recommendation that the whole of the surplus available should be used for debt redemption, which was agreed to.

Mr. Moore also presented draft revenue and capital budgets for 1954. For certain reasons, which he gave, arising out of an overall increase in the anticipated expenditure, the total surplus for 1954 was estimated conservatively at £45,309.

Mr. D. CALLANDER presented a report from the Building Committee. He also announced that there had been received that morning certain long-awaited consent with regard to the property at the rear of B.M.A. House. This would enable the Association to proceed with its plan of development.

For the Journal Committee, Dr. O. C. CARTER, the chairman, mentioned some considerations which the Committee had had in mind in forming the budget for 1954. More copies of the *Journal* would have to be printed each week, there had to be faced the possibility of a rise in the cost of paper and printing, and the advertising position was difficult to predict. The Committee considered that there was a case for providing more text pages in the *Journal*, but that a cautious start should be made during the first six months of the year and the situation reviewed at the end of June.

A recommendation to this effect was agreed to. Dr. Carter also presented the budgets for the *Abstracts* and for the special journals, which were also approved.

War Memorial

Dr. H. G. DAIN presented a report of the War Memorial Committee. He said that in order that there should be no doubt that the memorial was erected in memory of all British medical men and women who lost their lives in the recent war—not members of the Association only—the Committee was of the opinion that a suitably inscribed bronze tablet which would form an integral part of the memorial should be prepared and placed at the entrance to the memorial, bearing these words:

"In honour of the medical men and women of the British Commonwealth of Nations who gave their lives in the Second World War."

He added that the incorporation of this tablet within the memorial itself would have the advantage that it would form the focus for the unveiling ceremony.

A member suggested that the words "In memory of" should be substituted for "In honour of," but it was pointed out that on the war memorial itself the words were inscribed: "In Memoriam; 1939-1945." The inscription was agreed to, except that the phrase "British Empire and Commonwealth of Nations" was preferred.

Central Consultants and Specialists

Dr. T. ROWLAND HILL introduced the report of the Central Consultants and Specialists Committee, which covered the business already set out in the report of the meeting of that Committee in the *Supplement* (December 18, 1953, p. 232).

He moved on behalf of the Psychological Medicine Group and Deficiency be asked to give the Association an opportunity to submit evidence and that the preparation of the evidence be referred to the Group Committee with power to co-opt for the purpose representatives of other interested committees and, if necessary, additional members with special experience.

This recommendation was agreed. Dr. Rowland Hill also presented a draft memorandum on the procedure for dealing with legal actions involving hospital authorities and members of their medical staffs, and this was approved.

General Medical Services

Dr. TALBOT ROGERS presented the report of the General Medical Services Committee, which covered the two last meetings of that Committee, reported in the *Supplement* of December 5, 1953, p. 218, and of January 2, 1954, p. 1.

The report included a memorandum by a subcommittee which had inquired into the number of students entering medical schools, the number qualifying, and the number of newly qualified practitioners likely to be absorbed into the various branches of the medical profession during the next few years.

The Council accepted a recommendation to invite the Ministry of Health to co-operate in the establishment of a Working Party to examine on a long-term basis and with the widest possible terms of reference the future number of medical practitioners likely to be required in all branches of the profession and to relate the intake of students at the teaching schools to these needs.

On the question of general-practitioner representation on regional hospital boards the Committee reported that there was now at least one such practitioner on every board, but in several instances these practitioners were not the nominees of general practitioners in the area. It transpired that nominations had been rejected by the Ministry for geographical reasons and in order to preserve the balanced representation of different localities. The Committee recommended that to overcome this difficulty the Association, taking up the suggestion of the Ministry, should make more than one nomination for any particular vacancy, so that if the first was unacceptable for geographical reasons the second would be available.

The recommendation was agreed to.

Public Health

Dr. H. D. CHALKE, for the Public Health Committee, introduced the report of a joint subcommittee set up to consider a resolution of the last Annual Representative Meeting to the effect that ways should be considered whereby the help given by health visitors to general practitioners might be increased. This report took the form of a general statement on the position, followed by a number of suggestions whereby greater co-operation between general practitioners and health visitors could be achieved. It was agreed that this report should be sent out with a covering letter to all Branch and Divisional secretaries, secretaries of local medical committees, and medical officers of health; also that the document should first be submitted to the Council of the Society of Medical Officers of Health with a view to obtaining approval in order that when published it might represent the views of both bodies, and that the document be published at the appropriate time in the *Journal*.

Private Practice

Dr. IAN GRANT presented the report of the Private Practice Committee. He said that the methods whereby private practice might be encouraged had been considered. On the question of the issue of Form E.C.10 to private patients it was noted that this had been approved both by the Representative Body and by the Conference of Local Medical Committees. It was felt that representations should now be made to the Ministry of Health. The General Medical Services Committee had been informed accordingly and it had been suggested that, as this was a matter of special interest to private practitioners, two representatives of the Private Practice Committee should attend any discussions with the Ministry.

Dr. HALE-WHITE said that it was important that the representatives chosen should be people engaged almost entirely in private practice and in contact with patients, not merely concerned with life assurance work or something like that.

Radio and Television

Dr. R. FORBES, chairman of the Central Ethical Committee, brought forward a brief report on the policy of the Association regarding sound radio and television. The B.B.C.

for many years did not disclose the names of medical practitioners who broadcast, but recently this policy appeared to have been abandoned and practitioners who appeared in the programmes, both sound and vision, were frequently announced by name and their names and qualifications, and sometimes their photographs, were published in the *Radio Times*. It was agreed that the B.B.C. be invited to receive representatives of the Association to discuss sound and television programmes on medical matters involving the participation or personal appearance of practitioners, and that if the invitation was accepted the following be included in the deputation: Dr. E. A. Gregg, Dr. R. Forbes, Dr. S. Noy Scott, and Dr. Annis Gillie.

The Tynwald Commission

It was reported to the Council that the representations made by the Association and other professional organizations to the Tynwald Commission on salaries and emoluments in the Isle of Man had been successful. The Commission was convinced of the rightness of the principle whereby the remuneration of persons employed by the Government should be reduced to take account of the difference in income tax between the island and the mainland, but, as such a measure would be resented by important sections of the community and would possibly involve a serious administrative deadlock, it did not appear to the Commission that the amount likely to be saved was sufficient to outweigh the disadvantages of the suggested method of saving. The Commission recommended, however, that all boards, etc., in dealing with questions of salaries and emoluments, should bear in mind the difference between the Manx and English conditions and endeavour by negotiation and agreement to arrive at scales which would recognize these differences.

The CHAIRMAN said that a great debt of gratitude was due from practitioners in the Isle of Man to the Association's Secretary, Dr. Macrae, for the fine work he had done in this connexion. He paid a high tribute to him for the promptness and persistence with which he had dealt with this matter. They were also grateful to Dr. Talbot Rogers, who, at the shortest notice, had accompanied Dr. Macrae and supported the Association case.

Compensation and Superannuation

Dr. WAND, for the Compensation and Superannuation Committee, reported that representatives of the Committee had met the Ministry of Health to discuss certain points which had been the subject of various resolutions of the Representative Body. The Ministry had stated that any general compensation could be obtained only on retirement or in the case of hardship arising out of the purchase of a practice before the Appointed Day, but it recognized that there would be individual cases of hardship where an elderly doctor or one whose health was failing found it necessary to take a partner in order to prevent the complete disintegration of his practice, and the Ministry would look sympathetically at cases of that nature. The Committee felt that this new principle should be established in full, and was pressing at once for its extension to include advance payment of compensation where an elderly doctor continued to work because he was unable to retire on economic grounds.

The Council sent a message of sympathy and best wishes to Dr. A. N. Mathias, Chairman of the Compensation and Superannuation Committee, in his illness.

World Medical Association

The Council authorized the payment of the 1954 subscription to the World Medical Association at the new rate, and also appointed two delegates and two alternates to attend the General Assembly in Rome in October, 1954.

A letter with some well-known signatories was read proposing a "United Kingdom Committee for the World Health Organization of the United Nations." This would be a specialized body to study closely the work and plans of W.H.O., organizing meetings and giving assistance to

the Organization in a number of ways which were set out. The CHAIRMAN OF COUNCIL said that he thought inquiries should be made of the sponsors of the new organization as to any ways in which the B.M.A. could be of service, but, of course, the interests of the B.M.A. in W.H.O. were in charge of the World Medical Association.

Guillebaud Committee Evidence

The Council spent three hours on the discussion of the draft interim memorandum of evidence, prepared on the basis of memoranda received from the standing committees concerned, for submission to the Guillebaud Committee. The memorandum covered questions concerning the general administration of the National Health Service, the hospital services, the local authority services, and the general medical services. It extended to 133 paragraphs, which were considered one by one by the Council.

On the section relating to ophthalmic services Mr. O. GAYER MORGAN, chairman of the Ophthalmic Group Committee, attended the Council by invitation to clarify certain points.

Warm thanks were expressed to Dr. Stevenson, the Deputy Secretary, for his work on the memorandum.

Various emendations, mostly of an unimportant character, were made in the evidence, which was finally approved for submission to the Guillebaud Committee.

Society of Medical Officers of Health Evidence

It was reported that the Society of Medical Officers of Health had not yet completed the preparation of its evidence for the Guillebaud Committee. Three of its members—Dr. C. Metcalfe Brown, Dr. H. K. Cowan, and Sir Allen Daley—had been appointed to confer with the Association on the subject. Their observations on certain paragraphs were considered by the Council.

Dr. FRANK GRAY said that he hoped that in the presentation of the evidence there would be the closest co-operation between the Association and the Society of Medical Officers of Health. He presumed that the revised draft would be placed before the Council of the Society and also that the Society's evidence when ready would be submitted to the Association. The fullest consideration should be given on each side to the evidence tendered by the other.

Dr. CHALKE, on behalf of the Council of the Society, said that he entirely associated himself with Dr. Gray's remarks.

On the question of witnesses to give oral evidence before the Guillebaud Committee, Dr. HUTCHINSON suggested that, as the Steering Committee had done so much already in the preparation of the evidence, it should be asked to choose the witnesses, and this was agreed to.

Other Business

Dr. D. F. HUTCHINSON, for the Waverley Evidence Committee, reported that it had prepared a basis for its deliberations and had invited the Armed Forces and the Overseas Committees to submit memoranda.

Dr. H. H. D. SUTHERLAND, for the Amending Acts Committee, reported that it was considering, as instructed by the Council, a draft scheme for the restoration of the right to buy and sell goodwill, and hoped to submit final proposals to the March meeting of Council.

An application for legal assistance was brought forward by the Legal Actions Committee on behalf of a doctor who was contesting an appeal made by H.M. Inspector of Taxes against the decision of the Commissioners of Inland Revenue with regard to certain allowances. It was agreed to authorize financial assistance not exceeding £200.

The Joint Committee of the B.M.A. and the Magistrates Association reported that it was continuing its task of preparing a memorandum on the subject of cruelty to and neglect of children.

Dr. F. GRAY again brought forward his motion to instruct the Finance Committee to consider and report what remuneration should be paid to the officers of the Association for their services. The Council agreed to the instruction being given.

Dr. J. G. M. HAMILTON presented the report of the Scottish Committee. In view of the very successful visit of a party of Scottish doctors to Denmark in September, 1953, the Committee had asked that the prospects of arranging a similar tour of Scotland for Danish doctors in the summer of 1954 be investigated.

An invitation from the Royal College of Nursing to meet members of other interested bodies at a conference on the legal position of the nurse undertaking procedures outside her professional scope was accepted, and the Chairmen of the General Medical Services, Central Consultants and Specialists, and Public Health Committees, or their nominees, were asked to attend.

An invitation had been received to a celebration in Frankfurt on the occasion of the 100th anniversary of the birth of Paul Ehrlich and Emil von Behring, founders of chemotherapy and immunotherapy, on March 14 and 15. It was agreed that the Editor of the *British Medical Journal* should represent the Association.

A congratulatory letter had been sent by the Chairman of Council to Professor Raffaele Bastianelli, of Rome, a Foreign Corresponding Member of the Association, on his forthcoming 90th birthday, and a very charming letter was read from him in reply.

The Public Relations Committee reported that it had considered the resolution from the Annual Representative Meeting deploring the publication in the popular press of extracts from medical articles and of articles of an irresponsible character praising new drugs without illustrating any potential dangers. The Committee was fully in sympathy with the resolution but considered that no action could be taken in the matter.

Owing to the manner in which chairmen of committees and members of Council generally had acted on the Chairman's instruction given at the beginning of the meeting, the heavy programme of business was completed at 5.45 p.m., a much earlier hour than had been expected.

G.P. OBSTETRIC BEDS IN BLACKBURN

H.M.C. CLOSES MATERNITY HOME

The Springfield Maternity Home, Blackburn, a home with 20 G.P. obstetric beds, was closed on the instruction of the hospital management committee on January 8. The patients were transferred to the Bull Hill Maternity Home, Darwen. It is understood that the doctors concerned were not notified of the date of closure and that the patients themselves had barely 24 hours' warning.

Lack of Consultation

As already reported in the *Supplement* (December 19, 1953, p. 234), the hospital management committee's decision to close Springfield on the grounds of redundancy, and without first obtaining the view of those most affected, aroused the resentment of the local G.P.s and the people of Blackburn. The local executive council passed a resolution of protest because it had not been consulted and asked that no further action be taken in the matter until there had been an opportunity for discussion. It was said that the closing of the beds would seriously affect the general practitioners' facilities to practise obstetrics and that the alternative accommodation was inconvenient because of distance.

Letter to the Minister

The Lancashire Local Medical Committee has now sent a letter of protest to the Minister of Health. It calls attention, among other things, to the manner in which lay officials of the hospital management committee finally ordered the evacuation of the patients without first informing the doctors in charge of them and without, it is understood, any medical examination. The letter requests the Minister to institute a public inquiry into the whole matter.

ADVANCE PAYMENTS BY EXECUTIVE COUNCIL

SPECIAL PROVISION

On one or two occasions recently the General Medical Services Committee has learnt of difficulties experienced by general practitioners in securing advance payments on account of the usual quarterly cheque from the executive council. Special provision is made in the model distribution scheme for a general practitioner to apply for payment on account, and executive councils are required to make such a payment if the practitioner satisfies the council that it would involve him in difficulties if he had to wait until the end of the quarter.

Ministry's Letter

The G.M.S. Committee has made representations to the Ministry of Health that no undue burden of proof should be placed upon the doctor when he is making an application of this nature, and as a result of the Committee's intervention the Ministry has written the following letter to the Honorary Secretary of the Society of Clerks of Executive Councils:

"Paragraph 19 of the Model Distribution Scheme does, as you know, make provision for a medical practitioner to apply for payment on account, to be made in advance of the payment due at the end of a quarter. The paragraph says that an executive council should make such payment if the practitioner 'can satisfy the council that it would involve difficulty or hardship to wait until the end of the quarter.'

"The representatives of the profession have stated that in their experience councils are applying divergent criteria in deciding what satisfied them that it will create hardship for a practitioner to wait until the end of the quarter, and they have urged that to executive councils should normally exercise their discretion to make an advance payment where a doctor has asked for such payment because of financial difficulty. We appreciate that any undue extension of these arrangements might involve executive councils in more additional work than they could at present undertake. We would like to suggest, however, that where possible councils should normally comply with such requests without insisting upon a detailed proof of the nature of the difficulty or hardship."

This letter has been published in *The Executive Council*—the society's journal—and the G.M.S. Committee hopes that as a result no further difficulties will arise.

PRESIDENT SUBMITS HEALTH MESSAGE TO U.S. CONGRESS

On January 18 President Eisenhower submitted to Congress a special message containing recommendations "to improve the health of the American people." One of the message's main features is the proposal to strengthen private hospitalization and health insurance by establishing a "limited Federal reinsurance service."

The Message

After reviewing what he called the "rapid progress toward better health" of the American people, the message said that much remains to be done. Medical knowledge and skill were not always available to old people where and when needed. Two of the key problems are the distribution of medical facilities and the costs of medical care. Further action must be taken on these problems, but freedom, consent, and individual responsibility were fundamental to the American system. In adhering to the principles of the doctor-patient relationship and the freedom of the patient to choose freely the manner of his care in illness, and rejecting the socialization of medicine, the President said that certain national health goals could still be attained.

The Proposals

The message proposes a voluntary health insurance plan. The Government should work with private non-profit health

insurance organizations and study and devise better insurance protection. A limited Federal reinsurance service to offer broader health protection to more families is recommended. A capital Government fund of \$25,000,000 for this purpose is proposed.

Grant-in-aid Approach

Federal support to a simplified formula of all the various and complex existing grant-in-aid schemes is recommended. The States should be aided in inverse proportion to their financial capacity.

Referring to the 2,000,000 disabled persons who could be rehabilitated, the message says that there should be Federal grants to the States to train medical personnel and foster research in this subject.

Hospital Needs

It is estimated that there is need for 500,000 hospital beds in addition to the present 1,060,000. It is recommended that Federal funds should be given to develop the hospital service, particularly for the chronic sick and the aged. Four proposals for expansion are put forward: (1) Added assistance in the construction of non-profit hospitals for the care of the chronically ill. These would be of a type more economical to build and operate than general hospitals. (2) Assistance in the construction of non-profit medically supervised nursing and convalescent homes. (3) Assistance in the construction of non-profit rehabilitation facilities for the disabled. (4) Assistance in the construction of non-profit diagnostic or treatment centres for ambulatory patients.

It is reported that on the whole the recommendations have been received favourably by Congress. The Speaker of the House of Representatives said the House would give them "sympathetic consideration."

ANNUAL MEETING, GLASGOW, 1954

SLEEPER ACCOMMODATION

The attention of members is drawn to the fact that sleeping accommodation on trains both to and from Glasgow is limited and in July is generally booked up many weeks ahead. Those wishing to travel by sleeper to or from the Annual Meeting are advised to make their arrangements at the earliest possible moment. It is understood that some trains are already booked up.

ALL-DAY EXCURSION DOWN THE CLYDE

An all-day excursion has been arranged for Sunday, July 4. One of the large Clyde steamers has been booked for the occasion and will start from the Glasgow Docks (Broomielaw) on Sunday morning and proceed down the river estuary as far as Rothesay and the Kyles of Bute, thus giving members an opportunity of enjoying some of the most beautiful scenery in the West of Scotland, as well as seeing many famous Clyde shipyards. The steamer will accommodate without crowding 400 or 500 people and there will be adequate catering arrangements. The return journey from Wemyss Bay or Greenock to Glasgow will be by train.

Particulars as to booking will be published later, but members wishing to avail themselves of this opportunity should make their arrangements so as to be in Glasgow early on Sunday morning, July 4.

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE DINNER

It has now been found possible to include wines in the price of the ticket for the Central Consultants and Specialists Committee Dinner, which will be held at B.M.A. House on February 3, and at which the chief guest will be the Minister of Health. Consultants may apply to the secretary for tickets for themselves and medical colleagues. Price £2 10s. inclusive of cocktails and wines.

Correspondence

Remuneration of Hospital Medical Staff

SIR,—May I congratulate Dr. E. Snell on his forthright letter on the subject of remuneration of hospital medical staff (*Supplement*, December 19, 1953, p. 237)? It is a wonder your columns do not contain more such letters.

Clearly the Government has not kept the bargain made when the Spens Report was accepted, and now appears unwilling to face and act upon this unpleasant fact. One wonders why our representatives have been so slow to force a decision and obtain for us a settlement to match the Danckwerts award. Surely it is not for lack of a strong case. Let us hope that the matter will be resolutely dealt with in 1954.—I am, etc.,

Surbiton, Surrey.

J. R. DICKSON.

SIR,—The subject of hospital staff remuneration for some months did not appear in the columns of the *Supplement*. One assumed that this silence was maintained by tacit agreement to avoid embarrassing delicate negotiations of Whitley Committee "B." It is apparent that there was no foundation for hope that a satisfactory outcome might be imminent. Resumption of relevant correspondence by Dr. E. Snell (*Supplement*, December 19, 1953, p. 237), Dr. Bernard Sugden (*Supplement*, January 2, p. 7), and Dr. C. C. Cookson (*Supplement*, January 9, p. 11) is timely, lest it be thought that interest is waning. It is useless to speculate upon reasons for the absence of any profitable outcome to deliberations of Whitley Committee "B." This committee stands as a failure, and its minutes as a monument to bureaucratic ineptitude. Let it redeem itself, and this can only be if the watchword of the Staff Side, and of consultants and specialists, be "Spens now, or immediate arbitration."—I am, etc.,

Worcester.

ANTHONY A. VICKERS.

SIR,—May I draw the attention of members of the profession to the quandary facing many young doctors at the end of their national service? They feel that before entering practice a further period of postgraduate hospital experience is desirable—e.g., in obstetrics, paediatrics, or otolaryngology. A married man is, however, faced with a fall in his income from approximately £900 per annum (Service pay and marriage allowance and ration allowance) to £450 per annum, a salary that many of us were earning before joining the Services. From this, £100 is deducted for our keep, whilst we have to provide separate accommodation for wife and family. One is accordingly compelled to fall back on one's savings.

Surely, after six years' study and three and a half years' postgraduate work, a man doing house appointments should be paid at the rate of a senior house officer? This is, in fact, the custom in certain more highly specialized posts.—I am, etc.,

N.S.M.O.

Rural and Urban Mileage Payments

SIR,—As rural practitioners do not receive mileage for patients who reside within two miles of their surgeries or their partners' surgeries, or for patients living in urban areas, what honest argument is there for paying mileage to urban doctors whose patients live within two miles of a rural doctor's surgery?

When patients move from an urban area to a rural one the urban practitioner, owing to mileage payments, is prepared to retain them on his list. The rural practitioner does not have the same economic inducement when his patients move into an urban area. What is the reason for this apparently unfair and peculiar arrangement?—I am, etc.,

Harold, Beds.

R. STUART.

Association Notices

Diary of Central Meetings

- JANUARY
- 22 Fri. Meeting of Chairman and Speakers, Plenary Session—"Food and Disease," 11.30 a.m.
 - 25 Mon. Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.), 10.30 a.m.
 - 25 Mon. Pharmacopoeia Subcommittee, Science Committee, 2 p.m.
 - 25 Mon. Full General Whitley Council (at 14, Russell Square, London, W.C.), 2.30 p.m.
 - 26 Tues. Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.
 - 27 Wed. Planning Subcommittee, Occupational Health Committee, 10.30 a.m.
 - 27 Wed. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
 - 27 Wed. Psychological Medicine Group Committee, 2 p.m.
 - 28 Thurs. Meeting of Chairman and Speakers, Plenary Session—"Problem of Sleep" (at 234, St. Vincent Street, Glasgow), 2.30 p.m.
 - 29 Fri. Consulting Pathologists Group Committee, 2 p.m.
 - 30 Sat. Hypnotism Subcommittee, Psychological Medicine Group Committee, 10 a.m.

Branch and Division Meetings to be Held

CHELSEA AND FULHAM DIVISION.—At St. Stephen's Hospital, 369, Fulham Road, Chelsea, S.W., Friday, January 29, 8.30 p.m., general meeting. Lecture by Dr. F. Dudley Hart: "Some Therapeutic Advances." Members of Kensington and Hammer-smith Division are invited.

CITY DIVISION.—(1) At Hackney Hospital, Homerton High Street, E., Wednesday, January 27, 2 p.m.; films: (a) "Senile Obliterative Arteritis of the Legs"; (b) "Movements of the Tongue in Speech." (2) At Institute of Laryngology and Otolaryngology, Gray's Inn Road, W.C., Friday, January 29, 3.30 p.m., clinical meeting. Mr. A. R. Dingley: "Hoarseness: Differential Diagnosis and Treatment."

COVENTRY DIVISION.—At Gymnasium, Coventry and Warwickshire Hospital, Tuesday, January 26, 8.30 p.m., ordinary general meeting. Dr. S. J. Hadfield (Assistant Secretary, B.M.A.): "The Hadfield Report—A Field Survey of General Practice, 1951-2." A discussion and questions will follow.

DUDLEY DIVISION.—At Guest Hospital, Dudley, Tuesday, January 26, 8.15 p.m., clinical meeting. Mr. L. H. G. Moore: "Fundus Conditions" (illustrated by slides).

GRIMSBY DIVISION.—At Scartho Road Infirmary, Grimsby, Thursday, January 28, 8.30 p.m., meeting. Professor A. M. Boyd: "Management of Obliterative Arterial Diseases of the Lower Extremities." All medical practitioners in the area of the Division are invited.

HYDE DIVISION.—At "Pack Horse Inn," Mottram, Wednesday, January 27, 8.45 p.m., meeting. Mr. C. E. B. Richards: "Multiple Pregnancy." Members of the Glossop Division are invited.

KINGSTON-ON-THAMES DIVISION.—At Kingston Hospital, Wolverton Avenue, Kingston-on-Thames, Tuesday, January 26, 8 for 8.30 p.m., Mr. J. V. O'Sullivan: "Some Problems in Obstetrics and Gynaecology Common in General Practice."

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Macclesfield Arms Hotel, Macclesfield, Thursday, January 28, 8.30 p.m., meeting. Dr. R. Forbes (Medical Defence Union): "Recent Developments in Medical Litigation."

MID-ESSEX DIVISION.—At Out-patients Department, Chelmsford and Essex Hospital, London Road, Chelmsford, Wednesday, January 27, 8.15 p.m., meeting. Sir Heneage Ogilvie: "The Pit-discussion will follow."

SOUTH BEDFORDSHIRE DIVISION.—At Warden Tavern, Wednesday, January 27, 8.30 p.m., annual general meeting.

SOUTH STAFFS DIVISION.—At Bell Library, Royal Hospital, Wolverhampton, Tuesday, January 26, 8.30 p.m., meeting.

STRATFORD DIVISION.—At Minor Hall, East Ham Town Hall, E., Friday, January 22, 9 p.m., meeting at invitation of East Ham Local Medical Committee. Dr. Robert Forgan: "The Experimentally Minded General Practitioner."

SWANSEA DIVISION.—At Swansea Hospital, Thursday, January 28, clinical meeting.

WANDSWORTH DIVISION.—At Putney Hospital, Lower Common, S.W., Thursday, January 28, 8.30 p.m., clinical meeting.

WEMBLEY DIVISION.—At Lecture Theatre, Wembley Hospital (near the Pathological Laboratory), Tuesday, January 26, 9 p.m., meeting. Discussion: "Current Anaesthetic Methods, with Special Reference to Hibernation Technique." Speakers, Dr. J. Kennedy Harper and Mr. J. S. Callcutt. All medical practitioners in the area of the Division are invited.

WOOLWICH DIVISION.—At Eltham and Mottingham Hospital, London, S.E., Tuesday, January 26, 8.15 p.m., meeting. Sherry Party, followed by demonstration of clinical cases, and film: "Senile Obliterative Arteritis of the Legs." Members of Greenwich and Deptford Division are invited.

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THE BROTHERHOOD OF MEDICINE*

BY

ANGUS MACRAE, M.A., M.D.
Secretary of the British Medical Association

Referring to the relations between members of the Bar in a speech delivered many years ago, the late Lord Macmillan said: "I am convinced that there is no profession which binds its members in a closer fraternity. It is not for nothing that in the law we call each other brethren. . . . If I were to seek for the explanation of the bond which binds in brotherhood the servants of the law throughout the world, I venture to think that I should find it in our common devotion to a great ideal, the promotion of the orderly progress of civilization."

We, too, in medicine ought surely to be united in the pursuit of a common ideal; and, happily, there is much good feeling among us. When I hear old doctors with long memories talking about the conditions of certain forms of practice 50 or 60 years ago, I feel that we have advanced far towards fraternal harmony. Certainly great progress in this direction has been made since the first half of the nineteenth century, when our Association was founded. Yet one has only to glance at the correspondence columns of the medical press to-day—and, unfortunately, of the public press as well—to realize that complete professional brotherhood is still an unattained ideal.

Ethical Disputes

What, then, are some of the causes of friction and unhappiness in our professional relations at the present time, and what can we do—what are we doing—as an Association and as individuals, to remove them?

In the first place, there are the occasional disputes that occur between one doctor and another because of difficulties of personality—the hasty temper, for example, that causes a man to bring angry accusations against a colleague merely because of an uncorroborated and possibly inaccurate account given by a patient of the colleague's words or actions. Human nature being what it is, such difficulties are perhaps to be expected, though our Association can and does help to prevent them by providing oppor-

*An abridged version of a talk to the Ayrshire Division of the British Medical Association on January 10.

tunities in the Divisions for neighbouring doctors to cultivate friendly relations and acquire mutual understanding. And when a serious breach has occurred, we can sometimes help to close it through our procedure for investigating complaints of unprofessional conduct. This procedure should not be thought of solely as a means of bringing the guilty to trial and conviction. It is intended to serve also as a ministry of reconciliation, and I am glad to say that I can recall occasions on which, as a result of an impartial adjudication by the Ethical Committee, an atmosphere of bitterness and distrust has been dispelled and harmony restored.

The Bitter Memory

It is inevitable that there should be divisions among us from time to time because of differences of opinion on matters of policy in the medico-political field. As has been shown twice in this century, it is not easy to maintain cohesion in our ranks when we are confronted with new and revolutionary projects for the organization of medical services by the State. Yet I wonder if it is necessary that such differences should result in continuing bitterness and rancour. When I joined the staff of the Association in the year 1935, one of the things that surprised me was to find that there were doctors who rejected all appeals to rejoin our membership because they could not forget the year 1911. They had withdrawn permanently from our company solely because they believed that, at one particular point in time, we had taken a wrong turning. Fortunately, there are many to-day who, although they took a similar view of the events of 1948, have nevertheless remained with us and are helping us in our efforts to remedy the faults that have been disclosed in our National Health Service.

I can understand bitter feelings among those who sincerely believe that measures promoted or accepted by the profession are not merely unwise but are also unjust to them as individuals by denying them a fair financial reward for their labours. An example which comes readily to mind is the revolt of the "small-list" general practitioners against what they consider to be the injustice of the new distribution scheme associated with the Danckwerts award. My theme being brotherhood, I have no wish to introduce controversy here and now. Let me just say that when a discontented minority, however loud in complaint, has little voice in decision, it behoves those responsible for the decision, particularly if they themselves should be interested parties, to be specially heedful of the claims of brotherhood

in their approach to the problem. I believe that, whatever the outcome in the case to which I have alluded, that spirit will not be absent from the forthcoming discussions.

The Rules for Consultation

It very often happens that two or more doctors engaged in different forms of practice are concerned with one and the same patient, and in this circumstance is perhaps to be found the main source of strife, not merely between individuals but also between whole sections of the profession. On many occasions our Association has found it necessary to regulate the professional relationships in such cases in order to minimize the dangers of friction.

For example, 20 years ago there was some dissatisfaction among general practitioners about their patients being seen by other doctors in private practice, including consultants, without their consent or knowledge. The Central Ethical Committee drew up a series of rules concerning the intra-professional obligations in these circumstances. The rules were designed to protect the freedom of the patient to seek medical advice from any source which he considered suitable; and to protect also the right of every registered medical practitioner in private practice, whether general or special practice, to see any patient who sought his professional assistance, subject to the observance of certain generally recognized courtesies.

Consultant and G.P.

At the present time frequent complaints are made by the general practitioner about delay in obtaining out-patient appointments at the hospital, delay on the part of the consultant in reporting on out-patients, and delay—particularly embarrassing to the patient's doctor—in notifying the discharge or the death of in-patients. When bad feeling is aroused in connexion with these matters it may sometimes be due to a too hasty assumption by the general practitioner that his consultant colleague is neglectful and is not attempting to pull his full weight in the professional team.

When general practitioners and consultants come together for friendly discussion of such problems, as they do in a liaison committee which we have established at the Association's headquarters in London, it becomes clear that the difficulties are by no means all on the one side. The truth appears to be that the hospital facilities at present, including the supply of junior medical staff and of clerical staff, are unequal to the heavy demands that are being made upon them. However, it has been agreed in the liaison committee that no difficulty should be allowed to stand in the way of immediate notification of the death or discharge of a patient, even if the general practitioner may have to be kept waiting for a full report; and it is proposed to emphasize the importance of this in a letter to be addressed to hospital medical committees.

More detrimental in its effect on professional relations, if all reports on the subject be true, is the growing gulf between the general practitioner and the consultant resulting from the diminished opportunities for the general practitioner in hospital work on the one hand, and on the other from the rigid training scheme which makes it virtually impossible for the would-be consultant to gain experience of general practice without endangering his prospects of promotion in the hospital hierarchy. It is said by some that, as one unhappy consequence of the separation of the two professional groups, there is a tendency among consultants to adopt an arrogant attitude towards their general-practitioner colleagues and to regard them as belonging to a vastly inferior order of being.

I am told, however, that in some areas the recent shortage of hospital medical staff has resulted in those general practitioners who were ousted from the hospitals at the beginning of the National Health Service being reinstated as members of the hospital medical teams. This is good news. A large extension of part-time hospital appointments for general practitioners is now generally regarded as necessary from the point of view of the needs of the hospitals for

"pairs of hands." It will not only be good for the hospitals, it will be good also for general practice. And, incidentally, it should help to promote good fellowship between general practitioners and consultants. Meantime we may rejoice in the fact that there are very many members of these two sections of the profession who regard one another with mutual respect and friendliness and whose relations are so pleasant that thoughts of relative status never enter their heads.

Local Authority Clinics

Although our Association was active in promoting, in the public interest, the development of the local authority clinical services, there is a long history of suspicion among general practitioners about the activities of the public health medical officers. Twenty-five years ago there were complaints about encroachment on private practice by the local authority clinics, and Dr. Alfred Cox, then Medical Secretary of the Association, was sent out to make a field investigation of the position. The following words are taken from his illuminating and frank report:

"I suggest that active Divisions cannot do better work than by organizing, in collaboration with the medical officer of health, visits of their members, a few at a time, to the local clinics. There I think they would find that some of their ideas about encroachments on their field of work are wrong or exaggerated. They would find that the work done is highly necessary and that most of it is work that has never come their way; and, noting the character of the people who attend, they would, I think, agree that the vast majority are not people who would have sought (or indeed could afford to seek) the services of any doctor privately; that if the work was not being done at the centres (whether by whole- or part-time practitioners) it would mostly not be done at all, or done at the hospitals. . . . I submit that we would be doing a great service to the profession if we educated them to claim and to take their part in the present scheme, instead of bemoaning the encroachments on private practice."

Better Relationships

Since that time difficulties have continued to arise between the general practitioners and the public health medical officers. Three years ago our Association, in conjunction with the Society of Medical Officers of Health, found it necessary to offer guidance in the form of rules of procedure to be observed when a medical officer of a local authority contemplates that the condition of a schoolchild needs special investigation or treatment. The rules require the medical officer to approach the general practitioner, so that he, if he so wishes, may arrange the consultation; and they require the medical officer to send to the general practitioner a copy of any report on the child received by him when he, with the concurrence of the general practitioner, has made the arrangements. This procedure has been put into force in many areas and is reported to be working smoothly and to have led to an improvement in personal relations.

At the Annual Representative Meeting in Cardiff last July there were complaints, by no means the first of their kind, about some of the activities of health visitors. Once again our Association has assumed the role of mediator and has produced a memorandum of proposals—to be sent shortly to the Divisions—designed to promote closer co-operation between the general practitioner and the health visitor in the interests of the patient.

In the report of his Field Survey of General Practice, published in the *Journal* last September, my colleague Dr. Stephen Hadfield writes as follows: "During my investigation I found almost no evidence to suggest an enlightened attempt, either by the public health medical officers or by the general practitioners, to co-ordinate the public health service and the general-practitioner service." Compare these words with those used by Dr. Alfred Cox in his report a quarter of a century ago: "Not half enough trouble has been taken in most areas either by the general practitioners

¹British Medical Journal, 1953, 2, 683.

or by the medical officer of health to prove to each other that they are men and brothers, and each interested in the other man's side of the question." Truly in this field the advance towards brotherhood, if steady, is painfully gradual.

Towards a Better Organization

There is an important question which I cannot attempt to discuss in detail this evening—the question whether the constitution of our Association is the one best suited to our present circumstances and most conducive to unity in our ranks. We have an elaborate system of cross-representation of committees, and it is usual for one committee to invite the views of another before deciding on proposals of mutual interest. Such proposals are then subjected to the test of a wider professional opinion in the Council, and later—if they are concerned with major matters of policy—in the Representative Body. The Representative Body has been admired as a thoroughly democratic assembly, composed as it is in the main of persons elected by their local colleagues in the Divisions, the membership of which embraces all sections of the profession. In the past it has been our proud claim that the voice of the Representative Body was the authentic voice of the medical profession of this country.

It may be doubted—indeed, it has been doubted—whether this claim is fully justified at the present time. For the Representative Body is predominantly composed of general practitioners, and is liable to adopt resolutions relating to practitioners, and is liable to adopt resolutions relating to the hospital services which the Council is unable to carry into effect because they are not acceptable to those in the Association and in the Colleges who negotiate such matters with the Ministry of Health and the Department of Health for Scotland. This is a state of affairs which not only detracts from the authority of the Representative Body but also tends to cause dissension between sections of our membership. A special committee is now about to begin a review of the Association's constitution, with special reference to the question of reorganization of the Representative Body. Much hard thinking and wise judgment will be necessary in the fashioning of a new instrument which may better serve the purposes of our Association as an organization representative of the entire medical profession.

It may be that the time has come to reconsider not only our domestic machinery for the formulation of policy but also the methods of negotiating terms and conditions of service with the authorities concerned. From time to time, as I witness a brilliant exhibition of the arts of evasion, of negation, and procrastination by the Management Side of a Whitley Council Committee I feel that we may find ourselves forced to conclude that a procedure designed for the settlement of claims by friendly discussion has proved a miserable failure.

If, in matters affecting the Treasury, we can achieve acceptance of reasonable claims only by a *sais fecht*, I wonder whether we are wise in conducting separate actions by isolated bands of warriors. May not the very success of the Danckwerts battle make the struggle harder on other sectors of the front? Is it too much to hope that our approach to brotherhood is such as to enable us to devise a means of joining our forces in a single concerted attack when the occasion calls for a combined operation?

The Ideal of Brotherhood

Much as I admire the comradeship of the Bar, I believe that the nature of medical practice, and the conditions in which it is carried on in this country to-day, are such as to make the consistent exercise of brotherly love much more difficult for us than it is for our friends of the law. Nevertheless, the ideal of brotherhood is one that we must always pursue, and I have no doubt that our Association will continue to play a prominent part in promoting what was one of the objects of our pious founder—the object, as Charles Hastings expressed it, of "establishing the harmony and good feeling which ought ever to characterize a liberal profession."

But the thought that I should like to leave with you, in conclusion, is this. The efforts of our Association to improve intraprofessional relations cannot be fully effective unless there is good will on the part of the individual doctor. If good will is absent, rules and regulations and memoranda of guidance drawn up by our committees can avail little; and if more good will were present, many of the deliberations on these matters in the committees would be unnecessary. I cannot express the matter better than in words written by the late Dr. C. O. Hawthorne, who was one of the giants of our Association 20 years ago: "In the relations of the practitioner to his fellows, while certain established customs and even rules are written and must be written, the principal influence to be cultivated is that of good fellowship. Most men know what is meant by 'cricket' and the spirit of the game. Difficulties and differences will arise, but most of them can be successfully met by mutual good will and recognition of the other fellow's point of view."

Five years ago, the World Medical Association, founded on the initiative of our own Association with the object of promoting a larger brotherhood of medicine among the doctors of the world, gave its approval at a meeting in Geneva to a document known as the Declaration of Geneva. This is a revised and modernized version of the ancient Hippocratic Oath. It was hoped that it might be adopted widely for use at medical graduation ceremonies. The declaration includes these words: "I will maintain by all the means in my power the honour and the noble traditions of the medical profession; my colleagues will be my brothers."

I hope that it may not be out of place if, on a Sunday night in this country of Robert Burns, I suggest that it would be well if all of us at the beginning of a new year were to search our consciences and ask ourselves how far, both in our personal dealings with other members of our profession and in our contributions in councils and committees to discussions of professional affairs—how far we are faithful to the ideal embodied in these words, "my colleagues will be my brothers."

ENCOURAGEMENT OF GROUP PRACTICES IMPLEMENTATION OF WORKING PARTY'S REPORT

The Ministry of Health has sent a letter (E.C.L.3/54) to all executive councils setting out the arrangements that have been made to implement the recommendation in paragraph 29 of the Report of the Working Party on the Distribution of Remuneration among General Practitioners (*Supplement*, June 7, 1952, p. 283) that an annual sum, provisionally fixed at £100,000, should be set aside for the purpose of stimulating the formation of group practices.

Definition of Group Practice

A group practice is defined as follows: "Group practice applied to general medical practice means that the medical practice is carried on by several general practitioners working together in close association, consulting one another about their patients, and doing their 'surgery work' in whole or in part in a common building controlled by the doctors. All members of a 'group' should work in the common surgery premises even if on occasions they also work at separate branch surgeries. A group practice should employ ancillary help to the extent of one or more persons who can provide services of the secretarial, nursing, receptionist, or almoner type. Normally, a group should consist of three, four, five, or six principals. Larger numbers tend to diminish the value of group association. The group may or may not be a partnership, but, if not, there must be a proper understanding between the members of a group on the sharing of the earnings of the group and particularly as to the sharing of expenses. Patients must continue to be

the responsibility of the doctor of their choice in the group. The group should provide a 24-hours service to patients and also proper off-duty and holiday relief for its members."

The Ministry Committee on General Practice which drew up this definition recognized that in some rural areas the potential number of patients could not support more than two practitioners and did not consider that such a case should be ruled out. The Minister has also accepted this view.

Outline of Proposals

The Ministry has decided, in consultation with the G.M.S. Committee, that assistance should take the form of interest-free loans which will normally be recoverable by quarterly deductions from the remuneration payable by executive councils to individual members of the group. The sum to be set aside annually for the purpose, together with the sums repaid on the loans, will be known as the Group Practice Loans Fund.

An application for a loan will, in the first place, be made to the executive council, who, in consultation with the local medical committee, should forward it to the Ministry with their comments. It will then be referred to a committee to be called the Group Practice Loans Committee, composed of representatives of the medical profession and the Ministry, for a decision. The committee will advise the council in each case whether a loan should be made, and, if so, the amount to be lent. It has been decided not to prescribe a standard term of years for these loans, but that the period of repayment should depend so far as possible on the circumstances of a particular application. It is thought that the normal period should be 10 years and should not in any case exceed 20 years.

The council will then enter into a contract with the members comprising the group. It will be essential for the group to draw up an agreement among themselves which may or may not form part of their partnership agreement (if any). Details of the nature of the loan agreement between the executive council and the group may be obtained from the executive council concerned. All expenses, including those of the council, incurred in drawing up and executing the necessary legal documents will be borne by the group and will not be included in the loan.

Uses of the Loan

Assistance by means of these loans will be available for the following purposes: (a) the erection of a new building, either on land already owned by one or more of the members or on land which may have to be acquired for the purpose and for the acquisition of such land; (b) the acquisition of an existing building and its conversion into surgery premises; (c) the conversion of a building already owned by a member of the group.

It is essential that the premises should be used for the purposes for which the loan is made for a period of years substantially longer than the duration of the loan, and as a minimum the period should be 21 years. Applicants must be willing to accept this condition. Application for a loan may be made by general practitioners taking part in general medical service who propose to form a group practice or who, having formed a group, propose to provide new practice premises or substantially to improve the existing premises.

Additions to the Group

Where a group wish to admit a new member either as an addition to the existing group or to fill a vacancy, whether in formal partnership or not, admission to the medical list will be subject to the same conditions as if the members of the group were in formal partnership—that is, the right to replace a member can be assumed, though additional members, whose names are not already included in the medical list in the locality, will not normally be admitted in a restricted area. Agreement should be reached between the members in the first place as to the new member's share of liability for the outstanding or continuing loan.

EXCHANGE VISITS WITH CANADA AND THE U.S.A.

The scheme for exchange visits between members of the American, British, and Canadian Medical Associations, which has the approval of the Bank of England, will be continued this year.

Procedure

Three doctors from Britain may visit Canada in exchange for three doctors from Canada. Each doctor from Britain will be required to make all his own travel arrangements and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in Canada he will receive the equivalent in Canadian dollars. Similarly, each Canadian doctor on arrival in Britain will receive the sum deposited in sterling.

Three doctors from Britain may visit the U.S.A. in exchange for three doctors from the U.S.A. Each doctor from Britain will be required to make all his own travel arrangements and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in the U.S.A. he will receive the equivalent in U.S. dollars. Similarly, each U.S. doctor on arrival in Britain will receive the sum deposited in sterling.

Duration of Visits

The duration of the visits is left to the discretion of the doctors concerned. The American, British, and Canadian Medical Associations cannot accept any responsibility for a doctor who allows his visit to outlast the money placed at his disposal.

Applications are invited from members of the B.M.A. to take part in such exchanges during the next financial year—i.e., April 1, 1954, to March 31, 1955. Each applicant must state the object of his visit. (This is not a scheme for the exchange of appointments or practices.) Medical practitioners in all branches of the profession, including general practice and public health, are eligible. Applicants should also give approximate dates of the visit desired. (Successful applicants will in due course be required to furnish exact dates and details of travel.) Applications must be received by the Secretary of the Association by March 1, 1954.

WAVERLEY EVIDENCE COMMITTEE

The following have been co-opted to the special committee set up by the Council (see *Supplement*, December 12, 1953, p. 229) to prepare the Association's evidence to the Waverley Committee on the Provision of Medical and Dental Services for the Armed Forces: Dr. E. R. Boland, Brigadier D. C. Bowie, Mr. H. Parker Buchanan, Sir Zachary Cope, Sir George McRobert, Dame Louisa Wilkinson, Dr. Lena Williams.

SPRINGFIELD MATERNITY HOME, BLACKBURN

A report of the questions asked of the Minister of Health in Parliament about this matter and his replies will be found under "Medical Notes in Parliament" in this issue of the *Journal* (p. 281). The matter is to be raised again by Mr. H. Hynd (Member for Accrington) on the adjournment.

Correction.—In the report of the proceedings of Council (*Supplement*, January 23, p. 19) it was stated that Dr. Jean Chappell had been appointed to the Association's Constitution Committee. It should have been Dr. Joan Chappell.

Notes and News

Medical Aid Scheme for Africans.—Southern Rhodesia may soon have a medical aid society for the benefit of Africans—a scheme which has never been attempted in Rhodesia before. It is being planned with the co-operation of the Salisbury Rotary Club and the Salisbury Chamber of Industries. It is the idea of the new scheme that clinics should be established in the industrial area of Salisbury and supported entirely by industrialists. Employers would be asked to pay for the establishment of the clinics, but in time Africans would be invited to subscribe.

Exchange of Hospitality.—A medical family with three children, who live in a small village in Denmark and also have a summer cottage by the sea, offers hospitality to an English medical family with children, during July or August. In return the Danish family would like to receive hospitality in Britain in 1955. They would like to find an English family living near the sea. Would anyone interested please communicate with Brigadier H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1?

Questions Answered

Unclaimed Capital Allowance

Q. I bought a new car in January, 1951, and paid by 36 monthly instalments, which are now finished. I receive a monthly car allowance from my principal. I have been informed that I can claim depreciation allowance from the income-tax authorities, and that I could have been claiming this during the past three years. Can I claim the allowance now, and also for the past three years? I presume I have not been granted this automatically, as I did not claim at the time.

A.—An omission to claim a capital allowance can be rectified by a claim made during the six years following the year concerned, provided that declarations of income have been made for the years of claim. The statutory provision is commonly known as the "Errors and Omissions Section." The basis of calculation of the claim would be 25% per annum wear and tear allowance, on the total cost for the first year—that is, for the three months to April, 1952—and thereafter on the written-down value. The questioner does not state the amount of the "monthly car allowance" received by him from his principal. If, as may be the case, that allowance is sufficient to cover all the necessary expense of the car when being used for practice purposes (including a reasonable amount for wear and tear of the car) the revenue authorities will probably take the view that there is no claim to the capital allowance. That allowance forms part of the total cost of running the car and cannot be claimed on as a separate item of expenditure.

A Guide to Income Tax

Q.—Could you recommend a really sound book dealing with the details of income tax?

A.—Presumably the questioner wants a book which will supply guidance on (a) the calculation for income-tax purposes of the gross amount assessable in the case of professional profits, and (b) the allowances, etc., deductible in determining the amount of tax payable. Unfortunately there is a dearth of books of that type. The trouble is that there are almost yearly changes in some elements in the income-tax code, with the result that books become out of date, and therefore misleading, so quickly that publication is apt to be unprofitable. A useful handbook was published by Stone and Cox., Ltd., 44, Fleet Street, London, E.C.4, in 1946, price 6s. 6d., which may meet the questioner's requirements, provided he remembers that in some points

of detail there have been changes since 1946. If a more comprehensive textbook is required, there are publications available at 35s. upwards, but they deal with questions that do not arise in the calculation of tax on professional profits, and, of course, are also liable to become out of date.

Balancing Charge

Q.—My car was purchased just over two years ago and I was permitted the initial 40% allowance for income-tax purposes. The written-down value is now about £160. I propose to sell this car and buy another for the price I shall receive from the sale (about £350). Shall I be obliged to pay tax on the difference between this sum and the written-down value, despite the fact that the vehicle I subsequently obtain will be of exactly equal value to my present car? What would the position be if I exchanged my present car for another without any money transaction?

A.—If the present car, now written down by income-tax allowances to £160, is sold for £350 the effect will be that an excessive allowance will have been given in the sum of £350 - £160 = £190, and that will be the amount of the "balancing charge" on which income tax will be payable. The allowance for the car bought for £350 will be:

Initial allowance 20% of £350	..	..	..	£
Wear and tear allowance @ 25%	..	..	..	70
				88
				£158

Written-down value to be carried forward .. £192

If the questioner desires, he can elect for the calculation to be made as follows (in which case, of course, he will not be liable to pay tax on the £190 as a balancing charge):

Cost of new car	..	..	..	£
Deduct amount of balancing allowance	..	..	..	350
				190
				£160

Initial allowance	..	..	..	£32
Wear and tear allowance	..	..	..	40
				72

Written-down value to be carried forward .. £88

This alternative gives a short-term advantage as compared with the more usual one, but results in small allowances in future years.

The allowances would remain the same if a simple exchange of cars were made, provided that the car acquired was of a value of £350—that is, an exchange would be regarded as a double transaction of sale and purchase.

Part-time Locum

Q.—Between hospital appointments I am doing part-time locum work as a refractionist. Can I claim tax relief for (1) examination fees for the D.O., (2) replacement of an ophthalmoscope which was necessary for the work and was not provided, and (3) travelling expenses to various hospitals?

A.—(1) Examination fees cannot be claimed as expenses incurred in doing the work for which payment is received. (2) It is considered that there are grounds for the claim on replacement of an instrument which is "necessary for the work and was not provided," so long as any element of improvement is eliminated from the cost as being capital expenditure. (3) Travelling expenses to various hospitals should be allowable. It is assumed that the questioner is, or will be, assessed under Schedule D, as carrying on his profession as a locum tenens, and not under Schedule E as for a series of separate employments.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

The Obstetric List

SIR.—Your correspondent Dr. D. Saklatvala in his letter (*Supplement*, January 2, p. 6) refers very ably but all too superficially to the compilation of the Obstetric List. When applications were invited by the executive councils in 1948 for inclusion in the list, each general practitioner had to decide for himself whether he would apply to be paid perhaps £7 7s. per confinement or to limit his services to the maximum of £5 5s. A young and inexperienced man would naturally be anxious to increase his practice and his income and would apply for inclusion. An old man whose activity, practice, and income were falling would also apply, and between these age groups the man who, perhaps through no fault of his own, had not built up a busy practice might also apply.

But what of the man in the middle-age group who is possibly at the peak of his experience and activity and is responsible for as big a practice as is considered reasonable? Surely he is perhaps the most desirable candidate? But he is already fully occupied in giving attention to his own patients, maternity and otherwise, and he must reflect on whether it would be wise for him to chance breaking the camel's back by making himself liable to be called upon to attend patients to whom he is not, and never will be, the family doctor. He must, if asked by the maternity nurse—and presumably he is already well known and therefore springs to mind easily—travel beyond the normal limits of his practice; and, the more efficient and useful he proves, the fewer nights he will have in bed and the more surgeries he will have to curtail. In a seaside area the population is vastly increased in the summer, and the incidence of premature labours with attendant complications rises steeply. Is it surprising that this man may, in the interests of service to his own patients, decline to apply for the doubtful privilege of earning increased fees?

Dr. Saklatvala has brought an unsatisfactory state of affairs to notice, but he has surely assumed too readily that every general practitioner of 20 years' standing is already on the Obstetric List; that it may right itself in 20 years is small contribution to the present service.—I am, etc.,

Bosmor Regis.

DAVID HAY.

Specialists' Remuneration

SIR.—I should like to support the comments of Dr. E. Snell (*Supplement*, December 19, 1953, p. 237) and Dr. Bernard Sugden (*Supplement*, January 2, p. 7), with which I am in whole-hearted agreement.

The failure to press for simultaneous implementation of both Spens Reports has resulted in a disturbance of balance within the profession, and, while the general practitioners are receiving no more than their due, the skill of hospital staff and the responsibility, both moral and legal, which they bear are not being adequately recompensed. The long and arduous training of the specialist and his large financial outlay as he gains experience in various centres are factors which cannot be over-emphasized in the assessment of a revised salary scale.

It is now over fourteen months since a claim for this was entered on our behalf by the Staff Side of Whitley Committee "B." One must recognize that speed of settlement is an essential factor in such negotiations, otherwise certain points may lose their relevance. If, after all these months, the Management Side are unable or unwilling to make even an offer, surely the time has come to abandon salary claims and press only for arbitration, which is the right of almost every State (or other) employee whatever

his level in modern society. In such a demand for simple justice, we should have the full support of public opinion. And that is important, because it must be borne in mind that, while public opinion was on the side of the practitioners in their fight for Spens, specialists have no such fund of good will in their favour. The majority of even well-informed laymen believe that the Danckwerts award and the Spens scales applied to all members of the profession. I was amazed recently to find that in a group representing the legal, banking, teaching, and engineering professions, all those individuals to whom I spoke on the subject held this mistaken view. The importance of our public relations in eliminating such erroneous ideas, at the same time as any announcement is made regarding salary adjustments or arbitration demands, cannot be over-stressed.—I am, etc.,

Worcester.

E. N. MOYES.

Whitley Arbitration Machinery

SIR.—At the A.R.M., July, 1953, the following resolution was passed: "That this meeting deplores the lack of a Whitley Court of Arbitration to which there should be a right of appeal by unilateral reference and where the ruling should be binding on both parties, and instructs Council to take immediate and urgent action . . ." (*Supplement*, July 18, 1953, p. 24).

After a silence of six months may I ask what have been the results of this urgent action? When the general practitioners were unable to obtain arbitration the Association named a date for withdrawal from the N.H. Service unless arbitration had been agreed. We know the result. The only effective action which the Council can take is to state by July 10, 1954, one year after the mandate given at the last A.R.M., all public health medical officers shall be withdrawn from service. Is there any other body of men and women who would tolerate the conditions whereby they are unable to go to arbitration without their employers' consent, and when an award has been made the employers are not bound to implement it?—I am, etc.,

Darlington.

MAURICE B. GRIFFITH.

Quality and General Practice

SIR.—Your correspondent Mr. B. J. Shaw (*Supplement*, January 9, p. 11) asks whether a stimulus and incentive for could be provided by a system of merit awards and grading of general practitioners. Many of us think that this is not of a doctor's qualities and are happiest when able to pay him directly for his services. Let the doctors be "set free" and given back the right to ask the fees which they deserve. If a patient considers he has not had his "money's worth" the doctor will soon lose that patient to a colleague. The G.P. who gives his patient a "good deal" will be able to secure a just reward. The registrar who fails to obtain a consultant's post will once again be pleased to become a G.P. in that he will feel he will be able to secure fees which are related to the type of service which he is able to give his patient.

Fewer of the millions now spent on the N.H.S. would be needed for the hospitals, and more would be available for the general practitioners, who should be paid for their services by the patient, and he in turn should receive fixed sums per item-of-service from the State in exchange for the money he has been compelled to pay for a National Health Service in taxes and insurance contributions.

This proposition is not reactionary. Look at Australia—a progressive country where the Government believes that a partnership of the medical profession, the community, insurance organizations, and the Government can evolve a method of retaining all the existing traditions and advances on the medical side and still bring the cost of a first-rate medical service within the means of the people. Look at New

B.M.A. LIBRARY

The following books have been added to the Library:

- Adams, R. D., et al.: *Diseases of Muscle: A Study in Pathology*. 1953.
 Bell, G. H., et al.: *Textbook of Physiology and Biochemistry*. Second edition. 1953.
 Bicknell, F., and Prescott, F.: *Vitamins in Medicine*. Third edition. 1953.
 Boenheim, C.: *Practical Child Psychotherapy*. Second edition. 1953.
 Bourne, G. H.: *Introduction to Functional Histology*. 1953.
 Burnet, Sir M.: *Natural History of Infectious Disease*. Second edition. 1953.
 Cattell, R. B., and Warren, K. W.: *Surgery of the Pancreas*. 1953.
 Centre d'Etudes Laennec: *L'Expérimentation Humaine en Médecine*. 1952.
 Comroe's *Arthritis and Allied Conditions*. Fifth edition revised by J. L. Hollander. 1953.
 Cope, Sir Z.: *William Cheselden, 1688-1752*. 1953.
 Critchley, M.: *The Parietal Lobes*. 1953.
 Dale, Sir H. H.: *Adventures in Physiology*. 1953.
 Dock, W., et al.: *Ballistocardiography*. 1953.
 Dudley, Sir S. F.: *Our National Ill Health Service*. 1953.
 Goldzieher, M. A., and Goldzieher, J. W. (Editors): *Endocrine Treatment in General Practice*. 1953.
 Gordan, G. S., and Lissner, H. (Editors): *Endocrinology in Clinical Practice*. 1953.
 Gould, S. E. (Editor): *Pathology of the Heart*. 1953.
 Grundy, F.: *Preventive Medicine and Public Health*. Second edition. 1953.
 Hutton, I. E.: *Hygiene of Marriage*. Ninth edition. 1953.
 Illingworth, C. F. W.: *Peptic Ulcer*. 1953.
 Joslin, E. P.: *Diabetic Manual for the Doctor and Patient*. Ninth edition. 1953.
 Kamath, M. A.: *Ophthalmic Medicine and Surgery with Sight-testing*. Third edition. 1953.
 Kane, I. J.: *Sectional Radiography of the Chest*. 1953.
 Keynes, G.: *Bibliography of the Writings of Dr. William Harvey, 1573-1657*. Second edition. 1953.
 Lipman, B. S., and Massie, E.: *Clinical Unipolar Electrocardiography*. Second edition. 1953.
 Lyle and Jackson's *Practical Orthoptics in the Treatment of Squint*. Fourth edition. 1953.
 McFadden, C. J.: *Medical Ethics*. Third edition. 1953.
 McFarland, R. A.: *Human Factors in Air Transportation: Occupational Health and Safety*. 1953.
 Mackie, T. J., and McCartney, J. E.: *Handbook of Practical Bacteriology*. Ninth edition. 1953.
 Moseley, H. F.: *Shoulder Lesions*. Second edition. 1953.
 Polson, C. J., et al.: *Disposal of the Dead*. 1953.
 Rank, B. K., and Wakefield, A. R.: *Surgery of Repair as Applied to Hand Injuries*. 1953.
 Raven, J. C.: *Human Nature: Its Development, Variation, and Assessment*. 1952.
 Reading, P.: *Common Diseases of the Ear, Nose, and Throat*. Second edition. 1953.
 Rowbotham, G. F., and Hammersley, D. F.: *Pictorial Introduction to Neurological Surgery*. 1953.
 Scherf, D., and Schott, A.: *Extrasystoles and Allied Arrhythmias*. 1953.
 Schnitzer, M. A.: *Congenital Anomalies of the Heart and Great Vessels*. 1952.
 Sears, T. P.: *Physician in Atomic Defense*. 1953.
 Smout, C. F. V., and Jacoby, F.: *Gynaecological and Obstetrical Anatomy and Functional Histology*. Third edition. 1953.
 Sorsby, A. (Editor): *Clinical Genetics*. 1953.
 Ten Teachers: *Diseases of Women*. Ninth edition under the direction of F. W. Roques. 1953.
 Thornton, J. L.: *John Abernethy: A Biography*. 1953.
 Todd, J. C., et al.: *Clinical Diagnosis by Laboratory Methods*. Twelfth edition. 1953.
 Tredgold, A. F., and Tredgold, R. F.: *Manual of Psychological Medicine*. Third edition. 1953.
 Verhandlungen der Deutschen Gesellschaft für Arbeitsschutz. Band 1. Die Fünfte Verordnung über Ausdehnung der Unfallversicherung auf Berufskrankheiten. 1953.
 Whitty, Sir L. E. H., and Britton, C. J. C.: *Disorders of the Blood*. Seventh edition. 1953.
 Williamson, B.: *Handbook on Diseases of Children*. Seventh edition. 1953.

Six new members of the Scottish Health Services Council have been appointed by the Secretary of State for Scotland in place of those who retired on December 31, and other members whose term of office expired on that date have been reappointed. Mr. J. Dunlop, Mr. W. Russell Logan, Colonel J. M. Miller, Miss E. Renwick, Dr. J. Riddell, and Councillor J. Thomson have been appointed members until December 31, 1956; Mr. J. M. Graham, Dr. G. W. Ireland, Colonel W. Mackie, Professor G. L. Montgomery, Dr. C. J. Swanson, and Captain J. P. Younger have been reappointed to the Council until December 31, 1956.

Zealand. No less a man than Dr. Ian Grant, the Deputy Chairman of the Representative Body, tells us that if we go to New Zealand we will work in a health service where individual effort and merit are still rewarded and where quality is given pride of place over quantity. Haven't we got the answer? Why not let us seriously consider such a scheme, and not cast it aside as either financially or administratively impossible?—I am, etc.,

Dorling.

CYRIL E. BEARE.

Economy in Prescribing

SIR.—The letter by Dr. B. MacKenzie Hegarty and others (*Supplement*, December 19, 1953, p. 237) contains much food for thought. There are, however, other aspects of the problems they discuss.

Most medical journals are well besprinkled with advertisements of proprietary medicines, and the way to learn about them is from the literature sent by the pharmaceutical firms. Consultants and specialists are prodigal users of proprietaries and advise G.P.s accordingly; and patients frequently know this. The public are not given sufficient direction by propaganda to ease their demands on G.P.s, and are not told that they too have to take part in the economy drive. Much literature has been circulated to the G.P.s by official bodies; and articles in medical journals, usually by consultants and specialists, seem to put the G.P. "on the spot" by stating or implying he over-prescribes or chooses expensive drugs; or the G.P. panders to the demands and whims of patients. A few newspapers, some M.P.s, and other public personalities indicate that the high cost of the drug bill is due to the G.P.s. G.P.s who are on call round the clock have little or no redress against complaints of excessive demands by patients. The status of the G.P. is not what it was. The 1952 N.F. in "Notes For Prescribers," which appears to contain the style and ideas of several authors, seems to imply that the prescriber (usually a G.P.) is a "tyro" at the job. The N.F. is neither national nor reasonably comprehensive. Neither is it up to date, nor does it bear the imprint of down-to-earth prescribing. If we consider the whole range of useful drugs available, desirable, essential, and necessary for treatment we find the N.F. is "negligently deficient." Moreover, the N.F. is biased against proprietary drugs. The committee which formulates it seems over-balanced by a plethora of professors and people who may know pharmacology in abstract but do not give the impression that they understand prescribing for patients. For these reasons G.P.s are on the losing side before they begin to justify their action if accused of over-prescribing. Here is a case to consider. One of my patients, a professional man in the middle fifties, is an asthmatic. He has been given and has tried most remedies but finds that a proprietary listed in a proscribed category is the only thing to relieve him and to keep him at work. Has he to buy the drug himself?—I am, etc.,

Luton.

DOUGLAS R. SNELGROVE.

Aureomycin in General Practice

SIR.—I wonder whether you or any of your readers can tell me why general practitioners are not permitted to prescribe aureomycin, although they are allowed to prescribe chloramphenicol, a more expensive and more dangerous substance. I have recently had two cases of pneumonia in practice which failed to respond to penicillin and sulpha drugs, and for which aureomycin seemed indicated. The only way I was able to obtain this was by getting a consultant to do domiciliary visits.

Aureomycin, I understand, has now been out for at least five years and it seems difficult to understand why better supplies are not forthcoming. One final point: Would it not be possible for general practitioners to be allowed a quota per month, obtainable through their local hospitals?

—I am, etc.,

Winchester.

H. J. BLISS.

ANNUAL MEETING, GLASGOW, 1954

HOSTEL ACCOMMODATION

Members who wish to reserve hostel accommodation in Glasgow during the Annual Meeting in July are asked to write direct to the Executive Officer, B.M.A. House, Tavistock Square, London, W.C.1, stating their requirements. A list of hostel accommodation was published in the *Supplement* of January 16 at page 14.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Commanders J. B. Patrick, P. B. Jackson, and A. D. Sinclair to be Surgeon Captains.
Surgeon Lieutenant-Commanders (Acting Interim Surgeon Commanders) The Hon. A. G. Gathorne-Hardy, F. B. B. Weston, L. G. Topham, L. D. Arden, D. J. O'Donoghue, and W. J. Cranley to be Surgeon Commanders.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieutenant-Commanders A. Ruffman and R. Vaughan-Jones to be Surgeon Commanders.
Surgeon Lieutenant-Commander (Emergency) S. D. Moss, R.N., has re-entered the Permanent R.N.V.R., in the rank of Surgeon Lieutenant-Commander.
Surgeon Lieutenant E. M. Stirk to be Surgeon Lieutenant-Commander.
Surgeon Lieutenant (D) F. G. Hardman, M.B., Ch.B., B.D.S., F.D.S., to be Surgeon Lieutenant-Commander.

ARMY

Major-General A. G. Harsant, C.B., O.B.E., Q.H.S., late R.A.M.C., has retired on retired pay.
Colonel (Temporary Brigadier) J. Huston, late R.A.M.C., to be Brigadier.
Colonel J. N. Atkinson, late R.A.M.C., having attained the age for retirement, is retained on the Active List.
Lieutenant-Colonel L. T. Furnivall, D.S.O., from R.A.M.C., to be Colonel.

Association Notices

ELECTION OF MEMBER OF THE COUNCIL BY
THE FAR EASTERN BRANCHES

Notice is hereby given that, owing to the resignation of Professor Kenelm H. Digby, there is a vacancy in the Council of the Association. Nominations of candidates for election as a member of Council by the Far Eastern Branches for the remainder of the period ending with the conclusion of the Annual Representative Meeting, 1955, must be forwarded in writing so as to reach the Secretary not later than March 25, 1954.

The Branches in the Group are: Borneo, Ceylon, Hong Kong and China, Malaya.

Nominations must be signed by not fewer than three members of any branch in the Group, and should be in the following form:

We, the undersigned, hereby nominate.....

of..... (full name and address to be given) for election by the Borneo, Ceylon, Hong Kong and China, and Malaya Branches as a member of the Council of the Association for the period ending July 23, 1955.

Signatures and addresses of three nominators.....

Branch.....

If a contest occurs voting papers will be issued from the Head Office, British Medical Association, Tavistock Square, London, W.C.1, to each member in the Group.

A. MACRAE,
Secretary.

Diary of Central Meetings

JANUARY	
30 Sat.	Hypnotism Subcommittee, Psychological Medicine Group Committee, 10 a.m.
FEBRUARY	
2 Tues.	Waverley Evidence Committee, 11 a.m.
2 Tues.	Organization Committee, 2 p.m.
3 Wed.	Committee on the Rehabilitation of Disabled Persons, 10.15 a.m.
3 Wed.	Staff Side, Committee B, Medical Whitley Council, 10.30 a.m.
3 Wed.	Coroners Subcommittee, Private Practice Committee, 2 p.m.
4 Thurs.	Organization Subcommittee, Central Consultants and Specialists Committee, 9 a.m.
4 Thurs.	Central Consultants and Specialists Committee, 10.30 a.m.
5 Fri.	Overseas Committee, 2 p.m.
5 Fri.	Transport Medical Standards Subcommittee, Occupational Health Committee, 2.30 p.m.
9 Tues.	Central Ethical Committee, 2 p.m.
10 Wed.	Arrangements Committee, Annual Meeting, Toronto, 1955, 10 a.m.
10 Wed.	Staff Side, Medical Whitley Council, 12 noon.
10 Wed.	Arbitration Machinery Committee, 2 p.m.
10 Wed.	Film Committee, 2 p.m.
12 Fri.	Private Practice Committee, 2 p.m.
12 Fri.	Library Subcommittee, Science Committee, 11.30 a.m.
12 Fri.	Ophthalmic Qualifications Committee, 1.45 p.m.
12 Fri.	Ophthalmic Group Committee, 2 p.m.
12 Fri.	Science Committee, 2 p.m.
15 Mon.	Anaesthetic Services Subcommittee, Anaesthetists Group Committee, 10 a.m.
16 Tues.	Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.1), 2 p.m.
17 Wed.	Occupational Health Committee, 10.30 a.m.
17 Wed.	Joint Health Visitors Subcommittee, Public Health, G.M.S., and Central Consultants and Specialists Committees, 2.15 p.m.
23 Tues.	Office Committee, 10.30 a.m.
23 Tues.	Constitution Committee, 2 p.m.
24 Wed.	Geriatrics Joint Subcommittee, Central Consultants and Specialists, G.M.S., and Public Health Committees, 2 p.m.
25 Thurs.	Journal Committee, 2 p.m.

Branch and Division Meetings to be Held

BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Bournemouth, Friday, January 29, 8.15 p.m., meeting. Address by Surgeon Lieutenant-Commander W. E. Crocker, R.N.: "Medical Problems Associated with Deep Diving."
CARDIFF DIVISION.—At Park Hotel, Cardiff, Wednesday, February 3, 7.45 for 8 p.m., supper-meeting. Address by Dr. W. R. Harrison, M.Sc., Ph.D.: "Forged, Anonymous, and Suspect Documents."
DONCASTER DIVISION AND DONCASTER MEDICAL SOCIETY.—At Parkinson's Café, High Street, Doncaster, Tuesday, February 2, 7.30 p.m., joint meeting. Address by Mr. L. B. Patrick: "The Cause and Prevention of Genital Prolapse."
DUNDEE AND ANGUS DIVISIONS.—At Medical School, Dundee, Friday, February 5, 8.30 p.m., general meeting. Professor D. M. Douglas and Professor Ian G. W. Hill: Mitral Stenosis and the Selection of Cases for Valvotomy, followed by colour film of valvotomy operation.
LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, S.E., Friday, February 5, 8.30 p.m., meeting. Dr. Horace Joules: "Smoking and Cancer of the Lung" (lantern).
METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C.1, Tuesday, February 9, 5 p.m., meeting. Address for senior students by Dr. Charles Hill, M.P.: "Medicine from the Outside." All recently qualified practitioners are invited.
MONMOUTHSHIRE DIVISION.—At St. Mellons County Club, Thursday, February 4, 7.30 for 8 p.m., dinner. Address by Dr. Griffith Pugh: "The Ascent of Everest" (illustrated). Wives and friends of members are invited.
NUNEATON AND TAMWORTH DIVISION.—At Red Lion Hotel, Atherstone, Tuesday, February 2, 8 for 8.45 p.m., B.M.A. Lecture by Dr. Vaughan Jones: "Occupational Health and the Hazards of the Housewife."
REIGATE DIVISION.—At Redhill County Hospital, Tuesday, February 2, 7.30 p.m., clinical meeting.
ST. PANCRAS DIVISION.—At B.M.A. House, Tavistock Square, London, W.C.1, Friday, February 5, 8.30 p.m., meeting. Lecture by Professor M. L. Rosenheim: "Hypertension."
TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Devon Road, Bow, E., Friday, January 29, 3 p.m., clinical meeting. Dr. P. B. Woodruff: Cancer Campaign.
WEST DENBIGH AND FLINT DIVISION.—At Marine Hydro Hotel, Rhyl, Thursday, February 4, 8 p.m., dinner. 9 p.m., Annual B.M.A. Lecture by Dr. Marjory W. Warren: "Medical Problems and Management of Elderly Sick."

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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The B.M.A. in Committee

PUBLIC RELATIONS

A few years ago the term "public relations" had hardly come into currency; where it had done so it was scarcely understood, and where it was understood it was mostly disliked. It was disliked especially by the medical profession, whose relations with the press had been like those of the Jews with the Samaritans. The dislike was largely founded on a traditional aloofness on the part of the profession, continually reinforced by instances in which at any rate the popular press had headlined the doings of an errant doctor or had made the whole profession or a section of it the target for mischievous criticism. Much that had appeared in the press about medicine and doctors was false, if not in fact at least in emphasis, but the doctor was a good body, for the members of no other profession come into such close relation with the public in their homes, and therefore on occasion make such good "copy." The doctors themselves in their contacts with the press often adopted a lofty and patronizing "I am telling you" attitude. All this had its repercussions when medicine ceased to be a private affair between doctor and patient and, first, National Health Insurance and then, a generation later, the National Health Service were cradled in party politics.

Early Efforts

In the British Medical Association itself the idea of public relations was not at first favoured. In 1937 a propaganda committee was set up, consisting of the principal officers of the Association and the chairman of the National Insurance Defence Trust. This committee was to consult with the chairman of the appropriate standing committee when it was proposed to issue any information on the work of the Association or its attitude on any public question. On the outbreak of war this kind of propaganda, like so many other things, ceased to exist. The idea, however, was revived before the war ended, and the functions of the reconstituted body were described as the collection and correlation of medical intelligence.

The Public Relations Committee to-day consists of the officers of the Association, two members appointed by the Council, four by the General Medical Services Committee, two by the Central Consultants and Specialists Committee, two by the Public Health Committee, one by the Journal Committee, and a member of the Occupational Health Committee, and there is power to co-opt two other members. Its reference is in the widest terms: "To

consider matters involving the relations of the profession to the public." The Public Relations Department, which is run at an expenditure of about £6,000 a year, is financed half by the Association and half by the National Insurance Defence Trust, but the Public Relations Officer is an officer of the Association, which is responsible for his salary. The special problems of Scotland with its separate National Health Service Act, are catered for by the maintenance of a part-time press officer in Edinburgh to advise and assist the Scottish Committee and Secretary.

Creating a Climate of Opinion

The chairman of the Committee is Dr. H. Guy Dain, who has already given such immense service to the Association over so many years. He has brought to this latest task a practical outlook and a shrewd judgment. It was largely due to his insistence that some organization along these lines was felt to be necessary, and the Public Relations Department was accordingly set up. It was at his instance that in 1943 Mr. Colin Hurry was appointed in a consultative capacity. Dr. Dain impressed upon the Council many years ago that by reason of political developments the medical profession would become more or less vulnerable to public opinion. The greatly improved attitude of public opinion to-day on matters affecting the medical profession is largely due to his inspiration and ideas.

On many occasions in the past, when the profession has been passing through times of crisis, it has had what has been described as a "bad press." The British Medical Association used to be called—one hears the reference less frequently now—the most exclusive of all trade unions. The old picture, "The Doctor," by Sir Luke Fildes, popular in Victorian dining-rooms, faded out of recognition and gave place in many quarters to the figure of a mercenary individual concerned above all things about his fees, the unreasonable demands made upon his time by trivial calls, and complaints about this, that, and the other. The term "panel doctor" was often used disparagingly. In the National Health Insurance struggle in 1911 the profession for the first time in its history was brought up against an acute political issue in which it was directly involved, and its case, however good, found very little support in the organs of public opinion.

For many years Fleet Street continued to be 1,000 miles from Tavistock Square. Many journalists did not really know what the B.M.A. was. It was confused repeatedly with the General Medical Council, so that such a hybrid term as "British Medical Council" appeared with extraordinary frequency. By the way, in a television play, in December, 1953, a doctor was erased from the *Register* by

the General Medical Council, or rather by its President, apparently acting in his individual capacity, and the decision was referred to later in the play as that of the British Medical Association! For many years the B.M.A. was the last source to which the journalist would have turned for medical information.

The Public Relations Officer

The Public Relations Department is now a solid piece of Association machinery. In 1947 the Council appointed a Public Relations Officer admirably suited for his task by his journalistic experience on the *Manchester Guardian* and the B.B.C. Mr. John Pringle has a job which calls for skill and tact. The function of the Public Relations Department is not to dispense refreshment on occasion for members of the press nor simply to give them what are called "hand-outs." It is to interpret to the public the views and attitude of the Association itself—in other words, to put medical affairs in journalistic language without doing violence to their meaning. What, for example, can the term "Implementing Spens" mean to the average member of the public? What would such a term convey at the top of a newspaper column?

The Public Relations Officer must be familiar with two worlds—the world of the press and the world of medicine, each revolving in separate orbits and sometimes sneering at one another as they come into juxtaposition. When Mr. Pringle joined the Association, in the year before the National Health Service came into operation (though the Act was already on the Statute Book), the quarrel with Mr. Aneurin Bevan was at its height. Left-wing newspapers were, of course, denouncing the Association and all its works, but anti-doctor cartoons and leading articles were by no means confined to that section of the press. Whatever may have been thought of Bevan, Beveridge was highly popular, and there was a widespread belief that the B.M.A. was setting itself to sabotage the Beveridge Social Security plan in so far as it affected the interests of a "selfish profession." One little incident among a hundred may be recalled. The Representative Body was in session in London when the results of the 1945 General Election were announced, and on the announcement of the defeat of Sir William Beveridge (as he then was) there was a slight murmur of applause from a back bench. This was magnified at once into the headline: "Doctors cheer Beveridge defeat."

An Information Service

That sort of thing, expressed in innumerable ways, had to be overcome. A comprehensive service of information, particularly in the field of social medicine, was set up to answer press inquiries, and this has now become well established and is made use of daily by practically the entire national press. The telephones of the Public Relations Department are almost constantly ringing with inquiries on all sorts of medical and medico-political subjects, from medical education to geriatrics, from the Association's policy on spiritual healing to a dispute over a local authority appointment. Swift and accurate information is distributed. The Association's Public Relations Officer, like the doctors whom he serves, has no fixed hours. His private telephone number is known in Fleet Street, and calls may reach him at midnight concerning the accuracy of some statement (perhaps a statement just made in the House of Commons), or the likely attitude of the Association on some question which has arisen as a newspaper goes to press, or the verification of some fact affecting the profession or a member of it. It is not only the press which is served, but also the B.B.C., and many other institutions, including Government departments, which in their special ways require information. It is not simply a question of correcting some fantastic statement in a popular Sunday paper, but, maybe, of devising the best reply to some more eminent and dangerous critic. An example of prompt refutation was afforded during the critical plebiscite just before the

National Health Service came into operation. Mr. Bevan in the House of Commons had attacked the method by which the plebiscite was taken, declaring that it was a long way removed from the secret ballot and the workings of democracy. The immediate response of the Public Relations Department was to invite the press—who came in large numbers—to witness the counting of the votes and the precautions to ensure that the real unembarrassed voice of the profession had been heard. This demonstration disposed of Mr. Bevan's insinuations once and for all.

The Press at the Annual Meeting

It is curious to reflect that at the very first Annual Representative Meeting 50 years ago the press—and only the local press at that—timidly knocked at the door and were refused admission. Since then the press have been not only admitted but welcomed, and special facilities provided for them. On rare occasions the meeting has gone into secret session, but more often when matters not ripe for publication have been discussed the press has been asked not to report the proceedings, and the request has been punctiliously respected.

At the Annual Meeting of the Association the Public Relations Department is concerned with arrangements whereby any number up to 40 journalists require not only accommodation in the meeting-places but telephone facilities, hand-outs, synopses of papers, and so on. They have to be "fed" as in fact the modern journalist expects to be. The journalist is no longer the "chiel amang you takin' notes"; he is a pampered recipient of more ready-made matter than he knows what to do with, with the result that going news-gathering are no longer necessary. Everything comes to him who waits, and he has not to wait long. But the net result is more accurate and well-informed reporting, and that is all to the good. Press conferences are held whenever anything important has to be announced. Publicity is arranged for major decisions of the Representative Association or its committees are also publicized by every appropriate means. The Department is responsible for organizing various lectures, such as the Sir Charles Hastings lecture, on medicine and health for the general public.

All the principal newspapers and periodicals are read by members of the Department, and passages marked for circulation to other Association officers. An extensive filing system is maintained. A duty of the Department is a close scrutiny of *Hansard*. Correspondence from the general public is dealt with, many of the replies involving considerable research. One curious question often asked, for example, is how to proceed to bequeath one's body for research purposes. So numerous have been such inquiries that the Department has had to have the complicated procedure set out on a printed sheet. Many letters and telephone calls often reveal a simple misunderstanding with regard to medical practice or the regulations of the National Health Service. The explanation often dispels any resentment. The Public Relations Officer attends all the important committees of the Association, and is frequently called upon to give his advice as to the likely public reactions on any contemplated action. In all its work the Department is in closest touch with the medical secretariat, the staff of the *British Medical Journal*, and the library.

Other work includes the preparation of a list of forthcoming medical conferences, copies being circulated to the press and to inquirers. This list is now by far the most complete in existence and is of assistance to organizers such work as the preparation of a popular illustrated edition of the Association's Report on "The Care and Treatment of the Elderly and Infirm." The preparation of a "B.M.A. Book of Medical Scholarships," containing a list of all such awards available in Great Britain and Northern Ireland, developed out of the work of the Department in answering questions on careers in medicine.

Local Public Relations

Finally it should be said that public relations is not the affair of Headquarters alone. The importance of the local newspaper has often been overlooked, yet its influence in a particular community may surpass that of any national daily. Over 200 of the Divisions in Great Britain and Northern Ireland now have a Public Relations Secretary, and in not far short of half of these he is a different individual from the Honorary Secretary of the Division. Guidance is given to the local press, speakers are provided for meetings, and Headquarters is kept in touch with local events and opinion. Many of these Public Relations Officers are keen and enthusiastic workers, well abreast of the events and feelings in their own areas.

It must be borne in mind that public relations is not just a "crisis" activity. If it was mobilized only in a crisis it would fail. It goes on all the time. Every day at Headquarters and at the periphery there is a steady build-up of favourable public opinion which will act as a defence should a crisis arise. The really big achievement of the Department has been to demonstrate that the public interest and the interest of the profession are not antagonistic, are not indeed separate, but over a great part of the field, perhaps over the whole field, are identical.

WHITLEY COUNCILS FOR THE HEALTH SERVICES (GREAT BRITAIN)

MEDICAL COUNCIL: COMMITTEE "C"

The following M.D.C. circulars (Nos. 19 and 20) signed by the joint secretaries, Dr. A. V. Kelynack and Mr. T. B. Williamson, and dated January 22, 1954, have been issued to all local authorities in England, Wales, and Scotland.

PUBLIC HEALTH MEDICAL OFFICERS: INCREMENTALS FOR PART-TIME OFFICERS (No. 19)

"Committee 'C' of the Medical Whitley Council have agreed that part-time public health medical officers who are paid an annual salary related to full-time pay should be paid not as a 'flat rate' but in accordance with the appropriate salary scale; i.e., they should be entitled to annual increments in the same way as whole-time officers. "Committee 'C' accordingly recommend: (1) that such part-time officers should be paid the appropriate proportion of the salary which would be payable if the employment were whole-time, so that in each year of employment the salary will be related to the appropriate incremental point of the whole-time salary scale; and (2) that where such an arrangement is not already in operation, it should come into effect from April 1, 1954, at the incremental point which the officer would have reached on that day if this arrangement had been in operation from the date on which the officer took up his present post with his present employing authority."

PUBLIC HEALTH MEDICAL OFFICERS MATERNITY LEAVE SCHEME (No. 20)

"Following the introduction by the Ministry of National Insurance of a revised scheme of maternity benefits, Committee 'C' of the Medical Whitley Council have reconsidered the Maternity Leave Scheme applicable to women public health medical officers, and have agreed on the following amendments to the scheme set out in Appendix I to M.D.C. Circular No. 11:

"(1) In respect of the period October 26, 1953, to January 23, 1955, (a) the scheme set out in Appendix I to M.D.C. Circular No. 11 shall apply to women officers not paying National Insurance contributions; (b) women officers paying contributions and electing to take the new benefits shall be granted leave for 18 weeks, with full pay for the first four weeks with deduction of maternity allowance, and half pay for the remaining 14 weeks without deduction of the

allowance. Account shall not be taken of any additional benefit which may accrue in certain circumstances.

"(2) In respect of confinements after January 23, 1955, (a) the present period of maternity leave shall be extended from 13 weeks to 18 weeks, absence from duty to commence 11 weeks before the expected week of confinement; (b) full pay shall be granted for the first four weeks of absence, with reduction of maternity allowance and of any other additions which may accrue; and, for the remaining 14 weeks, half pay shall be granted, without deduction of allowances except to the extent to which the combined pay and allowances may exceed full pay; (c) women officers who do not pay National Insurance contributions shall be deemed to be insured and the appropriate weekly allowances shall be deducted from their full pay.

"(3) In respect of the understanding in regard to return to work (paragraph (f) of Appendix I to M.D.C. Circular No. 11): the return to duty shall be for a period of at least three months. This requirement may, however, be varied at the discretion of the employing authority, on good cause being shown."

MEDICAL SERVICE COMMITTEE CASE

HOSPITAL DOCTOR'S STATEMENT

In a case which came before the Medical Service Committee of the London Executive Council recently the complainant alleged that the practitioner had been negligent in the treatment of his late wife and failed to diagnose her illness as quickly as he might have done. The committee decided in favour of the doctor, and in doing so added the following opinion:

"It appeared to us from the correspondence and the oral statement made to us by Mr. A that there might have been no complaint made in this case had it not been for a statement alleged to have been made to Mr. A by a doctor at the hospital. That statement was that 'it would have made all the difference if the patient had been admitted to hospital some weeks previously.' In this connexion we had before us a letter written by the house-physician at the hospital, in which he said that he . . . was sure he did not tell Mr. A that earlier admission to hospital would have made 'all the difference,' and he suggested that Mr. A, who was extremely distraught at the time, must have misunderstood what was said to him. We have pointed out in previous reports how unfortunate it is that statements are made to patients' relatives at hospitals that if something different had been done it would have made all the difference, particularly when these statements are made by unauthorized persons—e.g., nurses, etc."

METROPOLITAN COUNTIES BRANCH

The Annual Charities Ball of the Metropolitan Counties Branch will be held in B.M.A. House on Thursday, May 6, 1954. It is hoped that as many members of the profession as possible, including those outside the Branch area, will attend and thus enable the Branch to make a handsome contribution to the medical charities. Dancing to the music of the Sydney Lipton Ballroom Orchestra; buffet and bars. Tickets £2 2s. each, or six for £11 11s. Further particulars will be issued in due course.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

GROUP PRACTICE LOANS

BROADCAST BY ASSOCIATION'S P.R.O.

Mr. John Pringle, Public Relations Officer of the B.M.A., was invited by the B.B.C. to take part in its "At Home and Abroad" programme in the Home Service on January 29. Mr. Pringle talked about the new proposals for stimulating group practice (see *Supplement*, January 30, p. 27), and the following is a slightly abridged version of what he said.

"There is, of course, nothing new about group practice itself. Group practice existed in this country long before the magic words 'Health Centre' were ever invented. Medicine is, and always will be, a highly individual profession, and some doctors—and first-rate ones, too—prefer to work single-handed or independently. Other doctors feel that practice in a large partnership enables them to do their best work, to pool knowledge and skill, and to work out a rota system for night and emergency calls. So more and more the tendency has been towards the development of partnerships, and when you have several doctors working together, sharing the services of secretary, nurse, receptionist, and so on, then you have a group practice.

Spontaneous Development

"Group practice is a voluntary, spontaneous development called forth by the needs of the public in a particular district and by the fact that a number of doctors find they can work well and get on happily together. It is not created by external authority; the doctors arrange their own work, as they themselves think best. If the public do not like the medical treatment they get there, they can go elsewhere.

"The fully-blown health centre is a rather different thing. It usually means a building specially erected, maintained by the local health authority—and in connexion with it there are usually different kinds of local authority services, ante-natal or child welfare clinics, for example. They tend to be expensive to build and maintain, and the full capital cost, of course, falls on you as ratepayers or taxpayers.

A Cheaper Way

"The medical profession have always been slightly cautious about the wholesale setting up of health centres, especially in view of the enormous cost to the nation, and they have rightly insisted on experiments first. Meanwhile, so doctors have argued, why should their own existing premises not be converted or enlarged cheaply to make group practice easier? The trouble, of course, has been finding the money. This is where this new £100,000 loan comes in. And I want to correct a misunderstanding. This is not a Government loan to doctors. Most doctors, as you know, are paid out of a central pool, which is calculated on a national basis and arranged to meet not only their remuneration but all practice expenses. At the last agreement on the distribution of this money it was agreed that a sum of £100,000 should be set aside annually. In effect, therefore, every family doctor is voluntarily forgoing a part of his proper remuneration every year in order to assist something which the profession believes to be a good thing.

A Step in the Right Direction

"One hundred thousand pounds annually for the whole country may strike you as a very modest sum. So it is, but this is a start, and as the years go by the loans will be repaid and become available for further loans. It will strike many people as a step in the right direction—a little healthy encouragement to a natural organic development—something not imposed on the public and the profession from the outside, but springing directly from the needs of patients and the experience of doctors working together to serve them."

MEDICAL PRACTICES COMMITTEE

AMENDMENT OF CLASSIFICATION OF AREAS
On the admission of an additional doctor or doctors the following areas in England and Wales have been reclassified.

"Intermediate" from "Designated"

Berkshire.—Urban District and Rural District of Abingdon.
Buckinghamshire.—Aylesbury; Newport Pagnell.
Cambridgeshire.—City of Cambridge.
Durham.—Urban District of Chester-le-Street.
Essex.—Harlow New Town Development Area; Borough of Walthamstow; Urban District of Rayleigh.
Hampshire.—Borough of Gosport.
Kent and Canterbury.—Borough of Chatham.
Lancashire.—Urban District of Urmston; Rural District of Preston; Irlam District.
London.—Borough of Greenwich: North 1, 2, 3, and Marsh Wards. Borough of Islington: Tollington and Upper Holloway Wards. Borough of Lewisham: Rushey Green and Lewisham Park Wards. Borough of Westminster: Victoria Ward.
Middlesex.—Borough of Heston and Isleworth. Borough of Willesden: Roundwood Ward. Urban District of Hayes and Harlington.
Nottingham County and City.—Kirkby-in-Ashfield.
Somerset.—Rural District of Clutton.
Wiltshire.—Salisbury.
Yorks (North Riding).—Urban District of Eton.
Yorks (West Riding).—Urban District of Worsborough.
Northampton.—Whole of County Borough.
Monmouthshire and Newport.—Urban District of Ebbw Vale.

"Restricted" from "Intermediate"

Dorsetshire.—Winfrith, Wool and District.
Gloucester County and City.—Corse and Newent.
Northamptonshire.—Kingscliffe.
Somerset.—Rural District of Dulverton.

"Intermediate" from "Restricted"

London.—Borough of Westminster: Covent Garden, Strand, and Charing Cross Wards.

B.M.A. LIBRARY

A SERVICE TO MEMBERS

It may not be generally known that the services of the library at B.M.A. House, situated on the first floor of the garden block on the south side of the main building, is available free to members of the Association resident in Great Britain and Northern Ireland, and by special arrangement to members of the Irish Medical Association. The only charge is for postage of books.

The B.M.A. library has one of the finest collections of modern medical books in London and the largest holding in the country of current medical periodicals. The Librarian will supply references and literature on specific medical subjects.

A copy of the library rules can be obtained on application to the Librarian.

EVIDENCE TO GUILLEBAUD

The Association's memorandum of evidence has been sent to the Guillebaud Committee. In due course the Association's representatives will present oral evidence to the Committee.

NEW FILMS FOR THE FILM LIBRARY

The Film Committee will shortly be considering the possibility of adding to its library and will welcome any suggestions from members as to suitable films for this purpose. The Secretary will be grateful to receive suggestions or particulars of any films considered suitable.

TUNBRIDGE WELLS DIVISION

SPECIAL MEETING

The Tunbridge Wells Division of the B.M.A. has arranged a special meeting on Sunday, February 28, to give all its members an opportunity to discuss various aspects of the National Health Service. Secretaries of neighbouring Divisions have also been notified, and an invitation extended to their members to attend the meeting. The discussion will be opened by four speakers—Dr. A. E. Loden ("The general practitioner in relation to the local authority and the facilities available under the local authority"), Dr. A. Elliott ("The facilities available under the local authority, their use and abuse"), Dr. A. V. Adams ("The general practitioner in relation to the hospital service"), and Mr. John Simons ("The hospital services, their use and abuse"). The meeting will conclude with a brains trust on the National Health Service, in which Dr. F. Langford will take part, in addition to the four speakers.

Drs. Loden and Adams are general practitioners. Dr. Elliott is M.O.H., Kent County Council, and Dr. Langford is M.O.H., East Sussex County Council. Mr. Simons is an F.N.T. specialist.

U.S. HEALTH PLAN

QUALIFIED APPROVAL BY A.M.A.

According to the *New York Times* the American Medical Association has endorsed the "general objectives" of President Eisenhower's health plan (*Supplement*, January 23, p. 23), but has withheld specific approval.

In a statement on behalf of the American Medical Association issued by the chairman of its Board of Trustees, Dr. Dwight H. Murray, it was said that the Board was pleased to find in the President's message to Congress so many of the ideas and principles for which the American Medical Association had striven so long. The Association, however, could make no comment on the Administration's Federal re-insurance proposal until it became clear whether this was true re-insurance or another form of government subsidy. At present the proposal was indefinite and the whole subject needed careful study.

U.S. Medical Costs

The total private medical bill of the United States exceeds \$9,000,000,000, an average of nearly \$200 a family. Last July, according to a survey by the National Opinion Research Centre of the University of Chicago, about 1,000,000 families were in debt for medical services to the extent of \$195 or more. About 58% of the population are covered by the voluntary insurance of some sort. Fifteen per cent. of the total cost of illness in the year ended June, 1953, was covered by such insurance.

SERVICE COMMITTEE AND TRIBUNAL
REGULATIONS

DEPUTATION TO MINISTRY

Representatives from the G.M.S. Committee of the B.M.A., the British Dental Association, and the National Pharmaceutical Union went to the Ministry of Health on Monday, February 1, to put forward proposals for amending the National Health Service Committee and Tribunal Regulations. The proposed amendments were recommended by a subcommittee of the G.M.S. Committee under the chairmanship of Dr. H. Guy Dain¹ and were approved by the Conference of Local Medical Committees at its meeting last year.²

A report of the discussions at the Ministry will be given to the G.M.S. Committee and the Conference of Local Medical Committees.

¹ *Supplement*, 1953, 1, 190.
² *Ibid.*, 1953, 1, 293.

Correspondence

Service Recruitment

SIR,—I apologize because this letter is in reply to letters published in the *Supplement* of November 28 last year. There is a normal delay of four to six weeks in sea-mail from U.K. Also my duties take me away from base frequently, which usually means delay of another week or two before I actually read your *Journals*.

"N.S.M.O." and Dr. W. J. Atkinson (*Supplement*, November 28, 1953, p. 213) both state that Service doctors waste too much time on administrative duties and have not sufficient opportunity for professional work. "N.S.M.O." further states that new rates of pay will increase bad feeling between medical and other officers. To argue the case it is first necessary to stress that a doctor who joins the Regular Army does so to serve his Queen and country. The importance of the word *service* must be stressed. The basic principle of the individual serving the community rather than the community serving the individual does not seem to appeal to many young doctors to-day. This is perhaps not surprising, because since the end of the war the ideals of the Welfare State have gained much prominence. Out of this grows the frame of mind "to get" rather than "to give."

Secondly, the medical services exist to keep the soldier fit, and when he gets sick or injured to attempt to make him fit for duty again. The medical services have been organized to do these things in the most efficient manner possible. The system has evolved over a considerable number of years through trial and error to its present form. It is quite wrong to suggest that non-medical officers could carry out administrative duties entirely. It is ridiculous to think that an assistant director of medical services were he a non-professional officer could understand and advise a regimental medical officer on his work when he himself had never been an R.M.O. No self-respecting Service doctor would accept this situation. In other words, the "tail would wag the dog" rather than the reverse, and thus efficiency would be impaired.

Dr. Atkinson suggests that senior R.A.M.C. doctors are professionally out of date. It should be remembered that every regular R.A.M.C. doctor does a professional refresher course at the R.A.M.C. College and Hospital between his fourth and tenth year of service. This is followed by a competitive examination. All regular R.A.M.C. officers are permitted to specialize if they wish. Many do so, and if some officers get out of date it is largely their own fault. Senior officers with zeal and energy can always combine both professional and administrative duties.

Finally, "N.S.M.O." thinks that bad feeling will be increased between other officers and doctors by further pay increases. This may be so in the case of a few short-sighted "other officers." However, any sensible officer without specialist qualifications expects a doctor to draw higher pay than him. It should be remembered that engineer officers, R.E.M.E., and others with specialist qualifications also get extra pay even if not quite so high as that of medical officers.—I am, etc.,

Seremban, Malaya.

J. G. P. POWER.

Remuneration of Hospital Medical Staff

SIR,—I support absolutely Dr. E. Snell (*Supplement*, December 19, 1953, p. 237) and the other correspondents on this subject. Six years have gone by since 1948. It is incredible to think that negotiations, if they have been going on, have outlived the war in Korea and the truce talks too.—I am, etc.,

Oxford.

J. M. BLACK.

SIR,—The recent letters show quite clearly that the delay in the implementation of the Spens Report is causing disquietude among the consultants. It is now obvious that

our present negotiators are powerless to bring about the desired results. The time has now come when they should immediately withdraw and produce a factual report on the reasons for this impasse. In the meanwhile I should suggest that every consultant should write to his or her M.P. and request their aid in bringing this matter into the open. The negotiations may be delicate, but after seven years' treatment without any clinical cure the patient is entitled to change his physician.—I am, etc.,

Farnborough, Kent.

LOUIS L. GRIFFITHS.

Association Notices

SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

An Ernest Hart Memorial Scholarship of the value of £250.
A Walter Dixon Scholarship of the value of £250.

These scholarships will be awarded to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease.

Each scholarship is tenable for one year commencing October 1, 1954. A current scholar may apply to be re-appointed for an additional year. No scholarship may be held for more than three years. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships must be made not later than March 1, 1954, on the prescribed form, a copy of which will be supplied on application to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

Diary of Central Meetings

FEBRUARY

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| 9 Tues. | Central Ethical Committee, 2 p.m. |
| 10 Wed. | Arrangements Committee, Annual Meeting, Toronto, 1955, 10 a.m. |
| 10 Wed. | Staff Side, Medical Whitley Council, 12 noon. |
| 10 Wed. | Arbitration Machinery Committee, 2 p.m. |
| 10 Wed. | Film Committee, 2 p.m. |
| 10 Wed. | Private Practice Committee, 2 p.m. |
| 10 Wed. | Goodwill Subcommittee, Amending Acts Committee, 3 p.m. |
| 12 Fri. | Library Subcommittee, Science Committee, 11.30 a.m. |
| 12 Fri. | Ophthalmic Qualifications Committee, 1.45 p.m. |
| 12 Fri. | Ophthalmic Group Committee, 2 p.m. |
| 12 Fri. | Science Committee, 2 p.m. |
| 15 Mon. | Anaesthetic Services Subcommittee, Anaesthetists Group Committee, 10 a.m. |
| 16 Tues. | Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.1), 2 p.m. |
| 17 Wed. | Occupational Health Committee, 10.30 a.m. |
| 17 Wed. | Joint Health Visitors Subcommittee, Public Health, G.M.S., and Central Consultants and Specialists Committees, 2.15 p.m. |
| 18 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 23 Tues. | Office Committee, 10.30 a.m. |
| 23 Tues. | Constitution Committee, 2 p.m. |
| 24 Wed. | Geriatrics Joint Subcommittee, Central Consultants and Specialists, G.M.S., and Public Health Committees, 2 p.m. |
| 25 Thurs. | Journal Committee, 2 p.m. |

MARCH

- 19 Fri. Joint Committee of B.M.A. and the Magistrate's Association, 10.30 a.m.

Branch and Division Meetings to be Held

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, Queens Drive, Blackpool, Wednesday, February 10, 7.15 p.m., dinner; 8.30 p.m. Sir Heneage Ogilvie.

BRADFORD DIVISION.—At Bradford Royal Infirmary, Wednesday, February 10, 8.15 p.m., meeting. Dr. P. H. Addison: "Medico-Legal Problems Facing the Profession at the Present Day."

CHESTERFIELD DIVISION.—At Walton Sanatorium, Chesterfield, Friday, February 12, 8.45 p.m., meeting. Dr. J. M. Rice-Oxley: "Ulcerative Colitis."

CITY DIVISION.—At Finsbury Health Centre, Pine Street, E.C., Tuesday, February 9, 8.30 p.m., meeting. Mr. E. F. King: "Some Recent Work in Ophthalmology in its Relation to General Practice."

COVENTRY DIVISION.—At Gymnasium, Coventry and Warwickshire Hospital, Tuesday, February 9, 8.30 p.m., clinical meeting. Mr. O. T. Mansfield: "Surgery of Repair."

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, February 9, 8.30 p.m., general meeting. Address by Mr. J. G. Yates-Bell: "Some Aspects of Urology in General Practice."

DORSET DIVISION.—At the Clinic, Glyde Path Road, Dorchester, Wednesday, February 10, 8.30 p.m., meeting. Demonstrations by Dr. T. V. Cooper and his staff.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, February 11, 7.30 p.m., dinner; 8.45 p.m., Dr. Michael Kremer: "Pain in the Upper Limb."

GLOUCESTERSHIRE BRANCH.—At Gloucestershire Royal Hospital, Thursday, February 11, 6.15 p.m., meeting. B.M.A. Lecture by Dr. Ffrangcon Roberts: "Health, Wealth, and Population."

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, February 11, 8.30 p.m., Mr. J. D. S. Flew: "Modern Obstetric Practice."

HAMPSTEAD DIVISION.—At New End Hospital, Hampstead, N.W., Wednesday, February 10, 8.30 p.m., meeting. Film: "Vascular Diseases and the Management of Ulceration of the Leg."

HASTINGS DIVISION.—At Royal East Sussex Hospital, Hastings, Tuesday, February 9, 8.15 p.m., B.M.A. Lecture by Dr. Wilfrid Sheldon: "Some Common Problems in a Paediatric Out-patient Department."

HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, February 9, 8.45 p.m., meeting. Dr. J. W. McCarthy: "Complaints Against the G.P."

KINGSTON-ON-THAMES DIVISION.—At Griffin Hotel, Kingston-on-Thames, Thursday, February 11, dinner, followed by "Brains Trust."

LEICESTERSHIRE AND RUTLAND BRANCH.—At Grand Hotel, Leicester, Saturday, February 13, 7.30 for 8 p.m., dinner dance.

LEIGH DIVISION.—At Courts Hotel, Church Street, Leigh, Tuesday, February 9, 8.30 p.m., meeting. Address by Professor Wilfrid Gaisford: "Oral Therapy in Paediatrics."

ROCHDALE DIVISION.—At Kingsway Hotel, Rochdale, Monday, February 8, 8.30 p.m., clinical meeting. Dr. E. T. Baker-Bates: "Some Critical Observations on Modern Medical Treatment."

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, February 11, 8.30 p.m., meeting. Dr. J. S. Richardson: "Tenacity in Troublesome Treatments."

SHROPSHIRE AND MID-WALES BRANCH.—At Copthorne Hospital, Shrewsbury, Wednesday, February 10, 3.30 p.m., meeting of Clinical and Pathological Section: "Case Conference."

SOUTH BEDFORDSHIRE DIVISION.—At Luton and Dunstable Hospital, Friday, February 12, 9 p.m., meeting. Mr. L. R. Broster: "Adrenal and Allied Conditions" (illustrated by films and slides).

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Tuesday, February 9, 8.30 p.m., meeting. Address by Dr. F. E. Camps: "The Queen v. Christie."

SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, February 5, 9 p.m., meeting. Dr. W. J. Smither, seconded by Dr. E. A. Atkinson: "Gastro-enteritis in General Practice."

SOUTH-WEST ESSEX DIVISION.—At Whipps Cross Hospital, Leytonstone, E., Tuesday, February 9, 8.30 p.m., meeting. Lecture by Dr. William Evans: "Cardiac Pain." A discussion will follow.

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, February 12, 8 p.m., clinical evening.

TOWER HAMLETS DIVISION.—At Poplar Hospital, East India Dock Road, E., Friday, February 12, 8 p.m., clinical meeting.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Tuesday, February 9, 8.30 p.m., clinical meeting. Symposium on the Thyroid Gland.

WEST SUFFOLK DIVISION.—At Everard's Hotel, Bury St. Edmunds, Tuesday, February 9, 8.30 p.m., annual meeting.

WEST SUSSEX DIVISION.—At Burlington Hotel, Worthing, Wednesday, February 10, 6 p.m., general meeting.

Meetings of Branches and Divisions

SOUTH-EASTERN COUNTIES DIVISION

A meeting was held at the Royal Hotel, Galashiels, on July 19, 1953. Dr. Smith was in the chair, and there were 15 members present. On December 5, 1953, 86 members and guests attended a dinner-dance at the Dryburgh Abbey Hotel.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

HOSPITAL JUNIOR STAFFING ARRANGEMENTS

An all-day meeting of the Central Consultants and Specialists Committee was held on February 4 under the chairmanship of Dr. T. ROWLAND HILL. The Committee congratulated those responsible for the arrangements for the dinner on the previous evening in celebration of five years' work of the Committee (see page 42), and expressed its gratification that the Minister of Health in spite of the pressure of parliamentary duties had found it possible to attend.

Professor G. I. STRACHAN introduced a report on the work of the Hospital Junior Staffing Subcommittee, which had been set up to study the urgent problems arising from the shortage of hospital junior staff. He said that his subcommittee felt that many of the present difficulties were due to the rigid staffing structure, which was proving unsuitable for the needs of many peripheral hospitals. Another difficulty was the deterioration in the prospects of advancement in the non-teaching hospitals, which was adversely affecting the recruitment of junior staff.

Professor Strachan submitted a series of recommendations covering matters of general principle which, he explained, were put forward to test the feeling of the parent committee. If they met with approval his subcommittee would then continue with its deliberations, and frame detailed proposals to meet the present situation.

The proposals were the subject of a long debate, in the course of which Dr. S. WAND drew attention to some considerations affecting the general practitioner. He pointed out that there was at present no method whereby the general practitioner with higher qualifications, once he got into general practice, could become a consultant unless he left general practice and started all over again. If any arrangement could be made whereby that anomaly was overcome it would be a very good thing. There were doctors who, after having gone into general practice, wanted to turn to consultant practice, but there was no opportunity for them to do so without incommensurate sacrifice. He suggested that it might be a good thing before the Committee arrived at any firm decisions to consult the General Medical Services Committee.

After further discussion Professor STRACHAN undertook to reconsider the proposals in the light of the remarks made, and bring forward an elaborated report at the next meeting. He was reminded that his subcommittee had power to co-opt.

On other matters concerning hospital junior staffing arising out of a memorandum from the Ministry on the distribution of such staff at various types of hospital and some comments from the Joint Committee, Professor

STRACHAN said that his subcommittee had formed the conclusion that the possibility of solving this particular staffing problem by the training of additional medical practitioners could not be entertained, since this would lead to the gross overcrowding of the profession. But the facts of the present junior staffing should be brought forcibly to the notice of hospital boards and committees with a view to obtaining the better use and distribution of available manpower and the employment of general practitioners on a part-time basis.

The G.P. and the Hospital Anaesthetic Service

Another matter which arose out of this general subject was on a report from the Faculty of Anaesthetists drawing attention to the shortage of anaesthetic staff at hospitals. One suggestion in the report was that an attempt should be made to provide more opportunities for general practitioners to play a part in the hospital anaesthetic services, such as supplementary staff. They would be required to produce evidence of special training in anaesthesia and would be under contract for a limited, but reasonable, number of years.

Dr. TALBOT ROGERS, on behalf of the G.M.S. Committee, welcomed the suggestion that suitably qualified general practitioners should be employed in anaesthetic duties in hospitals, but pointed out that, if there was any suggestion that general practitioners were to be looked upon as an inferior group of people who could only be integrated into the work of the hospital in very junior capacities, very few of them would come forward.

The Committee endorsed the suggestion and asked the subcommittee to look again at the conditions under which such appointments should be made.

Organization of Consultants and Specialists

Mr. H. H. LANGSTON reported on the work of a subcommittee which is considering the reorganization of the Consultants machinery. Suggestions to amend the constitution of the Central Committee included the elimination of group representatives as full members, though representatives of the groups would be invited to attend when matters of special interest to them were under consideration. This and another suggestion would have the effect of bringing down the total membership of the Committee from 77 to 59. The suggestions are to go to the Group Committees for their consideration.

With regard to the regional committees, Mr. Langston said that it was desired to discuss their functions as well as their constitution. He reminded the Committee that it had already expressed the opinion that there should not be separate representation of whole-time consultants and of part-time consultants, and he thought the same applied to consultants and S.H.M.O.s. To split up the constituency

into separate electorates in this way would be quite wrong. It was proposed in the model constitution put forward that the electorate of regional committees should consist of those members of hospital medical staffs who were graded as consultants or S.H.M.O.s.

Review of S.H.M.O. Grade

Dr. PETER EDWARDS, for the Tuberculosis and Diseases of the Chest Group Committee, urged the Committee to press for the adoption of the principle that S.H.M.O.s in posts which are established as consultant should be remunerated on the consultant scale. He said that in his own group as well as in others numbers of men who were S.H.M.O.s were carrying complete responsibility. Mr. NICHOLSON-LAILEY supported this contention. These men were doing their work entirely on their own responsibility, and were not under supervision. It was agreed by a majority that this proposal should be sent to the staff side of Whitley Committee "B." One or two members expressed the fear that action on these lines might in some cases result in disservice to the officers concerned.

Privilege for Hospital Reports

Dr. S. COCHRANE SHANKS reported that a subcommittee under his chairmanship had been considering the possibility of securing that reports of untoward incidents in hospital should be regarded as privileged documents so that they would not be liable to compulsory disclosure in legal actions. It was agreed that this matter be further discussed with the Ministry.

Machinery for Investigating Complaints

The procedure for investigating complaints against the professional competence or personal conduct of hospital medical staff was also the subject of a report by Dr. COCHRANE SHANKS. He said that his subcommittee had worked out a procedure which, subject to the approval of the Council, of the Joint Committee, and of the three defence societies, would be recommended to the Ministry. In brief summary, when a charge was made, the chairman of the employing authority, if satisfied that a prima facie case had been made out, would authorize an inquiry to be conducted by a committee appointed by the authority. The procedure provided for consultation by the respondent with his medical defence organization and for his right to be heard in his own defence. The proposed constitution of the committee of inquiry was carefully defined. The committee would have no disciplinary powers; it would be empowered only to make recommendations. Provision was made for appeal.

The report was approved by the Central Committee, and the subcommittee was thanked for its work.

Study Leave

The question of study leave was raised by Mr. NICHOLSON-LAILEY, who called attention to the unsatisfactory position which had arisen in the South-western Region. It appeared that a limited period of six days' study leave was granted by the hospital board without question, but any further period was almost impossible to obtain. He spoke of an extremely unsympathetic attitude in this matter, especially towards consultants in the smaller hospitals.

Mr. LANGSTON said that the difficulty was that the Ministry had never given any guidance concerning the amount of study leave that might be granted in any one year or other period. Another difficulty was that in a regional area one individual might apply repeatedly for study leave, while another, whom it was desired to send on study leave, could not easily be encouraged to apply.

Other members of the Committee spoke of the difference between the practice of boards of governors and regional boards, the former being much more generous in granting study leave.

The CHAIRMAN suggested that this matter was one which should go to the Joint Committee, and it was agreed that this course be taken.

Other Business

Consideration was given to the question of defraying the expenses, including travelling expenses, of members attending meetings of regional committees, and it was agreed that inquiries be made to ascertain the total financial liability with a view to an expense levy.

At its previous meeting the Committee approved the policy of sending a bulletin at intervals to the medical staffs of hospitals throughout the country with a view to supplying them with information about the work done at the centre. It was reported that many letters of appreciation had been received from hospital group medical committees with regard to the usefulness of the first of these issues, and it was agreed that in future copies of the bulletin should be supplied in bulk for all members of hospital group committees.

Scottish News

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

In view of the increasing amount of work which has fallen to the Subcommittee during the winter it has been decided that meetings of the Subcommittee will be held monthly and that every third meeting will take place in the Glasgow Regional Office for the convenience of the many members in the West of Scotland. The Subcommittee met in the Scottish Office twice in December and the January meeting was held in the Glasgow Regional Office. The following are some of the matters which arose at those meetings.

It was intimated with regret that owing to pressure of work Dr. D. S. Robertson, of Edinburgh, and Dr. W. A. Weatherhead, of Galashiels, had been forced to resign from the Subcommittee. They were replaced by Dr. E. V. Kuenssberg, of Edinburgh, and Dr. R. McGregor, of Hawick, respectively.

Highlands and Islands Affairs

Representatives of the Subcommittee had a meeting with certain practitioners from the Highlands and Islands areas to discuss points which seemed to be causing these practitioners some concern—namely, the mileage fund and the representation of their views centrally. The meeting was most successful, and further meetings are being arranged.

Group Practice Loans

The Subcommittee has been in consultation with the Department of Health regarding the proposal to set up a fund to make loans available to practitioners to encourage the establishment of group practice. In England, the Cohen Committee produced a definition of group practice for the purpose of a similar fund (*Supplement*, January 30, p. 27), and their definition, while not being accepted rigidly in Scotland, will form the basis on which claims will be considered—the intention in Scotland being that the availability of such loans should be on as wide a basis as possible. The fund will be administered by a Joint Committee with representatives of the Department of Health and the Subcommittee. The representatives from the Subcommittee are: Dr. J. T. Baldwin, chairman; Dr. C. J. Swanson, vice-chairman; and Dr. J. T. McCutcheon, secretary. The Subcommittee has almost completed its discussions with the Department, and it is hoped that the scheme will commence on April 1, 1954. Additional details should be available to practitioners in the near future.

Trainee Assistants Scheme

The Subcommittee has approved a note of guidance for "trainers" under the Trainee General Practitioners Scheme

which is to be issued by the Department of Health to all "trainers." It is hoped that this memorandum, which contains items of administrative interest, will prevent the recurrence of some minor difficulties which have arisen.

The Subcommittee has had discussions with the Ministry of National Insurance and the Department of Health regarding the reference of cases to regional medical officers. Every endeavour is being made to persuade the Department that the reports submitted by practitioners on patients called for examination by regional medical officers should influence them on whether or not the patient should, in actual fact, be required to attend for examination.

Prescribing Costs

The Subcommittee is also discussing with the Department the question of the investigation into extravagant and excessive prescribing. Areal statistics will again be available shortly, and it is hoped that these will ease the work of local medical committees in the investigation of prescribing and enable practitioners to keep an eye on their own prescribing, since they will know the average for their own area. Discussions are about to take place on the subject of examination of prescriptions for drugs listed in categories 5 and 6 of the classifications by the Joint Committee on Prescribing, and an announcement about this will be made as soon as possible.

At the request of the Scottish Committee the Subcommittee is undertaking at an early date a revision of the Partnership Memorandum which the Subcommittee prepared originally in 1951. It is hoped to improve on the Memorandum in the light of experience.

SALARY SCALES OF L.C.C. MEDICAL STAFF

A report made by the several committees concerned to the London County Council on February 2 contained proposals for new salary scales for the senior medical staff. In general the scales for the senior staff have not been altered since 1951, apart from the cases of the deputy medical officer of health and the senior principal medical officer, for whom increases were approved in November last. The junior grades of assistant medical officer and senior assistant medical officer have lately received increases. It is considered that it would be equitable to grant increases as from July 1 to the intermediate grades of medical staff and to the chief dental officer. For these grades and for divisional medical officers increases of £100 are suggested throughout the salary scales, and for assistant divisional medical officers of health in five of £50. For the divisional medical officers of health in five divisions with populations under 400,000 the increase is proposed on the understanding that it will be merged in any future increase in the relevant national rates; the salaries of the other grades are not prescribed nationally. The proposals do not apply to one division where the divisional officer is also medical officer of health for two metropolitan boroughs and each of the two assistant medical officers is deputy medical officer for one of the boroughs; these positions will be dealt with later. The proposed revised scale will be as follows:

Principal medical officer	£1,750 by £50 to £2,050
Chief dental officer	£1,750 by £50 to £2,050
Divisional medical officer, divisions 1, 2, 7	£1,700 by £50 to £2,050
Divisional medical officer, divisions 3, 4, 5, 6, 8	£1,600 by £50 to £2,000
Psychiatrist (whole-time)	£1,750 by £50 to £2,050
Assistant divisional medical officer, divisions 1, 2, 7	£1,450 by £50 to £1,750
Assistant divisional medical officer, divisions 3, 4, 5, 6, 8	£1,400 by £50 to £1,700

The County Council agreed to the proposals.

AMBULANCE SERVICES

THE LOCAL AUTHORITY WITHIN THE HOSPITAL

A circular (H.M.(54)11) for the guidance of hospital boards on the question of indemnifying local health authorities against legal liability incurred by their ambulance crews on hospital premises has been issued to regional hospital boards, hospital management committees, and boards of governors of hospitals by the Ministry of Health. Local health authorities have received a similar circular.

The Ministry states that "for reasons of economy of expenditure and manpower" it is desirable that the practice in some hospitals, where local authority ambulance crews carry patients within the hospital, should be continued. The ultimate responsibility for meeting all awards of damages, etc., against the local health authority in respect of negligence of its employees in these cases, however, rests with the hospital board, as it is not a local authority duty under the Act to transport patients beyond the reception point (the point at which the patient leaves the ambulance). The local authority should be indemnified accordingly.

PAYMENTS ON ACCOUNT

SHEFFIELD EXECUTIVE COUNCIL'S DECISION

The Sheffield Executive Council at its meeting on November 3, 1953, considered whether the Minister should be asked to approve an amendment of the distribution scheme to ensure definite provision for payments on account to doctors, apart from any considerations of difficulty or hardship to individual medical practitioners. The local medical committee had recommended appropriate amendment of paragraph 19 of the model scheme, and the council resolved "That, subject to the approval of the Minister of Health, the council's distribution scheme be amended by the deletion of paragraph 19, and the substitution therefor of the following amended paragraph:

Advances on Account

19. (1) The Council may on the request of the local medical committee make a payment on account in advance of the payment due to a practitioner at the end of a quarter. The payment on account shall consist of a single advance payment not earlier than the middle of the quarter of not more than one-half of the amount estimated to be due to the practitioner for the quarter by way of capitation payments and loadings having regard to the number of persons on his list on the first day of the quarter and the quarterly rates notified by the Minister for the immediately preceding quarter in respect of capitation payments and loadings.

(2) If a practitioner, after receipt of an advance payment made in accordance with sub-paragraph (1) of this paragraph but before the end of the quarter in respect of which such an advance is made, can satisfy the Council that it would involve difficulty or hardship for him to wait for further payment until the end of the quarter, the Council may, at their discretion, make a supplementary advance which shall not exceed the balance of the amount estimated to be due to the practitioner for the period from the beginning of the quarter to the date on which the supplementary advance is made.

Minister's Approval

The clerk of the executive council was instructed to seek the Minister of Health's approval to this amendment, to have effect from April 1, 1954.

At its meeting on January 5 the clerk reported that, following the last meeting, he had conveyed to the Ministry of Health the council's feelings concerning its proposed amendment; and he stated that he had received from the Department a letter dated November 21, 1953, in which it was stated that the Minister was prepared to accept the proposed amendment on the understanding that no additional staff would be required to cope with the work involved.

WHITLEY COUNCILS FOR THE HEALTH SERVICES (GREAT BRITAIN)

MEDICAL COUNCIL COMMITTEE "C"

The following M.D.C. circular (No. 21) signed by the joint secretaries, Dr. A. V. Kelynack and Mr. J. S. B. Butler, and dated February 4, 1954, has been issued to all local authorities in Scotland.

CAR AND SUBSISTENCE ALLOWANCES FOR PUBLIC HEALTH MEDICAL OFFICERS IN SCOTLAND

"Committee 'C' of the Medical Whitley Council have over a long period of time been considering the question of car and subsistence allowances for public health medical officers in Scotland. The arrangements in England and Wales for payment of subsistence allowances to public health medical officers are set out in Appendix II to M.D.C. Circular No. 11; and for the payment of car allowances, in the enclosure to M.D.C. Circular No. 13 as revised by the enclosure to M.D.C. Circular No. 15 and by M.D.C. Circular No. 18. No final agreement has yet been reached for Scotland, but as an interim measure the Committee have agreed to make the following recommendation to all local authorities in Scotland:

"That if by May 16, 1954, no final agreement has been reached in Committee 'C' on car and subsistence allowances for public health medical officers in Scotland then the arrangements made by the Committee for the payment of these allowances to public health medical officers in England and Wales should be applied to public health medical officers in Scotland. This provision is an interim arrangement, which shall cease upon the expiry of three months after the promulgation of any agreement relating to local authority officers in Scotland reached by the Joint Negotiating Committee for Chief Officials of Local Authorities (Scotland)."

"Our Committee wish to make it clear that, since the arrangement described above is an interim one, they do not regard their recommendation as in any way constituting a precedent in support of any representations that may be made in negotiations in Scotland relating to the fixing of car and subsistence allowances for chief officials."

THE COST OF HEALTH, 1952-3 CIVIL APPROPRIATION ACCOUNTS

For the year 1952-3 the National Health Service (England and Wales) cost £450,818,689,* an increase of over £40m. on the cost for 1951-2. Included in this increase is a supplementary grant of £34,569,000 to cover the cost of the Danckwerts award. The administrative expenses of the Ministry of Health and the Welsh Board of Health were £2,153,567. The World Health Organization received £343,535 on grant-in-aid from the Ministry of Health.

Hospital Services

The total expenditure on the hospital, specialist, and ancillary services in England and Wales during 1952-3 was £255,925,715. Of this amount, advances to regional hospital boards and to boards of governors of teaching hospitals accounted for £214,740,965 and £35,808,861 respectively. Capital expenditure by the Minister in the acquisition of land, hospitals, and equipment was £685,850. The expenses of the Minister in connexion with research were £29,786. The treatment abroad of residents of England and Wales

The treatment abroad of respiratory tuberculosis cost £96,573 (an increase of over £68,000 over the previous year, when this was a new service). Current expenditure of the Public Health Laboratory Service was £831,209.

Local Health Authorities

The cost of grants to local health authorities was of the order of £18,553,086. Midwifery and the care of mothers

*Civil Appropriation Accounts (Classes I-VIII), 1952-3. H.M. Stationery Office, London.

and young children cost £6,445,119, and £5,490,176 was spent on health visiting, home nursing, and domestic help. The cost of vaccination and immunization was £243,102. £4,574,699 was spent on the ambulance services.

General Medical Services, etc.

The total expenditure on general medical and dental services, pharmaceutical services, and supplementary ophthalmic services in England and Wales was £149,832,859. In this were included the expenses of executive councils as follows: administration, £2,372,897; general medical services, £75,631,433; pharmaceutical services, £42,886,979; general dental services, £22,089,093; supplementary ophthalmic services, £6,034,701.

Other Expenditure

The general expenses of Broadmoor Institution and mental deficiency hospitals administered by the Board of Control were £451,327. Salaries, etc., in these institutions amounted to £448,075.

Maintenance of the National Health Service Central Register by the Registrar-General's Office cost £175,321.

**MINISTER AT CONSULTANTS' DINNER
WHOLE-TIME SALARIED SERVICE "DISASTROUS"**

A dinner to celebrate five years' work of the Central Consultants and Specialists Committee was held in the Great Hall of B.M.A. House on February 3 under the chairmanship of Dr. T. Rowland Hill. The Minister of Health was the principal guest. Before he could make his speech, however, he was called to the House of Commons. He returned at a later stage of the proceedings and delivered the final speech of the evening.

Mr. T. HOLMES SELLORS, in proposing the Minister's health, referred to the pre-N.H.S. days as the bachelorhood of the profession, when it went along in a fairly happy-go-lucky way and managed its own affairs. Since then there had been a "shot-gun marriage," and from that time onwards most of its housekeeping had been done for it. This argument and difference of opinion. It might be that they were now on their way to greater harmony. Certainly both sides realized that nagging and too much attention to detail were the easiest way to destroy unity. He expressed appreciation of the sympathetic attitude shown by the Minister and officials of the Ministry which had helped to make things run smoothly in one of the greatest social experiments in this country's history.

Mr. D. W. C. NORTHFIELD, in toasting the guests, said that these included the Presidents of the three Royal Colleges and of the British Medical Association. He highly praised Sir Russell Brain's chairmanship of the Joint Consultants Committee. He referred also to the presence of Mr. A. M. A. Moore, who was one of the principal architects of the Central Consultants and Specialists Committee and who must be rejoicing in its sturdy growth. A tribute was also due to the staff of the Association, in particular to the Committee clerk, Mr. Hacker.

The President of the Royal College of Physicians
Sir RUSSELL BRANDE

Sir RUSSELL BRAIN, P.R.C.P., referred to the happy relations existing between consultants and general practitioners. If there were any serious difference between the two branches of the profession on any matter of moment it would be a kind of professional schizophrenia. The two branches were in constant consultation, and he thought it was true to say that no important step was taken on either side without joint discussion. Speaking of the Joint Consultants Committee, he said that it might be thought that this was rather an illogical body, but in practice it worked extremely well.

The Joint Committee and the staff side of Whitley Council had very great responsibilities, and their difficulties were not diminished by the fact that from time to time, for reasons outside their control, they were not able to say exactly what was going forward. Physicists told him of the principle of indeterminacy. He had discovered the principle that a thing might be completely motionless and even so be completely undiscoverable, and this he proposed to call the Whitley principle of obscurity.

The Minister would agree with him, Sir Russell Brain went on, that neither politics nor administration was an end in itself. The purpose of administration, and even of Whitely Councils, was to create conditions in which the best possible work could be done. Let it also be remembered that they were now legislating for the future. What happened to themselves at this time did not matter so much as what happened to their successors, the conditions they would be called upon to work under, the sort of freedom they would enjoy.

Dr. J. D. S. CAMERON proposed the health of the Central Consultants and Specialists Committee. He said that complete harmony existed between the representatives of the Colleges and Corporations on the Joint Committee and the representatives of the Central Committee. The Chairman of the Central Committee (Dr. Rowland Hill) had proved a most admirable member (and vice-chairman) of the Joint Committee, and in addition to him five other members of the Central Committee served on the joint body. The motto of them all might be "With One Aim," and the primary aim was to secure a smooth-running health service.

The Chairman of the Committee

Dr. T. ROWLAND HILL, in replying to the toast, briefly outlined the constitution of the Committee. After five years it was not surprising that some of the machinery required attention from the point of view of efficiency, and a subcommittee was working under Mr. H. H. Langston with a view to strengthening it. Between the Joint Committee and the Central Committee there was perfect amity in the formation of policy. During the last five years an enormous amount of hard constructive work had been done by both bodies.

He felt at times that they might have done better than they had done, and that in particular not sufficient attention had been given to the technique of joint consultation. He pleaded for more systematic study of the art of thinking together. Too often perhaps consultation took place after, and not before, one or both sides had already made up their mind to a certain course of action or inaction.

Another important aspect of the work of the representative consultant organizations was the humdrum but very necessary down-to-earth work on terms and conditions of service and their modification from time to time. Many critics of the Whitley machine to-day had expressed the view that it was not working satisfactorily in the Health Service, and was in need of re-examination. They were all agreed that negotiating machinery of this kind was absolutely essential, but it was a question of making it work. He hoped that as time went on something warmer and better than the cash nexus would unite the profession with the public administration of hospitals.

The Minister of Health

The Rt. Hon. IAIN MACLEOD, M.P., who had by this time returned from the House of Commons, made the last speech of the evening. He said that if we looked back to the White Paper of 1944 which plotted the Health Service we should find that it said that there were not enough consultants, and that, of those who were in their posts, many of them were not in the right place. In so far as numbers were concerned, there had been an increase in five years of something like 25%—that is to say, an annual increase of about 6%, compared with an increase in the number of beds brought into use of 14%. Thus there had been an increase both

some danger of suggestions that I think are utterly unworthy being made. I am particularly concerned at the suggestion that in some strange way whole-time specialists are different from part-time specialists. There was a particularly unworthy article in a weekly newspaper about 10 days ago on that subject, and to read that sort of article and listen to the speeches which are made on the subject one might come to think that all the whole-time consultants are unselfish, righteous, holy people—and, of course, Socialists—while the part-time consultants are wicked, money-grabbing charlatans—and, of course, Tories. It is not necessary for me to comment on that to you, but it may be necessary to make a comment on it for the benefit of people outside these walls. Consultants and specialists are not primarily whole-time or part-time, they are primarily doctors, and they have the same standard of ethics and conduct towards their patients whether those patients are in private rooms or in wards, and whether the consultant works whole-time or part-time or in fact is not within the N.H.S. at all."

Questions Answered

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

University Lecturer and Tax Relief

Q.—I am a full-time university lecturer, holding an honorary contract from the regional board as a consultant in medicine. The regional board will grant car allowance for visits to peripheral hospitals only when these are concerned with the care of patients. The majority of visits are connected with research, and these are not allowable for expenses. Claims for income-tax relief on these car journeys have been refused. The inspector of taxes has also refused relief for telephone expenses, replacement of textbooks, subscriptions to societies, and cleaning and heating of a study used for private work, such as writing textbooks and occasional examination of private patients. Is he correct in all these refusals?

A.—It is assumed that the remuneration as a whole-time university lecturer is the only source of income with which the taxing authority is concerned—the contract with the regional board being an honorary one and the receipts from private patients appear to be negligible. Unless, therefore, the holding of the regional board's appointment is a condition attached to the university appointment, the only expenses that are allowable are those incurred "wholly, exclusively, and necessarily in the performance of the duties of the office" of university lecturer. The phrase quoted has been the subject of judicial consideration in many cases, and the courts have construed it strictly. For instance, in the case of *Nolder v. Walters*, Rowlatt J. said: "In the performance of the duties means in doing the work of the office—in doing things which it is his duty to do while doing the duty of the office. Expenses incurred in getting to the work are not incurred in the performance of the duties—although he is obliged to perform them."

Taking the various expenses mentioned *seriatim*:—(1) Car expenses and telephone expenses: The questioner is unlikely to succeed in his claim unless his holding of the regional board's appointment is an express condition of his contract of service with the university. If there is such a condition it is considered that a reasonable allowance can be claimed. (2) Textbooks and subscriptions: Expenditure of this nature has been regarded by the High Court as incurred to maintain ability to do the work required, but not incurred in "the performance of the duties" and consequently not allowable. (3) Use of part of residence for writing textbooks and seeing occasional private patients:

A reasonable amount can be deducted as expenses in the calculation of the income derived from those sources.

Entertainment Expenses

Q.—I am a part-time consultant in pathology, and depend for my private practice on the good will and close liaison with other consultants, as patients never come directly to me. The inspector of taxes refuses my claim for entertainment expenses. May I have an opinion on this matter?

A.—The leading case on the question of expenses incurred in entertaining with a view to financial gain is the case of *Bentleys, Stokes and Lowless v. Beeson*, which was heard by the Court of Appeal in May, 1952. The expenses then concerned were incurred in entertaining clients to lunch at a club or at restaurants. The entertainment was confined to existing clients, who alone were present and with whom the discussions, which were an essential feature of the professional work of the firm, then took place. The Court allowed the firm's appeal against disallowance of the expenses so incurred, holding that the professional purpose was the sole purpose of the hospitality given. It was, however, stated that, "if the activity be undertaken with the object both of promoting business and also with some other purpose, for example with the object of indulging an independent wish of entertaining a friend or stranger," then the statutory requirement is not satisfied. It is, of course, difficult to say how far the questioner's case falls within the principles laid down as governing the allowance of the expenses incurred by him, but there are two rather important distinctions. In the decided case only existing clients were entertained, and professional work was done during the entertainment. I doubt whether other consultants would be regarded as clients, and, while the questioner's case has claims to sympathy, I should not regard an appeal against the inspector's decision as likely to succeed.

Correspondence

Grading of S.H.M.O.s

SIR.—One aspect of the Ministry of Health's economy campaign calls not only for close scrutiny but also for action by the B.M.A. It is becoming increasingly obvious that the Ministry is not only ready to confirm S.H.M.O.s in an occupational "dead-end," but under the guise of retrenchment is exacerbating the position by its refusal to implement the recommendations of regional boards with regard to consultant posts; with the result that these positions, initially regarded as warranting consultant status by those best fitted to judge, are eventually advertised under an S.H.M.O. grading. But the work remains the same. The Ministry doubtless counts on filling the ranks of the "dead-end kids" from the Cinderellas of the registrars.

If this policy is permitted to continue and to expand—as expand it will, unless strongly challenged—the prospects of the S.H.M.O. and the registrar will become increasingly gloomy. The position is not ameliorated either by the decline in the purchasing power of the £ since 1947 or by the refusal of the elementary right of arbitration. Any trade union may go to arbitration: indeed, refusal so to do is regarded, in the Shavian sense, as immoral. But the consultants and specialists are denied this right.

Substantial economies can and must be made, but the niggling saving resulting from the downgrading of posts, and similar cheese-paring, gives rise to grave discontent and is effected at the expense of the morale of the Service.—I am, etc.,

Middlesbrough.

STEWART GOURLAY.

Remuneration of Hospital Medical Staff

SIR.—The remuneration of hospital staffs seems to be following a familiar pattern. Some years ago when negotiations concerning panel fees were in progress the B.M.A. stated

that the Government displayed not only lack of good will but bad faith. In respect of the Spens award the same situation arises. The Government knows that it is disregarding its obligations and that dispassionate arbitration would show this. It therefore refuses arbitration.

The interest of the hospital staffs is divided by the distinction awards. Those in receipt of these Government payments do not feel the pinch as do those who remain undistinguished. It is curious that the Minister should be so disinclined to earn the respect of hospital staffs and so careless of the prospects of recruitment. It is to be regretted that arrangements for remuneration intended to provide incentives should rest on obvious inequity and favour divisions within the profession.—I am, etc.,

K. E. BARLOW.

Ipswich.

Regional Medical Officers

SIR. It would be instructive to have the views of other practitioners on the need for regional medical officers. At the present time when much is being done to reduce the cost of the Health Service, this particular office seems to be an unnecessary luxury.

Surely, when a registered practitioner is regularly seeing a patient at short intervals and supervising his treatment he is able to judge whether the patient is fit for work or not without the patient having to go to the R.M.O. for him to decide. Moreover, when the practitioner in charge has sent detailed notes to the R.M.O. explaining why the patient is unfit for work, and in many cases points out that he is also having treatment as a hospital out-patient under the care of a specialist, and the R.M.O. still insists on seeing the case, it is an insult to both general practitioner and specialist, as it questions either their professional competence or honesty.

For over 29 years I have had to send patients, whom I have certified as unfit for employment, to the R.M.O. for him to decide whether I am right in my judgment, and out of hundreds of cases only once has he disagreed with my opinion. This must be the experience of many others, and I would like to suggest that the R.M.O.'s services be done away with, except in those cases in which there is a real difficulty in deciding whether a patient can do a certain job or not.—I am, etc.,

H. TUDOR EDMUNDS.

Slough.

Ophthalmic Group Committee

SIR. The Supplement of January 2 (p. 5) had a report of an Ophthalmic Group Committee meeting held on December 11, 1953, at which evidence to be produced to the Guillebaud Committee was discussed. It appears that this evidence was agreed by the Council of the B.M.A. and duly submitted, and that it recommended the introduction of a sessional refraction service, to be run by hospital boards, in place of the present per capita Supplementary Eye Service.

It is very doubtful if such a service—considering the capital expense involved in establishing the clinics, and the swollen overheads inevitably associated with hospital boards—would involve any overall saving to the National Health Service. But there is no doubt whatever that such a service would involve reduced earnings for ophthalmologists, and it would be interesting to know whose interests the Group Committee consider they are serving in making this recommendation—those of the general taxpayer or those of ophthalmologists? And if the latter, which ophthalmologists?

The report talks glibly about "the enhanced status" to be enjoyed by working in a clinic, but who wants an enhanced status if it means that one's earnings are reduced to a maximum of £1,500 per annum (as a part-time S.H.M.O.)? And, pray, just what "opportunities for promotion and advancement in the hospital service" are there for the S.H.M.O. without his Fellowship?

Unlike other groups, the Ophthalmic Group never holds general meetings. The Committee, once elected, becomes the complete dictator of ophthalmic politics. It never takes any steps to find out what are the views of its members before taking important decisions such as the above. As the earnings of all ophthalmologists, be they well known or small fry, are now so largely dependent on politics, I would suggest that all who wish to have some say in their future should: (1) join the Ophthalmic Group. There is no extra fee apart from the B.M.A. subscription, (2) take a very active interest in the election of Committee members, (3) in voting, pay more attention to the candidate's political views (if these can be found out) than to his professional eminence.—I am, etc.,

Petersfield.

R. L. KERR.

Reforming General Practice

SIR.—From time to time some criticism of the Health Service has appeared in the *Journal*. Also, recently, responsible and far-sighted men have been saying that the expenditure on the Welfare State is more than can be afforded. As economic realities come to be faced, these voices will grow stronger and louder, and presently no doubt will insist on pruning the Service to reduce its cost to the country.

The general-practitioner service as it stands now is not sacrosanct, and after five years some modifications are both desirable and necessary. First, the flat capitation rate of 17s. needs to be more flexible. In most walks of life age and experience achieve some measure of acknowledgment. A recently qualified man may, under certain fortuitous circumstances, command the same reward as his senior who has a lifetime of hard work and experience behind him. That both should receive the same level of remuneration is a matter for thought and reflection. After 50, age with its flagging energies limits a doctor's plans as well as his list. In the past some of these anxieties were relieved by the employment of an assistant. To-day the expense is prohibitive.

Partnership is another item requiring attention, with a reversal of the official encouragement to the grouping of doctors. Collectivization of practices and the monopolizing of whole areas by a firm or firms of doctors does not lend itself to healthy competition. Such partnerships are evolved and formed for personal gain, usually of a financial nature. Public interest is scarcely considered in the deliberations of these transactors. To subsidize them is a misuse of funds that could be better applied elsewhere.

Lastly, the closure of any area should be abolished and a doctor left free to practise where he chooses. On the other hand the classification should remain, and the financial inducements to such areas retained. As things stand, an incompetent or indifferent doctor need not fear the spur of active competition in a closed district. He is not going to be disturbed by anything less than an explosion. Changes along these lines might well be taken while there is time. We were caught on the wrong foot once. Why repeat the operation?—I am, etc.,

Blakeney, Glos.

J. M. ASHTON.

Notes and News

A State of Too Much Welfare?—A young collier aged 22 recently walked into a doctor's surgery on a bitterly cold morning with temperatures below freezing point. He asked for a certificate for the National Coal Board to cover his bonus due to absence from work the previous day—because he had overslept. He then remarked that he wasn't going to work the rest of the week, and appeared completely surprised on being informed that the doctor could not comply with his demand for a National Insurance "Compo" certificate.

H.M. Forces Appointments**ROYAL ARMY MEDICAL CORPS**

Major R. L. MacPherson, M.B.E., to be Lieutenant-Colonel.
Major L. R. Taylor has retired with a gratuity and has been granted the honorary rank of Lieutenant-Colonel.
Captain J. H. G. Brodribb to be Major.
Short Service Commission.—Captain C. C. Langford to be Major.

REGULAR ARMY RESERVE OF OFFICERS

Colonel H. C. Godding, M.C., late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the R.A.R.O.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel W. H. Scriven, M.B.E., from T.A., to be Lieutenant-Colonel.
Captain (Honorary Major) C. C. Langford has relinquished his commission.

ARMY EMERGENCY RESERVE OF OFFICERS**ROYAL ARMY MEDICAL CORPS**

Majors T. E. Jones-Davies and C. Cameron to be Lieutenant-Colonels.
Captain (acting Major) R. A. Shanks has been granted the acting rank of Lieutenant-Colonel.
Captains P. W. Ingram and F. Smith to be Lieutenant-Colonels.
Lieutenant (acting Major) A. W. Naddell has been granted the acting rank of Lieutenant-Colonel.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: G. Ashe, M.B., Ch.B., D.T.M.&H., Medical Officer (T.B.), Aden; A. B. Da Costa, M.B., B.S., M.R.C.P., Senior Physician, British Guiana; C. H. Gurd, M.B., Ch.B., M.R.C.P., C.P.H., Physician Specialist, Fiji; D. H. Mackay, M.R.C.S., L.R.C.P., D.P.H., Senior Medical Officer, Kenya; F. Zammit, M.D., Medical Officer, Nigeria; Maureen D. Connolly, M.B., Ch.B., M.R.C.O.G., D.C.H., and J. A. McKinnon, M.B., Ch.B., Medical Officers, Kenya; J. S. Holden, M.B., Ch.B., Medical Officer, Uganda; A. G. Larson, M.B., B.S., and G. Y. McCrirk, M.B., Ch.B., Medical Officers, Fiji; P. O'Driscoll, M.B., Temporary Medical Officer, Nigeria; M. J. Robertson, M.R.C.S., L.R.C.P., Medical Officer, Federation of Malaya; F. J. Wickremasinghe, M.B., B.S., D.P.H., Temporary Medical Officer of Health, Gold Coast; A. E. O. Williams, L.R.C.P.&S.I., Medical Officer, Sierra Leone.

Association Notices**Diary of Central Meetings****FEBRUARY**

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| 15 Mon. | Anaesthetic Services Subcommittee, Anaesthetists Group Committee, 10 a.m. |
| 16 Tues. | Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 2 p.m. |
| 17 Wed. | Occupational Health Committee, 10.30 a.m. |
| 17 Wed. | Joint Health Visitors Subcommittee, Public Health, G.M.S., and Central Consultants and Specialists Committee, 2.15 p.m., followed by Joint District Nurses Subcommittee. |
| 18 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 18 Thurs. | Tuberculosis and Diseases of the Chest Group Committee, 2.30 p.m. |
| 19 Fri. | Public Health Committee, 2 p.m. |
| 22 Mon. | Hospital Junior Staffing Subcommittee, Central Consultants and Specialists Committee, 11.30 a.m. |
| 23 Tues. | Waverley Evidence Committee, 11 a.m. |
| 23 Tues. | Constitution Committee, 2 p.m. |
| 23 Tues. | Working Party Subcommittee, Joint Consultants Committee (at 23, Savile Row, W.), 2 p.m., to be joined by Officers of the Ministry of Health, 2.30 p.m. |
| 24 Wed. | Financial Advisory Committee, 11.15 a.m. |
| 24 Wed. | Compensation and Superannuation Committee, 1.45 p.m. |
| 24 Wed. | Building Committee, 2 p.m. |
| 24 Wed. | Geriatrics Joint Subcommittee, Central Consultants and Specialists, G.M.S., and Public Health Committees, 2 p.m. |
| 24 Wed. | Psychological Medicine Group Committee, 2 p.m. |
| 25 Thurs. | Amending Acts Committee, 2 p.m. |
| 25 Thurs. | Journal Committee, 2 p.m. |
| 26 Fri. | Public and Professional Relations Subcommittee, Central Consultants and Specialists Committee, 2 p.m. |
| 26 Fri. | Venerologists Group Committee, 2.30 p.m. |

MARCH

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| 2 Tues. | Office Committee, 10.30 a.m. (date changed from February 23). |
| 2 Tues. | Finance Committee, 2 p.m. |
| 2 Tues. | Registrars Group Executive Committee, 2 p.m. |
| 3 Wed. | Catering Committee, 11 a.m. |
| 18 Thurs. | Dermatologists Group, 2 p.m. |
| 19 Fri. | Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m. |

Branch and Division Meetings to be Held

BATH, BRISTOL, AND SOMERSET BRANCH.—At Royal United Hospital, Bath, Wednesday, February 17, 8.30 p.m., Branch meeting, Dr. W. E. W. Bridger: "The Scope of Psychiatry To-day," with particular reference to the principles and procedures as they affect general practitioners and consultants.

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, February 16, 8.30 p.m., meeting. Address by Dr. Clifford G. Parsons.

BRIGHTON AND MID-SUSSEX DIVISION.—At Hotel Metropole, Brighton, Friday, February 19, 8 for 8.30 p.m., annual dinner.
ENFIELD AND POTTERS BAR DIVISION.—At Chase Farm Hospital, Enfield, Friday, February 19, 8.30 p.m., meeting. Lecture by Dr. G. F. Newbold: "Hypnotism and its Importance in Medicine." Some diagrams and a film will be shown, and there will be a demonstration of hypnotism.

LAMBETH AND SOUTHWARK DIVISION.—(1) At Lambeth Hospital, Brook Drive, Kennington Road, S.E., Sunday, February 14, 11 a.m., clinical meeting. (2) At South Western Hospital, Landor Road, Stockwell, S.W., Friday, February 19, 2.15 p.m., clinical meeting.

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, February 16, 2.30 p.m., clinical meeting.

NORTH OF ENGLAND BRANCH.—At Royal Victoria Infirmary, Newcastle-upon-Tyne, Thursday, February 18, 7.15 p.m., clinical demonstration by Mr. J. D. T. Jones: "Treatment of Portal Hypertension"; 8.45 p.m., address by Professor E. Farquhar Murray: "Return Trip to China and Japan."

OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Oldham, Monday, February 15, 9 p.m., meeting. Dr. J. W. A. Hunter: Discussion on some aspects of Prolapse, illustrated by a film.

SOUTH STAFFS DIVISION.—At Bradmore Hotel, Trysull Road, Wolverhampton, Friday, February 19, 8 p.m., supper meeting; 9.15 p.m., lecture by Dr. J. H. Sheldon: "Obesity."

SUNDERLAND DIVISION.—At Bay Hotel, Sunderland, Thursday, February 18, annual dance.

SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Friday, February 19, 9.15 p.m., meeting. Annual B.M.A. Lecture by Dr. R. M. B. MacKenna: "Some Difficulties in Dermatology," illustrated by coloured lantern slides.

SWANSEA DIVISION.—At Osborne Hotel, Swansea, Thursday, February 18, B.M.A. lecture by Dr. R. Donald Teare.

WINCHESTER DIVISION.—At Royal Hotel, Winchester, Wednesday, February 17, 8.15 for 8.30 p.m., meeting. Annual B.M.A. lecture by Dr. Macdonald Critchley: "The Body Image."

Meetings of Branches and Divisions**GLASGOW DIVISION**

A meeting was held in the Glasgow Regional Office on December 9, 1953. Fourteen members were present, and Dr. W. D. Anderson took the chair. Arrangements were discussed for the Annual Meeting to be held at Glasgow.

MOMBASA DIVISION

A meeting was held at the Pandya Memorial Clinic on October 23, 1953. Dr. A. U. Sheth took the chair in the absence of the chairman, and there were eight members present. At a meeting at the Rahimtulla Waljee Hirji Asian Hospital on October 27, when 10 members attended, Dr. Harries presented interesting cases. Another meeting was held on November 27, 1953, at the Pandya Memorial Clinic, when Dr. Sheth again took the chair, and 12 members were present.

ROCHESTER, CHATHAM, AND GILLINGHAM DIVISION

The annual general meeting was held at the Guildhall, Rochester, on January 17, 1954. In the unavoidable absence of the chairman, the chair was taken by Dr. H. J. Hoby. There were 20 members present. The following officers were appointed:

Chairman.—Dr. E. C. Gross.
Vice-chairman.—Dr. M. Landau.
Hon. Secretary.—Dr. J. O. Murray.
Hon. Treasurer.—Mr. E. J. Greenwood.

Dangerous Drugs Act: Restoration of Authority

The Home Office announces that the authorities granted by the Dangerous Drugs Regulations under the Dangerous Drugs Act, 1951, have been restored to Dr. Geoffrey Roderick Richards (Swansea).

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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THE B.M.A. AND THE PROVISIONALLY REGISTERED PRACTITIONER**ORGANIZATION COMMITTEE'S DISCUSSION**

The Organization Committee of the Association at its meeting on January 26 discussed a report of one of its subcommittees, known as "The Medical Students and Newly Qualified Practitioners Subcommittee," about the relationship between the B.M.A. and the hospital resident, with particular reference to the provisionally registered practitioner. The subcommittee includes representatives of the teaching schools and of the British Medical Students Association, and, as its name implies, its chief concern is the recruitment to the B.M.A. of the newly qualified practitioner. It has done much to stimulate the interest of senior students, and in co-operation with the B.M.S.A. has initiated, among other things, the arrangement by which they receive the *Journal* at a special rate and the holding of B.M.A. lectures in the teaching centres.

Student or Doctor?

The Organization Committee had in mind the value of the close co-operation between the Association and the students organization which was shown during the discussions that accompanied the passing of the Medical Act, 1950, and the start of the pre-registration year. At that time it was not clear at first whether the pre-registration house-officer would look to the B.M.A. to watch his interests or whether he would continue to rely on the British Medical Students Association, with which he was familiar and in which presumably he had confidence. When it became clear that while holding an approved post the provisionally registered houseman would virtually be regarded as a duly qualified and registered practitioner, the Association altered its by-laws to admit the provisionally registered practitioner to membership. The Organization Committee, therefore, recognizes its obligation to provide means by which both as an individual and as a member of a definite group he can have the full benefits of membership.

Reduced Subscription

The newly qualified practitioner has always paid a reduced subscription to the B.M.A. This is not, as was pointed out in the Committee, solely because the payment of the full rate might cause hardship but rather because in the days before the Health Service many of the privileges of membership were of no value to him. The house-officer's world was then bounded by his hospital and he had few interests in common with the Division in which he was temporarily resident. Indeed, he frequently belonged to

another Division with which his home address was registered. He had no special problems and could not be expected to take an interest in medical politics.

By virtue of the N.H.S. Act, 1946, however, the provisionally registered practitioner is now an officer of a hospital in a national service. He has terms and conditions of service and superannuation rights. Under the Medical Act, 1950, he has become subject to certain special regulations. Problems of hospital policy with which he is closely concerned are being discussed by committees of the Association—for example, the shortage of junior hospital staff and the position of the married house-officer. The subscription paid by the newly qualified practitioner still remains at a special reduced rate.

Channel for Particular Problems

The Organization Committee does not deal with medico-political matters, which are rightly the task of other committees. It is concerned with providing means by which the provisionally registered group of members may find its proper place in the Association's machinery and through which its problems may be brought to the notice of the committees directly concerned. The Committee feels that a great deal can and must necessarily be done in the Divisions and Branches, and for this reason one of the main topics of the Annual Conference of Honorary Secretaries, which will be held in the late spring, will be, "What is the Association doing for the hospital resident?"

A Voice at the Centre

Meanwhile, as an interim measure the Committee has decided that the provisionally registered house-officer shall be represented in the Medical Students and Newly Qualified Practitioners Subcommittee at Headquarters. The difficulties of securing effective representation of a group of this kind are very great. These doctors are scattered and have few opportunities, except in the teaching hospital areas and in the large cities, for discussing questions which interest them. It is almost impossible for them to nominate or elect a representative who would be known to more than a very few. It is suggested, therefore, that the members of the Subcommittee appointed by the B.M.S.A. should continue to remain members of the Subcommittee for a further session after they are qualified. This suggestion has many advantages. The representative will belong to the same year as those he represents and whom he formerly represented as a B.M.S.A. member. He will be known to many. What is more important, there will be continuity, as he will have been a member of the Subcommittee for at least a year and will have become familiar with its work. Meanwhile other possibilities are being explored.

SIR.—In reply to Dr. H. J. Bliss's letter (*Supplement*, January 30, p. 31) about supplies of aureomycin to general practitioners, the following information may be of value. The supply of aureomycin in Britain is controlled by the Ministry of Health at the present time because most of the crude

aureomycin is imported from the United States, and this involves dollar expenditure. However, the production of aureomycin in Great Britain is now under way, and as soon as adequate supplies are forthcoming we understand that the Ministry of Health may make it freely available.—I am, etc.,

London, W.C.2.

A. T. MENNIE,
Medical Director,
Lederle Laboratories Division,
Cyanamid Products, Limited.

Association Notices

ELECTION OF MEMBER OF THE COUNCIL BY THE WEST INDIAN BRANCHES

Notice is hereby given that, owing to the resignation of Aubrey G. Leacock, there is a vacancy in the Council of the Association. Nominations of candidates for election as a member of Council by the West Indian Branches for the remainder of the period ending at the conclusion of the Annual Representative Meeting, 1955, must be forwarded in writing so as to reach the Secretary not later than April 17, 1954.

The Branches in the Group are: Barbados, Bermuda, British Guiana, British Honduras, Grenada, Jamaica, Leeward Islands, St. Lucia, St. Vincent, Trinidad and Tobago. Nominations must be signed by not fewer than three members of any Branch in the Group, and should be in the following form:

We, the undersigned, hereby nominate

of (full name and address to be given) for election by the Barbados, Bermuda, British Guiana, British Honduras, Grenada, Jamaica, Leeward Islands, St. Lucia, St. Vincent, and Trinidad and Tobago Branches as a member of the Council of the Association for the period ending July 23, 1955.

Signatures and addresses of three nominators

Branch

If a contest occurs voting papers will be issued from the Head Office, British Medical Association, Tavistock Square, London, W.C.1, to each member of the Group.

A. MACRAE,
Secretary.

Diary of Central Meetings

FEBRUARY

- 22 Mon Hospital Junior Staffing Subcommittee, Central Consultants and Specialists Committee, 11.30 a.m.
- 23 Tues Waverley Evidence Committee, 11 a.m.
- 23 Tues Working Party Subcommittee, Joint Consultants Committee (at 23, Savile Row, W.), 2 p.m., to be joined by Officers of the Ministry of Health, 2.30 p.m.
- 23 Tues Constitution Committee, 2 p.m.
- 24 Wed Financial Advisory Committee, 11.15 a.m.
- 24 Wed Compensation and Superannuation Committee, 1.45 p.m.
- 24 Wed Building Committee, 2 p.m.
- 24 Wed Geriatrics Joint Subcommittee, Central Consultants and Specialists, G.M.S., and Public Health Committees, 2 p.m.
- 24 Wed Psychological Medicine Group Committee, 2 p.m.
- 25 Thurs Amending Acts Committee, 2 p.m.
- 25 Thurs Journal Committee, 2 p.m.
- 26 Fri Public and Professional Relations Subcommittee, Central Consultants and Specialists Committee, 2 p.m.
- 26 Fri Venereologists Group Committee, 2.30 p.m.

MARCH

- 2 Tues Office Committee, 10.30 a.m. (date changed from February 23).
- 2 Tues Finance Committee, 2 p.m.
- 2 Tues Registrars Group Executive Committee, 2 p.m.
- 3 Wed Catering Committee, 11 a.m.
- 18 Thurs Dermatologists Group Committee, 12 noon.
- 18 Thurs Dermatologists Group Conference, 2 p.m.
- 19 Fri Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.

Branch and Division Meetings to be Held

BRADFORD DIVISION.—At Princes' Ballroom, Midland Hotel, Bradford, Thursday, February 25, 7 for 7.45 p.m., annual dinner and dance.

CARDIFF DIVISION.—At Pathological Lecture Theatre, Royal Infirmary, Cardiff, Wednesday, February 24, 8.15 p.m., general meeting followed by B.M.A. Lecture by Professor Wilfrid F. Gaisford: "The General Therapeutic Principles in the Treatment of Children." Members may take friends who are interested.

CITY DIVISION.—(1) At Hackney Hospital, Homerton High Street, E. Wednesday, February 24, 2 p.m., films: (a) "Thrombosis and Embolism"; (b) "Marrow Puncture." (2) At Institute of Laryngology and Otology, Gray's Inn Road, W.C., Friday, February 26, 3.30 p.m., clinical meeting. Mr. G. H. Howells: "Modern Trends in Treatment of Cancer of the Ear, Nose, and Throat."

DARTFORD DIVISION.—At Nurses' Home, West Hill Hospital, Dartford, Thursday, February 25, 8.45 p.m., meeting. Lecture by Mr. W. P. Cleland: "Cardiac Surgery" (illustrated by lantern slides).

DEWSBURY DIVISION.—At Batley Hospital, Friday, February 26, 8.15 p.m., clinical meeting.

DUDLEY DIVISION.—At Bell Hotel, Market Street, Stourbridge, Thursday, February 25, 7.45 for 8.15 p.m., annual dinner. Principal guest, Dr. A. Macrae (Secretary, B.M.A.).

FINCHLEY DIVISION.—At Finchley Memorial Hospital, Bow Lane, N., Friday, February 26, 8.45 p.m., meeting. Dr. A. Lisle Punch: "Antibiotics in the Treatment of Pulmonary Tuberculosis."

GREENWICH AND DEPTFORD DIVISION.—At Miller General Hospital, Greenwich High Road, S.E., Wednesday, February 24, 8.45 p.m., meeting. Annual B.M.A. lecture by Dr. J. C. M. Matheson: "Prison and Prisoners." Wives and other guests of members are invited. Members of the Woolwich Division are also invited.

GRIMSBY DIVISION.—At Scartho Road Infirmary, Thursday, February 25, 8.30 p.m., meeting. Lecture by Dr. W. E. Orchard: "Recent Advances in Venereology." All members of the profession are invited.

KESTEVEN DIVISION.—At Grantham and Kesteven General Hospital, Thursday, February 25, 8.15 p.m., meeting. Address by Mr. Malcolm Donaldson: "Cancer, What the Public Should Know." A film will also be shown.

MID-ESSEX DIVISION.—At Out-patients Department, Chelmsford and Essex Hospital, Wednesday, February 24, 8.15 p.m., meeting. Mr. Aleck W. Bourne: "Forty Years of Obstetrics." A general discussion will follow.

MID-HERTS DIVISION.—At Pea Hen Hotel, London Road, St. Albans, Friday, February 19, 8.15 for 8.30 p.m., joint meeting with Bedfordshire and Hertfordshire Veterinary Society. Dr. R. Cove-Smith: "Fitness and its Implications in Men and Animals."

MIDLAND BRANCH.—At Selly Oak Hospital, Birmingham, Friday, February 26, 8 p.m., meeting of clinical and pathological section.

NORTH STAFFS DIVISION.—At Grand Hotel, Hanley, Tuesday, February 23, 8 p.m., supper meeting. Lecture by Dr. P. H. Davison: "Modern Views on Arteriosclerosis."

SALFORD DIVISION.—At Hope Hospital, Salford, Friday, February 26, 8 for 8.15 p.m., meeting. Address by Dr. Bernard Sandler: "The Infertile Marriage."

SOUTH ESSEX DIVISION.—At Rush Green Hospital, Romford, Sunday, February 28, 10.30 a.m., clinical meeting.

STOCKPORT DIVISION.—At Alma Lodge Hotel, Stockport, Thursday, February 25, 7.30 for 8 p.m., Annual B.M.A. dinner and dance.

STRATFORD DIVISION.—At Queen Mary's Hospital, West Ham Lane, E., Tuesday, February 23, 9 p.m., meeting. Address by Mr. W. McKim H. McCullagh: "Curable Causes of Marital Unhappiness."

SWINDON DIVISION.—At St. Margaret's Hospital, Stratton St. Margaret, Wednesday, February 24, 8 for 8.30 p.m., joint meeting with Swindon Medical Society. Film: "The Accessible Cancers. (1) Skin; (2) Lip and Tongue; (3) Cervix and Uterus."

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, E., Friday, February 26, 3 p.m., clinical meeting.

TUNBRIDGE WELLS DIVISION.—At Royal Mount Ephraim Hotel, Tunbridge Wells, Sunday, February 28, 3 p.m., discussion on the National Health Service. Speakers: Dr. A. E. Loden (General Practitioner), "The General Practitioner in Relation to the Local Authority and the Facilities available under the Local Authority"; Dr. A. Elliott (Medical Officer of Health for Kent), "The Facilities available under the Local Authority, Their Use and Abuse"; Dr. W. B. Adam (General Practitioner), "The General Practitioner in Relation to the Hospital Services"; Mr. John A. Simons, "The Hospital Services, Their Use and Abuse." Followed by a "Brains Trust" on the National Health Service, in which Dr. Frank Langford (Medical Officer of Health for East Sussex) will take part with the four speakers named above.

WOOLWICH DIVISION.—At St. Nicholas Hospital, Plumstead, S.E., Tuesday, February 23, 8 p.m., clinical meeting. Members of the Greenwich and Deptford Division are welcome.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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PRIVATE PRACTICE CERTIFICATES FOR MINERS

A meeting of the Private Practice Committee of the Association was held, under the chairmanship of Dr. IAN D. GRANT, on February 10.

Attention was drawn to the correspondence with the National Coal Board on the extension of the bonus shift agreement which had resulted in a greatly increased demand by miners for medical certificates from their family doctors. The reply of the National Coal Board to representations on this subject was published in the *Supplement* of December 19, 1953 (p. 233). The CHAIRMAN said that he thought the result was about as satisfactory as could be expected. A member of the Committee from a mining area said that the problem of these certificates was not as formidable as it was three or four months ago. In Scotland in some areas it appeared that miners were not yet aware of the conditions under which these certificates were required. This was being discussed with the National Coal Board.

On a further matter dealing with colliery practice it was reported that the Ministry of Health had confirmed that under the National Health Service a practitioner in the hospital field or one providing general medical services who suffered injury or death in attending an accident at a colliery would be eligible for benefit under regulation 9 of the N.H.S. Superannuation Regulations, 1950.

The question was raised whether the private practitioner not under contract would be covered. It was decided to take up this point.

Life Assurance Fees

Reference was made to the statement published in the *Supplement* of December 19, 1953, on the fee for the "long" form of life assurance examination. The Annual Representative Meeting had urged that the fee for this form should be increased from one and a half guineas to two guineas, but the Life Offices Association held that the present fee was adequate. The CHAIRMAN said that there had been differences of opinion as to the amount of time required for the completion of these reports. He himself had suggested 30 to 45 minutes.

Another point in this connexion was brought forward by a member—namely, that two companies for which he acted as referee had recently decided that no medical examination was required for policies below £2,000 unless for some special reason; the result had been to reduce his income from this source to negligible proportions.

It was decided to inform the Life Offices Association that the present fee should apply only for examination at the doctor's consulting-room. Where a life assurance office required examination at the patient's home, mileage should be paid. In addition the attention of the Life Offices Association is to be drawn to the varying fees for reports made from medical records without an examination of the proposer. A minimum fee of £1 1s. is to be requested.

Fees for Medical Witnesses

Dr. ROBERT FORBES introduced a report of the Medical Witnesses Subcommittee. A scale of allowances for professional witnesses at criminal courts was approved at the last Annual Representative Meeting. The Consultants and Specialists Committee had expressed the view that when consultants gave evidence of fact they should be paid at higher rates. The view taken in the Private Practice Committee was that so far as evidence of fact was concerned there was no difference between the consultant and the general practitioner or any other member of the profession. The regulations lay down a maximum fee of £5 a day for professional witnesses to fact, and this maximum applies to all classes of the profession, whether consultants or not. As for allowances for the expert witness, it was for him to make his arrangements before he gave evidence at all. Dr. Forbes stated that the subcommittee was to consider expert witnesses' fees at the next meeting, and in the meantime one of the members had agreed to obtain information from police surgeons as to time involved in attendance at court and the allowances paid.

Drivers over 70

The Committee had been asked by a Division to consider the question of drivers over 70 years of age who were refused full car insurance unless they brought a medical certificate from their own doctor that they were physically fit to drive. A correspondent had suggested that if these examinations were to be of any value they must be comprehensive and adequately remunerated and possibly best undertaken by an independent medical practitioner appointed by the insurance company.

One member pointed out that the Government did not insist that applicants for a driving licence who were over 70 should have a medical examination. In his own practice he had not come upon anything specially disturbing among drivers over 70, and he considered that conditions likely to be a cause of danger in a driver were not limited to

this age group. Moreover, he had found these old people were as a rule quite reasonable if any serious physical defect was brought to their attention. It was decided to watch the situation, but not to take action at the moment.

National Gas Industry

The Committee resolved to advise practitioners that the minimum fee for reports of examinations of employees in the gas industry for fitness to enter the national sick pay scheme should be 25s., and that in cases of doubt a copy of the report required might be submitted to B.M.A. Headquarters for a decision on the appropriate fee.

The Committee considered a very large number of other detailed matters, relating to insurance examinations, fees for cremation certificates, various aspects of certification, and so on. The agenda included 50 items.

NATIONAL HEALTH SERVICE COSTS

TREASURY MINUTE TO COMMITTEE OF PUBLIC ACCOUNTS

A Special Report from the Committee of Public Accounts (session 1953-4) has just been published.* It contains the Treasury's comments (dated December 15, 1953) on the First, Second, and Third Reports from the Committee of Public Accounts, session 1952-3. The following are some extracts from the sections which deal with the National Health Service.

Levels of Remuneration

The Treasury agrees that no increase in the scale of remuneration for work under the National Health Service should be considered unless the fullest facilities are given for the inspection of books and records from which the facts about past remuneration and expenses can be established. This is the answer that has been given to claims for higher remuneration submitted by the dentists, opticians, and (in England and Wales) chemists who provide services under Part IV of the National Health Service Acts. Discussions are now proceeding with the representatives of the dentists and opticians to secure their co-operation in full fact-finding investigations into the remuneration of those two professions, and also with the representatives of the chemists regarding the conclusions to be drawn from certain facts about the remuneration of chemists which they collected and submitted in 1952.

Investigation into Profits on Commodities

Steps have already been taken to intensify measures to ensure that only fair and reasonable prices are paid for commodities in substantial demand for the National Health Service. Reliance must be placed on competition for many of the supplies used in substantial quantities in the National Health Service. This applies particularly to goods for which the National Health Service are not the major buyers, or users, such as provisions, linen, and household goods. A very large number of items, however, which are mainly used by or supplied through the N.H.S. are now being covered by costs and profits investigations. These investigations cover certain widely used basic drugs, dressings, and selected proprietary preparations, and spectacles.

Control of Hospital Expenditure

Review of Hospital Establishments.—Regional reviews have been continuing in all areas. Progress is being made in central reviews, but has been limited by the number of experienced investigators available. While it is expected that the central reviews of administrative and clerical staff

*Special Report from the Committee of Public Accounts, session 1953-4. H.M.S.O., London.

(including those of non-teaching as well as teaching hospitals) will be completed well before the end of 1954, it will not be possible to finish the reviews of teaching hospital domestic and ancillary staff by the same date.

Hospital Cost Accounting.—The Treasury agrees that the costing of hospital expenditure offers considerable possibilities for the securing of economical administration. The Ministry of Health has impressed on the authorities more than once the desirability of their co-operation in making comparisons of items of cost shown in the hospital costing returns. On the question of introducing more detailed departmental hospital costing, the Ministry has completed preliminary discussions with hospital bodies and organizations, and has set up an expert working party to consider the manner in which such a costing system can best be applied in the hospital service.

It is understood that in Scotland a working party composed of officers of the Department of Health and of regional hospital boards and boards of management is now engaged in the study of the results of experiments in departmental costing at some of the multi-purpose hospitals in Scotland, and that the Department foresees no difficulty in devising a practical scheme of functional costing for the larger hospitals in Scotland.

Property Acquired for Hospital Purposes

The Treasury has reviewed with the Ministry the general arrangements for examining accommodation requirements in the hospital service and the use made of property acquired for that service. It has not been the practice of the Ministry hitherto systematically to follow up subsequent action taken by regional hospital boards. A special review which has recently been made has shown that in a number of cases property acquired between 1950 and early 1952 has not yet been brought into use, principally because of the inability of the boards concerned to undertake immediately, with the limited capital resources available, the necessary work of adaptation. Arrangements have been made to avoid such delays in the future.

Grants to Local Health Authorities

The Departments are making further efforts to ascertain and examine the unit costs of services provided by local health authorities. So far as ambulance services are concerned, no evidence of substantial misuse has been found. The Department is now giving consideration to the desirability of a more widespread inquiry in this field.

There is a lack of uniformity in the methods of calculating the unit costs for services other than ambulances (for example, in apportioning the cost of administration over the various services), which renders it extremely difficult to use the results for the purpose of making comparisons in the costs of different areas. The evidence so far does not suggest that there is any general extravagance. The fact that half the cost falls upon the local health authority is itself a strong disincentive to extravagance.

B.M.A. LECTURES

Each Division and Branch is entitled to one "B.M.A. Lecture" each year. This arrangement provides an opportunity of hearing—at the expense of the Association's central funds—a distinguished speaker, if desired, from a distant centre, whose services could not otherwise be secured because his travelling expenses would not be a legitimate charge on Division or Branch funds. The rules require that the invitation to a "B.M.A. lecturer" should be sent from Headquarters on behalf of the Council. If, as has happened occasionally, a Division makes all the arrangements without reference to Headquarters, it is not possible after the event to regard the lecture as a "B.M.A. lecture" and to pay the honorarium and expenses from central funds.

ANNUAL MEETING, GLASGOW,

JULY 1-9, 1954

HOTEL ACCOMMODATION

A number of rooms have been reserved for members in the Central Hotel, Glasgow, 1½ miles from the University. Those wishing to take advantage of this reservation should write direct to the Manager, Central Hotel, Glasgow, C.1, as soon as possible, mentioning that they are attending the B.M.A. Meeting. The tariff is as follows:

Type of Room	Bed and Breakfast Rate*
Single	40s.
Double	50s.
Double with bath	60s. (for 2)
Twin-bedded	83s. 6d. (for 2)
with bath	73s. 6d. (for 2)
Three-bedded	89s. (for 2)
	86s. (for 3)

* Please note that these prices are subject to modification and a guarantee can be given that there will be no increase in price before July, 1954.

Members are advised that no further accommodation is available at Green's Hotel, 22-24, Woodlands Terrace, Glasgow, W.3, during the period of the Meeting.

HOSTEL ACCOMMODATION

Members wishing to reserve hostel accommodation in Glasgow during the Annual Meeting are asked to write direct to the *Executive Officer, B.M.A. House, Tavistock Square, London, W.C.1*, stating their requirements, and not to the hostel concerned.

The hostels available are as follows:

Name and Address of Hostel	Tel. No.	Distance from University	Rooms Available for	Tariff B/B
MacBrayne Hall, 11, Park Circus Place, C.3	Douglas 5626	½ mile	35 men (single and twin-bedded rooms)	12/6
Douglas House, Jordanhill College, Southbrae Drive, W.3	Scotstoun 2694	2½ miles	50 men or women (single rooms)	14/6

The Provisional Programme of the Meeting was published in the *Supplement* of January 16 (p. 13).

SLEEPER ACCOMMODATION ON TRAINS

Members are reminded that sleeper accommodation on trains from London to Glasgow during July is booked up at a very early date. It is advisable to make reservations as soon as possible, and this can be done through Messrs. Shirley James' Travel Service Ltd., Tavistock House South, Tavistock Square, London, W.C.1 (Euston 5930).

COST OF ATTENDANCE AT L.C.C. DAY NURSERIES

The average cost per day for a child attending a London County Council day nursery during 1952-3 was 18s. 7d. This figure was given by the chairman of the L.C.C.'s health committee in answer to a question at the Council's meeting on February 16. It was stated, however, that this figure was inflated owing to arrears of pay to nursing staff for the period from February, 1949, to March, 1952. If this factor were eliminated the daily cost would be 14s. 8d. More recent figures of cost were not available.

The average number of approved places in the Council's day nurseries, 1952-3, was about 5,900. Attendance was roughly 83%.

MARCH MEETING OF B.M.A. COUNCIL

Owing to increased pressure of business it has been decided to extend the next meeting of Council to more than the usual one day. The meeting will therefore start at 2 p.m. on Tuesday, March 9, and continue as long as may be necessary on Wednesday, March 10.

SECRETARIES' CONFERENCE

The Secretaries' Conference this year will be held at B.M.A. House on Wednesday, May 19. It will begin at 10.30 a.m. and occupy both the morning and afternoon. There will be the usual informal dinner in the evening.

L.C.C. EVIDENCE FOR GUILLEBAUD COMMITTEE

The evidence to be given to the Guillebaud Committee by the London County Council proposes that the division of responsibility for maternity services between the local health authorities, the hospitals, and general practitioners, which results in overlapping of duties, should be reviewed. It points out that the Council is responsible for domiciliary midwifery and for ante- and post-natal care, which includes, in addition to medical supervision, a full range of educational and mothercraft services. There is danger of duplication of effort, as the hospitals which provide for confinements also provide antenatal clinics, in which little emphasis is placed on the education of the mother in the management of her baby. Similar overlapping may exist when a general practitioner or general-practitioner obstetrician provides maternity medical services.

The Council also holds the view that general practitioners should be encouraged to care for their patients in their own homes rather than seek their admission to hospital. If this were done better use could be made of available beds, and this might in the long run lead to a reduction in the cost of the service. This presupposes more district nursing service. The cost of providing a district nurse for a patient at home in London is about £1 per week.

Ambulance Service

The Council is specially exercised about its ambulance service. Hospital and clinic out-patient work, over which the Council has no control, now accounts for 75% of the total demands on the ambulance. One important factor increasing ambulance cost may be the developing practice of treating people as out-patients rather than in-patients wherever possible. This may indeed produce financial saving from the national standpoint, but the ultimate demand on the ambulance service is very great. The number of patients carried by the County of London Hospital Car Service increased from 17,266 in 1947, when the hospitals paid at the rate of 3d. a mile, to 149,046 in 1951, when no charge was made. Another factor is that patients under the National Health Service are free to choose their hospital and their doctor, and this frequently results in patients being carried long distances for treatment which could be obtained nearer home. It is considered that general practitioners do not always bear in mind the transport difficulties when selecting the hospital to which to refer patients.

Tuberculosis Service

Other recommendations are that one authority should be responsible for both the hospital and the home treatment of tuberculous patients to ensure that each is treated where it best serves his needs; that miniature mass x-ray units should be under the control of local health authorities, as this is essentially a part of preventive medicine; and that more hospital beds should be provided for mentally defective patients.

KEEP YOUR CIRCULARS

ADVICE TO MEDICAL OFFICERS IN THE
PUBLIC HEALTH SERVICE

The Secretaries of the British Medical Association and the Society of Medical Officers of Health and the Staff Side Secretary of Committee "C" of the Medical Whitley Council are constantly receiving inquiries regarding matters which have been the subject of negotiation and agreement in Committee "C" and which are fully covered in M.D.C. Circulars issued from time to time by the Joint Secretaries of Committee "C."

All these circulars (Nos. 1-21) which have so far been issued have been published in the medical press. In this way it had been hoped that every medical officer in the public health service would possess a complete set for his or her personal use.

In addition, copies of the circulars are issued by the Joint Secretaries of Committee "C" to local authorities, and every medical officer of health should have a set available in the public health department. Medical officers are strongly advised to read and keep copies of the circulars as they are issued and published.

Assistance Offered

It is regretted that additional copies are not available for issue to individual doctors but the Secretary of the Staff Side of Committee "C," to whom correspondence should be addressed at B.M.A. House, is always glad to assist in the explanation or clarification of any matter arising out of the Whitley agreements.

A list of the M.D.C. Circulars Nos. 1 to 16 was published in the *Supplement* of May 30, 1953 (p. 251). Nos. 17 to 21 are listed below.

No. 17, July 9, 1953. Acceptance of Award 2452. Remuneration of Assistant or Departmental Medical Officers. Revised (*Supplement*, July 25, 1953, p. 65).

No. 18, October 17, 1953. Motor-car allowances. Interpretation of M.D.C. Circular No. 15 (*Supplement*, October 31, 1953, p. 183).

No. 19, January 22, 1954. Increments for Part-time Medical Officers (*Supplement*, February 6, p. 35).

No. 20, January 22, 1954. Maternity Leave Scheme. Revised (*Supplement*, February 6, p. 35).

No. 21, February 4, 1954. Car and Subsistence Allowances in Scotland (*Supplement*, February 13, p. 42).

FILM COMMITTEE

At the first meeting this session of the Film Committee, which was held recently, Dr. R. P. LISTON was re-elected to the chair. Dr. FRANGCON ROBERTS, representing the Science Committee, and Miss A. D. BRAHAM, representing the B.M.S.A., were welcomed as new members. It was agreed to co-opt a member of the Medical Committee of the Scientific Film Association.

A report was received of the successful and well-attended lunch-time showings of medical films arranged by the Committee on the occasion of the first World Conference on Medical Education held in August, 1953. The Committee expressed its thanks to those who had introduced the films and to the Wellcome Foundation for the loan of their Film Theatre. Gratitude was also expressed to Drs. Cardew and Hansell and to the Royal Photographic Society for an exhibition of Medical Photography which had been displayed in the Great Hall of B.M.A. House for the period of the Conference and had aroused widespread interest.

Information Wanted

A report on the hiring of films from the Film Library showed a slight falling off in 1953 as compared with 1952 and the Committee considered the possibilities of acquiring fresh films for the Library. Difficulty is experienced in learning of films being made, especially in teaching hospitals

and medical departments. Members of the Committee believe that a considerable number of these films are being made and knowledge of them does not, in many cases, permeate beyond the confines of the hospital or department in which they are made, despite the fact that some of them would be of general interest and would prove popular additions to the B.M.A. Film Library.

It was agreed to circularize as many as possible of those likely to be making, or who have recently made, medical films suitable for the Film Library with a view to obtaining permission to have copies made. It was hoped also that members becoming aware of new films in the making or already made would notify the Secretary so that, as well as making additions to the Library, as much information as possible about medical films should be available at B.M.A. House.

It was reported that the following films have been added to the Film Library since the last meeting of the Committee:

Sciatic-Gastrocnemius Preparation, by A. Bligh and C. Rashbass. *Congenital Pyloric Stenosis*, by J. T. Rice Edwards. *Marrow Puncture*, presented by Imperial Chemical Industries, Ltd. *Milestones in Medicine*, presented by the American Medical Association. *Pentothal*, made for the B.M.A. and presented by Abbott Laboratories, Ltd. *Hay Fever*, presented by Parke, Davis and Co.

ARBITRATION

The Annual Representative Meeting last July called for urgent action to secure, within the Whitley Council procedure, the right to refer a dispute to a suitable arbitration tribunal (*Supplement*, July 18, 1953, p. 15).

The Whitley Council constitution provides for the drawing up of an arbitration agreement, but there is a long-standing dispute between the Staff and Management Sides about the form that this agreement should take. The Management Side is opposed to the idea of unilateral action, and insists that recourse to arbitration must be by mutual consent. This means that when the two sides hold conflicting views and no satisfactory compromise can be found, the dispute may remain unresolved because arbitration is vetoed by one side or the other. The Staff Side is insistent that it should be open to either side independently to demand arbitration. The very strong pressure which the Staff Side has continued to exert has had no effect, and urgent consideration is now being given to other possible methods of influencing the situation.

THE SMALL-LIST PRACTITIONER

At the Extraordinary General Meeting last May, the chairman of the G.M.S. Committee promised an inquiry into the position of doctors with small lists under the new distribution scheme (*Supplement*, May 9, 1953, p. 205). Full information has now been obtained through local executive councils and local medical committees, and this will be studied in the near future by the Working Party—composed of representatives of the G.M.S. Committee and of the Ministry—which was responsible for the distribution scheme in its present form.

B.M.A. CHARITIES BALL, MAY 6, 1954

The B.M.A. Charities Ball, organized by the Metropolitan Counties Branch, will be held in B.M.A. House on Thursday, May 6, 1954. It is hoped that as many members of the profession as possible, including those outside the Branch area, will attend and thus enable the Branch to make a handsome contribution to the medical charities. Dancing to the music of the Sydney Lipton Ballroom Orchestra; buffet and bars. Tickets £2 2s. each, or six for £11 11s. Further particulars will be issued in due course.

OPHTHALMIC GROUP COMMITTEE
HOSPITAL TRAINING OF OPTICIANS

A meeting of the Ophthalmic Group Committee was held at B.M.A. House on February 12, with Mr. O. GAYER MORGAN in the chair.

The Committee considered a letter from the President of the Association, Mr. J. W. TUDOR THOMAS, in which he said that the Welsh Regional Hospital Board had been approached by certain persons, including the president of the local association of ophthalmic opticians, with a request for facilities for opticians and optical students to attend hospital departments as observers and for the purpose of training. It was feared that the continued lack of such facilities in Wales would result in the department at the Cardiff Technical College having to close down. Mr. Tudor Thomas asked the Group Committee for its opinion as to the propriety or otherwise of affording these facilities, but said that his impression was that this type of training for ophthalmic opticians in hospital departments was not acceptable, and it was only in the case of those who were entering whole-time into the hospital service that such training might in due course be given.

The Committee endorsed a reply which had already been sent by Dr. Stevenson, Deputy Secretary, that the Group Committee had expressed the view on a previous occasion that it was undesirable for ophthalmologists personally to impart instruction to optical students or opticians except those employed whole-time in the hospital service. It was true that the Crook Committee had recommended that opticians and students should have opportunity for clinical training by medical men in suitable hospital departments, but discussions were taking place with the Ministry on all aspects of the Crook report, and no doubt the question of medical training would come under review.

Contact Lens Centres

A letter from a member drew attention to the difficulties surrounding contact lens practice. It was stated that no ophthalmologist could hope to compete in private contact lens practice with lay practitioners who had built up their practice by advertising. The most serious factor was that the ophthalmologist interested in this work could not secure the adequate and regular experience which was essential if he was to offer an efficient service himself to the public.

Mr. G. W. BLACK pointed out that while dentists employed technicians, and nobody had cavilled, the idea of technical assistance for the ophthalmologist had been looked on with disfavour. The CHAIRMAN said that the question of "covering" had to be watched. Mr. J. H. DOGGART said that the Faculty of Ophthalmologists in December last had set up a subcommittee on this subject, under the chairmanship of Dr. Dorothy Campbell, and already a certain amount of information was being accumulated. It was decided to await the considerations of this subcommittee.

Representation of the Group Committee

It was reported that the Central Consultants and Specialists Committee was considering the reorganization of its constitution, and one proposal put forward was for the elimination of Group Committee representation in order to reduce the size of the Central Committee. The CHAIRMAN said that he had represented the Ophthalmic Group Committee on the Central Committee and from his experience he thought it would be a great pity if the Group Committee's representatives, numbering 20 in all from the various groups, could no longer take part in its work. It was also pointed out that much of the work of the Central Committee concerned S.H.M.O.s, who were probably more numerous in the ranks of ophthalmology than in any other specialty. Another member said that the proposal would relegate Group Committees to the role of Cinderella.

On the motion of Mr. McKIE REID, a resolution was unanimously agreed to expressing grave concern at the proposal that Group Committee representation should cease.

Spectacles for Schoolchildren

The question of spectacles for schoolchildren and additional charges for special frames again came forward. A circular from the Ministry had suggested that opticians should do what they could to dissuade parents from choosing unsuitable frames for their children, reminding them that in deciding whether breakage was due to carelessness the Ophthalmic Services Committee would be bound to disregard any greater likelihood of accidents owing to the type of frame. It was urged that what was wanted for the child was something extremely rigid.

Dr. LLOYD JOHNSTONE produced some details of charges for spectacle frames for children, and agreed to put them in writing with a view to supporting certain representations by the Committee to the Minister.

Treatment of Cataract and Glaucoma

A circular recently issued by the Ministry to hospital authorities on the treatment of cataract and glaucoma in the National Health Service evoked some discussion. Mr. G. W. BLACK considered that this circular should receive very close attention because it gave such support to their claims. It stated, for example, that "early diagnosis [of glaucoma] appears to be all too frequent, although it is in the early stages of the condition that there is the best chance of successful treatment." The reason for this was fairly obvious. It was that so many cases were seen by opticians in the Supplementary Ophthalmic Service. He thought that a subcommittee should be appointed to make a detailed commentary on the circular and bring it to the attention of general practitioners and others concerned.

It was agreed to set up such a subcommittee.

Arising out of this circular it was also agreed to ask the Ministry to remove the word "normally" from the instructions for the Supplementary Ophthalmic Service concerning cases referred back—i.e., to make it obligatory not to prescribe glasses under the Service for cases referred back to the general practitioner.

Domiciliary Consultation Arrangements

A letter was read to the Committee from an S.H.M.O. employed by two Metropolitan Regional Hospital Boards, with a hospital appointment in both areas. In one area he was debarred from doing domiciliary visits on the ground that there were sufficient consultants to cover the work, while still allowed to do so in the other.

In the discussion it was pointed out that if S.H.M.O.s did consultant work without certain safeguards there would be a tendency on the part of the authorities to get consultant work done at the cheaper rate. The discussion widened into the question whether inquiry should be made in every case of the receipt of an advertisement for an S.H.M.O. post to find out whether it fulfilled the requirements laid down for S.H.M.O. posts in ophthalmology—namely, posts primarily concerned with non-operative work—e.g., refraction. One member said that S.H.M.O.s were complete consulting ophthalmologists in the majority of cases.

It was decided to make certain representations on the subject to the Central Consultants and Specialists Committee, though these did not cover the immediate point of the correspondent who had raised the subject, which was that he was not permitted to do in one regional area what he was permitted to do in the other.

On the suggestion of Dr. J. MARSHALL the Committee agreed to the appointment of a Scottish representative to the deputation from the Group Committee and the Faculty to discuss with the Ministry the Crook report.

CONSTITUTION COMMITTEE

The Council at its last meeting completed the appointment of the members of the Constitution Committee (*Supplement*, January 23, p. 19). The Committee has the following terms of reference:

"To examine and report on the present structure and constitution of the Association, with special reference to the reorganization of the Representative Body."

The first meeting of the Committee was held on February 23. Mr. H. H. Langston was elected chairman. At this meeting the programme of work was considered and the general procedure laid down.

Scottish News

ENCOURAGEMENT OF GROUP PRACTICES
IMPLEMENTATION OF WORKING PARTY'S REPORT

The General Medical Services Subcommittee (Scotland) has now completed its discussions with the Department of Health on the subject of Group Practice Loans, and every general practitioner in Scotland in the National Health Service should have received, from the Department, a memorandum explaining details of the scheme. The following points are worthy of note:

(1) In the first year of the scheme, approximately £12,000 will be available for loans in Scotland.

(2) No hard and fast definition of group practice has been laid down, but the following description—which is taken from the report of the Committee on General Practice set up by the Central Health Services Council in England and Wales—indicates the kind of arrangements which would qualify for assistance:

"Group Practice applied to General Medical Practice means that the medical practice is carried on by several general practitioners working together in close association, consulting one another about their patients, and doing their 'surgery work' in whole or in part in a common building controlled by the doctors. All members of a 'group' should work in the common surgery premises even if on occasions they also work at separate branch surgeries. A group practice should employ ancillary help to the extent of one or more persons who can provide services of the secretarial, nursing, receptionist, or almoner type. Normally, a group should consist of three, four, five, or six principals. Large numbers tend to diminish the value of group association. The group may or may not be a partnership, but, if not, there must be a proper understanding between the members of a group on the sharing of the earnings of the group and particularly as to the sharing of expenses. Patients must continue to be the responsibility of the doctor of their choice in the group. The group should provide a 24 hours' service to patients and also proper off-duty and holiday relief for its members."

This account of group practice is not to be regarded as an exhaustive definition of arrangements which would qualify for assistance; and doctors should not refrain from applying for a loan because their group arrangements are different from those described above.

(3) Any loan granted will be interest free and will be towards the cost of providing premises for group practice.

(4) The loans will be advanced by the executive council on the recommendation of a joint committee representing the General Medical Services Subcommittee (Scotland) and the Department of Health for Scotland.

(5) The loans will be available for the following purposes: (a) the acquisition of land and the erection of consulting premises on it; (b) the acquisition of existing premises and their conversion into consulting premises; and (c) the conversion into consulting premises of premises leased by the group.

(6) The period for repayment of the loan will depend on the circumstances of the particular application. Normally, however, the period will be ten years; and it will in

no case exceed 20 years. Repayment will be made by quarterly deduction from remuneration. The first deduction must be made not later than two years from the date on which the loan is advanced; subject to this, the practitioners may themselves propose the quarter at the end of which repayment is begun.

(7) Application for a loan may be made by practitioners taking part in the general medical service who propose to form a group practice of two or more members; plans carried out since April 1, 1953, are eligible for assistance on an equal footing with plans to be carried out in future; plans carried out before April 1, 1953, will be eligible if resources permit. Applications should be made to the executive council, who, after consulting the local medical committee, will forward them to the Department of Health for Scotland with their comments, for consideration by the Joint Committee referred to in paragraph 4.

GENERAL MEDICAL SERVICES
SUBCOMMITTEE (SCOTLAND)PRESCRIBING AND CATEGORIES 5 AND 6 OF THE
JOINT COMMITTEE ON PRESCRIBING
CLASSIFICATIONS

Representatives of the General Medical Services Subcommittee (Scotland) have had a meeting with representatives of the Department of Health in connexion with the Department's proposal that any items listed in Categories 5 and 6 of the Cohen Committee's Report and prescribed by general practitioners should automatically be referred to local medical committees for investigation.

The Department have now agreed to reconsider this proposal on the following conditions:

(1) The Department have undertaken to collect statistics over a period in an endeavour to ascertain the number of prescriptions containing items listed in Categories 5 and 6.

(2) The Department will review their proposal with the Subcommittee when the above statistics are available.

(3) In the meantime prescribing of such items will not automatically lead to the scripts being referred to local medical committees for investigation.

(4) The Subcommittee have agreed, however, that the Department shall not be precluded meanwhile from referring to an executive council for investigation by a local medical committee any unduly frequent prescribing of such items by a practitioner. It is understood, however, that such reference may only be made in exceptional circumstances.

After the Subcommittee have consulted with the Department again a further announcement will be made.

Questions Answered

Car Allowance on Transfer from Whole-time to
Part-time Post

Q.—I purchased a new car in 1950, and as I have always held a whole-time salaried post I have had no income-tax relief for the car. In the event of taking up a part-time post, how would the income-tax authorities assess the value of the car?

A.—In a case where a car was acquired before the date at which it gives ground for an allowance the value of the car for the purposes of the calculation is reckoned at the amount it would have stood at if the normal allowance had been given. To take a very simple example, suppose a car was acquired for £800 on April 5, 1953, and the purchaser goes into general practice as from April 5, 1954, the allowance for the financial year 1954-5 would be 25% of £600—i.e., of £800, less the £200 which would have been the allowance for 1953-4 if the owner had then been able to claim an allowance.

The Garden Path

Q.—I have a front garden measuring about 400 sq. yd., through which all my patients walk to reach the surgery door. The cost of maintaining this garden in a presentable manner is £100 per annum, including labour and material. The local inspector of taxes has only agreed to allow £10 per annum for materials only. May I have your advice?

A.—It is generally admitted that a practitioner is entitled to regard as an allowable expense the cost of maintaining a reasonably presentable access to the consulting-room, etc., as well as keeping up the condition of the rooms themselves. On the other hand, it is thought that it would be difficult to maintain to the satisfaction of a body of appeal commissioners that more than a part of the expenditure on 400 sq. yd. of garden was incurred for purposes of the practice. The questioner cannot therefore succeed in claiming the full amount of £100, but whether £10 is an adequate allowance must depend on the actual facts of the particular case. The fact that it is given "for materials only" is not understood; surely if that cost is allowable so is the cost of using them.

OCCUPATIONAL HEALTH

An all-day meeting of the Occupational Health Committee of the Association was held on February 17, with Dr. J. A. L. VAUGHAN JONES in the chair.

It was reported that the memorandum on the future of occupational health services on which the Committee has expended so much labour had been submitted to the Ministry of Labour and National Service. Discussions with the Ministry would be entered into, as it was believed that the Ministry desired to proceed with the development of a service, even though legislation might not be possible for some time.

Industrial Chest Diseases

A memorandum on industrial chest diseases was prepared by the Tuberculosis Group Committee some time ago, was revised as a result of various discussions, including one in the Joint B.M.A. and T.U.C. Committee, and now it again came before the Occupational Health Committee. Its main proposal for a central statutory register of industrial chest diseases, one of the purposes of which would be to detect cases of pulmonary disease in industries not at present scheduled, had been generally favoured, but some difference of opinion had arisen on the proposal that the register should be maintained by the Home Office, with close liaison with the Ministry of Pensions and National Insurance, and the corresponding departments in Scotland and Northern Ireland.

One member of the Occupational Health Committee considered that the Ministry of Health was the appropriate department to have charge of the register, and after discussion this appeared to be the general feeling of the Committee. It was agreed that after the B.M.A. representatives on the Joint B.M.A. and T.U.C. Committee had considered the matter it should be brought forward at a meeting of the Joint Committee, which it was known the T.U.C. representatives were anxious to have at an early date.

Industrial Surveys

It was mentioned that at a meeting of the Planning Subcommittee a few days previously the subcommittee had considered industrial surveys forwarded by the medical officers of health concerned from the Govan ward of Glasgow, the Southampton dock area, a central ward in Reading, the borough of Tottenham, and certain rural areas in Cheshire, borough of Tottenham, and certain rural areas in Cheshire, also a survey by the chief medical officer of five different types of factory in the Unilever Organization. Each of the reports had been carefully studied and appropriate comments had been made.

The CHAIRMAN said that thanks were due to the medical officers concerned for this particularly good job of work. An endeavour had been made to get the universities or the Nuffield Trust to undertake surveys of this kind, but without success. Then the Society of Medical Officers of Health offered its services, and to that Society also their thanks were due. A member of the Committee said that the surveys were most useful, but, of course, they represented the personal opinion of the man responsible for the work. There was as yet no standard by which they could be judged.

The report was sent back to the Planning Subcommittee with the suggestion that now specific questions based on the information already afforded might be put, with a view to achieving some standardization.

Industrial Injuries

Dr. J. COTTRELL presented a draft memorandum of evidence which had been prepared by the subcommittee set up for this purpose for submission in the name of the British Medical Association to the Departmental Committee which is reviewing the provisions of the Industrial Injuries Act. The Committee spent some two hours considering the draft and making certain revisions.

Dr. M. E. M. HERFORD gave the Committee a statement on the Federal and State laboratory services available in the United States for service to industry, and suggested that a parallel service be instituted in the United Kingdom.

It was agreed to add this as an appendix to the memorandum of evidence, and Dr. Cottrell, Dr. Alexander, and Dr. Herford were appointed to support the evidence orally.

Transport Medical Standards

Dr. L. G. NORMAN submitted draft notes for the guidance of doctors who undertake the medical examination of applicants for public service vehicle driving licences.

The Private Practice Committee, in intimating its view that the proper fee for the revised form P.S.V. 15 A was 25s., gave its opinion that it was important to prevent substitution at these medical examinations, where the applicant was not known to the examining practitioners, and that to this end it might be advantageous to insist that the form should contain a photograph of the applicant as well as a space for his signature in the presence of the doctor.

The Committee noted this suggestion, but did not endorse it.

Arrangements for the forthcoming joint conference of Advisory Councils on Occupational Health were considered. The conference is to be held on April 13.

PUBLIC HEALTH

PROFESSIONAL SECRECY

At its meeting on February 19, 1954, the Public Health Committee discussed the question of the disclosure of confidential medical details about patients in the course of inquiries by lay officers in various fields of local authority work. Some members said that in carrying out their statutory duties lay officials often had occasion to try to find out about the medical condition or history of those with whom they were dealing, and applied to the appropriate health department for the information they required. These inquiries sometimes put the medical officer concerned in a difficult position in relation to the rule of professional secrecy.

It was generally agreed that information should not be given under these conditions, but some members thought that confidential medical details did sometimes get into lay hands. It was decided to try to ascertain if there were specific examples of cases of this kind, and to bring the matter up again in the light of further information.

A full report of the meeting of the Public Health Committee will be printed in next week's *Supplement*.

Correspondence

Remuneration of Hospital Medical Staff

SIR,—At a time when large sections of the population are demanding and receiving increases in earnings, when solicitors have increased their scale of fees, M.P.s and judges are expecting increased remuneration, is it too much to expect that the hospital staffs should receive their proper salary? It is now many months since the decision at arbitration that the proper application of the Spens recommendations on general-practitioner earnings involved a betterment factor of 100%. When is this decision to be applied to the earnings of hospital staffs? Unless the salary of the consultant, based on the earnings of the full-time employee, is brought up to the level of his general-practitioner colleague the standard of hospital practice will deteriorate. It is to be hoped that the committee of distinguished and eminent members of the profession who represent our interests in any negotiations are not too eminent to realize how adversely the difference in earning capacity between the two main branches of the profession influences the hospital service. Can we expect an early announcement to the effect that the salaries of the hospital staffs are to receive the same betterment as that applied to the G.P.s and, as in their case, retrospective effect?—I am, etc.,

Middlesbrough.

H. LESLIE LEAMING.

Remuneration of Middle-grade Registrars

SIR,—In view of the reduced number of senior registrar posts, most middle-grade registrars face the prospect of holding their present grading for many years before a step to a higher salary level is made on the ladder to consultant status. In addition, if present trends continue, registrars in non-teaching hospitals will ultimately stand little chance of being consultants at all. Yet there is no doubt that there is a real need for the registrars now in office. They carry a large part of the executive burden of hospital practice, particularly in the out-patient clinic, on the operating list, and in anaesthetics. True, the post lasts but two years, but at the end of this there is an "all change" call which sends the same band of doctors about the same work, in new surroundings.

This may go on for six or eight years, but their salary is unchanged after the second year. If the disappointed registrar then enters general practice, usually as an assistant, his financial loss over the whole period, as against his colleague who originally entered G.P. work, is large. There seems to be a good case, therefore, for regarding the registrar grade as to some extent an *ad hoc* post, and for making annual increments up to a reasonable maximum of, say, six years; at this stage, the salary might approximate to that of a second-year senior registrar, at £1,100 per annum. For a doctor with some 10 years of experience of medicine, much of it spent doing near-consultant work, this is not a disproportionate reward. Alternatively, some sort of family allowance for married registrars might be applied after the second year in this grade.—We are, etc.,

J. C. DAVIDSON. R. T. S. LOUITT.
S. DUBIEL. J. D. KEITH PALMER.
C. K. KOLODYSKI. W. K. SLACK.
M. LOUGHLAN.

London, E.11.

The Survival of Private Practice

SIR,—In his speech at the Central Consultants and Specialists Committee dinner (*Supplement*, February 13, p. 43), the Minister of Health stated that he considered a whole-time salaried service would be disastrous. In other words, he was anxious that private practice should continue and thrive. If he spoke in good faith, he should immediately implement the words of his predecessor, Mr.

Aneurin Bevan, who stated that the free National Health Service would be available to all members of the community in part or in whole. He should, in fact, allow private patients to obtain their medicines, spectacles, dentures, surgical appliances, etc., on the same terms as the N.H.S. patient, and he should reduce the cost of private pay-beds in hospital by 50%. If he cannot see his way to correct this injustice, it were better to remain silent and not further embitter our once happy profession with empty words. Actions speak louder than words.—I am, etc.,

Camberley.

LESLIE HARTLEY.

Public Relations Committee

SIR,—The account of the Public Relations Committee (*Supplement*, February 6, p. 33) must have been an eye-opener to many, as it was to me. There was no such body in my time and I don't know that anybody missed it. But times have changed and now it is obvious that no body of the size and importance of the B.M.A. could do without it. Incidentally, the account shows how fortunate we have been in our choice of a Public Relations Officer. He has indeed created a department which is handling a difficult and delicate job with success.

The columns of the *Journal* were recently occupied with the thorny question of how far the claims of the Press for the right to give unlimited publicity to any matter it considers to be news can be reconciled with the claims of our profession to have its traditional right to the privacy of some of its relations with the public a claim equally in the interest of the public.

There is a body called the Press Council. Up to the present it does not seem to have done much to justify its existence. It seems to me that the problem which is troubling us is, to use a slang expression, "just up its street." I suggest that our Public Relations Committee should ask the Press Council to try its hand on the formulation of a pronouncement which, while satisfying all reasonable demands of the lay press, would meet the requirements of the medical profession, and at the same time safeguard the legitimate demands of the public for privacy in certain matters—if there is to be such a thing as privacy for the individual. I believe that our approach to the Press Council would be greatly strengthened by the fact that we have in existence a Public Relations Committee with a very capable Public Relations Officer.—I am, etc.,

London, S.W.7.

ALFRED COX.

Service Recruitment

SIR,—Having just read Dr. J. G. P. Power's letter (*Supplement*, February 6, p. 37), I would like to make a contribution to this correspondence. I am now doing my National Service as a doctor. For the past year I have served as R.M.O. to a regiment. I like my job. I have learnt not a little about minor injuries, skins, and other common ailments of troops. I don't claim that all my day is spent in practising medicine, or that my day is free of paper work, but altogether I am very happy in the regiment. I feel that my time in the Army is not being wasted, and I shall be extremely sorry to leave.

Why then do I not sign on? For undoubtedly Service life suits me, and the pay is good. My reason is this. I believe my *métier* to be general practice. Therefore, if I stayed in the Army I would not seek specialist status but remain as a general duties medical officer. Now what are my prospects of general practice in the Army? For my first five years with good fortune I would remain a regimental medical officer—that is, the G.P. of the Army medical officer with a field ambulance. In five to ten years' time, in all probability, I would be promoted to major. Now as a general duties major in R.A.M.C. as far as I know there are three posts I could fill: (1) deputy assistant director of medical services, (2) second-in-command of a field ambulance, or (3) regimental medical officer. The first I feel must be purely administrative, even in war. The second, in war, would probably be a very interesting job, but in peace, purely administration and training; and we are building our Army for peace. The third, though

theoretically possible, is actually unlikely. So in peacetime as a general duties major in R.A.M.C. I will in all probability have ceased to practise medicine. And should I rise higher to lieutenant- or even full colonel, then, as far as I know, only administrative posts are available.

Now I will agree that these administrative posts must be filled by doctors; and I would, I hope, have sufficient sense of serving the Queen to fill one of these posts for two, three, or even five years. But not for the remaining 15 to 20 years' service I would have left after my promotion to major—not when I feel that my *métier* is general practice.

If I leave the Army at the termination of my National Service next October I shall seek an opening in general practice (not easy to find, I agree). But when found I know that I will have the prospect of 30 years' practice in that branch of medicine that is my choice. That the Army cannot offer me; that is why I will not sign on.—I am, etc.,

ANOTHER N.S.M.O.

The G.M.C.'s Warning

SIR,—An account of each session of the General Medical Council is published in the *Supplement* to the *British Medical Journal*. I have carefully searched the records of each session from July, 1948, to November, 1953, to discover how many cases there have been of fraudulent claims on the National Health Service. I find the answer is that there have been only four cases in 5½ years—that is, less than one per year amongst the tens of thousands of doctors taking part in the Health Service. It follows that approximately one in 5,000 general practitioners over a period of six years has offended in this way. This is indeed a microscopic figure.

Sir, I ask you to publish this bare fact for the sake of the honour of British doctors, both now and in history.—I am, etc.,

Hemel Bay.

C. T. H. WHITESIDE.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). The only charge made is for postage of books. A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Abruzzese, G.: *La Fecondazione Artificiale Umana*. 1953.
Advances in Medicine and Surgery from the Graduate School of Medicine of the University of Pennsylvania. 1952.
Arnold, H. L.: *Modern Concepts of Leprosy*. 1953.
Art of Dispensing. Twelfth edition. 1953.
Atlay, J. B. (Editor): *Trial of The Stauntons*. Revised edition. 1952.
Badenoch, A. W.: *Manual of Urology*. 1953.
Bassermann, F. J.: *Probleme der Morphologie, Cytochemie und Wuchsform des Tuberkulose-erregers*. 1953.
Beard, D. E., et al.: *Radiologic Diagnosis of the Lower Urinary Tract*. 1952.
Bell, A. C. H.: *Pocket Obstetrics*. Third edition. 1953.
Bell, G. H. (Editor): *Experimental Physiology*. Fifth edition. 1952.
Berkeley's Handbook of Midwifery for Pupil-midwives and Midwives. Fourteenth edition by Arnold Walker. 1953.
Bibby, C.: *Healthy People*. 1953.
Blum, P.: *La Peau*. 1953.
Brett's History of Psychology. Edited and abridged by R. S. Peters. 1952.
Brooke, B. N.: *Ulcerative Colitis and its Surgical Treatment*. 1954.
Browne, O. (Editor): *Rotunda Textbook of Midwifery for Nurses*. 1952.
Buchwald, E.: *Physical Rehabilitation for Daily Living*. 1952.
Chesser, E.: *Unquiet Minds: Leaves from a Psychologist's Case-book*. 1952.
Corman, L.: *Connaissance des Tempéraments par la Méthode Morpho-physiologique*. 1953.
Cory, D. W.: *The Homosexual Outlook: A Subjective Approach*. 1953.
Davies, E. S., and Jeffreys, G. V.: *Laboratory Course of Chemical Analysis*. 1952.
Davson, H., and Danielli, J. F.: *Permeability of Natural Membranes*. Second edition. 1952.
De Groot, J.: *Significance of the Hypophysial Portal System*. 1952.
Delario, A. J.: *Roentgen, Radium, and Radioisotope Therapy*. 1953.
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Di Francesco, S.: *Il Diritto alla Nascita*. 1952.
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H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Major F. L. Holroyd has retired on account of disability.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Lieutenant (acting Lieutenant-Colonel) A. W. Naddell to be Captain.
Captain H. W. James has been granted the acting rank of Major.
Captain J. C. Grant, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.
Lieutenant (War Substantive Captain) C. W. S. F. Manning, from Emergency Commission to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel W. D. F. Lytle, O.B.E., T.D., has been granted the acting rank of Colonel.
Major J. S. H. Wade, M.C., to be Lieutenant-Colonel.
Captain (acting Major) R. P. Harwood has been granted the acting rank of Lieutenant-Colonel.
Major D. Macartney has retired.
Captain (Acting Major) J. S. Binning to be Major.
Captains A. C. P. D. Thomson and A. R. Currie have been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY
MEDICAL CORPS

Colonels R. F. Guymer, T.D., and R. W. Nevin, T.D., from Active List, to be Colonels.
Lieutenant-Colonel (Honorary Colonel) A. H. Whyte, D.S.O., T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.
Lieutenant-Colonel F. J. Manning, T.D., and M. J. Lindsey, M.C., T.D., from Active List, to be Lieutenant-Colonels.
Majors (Honorary Lieutenant-Colonels) E. H. Brindle, T.D., H. S. Kent, T.D., and R. S. Creed, T.D., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O.
Major A. K. Dougall, M.C., T.D., from Active List, to be Major.
Major S. Andrews, having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.

ROYAL AIR FORCE

ROYAL AUXILIARY AIR FORCE

Squadron Leader D. Turner has been transferred to the Reserve.
Flight Lieutenant I. Thomas to be Squadron Leader.

ROYAL AIR FORCE VOLUNTEER RESERVE

Squadron Leaders G. P. Arden and R. T. H. James have relinquished their commissions.

Association Notices

Diary of Central Meetings

MARCH

- 2 Tues. Office Committee, 10.30 a.m. (date changed from February 23).
2 Tues. Finance Committee, 2 p.m.
2 Tues. Registrars Group Executive Committee, 2 p.m.
3 Wed. Catering Committee, 11 a.m.
4 Thurs. Staff Side, Committee "B," Medical Whitley Council (at 23, Savile Row, W.), 10 a.m., to be joined by Minister of Health and his officers, 10.30 a.m.
9 Tues. Committee on Arbitration Machinery, 1 p.m.
9 Tues. Council, 2 p.m.
10 Wed. Council, 10 a.m.
11 Thurs. Subcommittee on Service Committee and Tribunal Regulations, G.M.S. Committee, 11 a.m.
16 Tues. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
17 Wed. Remuneration Subcommittee, Occupational Health Committee, 2 p.m.
18 Thurs. Dermatologists Group Committee, 12 noon.
18 Thurs. Dermatologists Group Conference, 2 p.m.
19 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.

Branch and Division Meetings to be Held

BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Bournemouth, Friday, February 26, 8.15 p.m., meeting. Address by Dr. R. S. F. Schilling: "Industrial Medicine."

BRIGHTON AND MID-SUSSEX DIVISION.—Thursday, March 4, conjoint meeting with Brighton and Hove Association of Pharmacy. Subject: "The Nation's Drug Bill."

BUCKINGHAMSHIRE DIVISION.—At St. John's Hospital, Stone, Friday, March 5, 8.30 p.m., lecture-demonstration by Dr. S. L. Last: "Clinical Uses of Electroencephalography."

CHESTER DIVISION.—At Blossoms Hotel, Foregate Street, Chester, Friday, March 5, 8.30 p.m., joint meeting with Chester and North Wales Medical Society. Annual Lecture by Sir Arthur E. Porritt: "Abreast of the Times."

CHESTERFIELD DIVISION.—At Walton Sanatorium, Chesterfield, Friday, March 5, 8.45 p.m., meeting. Discussion to be opened by Dr. J. P. Davie, Dr. R. T. Gaunt, Dr. G. L. Fine, and Dr. Elizabeth Michael: "The Control of the Drug Bill."

CITY OF DUNDEE AND COUNTY OF ANGUS DIVISIONS.—At Medical School, Dundee, Thursday, March 4, 8.30 p.m., meeting. Lecture by Professor J. L. Henderson: "Some Nutritional Problems in Childhood."

COVENTRY DIVISION.—At Chace Hotel, London Road, Willenhall, Tuesday, March 2, 7.30 for 8 p.m., ordinary general supper meeting. Paper by Dr. D. W. Jones: "Some Aspects of Pneumococcosis."

DONCASTER DIVISION.—At Messrs. Parkinsons' Café, High Street, Doncaster, Tuesday, March 2, 7.30 p.m., joint meeting with Doncaster Medical Society. Dinner, followed by an address by Professor R. S. Illingworth: "Some Common Problems in Paediatrics."

EAST SOMERSET DIVISION.—At The Small Hall, Wells, Sunday, March 7, 3 p.m., general meeting.

GRIMSBY DIVISION.—At Field House, Grimsby, Thursday, March 4, 6.30 to 8.30 p.m., cocktail party.

HAMPSHIRE DIVISION.—At Hampstead Central Library, Finchley Road, N.W., Wednesday, March 3, 8.30 p.m., meeting. Discussion between Dr. Desmond Curran and an eminent barrister: "Insanity and the Law." Members' friends and members of the legal profession are invited.

LANCASTER DIVISION.—At Grosvenor Hotel, Morecambe, Saturday, March 6, 7.30 for 8 p.m., annual dinner.

LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, S.E., Friday, March 5, 8.30 p.m., meeting. Dr. F. H. R. Smithard: "Co-operation and Liaison between General Practitioner and Public Health Department."

NORTH BEDFORDSHIRE DIVISION.—At Bedford General Hospital, Friday, March 5, 8.30 p.m., joint meeting with Bedford Medical Society. Annual B.M.A. Lecture by Mr. L. Colebrook, F.R.S.: "The Treatment of Burns."

REIGATE DIVISION.—At Netherne Hospital, Coulsdon, Tuesday, March 2, 8.30 p.m., meeting. Subject: "Care of the Psychiatric Case."

ST. PANCRAS DIVISION.—At B.M.A. House, Tavistock Square, London, W.C., Wednesday, March 3, 8.30 p.m., meeting. Dr. N. J. Pratt: "Homoeopathy."

SCUNTHORPE DIVISION.—At Scunthorpe and District War Memorial Hospital, Wednesday, March 3, meeting. Mr. Eric Dyson: "The Coroner and the Doctor."

SOUTH ESSEX DIVISION.—At Rush Green Hospital, Romford, Sunday, February 28, 10.30 a.m., clinical meeting.

SOUTH WALES AND MONMOUTHSHIRE BRANCH.—At Morriston Hospital, Swansea, Thursday, March 4, 3 p.m., joint clinical meeting with Swansea Division.

WEMBLEY DIVISION.—At Myllet Arms, Western Avenue, Wednesday, March 3, 8 for 8.30 p.m., annual dinner and dance.

WEST DERBYSHIRE DIVISION.—At Card Room, Smedley's Hydro, Matlock, Wednesday, March 3, 8.30 p.m., meeting. Professor C. H. Stuart-Harris: "Chronic Bronchitis and Pulmonary Heart Failure." All medical practitioners in the area of the Division are invited.

WESTMINSTER AND HOLBORN DIVISION.—At Royal Society of Medicine, 1, Wimpole Street, W., Thursday, March 4, 7.30 for 7.45 p.m., dinner. 8.45 p.m., lecture by the Rt. Hon. Lord Amulree: "Geriatrics." Discussion to be opened by Dr. Geoffrey Hale.

Meetings of Branches and Divisions

SARAWAK BRANCH

A meeting was held at the General Hospital, Kuching, on November 18, 1953. Dr. Philpott was elected chairman. There were eight members present.

CHELSEA AND FULHAM DIVISION

A general meeting was held at St. Stephen's Hospital on January 29, 1954. With Colonel W. L. Harnett in the chair there were 40 members and guests of the Kensington and Hammersmith Division present. Dr. Dudley Hart gave a lecture on "Some Recent Advances in Therapeutics."

The Minister of Health has approved an increase of subscription from £50 to £65 by boards of governors of teaching hospitals to the Teaching Hospitals Association during the financial year 1954-5 and for subsequent years until further notice.

SUPPLEMENT TO THE
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THE GENERAL PRACTITIONER AND THE
HEALTH VISITOR

The following Resolution was passed at the Annual Representative Meeting in 1953:

"That the Association welcomes health visitors working under the guidance of general practitioners as a means by which such practitioners may increase the help they can give to their patients, and that the Council be requested to consider ways whereby the help given by health visitors to general practitioners may be increased."

Since then the subject of co-operation between general practitioners and health visitors has been discussed in detail by a Joint Subcommittee of the General Medical Services and Public Health Committees, as a result of which the statement which follows has been approved by the Council of the Association and the Society of Medical Officers of Health. The statement has been sent to secretaries of local medical committees, medical officers of health of local health authorities, and honorary secretaries of Branches and Divisions. Secretaries of Branches and Divisions have been asked to convene meetings between the medical officer of health, together with senior members of his staff, and representatives of the B.M.A. Branch or Division and the local medical committee so that the matter of co-operation may be talked over between them.

THE STATEMENT

The need for the closest co-operation between general practitioners and health visitors is fully accepted by the Association, and in conjunction with the Society of Medical Officers of Health detailed consideration has been given to the most effective means of securing this co-operation. It is appreciated that in many areas reasonably satisfactory arrangements already exist with resultant benefit to all concerned, but it is apparent that in other areas the necessary degree of co-operation has yet to be attained. It is the view of both bodies that harmonious relations can be established if good will and interest are shown by all concerned and if the following principles are accepted:

- (1) Co-operation between general practitioners and the medical officer of health and his staff regarding the health, care, treatment, and aftercare of all patients is essential.
- (2) The local health authority has certain statutory obligations regarding the health of the community, and the health visitor who is employed by the local health authority is under the direction of the medical officer of health. This, however, in no way prevents the health visitor from working closely with the general practitioner and under his guidance in the care of individual patients.
- (3) Direct consultations should take place between general practitioners and health visitors with a view to the exchange of information regarding individual patients.

(4) The general practitioner is primarily responsible for the health of the individual and the family, while the health and welfare of the family in relation to the community is a responsibility of the medical officer of health and his staff. The close association of all concerned, as members of one team, is of vital importance if these responsibilities are to be adequately fulfilled.

The Association and the Society realize that to a great extent the question of co-operation is a local problem, and the means by which such co-operation can be obtained are for local consideration and arrangement. It is strongly recommended that urgent consideration be given to this matter in all areas. It is only in this way that the general practitioners, medical officers of health, and health visitors can work in partnership towards that co-operation which will ensure efficient and all-embracing care for the patient, whatever his age or state of health.

APPENDIX

The following suggestions of some of the ways by which greater co-operation between general practitioners and health visitors could be better understood and improved may be helpful:

- (1) In the first place discussions to this end should take place between the medical officer of health of the local health authority, together with senior members of his staff, and representatives of the B.M.A. Branch or Division and the local medical committee. This is essential, for the detailed arrangements will vary, not only between local health authorities but in different parts—that is, rural and urban—of a local health authority. Agreement on the principle of co-operation at this level should ensure full implementation elsewhere.
- (2) Close personal contact and exchange of information between individual general practitioners and health visitors is essential. In this way both parties will understand and appreciate the other's duties and responsibilities. In rural areas where the one individual is home nurse, midwife, and health visitor there is usually that understanding between her and her G.P. colleagues. In urban areas, particularly in the large towns and cities, and where in most cases the health visitor does not act as home nurse or midwife, general practitioners do not know personally the health visitors working in the area.
- (3) Complaints have been made by general practitioners that at times contradictory advice is given to patients by health visitors. It is clear that this must be avoided, and here close consultation and co-operation between general practitioners and health visitors is essential.
- (4) In addition to their statutory duties, health visitors are available, at the discretion of the medical officer of health, for visiting patients when requested by general practitioners. Full consultation between the parties will result in efficient and economic use of health visitors.
- (5) Many general practitioners are unaware of the many facilities which can be made available for their patients through the local authority health and welfare services. Some medical

officers of health regularly circulate all general practitioners in their area with detailed information, and it is strongly recommended that this should be done in all areas. It can be of great value to the general practitioner to know what assistance can be provided by his local authority. The full use of health visitors would tend to obviate repeated visits on the part of the general practitioner and would facilitate his work by securing rapid assistance through the local authority.

In all these ways the health visitor can supplement the service of the general practitioner, and by working in partnership they can weld together both the clinical and preventive aspects of the service within the existing arrangements under Parts III and IV of the National Health Service Act.

In certain areas a health visitor has been allocated by the medical officer of health to work with a group of general practitioners. This has proved to be a satisfactory arrangement, but its practicability depends on local circumstances. It is recommended that this arrangement could well be extended wherever possible.

GENERAL MEDICAL SERVICES COMMITTEE

The January meeting having been cancelled, the members of the General Medical Services Committee, meeting on February 18, had 50 items on the agenda and separate documents to the number of 25. The chair was taken by Dr. A. TALBOT ROGERS.

The Committee decided to renominate Dr. Joel Green to the Joint Pricing Committee, and Dr. Wand, with Dr. Gorsky as his alternate, were nominated for co-option by the Psychological Medicine Group Committee for the purpose of assisting in the preparation of evidence to the Royal Commission on Mental Illness and Deficiency. The Chairman said that the Government wanted a general practitioner to serve on the Advisory Council for Handicapped Persons. The name of Dr. Vaughan Jones, the chairman of the Occupational Health Committee, was put forward and agreed to unanimously.

Maternity Medical Services

Dr. CATHERINE HARROWER introduced the report of a subcommittee which had been appointed to review maternity medical services, with particular reference to the relation of fees to the work done. The subcommittee stressed that the abolition of the obstetric list as it now exists, for which the Association has been pressing, must not involve any reduction in the present fee which covers antenatal care during pregnancy, attendance at confinement if necessary, medical care of mother and child for 14 days after confinement, and a post-natal examination. Dr. Harrower said that the subcommittee was not at present making any recommendation as to the adequacy of existing fees, but was of opinion that, should this be the subject of examination at a later date, the fact that the great majority of general practitioners undertook the fullest antenatal care (not usually restricted to the two examinations which, when the regulations were framed, were regarded officially as discharging the doctor's obligation) should be borne in mind. The report also asked for more widespread facilities for the postgraduate education of the general-practitioner obstetrician.

Dr. A. B. DAVIES moved that the report be received with congratulations to the subcommittee. The CHAIRMAN said also that thanks were due to Dr. Harrower and her subcommittee for the work they had done. If this report were passed by the Conference it would embody their firm policy over a large number of matters connected with the maternity services.

A question was raised by the Rochester, Chatham, and Gillingham Division concerning institutional midwifery. The secretary of the Committee explained that the Ministry had sent out an R.H.B. circular in which it was stated that the social factors determining whether a patient should be confined in hospital should be assessed by the medical officer

of health on the advice of health visitors and midwives. The Ministry was not prepared to amend the circular, but the deputy chief medical officer had said that he would naturally be in favour of consultation with the general practitioner in regard to a patient's home conditions, and that he would deal with that through informal channels. But the county medical officer of health in the area mentioned had insisted on rigid adherence to the terms of the circular, and therefore there seemed nothing for it but to take up the point with the Ministry.

A small sampling inquiry is being made by the Ministry into analgesia in domiciliary midwifery, the purpose being to find out why some patients do not have gas-and-air analgesia. A copy of the questionnaire was shown to the Committee. One member expressed the fear that medical practitioners doing midwifery did not make use of this facility to the extent they might. Another said that the midwives were doing their job, and the parturient woman was having a much easier time than 15 or 20 years ago. The Chairman said that there should be universal availability of gas and air.

The Scottish Subcommittee

After Dr. J. T. BALDWIN had presented the minutes of three meetings of the General Medical Services Subcommittee (Scotland), the CHAIRMAN said that during the previous week he and the secretary of the Committee had attended in Scotland with a deputation from the subcommittee to the Department of Health, and had been very much impressed, not only with the way in which the subcommittee had tackled its problems, but particularly with the friendly atmosphere in the Department. There was a free and frank discussion and a willingness on the other side to see the profession's point of view.

Responsibility in Partnerships

A report was made to the Committee of a conference which had taken place with representatives of the medical defence societies on the question of responsibility for the acts or omissions of a partner or deputy. The conference had arrived at the following principles: that a practitioner remains responsible for the acts or omissions of any other practitioner acting as his deputy, where the deputy is an assistant or locum tenens not on the medical list; that where the deputy is also principal on the medical list, whether as partner or agent, he should be responsible for his own acts or omissions unless there is prima facie evidence that the principal upon whose list the name of the patient appeared had himself acted in breach of the terms of service; in the event of a complaint being made it should be the duty of the Service Committee before the hearing to decide whether there was a prima facie case against the first doctor or whether he had merely been cited because the patient's name appeared on his list. In the latter event, if he could show that he had made proper deputizing arrangements, no further action should be taken against him, and only the deputy should be required to appear.

After a short discussion it was agreed that the proposals should be referred to the Annual Conference of Local Medical Committees.

Woodberry Down Health Centre

The London Local Medical Committee sent a letter asking for advice on certain points of principle arising in connexion with the Woodberry Down Health Centre, which was opened in 1952. The practitioners working at the centre had asked that physiotherapy facilities should be provided there, these to be available also to local doctors outside the centre. The question arose whether such provision would place the doctors working at the centre in an unduly advantageous position as against their colleagues outside. A similar request had been made for a part-time technician in the pathological laboratory at the centre, and here the same considerations applied.

Dr. M. SORSBY said that it was obvious that what was being done in London might have its effect in other centres. He reminded the Committee that Woodberry Down was not established for the practitioners who worked in it, but for a specified unit of population in the neighbourhood. If the proposals for physiotherapy facilities and for technical assistance in the pathological laboratory went forward it must be always provided that other practitioners in the district would be allowed to share for the benefit of their patients.

Dr. DAVIES hoped that the Committee would give the utmost support to the London Local Medical Committee in these negotiations. Dr. WOOLLEY pointed out that health centres for the present were on an experimental basis. He suggested that the request for technical assistance in the pathological laboratory should be supported, but not the request for physiotherapy facilities.

The CHAIRMAN said that Woodberry Down was built lavishly, but also with some foresight, and it was intended by its planners to have a certain elasticity of function. He believed that the Committee was prepared provisionally to agree with the London Local Medical Committee in going forward with these negotiations, provided the facilities were available to all.

Asked whether the rent paid by the doctors using the centre would be increased in view of these additional facilities, Dr. SORSBY said that when the rent was fixed at £350 a year for each suite it was known that the facilities would be increased; that amount would remain the rent for a term of years.

It was finally agreed that the London Local Medical Committee should have full discretion in dealing with the proposal in the light of the views expressed.

Exchange of Practices

Dr. DAIN, in presenting the report of a subcommittee which had been appointed to explore ways and means of making it easier for general practitioners to exchange practices, said that no "clever" solution had been found. The ideal would be to have a clearing-house for all doctors who wished an exchange, having specially in mind those doctors who, approaching retirement age, desired perhaps to move from a large industrial practice to a small one in a residential area. Dr. Potter, medical director of the Medical Practices Advisory Bureau, had been able to put a large number of doctors in touch with one another, but for many reasons the results had been disappointing. With better publicity, however, and the co-operation of the executive councils, more might be done.

Dr. POTTER said that the mass advertisement which appeared in a recent issue of the *Journal* had produced a large number of inquiries, but again the results had been disappointing. The reason why there were not more exchanges was that the people who wanted to exchange all wanted the same thing—in other words, the best of the bargain. The machinery was in the Bureau ready for use. Dr. WAND suggested the possibility, with the co-operation of the Medical Practices Committee, of earmarking certain of the Medical Practices Committee would certainly co-operate. Already a certain number of men over 50 were being put on short lists, and only the previous week his committee had agreed to a recommendation for a man aged 62 to a small practice.

It was agreed to bring this matter before the Conference, and in the meantime to discuss it with the Medical Practices Committee.

The Defence Trusts

The Committee resolved itself successively into the National Insurance Defence Trust and the General Medical Services Defence Trust. Dr. CATHERINE HARROWER, the treasurer, reported that at the end of 1953 the total accumulated funds of the former amounted to £453,674 and of the latter, £73,368. The income of the N.I.D.T. in 1953

was £14,462, exceeding the expenditure by £448, and the income of the G.M.S.D.T. was, from subscriptions, £37,601, and from investments £1,601.

The Springfield Story

The Committee heard a report by one of its members, Dr. A. CAMPBELL, on the closure of Springfield maternity home at Blackburn. For over a quarter of a century Springfield, a 20-bedded hospital, the only general-practitioner hospital in the town, had served a population of over 110,000 people. Dr. Campbell said that in October, 1953, without consultation with the Blackburn or Lancashire Executive Councils or the general practitioners concerned, the hospital management committee recommended closure to the regional hospital board. Vigorous opposition to this step was evoked, and the strongest protest went to the Ministry. On the evening of January 7, however, the secretary of the hospital management committee announced to the patients that the hospital was to be closed on the morrow and they were given the alternative of transfer to a maternity hospital eight miles away or return to their homes. Some of the general practitioners who had charge of patients in the hospital were informed of this development by telephone on the morning of the evacuation. In one case the patient had been delivered on the previous day, but she was removed in spite of the protests of her doctor. Complaint was also made concerning the attitude of the Minister of Health when speaking at a political meeting at Darwen a month later, in which he declared that he was satisfied that the right thing was done at the right time. Dr. Campbell urged that a deputation should go from the Committee to the Ministry.

After a very full discussion it was agreed that Sir John Hawton, permanent secretary to the Ministry of Health, should be asked to receive a small deputation to discuss the matter.

Other Business

It was stated that the Joint Committee on Prescribing, which had now completed the task for which it was set up, had recommended to the Central Health Services Council that a small permanent committee should be appointed to continue its work, and that the Association would be asked to make a nomination. The CHAIRMAN said that this should be a purely advisory committee, and that further information about its constitution and terms of reference should be sought before any nomination was made. The Committee approved the Chairman's proposal.

The report of a section set up by the London Local Medical Committee to examine the problem of the aged and infirm sick had been sent to the General Medical Services Committee for consideration. It was referred first of all to the Geriatrics Subcommittee.

Representatives of the Committee had met officials of the Board of Customs and Excise to discuss the Committee's contention that general practitioners should no longer be called upon to provide certificates to enable surgical corsets to be obtained free of tax. The customs officials had expressed their full sympathy with the Committee's views on the abuse of the present arrangements and were glad of the opportunity of first-hand medical advice on the subject. It was pointed out, however, that there were difficulties in the way of completely abolishing certificates for this purpose. Surgical corsets were only part of the wider problem of surgical appliances as a whole. The feeling was expressed that any conditions which might give rise to abuse should be deleted from the prescribed list. To this end severe splanchnoptosis had already been deleted. It was agreed that the Committee should keep the complete list under review and suggest any further deletions which might be made in order to reduce the certification burden.

Much other detailed business, some of it arising out of questions from local medical committees, was dispatched.

THE AMENDING ACTS COMMITTEE

RESTORATION OF GOODWILL

The Amending Acts Committee met on February 25, with Dr. H. H. D. Sutherland in the chair, to consider for presentation to the Council a scheme for the optional restoration of the right to buy and sell practice goodwill. The Committee had before it the observations of a subcommittee which had been appointed to go into the details of the matter.

The Committee agreed to a scheme which will be put before the Council of the Association for debate at its next meeting on March 9.

FRIENDLY SOCIETIES' DROP IN MEMBERSHIP

CHIEF REGISTRAR'S REPORT

The principal object of friendly societies is to ensure sickness pay and death benefit, although they often provide other benefits such as accident pay, superannuation, etc. They suffered "serious set-backs" when the Government, in 1946, created its own machinery for administering the National Health Insurance Scheme, and extended the range of compulsory insurance to include almost the whole of the working population. The Chief Registrar of Friendly Societies, in his report for the year 1952,* shows that membership of the societies fell by 21%, from 8,608,000 to 6,786,000, from 1947 to 1952, having previously risen by 3% since 1937 (the last year in which Part 2 of the yearly report was issued). Juvenile membership had the sharpest fall—by 47% as against the adult 23% in some branches, and by 54% as against 15% in others. In spite of the decline in membership, total funds have continued to rise—from £146,142,000 in 1937 to £215,996,000 at the end of 1952. During this period sickness pay dropped from £5,695,000 to £5,292,000, but death benefits increased from £1,628,000 to £1,889,000.

Among exceptions to the trend of declining membership the Hearts of Oak Benefit Society and the six largest Holloway societies have increased their membership. Societies providing institution treatment and whose main business is other than a cash sickness benefit have suffered only a negligible loss of membership.

Decline of Voluntary Service

The Chief Registrar in his report says that it would be wrong to attribute the decline of membership solely to the impact of National Insurance. The rate of decline, although still serious, has in fact slowed considerably since 1949. The need to supplement national by voluntary insurance is generally acknowledged, states the report, but far more activity on the part of the societies is needed than at any time in the past. One of the difficulties mentioned is that of finding members willing and able to give time to the societies' management; it has become increasingly harder to find volunteers to carry on the work, and the death or retirement of a secretary is often the signal for dissolution.

The group of medical societies providing medical attendance, medicines, or surgical appliances has been closed, as these benefits are provided by the State under the N.H.S. Act, 1946. Some of these societies have changed their object to that of the provision of cash benefits, and have been reclassified accordingly.

* Report of the Chief Registrar of Friendly Societies for the Year 1952, 1954, Part 2, H.M.S.O., London.

At the Royal Halifax Infirmary general practitioners are encouraged to meet members of the hospital medical staff in the hospital library between 11 and 11.30 a.m. Light refreshments are served.

Scottish News

PRESCRIBING STATISTICS FOR SCOTLAND

A circular (E.C.S.(P.)5/1954) issued by the Department of Health for Scotland to Scottish executive councils says that the Secretary of State for Scotland has made arrangements, in consultation with representatives of the medical profession and of executive councils, for the periodical issue of statistics about the prescribing of general practitioners. The statistics will be produced by the pricing bureaux three times a year and will cover a month's prescriptions in each case. The table will show, for each doctor resident in the area covered by the executive council, the average cost per prescription form and average cost per patient, together with corresponding averages for the area and for the whole of Scotland. About 55% of each doctor's prescription forms will be fully priced, and it is thought that this will produce reliable figures for comparing the different doctors' prescribing costs.

In the case of a partnership, the average cost per form E.C.10 will be calculated on the total number of patients and the total cost of prescriptions of the partners. In the case of a dispensing doctor paid on a capitation basis the average cost per patient will be found by adding 9d. for each "dispensing" patient to the total cost of forms E.C.10 issued and dividing this sum by the total number of patients on the list.

Use of the Statistics

The statistics will have a double function. They will show doctors how their prescribing costs compare with those of their colleagues, and they will indicate to local medical committees the doctors whose prescribing might merit investigation under the regulations. Executive councils are asked to send a slip to each doctor showing his own prescribing statistics and the corresponding averages for the area and for the whole of Scotland, in order to help him to compare his prescribing costs with those of his colleagues.

REMUNERATION OF CONSULTANTS

LIVERPOOL REGION MEETING

At the request of a number of consultants in the Liverpool Region a special general meeting was called on Sunday, February 28, to discuss the present state of the negotiations for the implementation of the Spens report. The meeting was attended by 110 consultants and specialists, together with some registrars who had been invited as observers. After lengthy discussion in which a number of speakers expressed their anxiety at the lack of knowledge regarding the negotiations and the length of time that they were proceeding, the following two resolutions were passed unanimously and with enthusiasm:

(1) "This Meeting is of the opinion that in any negotiations that may be undertaken it is essential that the Spens Report on terms and conditions for hospital medical staff should not be abandoned or altered without reference to the general body of all consultants and specialists. Furthermore, this Meeting is of the opinion that there has been undue delay in the full implementation of the Spens Report and considers that the Whitley machinery is an unsatisfactory method of negotiation. It calls for the right of arbitration, even if this necessitates an amendment in the National Health Service Act."

(2) "That this Meeting further calls on the Central Consultants and Specialists Committee to consider now what further steps should be taken to bring a speedy conclusion to these protracted negotiations."

It was furthermore resolved to send these resolutions to the Central Consultants and Specialists Committee, regional consultants and specialists committees, and the Registrars' Group with the hope that these bodies would give them their full support.

PUBLIC HEALTH COMMITTEE

A meeting of the Public Health Committee of the Association was held on February 19, with Dr. H. K. Cowan in the chair. It was reported that the evidence to be submitted on behalf of the Association to the Working Party on Health Visitors, the preparation of which had been the responsibility of a Joint Subcommittee of the Public Health, General Medical Services, and Central Consultants and Specialists Committees, had been completed and would be submitted to the parent committees at their next meetings, with a view to approval by the Council on May 5.

Remuneration

The Committee received a report that only three authorities have not yet implemented Industrial Court Awards Nos. 2285 and 2321. With reference to the recent Award to assistant medical officers (No. 2452) all local health authorities, with one exception, have accepted and are implementing the Award. The position in County Down in connexion with the remuneration of divisional medical officers had been the subject of a special report to the Ministry of Health and Local Government, Northern Ireland. This report was discussed by the Committee and the view was expressed that the advice given by the independent investigator was acceptable to the Committee subject to clarification on two points. It was agreed that an assurance should be sought from the Ministry and that if satisfactory the Council be recommended to concur with the advice set out in the report, which it was understood had been accepted by the Ministry.

Appeals Machinery in Northern Ireland

What was described as a step forward was contained in a letter from the Ministry of Health and Local Government, Northern Ireland, with regard to appeals machinery in Northern Ireland. A liaison committee representing the various interests in the health services found that in the absence of formal Whitley machinery for the health services in Northern Ireland it would be difficult for an appeals arrangement to be fashioned on the British model, yet benefit might be derived from the formation, where appropriate, of *ad hoc* committees consisting of representatives of the employing authority and of the professional association or trade union of the employee. The Minister appreciated the value of *ad hoc* committees in seeking to resolve disputes, but pointed out their limitations. Further consideration must be given to the point that if an *ad hoc* committee failed to agree there was no provision for further appeal save by recourse to the general machinery for the settlement of industrial disputes.

The Public Health Committee was reminded that the suggestions for the constitution of *ad hoc* committees had been put forward by the Association last year when a deputation led by the chairman had discussed the matter with the Minister of Health. It was felt that progress was being made but that details of the arrangements would need to be discussed further.

Public Health Representation on Regional Hospital Boards

An analysis was placed before the Committee of the medical membership of regional hospital boards in England and Wales. The total number of members of the boards is 379, and, of these, 115 are medical members, but include only three members of the public health services. It was felt that medical officers of health could give valuable assistance and advice to boards, and it was agreed to ask the Council to include in the list of doctors recommended for appointment to regional hospital boards and boards of governors the names of suitable members of the public health service.

"Added Years"

It was reported that as a result of representations made by the Association the Minister of Housing and Local Government had decided that the medical and nursing staff of local authorities (who had hitherto been excluded) should have the benefit of the "added years" regulation. This regulation (No. 12 of the Draft Local Government Superannuation (Benefits) Regulations) lays it down that where, for the efficient discharge of his duties, a contributory employee is required to possess professional or other qualifications which he has not acquired during employment with a local authority, he may request the authority to direct that a number of years be added to his service, and he will be entitled to reckon that number of additional years as contributing service.

Conference on Venereal Disease

The Venereologists Group Committee had represented to the chairman of the Public Health Committee the increasing difficulty in the follow-up of venereal cases and more particularly the tracing of contacts, and had suggested that it might be useful to call a conference of venereologists to which medical officers of health also might be invited.

The chairman reported that during the informal discussions held between representatives of the two committees it had been agreed to recommend that such a conference should be held in the form of a joint meeting of the Public Health and Venereologists Group Committees and that the Society of Medical Officers of Health and the Medical Society for the Study of Venereal Diseases be invited to send representatives. The Committee accepted the recommendation and provisional arrangements were made for the conference to be held in March.

Meat Production and Control

It was reported that the British Veterinary Association had submitted a memorandum to the Ministry of Agriculture in which it had suggested that the veterinary profession should be responsible for the supervisory control of meat inspection and that local authority meat inspection functions should be transferred to the Ministry's animal health service. An important implication of the plan was that medical supervision through the medical officer of health over meat inspection would be removed.

Regret was expressed that the British Veterinary Association had not seen fit to inform the British Medical Association of its intended action through the Joint Committee of the two bodies, which had already discussed the matter. After detailed discussion it was agreed that the principle of medical supervision was vital, especially bearing in mind the relationship between meat inspection and the prevention and control of human disease. It was understood that the Council of the Society of Medical Officers of Health felt strongly on this matter, and it was agreed that the Society of Medical Officers of Health be asked to join with the Committee in preparing a memorandum setting out the views of the profession to be submitted to the appropriate Government department.

Other Matters

Other matters under discussion included the occupational resettlement of tuberculous persons, vaccination, and institutional accommodation for mental patients.

At the conclusion of the Public Health Committee a formal meeting of the Trustees of the Public Health Service Defence Trust was held.

Correction.—In the report of the Ophthalmic Group Committee meeting (Supplement, February 27, p. 55), under the heading "Treatment of Cataract and Glaucoma," the quotation from a Ministry circular, "early diagnosis [of glaucoma] appears to be all too frequent . . ." should have read, ". . . appears to be all too infrequent."

HOSPITAL PUBLIC AND PROFESSIONAL RELATIONS

The Public and Professional Relations Subcommittee of the Central Consultants and Specialists Committee met on February 26. Professor P. C. P. Cloake was in the chair, and Dr. H. Guy Dain, the chairman of the Association's Public Relations Committee, attended the meeting by invitation. The Subcommittee gave further consideration to the questions of the improvement of professional relationships, the relations between hospital staffs and general practitioners, and the relations between hospitals and the public. Some recommendations on these matters were agreed to and will be put before the parent committee at its next meeting.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

The Clare Wand Fund

SIR.—At the last Annual Conference of Local Medical Committees the Chairman of the Conference gave a brief report on the progress of the Clare Wand Fund, which it will be remembered was established as a mark of appreciation of the services rendered to the profession by the Chairman and Secretary of the General Medical Services Committee during the course of the long negotiations which led up to the Danckwerts award. The Trustees of the Fund wish to express their grateful thanks to all those local medical committees and individual general practitioners who have responded to their appeal, and are glad to be able to report that as a result upwards of £12,000 now stands to the Fund's credit.

When making their appeal the Trustees stated that the principal object of the Fund would be to provide educational assistance to those in general practice, and since then a good deal of thought has been given to the precise use to which the Fund should be put. First, the Trustees wish to encourage projects which will enhance the prestige of general practice itself, and they have been in touch with a number of organizations which have shown a good deal of interest in the establishment of the Fund and offered much help and encouragement. Secondly, the Trustees have examined a number of specific projects which they consider would be appropriate for the Clare Wand Fund to undertake, and the following are among the suggestions that have been made:

- (1) Travelling scholarships to study methods of practice, either from the point of view of clinical method or of organization.
- (2) Financial help to general practitioners: (a) to enable them to carry out research, particularly in subjects which are regarded as primarily the concern of the general practitioner; and (b) to assist them to take postgraduate degrees or diplomas, including original work for a thesis.
- (3) Sponsored lectures and demonstrations for groups of general practitioners in their own localities for purposes of revision and keeping up to date.

For the time being the Trustees have decided to keep the allocation of grants approximately within the limits of the Fund's investment income, and this will mean that for the next 12 months about £700 will be available to finance approved projects. It is obvious that this figure may restrict the Trustees in making grants for research projects which they might otherwise have wished to encourage, and it is hoped that in certain cases it may be possible to provide financial assistance by means of a loan.

The suggestions set out above are to be regarded as tentative and exploratory and any additional suggestion which comes within the broad objective of the Fund, whether de-

signed to enhance the status of general practitioners, or individual items of research, will be sympathetically examined. The Trustees are anxious to receive all the help they can in launching the Fund, and they hope that general practitioners who wish to avail themselves of the opportunities which the Fund offers, either for purposes on the lines indicated above or for other projects which they themselves wish to suggest, will not hesitate to get in touch with them.

Full details should be sent with any application made, and addressed to Mr. R. H. Currey, Secretary of the Clare Wand Fund, British Medical Association House, Tavistock Square, London, W.C.1.—I am, etc.,

London, W.C.1

S. WAND,
Chairman

Remuneration of Hospital Medical Staff

SIR.—One of your correspondents (Dr. K. M. Hume, *Supplement*, February 20, p. 49) thinks it unjust to criticize the efforts of those dealing with this problem when we know nothing of the difficulties. I support him. I was connected with those efforts at the start, and I assure the critics that their representatives hold very strong views indeed on the matter. One of several reasons which made me give up my attempt to represent the profession was that I could not agree on the policy to adopt in this extraordinarily difficult problem, and was not happy in going as far as the present negotiators. Your correspondents can be sure that everything is being done they would wish.

But what happens is this. Negotiators have to persuade Ministry officials to advise the Minister to put to the Cabinet for submission to a House of Commons in which the Government has not too big a majority (depending on a small percentage of votes in the country) a proposal which would be the very probable target of criticism that might swing an appreciable number of votes in an election. These votes come from an electorate whose constitution must be considered by a Government whose future depends on it. According to the *Radio Times* (February 5, p. 12), of 23½ million people in this country 80% get no more than £500 a year, and 38% less than £250. *The Times* of February 17 stated that the purchasing power of £1,000 in 1946 is represented to-day by the sum of £1,446. Another of your correspondents (Dr. B. Sugden, p. 49) suggests at least an 80% betterment factor. This would raise the annual income of a whole-time consultant from £2,750 to £4,950. We cannot really expect the Government to suggest this straightaway to an electorate of whom 80% earn little more than a tenth of it, and 38% a twentieth.

Of course, net receipts from higher incomes are relatively small. At the same time, this will not be easily understood by the majorities and minorities referred to above, at whom the Government must look, and to whom (and this is the point of this letter) hospital medical staffs should equally make good their case.—I am, etc.,

Hove.

W. A. BOURNE.

SIR.—Most of us in general practice know very little of the work or economies of S.H.M.O.s. I presume they are specialists. Of their hours of duty and their work we know nothing, so we cannot judge, but obviously from the correspondence in the *B.M.J.* they feel they are very unfairly treated.

I feel that a lot of their trouble may be due to an unrealistic attitude. I am a country doctor whose work brings him into touch with the farm worker. This fine type of highly skilled and knowledgeable man owes his position at the bottom of the wage division to his scattered job—a few here and there on scattered farms—and his idealism. Much the same applies to S.H.M.O.s. Nowadays those employed by the Government do not obtain better pay and conditions by reasoned argument but by their ability to cause public distress if they withhold their services. In the case of the railways the effect of ceasing work is felt by the community

immediately, and especially at Christmas, so the State was obliged to pay up at once. The S.H.M.O.s, wishing to be good citizens and gentlemen, will not take drastic action, so they are not getting anywhere. Let us also realize that nowadays politics play a great part in relation to the pay packet. The voting power of the S.H.M.O.s is negligible. With a party political system the effect of economic policy is bound to be affected by considerations of political expediency.—I am, etc.,

Shrewsbury.

ALBERT E. NICHOLLS.

SIR.—Dr. K. M. Hume says (*Supplement*, February 20, p. 49) that he had to purchase a car at the peak of its price; that he is faced with obtaining and furnishing a house, and preparing for the schooling of a family. These are the aims, I infer, that he hopes to achieve on the salary of a consultant in the National Health Service. I am happy to be able to tell him how to obtain his ends. As a preliminary he should give up all hope of fulfilment of the recommendation of the Spens Report in his lifetime. He must then: (1) give up any idea of increasing his family; (2) give up paid domestic help; (3) give up endowment and life insurance policies; also sickness insurance policy; (4) give up holidays except those taken at home and spent in house redecoration, etc.; (5) give up all secretarial help other than what his wife can offer when she is not occupied in household chores or looking after the children; (6) give up all hope of ever replacing his car; (7) give up smoking, give up all entertaining; (8) become a teetotaller; (9) build his hospital department into an empire of underlings; and then (10) act the sycophant to any acquaintance who may promote his scanty hopes of a merit award.

By following these few simple instructions and not attending the cinema more than once in three months Dr. Hume should find himself in a position to send two children to a public school and live within his means.—I am, etc.,

D. J. ROSS STEEN.

Weymouth.

A Bob a Job

SIR.—I wonder that more protest is not made regarding the odious practice of rural practitioners being forced to collect a shilling in respect of medicine given to the patient. The point of this is completely lost on 90% of patients, who regard it as a direct supplement to their doctor's income. As one tersely said to me the other day: "It must be much better for you now, doctor."

I am continuously asked after suturing lacerations, syringing ears, and even on one occasion after examining a chest, if the fee for my services is 1s. But the climax came one evening when, out of surgery hours, a local man on the list of a colleague four miles away (and therefore not eligible to be a temporary patient) came in distress with a small piece of metal embedded in his conjunctiva. I removed this with a great deal of patience and a fair amount of dexterity, whereupon he flung down two sixpences, saying, "I suppose that'll be a bob," and left me standing open-mouthed. To what further depths can our reputations and the recognition of our skill sink?—I am, etc.,

Thirk.

MARGARET J. OLDFIELD.

Notes and News

A Closer View.—An executive council in the north of England recently asked nine applicants for a practice vacancy to come for interview. When five of the applicants—all assistants in general practice—failed to attend, inquiries were made and it was found that all five had received offers of partnerships from their own principals as a result of being short-listed.

Association Notices

ELECTION OF MEMBERS OF COUNCIL

Notice is hereby given that nomination of candidates for election as members of Council, 1954-5, (a) by the following Divisions and Branches, (b) by public health service members, and (c) by women members, must be forwarded in writing so as to reach me not later than Saturday, April 3, 1954.

Forty Members by Branches in Great Britain and Northern Ireland

Group	England and Wales	No. of Members of Council to be Elected by Group
1.	North of England Branch; Tees-side Branch	2
2.	East Yorkshire Branch; Yorkshire Branch	3
3.	North Lancashire and Westmorland Branch	1
4.	Divisions in Cheshire: Birkenhead and Wirral; Chester; Crewe; Hyde; Macclesfield and East Cheshire; Mid Cheshire; Stockport; Wallasey	1
5.	Lancashire Divisions of Merseyside Branch: Liverpool; St. Helens; Southport; Warrington. Isle of Man Branch	1
6.	Lancashire Divisions of South Lancashire and East Cheshire Branch: Ashton-under-Lyne; Bolton; Bury; Leigh; Manchester; Oldham; Rochdale; Salford; Wigan	1
7.	Derbyshire Branch; Nottinghamshire Branch; Lincolnshire Branch; Leicester and Rutland Branch	2
8.	Midland Branch	1
9.	Staffordshire Branch; Worcester and Hereford Branch	1
10.	Berks, Bucks, and Oxford Branch; Northamptonshire Branch	1
11.	Cambs and Hunts Branch; Norfolk Branch; Suffolk Branch	1
12.	Divisions of Metropolitan Counties Branch in Middlesex	2
13.	Marylebone Division	1
14.	City Division; South-west Essex Division; Stratford Division; Tower Hamlets Division	1
15.	Hampstead Division; St. Pancras Division; Westminster and Holborn Division	1
16.	Chelsea and Fulham Division; Kensington and Hammersmith Division; Paddington Division	1
17.	Camberwell Division; Greenwich and Deptford Division; Lambeth and Southwark Division; Lewisham Division; Wandsworth Division; Woolwich Division	1
18.	Bedfordshire Branch; Essex Branch; Hertfordshire Branch	1
19.	Surrey Branch	2
20.	Kent Branch	1
21.	Sussex Branch	1
22.	Dorset and West Hants Branch; Southern Branch	1
23.	Bath, Bristol, and Somerset Branch; Gloucestershire Branch; Wiltshire Branch	2
24.	South-western Branch	1
25.	North Wales Branch; Shropshire and Mid-Wales Branch	1
26.	South Wales and Monmouthshire Branch	1

Scotland

27.	Aberdeen Branch; Dundee Branch; Northern Counties of Scotland Branch; Perth Branch	1
28.	Edinburgh and South-east of Scotland Branch; Fife Branch	1
29.	Glasgow and West of Scotland Branch (Glasgow Division)	1
30.	Glasgow and West of Scotland Branch (County Divisions); Border Counties Branch; Stirling Branch	2

Northern Ireland

31.	Northern Ireland Branch	2
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Public Health Service Members

Two members of Council are nominated and elected by members of the Association employed in the public health service as defined in By-law 1 (3). Candidates must be members of the public health service as so defined.

One Woman Member

One woman member of Council is nominated and elected by women members of the Association.

Nominations

The nominations must be on the prescribed forms, copies of which can be obtained on application to me. In the case of the 40 members to be elected by Divisions and Branches, the nomination may be by a Division or Division-Branch as such, or by not fewer than three members of any Branch in the Group.

A notice will be published by the Council in the *British Medical Journal Supplement* on April 17, 1954, of the candidates nominated. Where contests occur, voting papers containing the names of all duly nominated candidates will be issued on April 24, 1954, from the Head Office, British Medical Association, Tavistock Square, London, W.C.1, to each member in the Group, or to the public health service members, or to women members. A notice will be published by the Council in the *Supplement* of May 15, 1954, giving the results of the elections where there have been contests.

A. MACRAE,
Secretary.

Diary of Central Meetings

MARCH

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| 6 Sat. | Hypnotism Subcommittee, Psychological Medicine Group Committee, 10 a.m. |
| 9 Tues. | Committee on Arbitration Machinery, 1 p.m. |
| 9 Tues. | Council, 2 p.m. |
| 10 Wed. | Council, 10 a.m. |
| 11 Thurs. | Subcommittee on Service Committee and Tribunal Regulations, G.M.S. Committee, 11 a.m. |
| 16 Tues. | Anaesthetic Services Subcommittee, Anaesthetists Group Committee, 1.30 p.m. |
| 16 Tues. | Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.1), 2 p.m. |
| 17 Wed. | Remuneration Subcommittee, Occupational Health Committee, 2 p.m. |
| 17 Wed. | Joint meeting of Public Health and Venereologists Group Committees, 2.30 p.m. |
| 18 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 18 Thurs. | Dermatologists Group Committee, 12 noon. |
| 18 Thurs. | Dermatologists Group Conference, 2 p.m. |
| 18 Thurs. | Organization Subcommittee, Central Consultants and Specialists Committee, 2 p.m. |
| 19 Fri. | Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m. |
| 24 Wed. | Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m. |
| 25 Thurs. | International Relations Committee, 2 p.m. |
| 26 Fri. | Charities Committee, 11.30 a.m. |
| 30 Tues. | Waverley Evidence Committee, 11 a.m. |

Branch and Division Meetings to be Held

BIRMINGHAM REGIONAL REGISTRARS' GROUP.—At Small Committee Room, Queen Elizabeth Hospital, Birmingham, Monday, March 8, 8.15 p.m., extraordinary general meeting. Dr. E. E. Claxton (Assistant Secretary, B.M.A.): "Current Registrar Problems"—including remuneration, future prospects for Registrars, and other relevant matters. There will be an opportunity for questions and discussion.

BRADFORD DIVISION.—At Medical Society's Room, Bradford Royal Infirmary, Wednesday, March 10, 8.15 p.m., meeting. Dr. J. F. Wilkinson: "Modern Treatments of Blood Diseases."

BURTON-ON-TRENT DIVISION.—At Bretby Golf Club, Ashby Road, Burton-on-Trent, Tuesday, March 9, 8 p.m., informal supper, followed by annual B.M.A. Lecture by Dr. W. R. Russell: "Poliomyelitis."

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, March 9, 8.30 p.m., general meeting. B.M.A. Lecture by Dr. R. D. Lawrence: "Diabetes in General Practice."

DAREFORD DIVISION.—At Embassy Ballrooms, Welling, Wednesday, March 10, 8 for 8.30 p.m., annual dinner.

DONCASTER DIVISION AND DONCASTER MEDICAL SOCIETY.—At the Danum Hotel, Doncaster, Thursday, March 11, 7.15 for 7.45 p.m., annual dinner and dance.

EAST HERTS DIVISION.—At Hertford County Hospital, Wednesday, March 10, 8.45 p.m., meeting. Address by Dr. R. F. Tredgold: "The Relations Between the Psychiatrist and the General Practitioner."

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Heane Bay, Thursday, March 11, 7.30 p.m., dinner: 8.45 p.m., Dr. R. H. Andrews: "Present Trends in the Management of Pulmonary Tuberculosis."

GOOLE AND SELBY DIVISION.—At The Lodge, Snaith, Thursday, March 11, 7.30 p.m., meeting. Dr. S. T. Anning: "Varicose Ulceration of the Legs."

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, March 11, 8.30 p.m., meeting. Lecture by Dr. R. S. Hodge: "The Psychology of Crime."

HALIFAX DIVISION.—At Out-patients Department, Halifax General Hospital, Wednesday, March 10, 8.30 p.m., clinical meeting.

HASTINGS DIVISION.—At Royal East Sussex Hospital, Hastings, Tuesday, March 9, 8.15 p.m., meeting. Address by Mr. A. Hollingsworth: "Some Causes of Sudden Loss of Vision."

HENDON DIVISION.—At Hendon Hall Hotel, London, N.W., Tuesday, March 9, 8.45 p.m., meeting. Dr. J. A. Hobson: "The Mentality of Christie." Illustrated by lantern slides.

KESTEVEN DIVISION.—At George Hotel, Grantham, Thursday, March 11, 7.15 for 7.30 p.m., dinner; 8.15 for 8.30 p.m., annual meeting. Address by Mr. E. A. J. Heath: "Health of the Doctor."

LAMBETH AND SOUTHWARK DIVISION.—(1) At Lambeth Hospital, Brook Drive, Kennington Road, S.E., Sunday, March 7, 11 a.m., clinical meeting. (2) At Court Room, Lambeth Town Hall, Brixton Hill, London, S.W., Tuesday, March 9, 8.15 p.m., meeting. Lecture by Dr. R. Forbes: "Recent Developments in Medical Litigation." Members of the Camberwell and Wandsworth Divisions are invited to this meeting.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, March 9, 5 p.m., address for senior students by Dr. Michael Ward: "The Ascent of Everest." All recently qualified practitioners are invited.

MONMOUTHSHIRE DIVISION.—At St. Mellons County Club, Friday, March 12, 7.30 for 7.45 p.m., dinner. Lecture by Dr. R. Donald Teare: "Murder" (illustrated).

NOTTINGHAMSHIRE BRANCH.—At 64, St. James's Street, Nottingham, Thursday, March 11, 8.30 p.m., meeting. B.M.A. Lecture by Mr. Harold Dodd: "The Perils of Thrombosis."

SALFORD DIVISION.—At Kersal Cell, Lower Kersal, Salford, Wednesday, March 10, dinner. Principal guest and speaker, Mr. Leslie Walsh, LL.B., B.C.L. Members, their ladies, and friends are invited.

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, March 11, 8.30 p.m., meeting. B.M.A. Lecture by Dr. A. H. Douthwaite: "The Treatment of Peptic Ulcer." Illustrated by lantern slides.

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Thursday, March 11, 8.30 p.m., meeting. Address by Dr. R. H. Dobbs with the collaboration of Dr. Young: "Recent Advances in the Treatment of Coeliac Disease."

SOUTH-WEST WALES DIVISION.—At Stepney Hotel, Llanelli, Saturday, March 13, 7.30 p.m., dinner. Dr. F. E. Camps: "The Role of the General Practitioner in Criminal Investigation."

SWANSEA DIVISION.—At Langland Bay Hotel, Swansea, Thursday, March 11, lecture by Sir Lionel Whitby.

TOWER HAMLETS DIVISION.—At St. George-in-the-East Hospital, Raine Street, Wapping, E., Friday, March 12, 8 p.m., clinical meeting.

TUNBRIDGE WELLS DIVISION.—At Pembury Hospital, near Tunbridge Wells, Tuesday, March 9, 8.30 p.m., clinical meeting.

WEST BROMWICH AND SMETHWICK DIVISION.—At Pathological Laboratory, Hallam Hospital, West Bromwich, Tuesday, March 9, 8.15 p.m., meeting. Talk and demonstration by Dr. J. C. Ford: "The Practitioner and the Laboratory."

WEST HERTS DIVISION.—At Shrodell's Hospital, Watford, Friday, March 5, 9 p.m., joint clinical meeting with Watford and West Herts Medical Society.

WEST SUSSEX DIVISION.—At Dolphin Hotel, Chichester, Wednesday, March 10, 6 for 6.30 p.m., general meeting. Mr. D. H. MacLeod: "Common Disorders in Gynaecology."

Meetings of Branches and Divisions

BLACKPOOL AND FYLDE DIVISION

There were 48 members present on February 10, 1954, to hear Sir Heneage Ogilvie give the B.M.A. lecture on the subject of "Dyspepsia."

HAMPSTEAD DIVISION

A meeting was held at the New End Hospital on February 10, 1954. Nineteen members were present, together with guests and members of the hospital staff. Dr. Lena Williams took the chair.

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announce that Dr. Thomas Leven (Irvine, Ayrshire) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 13 1954

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THE GUILLEBAUD COMMITTEE*
MEMORANDUM OF EVIDENCE FROM THE
ROYAL COLLEGE OF PHYSICIANS

The following is a summary of some of the points in the evidence submitted by the Royal College of Physicians to the Committee of Inquiry into the cost of the National Health Service (the Guillebaud Committee).

Introductory

"In considering how a service should be financed," the evidence says, "one must consider its particular purpose and nature." It is pointed out that the name of the National Health Service is somewhat misleading. The 1946 Act did not set up a national service, like the post office. Though the Minister of Health took wide powers which he could hold in reserve, the Government's avowed object was to integrate, support, and supplement the work of existing medical agencies, rather than to unify, regulate, or supersede them. The N.H.S. should in fact be regarded as a confederation of medical institutions, from single-handed practice to the large hospital, whose activities need co-ordination and sometimes leadership. It is they, not the Minister, who are directly responsible for what happens to the people who seek their help, and the Act was framed in such a way that personal responsibility to the patient, and local responsibility to the public, should be weakened as little as possible by the co-ordinating measures needed to ensure medical care for everybody.

Control of the Service

The College points out that in the hospital service efficiency depends largely on finding able and knowledgeable members for committees and boards; and such people will eventually cease to give their time to this work if they have little or no money to spend as they think fit.

Referring to hospital management committees, the College draws the difference between the management of the financial affairs of the old voluntary hospitals and the present hospital financial arrangements. On the whole it favours the present N.H.S. method, but points out that, until there are better methods of costing, it will tend to favour the hospital that asks for too much, and loses again if it spends less than it is authorized to spend. In the opinion of the College, "a sense of fuller responsibility, with incentives to economy, should be restored to management committees (1) by giving them the whole sum that they are authorized to spend during the year, (2) by making it easier for them to transfer expenditure from one budgetary heading to another, and (3) by letting them use savings for minor capital improvements or for establishing a contingency fund."

*The British Medical Association's evidence to the Guillebaud Committee will be published in the *Supplement* after the Association's representatives have presented their oral evidence.

Control over their housekeeping would be exercised by providing that deficits must be carried forward. A management committee finding itself in arrears would apply to the regional board, which (for good reason shown) might be prepared to pay off the deficit, in part or whole, from its own contingency fund; but failing such help the management committee would have to meet its obligations out of its own future income. . . . If a committee is to act responsibly it must feel responsible; and it will never feel responsible unless it can make its own choices and its own mistakes."

Regional Hospital Boards

The College, in its evidence, defines the primary function of the regional board as that of seeing that all the needs of the public are met. While keeping within the general policies which integrate the service it must have power to reduce the supply to one consumer while increasing the supply to another. So long as it is the executive intermediary between the centre and the periphery, it should also be responsible for transmitting, and if necessary interpreting, all directives or statements of policy to the hospitals of its region, and it should likewise receive the returns and accounts of those hospitals.

Capital expenditure must be planned in consultation with the Ministry, but, once a project has been approved in general terms, a regional board should be free to carry it out and tackle its problems in its own way unhindered by detailed blue-prints from London.

Ministry of Health

Funds for capital development, the College thinks, should be kept separate from those for maintenance. It would be a considerable improvement if capital development were financed by grants-in-aid from the Exchequer to the Ministry for periods of five years. It is advocated that the Ministry should have the advice of some central advisory body, possessing the confidence of the professions concerned, which should be charged with keeping the development policy of the service under continuous review. The College had hoped that the Central Health Services Council would fulfil this function, but it has not done so.

The Treasury

The College is aware that established financial practice is incompatible with its wish that the Ministry, the regional boards, and the management committees should each receive the sum allocated to them and should bear full responsibility for its proper use. Social innovations so great as the N.H.S., however, may necessitate innovations also in financial practice. A system devised for controlling Government department expenditure is not necessarily suitable for controlling the expenditure of a new kind of service administered basically by voluntary boards and committees. In the past five years, by continually exercising its final

authority, the Treasury has assumed no small responsibility for the administration and development of the N.H.S. and has thereby weakened the responsibility felt by everybody else. In the College's experience the conventional system of financial control has in fact removed incentives to economy, encouraged peripheral expenditure on non-essentials, and antagonized or depressed many of the abler voluntary administrators on whom success depends. The alternative put forward is to place financial responsibility squarely on the people, at all levels, who are administering the service. With severe penalties for irresponsible overspending, and real rewards for economy, the risk of the N.H.S. presenting supplementary estimates would be lessened.

Modifications in Organization

While agreeing that consideration of eventual alterations in the structure of the N.H.S. is desirable, the College thinks that any basic reconstruction now would be premature and done without sufficient knowledge. Little would be gained by abolishing the regional hospital boards, and the College favours giving them more scope.

With regard to the unification of the three branches of the Service under one local administrative authority, the College says: "Such unification might look good on paper yet do little to help patients; and its possible advantages in practice cannot usefully be assessed until the present organization has had full trial."

Public Health

The College feels that consideration of the nation's needs would show that the National Health Service could profitably devote more of its funds to public health. Such expenditure might reduce the demand on the expensive curative services.

General Practice

Pointing out that hospital care is the most costly care, the College says that money would be saved if more cases were investigated and treated by the general practitioner. "In the technical revolution in medicine general practice has lagged behind. With the rise of specialism, the scope of the work undertaken by the average practitioner has steadily narrowed, and the public has come to believe that all but the most trivial ailments need the attention of a specialist. Since 1948, when consultations with the practitioner became free, the number of patients going to him has risen and he has often responded by sending more of them to hospital. Yet the introduction of various new and effective remedies has made it possible for him—given the time and the will—to treat more patients in their homes or in general-practitioner hospitals of a simple kind. The Danckwerts award should lead to an increase in the number of practitioners, to a reduction in the size of their lists, and consequently to a better opportunity to practise as a doctor rather than a disposal agent. In many areas the practitioner already has direct access to pathological and radiological departments, which helps him to make his own diagnosis; but he also needs beds for the care of minor illnesses (with specialist advice at hand where required)."

The College also stresses the value of group practices.

Hospitals

The College states that a higher turnover of hospital beds, although desirable, will not lessen the cost of hospitals so long as there is a waiting-list.

The following is said about pay-beds: "Many potential paying patients are now deterred by the unnecessarily high charges made, and accordingly enter the ordinary beds of the hospitals where they are treated free. If pay-beds were regarded as an ordinary business proposition, the service would surely encourage, rather than discourage, people who want to pay for themselves."

Whole-time Service

The College gives its opinion that a whole-time salaried service for general practitioners "would make it easier

for practitioners to refuse unreasonable demands by patients; but the consequent saving of money on drugs would be offset by disadvantages. The remuneration of nearly all practitioners almost wholly by capitation fee is a sufficient innovation for the time being, and until its merits and demerits have been proved by many years' trial the profession will oppose any fresh experiment."

The evidence goes on to say that "some money might be saved by making all consultant appointments full-time. The possible saving is difficult to gauge, but the College does not believe that it would amount to much. Again, a long period of time would have to elapse before such a change could be made. More important is the harm that might be done to the service through this alteration in policy. Medical or surgical practice in a large hospital, with the aid of registrars and housemen, is quite different from medical practice more or less single-handed, or with the aid of a practitioner, in the patient's home, in which responsibility cannot be shared and the consultant gets to know the patient as a person. Senior consultants commonly believe that private practice has provided a discipline and experience which they could never have gained in hospital, and they look with apprehension towards a system in which the young physician or surgeon may lose alike in self-assurance, in understanding, in humanity, through having always worked within four walls as one of a large team aiming at a high turnover. . . . Examples of shortcoming, and also examples of outstanding success, can be found both among full-time and among part-time staff. If the part-timer can sometimes be accused of excessive interest in his private practice, the full-timer can sometimes be accused of deficient interest in anything except his leisure—a fault even graver."

"Medicine is unique in its scope, since it has to concern itself with the welfare of body and mind, and, in the modern world, every citizen, in health and even more in sickness, is increasingly brought into relation with the State. The independence of the medical profession is therefore of fundamental importance to every individual, and there is a widespread fear that, if almost all doctors were to become whole-time servants of the State, the traditional independence of the medical profession would be seriously compromised, and our society would have lost an asset, the value of which cannot be estimated in economic terms."

"An Adequate Service"

In discussing the future of the National Health Service the College says: "It is generally agreed (1) that, as medicine grows more complex, and undertakes more and more difficult cures, doctors will go on asking for more and more money for their work; (2) that neither this nor any other country can afford a perfect curative medical service. Nevertheless the word 'adequate' strikes chill because it suggests a dead level of uniformity in which medical progress itself must die. Clearly, in a service committed to providing medical care for everybody, the standard reached must be 'adequate' throughout; but this is not enough. In some at least of its institutions the N.H.S. must afford conditions in which medicine at the most advanced level can be practised. Otherwise British medicine will be quickly deprived of the remarkable position of leadership it has gained during and since the war, and will go into a slow decline until even adequacy will be unattainable."

Pointing out that when they were taken over in 1948 the hospitals were in various stages of development and that even now they are not by any means consistently adequate, the College's evidence tells of the difficulties and problems that have had to be overcome. It is thought that £35m. already spent on capital expenditure in five years has paid a good dividend, but nevertheless, a sum at least two or three times more is required to complete the necessary re-fore anything approaching adequacy can be claimed, much more will have to be done for the mental hospitals and institutions for the mentally sick and mentally deficient is far

below the standard of other social provisions . . . and a dangerous situation is arising in which the supply of mental nurses, on whom these institutions of course depend, is beginning to dry up."

A Rising Charge

The evidence concludes by discussing whether—if income and prices remained stable—an adequate service could be kept going on the sum now allocated to maintenance. Inducements to economy are needed, and money would also be saved by bringing more buildings and equipment up to date. "But the higher annual expenditure needed merely to put the care of mental patients on a level comparable with the care of other patients would more than offset any saving that economy or better buildings could conceivably achieve. Moreover, there are other parts of the N.H.S., including the establishment of consultants and specialists, in which the College believes that adequacy has not yet been attained. Hence, even if incomes and prices remained stable, a larger annual sum is likely to be needed for maintenance."

"Since," the evidence states, "a perfect service is impracticable, the nation should decide what proportion of the national income it is prepared to spend on medical care; and the N.H.S. should then be left to do the best it can with this allowance."

MEDICAL ETHICS

In response to requests from members, the Central Ethical Committee of the B.M.A. has asked that the Association's ethical rules relating to consultations and other matters should be published again in the Supplement. These rules were approved by the Representative Body in 1950 and were first published in the Supplement on June 10, 1950.

I.—RULES AS TO THE ETHICS OF MEDICAL CONSULTATIONS IN PRACTICE

1. In these Rules a practitioner consulted is a practitioner who, with the acquiescence of the practitioner already in attendance, examines a patient under this practitioner's care and, either at a meeting of the two practitioners or by correspondence, co-operates in the formulation of diagnosis, prognosis, and treatment of the case. The term "consultation" means such a co-operation between practitioners.

2. It is the duty of an Attending Practitioner to accept the opportunity of consultation in obscure and difficult cases, or to acquiesce in any reasonable request for consultation expressed by the patient or his representatives.

3. The Attending Practitioner should nominate the practitioner to be consulted, and should advise accordingly, but he ought not to refuse to meet a registered medical practitioner selected by the patient or by the patient's representatives, although he is entitled, if such is his opinion, to urge that the practitioner selected has not the qualifications or the experience demanded by the particular requirements of the case.

4. The arrangements for consultation should be made or initiated by the Attending Practitioner. The Attending Practitioner should ascertain in advance the amount of the fee, if any, to be paid to the practitioner consulted, and should inform the patient or his representatives that this should be paid at the time of the consultation.

5. In cases where the Consultant and the Attending Practitioner meet and personally examine the patient together, the following procedure is generally adopted and should be observed, unless in any particular instance there is substantial reason for departing from it.

(a) All parties meeting in consultation should be punctual, and if the Attending Practitioner fails to keep the appointment the practitioner consulted, after a reasonable time, may examine the patient, and should communicate his conclusions to the Attending Practitioner in writing and in a sealed envelope.

(b) If the consultation takes place at the patient's residence, the Attending Practitioner should, on entering the room of the patient, precede the practitioner consulted, and after the examination the Attending Practitioner should be the last to leave the room.

(c) The diagnosis, prognosis, and treatment should be discussed by the practitioner consulted and the Attending Practitioner in private.

(d) The opinion on the case and the treatment as agreed should be communicated to the patient or the patient's representatives where practicable by the practitioner consulted in the presence of the Attending Practitioner.

(e) It is the duty of the Attending Practitioner loyally to carry out the measures agreed at, or subsequently to, the consultation. He should refrain from making any radical alteration in these measures except upon urgent grounds or after adequate trial.

6. If for any reason the practitioner consulted and the Attending Practitioner cannot examine the patient together, the Attending Practitioner should send to the practitioner consulted a brief history of the case. After examining the patient, the practitioner consulted shall forward his opinion, together with any advice as to treatment he may advise, in a sealed envelope addressed to the Attending Practitioner, and he may give to the patient or to the patient's representatives such information as he judges appropriate to the position.

In cases where the Attending Practitioner accepts the opinion and advice of the practitioner consulted he should carry out the measures recommended as in the event of agreement (Rule 5); where, however, the Attending Practitioner finds he is in disagreement with the opinion and advice of the practitioner consulted he should by suitable means communicate his disagreement to the practitioner consulted.

7. Except in emergency, the arrangements for any future or other consultation or additional investigation shall be left to the initiative of the Attending Practitioner.

8. The practitioner consulted shall not attempt to secure for himself the care of a patient seen in consultation. It is his duty to avoid any word or action which might disturb the confidence of the patient in the Attending Practitioner. The practitioner consulted should not communicate with the patient or the patient's representatives subsequent to the consultation except through the Attending Practitioner.

9. The Attending Practitioner should carefully avoid any remark or suggestion which would seem to disparage the skill or judgment of the practitioner consulted.

10. Except by mutual consent the practitioner consulted shall neither supersede the Attending Practitioner during the illness with which the consultation was concerned, nor shall he act as Attending Practitioner to the patient in any subsequent illness.

11. Should the practitioner consulted and the Attending Practitioner hold divergent views, either on the diagnosis or on the treatment of the case, and should the Attending Practitioner be unwilling to pursue the course of action advised by the practitioner consulted, this difference of opinion should be communicated to the patient or his representatives by the practitioner consulted and the Attending Practitioner jointly, and the patient or his representatives shall then be advised either to choose one or other of the suggested alternatives or to obtain further professional advice.

Note.—In the following circumstances it is especially desirable that the Attending Practitioner should endeavour to secure consultation with a colleague:

(a) When the propriety has to be considered of performing an operation or of adopting some course of treatment which may involve considerable risk to the life of the patient or may permanently prejudice his activities or capacities and particularly when the condition which it is sought to relieve by this treatment is not itself dangerous to life;

(b) When any procedure likely to result in death of a foetus or of an unborn child is contemplated, especially if labour has not commenced;

(c) When continued administration of any drug of addiction is deemed desirable in the case of a person who does not need it otherwise than for the relief of symptoms of addiction;

(d) When there is reason to suspect that the patient (i) has been subjected to an illegal operation, or (ii) is the victim of suspected criminal poisoning.

II.—OTHER INTRA-PROFESSIONAL OBLIGATIONS

Under the code of ethics of the profession a practitioner ought not to accept as his patient (except with the consent of the colleague concerned),

1. Any patient or member of a patient's household whom he has previously attended either as a consulting practitioner or as a deputy for a colleague.

2. Any patient or member of the patient's household whom he has attended within the previous five years in the capacity of assistant or locumtenent.

3. Any patient who at the time of the application is under the active care of a colleague, unless he is personally satisfied that the colleague concerned has been notified by the patient or his representatives that his services are no longer required.

4. Any patient who so applies because his regular medical attendant is temporarily unavailable. In such case he should render whatever treatment may for the time be required, and should subsequently notify the patient's regular attendant of the steps he has taken.

5. Notwithstanding Rule 3 above, when a practitioner in whatever form of practice is asked for advice or treatment by a patient and has reason to believe that the patient is already under medical care and that the request is made without the knowledge of the attending practitioner, it is the duty of the practitioner so approached to urge the patient to permit him to communicate with the attending practitioner. Should the patient refuse this proposal and if the circumstances are exceptional the practitioner is at liberty to examine the patient and to tell the patient his findings and conclusions, but, save for any emergency which exists, he shall not accept the patient for treatment.

III.—GUIDANCE FOR PROFESSIONAL CONDUCT
IN RELATION TO DENTISTS

(As agreed with the British Dental Association)

Rules Governing Consultations

(1) Where a patient, in the opinion of his medical attendant, needs simple dental treatment, the patient should be referred in all but exceptional circumstances to his own dentist. In the event of the patient having no regular dentist, there is no objection to a doctor recommending a dentist of his own choice.

(2) Where a doctor (for the benefit of one of his patients) requires to consult a dentist, the doctor should communicate in the first instance with the patient's own dentist. In the event of the patient having no regular dentist there is no objection to the doctor consulting the dentist of his own choice.

(3) Where, for any reason, the patient's doctor considers that the patient should be sent to a dentist other than his own, or where a further dental opinion is sought, the patient's usual dentist should be informed.

Note.—Apart from simple dental treatment—that is, in the presence of a dental condition which might affect the general health of the patient or necessitate a major dental operation—the dentist should consult the patient's doctor before carrying out such treatment.

Anaesthetics

Where an anaesthetic is advised by the dentist, it is competent for him to select the anaesthetist, but, if such anaesthetist is not the patient's doctor, no objection should be taken to the patient inviting his doctor to be present. Where the operation proposed is a major one, or if it is known to the dentist that the patient is under medical care, the dentist should consult the patient's doctor upon the operation proposed and should invite him to be present if the patient so desires. Similarly, where the patient is under dental care and the doctor advises operative or other major treatment arising from the patient's dental condition, the dentist should be consulted.

On the completion of any dental operation, and especially if there is any reason to think that post-operative complications may ensue, the patient should be advised to consult the dentist immediately if such complications arise and the dentist should take all reasonable steps to facilitate such consultation.

IV.—EXAMINING MEDICAL OFFICERS

Ethical Rules

For the purpose of these Rules an examining medical officer is a practitioner undertaking the examination of a patient of another practitioner at the request of a third party with the exception of examinations under statutory requirements. Rules 2 and 3 do not apply to examinations in connexion with superannuation, pre-employment, or proposals for life or sickness assurance.

(1) An Examining Practitioner must be satisfied that the individual to be examined consents, personally or through his legal representative, to submit to medical examination and understands the reason for it.

(2) When the individual to be examined is under medical care, the Examining Practitioner shall cause the Attending Practitioner to be given such notice of the time, place, and purpose of his examinations as will enable the Attending Practitioner to be present should he or the patient so desire. (Preferably such notice should be sent to the Attending Practitioner through the post, or by telephone, but in certain circumstances a communication might properly be conveyed by the patient.)

Exceptions to this are:

- (a) When circumstances justify a surprise visit.
- (b) When circumstances necessitate a visit within a period which does not afford time for notification.

Where the Examining Practitioner has acted under (a) or (b) he shall promptly inform the Attending Practitioner of the fact of his visit and the reason for his action.

(3) If the Attending Practitioner fails to attend at the time arranged the Examining Practitioner shall be at liberty to proceed with the examination.

(4) An Examining Practitioner must avoid any word or action which might disturb the confidence of the patient in the Attending Practitioner and must not, without the consent of the Attending Practitioner, do anything which involves interference with the treatment of the patient.

(5) An Examining Practitioner shall confine himself strictly to such investigation and examination as are necessary for the purpose of submitting an adequate report.

(6) Any proposal or suggestion which an Examining Practitioner may wish to put forward regarding treatment shall be first discussed with the Attending Practitioner either personally or by correspondence.

(7) When in the course of an examination there come to light material clinical findings, of which the Attending Practitioner is believed to be unaware, the Examining Practitioner shall, with the consent of the patient, inform the Attending Practitioner of the relevant details.

(8) An Examining Practitioner shall not utilize his position to influence the person examined to choose him as his medical attendant.

(9) When the terms of contract with his employing body interfere with the free application of these rules, a Medical Officer shall make honest endeavour to obtain the necessary alteration of his contract either individually or through the British Medical Association.

ADDITIONS TO THE FILM LIBRARY

The following have been added to the Film Library of the Association:

Marrow Puncture: Presented by Imperial Chemical Industries Ltd. Colour, sound, 33 minutes. 1953.

Milestone in Medicine: Presented by the American Medical Association. Colour, sound, 12 minutes. 1951.

Hay-fever: Presented by Parke, Davis & Co. Black and white, sound, 18 minutes. 1953.

Pentothal—Its Use in Intravenous Anaesthesia: Presented by Abbott Laboratories Ltd. Colour, sound, 42 minutes. 1953.

The above films are now available for hire from the Film Library. Applications should be made to the Secretary. A catalogue of the films held by the Association has been published, and copies, price 5s., can be obtained on application to the Secretary.

Scottish News

TOUR OF DENMARK FOR SCOTTISH
DOCTORS

In view of the great success of the visit of a group of Scottish doctors to Denmark last autumn and of the fact that it was not then possible to include anything like all those who wished to go, the Danish Institute has repeated its invitation this year. Before accepting this invitation the Scottish Committee instructed the office to ascertain if the British Council or other similar body would sponsor a similar visit of Danish doctors to Scotland. Subsequent inquiries have shown that this is not possible at the moment. The Committee has gratefully accepted the Institute's invitation, at the same time resolving that steps be taken to arrange for a reciprocal visit of Danish doctors next year.

The tour will again be in the first fortnight of September, and will be on the same lines as last year—that is, visits to hospitals, university medical departments, medical institutes, and other places of interest to doctors. It is hoped to provide alternative programmes so as to meet the particular interests of the visiting doctors.

The cost of the tour will be approximately £40, including travel Newcastle-Copenhagen-Newcastle and the stay in Denmark. All expenses of travelling in Denmark will be met by the Danish Institute, who will make the programme arrangements in co-operation with the Danish Medical Association.

Doctors in Scotland who are interested in this tour should communicate with the Scottish Secretary, British Medical Association, 7, Drumsheugh Gardens, Edinburgh, 3, without delay.

IRISH HEALTH ACT

COMMENT BY I.M.A.'S PRIVATE PRACTITIONERS'
GROUP

The *Journal of the Irish Medical Association* (March, 1954, p. 87) reports that at a meeting of the Private Practitioners' Group of the Irish Medical Association on February 7, the secretary summarized some 50 communications received from members of the Group giving their opinions of the Health Act, 1953. Among other things, they stated that the remuneration offered was totally inadequate, that members should refuse under all circumstances to dispense medicines, and that travelling allowances should be payable in country districts. The chairman, Dr. Sean McCann, outlined the recent decisions of the Central Council of the Association (see *Supplement*, February 20, p. 48).

The members present at the meeting signed a document declaring their refusal to accept service under the Health Act until it conformed to the principles of the I.M.A., or until participation was approved by the Association. The view was expressed that similar action should be taken throughout the Association.

JOINT ANNUAL MEETING, TORONTO, 1955

Already the number of members of the Association who have notified their wish to attend the Joint Annual Meeting with the Canadian Medical Association in Toronto, June 20-24, 1955, considerably exceeds the number for whom the Exchange Control authorities are likely to supply the Canadian currency. Any other members who would like to attend the meeting are asked to notify the Secretary of the Association, B.M.A. House, Tavistock Square, London, W.C.1, as soon as possible, and not later than April 15, stating whether they prefer air or surface travel and whether they wish to accept the offer of private hospitality in Toronto. Details of costs were given in the *Journal* of November 7, 1953 (p. 1055).

CHANGES IN MATERNITY BENEFITS

New National Insurance (Maternity Benefits and Miscellaneous Provisions) Regulations, which came into force on March 1 and which supersede the provisional 1953 Regulations (*Supplement*, August 15, 1953, p. 78), make changes in the conditions for payment of maternity grants for multiple births and of the maternity allowance in the case of early confinement.

The £9 grant for each child of a multiple birth is now payable if the child survives 12 hours or longer. Previously the condition was that the child should survive until the day following confinement.

In cases of confinement earlier than expected and where the mother does not claim maternity allowance until after the confinement, the allowance of 32s. 6d. a week is now payable for the number of weeks by which the confinement is early in addition to the seven weeks' allowance which previously was all that could be claimed in such cases.

Correspondence

Remuneration of Hospital Medical Staff

SIR,—Your correspondents on the subject of hospital staff remuneration will, I am sure, find your leading article (*Journal*, February 27, p. 507) singularly unhelpful. Beyond summarizing the Spens report in its relevant parts and saying that it is a good thing, you do little to alleviate their "impatience and alarm," not to say well-founded anxiety. They know that the Spens report is a good thing and have been saying so for weeks. What, I imagine, is required is a statement of the present position in the negotiations and evidence that the Staff Side is pressing vigorously for a retrospective settlement.

Your emphasis, in the title and substance of the leading article on consultants rather than all hospital grades, while no doubt unintentional, was unfortunate. It would be a pity if the lower grades were to gain the impression that their badly needed salary increases are being held up while the consultants haggle about increasing their merit awards. —I am, etc.,

Edinburgh.

E. A. HARRIS.

SIR,—I have followed with interest the correspondence regarding the pay of hospital medical staff. You point out in your leading article (*Journal*, February 27, p. 507) that new features have been introduced which make any comparison with the position in 1939 difficult. This is an understatement of the position. The whole question of the "betterment" factor as applied to the pay of consultants has been bedevilled by the acceptance of the principle of the payment of merit awards. It would clearly be quite unrealistic to expect the Treasury to meet not only the cost of these awards but also a betterment factor comparable with that granted to general practitioners.

It is unfortunate that that section of the consultants chiefly interested in securing the implementation of the Spens recommendations consists of those with the least influence in shaping of medical policies. A large proportion of them work in smaller provincial centres and in rural areas. Though their work is at times meritorious it has not those particular qualities which are likely to attract the attention of the Merit Awards Committee.

You rightly say that the acceptance by the Government of the Spens report played a large part in persuading consultants to enter the Health Service, "albeit with reluctance." Another influence of equal importance was the promise to part-time consultants of continued opportunity for private practice. There has been a double dereliction of faith by the Minister of Health. The Spens recommendations have not been implemented, and in the smaller centres of population private practice has been effectively destroyed by fixing the cost of pay-beds at a prohibitive level. The result is that

the "undistinguished" consultant subsists on a part-time salary based on income rates ruling in the year 1938-9, plus 20%. He is at the present time worse off than the majority of his general-practitioner colleagues.

Any funds available for distribution as a "betterment" factor for consultants are likely to be limited. It would be following accepted principles if in the first instance some increase should be granted to the worst-paid group. Those who are clearly without distinction and are prepared to accept this fact as a permanent disability might well be granted a modest betterment increment as a consolation prize. It is unnecessary to stress the importance of maintaining secrecy in the payment of such awards based as they will be upon the absence of professional merit.—I am, etc.,

Sudbury, Suffolk.

H. BATHURST NORMAN.

SIR,—I have read your leading article on remuneration of consultants (*Journal*, February 27, p. 507) and other correspondence on this subject, and become more and more uneasy at the tardiness with which our affairs are conducted. Your leader offers no hope of an early settlement—in fact, tells us nothing that we do not already know. What we want to know is when are we going to receive our award and how much will it be. To those of us with families to educate these are urgent questions which must be answered soon.—I am, etc.,

Northampton.

T. K. DAVIDSON.

SIR,—We, the undersigned, find the letter of Dr. W. A. Bourne (*Supplement*, March 6, p. 66) quite astonishing. He appears quite content to throw overboard the sheet anchor of the Spens report and its corollaries. He accepts, without apparent demur, the continued absence of the right of arbitration, on which his population income statistics have no bearing.

The present situation arises directly from devaluation; had the 80% of the population received no redress for the fall in the value of money, there might be some substance in his argument. We are not prepared to allow his doctrine to pass unchallenged, because the fulfilment of the Spens recommendations and the grant of the right of arbitration are matters upon which the whole future of successive generations of the profession must depend. We are not aware that the foundations of Parliamentary stability were in any way shaken by the promulgation of the Danckwerts award. That the welfare state appears to survive solely on continuous inflation is a fundamental weakness, but if Parliament cannot stabilize the currency we must hold the administration to its bond, if persuasion fails, by direct action.—We are, etc.,

Dorchester.

T. V. COOPER.
A. N. BLADES.G. H. TEE.
R. O. J. CLARK.

Association Notices

Diary of Central Meetings

MARCH

- 16 Tues. Anaesthetic Services Subcommittee, Anaesthetists Group Committee, 1.30 p.m.
16 Tues. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
17 Wed. Remuneration Subcommittee, Occupational Health Committee, 2 p.m.
17 Wed. Joint meeting of Public Health and Venereologists Group Committees, 2.30 p.m.
18 Thurs. G.M.S. Committee, 10.30 a.m.
18 Thurs. Dermatologists Group Committee, 12 noon.
18 Thurs. Dermatologists Group Conference, 2 p.m.
18 Thurs. Organization Subcommittee, Central Consultants and Specialists Committee, 2 p.m.
19 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.

- 19 Fri. Joint Conference on B.V.A. Memorandum, 1934, 10.30 a.m.
24 Wed. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
24 Wed. Geriatrics Joint Subcommittee, Central Consultants and Specialists, G.M.S., and Public Health Committee, 2.15 p.m.
25 Thurs. International Relations Committee, 2 p.m.
25 Thurs. Medico-Legal Subcommittee, Central Consultants and Specialists Committee, 6 p.m.
26 Fri. Charities Committee, 11.30 a.m.
26 Fri. Hospital Junior Staffing Subcommittee, Central Consultants and Specialists Committee, 11.30 a.m.
30 Tues. Waverley Evidence Committee, 11 a.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Cambridge Hospital, Aldershot, Thursday, March 18, 8.30 p.m., clinical meeting.
ASHTON-UNDER-LYNE DIVISION.—At Physiotherapy Department, Lake Hospital, Ashton-under-Lyne, Friday, March 12, 8.45 for 9 p.m., meeting. Film: "Senile Obliterative Arteritis of the Legs." Mr. R. T. Grime will give a few comments after the film. Members of adjacent Divisions within the Hospital Group are invited.

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, March 16, 8.30 p.m., meeting. Lecture by Mr. Hugh Carson: "Abdominal Emergencies."

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, Queens Drive, Blackpool, Wednesday, March 17, 7.15 p.m., dinner; 8.30 p.m., Dr. M. C. G. Isaacs: "The Anaemias."

CHELSEA AND FULHAM DIVISION.—At West London Hospital, Hammersmith, W., Friday, March 19, 8.30 p.m., clinical meeting. Papers by Drs. L. S. Konstam, L. P. E. Laurent, and Mr. H. W. Burge. Members of the Kensington and Hammersmith Division are invited.

ENFIELD AND POTTERS BAR DIVISION.—At St. Michael's Hospital, Chase Side Crescent, Enfield, Wednesday, March 17, 8.30 p.m., clinical meeting. Short clinical papers by Dr. J. Hutton Chisholm, Dr. W. D. Hyde, Dr. Gerard Lang, and Dr. C. Allan Birch.

FURNESS DIVISION.—At Duke of Edinburgh Hotel, Abbey Road, Barrow-in-Furness, Friday, March 19, 7.30 for 8 p.m., attending. Male members and male guests only will be attending.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, March 11, 8.30 p.m., Dr. R. S. Hodge: "The Psychology of Crime."

LEEDS DIVISION.—At the Mansion, Roundhay Park, Leeds, Friday, March 19, 7.30 for 8 p.m., Hot Pot Supper.

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Dr. C. A. K. Bird's house, Scriven Lodge, Prestbury Road, Macclesfield, Thursday, March 18, 8.30 p.m., meeting. Address by Dr. D. G. Evans: "Whooping Cough."

NORTH OF ENGLAND BRANCH.—At Royal Victoria Infirmary, Newcastle-upon-Tyne, Thursday, March 18, 7.15 p.m., clinical demonstration by Dr. T. H. Boon: "Indigestion"; 8.45 p.m., address by Mr. Andrew Logan: "Surgical Treatment of Mitral Disease."

NOTTINGHAMSHIRE BRANCH.—Correction: The notice of a meeting of this Branch printed in the *Supplement* of March 6 (p. 68), Perils of Thrombosis" would be delivered at that meeting on March 11, was incorrect. Mr. Harold Dodd's B.M.A. Lecture will be on April 29 at 8.30 p.m.

OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Oldham, Monday, March 15, 9 p.m., meeting. Dr. A. Morgan Jones: "Recent Advances in the Diagnosis of Heart Disease."

SOUTHAMPTON DIVISION.—(1) At Polygon Hotel, Friday, March 19, 7.30 for 8 p.m., annual dinner dance. (2) At Canute Room, Polygon Hotel, Southampton, Wednesday, March 17, 8.30 p.m., general meeting. Address by Dr. F. E. Camps: "The Changing Face of Forensic Medicine in Relation to Murder."

SOUTH MIDDLESEX DIVISION.—At Red Lion Hotel, Hounslow, Wednesday, March 17, 8.45 p.m., meeting. Lantern slide lecture by Dr. R. Donald Teare.

SOUTHPORT DIVISION.—At the Assembly Rooms, Prince of Wales Hotel, Southport, Thursday, March 18, 8.30 p.m., meeting. B.M.A. Lecture by Dr. W. S. C. Copeman: "Treatment of the Rheumatic Diseases."

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, March 19, 8 p.m., meeting. Address by Professor A. M. Claye.

SWINDON DIVISION.—At Goddard Arms Hotel, Swindon, Friday, March 19, 8 for 8.15 p.m., annual dinner. B.M.A. Lecture by Sir Heneage Ogilvie.

WEST BROMWICH AND SMETHWICK DIVISION.—At the Red Cow, High Street, Smethtwick, Friday, March 19, 8 p.m., dinner (9 p.m., dinner).

WEST HERTS DIVISION.—At Stanbroughs Hydro, Watford, Wednesday, March 17, 8.30 p.m., general meeting. Two films: (1) "Dental Anaesthetics in Adults"; (2) "Dental Anaesthetics in Children."

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 20 1954

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British Medical Association PROCEEDINGS OF COUNCIL

A meeting of the Council of the Association was held at B.M.A. House, Tavistock Square, on Tuesday afternoon, March 9, and on Wednesday, March 10. The chair was taken by Dr. E. A. GREGG. The Council was faced with a formidable amount of business, the agenda consisting of more than 60 items, with 11 separate documents.

Obituary

The CHAIRMAN with regret announced the deaths of Dr. H. E. Gibbs (Wellington, New Zealand), a Vice-President of the Association, Dr. H. W. Pooler (Ashover), Vice-President and former member of Council, and Professor K. H. Digby (Bromley) and Dr. T. W. Morgan (New Malden), former members of Council. The Chairman said how much they all grieved at the loss of these old associates.

He also announced with regret the death of Dr. N. G. Horner, Editor of the *British Medical Journal* from 1928 to 1946. He succeeded Sir Dawson Williams and before that he was assistant editor.

He had written to Lord Horder in the name of the Council expressing sympathy on the death of Lady Horder.

Award of Gold Medal

The Chairman said that it was with great personal pleasure that he moved, on behalf of the Office Committee, that the Gold Medal of the Association for Distinguished Merit be awarded to Dr. S. Wand in recognition of his outstanding services to the Association and to the medical profession. Dr. Wand had been a member of Council since 1935, and he had been associated with many committees, of a number of which he had been chairman. He was chairman of the General Medical Services Committee during the difficult time of the final culmination of the efforts made on behalf of general practitioners in the National Health Service to get an adequate remuneration for their services. He did devoted work in that connexion and spent an enormous amount of time and energy, which finally led to what was now known as the Danckwerts award. Opportunities had already been taken of expressing the gratitude of the profession to Dr. Wand, but his friends in the Council had felt that the presentation of the Gold Medal was the only suitable and proper recognition which the Association could make, because it was the highest award in its power to bestow.

By the regulations governing the award the resolution had to be voted on by ballot, and when the ballot papers were collected it was announced, amid continued applause, that the award of the Gold Medal to Dr. Wand had been made unanimously.

Dr. WAND said that this was the one occasion on which he really could not find words, though it might come as a

surprise to some members of Council that that should have happened. He was deeply indebted to the Council for this award. It was the greatest possible honour, in his view, that could come to a member of the profession, and that it should have come to him, when in fact he had enjoyed doing the work so very much, seemed somehow all wrong.

Election of Vice-Presidents

The CHAIRMAN further moved that it be recommended to the Representative Body that, with effect from the conclusion of his term of office as President, Mr. J. W. Tudor Thomas be elected a Vice-President of the Association in recognition of his valuable services. He said that they all appreciated immensely the work that Mr. Tudor Thomas had put into the Association. Before he became President he was an active member. He had taken the duties of his Presidency very seriously, and they all still had in mind the memorable meeting in Cardiff when he was the moving spirit. They looked forward to many years when they would have his co-operation. They also would wish to convey their thanks and felicitations to Mrs. Tudor Thomas. The President was setting out that very night on his journey to the Middle and Far East to represent the Association. He would carry with him their greetings to their colleagues in those regions.

The recommendation was carried unanimously, and Mr. TUDOR THOMAS said how greatly he appreciated the honour and the words of Dr. Gregg about himself and his wife, to whom he would certainly convey the message.

At a later stage in the afternoon the Council took leave of the President and bade him God-speed on his journey.

The CHAIRMAN also proposed that it be recommended to the Representative Body that Mr. A. M. A. Moore be elected a Vice-President in recognition of his valuable services. He said that Mr. Moore, who had served the Association as Treasurer for six years, would not be continuing in that office after the Annual Meeting. Mr. Moore had put in a long period of service. He had taken great interest in the Metropolitan Counties Branch and he was also one of the moving spirits in connexion with the Board of Registration of Medical Auxiliaries. His work in the formative years of the Central Consultants and Specialists Committee would also be remembered. As Treasurer he had spent a great deal more time in that building in connexion with the financial affairs of the Association than the majority of members of Council could suppose. They felt it was a fitting thing that they should recognize the work he had done by adding his name to their roll of Vice-Presidents. This recommendation was also carried unanimously, and Mr. MOORE expressed his sense of the honour done to him.

Appointments

It was announced that Dr. R. Hale-White and Mr. S. A. S. Malkin would be the official delegates from the B.M.A. at the Annual Meeting of the Canadian Medical Association in Vancouver in June, 1954. Lord Horder had been invited by the Chairman to be the Association's delegate at the Annual Conference of the Cremation Society in July next. Dr. Annis Gillie and Dr. D. F. Hutchinson were appointed to represent the Association on the Central Council for District Nursing for London. Dr. I. D. Grant was appointed delegate of the Association to the 57th Conference of German Doctors to be held in Hamburg in June next.

Gift to the Association

Dr. D. BROWN (Liverpool) said that the Merseyside Branch Council had recently purchased the original minute book of the ancient Newton Medical and Surgical Association, established in 1837 as a Branch of the Provincial Medical and Surgical Association, which later became the B.M.A. It was proposed to keep this book at the Regional Office for the next few months and that the President of the Merseyside Branch should formally present it to the President of the Association at the Annual Meeting in Glasgow. The book could then be kept in the B.M.A. Library and be available to any member who wished to see it. The minute book was interesting to read because it showed the zeal which their illustrious founder, Sir Charles Hastings, put into the foundation of the Association. It dealt with medical reform and among many other matters with the inadequacy of doctors' remuneration at that time. There was even a reference in it to a proposal to form a college of general practitioners. His Merseyside friends felt that the rightful place for such a volume was in the Library.

The CHAIRMAN expressed the Council's thanks to the Merseyside Branch.

Staffing of Public Relations Department

Dr. GUY DAIN moved as a recommendation of the Public Relations Committee that a senior assistant to the Public Relations Officer be appointed at a salary of £1,500 per annum. He thought that the time had come for the development of the Public Relations Department to the level of its opportunities. It was originally thought of as a means of obtaining publicity for the case put forward on behalf of general practitioners, but public relations now entered into all branches of the National Health Service. The National Insurance Defence Trust had made itself responsible for half the expenditure of the department up to a limit of £5,000 per annum, but this contribution did not cover any part of the salary of the Public Relations Officer, and, after further consideration, the Trustees did not feel justified in agreeing to meet half the salary of any assistant who might be appointed, although willing to pay part of the additional cost within the agreed limit of £5,000.

Mr. MOORE said that the Finance Committee had felt that this proposal should be postponed for a year.

Dr. D. F. HUTCHINSON supported the proposal, saying that the Public Relations Officer had been heavily overworked.

The resolution to appoint a senior assistant was carried with one dissentient.

Salaries of Civil Service Medical Officers

The SECRETARY reminded the Council that at its last meeting it was reported that the Joint Negotiating Committee in connexion with the salaries of Civil Service Medical Officers appeared to be on the verge of agreement with the Treasury, and that all that remained was written confirmation. Since then there had been some further argument, but full agreement had now been reached, and all that remained was an exchange of letters between the Joint Committee and the Treasury. Both parties remained free to ask the Royal Commission on the Civil Service to consider any representations they might think fit to make about the remuneration of all grades in the medical officer class.

**Scheme for Restoration of Goodwill:
Amending Acts Committee's Proposals**

Dr. H. H. D. SUTHERLAND, chairman of the Amending Acts Committee, brought forward a scheme which his Committee had elaborated for the restoration of the right to buy and sell goodwill. He said that this followed from the instruction given by the Representative Body last year. His Committee had not produced a series of resolutions and recommendations, but had formulated what it believed to be the best possible scheme and was also submitting for the information of the Council two memoranda prepared by Mr. A. N. Dixon, general manager of the Medical Insurance Agency, on the subject of practice loans.

After a long debate, in which varied opinions were expressed about the practicability of some parts of the scheme, it was decided to refer the scheme back for reconsideration of certain matters. The CHAIRMAN of the Committee accepted the suggestion that additional members should be co-opted and that the scheme should come before the Council again at its next meeting. It would then be published in the Supplementary Report of Council, together with the Council's comments.

Rehabilitation of Disabled Persons

Professor R. E. TUNBRIDGE, chairman of the Committee appointed to prepare a memorandum of evidence for presentation to the Inter-Departmental Committee on Rehabilitation and Resettlement of Disabled Persons, attended the Council to present the draft memorandum. This was a document of nearly 60 foolscap pages, and Professor Tunbridge laid stress only on certain major items. The evidence covered the general principles of rehabilitation, the stage of acute illness, the stage of convalescence, recovery, and return to work, some special problems of resettlement relating to those suffering from tuberculosis, from rheumatism, from dermatitis, and other diseases, the administration of schemes of rehabilitation, including the Disabled Persons Register, and the question of research and education. He stressed the point that there should be established in hospitals or in hospital groups a resettlement clinic for the purpose of providing expert guidance for patients with special difficulties, whether medical, industrial, economic, or social. The Committee believed that such a clinic should be available to local general practitioners as well as to hospital staffs for the reference of patients. Its staff should comprise a consultant, possibly retired, with time to give to the work; a medical practitioner from outside the hospital (who might be a general practitioner, an industrial medical officer, or a medical officer of health), and an almoner and a resettlement officer.

It had been thought by the Committee that more attention should be given to planned convalescence. Workmen would be returned much sooner to their employment if convalescent facilities were available on a planned scale. Much prevention work could be done with a better resettlement service. Among other recommendations it was suggested that the Ministry of Labour and National Service should keep in constant review the register of disabled persons and refer the names of handicapped persons to the appropriate medical officer of health. An interdepartmental review, assisted by professional experts, of the registration of disabled persons was desirable.

Questions were asked about the staffing of the resettlement clinics, and Professor Tunbridge said that it was proposed that the chairman of each clinic should be either the consultant or the outside medical practitioner, or the two might alternate. Remuneration would be on a sessional basis.

The CHAIRMAN said that this document was one of the finest ever produced in the name of the Association. Dr. VAUGHAN JONES and Dr. H. ALEXANDER, as members of the Committee, spoke in high praise of the work which Professor Tunbridge himself had done in guiding its

The memorandum was approved and it was agreed that Professor Tunbridge, Dr. Alexander, Dr. Vaughan Jones, Dr. H. Osmond Clarke, and Dr. J. Rogan should be appointed to give oral evidence, if this was required, and that, subject to the permission of the Inter-Departmental Committee, the memorandum be published as a special report of the Association.

Consultants and Specialists

Dr. ROWLAND HILL, on behalf of the Central Consultants and Specialists Committee, presented a report on the business of the Committee, which was recorded in the *Supplement* of February 13 (p. 39). He moved a recommendation that when submitting nominations of consultants to fill vacancies on regional hospital boards the Association should in future not confine itself to supporting only one nomination in respect of each vacancy. This was agreed to. A further recommendation setting out the procedure for investigating complaints involving personal conduct or professional competence of members of hospital medical staffs was also adopted.

Dr. ROWLAND HILL reported that the Ministry of Health had refused to accept the advice of the Joint Committee that information in the records of chest clinics should not be disclosed to the Ministry of Labour in connexion with call-up of men for national service unless the prior consent of the man concerned had been obtained.

Dr. H. D. CHALKE and Dr. TALBOT ROGERS spoke of the importance of preserving the secrecy of these records. Dr. ROWLAND HILL said that the Joint Consultants Committee was continuing to make representations on the subject.

Dr. DAHNE congratulated Dr. Hill on the fact that as a result of further representations by him the Ministry had now been persuaded to look into the question of the grading of those S.H.M.O.s who, in the view of the Committee, appeared to have been wrongly graded. Following his own letter on the subject in the *Journal* he had received a large number of communications from S.H.M.O.s.

Public Health Representation on Regional Hospital Boards

Dr. K. COWAN presented the report of the Public Health Committee, which covered the business set out in the report of this meeting in the *Supplement* of March 6 (p. 65). He moved as a recommendation that the names of suitable members of the public health service be included in the list of doctors nominated by the Association for membership of regional hospital boards and boards of governors.

The SECRETARY said that the present procedure was that the Association was invited to nominate only for vacancies arising owing to a certain number of members of the board being due to retire at the end of their term of office. Almost invariably the medical members due to retire were either general practitioners or consultants. So far as general practitioners were concerned, most of the boards had not more than one such member, and presumably the Council would not wish to substitute a medical officer of health for that one, and he would have thought there might be some disinclination also on the part of consultants and specialists to sacrifice any of their representation. The Ministry might be asked to create an additional seat on the board for a medical officer of health, but the number of members serving on each board was defined by regulation. It might be as well to have some inter-committee consultation and bring the matter up at the next meeting of Council. With regard to boards of governors the Association did not and was not invited to nominate.

Dr. CHALKE said that there were only three public health representatives on regional hospital boards in England and Wales. Mr. STAVELEY GOUGH pointed out that hospital medical staffs frequently had a very small representation on these boards, and he thought they should be careful before they pressed for any alteration at regional hospital level which might reduce the representation of consultants.

It was agreed to refer this matter to the Liaison Committee of the General Medical Services, Consultants and Specialists, and Public Health Committees.

Meat Inspection

The Council agreed that formal protest should be sent by the Association to the British Veterinary Association in connexion with its proposal that the supervisory control of meat inspection and the local authority meat inspection functions should be transferred to the Ministry of Agriculture Animal Health Service, whereby medical supervision through medical officers of health over meat inspection would cease. It was decided that the appropriate Ministries be informed that the Association dissociated itself from the views expressed by the British Veterinary Association, and that a memorandum setting out the views of the profession should be submitted.

Hospital Records and Government Departments

Dr. R. FORBES, in presenting the report of the Central Ethical Committee, brought forward for approval a statement on the question of the loan of hospital records to Government departments. The Committee considered that medical records should be lent to the medical officers employed by Government departments only when written consent had been given by or on behalf of the patient. The form of consent should include a statement that the patient agreed to his hospital records being made available to the medical board in order to assist them in determining the degree of his disablement and any relation of it to an industrial accident. Wherever practicable, and particularly where disclosure of information might have an adverse psychological effect on the patient, the practitioner who compiled the record should be consulted, on the wisdom of disclosing all the confidential information to the patient, at the same time taking the opportunity of reviewing the notes before these left the hospital. The statement was approved.

The "British Medical Journal"

Dr. O. C. CARTER, in presenting the report, referred to the work of the late Dr. Horner, who was for nearly 20 years Editor of the *Journal*. He said that he was a very modest and self-effacing man. During his last few years of office uncertain health had prevented him from doing all that he would otherwise have done. The *Journal* Committee and the Council mourned the death of one who served the Association with such loyalty and ability and who added greatly to the *Journal's* reputation.

Dr. Carter went on to say that the Association's publications in total showed a satisfactory financial position. He also reported the satisfactory financial position of *Family Doctor*.

Association Membership

For the Organization Committee Dr. J. A. PRIDHAM reported that the figures for membership were satisfactory notwithstanding the increase in subscriptions. On December 31, 1953, the membership stood at 67,506, as compared with 67,905 on the corresponding date of 1952. There had been an increase in receipts from subscriptions during January, 1954, of approximately £10,000, as compared with January, 1953. A disturbing feature, however, was that the percentage of membership of the entire profession showed a slight but definite recession. This seemed to be due to an increase in resignations and a decrease in intake, particularly among the newly qualified. It called for special efforts to attract to and retain in the Association the newly qualified practitioner, particularly the provisionally registered. The Organization Committee was taking steps to strengthen the contact with the newly qualified and to provide for direct representation on the Medical Students and Newly-qualified Practitioners Subcommittee. A subject of discussion at the forthcoming conference of honorary secretaries would be "What is the Association doing for the Hospital Residents?"

Committee Reports

The report of the General Medical Services Committee, which contained no recommendations, was presented by Dr. TALBOT ROGERS and approved. The principal business

was set out in the report of the meeting of the Committee (*Supplement*, March 6, p. 62). The report of the Private Practice Committee was presented by Dr. GRANT. The various matters were set out in the report of the meeting of the Committee (*Supplement*, February 27, p. 51). Dr. VAUGHAN JONES, on behalf of the Occupational Health Committee, submitted a draft memorandum of evidence to be given to the Departmental Committee which is reviewing the provisions of the Industrial Injuries Act (*Supplement*, February 27, p. 57). The memorandum was approved.

It was reported that the Waverley Evidence Committee was continuing the preparation of the memorandum of evidence and had received contributions from the Armed Forces and Overseas Committees.

Dr. J. G. M. HAMILTON presented a report from the Scottish Committee embodying the memorandum of evidence to be submitted to the Guillebaud Committee.

Dr. WAND, for the Compensation and Superannuation Committee, submitted a report on the financial position of practitioners on retirement. This was approved for submission to the Representative Body, and will be published as an appendix to the Annual Report of Council.

The report of the Science Committee, presented by Dr. NOY SCOTT, contained recommendations, which were approved, for the awards in the competitions for the Sir Charles Hastings Clinical Prize, the Medical Students Prize, and the B.M.A. Research Scholarships.

General DOWSE presented the reports of the Armed Forces Committee and the Overseas Committee. With regard to the former he said that no satisfactory answer had as yet been received from the Ministry of Defence concerning the new arrangement of antedating new commissions according to civilian experience and the effect of this on promotion prospects and seniority of serving officers. On overseas business he reported that, although the Government of Cyprus had been included in the "Important Notice" for some time past, the vacant post of orthopaedic surgeon in the island had been filled by a member of the Cyprus Branch.

A report by the Arrangements Committee on the nominations of officers of scientific sections for the Joint Annual Meeting in Toronto, 1955, and on the arrangements for plenary sessions and special lectures was approved.

The TREASURER (Mr. A. M. A. MOORE) presented the Financial Report for 1953. The important figures will be given with the Supplementary Annual Report of Council. Dr. HALE WHITE said he hoped the amount earmarked for debt reduction would be placed in a prominent position in the report.

Mr. L. DOUGAL CALLANDER presented reports from the Building Committee (henceforth to be designated Estates Committee) and the Catering Committee.

Other Business

A letter was read from the honorary secretary of the Isle of Man Medical Society (Isle of Man Branch of the Association) in which "heartfelt thanks and deep gratitude" was expressed for the assistance given to the Isle of Man doctors in negotiations with the Commission appointed by Tynwald to consider the matter of salaries and emoluments in the island. "We feel sure that had it not been for the support which we have received from Headquarters the result would not have been so satisfactory."

Reports were presented to the Council on the year's work of the Medical Practices Advisory Bureau, the Empire Medical Advisory Bureau, and the International Medical Visitors Bureau. The thanks of the Council were accorded to Mr. L. R. BROSTER for his work as chairman of the committee of management of the two latter Bureaux, to Brigadier Sandiford, Director of these Bureaux, and to Dr. Potter, Director of the Medical Practices Advisory Bureau.

Dr. DAENE reported to the Council the result of conversations with the College of Heralds on a coat of arms for the Association. The Office Committee would have the matter fully before it at the next meeting, and it was hoped to present a definite proposal, satisfactory in both the

artistic and heraldic sense, to the next meeting of Council. Finally, the Council considered the duration of future Council meetings. Dr. HAMILTON moved that future meetings of Council be held, as had been done on this occasion, on two successive days. Other members spoke in favour of future two-day meetings, but some considered that the position might be met by arranging an additional meeting of Council during the year. It was agreed to circularize the members of Council with a view to ascertaining their wishes.

The Council began its proceedings on the first day at 2 p.m., and adjourned at 6.30 p.m., and on the second day, starting at 10 a.m., concluded its business at 5.45 p.m.

Scottish News

B.M.A. SCOTTISH COMMITTEE'S MEMORANDUM OF EVIDENCE TO THE GUILLEBAUD COMMITTEE

The Committee of Inquiry into the cost of the National Health Service (the Guillebaud Committee) is at present taking evidence in Scotland. The following is a summary of the memorandum of evidence sent to the Guillebaud Committee by the Association's Scottish Committee. Representatives of the Scottish Committee gave oral evidence on March 18.

Introductory

Of nearly 8,000 registered medical practitioners resident in Scotland approximately 6,000 are members of the British Medical Association. Among the approximately 5,300 providing medical services under the National Health Service (Scotland) Act the proportion of members of the Association is substantially higher. The Scottish Committee is a standing committee of the Council of the Association, whose remit is: "To consider all matters specially concerning Scotland, and, in conformity with the decisions of the Representative Body, deal with all such matters."

General Considerations

The Committee's evidence, starting with some general considerations, points out that an enterprise such as the Health Service differs essentially from a business undertaking in that, while its expenses are readily ascertainable, its "profits," which are in effect the improved mental and physical health of the community, are neither necessarily nor immediately assessable in monetary terms. If steps designed to increase efficiency and achieve economy in the medical services of the nation are to have their full effect they must at all times take account of the essential nature of these services; attempts to organize and administer health services as though medicine were nothing more than a skilled technological procedure will in the long run harm rather than benefit the community.

The ultimate unit of a health service is the individual. The conservation of his fitness must need planning in three particular respects. First, to ensure that his total environment as a member of a community is adequately safeguarded; this must entail an appropriate emphasis on the public health and preventive aspects of medicine. Secondly, he must be able to depend upon an efficient domiciliary service when he suffers illness—everything which affects the health of the individual and his family should be the concern of his general practitioner. Thirdly, the more specialized medical and surgical procedures require an elaborate, expensive, and efficient hospital and specialist service.

The Committee goes on to say that the Health Service can be fully efficient only if the administration of each of its parts is managed not in isolation but as a different aspect of a single enterprise. In particular, it was concerned at the apparently subsidiary role that is now assigned to the public health service. From the preventive aspects of medicine the greatest and most desirable economies will ultimately be made. The separation of public health departments from

the main stream of the Health Service has hindered recruitment to a branch of the profession which should stimulate the profession and the public alike in the preventive ideal.

The Committee says that the large cost of the Hospital Service makes it appear that this is the most important aspect of a health service—a very dangerous fallacy. Yet the Committee saw little prospect of materially reducing the cost of the hospital service. Each new advance in methods of investigation and of treatment tended to make hospital treatment more expensive. Furthermore, prolongation of life in itself increased the numbers of the elderly and the chronic sick who will ultimately require some form of hospital care. A hospital service is, and always would be, an expensive service, and the only way to lower its cost is to encourage the study of methods of keeping patients out of hospital. The Committee favoured more extensive provision of facilities for domiciliary care and the establishment, where appropriate, of hostel and other suitable residential accommodation for the elderly. The sums at present allocated from the annual Health Service Vote for capital development are inadequate for the extensive rebuilding, rehabilitation, and modernization which, in themselves, would result in reducing the running costs of the hospitals.

The Committee also points out that a large proportion of the annual expenditure is represented by nationally negotiated salaries and wages, and that any material economy will be contingent upon reduction in the numbers employed in the service.

The general conclusion is that economies in the hospital service are to be looked for in the direction of (1) increased attention to the promotion of health and prevention of disease, (2) the pursuit of a policy designed to improve the facilities for the treatment and care of sick and infirm persons outside hospital, (3) the reduction in maintenance and running costs which would follow modernization or replacement of obsolete buildings, and (4) the more efficient and economic use of lay staff, also following upon modernization of hospitals.

The Committee ends its introductory observations by drawing attention to the danger that things might be done in the name of efficiency or economy which could in time endanger the professional freedom of the doctor—"the widespread tendency, which we cannot too strongly deplore, to conceive of medicine as a sort of applied technology is in our view threatening this fundamental relationship between doctor and patient."

Organization and Administration

The Committee states that, "short of radical alteration in present conceptions of State responsibility for the provision of medical service, it is in our view to improvements in the two related fields of organization and administration that the community must look for any major and early reduction in the cost of its health services."

Tribute is paid to the patience, skill, and tact of the officials of the Department of Health, and no important criticisms are levelled at the central administrative arrangements. But attention is drawn to what is thought to be a potential weakness in the present scheme—namely, the impotence of appointment to any particular branch of permanence of appointment to any particular branch of work among the senior ranks of the central administration, which is inherent in the Civil Service system of promotion. "It is," the Committee says, "a matter for consideration whether, just as in the province of individual medical practice it is desirable to preserve the greatest possible continuity of treatment, provision should be made to ensure continuity of experience and policy in the central department. It is entirely possible that the relative success of the present central administration derives more from the chance of particular appointment to it than from the suitability of its design."

Turning to local administration, the Committee refers to the general criticism of the tripartite system and its undesirable effect of isolating the branches of medical practice from each other. To achieve closer co-ordination between general, specialist, and public health practice, the Com-

mittee thinks that the choice would seem to lie between strengthening and improving the existing co-ordinating mechanism, but preserving the present tripartite system, possibly with modifications, and amalgamating the local administration by constituting, for areas of a suitable size, authorities charged with the duty of planning, developing, and administering the whole service in these areas. There are some—particularly the general practitioners, with their favourable experience with executive councils—who would favour the first and less radical suggestion. Others argue that, even if under the existing provisions an effective co-ordinating mechanism could be devised, this would not lead to any direct and immediate economy, although, of course, it would lead ultimately to economy by improving efficiency.

The Committee thinks that amalgamation, in addition to meeting the need to foster co-operation and integration of the various services, might be expected to effect considerable economy; it gave much thought to its practicability, and the memorandum of evidence goes on to say: "We are assured by the representatives of the public health service that there would be no insurmountable obstacle to the transfer to the contemplated single administration of those medical services at present administered by local authorities. We realize, however, that so drastic an alteration of present local authority functions would carry with it many other implications and this alone would indicate that a solution on this line could not be contemplated without the fullest possible investigation. . . . Our conclusion in this matter, therefore, is that a full and careful investigation of the system of organization and administration of the service should be undertaken at an early date. It would be for consideration how best to undertake this task, but one possibility would be that it should be carried out under the aegis of the Scottish Health Services Council."

The Committee sets out some views of its own about the solution to the problems of local administration. The question of the need for "two tiers" of hospital administration is discussed, and the conclusion is reached that the advantages of abolishing one or other of the tiers would be outweighed by the disadvantages. Nor is the suggestion of the board of governors system for teaching hospitals which pertains in England and Wales favoured for Scotland.

Turning to the public health field, the Committee says that it has been widely canvassed that efficiency and economy would be served by amalgamating the health and welfare departments of local authorities. It believes that this view is right, and points out that such amalgamation has already been successfully achieved in approximately one-third of the Scottish local authorities, including some of the largest. Where these departments are separate, cases not infrequently occur in which a health visitor (or other health department officer) and a welfare officer from the welfare department duplicate each other's visits; arguments sometimes take place about whether a border-line patient is a case for aftercare services or for welfare services, and cases about which full information is already in the hands of one department are sometimes reinvestigated to supply similar information for the other department. The artificial separation of two departments with closely related functions is inconvenient and unnecessarily expensive for the community.

The Place of the Doctor in Administration of Health Services

Referring to the advocacy of the Scottish Trade Union Congress that doctors should not be appointed as members of administrative bodies in the National Health Service (see *Supplement*, November 21, 1953, p. 206) on the grounds that such appointments create irritation among other members of the hospital team and that the presence of medical members with professional axes to grind on committees prejudices the possibility of effecting economies, the memorandum of evidence says: "This opinion presumably rests on the proposition, commonly accepted in relation to public administration in this country, that 'interested parties'

should not be in a position to determine matters which directly affect them financially. To suggest, as this does, that doctors are 'interested' in the sense implied in the proposition is, in our view, thoroughly misleading and indicates a serious misunderstanding of the functions of the administrative bodies concerned. . . . It is incontrovertible that, in a nationally organized medical service, or indeed any medical service, the medical profession must hold the key position. Without doctors, there could be no medical service of any kind. The very *raison d'être* of the Health Service is to make available to the community the professional services of medically trained and skilled persons. It appears to us a self-evident corollary to this proposition that the special knowledge and experience of such persons should be available to the administration, not just occasionally and on request, but continuously and in all phases of administration."

The Committee discusses the related question of providing for the administrative authorities appropriate means of consulting the doctors concerned on staffing, projected developments, and so on. In any case, the Committee says, it is a sound principle of administration whenever possible to "take with you" those who will be affected by administrative decisions. No small part of the success of executive council administration has been the existence of the statutorily recognized local medical committees. In the Committee's view this system should be adopted in respect of both regional and management hospital boards. In the local authority field also the cultivation of such relations would make for better design and operation of the authorities' schemes.

Medical Superintendents of Hospitals

The medical superintendent is a distinctive, traditional, and valued feature of Scottish hospitals. It was established that the Department of Health for Scotland had no intention of abandoning the medical superintendent system. But the Committee goes on to say, "The highest salary attainable in this field (applicable in only three posts in the whole of Scotland) is £650 per annum less than the maximum of the *basic* whole-time consultant scale. There can be no reasonable doubt at all that a continuance of this discrepancy must inevitably jeopardize the Scottish system of hospital administration by preventing the recruitment of first-class men. Believing as we do that this system makes for both efficiency and economy, we regard it as a matter of urgency that the terms of service of our medical superintendents should be brought into line with those of their clinical colleagues on the senior medical staff."

Hospital Finance

The memorandum of evidence refers to the inflexibility of the present system of hospital finance and the fact that it militates against economy and frustrates responsible members of hospital boards. The Committee has this to say about a block grant system: "We have considered as a possible alternative a block grant system of finance on the model of the University Grants Committee's system, but we have come to the conclusion that this would not be wholly appropriate in the hospital field, particularly in regard to day-to-day running expenses. There is in this regard an important difference between the universities and the hospitals, in that, whereas the former have available other sources of income, the latter are dependent for all ordinary purposes on revenue from the Exchequer. If, therefore, the hospitals were to be financed by block grants covering periods of, say, three to five years, it would be necessary to make provision for contingencies such as rising food costs and increased wage and salary awards. Contrariwise, if there were deflationary developments, more money than necessary might be allocated to the hospitals. Block grants for lesser periods would in effect be little different from the present system. We believe that the main advantage claimed for the block grant system could be achieved by permitting boards, under suitable safeguards,

to carry over from year to year credit or debit balances in respect of their accounts for running costs and maintenance."

Charges under the N.H.S.

The Committee thinks that the charges for medicines and dressings and spectacles has not discouraged any genuinely needed consultation. It thinks that the dental charges have tended to discourage consultation for conservative treatment. Charges for surgical appliances are regarded generally as reasonable.

The Committee's evidence under this heading goes on to say: "While we fully subscribe to the view that no person should be excluded from admission to any hospital bed because of inability to pay, we are certain that many individuals would be prepared to pay reasonable sums for the advantages of private bed accommodation. The present cost, however, is prohibitive so far as most of the potential users of this accommodation are concerned, so that there is little income from this source. . . . It is economically unsound that hospitals should be forced to price themselves out of what might well be a useful source of income. . . . It should be possible to discover the proportion of beds of this category which would be in constant use without interfering with the efficient conduct of the 'free' service. We consider that each board of management might be given discretion as to the charges it might make, having regard to the local competitive rate."

Need for Adequate Development of Local Health Authority Services

The Committee reviews the purpose and some of the achievements of the public health service (it is calculated that eradication of diphtheria alone saved over £300,000 per annum in Scotland) and gives its opinion that with effective development the service could reduce the incidence of many diseases, and gives, among others, the following examples: immunization of school-leavers against tuberculosis; health education of food handlers, commercial and domestic, to reduce the incidence of food-poisoning, gastro-enteritis, and similar conditions; trained health visitors, working in close co-operation with general practitioners, who could do much to guide and advise parents about the elements of mental hygiene and parent-child relationships; further efforts to prevent home accidents, especially burns and scalds in the young and falls in the elderly.

The Committee says the following about the medical officer of health: "It is essential to appreciate that, while the medical officer of health has important functions as a co-ordinator and as a medical administrator in charge of an extensive branch of the whole Health Service, he is also a specialist in epidemiology (as applied to non-infectious diseases as well as to the infectious) and in health education. To fulfil the duties of such a post calls for capacities of high order, and, unless the public health service continues to attract doctors who possess them, both the health and the economy of the country will suffer. In the interests of efficiency and long-term economy, therefore, we feel that remuneration in the public health service should be examined afresh. . . ."

Whole-time and Part-time Appointments in Hospital

After tracing the history of the growth of whole-time consultant appointments in hospital, the Committee says that it is aware that it is being canvassed that a system of staffing hospitals with whole-time salaried personnel would effect economy. The Committee is not certain that this would be so and thinks that in the long run it would prove a false economy. Attention is drawn to the fact that, although the part-time consultant's remuneration is calculated on so many half-day sessions a week, he does in fact accept responsibility throughout the 24 hours of every day for his hospital patients.

The Committee goes on to say: "We believe that a prime consideration in a nationally organized medical service must

Correspondence

Group Practice and the Single-handed Practitioner

SIR,—We have recently been informed of the details of the £100,000 fund to promote group practice (*Supplement*, January 30, p. 27), and I wish to register a strong protest and invite all the other single-handed practitioners to do likewise.

I am unaware of any agreed policy by the profession that intended to put single-handed general practitioners out of business and conduct future practice only in groups operating from a single centre. This money comes out of all our pockets, and whilst the single-handed general practitioner is denied an interest-free loan to improve his practice he is forced to provide money to a possible opposition practice to create a veritable medical palace from which to operate. Could anything be more unfair? It would seem that "group practice" is to be the ideal of the future, perhaps so that we are conditioned for a State-salaried service when it comes at some future date. The first step along this path presumably is to eradicate the sturdy individualist, who often gives a far better personal service to his patients than some multiple partnerships.

It is claimed for group practice that each member will be a specialist in some aspect of medical practice. What nonsense this is! There is not enough of any one department in general practice to enable a G.P. to become a specialist in anything. Perhaps it is intended to replace G.P.s by registrars who find consultant status denied to them? Surely the curse of modern medicine is that there is too much narrow specialism in all fields, and the widely experienced general practitioner is an absolute necessity to-day. If our negotiators were forced to make us subscribe some of our income to improve the State service, then at least they could have insisted that all G.P.s who subscribe to this fund should have an equal opportunity of sharing in the benefits, or is it asking too much to insist on elementary justice?—I am, etc.,

Upminster, Essex.

E. ANTHONY.

A Bob a Job

SIR,—I think the reason why more protest is not made is because it would be a waste of time. I think it is a most degrading job for the doctor to do, but unlike Dr. Margaret J. Oldfield (*Supplement*, March 6, p. 67) I do not find any patients think I snaffle all or any of the shillings. I say, "Shilling for the Government, please, and put your initials in one of those squares," and they take that as a receipt. At the end of the month I stick a £1 stamp on each sheet, stamp it, and send it in.—I am, etc.,

Maldstone.

L. H. TAYLOR.

Grading of S.H.M.O.s

SIR,—There has been an ever-increasing volume of correspondence recently on the question of the regrading of officers in the S.H.M.O. grade. At the meeting of the Central Consultants and Specialists Committee on February 4 (*Supplement*, February 13, p. 39), Dr. Peter Edwards, for the Tuberculosis and Diseases of the Chest Group Committee, urged that the Committee press for the adoption of the principle that S.H.M.O.s in posts which are established as consultant should be remunerated on the consultant scale. This, of course, is a self-evident justice. Dr. Edwards added that in his group many S.H.M.O.s were carrying complete responsibility, and he was supported in his contention by Mr. Nicholson-Lailey.

Not only in the tuberculosis service but also in other "minor" specialties are S.H.M.O.s doing consultant work in jobs which are not graded as consultant posts and with (at present) no prospect of being regraded. I know of a colleague in charge of an important department in two important provincial hospitals serving a wide area who was

be the maintenance of the faith of the patient in his doctor outside or within the hospital. There must be no suspicion that the doctor, either in general or hospital practice, has not complete freedom to exercise his professional judgment and skill in the manner he thinks best for his patients. Likewise, there must be no feeling on the part of the doctors themselves that it would be inexpedient for any reason whatever to do what they think best. The conversion of the hospital service to a system of whole-time, or even mainly whole-time, staffing would tend, we claim, to raise in the minds of the public the feeling that the doctors were medical Civil Servants and therefore not entirely free to exercise their unfettered clinical judgment and skill, and in the minds of the doctors the fear that clinical control and direction might at any time be imposed for reasons not immediately concerned with the care of the patient. We repeat our admiration for the conscientiousness, ethics, and practice of the whole-time members of hospital staffs, but we claim that their admirable work and more or less unfettered conditions derive in great measure from the parallel existence of a large, indeed much larger, body of part-time men who also provide a private medical service for those who wish it as an alternative to that provided by the State, against which the quality of the latter can be measured."

The Committee also expresses a belief that a whole-time salaried hospital service would complete the separation and isolation of the general practitioner from the hospital service—a trend which is deplored.

Pharmaceutical Service

The Committee believes that the most effective of the measures which have been or are being instituted in the endeavour to arrest the rising cost of the pharmaceutical service is that of letting each prescriber have a regular note of his average prescribing costs together with the average for the area in which he works (*Supplement*, March 6, p. 64). It also believes that a similar procedure should be applied to the hospital service. No measure, however, should be taken which would infringe the fundamental principle that a doctor must be free to prescribe whatever he conscientiously believes to be essential for the efficient treatment of his patient, provided he can justify its use.

The Committee goes on to stress the need to educate the public by every means that it is in the public's interest to leave it to the doctor to decide what and when to prescribe. It also gives an opinion that too little attention is given in medical schools "to what might be called the art and economy of prescribing." The Committee also thinks that "there is a tendency to forget that the exhibition of many of the modern drugs, apart from saving lives, materially shortens many illnesses. Thus, regarding the matter from a purely economic standpoint, the high cost of these drugs may actually be more than offset by the saving in sickness benefit and in time lost to productive work."

Reference is made to the fact that part of the cost of proprietary preparations must be related to the research undertaken by the firms which produce them and the benefit of this research to the community and, incidentally, to the export trade.

The Committee also puts forward evidence on the organization of the geriatric service, the mental health service, the maternity service, and the ambulance service.

Copies of the Scottish Committee's evidence may be obtained from the Scottish Secretary, B.M.A. Scottish House, 7, Drumsheugh Gardens, Edinburgh, 3.

PRESCRIBING OF SCHEDULE IV POISONS

The Ministry of Health, in a circular addressed to clerks of executive councils (E.C.L. 13/54), draws attention to the fact that pharmacists and pricing offices are having difficulty in dispensing and pricing prescriptions ordering Schedule IV in poisons because prescribers are in many cases failing to give full particulars on the prescription of the quantity and strength of the drug required.

appointed before the appointed day on the understanding that he would be of "honorary" standing one year after joining the staff, who now finds himself apparently permanently tied to the S.H.M.O. grade. Neither his hospital colleagues nor the general practitioners doubt that he is of consultant status and treat him accordingly, but the employing authority think otherwise.

It is an undeniable fact that in some cases the grading of S.H.M.O. is not ungenerous. But in the case of men doing consultant work unsupervised, and in charge of important clinical departments with heavy responsibility, surely it is not beyond the wit of man to devise a way of obtaining fair play and of having these colleagues of ours regraded to their correct status.—I am, etc.,

Bristol.

DONAL F. EARLY.

Domiciliary Physiotherapy

Sir,—We read with interest the report of a recent discussion on domiciliary physiotherapy by the Physical Medicine Group Committee with representatives of the General Medical Services Committee (*Supplement*, November 7, 1953, p. 189). Physiotherapists in private practice would all agree that the success of domiciliary physiotherapy depends on the contact of general practitioners and physiotherapists with the physical medicine specialists and the physiotherapy departments of local hospitals. To provide this service appears to present two main difficulties: the supply of physiotherapists, and the cost involved. The supply of physiotherapists is probably larger than the meeting realized, and their distribution is known to the Organization of Chartered Physiotherapists in Private Practice, who will send information on request. The cost of treatment for occasional patients is economical if carried out by private practitioners who already have cars and are equipped with portable apparatus. In some areas mobile physiotherapy vans are already in use and could be increased should the need arise.

We are of the opinion that a domiciliary service could be quickly and easily put into operation.—We are, etc.,

T. A. C. OVERINGTON,
Chairman.Organization of Chartered
Physiotherapists in Private Practice,
London, S.E.11.OLIVE F. SANDS,
Hon. Secretary.

Association Notices

Diary of Central Meetings

MARCH

- 24 Wed. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
- 24 Wed. Geriatrics Joint Subcommittee, Central Consultants and Specialists, G.M.S., and Public Health Committees, 2.15 p.m.
- 25 Thurs. International Relations Committee, 2 p.m.
- 25 Thurs. Psychological Medicine Group Committee, 2 p.m.
- 25 Thurs. Medico-Legal Subcommittee, Central Consultants and Specialists Committee, 6 p.m.
- 26 Fri. Charities Committee, 11.30 a.m.
- 26 Fri. Hospital Junior Staffing Subcommittee, Central Consultants and Specialists Committee, 11.30 a.m.
- 30 Tues. Waverley Evidence Committee, 11 a.m.
- 31 Wed. Rehabilitation Committee, 2 p.m.

APRIL

- 1 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
- 2 Fri. Science Committee, 2 p.m.
- 3 Sat. Hypnotism Subcommittee, Psychological Medicine Group Committee, 10 a.m.

Branch and Division Meetings to be Held

ASHTON-UNDER-LYNE DIVISION.—At Broadoak Hotel, Wednesday, March 24, annual general meeting.
BRIGHTON AND MID-SUSSEX DIVISION.—At St. Francis and Hurstwood Park Hospital, Haywards Heath, Thursday, March 25, clinical meeting.
CHESTERFIELD DIVISION.—At Station Hotel, Chesterfield, Friday, March 26, 7.30 for 8 p.m.; Dinner; 9 p.m., Annual B.M.A. Lecture by Dr. J. H. Cyriax: "Lumbar Disk Lesions."

CITY DIVISION.—(1) At Town Hall, Upper Street, Islington, N., Friday, March 19, 2.30 p.m., special meeting. Discussion: "Sonne Dysentery." To be opened by Dr. W. Gunn, Dr. A. J. H. Tomlinson, and Dr. V. Freeman. All medical practitioners (including non-members B.M.A.) are invited. (2) At B.M.A. House, Tavistock Square, London, W.C., Tuesday, March 23, 8.30 p.m., meeting. B.M.A. Lecture by Mr. R. C. Brock: "The Present Position of Cardiac Surgery (illustrated by films and slides). All members of the St. Pancras Division are invited. (3) At Institute of Laryngology and Otology, Gray's Inn Road, W.C., Friday, March 26, 3.30 p.m., clinical meeting. Professor F. C. Ormerod: "Foreign Bodies in the Food and Air Passages."

CITY OF DUNDEE AND COUNTY OF ANGUS DIVISIONS.—At Medical School, Dundee, Friday, March 26, 8.30 p.m., meeting. Annual B.M.A. Lecture by Professor M. L. Rosenheim: "The Treatment of Hypertension."

DEWSBURY DIVISION.—At General Hospital, Dewsbury, Friday, March 26, 8.30 p.m., meeting. B.M.A. Lecture by Mr. A. Lawrence Abel: "Some Common Diseases of the Rectum and Anal Canal" illustrated by a cinematograph film.

DUDLEY DIVISION.—At Lecture Theatre, Guest Hospital, Dudley, Tuesday, March 23, 8.15 p.m., meeting. Lecture by Professor J. M. Webster: "Forensic Science." (Illustrated by slides.)

EAST HERTS DIVISION.—At Haymeads Hospital, Bishops Stortford, Thursday, April 1, 8.15 p.m., clinical evening.

GREENWICH AND DEPTFORD DIVISION.—At Greenwich Town Hall, S.E., Thursday, March 25, 7 for 7.30 p.m., Annual Dinner and Dance.

GRIMSBY DIVISION.—At Scartho Road Infirmary, Grimsby, Thursday, March 25, 8.30 p.m., meeting. Lecture by Dr. J. M. Clow: "Medical Missionary Work in China." All medical practitioners in the area of the Division are invited.

HARROW DIVISION.—At Rayners Hotel, Rayners Lane, Tuesday, March 23, 8.30 p.m., clinical meeting. Discussion on Tuberculosis. Short addresses by Dr. R. Grenville Mathers: "Pulmonary and Primary Tuberculosis"; Mr. M. F. Nicholls: "Renal Tuberculosis"; Mr. K. I. Nissen: "Tuberculosis of Bone and Joints."

HOLLAND DIVISION.—At Peacock and Royal Hotel, Boston, Saturday, March 27, 7.15 for 7.45 p.m., Supper; 9 p.m., Address by Dr. D. Evan Bedford: "Common Difficulties in Diagnosis of Heart Diseases."

MANCHESTER DIVISION.—At the Fallowfield Hotel, Wilbraham Road, Manchester, Thursday, March 25, 8.30 p.m., "Medical Forum." (a) Postgraduate Education, introduced by Mr. R. L. Newell; (b) The Relationship of the Industrial Medical Officer and the General Practitioner, introduced by Dr. P. J. Webb; (c) Entry into General Practice, introduced by Dr. Forbes S. Catto.

MID-ESSEX DIVISION.—At Out-patients Department, Chelmsford and Essex Hospital, London Road, Chelmsford, Wednesday, March 24, 8.15 p.m., meeting. Address by Dr. S. J. L. Taylor: "The Future of General Practice in the Light of My Recent Survey." A general discussion will follow.

MID-HERTS DIVISION.—At Red Lion Hotel, St. Albans, Friday, March 19, 8.45 p.m., meeting. Mr. John Beattie: "Abnormal Uterine Bleeding."

NORWICH DIVISION.—At Assembly House, Theatre Street, Ellis: "Some Natural History Adventures in Norfolk."

OXFORD DIVISION.—At Maternity Department, Lecture Theatre, Radcliffe Infirmary, Oxford, Wednesday, March 24, 8.15 p.m., meeting. Wing Commander A. J. Barwood: "Medical Aspects of High Speed and High Altitude Flight."

ROCHDALE DIVISION.—At Kingsway Hotel, Rochdale, Monday, March 22, 8.30 p.m., clinical meeting. Talk by Dr. E. T. Baker: "Some Critical Observations on Modern Medical Treatment."

RUGBY DIVISION.—At Grand Hotel, Rugby, Thursday, March 25, 8 for 8.15 p.m., supper; 9.15 p.m., annual general meeting.

SCARBOROUGH DIVISION.—At Scarborough Hospital, Thursday, March 25, 8.30 p.m., annual general meeting. Two films: "Anaesthesia in the Dental Chair for Adults and Children."

SHEFFIELD DIVISION.—At University Medical Library, Sheffield, Friday 26, 8.30 p.m., annual general meeting.

SHROPSHIRE AND MID-WALES BRANCH.—At Lecture Room, Copthorne Hospital, Shrewsbury, Wednesday, March 24, 8 p.m., meeting of Clinical and Pathological Section. Professor T. N. A. Jeffcoate: "The Position of the General Practitioner in Relation to Obstetric Services."

SOUTH BEDFORDSHIRE DIVISION.—At Luton and Dunstable Hospital, Wednesday, March 24, 9 p.m., meeting. Mr. A. W. Badenoch: "Haematuria."

SOUTH ESSEX DIVISION.—At Ye Olde King's Head, Chigwell, Thursday, March 25, 7.30 p.m., Dinner. Male guests, non-members of the Association, may be invited.

SOUTH STAFFS DIVISION.—At Bell Library, Royal Hospital, Wolverhampton, Wednesday, March 24, 8 p.m., meeting of Executive Committee; 8.30 p.m., Annual B.M.A. Lecture by Mr. R. D. Owen: "Prognosis and Treatment of Cancer of the Lower Pharynx and Upper Oesophagus."

TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Devon's Road, Bow, E., Friday, March 26, 3 p.m., clinical meeting.

WOOLWICH DIVISION.—At Woolwich Memorial Hospital, Shooters Hill, S.E., Tuesday, March 23, 8.30 p.m., meeting. "Plastic Surgery" (illustrated by lantern slides). Members of the Greenwich and Deptford Division are invited.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 27 1954

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British Medical Association

ANNUAL REPORT OF COUNCIL, 1953-4

Every member is asked to keep this Supplement, which contains matters referred to Divisions, until the subjects have been discussed by his Division.

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PRELIMINARY

Award of Gold Medal to Dr. S. Wand

1. The Council has much pleasure in reporting that it has decided to award the Gold Medal of the Association for Distinguished Merit to Dr. S. Wand in recognition of his outstanding services to the Association and to the medical profession.

Election of Vice-Presidents

2. The Council has much pleasure in recommending:
Recommendation: That, with effect from the conclusion of his term of office as President, Mr. J. W. Tudor Thomas, D.Sc., M.D., M.S., F.R.C.S., be elected a Vice-President of the Association in recognition of his valuable services to the Association.
Recommendation: That Mr. A. M. A. Moore, F.R.C.S., be elected a Vice-President of the Association in recognition of his valuable services to the Association.

Annual Meetings

3. The Annual Meeting of the Association will be held this year in Glasgow from July 1 to 9. A provisional programme of the Meeting appeared in the *Supplement* to

the *British Medical Journal* of January 16 and a revised programme will be published in the *Supplement* of April 3.

As already announced, the Annual Meeting in 1955 will be held in Toronto, as a joint meeting of the B.M.A. and the Canadian Medical Association; and in 1956 in Brighton.

The preliminary arrangements for the Toronto Meeting (June 20 to 24, 1955) are proceeding satisfactorily. The number of members for whom the Association will be able to obtain an allotment of Canadian dollars is likely to be much smaller than the number wishing to attend the Meeting, but the Canadian Medical Association, aware of this difficulty, has made a generous offer of private hospitality. The Annual Representative Meeting in 1955 will be held in London from July 20 to July 23.

In 1959 the Annual Meeting will be held in the British Isles jointly with the Canadian Medical Association, which has kindly invited the B.M.A. to nominate one of its members as President of the C.M.A. for that year.

The Council has received with much pleasure, and will consider at a later date, an invitation from the New Zealand Branch to hold the Annual Meeting in New Zealand in 1961.

Representatives of Overseas Branches on the Council

4. Two vacancies have arisen among the members of Council who represent Overseas Branches. Professor Kenelm H. Digby, Bromley (Far Eastern Branches) resigned in January and died shortly afterwards. Mr. A. G. Leacock, London (West Indian Branches) resigned in February. The necessary steps to fill the vacancies have been taken.

Representatives at Conferences of Other Bodies

5. The Council appointed the following to represent the Association at the Conferences named:

Danish Medical Association, Annual Meeting, Nyborg, September, 1953	Mr. J. W. Tudor Thomas
West German Medical Association, Lindau, September, 1953	Dr. A. Talbot Rogers
National Safety Congress, London, October, 1953	Dr. J. A. L. Vaughan Jones
Paul Ehrlich and Emil von Behring Centenary Celebrations, Frankfurt-am-Main, March, 1954	Dr. Hugh Clegg (Editor, B.M.J.)
Royal Sanitary Institute Congress, April, 1954	Dr. H. K. Cowan
Canadian Medical Association, Annual Meeting, June, 1954	Dr. Llywelyn Roberts
West German Medical Association, Hamburg, June, 1954	Dr. R. Hale-White
Annual Conference of the Cremation Society, Torquay, July 6-8, 1954	Mr. S. A. S. Malkin
	Dr. I. D. Grant
	Lord Horder

War Memorial

6. A licence to proceed with the erection of the War Memorial having at long last been granted, substantial progress has been made and it is confidently expected that the Memorial will be completed within the next few months. The Memorial, which was designed by Mr. J. Woodford, will bear the inscription "In Memoriam—1939–1945." This form of words was approved by the Council after careful consideration of the many suggestions made in response to the appeal by the Chairman of the War Memorial Committee (Dr. H. Guy Dain). It was felt that simplicity should be the keynote of the inscription and that it should be completely visible from the front of the Memorial. In addition to the inscription, it is proposed to place a bronze tablet at the entrance to the Memorial, bearing the following words:

In honour of the medical men and women of the British Empire and Commonwealth of Nations who gave their lives in the Second World War.

Roll of Honour

7. The Roll of Honour of members who fell in the First World War is being extended to incorporate the names of members who gave their lives in the Second World War.

Subscriptions to War Memorial Fund Earmarked for Charitable Purposes

8. When members of the Association were asked to contribute to the War Memorial Fund they were informed that after the cost of the Memorial had been met any surplus funds would be devoted to assisting the education of the sons and daughters of members of the profession who gave their lives in the Second World War. It is not yet known whether there will be any surplus funds, but approximately £330 was donated specifically for charitable purposes. After careful consideration, the Council has decided to transfer this sum to the Medical War Relief Fund with a request that it be used to assist in the education of children of medical practitioners, victims of the Second World War, who are in need of such assistance.

Staff

9. Because of the great increase in the work of the Public Relations Department the Council has decided to appoint a Senior Assistant to the Public Relations Officer.

The Council records with deep regret the death of a former member of the staff, Dr. N. G. Horner, who gave distinguished service to the Association as Editor of the *British Medical Journal* from 1928 to 1946.

Cost of Arms

10. Some years ago the Council applied to the College of Arms for Armorial Bearings for the Association, but the designs produced at that time were not judged altogether suitable. A new design is now under consideration and the Council hopes to include further information on this matter in its Supplementary Report.

Churches' Council of Healing

11. For some years the Association has had two representatives on the Churches' Council of Healing. This body is reorganizing its constitution and revising its functions, and, with a view to strengthening the co-operation between Medicine and the Churches, has sought additional representation of the Churches and the medical profession. The Council has accepted an invitation to increase its representation and has appointed the following as its representatives for three years: Dr. Peter W. Edwards (Market Drayton), Dr. Mary Esslemont (Aberdeen), Dr. Robert Forbes (London), Dr. Doris Odium (Bournemouth), Dr. H. H. D. Sutherland (London), and Dr. E. E. Claxton (Assistant Secretary, B.M.A.).

Council Dinner

12. The biennial Autumn Council Dinner, which was discontinued during the war, was reinstituted in 1951. Partly for reasons of economy, it was not held in 1953. The Council proposes to hold it in the autumn of this year.

Gifts to the Association

13. The Council has pleasure in reporting the generosity of one of its former members, Dr. J. A. Ireland, in presenting a Chinese Vase to the Association, to be placed in the Hastings Room.

It is very glad to report also a gift from the Merseyside Branch in the form of the original minute book of the Newton Medical and Surgical Association. This association was founded at Newton, in Lancashire, in 1837 as a branch of the Provincial Medical and Surgical Association, which later became the B.M.A. The book will be presented to the President of the Association during the Annual Meeting in Glasgow and will be placed in the Library at B.M.A. House.

Cricket Match Against the Law Society

14. A very enjoyable cricket match was played at Hurlingham on July 3, 1953, between teams representing the Association and the Law Society and was won by the Association's team.

The Council is indebted to Dr. R. P. Liston (Tunbridge Wells) for kindly making the necessary arrangements on behalf of the Association. A return match has been fixed for May 30, 1954.

Professor Raffaele Bastianelli

15. The Council has sent congratulations and good wishes to one of the Association's Foreign Corresponding Members—Professor Raffaele Bastianelli, of Rome—on the occasion of his ninetieth birthday.

Review of General Practice

16. The report of the General Practice Review Committee and the report of the personal survey of general practice by Dr. Stephen Hadfield (Assistant Secretary) were published in the *British Medical Journal* of September 26, 1953, and had a very good press.

Deaths

17. The Council regrets to report the deaths of 549 members during the year 1953.

GENERAL MEDICAL SERVICES**Liaison between the General Medical Services and the Public Health Committees**

18. During the present session a closer liaison between the G.M.S. and the Public Health Committees has been attained by the appointment of a direct representative of the G.M.S. Committee on the Public Health Committee and the appointment of a representative of the Public Health Service (jointly by the Public Health Committee and the Society of Medical Officers of Health) to the G.M.S. Committee.

It is hoped that even closer co-operation between the two committees will be attained by the decision to invite representatives of the Public Health Committee to join the liaison committee already existing between the G.M.S. and the Central Consultants and Specialists Committees.

Remuneration**SIZE OF THE CENTRAL POOL**

19. The principles established by the Danckwerts award made it necessary for the G.M.S. Committee to reach agreement with the Ministry each year on the detailed application of the variable factors which are involved in calculating the size of the Central Professional Pool. The following paragraphs set out the action which is being taken:

Number of Doctors in the Service.—Agreement has been reached on the method which is to be used in calculating the precise number of doctors in the Service in each financial year. Two actual counts of the numbers of principals on executive council lists will take place in each year, and the mean of the two figures will be taken for the purposes of calculating the size of the Pool. The count will not be confined solely to those whose names appear on the medical lists at the relevant dates but will have regard to applications for admission to the list which are under consideration at the time when the count is taking place.

Practice Expenses.—It will be remembered that Mr. Justice Danckwerts accepted an expense ratio of 38.7%, and this percentage has so far been used in calculating the size of the Central Pool. It is clearly desirable, however, that this figure should be brought up to date, and arrangements were made for a further review of the level of practice expenses, including an inquiry undertaken by the Board of Inland Revenue and based upon doctors' accounts for the financial year which ended during the March quarter of 1952. This inquiry is now complete and the results are to be discussed with the Ministry of Health. The agreed expense ratio will be applied retrospectively to the 1952-3 Pool.

Receipts from Private Practice.—The Ministry made the suggestion that the Inland Revenue inquiry into practice expenses should also be used to obtain an estimate of the receipts of general practitioners from private practice. The method of calculation which the Ministry proposed to adopt made it obvious to the Committee that no accurate assessment of private practice receipts could be obtained in this way. The Committee does not dispute that an up-to-date figure for private practice must eventually be ascertained, but it was unable to agree that the practice expenses inquiry was an appropriate way of obtaining the information.

These views have been accepted by the Ministry, and further thought is being given to possible ways and means of obtaining an accurate estimate of total receipts from private practice. In the meantime, both sides have agreed that the figure of £2,000,000 accepted by Mr. Justice Danckwerts should be used as a provisional basis for the calculation of the Pool for 1952-3, and that an adjustment either way should be made when a more detailed assessment of this source of income is made.

The Distribution Scheme

20. **Appeals Machinery.**—It will be remembered that the Committee felt that it was necessary to provide means whereby an appeal could be made against (1) the rejection

of any application for an initial practice allowance; (2) the refusal of a hardship payment; and (3) the refusal of an application to be paid on the basis of "notional lists." The Committee has been able to ensure that in those circumstances a practitioner will have a right of appeal to the Minister, and in reaching a decision the Minister will be advised by a committee consisting of equal numbers of representatives of the Ministry and of general practitioners from a panel nominated by the G.M.S. Committee.

Notional Lists.—The original E.C.L. on this subject made special provision that, where a new partnership had recently been formed but one of the partners could not be admitted to the list until some time in April, 1953, executive councils would be given discretion to determine the number of loadings due to the partnership as if the name of the incoming doctor had been included in the list on April 1, 1953. The Ministry has now agreed that a similar concession should be granted in the first month of any quarter. In other words, where an executive council is satisfied that a partnership was, in fact, effective from the beginning of a quarter but that there is some delay in the admission of the new member of the partnership to the medical list, so that inclusion in the list actually takes place at a date between the first and last days of the first month of a quarter, the executive council can agree to calculate the number of loadings due to the partnership as if the name of the incoming doctor had been included in the medical list from the beginning of the quarter. It has also been agreed that the Medical Practices Committee can, at its discretion, grant a partnership application from the date on which it first receives the application, provided that it is satisfied that the partnership was, in fact, effective from that date.

Maximum Lists.—Although normally most general practitioners complete their National Service soon after registration, occasionally call-up is deferred until after a practitioner has become established as a principal. The position of partnerships where one member is liable to be called up for National Service has therefore been considered, particularly in regard to the size of the partnership lists.

Following discussions with the Committee, the Ministry agreed that where a member of a partnership was called up for National Service this should not affect the calculation of the maximum lists for the partnership, provided that adequate deputizing arrangements had been made for the care of the patients of the absent practitioner. In addition, the Ministry agreed that there would, in the circumstances, be no need to disturb any arrangement for payment on notional lists which might then be in existence, since the deputizing arrangements should normally be accepted as complying with the requirements of the distribution scheme.

Initial Practice Allowances.—Attention has been drawn to an anomaly in the method of assessing total professional income in connexion with claims for Initial Practice Allowances. In the case of doctors filling vacancies in small single-handed practices executive councils are required to take dispensing payments into account, and the Committee felt that some allowance should be made for the fact that the amounts involved include the actual cost of the drugs supplied. Following consultation with the Ministry, it has been agreed that the total sums paid for dispensing should be disregarded.

The Danckwerts Award and the Small-list Practitioner

21. It will be remembered that the Extraordinary General Meeting of the Association and the Special Conference of Local Medical Committees last year reaffirmed their support of the new distribution scheme and endorsed the action which the Committee proposed to take to give effect to the rider passed by the Conference of L.M.C.s in 1952. The sense of the rider was briefly that if, after the new scheme of distribution had been endorsed by both parties, it was found in the light of experience that certain groups who might have expected to have benefited had, in fact, not done so, it should be left to the Working Party provi-

nationally to allocate an appropriate proportion of the final settlement moneys for the purpose of remedying any obvious defects in the distribution scheme.

Clearly, the wishes of the Conference could be implemented only after the new distribution scheme had been in operation for some time and its effects assessed in the light of experience. Again, it was felt that a comprehensive inquiry into the position of practitioners with small lists would be necessary before any revision of the distribution scheme could be justified.

In consequence the Committee, in consultation with the Ministry, called the Working Party together again to investigate the problem, and it was agreed to initiate an official inquiry designed to reveal both the number and groups of general practitioners who might in the light of experience have been found to be adversely affected by the new distribution scheme. The Committee felt that such a step would not only safeguard the accuracy of the information which was being sought but would also have the advantage that the Ministry would be aware of the Committee's intention to examine the situation and would be prepared, in advance, for any adjustment in the Working Party's scheme which might prove necessary.

At the same time, the Committee secured the inclusion in the regulations of a provision whereby, should it be decided to revise the distribution scheme in any way, the steps taken to this end could be applied retrospectively.

As a first step, the Ministry prepared a list of single-handed practitioners who, on January 1, 1953, were recorded as having lists of not more than 1,200 patients, and executive councils were asked to supply certain particulars about these doctors from their own records.

Although this official inquiry was designed to give the Working Party some knowledge of the circumstances of the practitioners concerned, it was felt to be desirable to invite local medical committees to supply additional information, mainly concerning the work which those within the scope of the survey were undertaking outside the provision of general medical services under the Act.

These two inquiries have been completed, and a further meeting of the Working Party has been arranged. Any further information on this subject will be given in the Supplementary Report of Council.

Future Proposals for the Administration of the Inducement Fund

22. In Scotland it has been agreed that, in future, an income level of £1,400 shall be taken into account when considering the provision of inducement payments. As a result of the Danckwerts award the Inducement Fund as such no longer exists, but it is the Ministry's intention to continue to make grants of this nature as and where they may be necessary. In future, they will be made upon a more generous scale to take account of the increased remuneration established by the award, and, although no specific figure has been laid down for England and Wales, the amounts will not, in any case, be lower than the Scottish scale. Instructions to this effect have been issued to executive councils.

Group Practice

23. Following its acceptance of the definition of group practice made by the Committee on General Practice of the Central Health Services Council, the G.M.S. Committee, in conjunction with the Ministry, has prepared a scheme for the allocation of the sum of £100,000 set aside by the Working Party to encourage group practice. An appropriate proportion of this sum will be set aside for use in Scotland, where a separate but similar scheme will operate. Group practice is defined, in brief, as a practice carried on by several general practitioners working together in close association, consulting one another about their patients, and doing their surgery work wholly or in part in a common building controlled by the members. Normally, it should consist of between three and six members, who may or may not be in partnership but who would have a proper

understanding between them on the sharing of the earnings of the group and of their expenses.

The Ministry has agreed with the Committee's view that while a group will not normally consist of fewer than three persons, in exceptional cases, particularly in rural areas, two will be recognized as a sufficient number for the purposes of this scheme. Financial assistance to a group will take the form of an interest-free, long-term loan which will be recoverable by quarterly deductions from the remuneration payable by executive councils to individual members of the group. Loans will be available for the purposes of erecting new buildings, the acquisition of existing buildings and their conversion into surgery premises, or the conversion of buildings already owned by members of the group.

A committee—the Group Practice Loans Committee—consisting of four members of the Committee and four officers of the Ministry of Health, together with legal advisers, has been set up to consider applications for loans. This committee will advise the executive council, to whom the application will in the first instance have been submitted, whether a loan should be made, and, if so, the amount which should be lent. Normally, the period of the loan will be not less than 10 years and not more than 20, although no standard term has been prescribed.

After considering whether any security should be given to the executive council for the repayment of the loan, it was decided not to require a formal mortgage to be taken out on the group premises, as while this would afford good security, it was felt that it might unduly restrict the operation of the scheme. The model agreement has accordingly been drawn to provide for the joint and several liability of the various members of the group and, in order to cover the possibility that one member may decide to leave the group before the expiry of the loan period, it is a requirement of the issue of the loan that the various members will enter into some formal agreement between themselves defining their respective rights and liabilities.

The Committee has also discussed with the Ministry and the Medical Practices Committee the question of the admission of a new member of the group to the medical list for the area. It was agreed that in a restricted area, while the group should have the right to replace an outgoing member they should not have a similar automatic right to add to their number by taking in an additional member. In an open area both replacements and additions will, of course, be without restriction.

In order therefore to regulate the position in a closed area it has been decided that where a group wishes to admit a new member either as an addition to the existing group or to fill a vacancy, whether in formal partnership or not, admission to the medical list will be as if the group were in formal partnership—i.e., the right to replace a member can be assumed although additional members whose names are not already included in the medical list in the locality will not normally be admitted. It would be necessary for the members of the group to reach agreement as to the new member's share of liability for the outstanding or continuing loan.

Admission of Students to Medical Schools

24. In its last Annual Report the Council announced that the G.M.S. Committee had established a special subcommittee to investigate the number of students entering medical schools, the number qualifying from the schools, and the number of newly qualified practitioners likely to be absorbed into the various branches of the profession. The Committee has, for a number of reasons, been concerned about this important problem, particularly since any surplus of medical practitioners will inevitably have to be absorbed into general practice.

Firstly, Mr. Justice Danckwerts in his award had expressed the view that it might be necessary to reconsider his decision that the Central Pool should be based on the number of doctors in the Service if the number of new entrants to

general practice subsequently proved to be disproportionately high. Secondly, although the new distribution scheme with its system of Initial Practice Allowances, etc., had eased the problem of new entrants, there was no doubt that some difficulties were being experienced in finding enough suitable openings in general practice.

Nevertheless, the reduction in the registrar establishment—a step which had aggravated the difficulties in general practice—and the many problems of those wishing to enter other branches of the profession made it essential that the investigations should not be confined solely to general practice, and, in consequence, representatives of the Central Consultants and Specialists, Public Health, Overseas, and Armed Forces Committees were invited to participate in the discussions.

As a first step, consideration was given to the various available sources of information on which the investigation could be based. Inquiries were made as to the data which could be obtained both from the Association's own records and from a number of outside bodies such as the General Medical Council, the Medical Practices Committee, the Ministry of Labour, etc.; and, since the inquiry which was envisaged involved an estimate of how the future output of the medical schools should be related to the recruiting needs of the various branches of the profession over a period of years, expert actuarial advice was also sought at an early stage in the proceedings.

As a result of these preliminary investigations, the experts expressed the opinion that before any attempt could be made to relate the output of doctors to the opportunities which would be open to them, an estimate would first have to be made of the medical needs of the country and, in the case of the National Health Service, the requirements for doctors in all its branches. The acceptance of this view clearly involved consideration of matters of the highest policy. For example, at what point could it be said that general practice was likely to reach saturation? What should be the average doctor-patient ratio throughout the country, and, on a long-term basis, was there a possibility that the maximum number of patients which a single-handed practitioner might have on his list would be revised?

Another problem was the overall establishment of hospital officers and the question of hospital staffing generally. The Ministry has made it quite clear that there is no possibility of any substantial increase in the number of consultant posts, and over the next 10 years there would inevitably be a heavy wastage of senior registrars and registrars. As this fact became known, fewer practitioners would be prepared to extend their hospital appointments, and this, in time, would necessitate their absorption into other branches of the profession.

Two other fields can be quoted as examples of the complexity of the problem. Firstly, could it be argued that the Colonial Service establishment was likely to decline because of the move towards self-government in the Colonies which are at present manned by British doctors? Secondly, how wide were likely to be the recommendations of the Waverley Committee, which was examining the requirements of the Services in peace and war?

All these factors having been given full consideration, it became obvious that, as so many outside interests were involved, no one organization could solve so complex a problem or obtain, with any pretence of accuracy, the statistical data which alone could give the general picture upon which an estimate of future requirements of medical personnel could be based.

The question then arose whether, taking all these factors into account, it would not be in the best interests of the profession for the Association to invite the Ministry of Health to co-operate in the establishment of a Working Party to examine on a long-term basis and with the widest possible terms of reference the future number of medical practitioners likely to be required in all branches of the profession, and to correlate the intake of students to the medical schools with these needs. Even so, before taking such a step, it was felt that every effort should be made to

secure some data which might indicate the extent of the problem and justify the fear that there was likely to be a substantial excess of doctors over the number of openings available during the next few years.

Although the limited data available made it impracticable to secure a strictly actuarial picture of the situation, it nevertheless proved possible to produce estimates based on the Association's own records which more than substantiated the view that if existing trends continued a surplus of doctors over the next few years was inevitable.

The Council has therefore asked the Minister to set up a working party to review the whole problem. In making this suggestion the Council informed the Ministry that it was envisaged that such a working party would, in addition to the members nominated by the Ministry and the Association, include officers of the Colonial Office, the Ministry of Defence, the Ministry of Labour, the Home Office, the General Medical Council, and deans of medical schools, etc.

The Minister's reaction to this proposal is awaited.

Change of Practice

25. The G.M.S. Committee has for some time been conscious of the difficulties facing established general practitioners who wish to change the area of their practice. Efforts have been made in the past to facilitate the exchange of practices, though, unfortunately, with disappointing results.

Attention has been drawn to this matter once again by the Representative Body, and the Committee established a special subcommittee to examine the problem. It has not confined its efforts to possible methods of improving the existing machinery for direct exchange between two practitioners, but has approached the problem from the point of view of the establishment of a general "clearing-house" through which the differing requirements of practitioners might be met—in other words, machinery whereby those wishing to change their area of practice will be able to do so by a number of methods. There are three possible lines of approach to the problem: (1) direct exchange of practices between established practitioners; (2) the appointment to small vacancies from a panel of practitioners who have notified their desire for this type of opening; and (3) exchange of vacancies by arrangement between executive councils whereby two applicants may both gain advantages.

Machinery has already been set up to facilitate the direct exchange of practices between established practitioners, whilst, similarly, measures have been taken to form a panel of practitioners who have notified their wish to be considered for appointment to small vacancies. Thus, the first two methods are to some extent covered, and there remains the third method visualized by the Committee—an exchange of vacancies by arrangement between executive councils. The Committee proposes that a general practitioner wishing to change the area of his practice would, when applying for the vacancy of his choice, be given special consideration on the ground that he would be surrendering an equivalent or better practice in another part of the country, thus leaving an opening for another practitioner. Such a proposal would in no way imply that the vacancies would not be advertised in the normal way, but merely that an applicant with a practice to offer in exchange would have that fact taken into account.

The success of such a scheme obviously depends upon the full co-operation of both executive councils and the Medical Practices Committee on the one hand and the maintenance of a central bureau on the other. The possibilities of such a scheme are being explored with the Medical Practices Committee.

Machinery for Filling Practice Vacancies

26. Discussions have taken place with the Ministry of Health on the recommendations which were approved by the Representative Body last year for modifying the present machinery for filling practice vacancies.

The Ministry feels that, as the Committee on General Practice of the Central Health Services Council is expected to report in the fairly near future, and as this report may well recommend changes in the existing methods of filling practice vacancies, it is preferable to defer further consideration of this question until the report has been published. The Committee has not dissented from this view.

Succession to a Vacant Medical Practice by a Partner

27. The Annual Representative Meeting referred back to the Council the section of the last Annual Report which dealt with the agreement reached between the Ministry of Health and the G.M.S. Committee on the steps to be taken to regulate the position of short-term partnerships. In effect the proposal was that, in the absence of special circumstances, the Medical Practices Committee would not accept one partner as a logical successor to another unless the partners had been in active practice together for about a year. Some doubt was raised as to the legal position of a local medical committee in giving advice of this nature to an executive council when considering a particular case.

The G.M.S. Committee has examined this question in detail with the Ministry in the light of views expressed by the legal advisers of both sides. It is confident that, provided the local medical committee acts in good faith, there are no grounds for fear that it might be liable to damages. In the circumstances, the Committee has reaffirmed its view that the agreement reached with the Ministry and the Medical Practices Committee on this issue should not be modified. Even so, the Ministry is being asked to afford the same measure of indemnity to local medical committees as has been promised to executive councils.

Allocation of Patients to General Practitioners

28. The G.M.S. Committee has once again discussed with the Ministry the considerable disquiet which exists about the position of a general practitioner who may be required to give medical attention to a patient already receiving treatment from an unqualified practitioner.

The Ministry is appreciative of the profession's point of view, but the only effective solution of the problem lies in the introduction of amending legislation. Not only is there little chance of early legislation in the health field, but the political implications of an amendment on the lines required are considerable. The Ministry felt, therefore, that at this stage they could only repeat their suggestion that a suitable reference should be made in the "Notes for Guidance of Service Committees," advising these committees that the attitude of the General Medical Council to covering should be borne in mind—if a practitioner is required to appear before them as a result of refusing treatment to a patient who is also receiving treatment from an unqualified practitioner.

The Committee has accepted this proposal as an interim solution, but has reiterated its firm opinion that, ultimately, this anomaly must be corrected by a suitable amendment of the Act itself. The position will be kept under constant review.

Acceptance by a Locumtenent of Patients of a Vacant Practice

29. The Committee has discussed at some length with the Central Ethical Committee the circumstances in which the patients of a vacant practice might be accepted by other doctors in the vicinity.

The main problem has been the difficulty of reconciling the right of the patient to select his own doctor with the obligation of an acting practitioner to hold the practice together for the eventual successor. At the same time, the Committee has been anxious to ensure that practitioners who, in order to help the widow of a colleague, temporarily take over responsibility for his practice, shall not as a result be placed in a less favourable position than other practitioners in the area who do not volunteer to help.

Initially, it was thought that the situation might be overcome by imposing a time limit during which patients should not be accepted by an acting practitioner, but it soon became apparent that such a course would not satisfactorily solve the problem.

In consequence, the Committee felt that it would be unwise to lay down any definite prohibition and that the problem could best be met by the issue of a general statement to the effect that a locum, by reason of the advantages he enjoys through his introduction to patients of the vacant practice, should in fairness to the incoming practitioner or successor exercise the utmost discretion in the acceptance of patients.

This suggestion is now under consideration by the Central Ethical Committee.

Economy in Prescribing

30. Following the Minister's speech to the Annual Conference last year, early discussions took place with the Ministry on ways and means of securing further economies in prescribing costs. The following paragraphs set out the steps which have been taken or which are in contemplation:

(1) The co-operation of the deans of medical schools, the vice-chancellors of universities, and the members of other examining bodies is being sought on the problem of training medical students in economical prescribing, and particularly newly qualified practitioners during the pre-registration period.

(2) The G.M.S. Committee is seeking an early return to the system of full pricing and areal averages whereby the individual doctor is notified of the average cost of prescribing in his own area. This the Committee considers to be one of the most effective ways of combating excessive prescribing, but at the present time the arrears of work which face pricing bureaux make it impossible for the system to be introduced at once on a national basis. Therefore the areas where pricing averages can be computed will, for the time being, be restricted possibly to groups of counties which will be selected in rotation.

(3) The issue of *Prescribers' Notes* is being extended to all professors of pharmacology and therapeutics. It is already being issued to hospital medical staffs, and the introduction of notes of special interest to consultants is also envisaged.

(4) Price lists showing the cost of preparations which appear in the *National Formulary* and the price of analogous proprietary preparations of equivalent therapeutic value have been circulated to all general practitioners, and it is hoped that by this method the general practitioner will more readily appreciate the cost of some of the items which he prescribes.

(5) It is felt that there is a need to simplify the names of the preparations in the *National Formulary*, and the assistance of the *National Formulary Committee* is being sought to this end.

(6) As the Representative Body will be aware, the Committee has for a considerable time been urging the immediate introduction of stock orders for doctors' surgeries—a step which it is convinced would result in a substantial and early saving. In this the Committee has the full support of the Ministry, but, unfortunately, without whose participation the scheme cannot, of course, be operated. Every opportunity is being taken to overcome these difficulties.

Apart from the steps which are being taken in consultation with the Ministry, the Joint Committee on Prescribing, under the Chairmanship of Professor Sir Henry Cohen, has now issued the detailed lists in which proprietary preparations are classified into a number of categories. With the concern lest pricing bureaux might be instructed to question all prescriptions for substances in categories 5 and 6—those drugs which the Cohen Committee considered should not normally be prescribed. It also became clear that many general practitioners were under the impression that any prescriptions which they might write for drugs in these categories would automatically be referred by the pricing bureaux for investigation.

This point was therefore taken up with the Ministry, and as a result a categorical assurance has been given that those drugs listed in categories 5 and 6 will not be referred by the pricing bureaux for investigation merely because they come within these categories. Indeed, the regulations themselves do not permit of investigations on this count.

Only where an individual practitioner's prescribing costs are excessive and are the subject of an inquiry on that ground will the prescribing of drugs in categories 5 and 6 be one of the factors which may be taken into account. In such circumstances the frequency of prescriptions for substances in the two categories will also be considered.

This important statement has been given publicity in the *Supplement to the British Medical Journal*.

The Association has been informed that the Central and Scottish Health Services Councils have decided to appoint a Joint Standing Committee on the classification of proprietary preparations, under the Chairmanship of Sir Henry Cohen, to undertake the classification of new proprietary preparations as they are introduced. This will take the place of the original Joint Committee on Prescribing on Form E.C.10.

The Association has been invited to nominate a general practitioner to serve on this committee, but before making any nomination has asked for details of its composition and terms of reference.

Dangerous Drugs Regulations

31. Following consultation with the Committee the Ministry has issued a circular letter drawing attention to the fact that midwives are forbidden to administer pethidine except under the supervision, and in the presence, of a doctor, unless the drug is obtained on the authority of the medical officer of health. General practitioners have accordingly been reminded that it is undesirable that they should supply or prescribe pethidine for use at confinements unless they themselves intend to be present.

Supply of Medicines to Private Patients

32. Joint representations to the Ministry are being made by the General Medical Services and Private Practice Committees to secure the implementation of the resolution passed by the Representative Body last year that private patients should be permitted to be supplied with drugs and appliances on Form E.C.10.

Medical Service Committee Procedure

33. The report of the special subcommittee appointed to review the whole of the disciplinary machinery under the National Health Service, amended in accordance with suggestions made by the A.R.M. and the Annual Conference of Local Medical Committees, has now been discussed with representatives of the Ministry of Health.

The majority of the Subcommittee's recommendations were accepted by the Ministry, which also put forward a number of suggestions of its own for revising the present regulations.

Discussions are proceeding, and it is hoped that it will be possible to give details of the progress which has been made in the Supplementary Annual Report.

The Committee is working in close contact with the B.D.A. and the N.P.U., and representatives of these organizations are taking part in the discussions with the Ministry of Health.

Responsibility for the Acts and Omissions of a Partner

34. Further consideration has been given to the anomalous position which arises under the terms of service whereby a general practitioner is responsible for all acts and omissions of any practitioner acting as his deputy or assistant. Whilst this provision is equitable in the case of assistants and locums, in the case of members of a partnership the Committee held that each partner should be held responsible for his own acts, as is the position under the Partnership Act.

The matter was accordingly discussed with the Ministry, which suggested that the Committee's objection to the present arrangements would be largely overcome if partners were treated as jointly responsible for the acts and omissions

of one in treating the patients of the other. The executive council would then be entitled to take action for a breach of the terms of service against the person who was in actual fact responsible for the treatment of the patient at the time when the complaint was lodged.

The G.M.S. Committee felt that this proposal went part of the way to meeting its objections to the present position, but there was the risk that if the action against one practitioner failed the Service Committee might then proceed against his partner.

Attention has also been focused on the larger question of the responsibility of individual principals in contract with an executive council who deputize for other principals with whom they are not necessarily in formal partnership.

Prior to making a further approach to the Ministry the whole position was discussed with the Medical Defence Societies. The meeting formulated the following proposals as a basis for a revision of the regulations, bearing in mind the need to reconcile the personal responsibility of the deputy with the contractual relationship which exists between doctor and patient:

(1) That a practitioner should remain responsible for the acts and omissions of any other practitioner acting as his deputy where the deputy is an assistant or a locumtenent not on the medical list of an executive council.

(2) Where the deputy is also a principal on the medical list, in any executive council area, whether as a partner or not, the deputy should be responsible for his own acts and omissions, unless it can be shown that there is *prima facie* evidence that the principal upon whose list the name of the patient appears had himself acted in breach of his terms of service.

(3) That in the event of a complaint being made it should be the duty of the Chairman of the Service Committee before a case is heard to decide (upon the advice of a panel nominated by the profession) whether there is a *prima facie* case against the first principal or whether he had been cited in the complaint merely because the name of the patient appeared on his list. In such an event, provided he was able to show that he had made proper and adequate deputizing arrangements, no further action should be taken against him, and only the deputy should be required to appear before the Service Committee.

These proposals will be placed before the Annual Conference, and if approved will be discussed with the Ministry of Health.

Standard of Accommodation in Surgeries and Waiting-rooms

35. A circular letter has been sent by the Chairman of the G.M.S. Committee to every general practitioner in the National Health Service, drawing attention to the necessity of maintaining a high standard of surgery and waiting-room accommodation.

Geriatric Units

36. Following consideration of a resolution of the Representative Body that the Minister should be urged to consider the establishment of geriatric units, a special subcommittee was set up jointly with the Central Consultants and Specialists and Public Health Committees to examine this problem. (See para. 71.)

Co-operation between General Practitioners and Health Visitors

37. Following consideration of a resolution passed by the Representative Body to the effect that health visitors working under the guidance of general practitioners could be of great assistance, a special subcommittee was set up jointly with the Public Health Committee to consider ways and means whereby the help given by the health visitors to general practitioners might be increased. (See para. 94.)

Employment of General Practitioners in Hospitals

38. Discussions have continued with the Joint Consultants Committee and the Staff Side of Committee "B" of the Medical Whitley Council on the terms and conditions of service for general practitioners employed in hospitals.

It will be remembered that the Ministry's proposals entailed the classification of general practitioners working in hospitals into several categories according to the work undertaken and the responsibilities involved. The Committee took the view that this subdivision was unnecessary, and maintained that, with the exception of a small number of posts of a purely training nature, the vast majority of general practitioners working in hospitals, although undertaking duties of a diverse character, carried a comparable degree of responsibility. It was therefore felt that no practitioner working as a clinical assistant under supervision should be paid less than the rate laid down in paragraph 10 (b) of the terms and conditions of service for hospital staff—that is, £175 per annum per weekly half-day.

The Ministry has now conceded the principle that a composite rate should apply to all these posts, but, at the same time, it maintains that a rate of £125 per annum per weekly session would be appropriate.

In view of the fact that negotiations are now proceeding in Whitley Committee "B" for a review of the remuneration of hospital medical staffs, it has been agreed between the Staff and Management Sides that the actual rate of payment for general practitioners working as clinical assistants should be left until the major question is resolved.

Representation of General Practitioners in Hospital Administration

39. The question of general-practitioner representation on regional hospital boards has once again been taken up with the Ministry of Health. The G.M.S. Committee is glad to be able to report that there is now at least one general practitioner on every board, but it is nevertheless perturbing that in several instances the general practitioners appointed were not those nominated by the general practitioners in the area. The Committee holds that it is essential that the general-practitioner representatives should always enjoy the confidence of their local colleagues.

Whilst the Ministry accepted the Committee's views in this matter, during the course of discussion it emerged that certain of the nominations made by the Association in these particular instances had been rejected primarily for geographical reasons and in order to preserve the balance of representation of different localities on the boards. To overcome this difficulty the Ministry has suggested that the Association should make more than one nomination for any particular vacancy, so that if the first nomination is unacceptable for geographical or other reasons there will be a second nomination available.

The Committee is in full agreement with this suggestion.

The Committee, through its liaison committee with the Central Consultants and Specialists Committee, has also considered the problem of obtaining adequate general-practitioner representation on other hospital administrative bodies. In the case of staff committees of the individual hospitals, the Committee feels that they should consist of all the members of the hospital medical staff, and, if there are general practitioners on the staff, then they would be so included. On group medical committees or on local medical advisory committees, whether constituted by the hospital staffs or by the hospital management committees, there should be adequate representation both of general practitioners, whether employed in the hospital or working outside, and of the public health service.

So far as the regional medical advisory committees are concerned, the Committee feels that the establishment of adequate general-practitioner representation on the boards themselves would largely ensure representation on the advisory committees.

Consolidation of the N.H.S. (General Medical and Pharmaceutical Services) Regulations

40. The National Health Service (General Medical and Pharmaceutical Services) Regulations were originally published in 1948, and since that time they have been considerably amended to meet changing conditions in the

Service. The Ministry has now incorporated these various amendments in the new regulations and proposes to issue them in consolidated form. The draft of the new regulations was submitted to the G.M.S. Committee, and various minor alterations have been suggested to and accepted by the Ministry.

The considerable amendments which have been made to the original regulations have also necessitated a revision of the Ministry's handbook for general practitioners. This is now under way, and the Committee hopes that it will be possible to issue the new handbook shortly.

Maternity Medical Services

41. The G.M.S. Committee established a special subcommittee to review the maternity medical services, with particular reference to the relation of fees to the work done and to the obligations of the general practitioner under the regulations. It was also asked to consider what steps could be taken to secure more effective co-ordination of the different sections of the maternity service.

The conclusion has been reached that, although the present framework of the Act and regulations is in some ways cumbersome, generally speaking a very satisfactory service is given to the public. A number of suggestions have been made designed to secure greater integration of the three branches of the Service. No definite recommendations have been made for any variation in the fees at the present time, but, should there be any alteration in the requirements made of the general practitioner providing maternity medical services, the question of the adequacy of the fees now paid would require re-examination.

The Obstetric List.—The Representative Body last year called upon the Council to report the steps which were being taken to secure the abolition of the obstetric list. As the Representative Body will be aware, this measure has the full support of the G.M.S. Committee, and particular emphasis was given to it in the Association's evidence to the Committee on General Practice of the Central Health Services Council.

The Committee is awaiting the report of the Cohen Committee on General Practice before it reopens discussions with the Ministry on the abolition of the Obstetric List.

Analgesia in Domiciliary Midwifery

42. The Ministry, after consultation with the Committee, is undertaking a small sampling inquiry into analgesia in domiciliary midwifery for the purpose of ascertaining why some patients do not have gas-and-air analgesia. Medical officers of health from selected local authorities are participating in the inquiry.

Trainee General Practitioner Scheme

43. Discussions have taken place with the Ministry on a report prepared by a special subcommittee of the G.M.S. Committee on the operation of the Trainee General Practitioner Scheme. The Ministry expressed its agreement with the recommendations made by this Subcommittee, and the report has since been circulated to executive councils with a request that they should consider the implementation of the various proposals contained in it, in the light of local circumstances. Similarly, the Committee, for its part, has sent copies to local medical committees.

Discount on Drugs

44. Discussions have taken place between representatives of the G.M.S. Committee and the National Pharmaceutical Union and the Association of the British Pharmaceutical Industry about the present unsatisfactory position whereby, as a result of differential rates of discount allowed to retail pharmacists and general practitioners, the dispensing doctor may suffer financial loss when supplying a number of proprietary preparations. Inquiries are being made to determine the exact extent of the problem, and further meetings are being arranged.

Reports to General Practitioners on the Death or Discharge of Hospital Patients

45. It will be remembered that the Representative Body expressed the view that the Ministry of Health should be pressed to instruct hospitals to send an immediate notification to the family doctor on the death or discharge of his patient from hospital.

The G.M.S. Committee, in common with the Central Consultants and Specialists Committee, felt, however, that this was a question for professional co-operation rather than for the issue of instructions by the Ministry.

Following discussions between the two committees, a letter has been sent to the chairmen of Hospital Group Advisory Committees, with copies to other hospital officers where appropriate, drawing attention to the importance of ensuring that general practitioners are promptly notified of the death or discharge of hospital patients.

The matter will be reviewed at a later date to see whether this action has in fact had the desired result.

Report by the Medical Research Council on Clinical Research in Relation to the National Health Service

46. The G.M.S. Committee was disturbed to see that the recent White Paper on the subject of clinical research in the National Health Service contained no specific provision for general practitioners to avail themselves of the funds which are being provided for this purpose. It was also felt to be unfortunate that it had not been possible to provide direct general-practitioner representation on the Clinical Research Board.

This matter was discussed with the Ministry of Health, and representatives of the College of General Practitioners were invited to take part in these discussions. The Ministry maintains that the terms of the White Paper do not exclude general practitioners from participating in the funds provided for research purposes, but it is not prepared to support the suggestion that a general practitioner should be nominated to sit on the Research Board as a right. Nevertheless, it conceded that if there were a vacancy there was no reason why a general practitioner nominee should not be considered. The board has now been set up, and contains no general practitioner amongst its members.

Joint representations to the board are being made with the College of General Practitioners—firstly, with a view to securing an adequate allocation of available funds for research in general practice, and, secondly, to press the rightful claim of the general practitioner to be represented on the board itself.

Health Centres

47. Two questions have arisen in connexion with the London County Council's health centre at Woodberry Down, upon which the advice of the Committee has been sought. Firstly, the Committee looked at the advisability of the County Council's policy not to employ any general practitioner working at the centre on a part-time sessional basis in their welfare clinics which operate at Woodberry Down. Secondly, the Committee's views were sought on the desirability of providing physiotherapy and pathological laboratory facilities at the centre.

The Committee, for its part, can see no objection to doctors working at the centre being employed by the county council upon a part-time sessional basis at these welfare clinics, although of course they should not receive preferential treatment compared with general practitioners from outside the centre who also wish to take these posts. Similarly, the Committee can see no objection to the provision of physiotherapy and pathological facilities at the centre, provided that they are not restricted to general practitioners working in the centre.

The Committee is conscious of the experimental nature of health centre practice as a whole, and it has recommended the local medical committee to proceed on the lines envisaged above and to review the situation in the light of experience.

Certification for Surgical Corsets

48. Although the Committee was successful in securing a reduction in the number of prescribed diseases for which tax-free corsets could be obtained and a consequent reduction in this form of certification, it still felt that the only solution to the problem lay in the total abolition of certificates for this purpose. It therefore made strong representations to the Board of Customs and Excise that further consideration should be given to the early removal of the need to obtain a certificate before a surgical corset could be secured free of purchase tax.

The Board were fully in sympathy with the Committee's views that it was difficult to prevent abuse of the present arrangements, but pointed out that the question of surgical corsets was part of the wider problem of surgical appliances as a whole, and they felt that the Committee would not object in principle to a scheme of purchase-tax exemption for any necessary surgical appliances. Whilst in the case of most appliances it would be readily apparent that they were required purely on medical grounds, in the case of corsets there was frequently room for doubt, and it was for this reason that a certificate was required as evidence of medical need. To withdraw the concession *in toto* would fall most hardly on private patients and on those National Health Service patients who prefer to buy their own appliances and corsets rather than get them through the National Health Service. There were also political difficulties involved in such a step.

Nevertheless, the Board were concerned to prevent unnecessary demands and abuse of any scheme for purchase-tax concessions, and they felt that the best course would be for any condition which might give rise to abuse to be deleted from the prescribed list. To this end they themselves had already deleted severe splanchnoptosis, and the Committee was provided with figures which showed that the demand for corsets supplied free of tax had shown a considerable drop since the list had last been pruned.

The Committee, at the invitation of the Board of Customs and Excise, will keep the list of prescribed diseases under review and, should it become apparent that there is any abuse of the scheme, steps will be taken to revise the list further. It is hoped that, by so doing, the demand for medical certificates for this purpose will be still further reduced.

Pension Scheme for Medical and Dental Employees

49. It will be remembered that during 1950 approval was given to the broad outline of a scheme to provide pensions and other benefits for employees of doctors and dentists. This scheme has now been completed in detail, and provides, *inter alia*, for: (a) pension on retirement at 65, or 60 in the case of a woman, based on salary and length of service with, in the case of men, the option of a "survivor" pension for widows; (b) death benefits for women; and (c) return of contributions on withdrawal from the scheme on death or retirement.

The Council acts as trustees to the scheme through the medium of a small committee appointed for the purpose of its administration. Full details can be obtained from the Medical Insurance Agency, Tavistock House North, Tavistock Square, London, W.C.1.

COMPENSATION AND SUPERANNUATION

Compensation

50. The following points which have been the subject of various resolutions of the Representative Body, including Minutes 230 and 231 of the A.R.M., 1953, have been discussed with the Ministry of Health: (a) The payment of compensation whenever a share in a practice is relinquished in favour of a new or existing partner; (b) the payment of compensation where a practitioner moves from one area to another; (c) the criteria for making hardship payments; (d) the publication of a definition of "hardship" in the context of the Compensation Regulations.

Following the meeting, the Ministry explained that, in general, the payment of compensation, except on retirement or in cases of hardship arising out of the purchase of a practice before the appointed day, could not be made at the present time. It was stated that, in reaching this conclusion, the Ministry had had regard not only to existing statutory provisions and the reasons therefor, but also to the general financial position of the country, which prevents any expenditure not essential to the maintenance of a service or vitally important for its development. However, the Ministry has recognized that there will be individual cases of hardship where an elderly doctor or one whose health is failing finds it necessary to take a partner in order to prevent the complete disintegration of his practice, and it will look sympathetically at cases of this nature.

In the opinion of the Council this new principle should be established in full before further representations are made on the four points set out above. The Council has decided, however, to press at once for an extension of this principle to include advance payment of compensation where an elderly doctor continues to work because he is unable to retire on economic grounds.

Financial Position of Practitioners on Retirement

51. The Council has considered the following resolution of the A.R.M., 1953:

233. Resolved: That the Council be instructed to inquire into the financial position of members of the profession who retire at the age of 60 or later, with special reference to the position of those who were over 45 years of age on the introduction of the N.H.S.

A report on the Council's inquiry and the conclusions reached are set out in Appendix II.

Concurrent Employments

52. The Ministry of Health has informed the Council that examination of the National Health Service (Superannuation) Regulations, 1950, has disclosed that an officer who holds more than one N.H.S. appointment concurrently is, for superannuation purposes, treated separately in respect of each appointment. This would result in anomalies which would be very much to the disadvantage of the practitioners concerned. The Ministry is prepared to amend the regulations to deal with this situation, and the Council has informed the Department that it welcomes this step.

HOSPITAL AND CONSULTANT SERVICES

53. The Council, through the Central Consultants and Specialists Committee, has continued to watch over the interests of hospital medical staffs, and an active part in negotiations on their behalf has been taken by the representatives of this Committee who serve on the Joint Consultants Committee and on the Staff Side of Committee "B" of the Medical Whitley Council.

The Committee is considering methods of improving the peripheral organization for consultants, and in particular the contact between the central and regional consultants and specialists committees and hospital group medical committees. In pursuance of this aim the Central Committee has already begun the issue through hospital group medical committees of regular bulletins giving an account of current items of interest for the information of all consultants and S.H.M.O.s.

Hospital Junior Staffing

54. The Ministry has asked the Joint Committee for its advice on the problem of shortage of hospital junior staff. It has given the Joint Committee details of the distribution of junior staff, numbers of posts in various grades—both filled and vacant—and other relevant information, and this has been made available to a special subcommittee appointed by the Central Consultants and Specialists Committee to study this intricate problem. The shortage appears to be

mainly in the non-teaching hospitals, where it occurs in most specialties at all levels between the pre-registration house officer and the consultant.

The number of doctors qualifying each year is between 2,000 and 3,000 less than the number of house officer and senior house officer posts. Since the training of many additional doctors would result in gross overcrowding of the profession, the problem must be solved in other ways, such as by a redistribution of available manpower, by the creation of inducements to young practitioners to continue longer in hospital posts, and by a greater use of general practitioners in the hospital service.

Some reduction in the total number of junior posts could probably be achieved, and a redistribution of posts as between teaching and non-teaching hospitals appears to be essential. The Central Committee is advocating a searching review of junior medical establishments with these considerations in mind.

The problem has been aggravated by the deterioration in the prospects of promotion in the non-teaching hospitals. The Representative Body drew attention to this position in the following resolution of the A.R.M., 1953:

That the Representative Body observes with concern that preference is being given to teaching hospital registrars in appointing consultants and senior registrars. This policy has seriously affected the recruitment of registrars to the non-teaching hospitals, with an ultimate threat to their efficiency and the comprehensive training of registrars, and the Council is asked to seek a remedy.

Another aspect of this problem is the breakdown of the old custom whereby a practitioner combined an appointment on the staff of the local hospital with a general practice. This has led young practitioners to doubt whether anything is to be gained by remaining in the hospital service longer than absolutely necessary if they intend ultimately to enter general practice. In this connexion the Committee welcomes the resolution of the Representative Body "that the Minister be asked to advise that executive councils should give equal consideration to practitioners who have spent several years in hospital, provided that they have adequate experience in general practice, as to other applicants for practice vacancies."

The Committee considers it necessary, in order to improve recruitment in the non-teaching hospitals, to provide in them better prospects both for those who intend to make a career in the hospital service and for those who would like to combine hospital work with general practice. Further consideration is being given to these and other aspects of the problem.

Senior Registrars and Additional Consultant Posts

55. The Council has considered the following resolution of the A.R.M., 1953:

That this Meeting is of the opinion that the Minister should increase the number of part-time consultant posts in general medicine and general surgery.

There has been a substantial increase in the total number of consultant posts in the past five years, but it appears that there are comparatively few vacancies in general medicine and surgery, and it is in these specialties in particular that there is an excess of senior registrars who are reaching, or have reached, the end of their training. No doubt the paucity of consultant posts in general medicine and surgery is to some extent due to the fact that many senior registrars in these specialties are engaged in work of a consultant nature. The Ministry agreed in May, 1953, that boards should be allowed to retain, for a further period not exceeding two years, senior registrar posts in excess of the fixed establishment where the abolition of the posts would involve transitional posts are to be filled in other grades. These "time-expired" senior registrars.

The Ministry has been urged to impress upon hospital boards the necessity of taking the opportunity offered by this arrangement to review their medical staffing so as to ensure that by the time these transitional posts come to an

end more permanent arrangements, including where necessary the creation of new consultant posts, are made to provide for the work of the hospitals.

In accordance with the circular on "Economy in Manpower," issued in December, 1952, hospital boards are not permitted to create additional consultant posts without the approval of the Ministry. The Ministry has now set up a small committee to consider applications from boards for permission to appoint additional consultants, and this committee includes representatives of the Joint Committee.

Senior Registrars: Removal Expenses

56. During the discussions between the Joint Committee and the Ministry on the question of the senior registrar establishment it was agreed that so far as practicable senior registrars should spend part of their four-year term in a teaching hospital and part in a regional board hospital. This had a twofold purpose: to widen the scope of the senior registrar's training and experience and to remove the handicap suffered by senior registrars whose experience was restricted to non-teaching hospitals when competing for consultant posts. This principle had the support of the Representative Body.

Despite the practical difficulties the system of interchange is being put into operation by most hospital boards. As a result, many married senior registrars have been faced with the problem of moving their homes during the period of their appointment, but the Ministry has informed hospital boards that a General Whitley Council agreement providing for reimbursement of removal expenses may be applied in cases of this kind.

Security of Tenure

57. The Council has considered the following resolution of the A.R.M., 1953:

That no contract made by the regional hospital board with its medical staff should be varied without prior consultation with the individual and medical committees of the establishments concerned.

So far as senior medical staff are concerned, this resolution is in accord with the policy accepted in principle by the Ministry. Moreover, it has now been established that a consultant or S.H.M.O. who feels that his contract is being modified unfairly has a right of appeal under paragraph 16 of the terms and conditions of service.

Remuneration of Hospital Medical Staff

58. The Council is fully in sympathy with the following resolution of the A.R.M., 1953:

That this Meeting is of the opinion that an adequate betterment factor should now be accorded to the consultants and specialists, in conformity with the intention of the Spens report accepted by the Government and the profession and already implemented in the case of the general practitioners by the Dankwerts award.

In 1952 the Staff Side of Committee "B" of the Medical Whitley Council submitted a claim for a review of the remuneration of hospital medical staff.

The Council understands that the Staff Side is making every effort to bring the negotiations to a satisfactory conclusion.

Legal Actions Involving Hospital Authorities and Members of their Medical Staffs

59. The Council has had before it the following resolutions of the A.R.M., 1953:

That this Meeting is concerned with the position of casualty officers as the result of recent legal actions, and the effect that it will have on the future staffing of casualty departments of hospitals, and urges the Council to continue its efforts to seek a solution to the problem.

That this Meeting (i) bearing ever in mind that medicine is not an exact science and that clinical phenomena never follow rigid laws, (ii) asserts that medical practitioners should not be held responsible (and liable) for damages on account of an incorrect diagnosis, provided that reasonable care and attention have been

given and no negligence has been proved, and (iii) urges that steps should be taken to re-emphasize this principle.

It is possible that the increasing risk of litigation has been one cause of difficulty in recruiting medical staff in casualty departments. The Joint Committee has informed the Ministry that, while it does not consider a uniform pattern of staffing in casualty departments to be desirable, it is strongly of the opinion that the casualty officer in many hospitals should be a more experienced practitioner than is often employed at present. It suggested to the Ministry that in appropriate cases, where the appointment of a practitioner with rather more experience than a S.H.O. or registrar (but not a consultant) was desirable, a senior casualty officer might be appointed for a period not exceeding four years at a salary within the range of £1,300 to £1,750. The Ministry has accepted this suggestion and a number of appointments of this kind have already been made.

With regard to the Representative Body's second resolution, the Council again points out that the law of negligence has not changed. The principle still holds that a medical practitioner owes to his patient the duty of exercising reasonable care and skill, and it is a breach of this duty which usually supports an action for negligence. The words "reasonable care and skill" have to be interpreted in the light of the circumstances of each case, and a house officer, for example, is not *ipso facto* negligent because someone of greater knowledge and skill would have acted differently.

There are probably many reasons for the increase in recent years in the number of legal actions involving hospital authorities and members of their medical staffs, but there can be no doubt that the action of the Ministry itself put the profession in a peculiarly vulnerable position.

In September, 1949, the Ministry issued a Circular (R.H.B. 49/128) instructing hospital authorities that they should not undertake the legal defence of any member of their medical staffs involved in a legal action. If it was sought to make the authority responsible for the alleged negligence of the practitioner, the authority should take such steps as were open to it by legal process to obtain a contribution from the practitioner in respect of any damages awarded to the plaintiff.

This new policy gave rise to two difficulties. If the practitioner made a report to his employing authority on any untoward incident that later became the subject of a legal action, the court might compel the disclosure of the report or the hospital authority itself might disclose the report to the complainant or use it in an endeavour to place the onus upon the practitioner. At the same time it was acknowledged that hospital authorities had a duty to investigate complaints and also that it was in the best interests of the practitioner involved that the facts of the situation should be placed on record while they were still fresh in his mind, and, if practicable, substantiated by independent witnesses.

It therefore became imperative to reach some arrangement with the Ministry that would enable hospital medical staffs to co-operate with their employing authorities, as they had done in the past, without prejudicing their own interests. Discussions, in which the three medical defence societies participated, took place with the Ministry. It was not suggested that the whole cost of "hospital" litigation should be borne by the hospital authorities. It was urged, however, that there should be some agreed method of settling the apportionment of any damages as between the hospital authority and its medical officer such as would remove the possibility of conflict between them, which could only be to the advantage of the plaintiff.

The Ministry readily co-operated in trying to find a solution of this problem, which was becoming as embarrassing to hospital authorities as to their medical staffs, and a satisfactory arrangement has now been reached between the Ministry and the three defence societies which in effect means an abandonment of the policy introduced in 1949. In future the hospital authority and the prac-

defence society will endeavour to reach agreement beforehand on the way in which any damages awarded to the plaintiff shall be apportioned, and failing agreement they will bear the damages in equal shares. Where, however, either the practitioner or the hospital authority decides, without the consent of the other, to settle the action out of court, the party settling the action will bear the whole of the plaintiff's damages and costs.

Discussions are now proceeding with the Ministry regarding the advice which should be given to hospital authorities and their staffs to ensure that so far as practicable reports made in connexion with untoward incidents are treated as privileged documents which will not be subject to compulsory disclosure in the event of legal action.

Consideration is also being given to the method of investigating incidents in hospitals which may result in a charge being made against the personal conduct or professional competence of a member of the medical staff.

Medical Advisory Machinery

60. After discussions with the Joint Committee, the Ministry has issued an important circular regarding the constitution and functions of medical advisory committees at board of governors and hospital management committee level.

This circular makes it clear that the constitution of these committees rests with the hospital medical staffs themselves. It specifies a number of matters on which hospital authorities should consult their medical committees, and it lays down the principle that the authorities should regularly seek the advice of these committees on all matters within their sphere.

It is hoped that the advice given in this circular will go a long way to restore hospital medical committees to the place they held in the counsels of hospital governing bodies before the appointed day, and thus remove what has become one of the most serious defects of the Service.

Unfortunately the circular does not apply to regional hospital boards, but the Joint Committee is continuing to urge the importance of establishing similar advisory machinery at that level.

Medical Reports and Loan of Hospital Records

61. There is considerable uneasiness among consultants about the arrangements which exist in many hospitals for giving medical reports, or copies of or extracts from hospital notes, to outside bodies. In some instances clinical records have been allowed to leave the hospital without the knowledge of the consultant concerned, despite the fact that this might be prejudicial to the interests of his patient or of the consultant himself. Some months ago the Law Society published a statement for the guidance of solicitors which did little to allay the fears of consultants as to the way in which the matter is being handled. The statement dealt primarily with the question of medical reports (which is within the consultant's control) and did not cover satisfactorily the loan of hospital notes. A comprehensive statement is now being prepared as a basis for discussion with the Ministry.

Whole-time or Part-time Service

62. The Council is disturbed to find that since 1948 there has been a slow but steady increase in the proportion of consultants employed on a whole-time basis. Some boards now allow candidates for consultant posts in most specialties to exercise an option for whole-time or maximum part-time service. In other regions, however, there is a tendency for the boards to prefer whole-time appointments, particularly in certain specialties, and to refuse existing whole-time consultants an opportunity of transferring to a part-time basis.

The Joint Committee is representing to the Ministry that boards should be asked to offer the option wherever it is consistent with the interests of the Service. The Ministry is

being asked also to consider the possibility of an independent hearing when a board refuses without good reason to agree to appoint on a part-time basis.

Representation of Whole-time Officers and S.H.M.O.s

63. The Council has given further consideration to the question of affording special representation to whole-time officers and S.H.M.O.s in the light of the following resolutions of the A.R.M., 1953:

That this Meeting is of opinion that senior hospital medical officers are not adequately represented at all discussions concerning their terms and conditions of service.

That this Meeting welcomes the action of the Staff Side of Whitley Committee "B" in consulting the representatives of whole-time specialists and urges that this be continued; and that whole-time specialists should have reasonable representation on the Whitley Committee "B."

The electorate of Regional Consultants and Specialists Committees is made up of all consultants and S.H.M.O.s in the region, whether whole-time or part-time. Through this avenue there is an opportunity for the whole-time consultant or S.H.M.O. to find his way to the central committee. The Council considers that to split up the electorate into a number of different groups would be a fundamental mistake, since it would tend to divide hospital staffs rather than unite them in one representative organization.

The Joint Committee and the Staff Side of Committee "B" are much smaller bodies, and in the opinion of the Council it is impossible to place representation on these negotiating bodies on the basis of sectional interest without weakening their authority. The Council is able to report, however, that through the normal channels one of the members of the Central Consultants and Specialists Committee who is a whole-time consultant from a regional board hospital has been appointed to the Joint Committee and to the Staff Side of Committee "B." Moreover, the Committees and the Staff Side are always willing to discuss with representatives of particular sections of hospital medical staffs any problems specially affecting them.

Delays in Out-patient Departments

64. The Council has considered the following resolution of the A.R.M., 1953:

That the Council be requested to investigate (a) the long wait for appointments at hospital out-patient departments, (b) the long wait by general practitioners for reports on patients, and to make recommendations to remove the difficulties.

Some of the reasons for the delays in obtaining appointments at out-patient clinics are not far to seek. Before 1948 a much higher proportion of patients were seen by the consultant in his private consulting-room than is the case to-day. Patients are more and more tending to seek the advantage of the consultant services provided under the Act, and there is increased pressure upon general practitioners for a second opinion. Again, the appointments system itself, by restricting the number of patients seen at an out-patient session, sometimes places a limitation on the work of the department, and the frequency with which out-patients fail to keep appointments without notifying the hospital tends to defeat the object of the appointments system and to lengthen the waiting period.

It appears that the service at present provided is not equal to the demands made upon it, and that the only remedy is an increase in the number, or a lengthening of the duration, of out-patient sessions. But in many hospitals the accommodation and other facilities are already in full use and any further extension of existing services is impracticable.

The Council considers it important that general practitioners, when seeking to arrange out-patient appointments, should indicate those cases which require an urgent appointment on medical grounds, and that these cases should be given priority. This practice already obtains in many areas, but its successful operation depends upon general practitioners asking for priority in really urgent cases only.

Wherever practicable, hospital out-patients should be referred back to their general practitioners for intermediate treatment or supervision.

The delay in sending reports on hospital out-patients to general practitioners is part of the problem of the pressure on out-patient departments. It is largely in those hospitals where the staff are fully extended in clinical work that delay in sending reports occurs. In all urgent cases, however, it should be possible to see that the general practitioner receives a report promptly.

Domiciliary Consultation Arrangements

65. In the light of the objections raised by the Representative Body in 1952 the Joint Committee has reopened with the Ministry the question whether consultants should be required to disclose the diagnosis in the domiciliary consultation certificate.

One of the objections put forward to such disclosure is that the information, which should be confidential, may be misused. The Ministry has asked for any evidence that the information has in fact been misused.

In support of its view that the diagnosis should be given, the Ministry claims that hospital boards need information regarding the types of case requiring the services of consultants to assist them in planning developments in the Service, and that the information is useful in other ways. The Joint Committee has asked the Ministry to substantiate its claim by giving specific details of the ways in which the information has assisted the boards.

Representations have again been made to the Ministry that the domiciliary consultation arrangements should be extended to cover visits by consultants in any specialty to babies born in private maternity homes.

The Ministry, while agreeing that the present arrangement (which permits visits by paediatricians only) is illogical, points out that there is no statutory authority to provide the services of consultants at private nursing-homes. For this reason it is unable to extend the present arrangements.

Domiciliary Consultations by Dental Consultants

66. Difficulty has been experienced by dentists in at least one region in obtaining the services of a dental consultant in the patient's home because of the board's ruling that domiciliary consultations may be arranged only at the request of a medical practitioner. Although the need for such a domiciliary consultation arises only infrequently, the services of a dental consultant in the patient's home are usually required in an emergency, when any delay—such as might be occasioned by the necessity to consult a general practitioner—might have serious results.

Domiciliary consultations are permissible only when the patient is unfit to attend hospital, and this normally involves a medical opinion. In order to meet the difficulty which has arisen the Joint Committee has suggested to the Ministry that in cases where the patient's unfitness to attend hospital arises from a dental condition the dentist should be allowed to arrange a domiciliary consultation directly with the dental consultant.

Filling of Part-time Consultant Vacancies

67. The Council has had before it the following resolution of the A.R.M., 1953:

That the Representative Body of the B.M.A. observes with concern that vacant part-time consultant appointments are not being advertised, and are filled by seconding existing whole-time consultants to them, and asks the Council to consider the propriety of such policy and its ultimate consequences.

The Council would strongly oppose any policy to transfer part-time consultant vacancies to whole-time consultant staff, and it is watching the position closely. Although there have been isolated instances where the duties of a vacant part-time post have been transferred to a whole-time consultant without the post being advertised, there is so far no evidence that this has been done in pursuance of a definite policy. Whole-time consultants, equally with their

part-time colleagues, are entitled to receive every help their employing authorities can give in finding them alternative employment under the "moral obligation" clause when they are threatened with a reduction of work as a result of a reorganization of hospital services. Moreover, when a part-time consultant is relinquishing one or two sessions it may not be practicable to offer the vacancy on a part-time basis. The Council considers, therefore, that each case must be considered on its merits.

Advertisement of Consultant Posts

68. The Council has considered the following resolution of the A.R.M., 1953:

That all advertisements for consultant posts should contain full details of the appointments and duties of the individual concerned, or that these details should be available in full at the time of the original application.

The Council has no reason to doubt that in most instances full details of advertised vacant consultant posts are in fact available to the candidate on application, even if not stated in the advertisement.

Welfare of Hospital Patients

69. The Central Committee is considering how the welfare of patients in hospital and the facilities for visitors might be improved, and how best the public might be given a better insight into the working of the hospitals. Attention is also being given to practical methods of bringing hospital medical staffs and general practitioners into closer touch in the treatment of patients.

Provision of Diagnostic Facilities

70. The Council has had before it the following resolution of the A.R.M., 1953:

That the Ministry of Health be urged to supply the means for pathological laboratories and radiological departments in hospitals to give direct service to general practitioners.

In this matter the policy of the Association is also the policy of the Ministry, which—in its report for the year ended December, 1952—states that these facilities are now available to general practitioners in more than four-fifths of hospital centres. During 1952 an additional 100 hospitals made their x-ray departments, and 40 hospitals their pathological laboratories, available to general practitioners.

Geriatric Units

71. The following resolution of the A.R.M., 1953, has been considered by the Council:

That this Meeting, realizing the pressing need for co-ordination of the various authorities caring for the aged, recommends the Minister to consider the establishment of geriatric units for that purpose, under the guidance of an experienced physician.

The problem of the care and treatment of the elderly and infirm was reviewed in a report by a special committee of the Association published in 1949, and some of the recommendations of that committee have already been put into effect.

The Council is, however, fully in sympathy with the view of the Representative Body that the question of co-ordination between the various authorities responsible for the care of the aged and chronic sick requires urgent consideration. Having regard to the clinical, social, and economic considerations involved, it believes that no piecemeal development is likely to be adequate to the needs of the situation. What is required is a closely integrated service for the treatment and rehabilitation of all chronically sick persons (including the elderly).

A joint subcommittee composed of representatives of the Central Consultants and Specialists, General Medical Services, and Public Health Committees has been appointed to study the problem. Assistance will be invited from practitioners with special experience in this field. The aim is to formulate practical recommendations which can be put into operation without delay.

Dependants of Services Personnel and Hospital Waiting-Lists

72. The Council is fully in sympathy with the spirit of the following resolution of the A.R.M., 1953:

That a recommendation (not a "directive") be issued by each regional hospital board to the effect that the dependants of Services personnel (and possibly of others) who are posted from area to area when on civil hospital waiting-lists (both in-patient and out-patient) be sympathetically reviewed on arrival in the new area, and the time already on a waiting-list be taken into consideration.

The Council considers that the matter is essentially one for local arrangement. The attention of the regional consultants and specialists committees has been drawn to the resolution so that they may press for its implementation so far as the circumstances of individual hospitals will permit.

Reports to General Practitioners on the Death or Discharge of Hospital Patients

73. The following resolution of the A.R.M., 1953, has been considered by the Council:

That the Ministry be pressed to instruct hospitals that on the day of discharge of a patient a preliminary note containing diagnosis and treatment be sent (a sealed note is not to be given to a patient) to a patient's doctor. This should be followed in the usual way by a complete report.

It is thought that this is a matter which can best be dealt with within the profession. Accordingly a letter has been sent to all hospital group medical committees emphasizing the importance of ensuring that general practitioners are promptly notified of the death or discharge of hospital patients, and urging that the committees should advise their hospital authorities to include this duty in the list of duties of all house officers and to draw the attention of new house officers to the obligation at the time of their appointment.

Regional consultants and specialists committees have also been asked to do all they can locally to see that general practitioners are given up-to-date information regarding their patients while in hospital, and from reports received it is apparent that in many areas appropriate steps are already being taken to deal with the matter.

Hospital Locums

74. Complaints have been received that practitioners employed as locums in the hospital service are not allowed any annual leave or sick leave. The attitude of the Ministry hitherto has been that locums should normally be engaged only for short periods in respect of which the granting of leave would be inappropriate. In practice, however, locums are sometimes employed for long periods, and the Staff Side of Committee "B" has suggested to the Management Side that practitioners employed as long-term locums should, at the discretion of the employing authority, be given two weeks' leave in every six months.

Whitley Appeals Machinery

75. In 1950 the General Whitley Council established an appeals machinery to deal with disputes between individual officers and their employing authorities on the application of nationally agreed terms and conditions of service which could not be resolved locally. In the past few years this machinery has proved itself to be a valuable safeguard for the officer who considered himself to be unfairly treated by his employing authority. Unfortunately, however, this right of appeal is now being denied to some members of hospital medical staffs who feel that they have a genuine grievance.

Under the terms and conditions of service certain matters are left to the discretion of hospital boards. For example, boards have a discretionary power to advance the starting salary of a consultant first appointed above the age of 32 on the ground of the age, special experience, and qualifications of the candidate. The starting salary may be advanced on the score of age alone where seniority has been lost because of service with H.M. Forces.

Caution has been exercised in sponsoring appeals on behalf of consultants aggrieved at the manner in which hospital boards have exercised this discretion, because of the risks of endangering the discretionary provisions in the terms of service, and of bringing the appeals machinery into disrepute. There have been cases, however, where the board has clearly been less than just to a newly appointed consultant of mature age and experience, and in at least one region there is evidence to suggest that the discretion is seldom if ever used. There is also the problem of the S.H.M.O.'s who as a result of the last review were upgraded to consultant status. So far as is known, these practitioners when occupying consultant posts have all been placed at the minimum of the consultant salary scale, despite the fact that many of them have been carrying out the same duties for very many years. They have particular justification for their sense of grievance, because the Ministry has advised their employing authorities that it did not consider it appropriate that the discretion should be exercised in their favour.

After a careful examination of the circumstances of a number of cases it was decided to lodge appeals on behalf of certain of these practitioners. Unfortunately, however, the Management Side of Committee "B" has refused to agree that these appeals should be heard, and in the absence of a unilateral right of arbitration there is nothing further that can be done to help these members of the profession except to press further that the competence of such appeals shall be acknowledged.

Appointment of Medical Members of Regional Hospital Boards

76. Regional consultants and specialists committees, local medical committees, and Divisions and Branches of the Association have been invited to recommend practitioners to be nominated by the Council for consideration by the Minister in filling vacancies arising on regional boards in March, 1954, when the term of office of one-third of the members expires.

In the past it has normally been the practice to recommend names equal in number to the vacancies due to the retirement of medical members. It appears, however, that on occasion this might lead to a nomination being rejected by the Minister solely because of the desirability of preserving the balance in the representation of different localities on the board: in other words, because the practitioner nominated came from the wrong area.

In future, therefore, it is proposed to send to the Minister more names than there are vacancies in the hope that this will assist in securing the appointment of a greater number of practitioners chosen by their colleagues.

The Council has noted the following resolution of the A.R.M., 1953:

That this Meeting feels that general practitioners are not sufficiently represented on hospital management committees, and asks that the Council will approach the Minister and urge that there should be representation of general practitioners on all hospital management committees.

The Council is dissatisfied with the present representation not only of general practitioners but also of hospital medical staffs, and is adhering to its policy that hospital management committees should include an adequate proportion of medical members democratically elected by the profession. This policy will be pursued in discussions with the Ministry as the opportunity arises.

Mental Health Officers

77. Members of hospital medical staffs who devote the whole or substantially the whole of their time to the treatment or care of mental patients are classified as "mental health officers." Under the terms and conditions of service their normal retiring age is 60, as compared with 65 in the case of hospital medical staff in other specialties, but to offset this earlier retiring age mental health officers enjoy special superannuation benefits.

This position has given rise to a number of anomalies. The designation "mental health officer" appears to have been applied in an entirely arbitrary manner by different boards, with the result that where two consultant psychiatrists are engaged in exactly similar duties one may be classified as a mental health officer but not the other. Furthermore, some of the older mental health officers have insufficient superannuable service to their credit to benefit by the special superannuation provisions, and they will suffer hardship if obliged to retire at the age of 60.

These problems are now being considered by the Joint Committee in consultation with the professional bodies representing psychiatrists.

Disclosure of Information Regarding Tuberculous Patients to the Ministry of Labour and National Service

78. A protest has been made to the Ministry regarding the instructions given to hospital management committees to send to local offices of the Ministry of Labour particulars from chest clinic records of men liable for National Service who have a history of tuberculosis. It was urged upon the Ministry that the prior consent of the patient should be obtained to the disclosure of this information.

The Ministry was unable to accept this advice, on the ground that the disclosure was in the public interest, and that there were practical difficulties in the way of obtaining prior consent to the disclosure. At the same time the Ministry gave an assurance that the information would be used only for the purpose for which it was sought. The Council is not satisfied with the position, and is pursuing the matter further.

Fees for Part-time Services for Government Departments

79. Representations are being made to the Treasury for an improvement in the fees paid by Government departments for part-time services undertaken by consultant members of the profession.

Royal Commission on Mental Illness

80. The Royal Commission recently appointed to consider the existing law and administration machinery governing the certification, detention, etc., of persons suffering from mental illness or defect has been invited to give the Association an opportunity of submitting evidence. A statement of evidence is now being prepared.

Study Leave

81. It appears that there is considerable variation in the policies of different hospital boards in dealing with applications from medical staff for study leave. The matter is now being considered in the light of the study leave provisions in the terms and conditions of service and the advice given by the Ministry on their application, with a view to securing a uniform standard of treatment throughout the country.

REFORM OF THE NATIONAL HEALTH SERVICE

Goodwill

82. The A.R.M. in 1953 passed the following resolution:

176. Resolved: That, the Amending Acts Committee having recommended the restoration of the right to sell goodwill, this Representative Meeting instructs the Council of the Association to produce a scheme for the return of goodwill and to report to the Representative Body in 1954.

The Meeting agreed that this decision was to be interpreted as an instruction to the Council to prepare a scheme for consideration by the Representative Body and was not intended as a determination of policy.

The Council has given preliminary consideration to a draft scheme prepared by the Amending Acts Committee, and has asked for further information on a number of points. Full details of the scheme, together with a statement on its advantages and disadvantages, will be submitted to the Representative Body as part of the Supplementary Report of Council.

ARBITRATION MACHINERY

83. The Council has been actively engaged in seeking ways and means of giving effect to the instructions of the A.R.M., 1953, relating to the establishment of a Whitley Court of Arbitration to which there should be a right of appeal by unilateral reference. The Council learnt with regret that the Minister of Health and the Secretary of State for Scotland had declined to receive representatives of the Staff Side of the General Whitley Council to discuss the important matter of arbitration, on which no agreement had been reached with the Management Side at the meeting of the General Whitley Council in July, 1953. When the Council became aware that the constitution of the recently established Police Council provided for arbitration, the Staff Side of the Medical Whitley Council was requested to raise the whole question again through the Staff Side of the General Whitley Council. This was done and in October, 1953, the Management Side of the General Whitley Council agreed to reconsider the matter. On January 25, 1954, the Management Side stated that it was unable to agree that there should be arbitration machinery for the Health Service which would provide an unrestricted right to refer disputes to arbitration.

This whole question is receiving urgent consideration by the Council and a statement on further developments will be made in the Supplementary Report.

OCCUPATIONAL HEALTH

Future of Occupational Health Services

84. As a result of discussions with the Ministry of Labour and National Service regarding action being taken to implement the recommendations of the Dale Report on Industrial Health Services, a Memorandum on "The Future of Occupational Health Services" has been prepared and submitted to the Ministry of Labour and National Service, the Ministry of Health and the Trades Union Congress. This Memorandum, which is set out in Appendix III, amplifies the policy of the Association in regard to a Comprehensive Occupational Health Service, as laid down by the Representative Body in 1949. In the course of its preparation, consideration has been given to the Report of the Dale Committee, published in 1951, to which the Association gave evidence. Informal discussions on the Memorandum have already taken place with the Ministry of Labour, and discussions with the Ministry of Health and, ultimately, with the Trades Union Congress, through the Joint B.M.A. and T.U.C. Committee, are being arranged.

Reports on surveys made during the past year in the following areas, to ascertain future requirements for Occupational Health Services in different types of areas, are now being studied in detail: (1) Govan Ward of Glasgow; (2) Southampton Dock area; (3) five different types of factory in the Unilever Organization; (4) Abbey Ward of Reading; (5) Borough of Tottenham; (6) Rural areas in Cheshire.

The Council wishes to take this opportunity of expressing its appreciation to all those who assisted with these surveys.

Medical Standards for Road, Rail, and Air Transport

85. In consequence of a request from the Ministry of Transport for the views of the Association on the advisability of employing diabetic bus drivers, a special sub-committee was set up to investigate the whole question of medical standards for road, rail, and air transport. The Memorandum subsequently prepared, which is set out in Appendix IV, has been submitted to the Ministry of Transport. Arrangements are being made to discuss with the Ministry the implementation of the recommendations contained in the report.

Duties of, and Ethical Rules for, Industrial Medical Officers

86. Consideration has been given to the decision of the Representative Body in 1953 confirming the Duties of, and Ethical Rules for, Industrial Medical Officers, as approved

by it in 1949, and urging that these Rules be brought specifically to the notice of all industrial medical officers, whether members of the Association or not. It has not been found practicable to give full implementation to this decision, as information is not available regarding part-time industrial medical officers. The Council accordingly decided to insert a notice in the *British Medical Journal* (B.M.J. Supplement, November 21, 1953, p. 205) drawing the attention of both whole-time and part-time industrial medical officers to the existence of the Rules and informing them that copies were available on request for any medical officer unfamiliar with them.

National Insurance (Industrial Injuries) Act

87. An invitation was received from the Ministry of National Insurance for the Association to present evidence to a committee appointed "to review the present provisions of the Industrial Injuries Act, whereby benefit is paid for the personal injuries not caused by accidents." A Memorandum of Evidence, set out in Appendix V, has now been prepared and submitted to the Ministry. The Council has also appointed representatives to give oral evidence to the Departmental Committee.

PUBLIC HEALTH

Salaries in the Public Health Service

88. The Industrial Court awards relating to public health medical officers have been implemented by almost all authorities throughout the country. In two instances employing authorities have refused to accept the rulings of Regional Appeals Committees, and the possibility of obtaining agreement to refer these disputes for settlement by arbitration before the Industrial Court is being considered. The recent award for assistant medical officers has been put into operation by all local health authorities.

A dispute, in which the Association has been actively involved, regarding the remuneration of divisional medical officers in a county in Northern Ireland is understood to be on the point of settlement.

The provisions of Ministry of Health circular 3/53, relating to the joint use of medical staff by hospital authorities and local authorities, have been extended to cover medical officers giving services to county districts and regional hospital boards, and implementation of the agreement is almost complete.

It has been agreed by Committee "C" of the Medical Whitley Council that part-time public health medical officers who are paid an annual salary related to full-time pay should receive the appropriate annual increment.

Car and Subsistence Allowances

89. The recommendations of Committee "C" of the Medical Whitley Council, promulgated in August, 1953, relating to revised car allowances in England and Wales, are being applied by the great majority of employing authorities. All local authorities in Scotland have recently been recommended by Committee "C" to pay allowances at the same rate as those applicable in England and Wales. This is an interim arrangement pending an agreement on this matter in the Joint Negotiating Committee for Chief Officers of Local Authorities (Scotland).

Subsistence allowances agreed in Committee "C" for England and Wales are being paid by all local authorities, and in Scotland an interim arrangement similar to that mentioned above has been recommended by Committee "C" to all Scottish local authorities.

Appeals Machinery

90. The Whitley Appeals Machinery continues to be invoked on behalf of medical officers in the public health service in those cases in which the matter in dispute appears to justify such action. A current appeal involving a county medical officer of health is based on a claim for increased remuneration in view of additional responsibilities under-

taken since his employing authority originally determined the salary scale under the award of the Industrial Court. A further appeal relates to the failure of a borough council to implement in full the agreed conditions of service for medical officers of health.

As a result of representations made to the Northern Ireland Ministry of Health and Local Government, the question of establishing appeals machinery for the Health Service in Northern Ireland is now under active consideration.

Superannuation

91. Careful consideration has been given to the draft Local Government Superannuation (Benefits) Regulations, 1953, which have been introduced with the object of securing benefits substantially the same as those under the N.H.S. superannuation regulations. In the Council's opinion these represent an appreciable advance on the benefits granted under the Local Government Superannuation Act, 1937. Successful representations have been made to the Ministry of Housing and Local Government regarding the extension to medical officers of the provision for "added years."

Infectious Diseases

92. The Council has considered Minute 86 of the A.R.M., 1953, and has received from the Ministry of Health an assurance that the Minister fully appreciates the need to achieve a high level of infant vaccination. All local health authorities take steps to ensure that infant vaccination is publicized and made readily available in their areas. The Council is satisfied that local health authorities are giving adequate publicity to the arrangements whereby infant vaccination can be obtained through the family doctor or the local health authority clinic. A circular letter has been addressed to the honorary secretaries of Branches and Divisions in England and Wales stressing the part which individual doctors should play in impressing upon parents the importance of infant vaccination.

The difficulties in following up cases of venereal disease and in the tracing of contacts have been under discussion, and steps are being taken to convene a conference of representatives of the interested committees of the Association, the Society of Medical Officers of Health, and the Medical Society for the Study of V.D.

Tuberculosis

93. The occupational resettlement of tuberculous persons has continued to receive the close attention of the Council. The views of the Association on this matter were made known to the Ministry of Health last year, and a memorandum on the prevention of tuberculosis has now been prepared by the Standing Tuberculosis Advisory Committee of the Central Health Services Council. The Council desires to express its appreciation of an opportunity given for comment on the draft of the memorandum.

Health Visitors

94. Full consideration has been given to Minute 95 of the A.R.M., 1953, regarding ways whereby the help given by health visitors to general practitioners may be increased. The Council has drawn up a statement (see Appendix VI) embodying principles and suggestions which, if put into force, should prove an effective means of securing co-operation between general practitioners and health visitors in all areas. It is gratifying to note that the council of the Society of Medical Officers of Health has approved the statement. Full publicity to this matter has been given in the *British Medical Journal*, and a communication has been issued to the honorary secretaries of Divisions and Branches, secretaries of local medical committees, and medical officers of health of local health authorities.

The Council is preparing evidence for submission to the Working Party appointed by the Ministers of Health and Education and the Secretary of State for Scotland "to advise on the proper field of work and the recruitment and training

of health visitors in the N.H.S. and the school health service." Reference will be made to this matter in the Council's supplementary report.

District Nurses

95. The Council is preparing evidence for submission to the Working Party which has been appointed by the Minister of Health and the Secretary of State for Scotland "to consider what training it is desirable that registered nurses and enrolled assistant nurses, respectively, should undertake prior to their employment on home nursing duties, and the means by which such training should be provided."

School Health Service Regulations

96. The new School Health Service and Handicapped Pupils Regulations, 1953, which came into force on August 4, 1953, incorporate a number of suggestions put forward by the Council.

Definition of "Public Health Service Member"

97. The Council has reviewed the definition in the By-laws of the term "Public Health Service Member" which was approved by the A.R.M. in 1953, and, after consultations with the Society of Medical Officers of Health, has come to the conclusion that no further amendment is necessary.

Liaison with other Branches of the Profession

98. The Liaison Committee which had originally been appointed for the discussion of matters of common interest to consultants and general practitioners has now been extended to include representatives of the Public Health Committee.

MEDICAL ETHICS

Professional Secrecy

99. Advice is frequently sought by members on questions relating to professional secrecy. The Council has considered the procedure which should be followed when the police ask to search the records of an antenatal clinic in connexion with the finding of the body of a newborn child. In the opinion of the Council, such information should not be disclosed at the request of the police in order to assist them in carrying out their investigations.

Ethical Inquiries

100. A number of inquiries into complaints regarding professional conduct have been investigated both locally and centrally. It is the constant endeavour of the ethical committees to effect reconciliation wherever a breach has occurred between neighbouring practitioners, and, although this is not always practicable, the Association's ethical machinery provides a valuable means of ventilating grievances.

The great majority of Divisions and Branches have now adopted the revised Ethical Rules. The Council is anxious that all units of the Association should adopt these rules so that there may be effective machinery throughout the country for the local investigation of complaints.

Medical Practitioners and Publicity

101. The Association's policy on the observance of anonymity by medical practitioners taking part in sound and visual broadcast programmes is brought to the notice of all members who seek advice on this matter. The Council has continued to examine the question of undesirable publicity which is sometimes given in the press to medical practitioners.

Psychiatrists

102. Patients sometimes approach psychiatrists without the knowledge of their general practitioner. This may at times cause undesirable results, such as dual prescribing of seda-

tives. The right of the patient to consult the practitioner of his choice is accepted, but it is desirable that every effort should be made to encourage a patient to agree to the psychiatrist communicating with the family doctor.

General-practitioner Obstetricians

103. If a patient is introduced by her own doctor to a "general-practitioner obstetrician" it would, in the opinion of the Council, be unethical for the latter subsequently to accept that patient on his list without the consent of his colleague. The acceptance of the patient by the general-practitioner obstetrician would not be unethical if he had been approached spontaneously by the patient for obstetric services.

Issuing of Circulars

104. The Council considers that an ophthalmic medical practitioner should not issue change of address notices to private or N.H.S. ophthalmic patients, although it would be in order for him to inform those practitioners who had been accustomed to send patients to him in the past.

It is considered undesirable that a general practitioner should provide those persons wishing to change to his N.H.S. list with a ready typed letter for signature, addressed to the local executive council.

PRIVATE PRACTICE

Bonus Shift Certificates

105. Further discussions have been held with representatives of the National Coal Board in accordance with the following resolution of the A.R.M., 1953:

That the Representative Body disapproves of the issuing of bonus shift certificates to a miner, unless he has been actually attended by the doctor during his illness, and that the Council be asked to consider reopening the question with the National Coal Board.

The Board has stated that it does not regard an "ipse dixit" certificate as a medical certificate and that it has discussed these difficulties with the National Union of Mineworkers. Both the Union and the Board are concerned that only cases of genuine sickness should be eligible for proportionate bonus under the five-day week agreement. By agreement with the Union, the National Coal Board has informed its divisions that if a man who is sick sees or calls in a doctor the following day and is still sick, a proper medical certificate covering the whole period of sickness would not be challenged. In the Board's view, however, it is essential, if abuse of the new provisions is to be avoided, that medical certificates should be issued only where a doctor has actually examined the patient at the time of sickness, and should state the nature of the incapacity which renders the man incapable of following his employment. A copy of the Board's statement appeared in the *Supplement* to the *British Medical Journal* of December 19, 1953.

Life Assurance—Fee for Ordinary Form

106. The A.R.M., 1953, resolved (Minute 267) that the fee for the ordinary form of medical report for life assurance should be increased from £1 11s. 6d. to £2 2s.

In the course of discussions with the Life Offices' Association, the Council was informed that insurance companies are agreed that £1 11s. 6d. is an adequate fee. In support of this contention, it was stated that companies have little evidence that doctors are dissatisfied with the present fee; in fact, the contrary appeared to be the case. The attention of members was drawn to this statement through the *Supplement* to the *British Medical Journal* in the hope that this would stimulate correspondence, but no evidence was forthcoming that an increase in the fee was justified and the Council has decided not to press for an increase at this juncture. However, in order to save the medical examiner's time the Life Offices' Association has been asked to ensure that proposers have ready the informa-

tion they will be required to give on their previous medical history and that of close relatives. Representations have also been made that a higher fee should be paid if the doctor is required to undertake the examination at the home of the proposer.

Life Assurance—Attendance Reports

107. It has previously been the view of the Council that the use of attendance reports (reports without medical examination) should be discouraged and that to attempt to agree with the Life Offices' Association on the fee to be paid would appear to give official approval to the practice of asking for these reports. At present, therefore, the fee is a matter for arrangement between the practitioner and the assurance company concerned. The Council has reason to believe that the use of attendance reports is increasing, and is now of the opinion that the minimum fee for these reports should be £1 1s. Representations have been made to the Life Offices' Association.

Duration Certificates

108. The following motion was referred to the Council by the A.R.M., 1953:

That a practitioner should never comply with a request to issue a "Duration Certificate"—that is, a medical report about the previous health and medical history of a person who has died shortly after having been accepted for life assurance (without prior medical examination). Such a certificate could jeopardize but could never be essential to establish the claim to the assurance.

This matter has been discussed with the Life Offices' Association. It is clear that many life assurance policies which are entered into without prior medical examination do contain a clause which gives the company the right to demand a duration certificate before the sum assured is paid. The representatives of the Life Offices' Association stated that the main concern of its members in asking for a duration certificate is to ensure that payment is not made in cases where relevant information relating to the health of the life assured has been deliberately withheld. It is only in cases where there has been attempted fraud that payment is refused and a return of premiums made.

The Council is satisfied that there are *bona fide* cases where a doctor may give information after the death of the patient, subject to the consent of the nearest competent relative, and, in its view, there is no reason to depart from the policy of the Association as laid down in the following resolution of the A.R.M., 1937, which was reaffirmed by the A.R.M. in 1949:

That the Representative Body is of the opinion that where any medical certificate is required by an insurance company in the case of a deceased person not previously examined for life insurance such certificate should be obtained direct from the medical practitioner of the deceased; that it should not be furnished without the previous consent of the nearest available competent relative; and that a fee should be paid by the insurance companies for any such certificate.

Also relevant to this issue is the fact that doctors who refuse to give a duration certificate at the request of the insurance company may be subpoenaed to appear before the Insurance Commissioners.

Life Assurance: Disclosure of Medical Information

109. The form to be used by the proposer for giving consent to the disclosure of medical information, which was approved by the Council for use in connexion with life assurance, has been adopted by all Life Offices which may require such information prior to the issue of a policy. The use of the new form of consent is not yet universal as there are still stocks of old forms in use. Until old stocks are exhausted the Life Offices have suggested that if a doctor is in any doubt whether adequate consent has been given he may approach the office concerned, or its local representative, or inquire from the patient direct. The Life Offices are not prepared to notify the doctor in each

case of the form in which consent has been given, and the Council has decided not to press the matter further at this stage.

Encouragement of Private Practice

110. The Council is agreed that, although there will always be a proportion of the public who will prefer to make private arrangements for medical treatment, there is a danger that the field of private practice may be materially reduced; that the continuation of private practice, which offers the public an alternative to the National Health Service, should be regarded as a form of insurance against a fully salaried service; and that, as the maintenance of private practice is Association policy, every means possible should be used to encourage private practice. To this end various methods, including the following, have been considered: (a) that patients should be allowed to opt out of the general medical services provided under the National Health Service; (b) that there should be a grant-in-aid to a person who elects to be treated in a private nursing-home instead of in a hospital; (c) that practitioners should be allowed to prescribe for private patients on Form E.C.10.

After the advice of an actuary had been sought, the Council came reluctantly to the conclusion that to allow patients to opt out was not practicable at the present time, and that, until there is an adequate number of hospital beds to ensure that admission to hospital can always be arranged without undue delay, the provision of grants-in-aid could only result in increased Government expenditure.

In the circumstances, it was decided not to take action in these matters at present. The Council, however, is in agreement with Minutes 210 and 211 of the A.R.M., 1953, concerning the prescribing of medicines for private patients on Form E.C.10, and representations are being made to the Ministry of Health on this question. The Council has also published in the *British Medical Journal* a statement of the benefits to which patients remain entitled under both the National Health Service and National Insurance when they elect to be treated by a private practitioner.

The Unattended Telephone

111. The A.R.M., 1953, resolved (Minute 266) that even stronger pressure be brought to bear on the General Post Office in order that a satisfactory solution may speedily be found for the problem of the unattended telephone. It is clear from further discussions held with the G.P.O. that the Post Office authorities are as anxious as the Association to secure an early solution of the problems of the unattended telephone, but Treasury restrictions on capital expenditure, and difficulties in the supply of labour and the special equipment required, make it impossible for all exchanges to be provided with adequate facilities for the frequent transfer of calls to an alternative number, although in some areas these facilities already exist. The Council is satisfied that the G.P.O. is alive to the problem and that it will do all it can to help in individual cases. The G.P.O. is also prepared to assist in the provision of special lines and equipment where local arrangements are made for calls to be handled by answering bureaux such as those operating in Glasgow and Carlisle, whether they are organized on a commercial basis or on a private co-operative basis amongst a number of practitioners.

A memorandum produced jointly with the G.P.O. was published in the *Supplement to the British Medical Journal* of January 16, 1954. This advised doctors with individual telephone problems to discuss them with the local telephone manager, who would be ready to give advice on the best method of meeting the problem in the light of local circumstances. If there were any difficulties which could not be resolved in that way, doctors were advised to bring them to the notice of B.M.A. Headquarters, which would seek the co-operation of the G.P.O. to find an acceptable solution wherever possible. Copies of the memorandum have been sent by the Post Office authorities to all telephone managers.

Car Badges

112. In 1950 three types of car badges were ordered: the bumper pattern, the radiator pattern, and the plastic badge with suction pad for attaching to the windscreen. The greatest demand has been for badges of the bumper pattern, and it has been necessary to order a further supply. Previously the bumper pattern was cast in two plates, and in some cases these separated in the course of normal wear and tear. In order to rectify this defect the badge is now cast in one piece.

Mortuary Accommodation

113. Further discussions have taken place with the Ministry of Housing and Local Government with a view to the implementation of the recommendations on mortuary accommodation contained in the 1949 Report by Council on the working of the Coroners Acts. At the request of the Ministry, medical officers of local health authorities were asked to complete a questionnaire relating to the mortuary accommodation available in the area of each authority. At a later date the Ministry hopes to be able to advise local authorities on the lay-out and siting of mortuary accommodation.

Friendly Societies—Medical Certificates

114. The Council has considered a request from the National Union of Holloway Friendly Societies that practitioners be recommended not to charge for medical certificates given to women and juvenile members of Friendly Societies who are not entitled to certificates under the National Insurance Act. The Union has been informed that the Council is unable to agree to this.

Form N.S.175

115. The Ministry of Labour and National Service has agreed to the payment of a fee of 5s. for Form N.S.175. This form is sent to the family doctor of a person examined by a Medical Board when information relating to previous medical history is required. Previously no fee was payable.

Coroners Bill

116. The Council has welcomed the Private Member's Bill which seeks to amend the Coroners (Amendment) Act, 1926, so that the fees and allowances payable to witnesses at coroners' courts and to medical practitioners making post-mortem examinations on the direction, or at the request, of the coroner will be set out in rules which may be made by the Secretary of State. As the power of the Secretary of State to make rules is not mandatory, the Council is seeking an assurance that rules will be made if the Coroners Bill receives Royal Assent. If this assurance is not forthcoming, then it may be necessary to press for an amendment to the Bill during the Committee stage so that the fees and allowances shall be so prescribed.

Hire Purchase: Doctors' Cars

117. The Council has continued to give its support, in appropriate cases, to applications made to the Board of Trade for licences under the Hire Purchase Control Order whereby the purchase price of a car may be repaid over an extended period of three years. The conditions laid down by the Board remain unchanged, and the concession applies only where the doctor is able to show that relief from the standard maximum period of 18 months is necessary on financial grounds and that there is a professional need, in the interest of service to the public, for a reliable car. The licences issued to practitioners who have applied through the Association over the past two years number 286.

"BRITISH MEDICAL JOURNAL"

118. During the past year there have been no startling developments in the work of the *British Medical Journal* to report. The steadying of the price of paper since its

astronomical increase in 1951 has made for greater financial stability in relation to the *Journal* and the 14 specialist periodicals the Association publishes. Although conditions have been much easier the strictest economy has been observed in production, and the size of the *B.M.J.* has been maintained within the limits imposed by Council in 1952. The number of papers submitted for publication in the *Journal* continues at a very high level, and what is published inevitably reflects the growing complexity of modern medicine and the more exact methods of measuring and recording results it is now possible to use. Medicine and medicine's changing face look less attractive to the older medical men than to those more recently qualified, and some of the former complain that, as expressed in the columns of the *Journal*, medicine has become too high-brow.

The *Journal* has a growing circulation in other countries and its income from non-members' subscriptions has steadily risen over the past few years. The successful results of the sale in book form of collections of articles that have appeared in the *Refresher Course* and "Any Questions?" sections of the *Journal* show that these are widely appreciated by readers who want practical information which can be applied in the day-to-day work of medicine.

The special journals, which now cover a wide range of subjects, maintain a high standard of content and presentation and enhance the prestige of British medicine in this country and abroad. A few years ago their high cost to the Association caused the Journal Committee much concern, and it is satisfactory to record that they are much less a burden on the Association's finances than in recent years. The Association publishes these journals and *Abstracts of World Medicine* to fulfil its first object—namely, "to promote the medical and allied sciences, and to maintain the honour and interests of the medical profession." *Abstracts of World Medicine* has a steady core of readers who find that more than any other publication it succeeds in providing succinct information of current progress in medicine in all subjects in different parts of the world.

"FAMILY DOCTOR"

119. In the Report of Council last year it was stated that the aim for 1953 was to conduct the affairs of *Family Doctor* "at no cost to the general funds of the Association." This aim has almost been achieved. The final figures for *Family Doctor* show a variation from the precise "break even" point corresponding to approximately 1% of the total financial turnover.

This financial result is the more satisfactory in the sense that, following criticisms made at the Annual Representative Meeting last year, steps were taken promptly to exclude a number of advertisements which had previously been regarded as acceptable.

For the first three issues of 1954, the advertisement revenue has been increased by £6,000, a figure which is only £1,500 less than the total increase in advertisement revenue achieved in the whole of 1953. So, on trading for the first quarter of the year, despite the fact that there has been a large expenditure on promotion at the *Daily Mail* Ideal Homes Exhibition in March, *Family Doctor* has been conducted at no cost to the general funds of the Association.

Over the past year the position of *Family Doctor* has been consolidated in a number of ways. The magazine is now being sold at over 800 local authority clinics. In the coming year it is hoped to expand this method of distribution and the special distribution in the London and Home Counties area which is operated through a small fleet of vans.

For the first time a number of *Family Doctor* pamphlets have been produced and have been well received. These pamphlets are available at 3d. and 6d. and are distributed to individual readers and in bulk quantities to the profession, and particularly to medical officers of health. Among

the most popular pamphlets are those on the "Rh Factor," "Feeding Your Family," "Having a Baby," "Infectious Diseases," and "Feeding in the First Two Years."

Articles in *Family Doctor* are widely quoted in the national press in this country, and many individual articles have been reproduced in newspapers and periodicals all over the world.

The existence of *Family Doctor* has already exerted a considerable influence upon the lay press in this country. For example, the appearance of an article about the value of crash helmets by the late Sir Hugh Cairns was promptly followed by a national newspaper campaign along the same lines. The decision of the tobacco manufacturers to make available the sum of £250,000 to aid research on lung cancer followed a clear proposal along these lines first put forward in *Family Doctor* in an article entitled "Is Smoking Harmful?—The Facts." Other articles in *Family Doctor* taking a critical view of the fish lens protein treatment for cataract, nature cure methods, and the Bates method have attracted a great deal of attention.

There is now a regular income from the sale abroad of the reproduction rights of *Family Doctor* articles, and these articles have frequently been quoted by the B.B.C. Overseas Service.

Three comments on *Family Doctor* from widely different sources may be quoted. A national advertiser wrote about the many thousands of applications for catalogues for his product received as a result of a recent advertisement in *Family Doctor*. His letter concluded:

"The total number of applications received up to date is a far greater number than we have ever had from any one previous advertisement in any other national magazine or newspaper."

A well-known Member of Parliament wrote to the Editor recently:

"*Family Doctor* is very popular with my family, which happens to include five doctors. I find it of great interest and read it right through. I think it should be in every home and is much more valuable than many women's magazines so prolific these days. . . ."

The editorial director of a publishing house of the highest repute, and one responsible for many standard educational books, also commented recently in these terms:

"*Family Doctor* holds a unique place in periodical literature, being the first serious enterprise aimed at the education of the laity in matters of health through the guidance of most-authoritative instructors who proceed along absolutely ethical lines—a most courageous design to meet a crying need."

Over the past year the influence exerted by *Family Doctor* has continued to grow, and the financial position of the magazine has greatly improved.

For the year 1954, the *Family Doctor* Committee hopes to increase the distribution and effective influence of *Family Doctor*, which is now recognized as one of the most important media of health education in the English-speaking world. Again, the intention is to do this at no cost to the general funds of the Association.

FINANCE

(As the auditing of the Association's accounts has not yet been completed, the Annual Financial Statement will be published in the Council's Supplementary Report.)

120. A close watch has been exercised on the level of income and expenditure throughout the year and the budgets of all the "spending" departments and committees have been subjected to the closest scrutiny by the Finance Committee and the Financial Advisory Committee. With this method of financial control the Council has endeavoured to achieve early redemption of the indebtedness resulting from the losses of earlier years. Whilst the accounts prepared for the past year show that the measures taken have met with a marked degree of success, it is evident that they must be continued if a complete stabilization of the Association's finances is to be achieved.

Income

121. As from January 1, 1953, higher rates of subscription were introduced for certain classes of members and it was anticipated that a substantial increase in the revenue from this source would follow. The Council is glad to report that this additional revenue has been realized without any material loss in membership and acknowledges the co-operation of all the members affected by the new rates.

Of this additional income the sum available for the clearing of the Association's indebtedness is considerably in excess of the proportion referred to by the Annual Representative Meeting at Dublin, which approved the raising of the annual subscription on the understanding that at least one-half of the moneys brought in by this increase was applied to debt redemption.

Expenditure

122. The budget for 1953 made provision for a total expenditure under all the headings, with the exclusion of the publications account, of £256,000. It is satisfactory to note, therefore, that the total expenditure of the "spending" committees concerned was only slightly in excess of £250,000.

As regards the cost of Representative, Council, and Committee Meetings the savings on estimates was £2,400. The number of meetings held has been reduced to a minimum and every economy has been exercised in the production of committee documents. The Council gratefully acknowledges the help given by the Trustees of the National Insurance Defence Trust, which has continued to bear all but £1,000 of the cost of the General Medical Services Committee.

Expenditure on the Medical Practices Advisory Bureau did not exceed the level anticipated in the budget, although there has been a marked increase in the numbers making use of the services of the Bureau, which are available to both members and non-members.

The Empire Medical Advisory Bureau and the International Medical Visitors' Bureau, too, have limited expenditure to the reduced budget accepted by the Committee of Management.

An improvement on estimates of over £2,000 was effected in the case of financial charges, as the cost of operating the bank overdraft was considerably less than had been anticipated.

Publications Account

123. With the emphasis upon economy the committees responsible for the management of the Association's publications have followed a cautious policy in regard to the size and make-up of the various journals. The price of paper has been steady throughout the year, and it has been possible to control the cost of production of the journals within the limits imposed by the budget.

During the year the Council authorized additional expenditure, not provided in the original estimates, for the publication of the Report of the General Practice Review Committee. Nevertheless the final accounts of the publications show an improvement on the budget expectations.

With regard to *Family Doctor*, the Council is well satisfied with the financial position at the close of the year.

Trust Funds and Medical Charities

124. By the close of the year there was an improvement in the market value of the investments held by the Trust Funds and their financial position can be regarded as satisfactory. In the case of the prize funds the income has been sufficient to meet the cost of the normal awards.

There was a slight falling off in the subscriptions and donations to the medical charities, although increased bequests were received. The total amounts distributed to the benevolent funds in the year again exceeded £10,000.

Revenue Budget for Twelve Months ending December 31, 1954

125. Based on estimates submitted by the "spending" committees and departments, the Council has approved a master budget setting out the anticipated income and expenditure for the 12 months ending December 31, 1954.

It is estimated that the income from membership subscriptions, rents, and investments, together with the surplus on publications, will total £317,971.

Out of this sum it will be necessary to make provision for expenditure under the various budgets for general expenses, salaries and wages, establishment costs, etc., amounting in all to £272,662.

After setting aside a reserve of £5,000 for contingencies, it is anticipated that the net surplus for the year will reach £40,309, which the Council is earmarking for debt redemption.

Membership Subscription of Members Assessed for Income Tax under Schedule E

126. The Council has considered the following motion referred to it by the A.R.M., 1953 (Minute 52):

That the membership subscription be modified for members who are assessed under Schedule E so that the net cost of membership may be equitable throughout the profession.

The various factors taken into account in assessing medical practitioners for income tax under Schedule E are such that without an inquiry into the financial circumstances of each practitioner it would be quite impossible to arrive at any modified form of subscription which would be equitable.

In the view of the Council the administrative difficulties and the anomalies involved are such as to make the proposal unworkable.

Subscription Payable by Whole-time Salaried Members in Receipt of Income up to £1,500 Per Annum

127. The Council has also considered the following motion referred to it in Minute 53 of the A.R.M., 1953:

That this Meeting considers that the reduced subscription of four guineas should be granted to all whole-time salaried members of the Association.

In its view there is no justification for extending the reduced subscription as suggested. The Council has, however, reviewed the equity of the present income limit of £1,500 which governs the four guineas subscription. This has proved satisfactory in the light of experience and the Council believes that any attempt to vary it would create considerable anomalies.

By-law 16 gives the Council authority to decide in cases of doubt whether a member comes within the four guineas subscription group. Acting under this authority, the Council has granted "marginal relief," up to a maximum of £100, in a small number of cases where, by reason of a small increment, a member paying the £4 4s. rate has slightly exceeded the £1,500 limit, though continuing to do the same work.

BUILDING

128. Throughout the past year it has been the policy of the Council to limit expenditure on maintenance and repairs to work considered essential for the preservation of the various parts of the building. It is recognized, however, that a considerable amount of work must be undertaken if the interior and exterior of the building are to be maintained in a good state of repair. The Council has approved in principle a maintenance programme which will ensure that all parts of the structure are covered in rotation within a limited number of years.

Approval has also been given to the interior reconstruction of the Scottish Office in Edinburgh, the plans of which were originally formulated in 1951. The Council has now approved a building programme for the carrying out of these alterations in phases, the first of which is expected to be started in July next. In this way the capital cost will be spread over a period of three years.

After considerable delay, through circumstances beyond the control of the Council, negotiations with the Bedford Office in regard to the acquisition of the Burton Street site have been resumed on the basis of the terms originally proposed in 1952. It will now be necessary for the Association to enter into a contract to develop the site in accordance with plans for which permission under the Town and Country Planning Act must be sought.

From a provisional survey of the site the architect has estimated that a building can be erected which will provide over 23,000 square feet of floor area, which will be approachable from the existing building. It will also be possible to add to and improve the facilities available to members for garaging and servicing their cars.

Although the Association continues to receive a substantial income in rents paid by the medical and other professional organizations occupying accommodation in Tavistock House North and South, it is apparent to the Council that it may be necessary to study the needs of the various departments of the Association before renewing the present tenant leases as and when they expire.

SCIENCE

Association Prizes

Sir Charles Hastings and Charles Oliver Hawthorne Clinical Prizes, 1954

129. The Sir Charles Hastings Clinical Prize, established to stimulate observation, research, and record in general practice, has been awarded for 1954 to G. I. Watson, of Peaslake, Surrey, for his essay on "A Study of the Problems Involved in the Prevention of the Bacterial Complications of Measles, with Special Reference to Prophylactic Sulphadiazine." The award consists of a certificate and a cheque for 50 guineas.

The Charles Oliver Hawthorne Prize, awarded to the author of the essay judged to be the second best in this competition, has been awarded for 1954 to Katharina Dalton, of London, for her essay on "The Similarity of Symptomatology of Pre-menstrual Syndrome and Toxaemia of Pregnancy and their Response to Progesterone." The award consists of a certificate and a cheque for 40 guineas.

Stewart Prize

The Stewart Prize, established for the recognition and encouragement of work carried out or of researches promising good results regarding the origin and spread of epidemic disease, has been awarded for 1954 to Professor H. E. Shortt, at present working in East Pakistan in connexion with the Colombo Plan, for his work on the pre-erythrocytic and exo-erythrocytic stages of the malaria parasite.

Prizes for Medical Students

"Is the Medical Curriculum Too Heavily Loaded?" was the subject set for the 1954 Medical Students' Prize Essay Competition. The number of entries received was small, and the Council has this year approved the award of only two prizes of £25 each to medical students in the United Kingdom. The winners of these prizes are:

A. W. Beatson (London Hospital Medical College).
G. Hatcher (Middlesex Hospital Medical School).

A prize of £25 has also been awarded to the following medical student, who submitted the best entry from overseas:

A. M. Nhonoli (Makerere Medical School).

As the number of entries received has been steadily decreasing, the Council is considering whether the future form of this competition should be altered. A further report on this matter will be included in the Supplementary Report.

Research Scholarships

The following Research Scholarships, tenable for twelve months from October 1, 1953, have been awarded:

Ernest Hart Memorial Scholarship (£250).—J. M. Tanner, M.B., B.S., D.P.M., Ph.D., for research into the relation of bodily growth in the first five years of life to size and build at maturity.

Walter Dixon Memorial Scholarship (£250).—H. M. Carey, M.Sc., M.B., B.S., D.G.O. (Sydney), F.R.C.S.Ed., M.R.C.O.G., for research into the action of oxytocics and spasmolytics on the human uterus at term.

Ordinary Research Scholarship (£200).—I. J. MacQueen, M.B., B.S., for research into the response of skeletal muscle to progressive resistance exercise.

Insole Scholarship (Joint Award) (£125 each).—G. W. Csonka, M.D., M.R.C.P., M.R.C.P.Ed., and A. S. Grimble, M.D., for research into the nature of non-specific urethritis.

The Council wishes to express its appreciation of the valuable work undertaken by the Visitors in connexion with the Research Scholarships.

B.M.A. Lectures

130. At the invitation of the Council, experts in various fields of medicine have continued to give B.M.A. Lectures to Branches and Divisions. The number of lectures arranged during 1953 was 71. Payment of an honorarium of 10 guineas to each lecturer, which was suspended in January, 1952, as an economy measure, has been reintroduced. The Council wishes to record its appreciation of the services of the lecturers.

Mackenzie Industrial Health Lecture, 1954

131. Dr. W. M. Goldblatt, of Welwyn, has accepted an invitation to deliver the Mackenzie Industrial Health Lecture in 1954. At the invitation of the Association of Industrial Medical Officers, this lecture will be given in Manchester in July, in conjunction with the Provincial Meeting of that Association.

Control of Therapeutic Substances

132. The Council has discussed the decision of the Representative Body in 1953 that the advisability of seeking restrictions on the free sale of oestrogen preparations should be considered, in view of the known dangers of these preparations and possible abuse due to their unrestricted sale to members of the public. Information on the subject has been sought from the honorary secretaries of Divisions and Branches and also, through the *British Medical Journal*, from individual members of the Association. Joint discussions have taken place with representatives of the Royal College of Nursing and the Pharmaceutical Society and further information is being sought on the extent of possible abuses. It is hoped that these inquiries will be of assistance in deciding upon appropriate action, particularly as any approach to the Government will require to be supported by strong evidence. The possibility is being considered of securing regulations under the Therapeutic Substances (Prevention of Misuse) Act or inclusion in Schedule IV of the Poisons List. Possible action in regard to the increasing number of advertisements for beauty preparations containing hormones is also being considered.

British Pharmacopoeia

133. The British Pharmacopoeia Commission once again sought the co-operation of the Association in connexion with the revision of the *British Pharmacopoeia* for the new edition to be published in 1958. The proposed additions and deletions have been considered and some additional amendments suggested.

Library

134. There has been a very slight drop in the recorded number of members visiting the Library and in the number of books borrowed, but it is noted that the majority of visitors do not sign the attendance book. During the year over 150 books have been presented to the Library by members of the Association, to whom the Council is extremely grateful. The cost of postage for books borrowed from the Library, which amounts to over £750 during the year, has continued to be borne by the individual members

concerned. Whenever the opportunity has arisen second-hand copies of journals missing from sets in the Library have been acquired, and books no longer required have been sold. The mutual borrowing arrangements with other medical libraries throughout the country have continued to work satisfactorily.

The Library continues to expand and the Council has been faced with difficulties in providing adequate storage space. It has been found possible, however, to make available additional storage space within the B.M.A. premises for a further three or four years, pending development of the Association's plan to build a new and larger Library.

The Charles Hastings Collection and other historical books in the possession of the Association are at present housed in the Library. As this is closed during the evening and at week-ends, when social functions take place, arrangements have been made for a portable display case which will enable these books to be on show in other parts of B.M.A. House on special occasions.

PUBLIC RELATIONS

135. The Council has considered the following Minute 73 of the A.R.M., 1953:

73. Proposed by E. Herts (J. S. Ross): That with a view to keeping the Public Relations machinery of the B.M.A. in readiness for an emergency, a meeting of the Divisional Public Relations Officers be held once a year.

The Chairman drew attention to the fact that the motion had not received the two months' notice necessary under the Standing Orders for a motion involving special expenditure which had not been considered by the Council, and it was

Resolved: That this matter be referred to the Council for consideration.

Whilst appreciating the importance of keeping in close touch with Honorary Public Relations Secretaries, the Council thinks it undesirable that it should be committed to an annual conference. It has decided, however, to hold a conference of Honorary Public Relations Secretaries during the present session and to leave it to the Public Relations Committee to call future conferences whenever necessary.

The Council has noted the following Minute 278 of the A.R.M., 1953, and is keeping a close watch on the situation:

278. That this Meeting deplores the publication in the popular press of extracts from medical articles and newspaper articles of an irresponsible character praising new drugs without illustrating any potential dangers.

Information Service

136. The good relations with the Press built up by the Department have been further strengthened. The work of the Information Service has also considerably increased, both in range and in volume. Of the many thousands of inquiries which are dealt with annually by telephone or personal visit, 24% come from the Press, 33% from the public, 12% from industry, 9% from universities, colleges, societies, and other institutions, 9% from staff at B.M.A. House, 7% from doctors, 5% from Government Departments and Embassies, and smaller percentages from research associations and the like. The following is an analysis of the information sought: particulars about organizations or individuals (34%); verification of statements and inquiries regarding B.M.A. policy (20%); sources of specialized information (10%); details of medical conferences (10%); statistical information (4%); medical procedure and ethics (4%); training in medicine, the curriculum, qualifications, etc. (3%); personal medical cases (2%); complaints of one kind or another (2%); names of manufacturers of drugs or special equipment (1.5%); homes for old people and the like (1.5%).

The register of conferences maintained by the Department continues to be added to. A selected list of national and international congresses is issued periodically to over 150 professional organizations, Government Departments, and interested persons.

A Press conference was held in connexion with the publication of the Report of the General Practice Review Committee in September, 1953, when Dr. C. W. Walker, Chair-

man of that Committee, and the Assistant Secretary (Dr. Hadfield) were present to explain the report and answer questions. The resultant press "coverage" was very heavy and the tone of editorial comment was sympathetic and favourable to the profession.

Hospital Public Relations

137. A Memorandum on Hospital Public Relations prepared by the Department was considered by the Central Consultants and Specialists Committee. As a result, copies were distributed to Regional Consultants and Specialists Committees, and a Public and Professional Relations Subcommittee of the Central Consultants and Specialists Committee was set up. The Council is anxious that the consultants and specialists should be given all possible help in the field of public relations.

First World Conference on Medical Education

138. The World Medical Association invited the Public Relations Officer to act as Press and Publicity Officer to the First World Conference on Medical Education held in London between August 22 and 29, 1953. The Department undertook to produce the official *Handbook* of the Conference. Separate editions were prepared in the three official languages—English, French, and Spanish. Complete press and publicity arrangements were also made by the Department. No fewer than 58 representatives of the Press attended the Conference, including correspondents from Germany, Ireland, Sweden, the United States of America, the Netherlands, Switzerland, France, Poland, Ceylon, and India. Press rooms were provided and copies of most of the 130 addresses were made available to the Press. As a result, very wide publicity was obtained for the Conference in the lay and medical press throughout the world.

Sir Charles Hastings Lecture

139. A highly successful Sir Charles Hastings Lecture was held on May 6, 1953, in the Great Hall. Professor F. A. E. Crew, of Edinburgh, spoke on "Medicine and Social Policy." Mr. Walter Elliot, M.P., was in the chair. The Great Hall was filled to capacity, over 700 people being present.

ARMED FORCES

Conditions of Service

140. At the end of 1952 the Council prepared, at the request of the Ministry of Defence, a Memorandum for the Working Party set up to consider all aspects of the Service medical officer's career, including remuneration. Despite repeated requests for information on subsequent action which the Ministry of Defence proposed to take, which it was hoped the Association would have been permitted to discuss before any public announcement was made, no information was received. Eventually, in September, 1953, the Ministry of Defence announced certain changes in the conditions of service for medical officers which it was hoped would result in an increase in the number of medical practitioners making the Service a career. These amendments, operative from October 1, 1953, were briefly as follows: (a) improved rates of pay for medical officers in the middle ranks—that is, major to brigadier, and their equivalents in other Services; (b) increased specialist pay, up to a maximum of £220; (c) introduction of a Permanent Commission Grant of £1,500 (taxable); (d) posts for retired medical officers; (e) opportunities to take a regular commission on entry to the R.A.M.C. instead of first being required to take a short-service commission; (f) antedating of commissions for all late entrants to the Service, according to civil experience, up to a maximum of seven years; (g) extension to the R.A.M.C. of the R.A.F. scheme for granting three-year short-service commissions to doctors with a National Service liability.

These are intended to be temporary measures pending the report of a committee, set up under the chairmanship of Lord Waverley, to review the arrangements for providing

medical and dental services for the armed Forces. In a later announcement on increases in pay for certain ranks in all branches of H.M. Forces, Captains R.A.M.C. (and equivalent ranks in the R.N. and R.A.F.) with at least four years' service in the rank were granted an increase of 4s. per day from April 1, 1954.

The Association was not given any opportunity to discuss these interim proposals before their publication, and more detailed information on a number of points was sought. Considerable concern was expressed at the proposal to antedate all commissions up to a maximum of seven years, in view of the effect which this proposal might have on the promotion prospects and prestige of medical officers already serving. Particular concern was expressed about those Service medical officers whose applications for antedating of commissions made prior to October 1, 1953, had been refused or only partially granted. Representations have been made to the Directors-General of the Medical Branches of H.M. Forces that any applications from Service medical officers for their previous claims for antedating to be reopened should be given favourable consideration. Attention has been drawn to the fact that if the new Permanent Commission Grant was paid within one tax year the amount of income tax payable would be high, particularly in the case of married medical officers.

The improved rates of pay do not conform in any way to the proposals submitted to the Ministry of Defence by the Council, and it is considered unlikely that the new conditions of service will attract a greater number of medical officers of the right quality.

ORGANIZATION

Association Membership

141. The Council submits the following report upon the membership of the Association for 1953:

New members	3,646	
Resignations withdrawn	250	
Reinstated	7	3,903
Removed in arrears	2,601	
Less paid arrears	1,164	1,437
Deaths	549	
Resignations	2,315	
Erased from Register	1	4,302
		Decrease 399
Membership, December 31, 1952	67,905	
Membership, December 31, 1953	67,506	

The membership of the Association in the United Kingdom represents 72% of the total profession and 81% of the working profession. The membership on March 16, 1954, was 65,654.

As will be seen from the above figures, the Association's membership has not met with any serious setback as a result of the increase of subscription rates, and the Council has noted with satisfaction that receipts from subscriptions paid during the first month of 1954 showed an increase of approximately £10,000 as compared with the amount received in the corresponding period of 1953. The Council feels, however, that the situation should not be viewed with complacency and that a special effort should be made to restore the normal annual increase in numbers.

The Newly Qualified Practitioner

142. The Council regards the recruitment of the newly qualified to the Association as a matter of considerable importance. The Medical Act, 1950, with its requirement of a year's compulsory residence in hospital as a house-officer, has created problems for these young practitioners. Provisionally registered practitioners are eligible under the By-laws for membership of the Association, and they have a right, therefore, to look to the Association for assistance in their difficulties. The fact that they are engaged in hospital appointments and are resident in one area for only

a limited period makes it difficult at present for them to use the ordinary Division machinery. The Council is actively considering how these newly qualified practitioners can be made to feel that membership of the Association is of real value to them and how they can be enabled through the Association's machinery to voice their views effectively. One of the items of the Agenda of the 1954 Conference of Honorary Secretaries will be a discussion on "What is the Association Doing for the Hospital Resident?" with particular reference to the role of the Branch and Division. The situation will be reviewed further in the light of the discussion at the Conference, and meanwhile other measures are being considered.

Honorary Secretaries

143. The Council, on behalf of the general body of members of the Association, desires once more to express its grateful thanks to the honorary secretaries of the Divisions and Branches, upon whose loyal co-operation the effective local organization of the Association so largely depends. The Council has noted with satisfaction a general increase in activity, particularly on the clinical and social sides.

Annual Conference of Honorary Secretaries

144. The 1953 Conference expressed by a very large majority its preference for holding the next annual session at the Central Office in London as a full day's meeting. This plan has been adopted, and the Conference will meet at B.M.A. House on May 19. Dr. D. M. Hughes, joint honorary secretary of the South Wales and Monmouthshire Branch, will be in the chair.

Conference of Regional Officers

145. A conference of regional officers was held at B.M.A. House on June 12, 1953. Developments affecting the regional offices were discussed, and there was a free and useful exchange of views. A similar conference will be held in 1954.

Financial Year of Divisions and Branches

146. The new procedure in respect of capitation grants to Branches arising from the system of budgetary control has been applied in respect of 1954. Under this procedure grants are determined at the beginning of the session and not towards the end, as heretofore. One result of the change in procedure will be that the grant, or first instalment of the grant, will be in the hands of the honorary secretary of the Branch at the beginning of the year to which it relates and not in the late spring as formerly.

An important result of the revised procedure is that Branches and Divisions are now asked to return their annual reports and accounts in the summer instead of at the beginning of the year.

Statements received from Divisions and Branches indicate that the action taken during 1952 and 1953 to disperse accumulated balances in Branch and Division accounts has had very satisfactory results. The policy of the Council in allocating grants continues to be to provide Branches and Divisions with funds adequate to meet their requirements, but without extravagance.

Areas of Branches and Divisions

147. The Council has pleasure in reporting the formation, after due notice in the *Supplement to the British Medical Journal*, of a Gold Coast Branch. Changes in areas to facilitate local organization have been approved, with due notice, both in home and in overseas Branches and Divisions.

Autonomous Bodies

148. The Council has referred to the Constitution Committee Minute 27 of the A.R.M., 1950, which lays down that the autonomous powers of the General Medical Services and Central Consultants and Specialists Committees, in so

far as they derive from the Representative Body, require to be specifically renewed by successive Annual Representative Meetings.

Pending the Report of the Constitution Committee and any changes in procedure which may result therefrom, it will be necessary to comply with the provisions of the resolution of the A.R.M., 1950.

The Council therefore recommends:

Recommendation: That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1954-5.

That the Representative Body looks to these Committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not delay the work of the Association.

Election of "Ten" Members of Council

149. The Council has considered the advisability of amending By-law 53 (c) and By-law 49 (1) to place beyond doubt the fact that the election by the Representative Body of the "ten" members of Council rests with representatives of constituencies and not with the Representative Body as a whole, as might be inferred from the wording of By-law 53 (c).

It recommends:

Recommendation: 1. That By-law 49 be amended as follows:

(i) By inserting the following new subparagraph:

(2) For the purpose of electing the President, the Chairman and the Deputy Chairman of the Representative Body, the Treasurer, and the members of the Council and of any Standing Committees required to be elected by the Representative Body votes shall be recorded at such time and in such manner as the Representative Meeting may decide.

(ii) By altering the numbering of the existing subparagraphs (2)-(5) to (3)-(6) respectively and by adding at the commencement of new subparagraph (3) the words "Except as aforesaid."

2. That By-law 53 (c) be altered by the deletion of all words after "as to" in line 3 and the substitution therefor of the following:

"ten by Representatives of Constituencies and of Public Health Service Members and Members of Council representing the medical branches of the armed Forces, as to a further two by the elected representatives of Constituencies comprised in the Branches and Divisions in Scotland, and as to a further one by the elected Representatives of Constituencies comprised in the Branches and Divisions in Wales, including Monmouthshire."

The By-laws as amended would read:

"Voting"

49
(2) For the purpose of electing the President, the Chairman and the Deputy Chairman of the Representative Body, the Treasurer, and the members of the Council and of any Standing Committees required to be elected by the Representative Body, votes shall be recorded at such time and in such manner as the Representative Meeting may decide.

(3) Except as aforesaid, voting shall be by show of hands, unless before the vote is taken fifteen Representatives present request that the vote be taken by roll-call, in which event it shall (subject as hereinafter provided) be so taken. If, however, upon the Chairman proceeding to take the vote, a vote by card is demanded by a majority of the Representatives present the vote shall be taken by card.

(4)

"Council: Composition"

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(c) Thirteen (being persons who have been members of the Association for at least the period aforesaid), at the Representative Meeting being elected as to ten by Representatives of Constituencies and of Public Health Service Members and Members of Council representing the medical branches of the armed Forces, as to a further two by the elected Representatives of Constituencies comprised in the Branches and Divisions in Scotland, and as to a further one by the elected Representatives of Constituencies comprised in the Branches and Divisions in Wales, including Monmouthshire.

(d)

Membership of Divisions and Branches

150. The Council has considered Minute 255 of the A.R.M., 1953, which referred to it the following motion:

That members of the Association shall ordinarily be allocated, as hitherto, to the various Divisions (and Branches) purely on an address basis, but where, by reason of ease of access, professional association, or for any other reason, a member finds it more convenient to attend the meetings of some other Division (or Branch), that member may, on application to Head Office, be transferred to the Division (or Branch) of his choice.

The view of the Council is that the adoption of this proposal would not only involve administrative difficulties but would also lead to unnecessary anomalies and complications. The object of the proposal is obviously to meet the convenience of the member in respect of local Association activities. This is already provided for. At the present time a member practising in one area and living in another may register the practice address for membership purposes and so automatically become eligible for all the privileges of membership in the area where he practises. Moreover, under By-law 12, any Division or Branch may elect as a Visiting Member any Ordinary Member of any other Division or Branch, and confer upon the Visiting Member such privileges (other than that of receiving notices of General Meetings or of voting) as the Division or Branch may think desirable, subject to the sanction of the Council. These privileges appear adequately to meet the object of the motion and no further action seems necessary.

Branches of the Association

151. The Council has referred to the Constitution Committee the following motion referred to it by Minute 256 of the A.R.M., 1953:

That the Council be requested to inquire into the position of Branches in the United Kingdom as intermediary between Headquarters and the Divisions, having particular regard to the increased efficiency and economy that might result from their abolition.

Medical Act, 1950: Appeal Against Decision of Employing Authority not to Grant a Certificate of Satisfactory Service

152. Full registration in the *Medical Register* is dependent upon a certificate of sufficient and satisfactory service in approved hospital appointments during the pre-registration year. This certificate is furnished by the licensing body after receipt of reports from the hospital authorities that the practitioner has completed such service.

The Medical Act, 1950, contains no specific provision for appeal by the practitioner where a satisfactory report is not forthcoming, and, after consultation with the Solicitor, licensing bodies have been approached regarding possible action in such circumstances. There is conflict of opinion between certain of the licensing bodies as to their role in the matter and as to whether in such cases they are required "to act judicially" or to exercise "administrative discretion." There is an important distinction between the two phrases. Exercise of administrative discretion might deny to the candidate for full registration the right of appeal to the courts, as the courts could not act unless satisfied that the licensing body was required to act judicially.

The Council is advised that an important principle is involved, and the opinion of leading counsel on the issue is being obtained.

The B.M.S.A. and the B.M.A.

153. The Association maintains its close connexion with the British Medical Students' Association. At its Annual General Meeting in November, 1953, the B.M.S.A. again expressed its thanks to the B.M.A. for the continued use of accommodation at B.M.A. House and for clerical services. It also thanked the B.M.A. for its interest and support in the negotiations with Government departments on the subject of the continuation of allowances to ex-Service married housemen during their pre-registration hospital appointments.

Group of Forensic Pathologists

154. A petition by members of the Association engaged in the practice of forensic pathology for the formation of a group of forensic pathologists has not received the approval of the Council, pending further exploration of the facilities for adequate representation of the specialty within the existing Consulting Pathologists Group.

CONSTITUTION OF THE ASSOCIATION

155. The A.R.M., 1953, passed the following resolutions:

249. **Resolved:** That an *ad hoc* Constitution Committee be formed to take evidence, consider, and report on a reorganization of the Representative Body, and such other constitutional matters as Council may decide.

253. **Resolved:** That the Council be instructed to appoint this Committee and that not more than 50% shall be members of Council.

In considering how it should carry out the mandate of the Representative Body, the Council accepted the principle that the Constitution Committee should be one which, while not too large for efficiency, should so far as possible be representative of the members of the Association and of its units both at home and abroad. Acting on this principle, the Council appointed a Committee consisting of 26 members—13 members of the Council and 13 others—with power to co-opt, provided the balance between Council members and others laid down by the Representative Body is maintained.

The Committee is constituted on a broad geographical basis and includes the four chief Officers of the Association and the Chairman of the Organization Committee *ex officio*. Overseas members are represented by the Chairman of the Overseas Committee, and the remaining members have been selected from the various Association regions in the United Kingdom with a minimal representation of three from Scotland, one from Wales, and one from Northern Ireland. The Committee has strengthened its geographical representation by co-opting three further members, one of whom is a member of the Council.

The members of the Committee as finally constituted are:

Council Members (14)

Ex Officio

J. W. Tudor Thomas, Cardiff (*President*)
S. Wand, Birmingham (*Chairman of Representative Body*)
E. A. Gregg, London (*Chairman of Council*)
A. M. A. Moore, London (*Treasurer*)
J. A. Pridham, Weymouth (*Chairman of Organization Committee*)

J. Cottrell, Grimsby
H. Guy Dain, Birmingham
R. G. Gibson, Winchester
I. D. Grant, Glasgow
F. Gray, London
R. Hale-White, London
J. G. M. Hamilton, Edinburgh
H. H. Langston, Winchester (*Chairman*)
A. Talbot Rogers, Bromley

Non-Council Members (15)

Ex Officio

J. L. Gilks, Petersfield (*Chairman of Overseas Committee*)
G. N. Bailey, Harrogate
J. T. Baldwin, Penicuik, Midlothian
H. J. Browne, Barlaston, Staffs.
Joan Chappell, Edmonton, Middlesex
R. Cove-Smith, London
H. J. Cronhelm, Belfast
A. B. Davies, Walsall
D. L. Gullick, Stevenage
F. Lishman, Crook, Co. Durham
P. Lyle, Southport
J. H. E. Moore, Leeds
J. R. Nicholson-Lailey, Taunton
D. F. Whitaker, Guildford
Morgan G. Williams, Cardiff

The terms of reference of the Committee have been deliberately made as wide as possible while keeping in the forefront the primary object of the resolution of the Representative Body—namely, consideration of possible reorganization of the Representative Body. They are:

To examine and report on the present structure and constitution of the Association with special reference to the reorganization of the Representative Body.

In carrying out its reference, the Committee will review the changes which have occurred during the last fifty years and the problems created by the enormous increase in the membership of the Association and the great increase in the association of the State with the provision of medical services for the community. It will consider the constituent parts of the Association's administration and the changes necessary to bring their functions and constitution into accord with present-day circumstances and needs.

SCOTLAND

Chairman and Deputy Chairman of Scottish Committee

156. Dr. J. G. M. Hamilton and Dr. W. M. Knox were appointed Chairman and Deputy Chairman respectively of the Scottish Committee for the session 1953-4.

Scottish Committee Jubilee

157. To celebrate the fiftieth anniversary of the founding of the Scottish Committee at Swansea in 1903, the Scottish Committee held a dinner in B.M.A. Scottish House on October 9, 1953. Advantage was taken of the occasion to entertain a number of prominent representatives of public life in Scotland, the guest of honour being the Secretary of State for Scotland, the Right Honourable James Stuart.

Visit to Denmark by Scottish Doctors

158. In view of the very successful visit of a party of Scottish doctors to Denmark in September, 1953, it is hoped to arrange another similar visit to Denmark this year. The Committee is endeavouring to arrange for a reciprocal visit to Scotland by Danish doctors in 1955.

Press Officer to Scottish Office

159. Mr. Alexander Bowman has been appointed part-time Press Officer to the Scottish Office in succession to Mr. George Donaldson.

Nominations to Fill Vacancies on Regional Hospital Boards

160. The Committee has been disturbed at the small proportion among medical members of boards of those nominated by the Association, and this matter is being pursued with the Department of Health.

Memorandum of Evidence to the Committee of Inquiry into the Cost of the National Health Service

161. The Committee has approved a memorandum of evidence for submission to the Committee of Inquiry into the Cost of the National Health Service. It has also appointed four members to give oral evidence to the Committee of Inquiry.

Partnership Advisory Memorandum

162. The Committee has asked the General Medical Services Subcommittee (Scotland) to revise the memorandum on Medical Partnerships under the National Health Service (Scotland) Act which was drawn up in October, 1951.

Maternity Services

163. The Maternity Services Subcommittee has considered a number of subjects in connexion with maternity services in Scotland. On the suggestion of the Sub-

committee, the Department of Health has agreed to certain alterations in the maternity record card. The Subcommittee has also drawn up draft forms which can be used by general practitioners and by hospital and local health authority doctors to facilitate closer co-operation in the field of maternity work.

Committees which Report to the Scottish Committee

164. (a) *General Medical Services Subcommittee (Scotland)*.—In connexion with the Working Party's recommendation that £100,000 should be set aside for the purpose of stimulating group practice, the Subcommittee has discussed with the Department the question of interest-free loans. It has been agreed that approximately £12,000 will be available for the scheme in Scotland. The Subcommittee feels that no hard-and-fast definition of "group practice" can be laid down until some experience has been gained as to how the scheme works. Agreement has been reached on certain conditions concerning loans and the Subcommittee has approved a draft agreement between a group and an executive council for use in connexion with these loans.

In response to an appeal by the Subcommittee the sum of £1,630 has been subscribed by local medical committees and individual doctors for the widow of a practitioner in Scotland who, owing to illness, had failed to lodge his claim for compensation.

(b) *Central Consultants and Specialists Committee (Scotland)*.—Dr. J. G. M. Hamilton and Dr. I. D. Easton were appointed Chairman and Deputy Chairman respectively of the Committee for the session 1953-4.

In addition to ordinary meetings, the Committee has met twice to prepare evidence for submission to the Scottish Committee in connexion with the Ministers' Committee of Inquiry into the Cost of the National Health Service.

The Committee has asked the Scottish Joint Committee to take action in connexion with the implications of Section 70 of the N.H.S. (Scotland) Act, which refers to the legal responsibilities of hospital authorities. Scottish Courts, unlike those in England, have so far held that hospital authorities are not vicariously responsible for the negligence of their medical staff. The Committee feels that acceptance of the principle of vicarious responsibility carries with it grave potential dangers to clinical freedom and thus threatens the true interests of both the community and the profession. Accordingly they are concerned to preserve the present position in Scots Law.

The Committee has considered representations from several whole-time hospital doctors relative to home to hospital mileage allowances. Two distinct groups are involved—namely, (1) those who hold whole-time contracts with regional hospital boards, and (2) whole-time university teachers holding honorary contracts with regional boards. It is appreciated that this is a matter which falls to be dealt with through Whitley Committee "B," and appropriate action to this end is being taken. Policy considerations are, however, also involved, and a summary of the position has been submitted to the Scottish Joint Committee with a request that it be discussed with the Department of Health.

The Committee's specialist subcommittees—namely, Ophthalmic, Anaesthetic, Radiological Services, and Tuberculosis and Diseases of the Chest—have also met and discussed matters relating to their respective services under the National Health Service.

The Committee's fourth Annual Report (1952-3) has now been issued to all consultants, S.H.M.O.s, and senior registrars in Scotland.

WALES

165. The Welsh Committee, which includes representatives of all the Divisions and Branches in Wales and Monmouthshire, has met in Shrewsbury under the chairmanship of Dr. Morgan G. Williams. It provides opportunities for discussion of all matters affecting Welsh members.

The Annual Welsh Dinner is to be held in Glasgow on Saturday, July 3.

OVERSEAS

Visit to the Far Eastern Branches

166. The Council is fully seized of the importance of maintaining personal links between the Overseas Branches and the parent body, and is happy therefore to report that the President of the Association (Mr. J. W. Tudor Thomas) has agreed to undertake a tour by air of the Borneo, Ceylon, Hong Kong, and Malaya Branches. Occasion will also be taken for the President to break his journey in Beirut and Bagdad, where he will meet members of the Middle East Branch.

The President's visit has been timed to coincide with the Annual General Meeting of the Malaya Branch at Kuala Lumpur from April 16 to 19, and at this and all other centres he will lecture, demonstrate cases, and operate, if invited to do so.

Gold Coast

167. Following the visit of Mr. Ian Fraser to the Gold Coast in March, 1953, a copy of his report was sent to the Secretary of State for the Colonies. At the same time, attention was drawn to the difficulty of attracting expatriate medical officers to the Gold Coast in the present uncertainty as to future constitutional developments and their possible effect on the careers of officers in the Colonial Service. It was suggested that a deputation from the Council might attend the Colonial Office for a general discussion on the position of British doctors in the Gold Coast and in other territories which are approaching self-government.

A reply was received from the Colonial Office which referred to the fact that officers in the public service of the various Colonial Governments were the servants of those Governments, and the Secretary of State was not therefore in a position to give any positive assurance in respect of the period during which their employment might continue. Attention was drawn to the statement made by the Prime Minister of the Gold Coast in the Legislative Assembly on July 8, 1953, to the effect that, in order to maintain an efficient administrative machine, the Gold Coast Government would for some years need the services of overseas officers and therefore guaranteed them pensions and terms of service no less favourable than those now obtaining.

A deputation was received by a Deputy Under-Secretary of State and other officials of the Colonial Office on December 18, 1953. A long discussion took place in which the Council's representatives emphasized the feeling of insecurity which, in spite of assurances given by the Prime Minister of the Gold Coast, still existed among British doctors as to the future of the Gold Coast Medical Service, and the consequent reluctance to take up vacancies as they occurred. They also pointed out the dangers of a situation which might open the door to the employment of unqualified and semi-qualified practitioners and to a general lowering of standards of practice.

The Colonial Office representatives took the view that security of tenure in the Gold Coast had not been impaired by recent events in spite of contrary impressions which had gained ground in many quarters. No further guarantees could be given beyond those which already existed, but it was their impression that the Gold Coast Government wished to retain its expatriate officers. The Council's representatives felt that it would be of assistance if greater publicity could be given to the safeguards which already existed.

The discussion then continued on the subject of articles and correspondence which had appeared in *The Times*, suggesting that a Civil Service might be organized on a Commonwealth basis. The Colonial Office representatives were interested in the suggestion, although some aspects of it were felt to be impracticable.

Cyprus

168. The Council regrets that it cannot report a settlement of the dispute with the Government of Cyprus over the remuneration of Government medical staff. Certain proposals were made by the Government of Cyprus to the effect that, in lieu of increasing the pensionable salaries of specialists in the manner suggested by the Association, special contract terms should be offered whenever it was necessary to recruit specialists from outside Cyprus. Neither the substance of this offer nor the terms suggested were considered to be satisfactory and, as from May 23, 1953 (nearly two years after the opening of negotiations), all appointments under the Government of Cyprus have been included in the "Important Notice."

The Council was, however, glad to learn of the appointment in November, 1953, of a Salaries Commissioner to examine the salary structure of the Government Service generally and to advise whether any measure of reorganization was called for and if there were any anomalies or inequities which should be removed. The Cyprus Branch submitted evidence, both written and oral, and a supplementary memorandum of evidence was also submitted by the Council. The Commissioner has not yet reported.

Hong Kong: Amendment to the Medical Registration Ordinance

169. The attention of the Council was drawn to an amendment of the Medical Registration Ordinance of Hong Kong which had been made without prior consultation with the local Branch of the British Medical Association, the Chinese Medical Association, or the Medical Board of Hong Kong, which is the statutory registration authority.

The law regarding medical registration is of the most intimate concern to the medical profession in every country. In amending the registration law of Hong Kong without consulting either of the representative medical associations of the Colony, and without even consulting the registration authority which is charged with the administration of that law, the Hong Kong Government has acted in an arbitrary manner which the Council deeply deplores. A strong protest has been lodged with the Colonial Office.

East Africa

170. A Commission to examine Civil Service salaries and conditions of service was appointed under the Chairmanship of Sir David Lidbury. Evidence, both written and oral, was submitted to the Commission by the Uganda Branch of the Association. Special attention was drawn to the decrease in recruitment to the Colonial Medical Service in the face of the counter-attractions of the National Health Service in the United Kingdom, to the increased demand for medical services in Uganda, and to difficulties arising from the devolution of local government to native authorities.

A supplementary memorandum of evidence was also submitted by the Council, dealing in greater detail with relative salaries of doctors in the United Kingdom and in the Colonial Medical Service. The report of the Commission is awaited.

Resolutions of the Caribbean Conference

171. It will be remembered that a number of resolutions were passed by the Caribbean Conference in January, 1951, and were remitted to the Colonial Office for consideration.

The Colonial Office has now informed the Council that the Caribbean Governments concerned are generally sympathetic towards the resolutions, some of which have already been given effect. The detailed comments of the Colonial Office will be brought to the notice of the next meeting of the Caribbean Council of the Association, which was scheduled to be held in December, 1953, in Barbados but has been temporarily postponed.

Testimonials for Ex-Colonial Medical Officers

172. The Council suggested to the Colonial Office that former members of the Colonial Medical Service should be permitted to give the name of a Director of Medical Services as a personal referee to whom any prospective employer might refer for a personal and confidential opinion. The Colonial Office undertook to forward the suggestion to the Colonial Governments, all of which have agreed to adopt it.

EMPIRE MEDICAL ADVISORY BUREAU

173. The Empire Medical Advisory Bureau, on behalf of the Association, welcomes and provides a personal advisory service to medical practitioners from the Dominions and Colonies visiting the United Kingdom.

The Committee of Management has met three times during 1953, and the Advisory Committee held its sixth Annual Meeting on May 28, 1953. The attendance of members at meetings and their help throughout the year with the problems of individual visitors is much appreciated.

The volume of inquiries dealt with by the Bureau continued at the same high level in 1953 as in the previous year; there were slight increases in the numbers of new visitors and new correspondents seeking advice or assistance, and a record number of more than two thousand visits were paid to the Bureau by old and new visitors.

The majority of new inquirers seek information about some aspect of postgraduate medical education and experience, including information on courses of instruction, examinations, and appointments in and visits to hospitals.

The "Summary of Regulations for Postgraduate Diplomas and of Courses of Instruction in Postgraduate Medicine," compiled and produced by the Bureau, has been revised and reprinted, as is usual each year. The "Summary" has been dispatched overseas to all Branches of the Association, Affiliated Associations, Deans of Medical Faculties of Commonwealth Universities, Postgraduate Committees, and Editors of Journals. These copies are intended for reference by overseas inquirers, and many tributes to their usefulness have been received.

Between two and three hundred doctors inquired about junior hospital appointments, and advice was given on the types, grades, and availability of these and on medical registration and protection.

Visits to hospitals, clinics, and special centres in many parts of the country have been arranged at the request of more senior visitors, who often combine a holiday visit with an intention to see methods and developments in the particular fields of medicine in which they are interested. The courteous co-operation of hospital authorities and consultants has enabled these requests to be met.

Many visitors have been met personally by the Port Health Medical Officers on arrival, and a letter of welcome from the Bureau is sent to every visitor whose place and date of arrival are known. There is no doubt that these attentions are much appreciated by the newly arrived visitor. Through the kindly co-operation of authorities arranging courses of instruction, the Bureau is enabled to contact those overseas visitors, already arrived in the country, who do not know of the Bureau's facilities; liaison letters are sent to all these visitors, and in many cases result in the Bureau being able to be of service and to invite the visitors to social functions.

The Bureau has found accommodation for visitors in readiness for their arrival, and all such requests have been met. In addition, visitors, after their arrival, have secured furnished flats and houses with the Bureau's help. Nearly three hundred doctors and families have been successfully helped with the difficult problem of accommodation during the year.

Overseas visitors have been enabled to meet their fellow practitioners from all parts of the Commonwealth, including senior members of the profession in the United Kingdom, at social functions arranged by the Bureau. "At

Homes" were held in Cardiff, Edinburgh, and London, and the Coronation "At Home" at B.M.A. House on May 28, 1953, was attended by 350 overseas guests. A total of nearly 1,100 overseas doctors and wives attended the social functions during the year, and many expressed their appreciation of the opportunities these afforded to make contacts which otherwise would not have been made.

The majority of visitors have inquiries which fall into the wide field of "General Information," and every endeavour is made to answer these or to assist the inquirer to find the answer.

That the Bureau's services are needed and welcome is shown by the many expressions of appreciation received from overseas visitors, and the Council is glad to feel that medical colleagues from the other parts of the British Commonwealth can obtain the assistance they require to make the most of their visits to this country.

INTERNATIONAL MEDICAL VISITORS BUREAU

174. The International Medical Visitors Bureau, established in 1950, provides a personal advisory service for medical practitioners desiring to visit the United Kingdom from countries other than those of the British Commonwealth. The Committee of Management met three times during 1953.

New inquirers from 33 countries consulted the Bureau, and the numbers of these were increased by about one-seventh as compared with 1952. In addition, more than 200 United Kingdom and Continental doctors, or their families, inquired about holiday exchanges. Many inquiries concerned postgraduate courses of instruction, diplomas, and examinations.

Temporary hospital appointments were sought, more especially by recently qualified practitioners who wished to gain experience in this country. Advice and assistance were given by the Bureau, and it is known that several doctors secured appointments.

Visits to hospitals, clinics, and other institutions were arranged at the request of visitors, and during the First World Conference on Medical Education several visits to medical schools were arranged for delegates. The Bureau is much indebted to the Heads of Departments, Consultants, the Chief Medical Officer of the London County Council, and others for the co-operation received in this field.

Suitable accommodation has been found in London and the provinces for all visitors requesting this.

Many inquiries in the field of "General Information" have been received and dealt with, and visitors are encouraged to make requests with a view to making their visits successful.

Inquiries about holiday exchanges for themselves or their families or children and about *au pair* visits were received from many doctors in Europe and in the United Kingdom. With the co-operation of national medical associations, the Bureau endeavoured to put the inquirers in touch with suitable professional contacts, and it is known that more than fifty "exchanges" were arranged.

Visitors have been very appreciative of the help they have received, and the Council is glad to know this assistance helps to strengthen international medical relations.

MEDICAL FILMS

175. There has been a slight decrease in the use of the Film Library during the past year. The Council believes this is partly due to the fact that some of the films are no longer up to date, and it is endeavouring to obtain information about medical films produced recently with a view to acquiring new films for the Library.

Fourteen films have been added to the Library, and a second addendum to the Film Catalogue has been issued.

Appraisal panels have met as required to view medical films which have been brought to the notice of the Association, and the Council wishes to express its thanks to the members of the profession who have served on these panels.

The Council is greatly indebted to the following, who have kindly presented films to the Association in the past year: American Medical Association; Abbott Laboratories Ltd.; Ciba Laboratories Ltd.; Imperial Chemical Industries Ltd.; and Parke, Davis & Co., Ltd.

During the period of the first World Conference on Medical Education in August, 1953, arrangements were made for an exhibition of medical photography, through the kind co-operation of the Royal Photographic Society, and for a series of lunch-time film showings in the Film Theatre kindly lent by the Wellcome Foundation. The attendance was good and the arrangements were much appreciated by members of the Conference.

WORLD RELATIONS**First World Conference on Medical Education**

176. In August, 1953, the Association had the pleasure of acting as host to the First World Conference on Medical Education, sponsored by the World Medical Association in collaboration with the World Health Organization, the Council for International Organizations of the Medical Sciences, and the International Association of Universities. The Conference, which was an outstanding success, was attended by 617 persons from 62 countries, and 127 universities and medical schools were represented.

World Medical Association

177. The Association was represented at the seventh General Assembly of the World Medical Association, held at The Hague in September, 1953, by the Chairman of Council and Dr. T. Rowland Hill as delegates, with the Chairman of the Representative Body and the Secretary as alternate delegates. Dr. J. A. Pridham was present as a member of the W.M.A. Council and the Editor of the *British Medical Journal* as a member of W.M.A. Committees; Dr. Mary Esslemont attended as an observer. The Public Relations Officer read an invited paper on the relations between the medical press and the public press at the annual meeting of medical editors of the world which followed the General Assembly.

Prior to the General Assembly, the Council of the World Medical Association met at B.M.A. House for four days. The members of the B.M.A. Council entertained the W.M.A. Council to dinner in the Great Hall.

It has been necessary to raise the subscription payable by member-associations, and the B.M.A. contribution for 1954 is £1,230.

World Health Organization

178. The Council has repeatedly represented to the Ministry of Health that the United Kingdom delegation to the W.H.O. should include a representative of the medical profession generally—that is, a non-official medical practitioner. So far these representations have been unsuccessful.

Anglo-American and Anglo-Canadian Exchange Schemes

179. The Council has continued to operate the Anglo-American and Anglo-Canadian exchange schemes, and seven British doctors visited Canada and the U.S.A. during 1953. Their reports say that the schemes are of real value in promoting contact between medicine in Britain and in North America.

OTHER ASSOCIATION ACTIVITIES**"The Recognition of Intoxication"**

180. A Special Committee was appointed by the Council in 1951 under the Chairmanship of Professor E. J. Wayne "to revise and bring up to date the Association's Reports on 'Tests for Drunkenness,' 1927, and 'The Relation of Alcohol to Road Accidents,' 1935." A Report from this Committee, entitled "The Recognition of Intoxication," is being issued in booklet form. It is a revised edition of "Tests for Drunkenness." The revision of the second

report mentioned in the Committee's terms of reference awaits the result of certain work now in progress in this country concerning the physiological effects of alcoholic intoxication.

"The Recognition of Intoxication" is intended primarily to offer to the general practitioner some guidance in the practical aspects of the medical examination of persons detained by the police and suspected of being under the influence of alcohol. It contains information on procedure, notes on pathological conditions which may simulate alcoholic intoxication, a model scheme for the examination of detained persons, and a section on the determination of alcohol in body fluids. In the preparation of the last-named section the Committee was assisted by a panel of the Royal Institute of Chemistry. Copies of the report may be obtained on application to the Publishing Manager.

Medical Practices Advisory Bureau

181. The volume of work in the agency section of the Bureau continues to be very high. During 1953 the Bureau was able to place over 650 prospective partners or assistants. Nearly 2,500 locums were introduced, and in addition the office dealt with a large variety of miscellaneous appointments both at home and overseas. It will be appreciated that the Bureau cannot nominate for advertised posts or vacancies, though occasionally it is asked to bring appointments to the notice of suitable candidates in order that they may be given the opportunity to apply. During the session the Bureau has reviewed its arrangements for facilitating the exchange of practices and has taken steps to make opportunities more widely known.

Very close liaison is maintained between Headquarters in London and the main branches in Manchester, Edinburgh, and Glasgow. The last-named can now be regarded as fully established and is doing an increasing amount of good work.

There is evidence that the personal advisory services are much appreciated, not only by members of the Association but also by solicitors and accountants acting on their behalf. A very large proportion of the requests for advice received during the past 18 months has been in connexion with the admission of new partners and with partnership agreements from the point of view of the doctor rather than the lawyer.

Guillebaud Committee

182. The Council was invited to submit evidence to the Committee, under the Chairmanship of Mr. C. W. Guillebaud, appointed by the Government to consider the cost of the National Health Service. A Memorandum of Evidence has accordingly been prepared and submitted to the Guillebaud Committee. Oral evidence will be given at a later date.

Control of Medical Manpower

183. As in the past, the Council has provided secretarial and clerical assistance and other facilities for the two Central Medical Recruitment Committees, and will recover three-quarters of the cost from the Government.

The constitution of the Metropolitan Regional Medical Recruitment Committee (for hospital and university officers in the four metropolitan hospital regions) was originally approved by the Council on the understanding that it would be reviewed after one year's working, as it was feared that there was inadequate representation of the hospital staffs in the Western Area of the South-west Metropolitan Region, which extends westwards as far as Bridport. The Council has accordingly reviewed the position, and has recommended to the Ministry of Health that a new and independent regional medical recruitment committee should be established in the Western Area of the South-west Metropolitan Region, with a constitution similar to that of the provincial regional medical recruitment committees.

At the request of the National Medical Manpower Committee, a detailed analysis (by sex, age, and occupation) of

the Central Medical Recruitment Committee's emergency register of the whole medical profession in Great Britain has been carried out.

Salaries of Civil Service Medical Officers

184. The Representative Body is aware of the long dispute with the Treasury regarding the salaries now being paid to medical officers in the Civil Service in accordance with the recommendations of the Howitt Committee. After much fruitless discussion of the possibility of arranging arbitration, or a review of the Howitt salary scales by an independent committee, the Treasury agreed to resume direct negotiations with the Civil Service Medical Officers' Joint Committee, on which the Council is represented together with the Medical Group of the Institution of Professional Civil Servants and the Ministry of Health Medical Staff Association.

The position has recently been complicated by the appointment of the Royal Commission on the Civil Service, but the Council is glad to report that a satisfactory interim agreement is about to be concluded between the Treasury and the Joint Committee. This provides for increases in pay for certain grades of the medical officer class in the Civil Service, and both parties remain free to ask the Royal Commission to consider any representations they may see fit to make regarding the remuneration of any of the medical grades. The arrangements for preparation of evidence for submission to the Royal Commission are under consideration by the Council. Meantime, the Council will afford the normal facilities for advertisement of Civil Service medical vacancies in the *British Medical Journal* at the rates of pay set out in the interim agreement, full details of which will be published in due course.

Rehabilitation

185. The Council has prepared, for submission to the Interdepartmental Committee under the Chairmanship of Lord Piercy, a Memorandum of Evidence on the Rehabilitation and Resettlement of Disabled Persons. This reviews the scope of rehabilitation and the available facilities. It makes a number of recommendations for the improvement of rehabilitation and resettlement services. The Council has authorized the publication of the Memorandum as a Special Report when it has been received by the Interdepartmental Committee.

The Council thinks that there is a need for educational work in the field of rehabilitation, and it is considering ways in which the nature, scope, and potentialities of rehabilitation may be brought to the notice of the medical profession and the public.

Joint Committee of the B.M.A. and the Magistrates' Association

186. This Committee has continued its study of the problem of cruelty to, and neglect of, children with a view to the preparation of a comprehensive report on this subject.

Tynwald Commission on Salaries and Emoluments

187. Last August the Council was called upon, at extremely short notice, to give evidence to a Commission appointed by the Manx Government with the following terms of reference:

To consider how far it is equitable and in the general interest of the Isle of Man that different conditions appertaining here (with particular reference to income tax) should be taken into consideration when applying English emoluments to positions in the Isle of Man, and to recommend in what way such emoluments can best be adjusted to Manx conditions.

The setting up of this Commission caused alarm to the Isle of Man Medical Society (Isle of Man Branch of the Association), since the Island has a health service similar to that on the mainland, the remuneration of the doctors being identical.

A hurriedly prepared memorandum of evidence was submitted to the Commission on behalf of the Council. This was followed by oral evidence and by a short supporting memorandum written by an eminent economist. It was strongly contended that any adjustment of the remuneration of the local doctors to take account of the lower local rate of income tax would be wrong in principle and inequitable in practice.

The Council is glad to report that its representations have been successful. The recently published Report of the Commission states that much thought was given to a suggested formula whereby salaries and emoluments amounting to £700 and upwards would be automatically reduced by an amount equivalent to the difference between the income tax and surtax in the Isle of Man and the corresponding taxes in the United Kingdom. The Commission estimated, however, that the net annual saving would not exceed £7,000, and it took the view that the magnitude of the economy was a relevant factor in the consideration of a measure attended with practical difficulties, likely to be resented by important sections of the community and "possibly involving a serious administrative deadlock." It did not appear to the Commission that the amount likely to be saved was sufficient to outweigh the disadvantages of the suggested method of saving.

The two memoranda submitted on behalf of the Council were published in the *Supplements* to the issues of the *British Medical Journal* dated August 29 and September 5, 1953.

"National Formulary"

188. The work of revising the *National Formulary*, 1952, is nearing completion and preparations are proceeding for the publication of a further edition towards the end of 1954 or early in 1955. Because of criticisms of the arrangement of the *National Formulary*, 1952, received from medical and pharmaceutical organizations and from individual members of both professions, the arrangement of the new edition will be similar to that of the 1949 edition. The headings of the main sections will be in Latin, but abbreviated Latin titles will be used as the main titles for individual preparations instead of the full Latin titles.

Catering

189. On the recommendation of the firm of management consultants which investigated the Association's Headquarters organization, a new committee known as the Catering Committee was appointed by the Council in July, 1953, to manage the Catering Establishment at B.M.A. House.

Representatives of those who make use of the catering facilities in the Members' Common Room and the Staff Canteen have been appointed to attend meetings of the Committee when their presence is required, or at their own request, for the special purpose of liaison between their "constituents" and the Committee.

The Committee has begun a review of the existing arrangements, and in the first instance has directed its attention to the equipment available in the kitchens and dining-rooms, with a view to ensuring an efficient service. Recent staff changes have already led to considerable improvement in the range and quality of the meals served and have made it possible for the manageress to devote more of her time to the tasks of buying and staff control.

The Catering Department now undertakes the provision of refreshments for certain of the larger meetings and receptions, a service which hitherto has necessitated the employment of an outside caterer. This has been done at a competitive price and the Council anticipates that when fully equipped the Catering Department will be able to undertake more of this class of work both for the Association and for other professional bodies using the building.

E. A. GREGG,
Chairman of Council.

APPENDIX I

RETURN OF ATTENDANCES OF COUNCIL

Name	Attendances	
	Actual	Possible
E. A. Gregg, London (Chairman of Council)	5	5
J. W. Tudor Thomas, Cardiff (President)	4	5
S. Wand, Birmingham (Chairman of the Representative Body)	5	5
A. M. A. Moore, London (Treasurer)	5	5
P. T. O'Farrell, Dublin (Immediate Past President)	2	5
Sir John McNee, London (President-Elect)	3	5
I. D. Grant, Glasgow (Deputy-Chairman of the Representative Body)	5	5
Abel, A. Lawrence, London	4	5
Alexander, H., London	4	5
Arthur, J. C., Low Fell, Co. Durham	4	5
Barker, A., Whitstable	4	5
Britton, C. J. C., London	5	5
Brown, Alexander, Linton, Cambs	4	5
Brown, David, Liverpool	4	5
Brownfield, O. D., Petersfield, Hants	3	5
Callander, I., Dougal, Doncaster	5	5
Carter, O. C., Bournemouth	5	5
Chalke, H. D., London	5	5
Cottrell, J., Grimsby	5	5
Cowan, K., Chelmsford	3	5
Dahne, S. F., Logan, Caversham, Berks	4	5
Dain, H., Guy, Birmingham	5	5
Davies, T. W., Swansea	5	5
Dawson, E. C., Derby	5	5
Dickson, N. S., Templepatrick, Co. Antrim	3	5
*Digby, Kenelm H., Bromley	2	3
Dornan, W. E., Sheffield	4	5
Douglas, N., Hamilton, Lanarkshire	5	5
Dowler, H. G., Churchdown, Glos	5	5
Dowse, J. C. A., London	5	5
Edwards, J. T., Rice, Newport, Mon.	5	5
Esslemont, Mary, Aberdeen	5	5
Forbes, R., London	5	5
Formby, Myles L., London	2	5
Fraser, Ian J., Belfast	1	5
Garnham, P. C. C., Farnham Common, Bucks	5	5
Gibbons, L. A., Reigate	2	5
Gibson, R. G., Winchester	5	5
Gillie, Annis, London	4	5
Golding, H. M., Westbury-on-Trym, Glos	2	5
Gorsky, J. A., London	4	5
Gough, A., Staveley, Watford	5	5
Gray, F., London	5	5
Hale-White, R., London	5	5
Hamilton, J. G. M., Edinburgh	5	5
Heywood-Waddington, W. B., Littlehampton	5	5
Hill, T., Rowland, London	5	5
Hutchinson, D. F., London	5	5
Innes, Ian G., Hull	5	5
Ireland, G. W., Ford, Midlothian	5	5
Jones, Isaac, London	1	5
Jones, J. A. L., Vaughan, Leeds	5	5
Jones, Leslie W., Anglesey	4	5
Knox, W. M., Glasgow	4	5
Langston, H. H., Winchester	3	5
*Leacock, A. G., London	1	5
Liston, R. P., Tunbridge Wells	4	5
Macarthur, J. C., Carlisle, Lanarkshire	4	5
Milne, J. L., Manchester	4	5
Moody, J. A., Ilford	4	5
Owen, D. R., Chester	5	5
Pracy, D. S., Atherstone, Warwickshire	5	5
Pridham, J. A., Weymouth	5	5
Rees, J. O. M., Guildford	5	5
Rogers, A., Talbot, Bromley	2	5
Rook, Sir Alan, Cambridge	5	5
Rose, F. M., Preston	5	5
Russell, A. V., Wolverhampton	5	5
Scott, Alexander, Ayr	5	5
Scott, S. Nov, Plympton, Devon	5	5
Sutherland, H. H. D., London	4	5
Watts, Weldon P. T., Newcastle-upon-Tyne	3	5
Weston, A., Greenford	5	5
Woolley, W., Bristol	5	5

* Resigned January, 1954; died February, 1954.
† Resigned February, 1954.

APPENDIX II

FINANCIAL POSITION OF PRACTITIONERS ON RETIREMENT

The Representative Body instructed the Council to inquire into the financial position of members of the profession who retire at the age of 60 or later, with special reference to the position of those who were over 45 years of age on the introduction of the National Health Service.

In carrying out its inquiry the Council, after consultation with the movers of the motion, has interpreted the resolu-

tion as referring to those doctors who became subscribers to the National Health Service Superannuation Scheme at an age which prevented them from receiving on retirement benefits commensurate with their seniority and long service under the N.H.I. Acts. The Council has also taken into account the fact that a number of practitioners may have been unable to make adequate provision for retirement, owing to circumstances outside their control. For instance, the war may have depreciated the value of a practice, with the result that the capital sum the practitioner will receive in compensation, and on which he had relied, may be insufficient even for the purpose of a modest annuity.

Although it is clear that the movers of the resolution had in mind the inadequacy of the superannuation scheme to deal with certain hard cases, the resolution itself does not refer to the scheme but asks in effect whether anything can be done by some form of subsidy to augment the pension which a doctor who is unable to complete more than 20 years' service will receive (15 years if, as is implied by the resolution, he wishes to retire at age of 60). That there is a problem here involving hardship in individual cases cannot be denied, but in referring to doctors who retire at 60 with only 15 years' service the resolution ignores the fact that a general practitioner may continue to contribute for a further 10 years up to the age of 70, making 25 years in all, and even then need not retire. It is true that in the hospital service extension of retiring age is exceptional, but the rule under which the great majority of consultants must retire at 65 has nothing to do with the superannuation scheme. It is relevant to suggest, however, that should some special provision be devised to supplement the superannuation benefits of "short-term" contributors, consultants and specialists would have at least as good a claim to participate; indeed, the principle applies to all contributors, medical or non-medical, who have not transferred from other pension schemes.

With regard to the second consideration, though in some cases a practitioner's compensation may be insufficient to purchase an adequate annuity, it must be borne in mind that the capital that he would realize from the goodwill of his practice could have been estimated (within reasonable limits) before the appointed day and provision made to supplement this by voluntary insurance to take into account increases in taxation and the cost of living. Before the N.H.S. Superannuation Scheme was envisaged it was always possible for general practitioners to arrange for a pension and to have contributions deducted by insurance companies.

The superannuation scheme has, in fact, made allowance for private arrangements of this kind by applying the employer's contribution to the maintenance of endowment assurance premiums. It is relevant to consider the effect on those who had exercised the option to contract out of the scheme if, at this stage, non-contributory annuities were added to the benefits they had forgone.

As in other contributory schemes, after the appropriate qualifying period, pensions and other benefits increase with each year of service. The Council has considered, therefore, the position of those who can only just serve the ten years enabling them to obtain a minimum pension, or who cannot even qualify, rather than those whose benefits are small because of their comparatively short service. If the inquiry were extended to include those with up to twenty years' service, there would inevitably be borderline cases who would feel aggrieved; in other words, it would be impossible to draw a line. Furthermore, benefits also vary according to salary on retirement or total net income; therefore, in trying to estimate the size of the problem, the Council has selected as its examples the average case.

Any scheme must apply to all members of a defined group and to single out those with very low incomes on the ground that they could not have been able to save for their retirement is to introduce a compassionate element into a question which must be treated as one of equity. It might well necessitate a means test of a most searching character and an inquiry into the opportunities for making alternative provision privately.

The following hypothetical examples are intended to illustrate the position of doctors who will reach normal retiring age after ten years' service—that is, practitioners who had reached the age of 55 in the third quarter of 1948 or practitioners who were beyond this age and could not therefore qualify for a pension without being forced to apply for extension and to continue to work after the normal age of retirement. Benefits for different incomes will be roughly in proportion. All figures are approximate, and although the examples take into account the capital received as compensation, they do not take into account National Insurance benefits, private capital resources, or voluntary provision by insurance.

Case 1.—Doctor aged 55 on July 5, 1948, married, wife aged 50. Gross income £2,000.

	A Retires at 65 after 10 Years' Service	B Retires at 70 with 15 Years' Service (Extension of Pensionable Age)
1. Pension	£ 210	£ 315
2. Retiring allowance	210	315
3. Compensation	3,200	3,200
4. Joint annuity (based on 2 + 3 above)	220	245
5. Income (1 + 4 above)	430	560
6. Widow's pension	70	105
7. Widow's income (4 + 6)	290	350
(National Insurance pension 54s. weekly (husband and wife), widow's pension 32s. 6d. weekly.)		

Case 2.—Doctor, single—as above.

	A	B
1. Pension	£ 210	£ 315
2. Retiring allowance	630	945
3. Compensation	3,200	3,200
4. Annuity	380	415
5. Income (1 + 4)	590	730
(National Insurance pension 32s. 6d. weekly.)		

Case 3.—Doctor aged 55 on July 5, 1948, forced to retire in 1954 (after more than five but less than ten years' service) because of permanent incapacity. Average income £2,000.

Short service gratuity (Reg. 10)	£ 1,400
Compensation	£ 3,200
Annuity	£ 460

Case 4.—Doctor having completed ten years' service who is forced to retire through permanent incapacity—income £2,000. In these circumstances the pension of a doctor whose "aggregate service" is less than 20 years may be increased by applying a rather complex formula contained in Regulations 8 and 46.

	A Aged 45 on July 5, 1948	B Aged 50 on July 5, 1948
Net pension	£ 210	£ 210
As corrected by applying the formula in the proviso to Regulation 46.3.e.	420	315
Add annuity derived from retiring allowance plus compensation	240	290
Annual income	660	605

Note.—The pension payable under these circumstances may be considerably more if the incapacity is attributable (Reg. 9)—up to two-thirds average income (£900) at discretion of Minister.

Case 5.—Part-time specialist compulsorily retired at age 65 after six years' service and unable to qualify for pension under Regulation 46.3.e. The retiring allowance may be increased by the capital value of the death gratuity (no death gratuity being payable thereafter). Average remuneration £1,560 (actual case).

	£
Lump sum retiring allowance (the amount of his contributions plus interest)	500
Average remuneration	1,560
Less retiring allowance	500
Normal death gratuity	£ 1,060
Capital value of normal death gratuity discounted for payment in advance	800
Total net amount payable	800 + 500 = £ 1,300

It is important to emphasize that the N.H.S. Superannuation Scheme is a contributory scheme and any modification in favour of a particular group of practitioners will have to be financed by the general body of contributors. It seems almost certain that an increase in pensions (or other benefits) which could be regarded as adequate would result in reduced benefits to all other classes in the scheme or in increased contributions.

In the N.H.S. Superannuation Scheme, as in other contributory pension schemes, the benefits have in the long run to be paid out of contributions. Under Regulation 45 it is incumbent on the Minister to maintain a balance between the assets of the scheme and its liabilities. There is to be an actuarial investigation every seven years, commencing in 1955. The purpose of these investigations is to determine what adjustments, if any, are needed to maintain this balance. It follows that if provision is to be made for increased benefits to certain officers, for instance, elderly practitioners and others who would not otherwise have qualified for a pension or will have qualified only for a comparatively small pension, these additional payments may result in the reduction of benefits to other classes.

It is clear that it would be impossible to provide for supplementary benefits in a limited group of cases without challenging the whole basis of the present superannuation scheme. Even if the profession were prepared to accept increased contributions to subsidize a relatively small group within its ranks, it is doubtful whether the scheme could be amended without taking into account all non-medical contributors and also the effect on other contributory pension schemes.

Conclusions

(1) In any contributory superannuation scheme there must always be a minority who, because they are unable to qualify for a pension, or because the number of years they can serve is limited, cannot hope to receive an adequate pension.

(2) To provide for non-contributory annuities or to subsidize other benefits would challenge the whole basis of contributory pension schemes.

(3) To provide subsidies for non-contributory pensions to individuals on hardship grounds would create anomalies and would imply a means test.

(4) The financial position of a late entrant to the N.H.S. Superannuation Scheme with a practice of average size would not appear to entail hardship sufficient to justify radical revision of the principles on which the scheme is based.

APPENDIX III

MEMORANDUM TO MINISTRY OF LABOUR AND NATIONAL SERVICE ON FUTURE OF OCCUPATIONAL HEALTH SERVICES

Introduction

1. For many years the British Medical Association has sought to promote the development of health services in industry as a service complementary to, and in no way encroaching upon, the personal health services available to industrial workers outside their working environment.

2. In 1936 a Subcommittee of the General Practice Committee of the Association was appointed to deal with industrial medical matters. Ten years later this Subcommittee was replaced by a Standing Committee now known as the Occupational Health Committee. This Committee includes members nominated by the Association of Certifying Factory Surgeons and the Association of Industrial Medical Officers. Members of these two independent bodies have served also on the Planning Subcommittee of the Occupational Health Committee, which has drafted the present memorandum. Neither of these bodies, however, is to be regarded as necessarily agreeing in all respects with the policy of the British Medical Association in regard to Occupational Health Services, or subscribing to the views expressed in this memorandum. In 1939 the Association published a report entitled "First-Aid in Industry." This report stressed the importance of efficient care of industrial injuries, even when apparently trivial, and the possibility of prolonged disability due to delays in treatment. The report

recommended that in all cases the First-Aid Service should be supervised by a medical practitioner: it defined the various categories of nursing staff and auxiliary medical workers in industry; and it gave an outline of a syllabus of instruction in industrial first-aid, supplementary to a general first-aid training.

3. The arms production drive of 1940 led to a fresh recognition of the value, so clearly demonstrated during the 1914-18 war, of medical supervision in factories. In 1940 the Council of the Association believed, on both humanitarian and economic grounds, that the time was ripe for the expansion of industrial health services, not merely to meet the stress of war but as a permanent feature of the industrial organization of the country. It therefore appointed a special Committee to consider and make recommendations on the principles which should govern the medical supervision of industrial workers. The report of this "Committee on Industrial Health in Factories" was published in 1941. It urged the importance of medical supervision in all factories, large or small. It described the various functions of the industrial medical officer and his relations with other medical services, and it recommended an extension of industrial health research. An Appendix contained a concise statement drawn up by the Association in 1937 of the Duties of, and Ethical Rules for, Industrial Medical Officers. A second Appendix, contributed by the Association of Industrial Medical Officers, dealt with training in industrial medicine and included a suggested syllabus for a postgraduate diploma. A revised version of the Duties of, and Ethical Rules for, Industrial Medical Officers was published in 1949.

4. In 1946 the Association published a "Report on Rehabilitation" prepared by a special Committee. This report stressed the complementary nature of the medical and industrial aspects of rehabilitation, the importance of co-operation in this field between medicine and industry, and the need for closer liaison between the general medical practitioner, the hospital medical staff, and the Industrial Medical Officer.

5. In 1949 the Representative Body of the Association approved a report on "A Comprehensive Occupational Health Service." This recommended that the Ministry of Health should arrange surveys to ascertain the special requirements of different areas in respect of occupational health services, and should thereafter assume responsibility for planning and supervising a service of a national character closely integrated with the National Health Service and in a form acceptable to both managements and employees. Since the preparation of that report the types of occupational health services already in existence have been considered. Following a suggestion by the B.M.A., the Society of Medical Officers of Health is arranging a number of small surveys which are now being undertaken in different types of areas to ascertain the occupational health requirements of industry.

6. The Association publishes the *British Journal of Industrial Medicine*, which was instituted in 1944, and under the Mackenzie Trust it arranges biennially a public lecture on an industrial health topic. Among the scientific sections at the Annual Meeting of the Association is one devoted to Occupational Health. Finally, through its local Divisions the Association has promoted the establishment of Advisory Councils on Occupational Health in which representatives of local employers, employees, and medical practitioners discuss matters of common interest relating to health in industry.

7. *Pari passu*, there have been other pronouncements in relation to occupational health services:

1944. The Government White Paper on "A National Health Service" included a reference to industrial medical services linked with but not a part of the proposed National Health Service.

1945. The Social and Preventive Medicine Committee of the Royal College of Physicians published its Second Interim Report on Industrial Medicine.

1948. The following statement was made by the Government after receiving a deputation from the T.U.C. on the subject:

"... In short, the policy of the Government is that there should be a National Industrial Medical Service properly co-ordinated with the National Health Service as soon as there is a sufficiently large cadre of suitably qualified doctors to form a sound foundation for the establishment of such a Service; and that in the meantime steps should continue to be taken to encourage the building up of such a cadre."

1951. The report of a Committee of Inquiry on Industrial Health Services (the Dale Report) was published. In the House of Commons on February 26, 1951, the Prime Minister stated:

"The Government accept the Report generally, subject to detailed consideration of the co-ordination machinery proposed. Accordingly, although the need for the utmost economy in the use of medical manpower still persists, the suggestion I made on June 1, 1949, that further development of industrial health services should be postponed for the time being is to be regarded as being no longer operative."

Policy of the Association

8. (1) The Association is convinced of the value of occupational health services and of the importance of all practicable measures being taken to provide such services for all occupational groups, large or small, both in industry and in non-industrial occupations.

(2) The Association considers that full provision to meet special health needs of occupational groups is not made under the existing administration of the National Health Service, and that additional arrangements, closely integrated with those of the National Health Service, are necessary.

(3) The Association believes that the State should assume responsibility for giving direction to the development of an occupational health service of a national character; for exercising central supervision of such a service, preferably through the Ministry of Health, with possibly delegated responsibility to other Departments for day-to-day administration, and for providing, at least in part, the necessary financial resources.

(4) The Association considers that the precise form of a comprehensive occupational health service cannot yet be defined. It thinks that it is desirable to introduce experimental forms of service acceptable to employers, employees, and the medical and allied professions; and to arrange surveys to ascertain exactly the existing position in different regions and the special character of the further services required. The Association is continuing, through its Occupational Health Committee, to give active consideration to this problem, and is assisting in the conduct of small surveys.

Proposals for Future Occupational Health Services

9. In order to give an adequate service to industry an occupational health service should include the functions which are listed below. In carrying out these functions the Industrial Medical Officer will be greatly assisted by the existence of a nursing service, which is a necessity for industry. The medical officer, the nurse, the dressing-station attendant, the first-aid attendant, and other ancillary workers will form a team operating for the benefit of the workers and the industry. It is intended that the carrying out of these functions shall be subject to the usual professional ethical relationships.

(1) General Advisory Services to Management on

- occupational hygiene—including advice, in collaboration with technical experts, on the design, construction, and layout of buildings and machines;
- the conditions affecting the health of the workers;
- the occurrence, risk, and significance of dangerous hazards;
- medical aspects of safety precautions, including questions as to the effects and avoidance of fatigue;
- medical aspects of "employee" services, including medical inspection of canteen facilities and medical supervision of the health and hygiene of canteen workers;
- study of sickness absenteeism and questions of personal and group morale;
- the causation and prevention of industrial disease, enlisting the help of inside and outside research and technical departments;
- medical aspects of legislation on health matters which places obligations on the employer or employee.

(2) Examination of individual workers with a view to advising management as to their conditions of employment

- (a) pre-placement examinations and the examination of persons returning to work after illness or injury, with a view to determining the work on which the worker is to be employed and his fitness for it;
- (b) periodical examinations of persons exposed to occupational hazards or where a hazard is suspected;
- (c) examination of persons doing work of such a nature that ill-health or the development of certain disabilities might endanger the lives of themselves or others.

(3) Therapeutic Services

- (a) supervision of nursing services and equipment;
- (b) supervision of ancillary services—that is, chiropody—and equipment;
- (c) supervision of first-aid services, including maintenance of the efficiency of first-aid personnel and equipment;
- (d) immediate treatment of medical and surgical emergencies occurring at the place of employment;
- (e) examination and continued observation of persons, including those returning to work after absence due to illness or accident, and advice on suitable work or change of occupation;
- (f) treatment for minor conditions, in agreement with the general practitioner, in order that the worker may be enabled to continue at work.

(4) Certain General Health Services to workers

- (a) general health supervision of all employees in relation to their work and working conditions, including diagnostic or periodic health examinations in addition to those referred to in Section (2), where, for example, there is doubt as to a person's fitness to continue in a particular occupation and with special reference to (a) young persons, (b) married women, (c) elderly persons, and (d) disabled persons;
- (b) promotion of the education of employees collectively and individually in matters of general and personal hygiene;
- (c) advice to those committees within the factory which are responsible for the health, safety, and welfare of the employees;
- (d) study of work and working environment and their effects on the health of employees.

10. The Council attaches importance to the supervision of environmental circumstances in relation to employees at the place of work. To this end there is a real need for an occupational hygiene laboratory service for industry.

11. There is also a great need for more research into problems of occupational health by the Medical Research Council, Government Departments, and Universities.

12. Particularly in the small factories one of the major problems concerns the resettlement of workers after injury or serious illness. In this connexion a medical practitioner with knowledge of the processes involved can prove extremely helpful. If alternative work is not available he may be able to suggest a modification of the worker's usual job. It is inevitable that some hazards will remain in industry whatever precautions are taken, but an adequate resettlement service can greatly assist in fitting the man into the job or modifying the job for the man.

13. The placement of disabled persons is another important problem which requires experience in assessment of capacity, not in general terms, as is more usually required in general medical practice, but in relation to the requirements of industry. Such assessment can best be made by practitioners with experience in industry. Liaison should be maintained with the Disablement Resettlement Service of the Ministry of Labour.

14. The Association has already expressed the view that before the establishment of any comprehensive occupational health service there is need for surveys and experimental services. From these surveys and experiments it may be possible to determine whether it would be preferable to provide occupational health services for selected types of industries only, or a basic service applicable to all workers. It may also be shown whether there is need for priority in any group or area for the establishment of a service. In any event, it is considered that there should be central supervision of any comprehensive occupational health service and it should have an administrative link with the National Health Service.

15. Under the Factories Acts there are certain statutory requirements for medical examinations and inspections, but, in the view of the Council, the Medical Inspectors of Factories are too few in number to supervise all these provisions. An enlargement of this Medical Inspectorate would bring about a greater enforcement of powers already in existence and is urgently required. This would lead to an expansion of occupational health services in industry.

16. It is the view of the Association that occupational health services should normally be available to all workers, but it recommends that as a first step the Government should consider the introduction of legislation requiring the occupiers of factories employing 51 or more workers to provide and maintain, in such form and in such degree as required and approved by a Central Supervisory Authority, their own occupational health services. (This would involve, at most, 22,694 out of 243,769 factories (see Dale Report), some of which already have their own occupational health services). There are certain occupations which, irrespective of the size of the factories, require general medical supervision. In such cases regulations could provide for the necessary arrangements to be made.

17. It is desirable that the appointment of the Medical Officers should be made by the management, but the conditions of the appointment should be in conformity with principles enunciated by the Central Supervisory Authority, to which both parties should have the right of appeal in the event of a dispute. In many instances general practitioners, public health medical officers, and others would be able to provide the necessary medical supervision, on a part-time basis, and employers should be encouraged to make use of their services.

18. The Association believes that supervision of such a service should be unified and co-ordinated. Unification at the centre whereby an Occupational Health Service is under the general direction and supervision of the Ministry of Health, together with full co-ordination of all interests at the periphery, would produce a service which would be of the greatest benefit to the nation.

19. An Occupational Health Service must have close relation to the General Medical Services, the Consultant Services, and the Public Health Sections of the National Health Service. The Consultant and General Medical Services are at present predominantly concerned with treatment of the patient when sick, which field, apart from emergencies, is not considered to be the province of an Occupational Health Service. On the other hand, the Public Health Service has a special responsibility towards the prevention of disease and ill-health and has special statutory duties in this direction.

20. The Council has given careful thought to the part to be played by local authorities in any Occupational Health Service. The Council appreciates that the local authorities, under the Factories Act, 1937, are charged with the enforcement of provisions as to sanitary conveniences in all factories and as to certain other environmental conditions in respect of any factory in which mechanical power is not used. They also have responsibilities in relation to premises and employees not covered by the Factories Acts, and they have other health functions which may have a direct bearing on the development of occupational health.

21. This would seem to imply that the Public Health Service has an important contribution to make to the development of an Occupational Health Service and may be the principal agent of co-ordination at the periphery. The closest relationship should be established between the Factory Medical Inspectorate, the Department of the Medical Officer of Health, and the School Health Service.

22. So far as their contributions to the promotion of occupational health in any future Occupational Health Service of a national character are concerned there should be integration of the three divisions of the National Health Service. The closer the relationship between an Occupational Health Service, the Public Health Service, and the

National Health Service, the less likelihood there is of overlapping of function.

23. At the present moment it is agreed generally that an Occupational Health Service is of great national importance. Its development should be encouraged, independently of the National Health Service, but co-ordinated with it. Such a Service requires suitably qualified consultants, specialists, research workers, and whole- and part-time industrial medical officers.

24. It seems also evident that suitably trained and experienced personnel are insufficient in number to form a comprehensive service at the present time. But the provision of the medical component of a comprehensive Occupational Health Service would be much encouraged with every step taken towards the development of a service.

25. If there is not to be further delay the first step must be more general recognition that occupational health should no longer be looked upon as something ancillary to a personal health service. The service should be able to provide conditions of service and opportunities for promotion not less favourable than those in other branches of medicine.

26. With this achieved, sufficient recruits of the necessary quality should be forthcoming to provide an adequate occupational health service. The Association regards this as an urgent matter without prejudice to the subsequent development of the service.

APPENDIX IV**MEMORANDUM ON MEDICAL STANDARDS FOR ROAD, RAIL, AND AIR TRANSPORT****Introduction**

1. A request for general advice on the suitability of diabetics to drive buses was received by the Association from the Minister of Transport. At the same time a similar problem was raised by a member of the Association regarding railway locomotive drivers. Two cases were quoted. The first concerned a bus driver in the provinces who was apparently fit on initial examination, but who was subsequently discovered to be receiving injections of insulin four times a day. The second was of a recent railway accident in which, happily, there was no loss of life, but which was due to the driver of the locomotive passing into diabetic coma.

2. These matters were referred to the Occupational Health Committee, which decided that it would be opportune to review the whole question of medical fitness as related to the safe handling of various forms of transport and not to confine attention to the study of diabetics alone. A Subcommittee was therefore appointed with the following terms of reference:

To examine, in the interests of public safety, the medical standards required for drivers and others concerned with the operation of all road, rail, and air transport, and to make recommendations.

3. The members of the Subcommittee were as follows:

L. G. Norman (Chairman).

H. Alexander.	R. M. S. McConaghey.
J. Bishop Harman.	J. A. A. Mekelburg.
A. Buchanan Barbour.	D. S. Pracy.
R. Forbes.	T. D. Spencer.
G. E. Graves Peirce.	J. A. L. Vaughan Jones.
T. C. Hunt.	P. J. Webb.

Advice was also received from Myles L. Formby, T. Rowland Hill, T. P. Rees, and P. D. Trevor Roper.

4. The above terms of reference relate to the medical standards of rail and air transport in addition to road transport. Brief consideration only has, however, as yet been given to the first two groups. Both the railways and the airlines have their own medical services, and it is acknow-

ledged that they are consequently in a far better position than many road transport undertakings to review their own medical standards. In addition, so far as the airlines are concerned, the medical standards for aircrew are laid down by international agreement through the International Civil Aviation Organization, which is a Government body. It is understood that these standards are constantly under review.

5. Some comments on existing standards for rail and air transport are set out briefly below:

Eyesight examinations at regular intervals for footplate staff and signalmen are required to be undertaken from the age of 50 upwards. Examinations also take place at earlier ages on promotion. Medical re-examination does not at present take place until the age of 60. Although a high standard of medical fitness on appointment is ensured by the railway medical officers, it is felt that the arrangements for re-examination could well be strengthened by requiring a full medical re-examination every five years. In cases of absence due to prolonged sickness there should be additional examinations. Insufficient information is available to enable comment to be made on the existing standards for aircrew, but the insistence on annual re-examination (every six months for pilots) and the rigid adherence to a high standard of re-examination after accident or sickness has been noted.

6. Although it is probable that the major causes of accidents lie more commonly in such factors as fatigue, inattention, and carelessness than in detectable illness, the Committee considered that a general examination of the question of medical fitness should be undertaken with a view to making recommendations regarding safety standards. The question of alcohol in relation to driving, which has been, and continues to be, dealt with elsewhere has not been considered.

7. Information on eyesight and medical standards at present in use together with the requirements, if any, for periodic or special re-examination was received from 20 undertakings and authorities (including the armed Forces) responsible for the operation of road, rail, and air transport. In addition the forms of application for a licence to drive public service vehicles (Forms P.S.V. 15, 15A, and 15B), private cars (Form D.L. 1), and London taxis (Forms P.C.O. 296, 296A, 297, and 9) were studied.

8. The information thus obtained was examined under the following broad headings: (1) visual standards; (2) hearing standards; (3) physique; (4) general medical condition, including emotional stability; and (5) frequency of examinations.

9. Inquiries were made of certain insurance companies from which it appears that records, which might indicate an association between medical defects and accidents, are not maintained. One or two insurance companies did compile statistics at one time, but found that insufficient evidence was forthcoming on which to base any modification of policy. The Committee has been singularly unsuccessful in its search for evidence revealing medical and surgical conditions as a common cause of accidents. If, however, it is accepted that the majority of accidents are due to such factors as impaired concentration, fatigue, errors of judgment, and emotional instability, then most accidents must be attributed to medical or psychological causes. These causes may operate in the case of others concerned in accidents quite apart from the drivers, although of course primary responsibility for the avoidance of accidents is placed on the person who drives the vehicle.

10. Certain medical conditions of sudden onset render a driver incapable of remaining in control of his vehicle and result in the possibility of a serious accident. This possibility is sufficient justification for insisting on the exclusion of drivers suffering from medical conditions which may constitute an ever-present but hidden danger. It is not an easy matter to decide which diseases fall into this category; certain of them are generally discussed in paragraphs 43-50.

11. The medical examination required before a licence to drive a public service vehicle is issued may be carried out by any registered medical practitioner. This means in prac-

tice that any one practitioner may be called upon only occasionally to undertake this type of examination, without the essential requirements as regards safety having been placed constantly before him. It is therefore recommended that the attention of all practitioners should be drawn to the essential features of this Memorandum.

12. It was noted with satisfaction that a high standard of medical and eyesight requirements is maintained by the London Transport Executive in the case of drivers of passenger transport in London. Indeed, the standards for periodic medical and eyesight examinations now applicable in the London area might with advantage be extended so as to apply to the remainder of the country (see also para. 32).

13. Medical examinations of passenger road service drivers in London take place on the following occasions, in addition to those required before issue and renewal of the public service vehicle driver's licence:

(a) on return to work as driver after 28 or more days' absence due to sickness; (b) on return to work as driver after three or more days' absence due to accident on or off duty; (c) on reaching the age of 65, and annually, thereafter, if still employed as a driver; (d) at any time at the request of the supervisor if there is any reason to suppose that a driver's state of health may be affecting his safety; (e) whenever a driver is stated to be suffering from epilepsy, fainting, heart disease, or vertigo whether he has been absent from duty or not; (f) of eyesight only at the ages of 50, 55, 58, 60, 62, 64 (and annually thereafter as part of the general medical examination).

The Application Forms for a Licence to Drive Public Service Vehicles (P.S.V. 15 and P.S.V. 15A)

14. Form P.S.V. 15 consists of a declaration by the applicant and includes the following question:

Do you suffer from epilepsy, or from sudden attacks of disabling giddiness or fainting, or from any disease, mental or physical, or disability likely to interfere with the efficient discharge of your duties as a driver or to cause the driving by you of a public service vehicle to be a source of danger to the public?

This question is on a form separate from the medical report form (P.S.V. 15A) and is not necessarily seen by the medical practitioner examining the applicant. The Committee observed that the question refers to the applicant's present condition and makes no reference to his past medical history. There is no reference to "blackouts," petit mal, or diabetes.

15. Form P.S.V. 15A comprises six questions to be answered by the medical practitioner, and involves a full clinical examination. There is, however, no specific requirement for a urine test or any mention of diabetes.

16. In addition to the examination of limbs, heart, lungs, vision, and hearing, the medical practitioner is required to state whether the applicant shows any evidence of addiction to excessive consumption of alcohol, tobacco, or drugs, and whether he is suffering from "any other disease or physical disability likely to interfere with the efficient discharge of his duties as a driver or to cause the driving by him of a public service vehicle to be a source of danger to the public." The medical standards required for the issue of a P.S.V. licence are not stated on the form, nor, as far as the Committee is aware, are they given in any other published document. The decision as to the applicant's fitness to drive is thus left to the discretion of the examining practitioner. It is therefore felt that in some circumstances examining practitioners may have difficulty in assessing the fitness to drive of an applicant for a P.S.V. licence. A note should be included on Form P.S.V. 15A inviting the examining practitioner to recommend a second opinion in cases where he considers this necessary, stating the reasons for making this suggestion. In addition, a question should be added to Form P.S.V. 15A inviting the examining practitioner to indicate those applicants who should be re-examined periodically.

17. If the visual acuity is below 6/12 in one eye and 6/36 in the other with glasses, or if the field of vision is "un-

satisfactory" (which presumably means restricted) a statement is required of the practitioner as to whether or not he considers the applicant's driving of a public service vehicle is likely to be a source of danger to the public.

18. In the opinion of the Committee, Forms P.S.V. 15 and 15A should be on a combined perforated form, and the latter form, after completion, should be detached and sent direct to the Licensing Authority by the examining practitioner. It is realized that this amendment of the present arrangements would presumably involve the payment of the fee for the examination and report by the licensing authority instead of by the applicant. The questions put to the applicant should include a reference to the past medical history, and also to "blackouts," petit mal, and diabetes. It is clearly necessary for the examining practitioner to know the answers given to these questions. He should also be able to assess each applicant against standards which should be indicated where possible. At present much is left to the personal opinion of practitioners who may have received no official guidance in the matter. A revision of Form P.S.V. 15A to include the Association's recommendations is attached as a Sub-appendix.

19. Similar considerations to those discussed in paragraphs 14-18 apply to the drivers of trams and trolley-buses.

20. In the London area applicants for a licence to drive a public service vehicle are required by the licensing authority—that is, the Commissioner of Police—to be medically examined at the time of first application and at the licence renewal date nearest the fiftieth birthday and every six years thereafter until 65, then annually. The London Transport Executive has additional requirements for periodic re-examinations, as stated in paras. 12 and 13. Outside the London area no re-examination is compulsory, but some individual undertakings themselves require certain re-examinations.

Passenger Transport Undertakings in General

21. From the information obtained from a number of passenger transport undertakings, it appeared that, in general, the minimum medical requirements complied with those for public service vehicle drivers as mentioned above. Some companies require a higher standard of visual acuity and some require accurate colour vision; one undertaking insists on normal hearing in the right ear.

22. In some areas there are provisions for re-examination after sickness or accidents, sometimes rather vaguely laid down. The Committee thinks it desirable that appropriately spaced re-examination should be applied by undertakings throughout the country. There should not be too much rigidity as to the period of sickness after which re-examination is necessary. To lay down a period of sickness may give a false sense of security, as in certain circumstances re-examination may be imperative after a very short illness.

23. In making the above recommendations the Committee is aware that statistics published by the Road Research Laboratory suggest that public service vehicle drivers have fewer accidents per million vehicle miles than any other drivers on the road. The Committee nevertheless feels that, in view of the special responsibility of P.S.V. drivers for large numbers of passengers, the arrangements for medical examination of these drivers should be particularly thorough.

Heavy Goods Vehicle Drivers

24. Prior to 1940 there was a regulation that an applicant for a licence to drive a heavy goods vehicle was required to undergo a medical examination. This requirement has not been reimposed. Despite wide differences between the two services, the Committee could not avoid drawing comparison between the rigid medical requirements for air pilots and the complete absence of medical standards for heavy goods vehicle drivers. Little evidence has so far been collected in regard to the relationship between accidents and medical conditions in drivers, but there must be an increased risk of accident, particularly where heavy goods vehicles are concerned, if the driver is suffering from any condition

which may cause a sudden collapse or impairment of his mental alertness. For this reason it is recommended that drivers of heavy goods vehicles should be medically examined before a licence is issued and that periodic medical examination should take place on the same basis as recommended above for P.S.V. drivers, the standard of medical examination being the same as for P.S.V. drivers.

Private Car Drivers

25. As on the P.S.V. driver's licence form, the application form for a licence to drive private cars and similar vehicles (D.L. 1) contains no reference to past medical history, to "blackouts," petit mal, or diabetes.

26. Owing to the fact that about five million licences are issued or renewed every year it is impracticable for drivers of private cars to be given periodic eyesight tests or medical examinations.

27. There is probably a number of drivers who, by reason of medical defect, constitute a potential danger to public safety on the roads. Defects of eyesight probably account for a considerable proportion of these. The dangers may not be realized by those with limitations or defects, particularly where the defect is insidiously progressive. Increased publicity and encouragement to seek medical opinion when in doubt should do much to bring the dangers home to the consciences of drivers. This should be supported by the laying down of certain minimum standards, particularly as to vision, below which a person should not be allowed to drive. The application of such standards by medical practitioners called on to advise would have the effect of removing a number of potentially dangerous drivers from the road.

28. The Committee suggests that in a case where a driving licence has been suspended, before its restoration is approved the Court should have power to require a medical certificate to the effect that the applicant is medically fit to drive, and such certificates should normally be required as a routine.

Visual Standards

Visual Field

29. As described in paragraph 15, Form P.S.V. 15A requires a statement that there is a satisfactory visual field. This is also a requirement of certain transport undertakings, but it is far from being universal. The Committee believes that in the case of drivers of all types of vehicle there should be no serious diminution of the normal visual field made apparent by a hand confrontation test. If there is such a diminution reference should be made to an ophthalmologist for an opinion as to fitness to drive. In certain ophthalmic conditions the individual can read a number plate at 25 yards, but the visual field is so restricted as to render the driving of a vehicle by that individual a potential source of danger.

Visual Acuity

30. The Committee believes that the wearing of spectacles in itself does not constitute any sort of danger, except in cases of extreme myopia where the thickness of the lenses may slightly interfere with the peripheral vision, and therefore any consideration of visual acuity should allow for correction by spectacles. In cases where the P.S.V. visual standard of 6/12, 6/36 is not reached without spectacles the Committee notes a requirement by one or two undertakings that driving is only permitted if the driver's record is endorsed "spectacles must always be worn when driving." In long-distance driving particularly, where the uncorrected vision is less than 6/12, 6/36, the carrying of a spare pair of spectacles should be insisted upon.

31. The P.S.V. standards appear to require a visual acuity corrected to at least 6/12 in one eye and 6/36 in the other. It is noted that some undertakings, particularly those operating city passenger services, insist on a considerably higher standard on recruitment. Since rapid deterioration may take place a recruitment standard well above the minimum requirement is highly desirable in order to allow for deterioration.

32. The Committee believes that a test of the vision of drivers of public transport every five years would represent a considerable step in the direction of safety. There should be a minimum standard of 6/9 corrected in one eye and 6/24 in the other for drivers of public transport and heavy vehicles.

33. The reading of a motor-car number plate at 25 yards is equivalent to a visual acuity of 6/12 using both eyes together. This appears to be an adequate standard for drivers of private cars, provided that the visual fields are satisfactory, as discussed in paragraph 29.

34. The driver with monocular vision is clearly at a disadvantage even though the loss of visual field is less than might be expected. The Committee believes that drivers whose vision is restricted in this way should not be recruited for driving public service or heavy goods vehicles. On the other hand, an experienced driver whose sight fails gradually in one eye should not necessarily be prohibited from driving even when he has become virtually one-eyed.

Colour Vision

35. It is interesting to note that normal colour vision is not required of the majority of drivers of public vehicles. Colour vision is not mentioned on Form P.S.V. 15A. It is insisted upon with drivers operating at certain airports. The Committee is unaware of any accidents that have occurred as a result of inability to distinguish traffic lights. The reason for this may well be that the red light is always placed at the top, and even the colour-defective can usually detect whether it is this or the bottom light that is shining. If, at any time, proof were forthcoming that accidents were caused by inability to distinguish between the red and the green lights the possibility of a different shape for the two would need to be considered. In view of the fact that about 4% of men are red-green colour defective, the Committee recommends that a British Standard Specification be prepared for traffic-light colours and that, in this connexion, consideration should be given to the suggestion that the green light should contain a strong blue component.

36. Where an accident has occurred which raises some doubt as to the visual acuity of the holder of a licence to drive a private vehicle it is desirable that he should undergo a general visual test, including a test of colour vision.

Hearing Standards

37. Form P.S.V. 15A inquires whether there is "any serious defect of hearing." Certain undertakings require "near normal" or good hearing in one ear, the right ear being specified by one undertaking.

38. The Committee is advised that hearing may sometimes be more acute in the roar of traffic than in the hush of the audiometer room. It is doubtful whether driving safety is materially affected by the absence of such higher degrees of auditory perception as are required to hear a whispered voice in a still room at a considerable distance.

39. The Committee agrees with the view expressed to it by a consultant in ear diseases that, while good hearing is an undoubted asset to a driver, it is by no means essential. Driving should be visual rather than auditory. In countries in which driving is on the left side of the road hearing in the right ear is sometimes regarded as being more important than in the left. On the other hand, the importance of this must not be exaggerated, for, whichever side the defect, unilateral deafness results in some difficulty in locating a source of sound.

40. It is unlikely that the development of impairment of hearing in a competent and experienced driver will constitute a danger or even detract from his driving ability. The Committee is in no doubt that in the interests of safety an applicant for a P.S.V. licence whose hearing is defective should be subjected to a driving test before the licence is granted.

41. Deafness must be regarded as a handicap, and consequently to entail a slightly added risk to the ordinary

hazards of the road. The Committee does not consider that deaf persons should be encouraged to drive, but believes that some advantage would result were those deaf persons who elect to take up driving taught and tested by deaf drivers of experience.

General Physique

42. Three of the undertakings consulted lay down height standards for drivers. These are presumably to ensure that a driver is not so tall or so short that he cannot achieve a comfortable position which gives him adequate and unhampered control of the vehicle.

Medical Conditions Barring Acceptance or Given Special Consideration

43. The Form P.S.V. 15A seems to demand a general cover by asking, in the final question to the examining practitioner, whether the applicant suffers from any disease or disability likely to interfere with the efficient discharge of his duties or to cause danger to the public. The wording is similar to that in the regulations made under the Road Traffic Acts and is concerned only with the efficiency of a driver in relation to his driving duties and not with his efficiency as an individual employee.

44. The requirements of many authorities mention certain conditions as barring acceptance as drivers. The Committee has sought to eliminate from its considerations those conditions which are an obvious bar because they will result in recurrent sickness or inefficiency in the performance of duties. The conditions listed below are those which appear to the Committee to carry with them a possibility of danger.

Cardiac Disease, Including Coronary Thrombosis (Previous Attack) and Angina Pectoris

45. The Committee believes that in the majority of cases it is possible for a driver who has recovered from an attack of coronary thrombosis to have safe charge of a vehicle. Available evidence suggests that the victim of a coronary occlusion usually but not always experiences sufficient warning to apply the brakes and disengage the gear of the vehicle before the final collapse overwhelms him. Nevertheless it would appear that a person who has been the subject of a confirmed coronary thrombosis is more liable to a further attack, and, in view of this, there is additional danger if he drives. It is therefore recommended that such an individual should be debarred from driving a public service vehicle.

46. Aortic regurgitation renders the patient liable to attacks of fainting; sufferers should not drive passenger or goods vehicles and practitioners should advise drivers of private cars in accordance with the severity of the condition. Cases of fainting attacks must be considered on their individual merits, but the examining practitioner should always advise his patient on the side of safety.

Hypertension

47. With a severe degree of hypertension the possibility of a cerebral accident is always present and there is some risk of sudden collapse. The Committee believes that careful and repeated appraisal of the patient's condition should therefore be made in drivers of passenger and heavy goods vehicles in cases where the blood pressure is raised above the normal limits.

Epilepsy

48. The Committee is in no doubt that anyone known to be the subject of epileptic fits, whether grand mal or petit mal, should not drive any type of vehicle. There seems little doubt that a number of drivers suffer from minor forms of epilepsy and consequently should not be driving, and in some cases neither they nor their relations or doctors are aware that such a condition exists. On the other hand, there is no doubt that there are some epileptics driving today who are aware that they have epilepsy. They rely on

the fact that an aura may warn them in time to prevent an accident. The Committee again stressed the desirability of clarifying the question relating to fits, giddiness, etc., on Forms P.S.V. 15, 15B, and D.L. 1, so that much fuller information may be obtained as to past medical history and the purport of the question may be made crystal clear to the applicant answering it. The Committee considered the desirability of the provision of special facilities for electroencephalographic examination in doubtful cases after accident in the presence of a sufficiently strong suspicion of epilepsy, but it must be stressed that only positive findings are of value in such examinations. A negative finding does not eliminate epilepsy, and the most important factor in accurate diagnosis of this condition is the obtaining of a neurologist's opinion, together with an accurate history not only from the subject himself, but also from relatives, friends, and eye-witnesses of attacks.

Vertigo

49. All forms of giddiness require careful consideration, but, in general, the existence of recurring attacks of sudden vertigo, such as Ménière's disease, should debar from driving unless of very slight degree.

Diabetes

50. The Committee has considered carefully the question of the diabetic driver, and it is quite clear that wide variations of opinion exist. There are those who say that no one taking insulin should be permitted to drive either a public or a private vehicle because of the danger of hypoglycaemic coma. This may be induced by an overdose of insulin or by added exertion due, for instance, to the changing of a wheel. On the other hand, there are those who consider that a co-operative well-controlled diabetic who is fully aware of the consequences of over- or under-dosage of insulin can be regarded as safe to drive. Great risks may be run by long-distance goods drivers due to irregularity in meals or incorrect injections of insulin. Whilst some are of the opinion that although the fully stabilized diabetic taking average doses of insulin can be safely allowed to drive, those taking large doses—for example, 50 units a day—or who are not well controlled should be automatically barred. It seems clear to the Committee that anyone suffering from diabetes who wishes to drive should be given careful individual consideration and kept under periodic review. In general, the Committee agrees with the opinion expressed by the Diabetic Association to the effect that great care is necessary in all instances where persons are suffering from diabetes, especially when taking insulin. Every effort must be made to ensure that those persons understand the possible causes of hypoglycaemic attacks and how they can be prevented by the regular intake of carbohydrates in their usual meals. The need for punctuality in meals is stressed and also the need to carry extra carbohydrates to guard against the possibility of unusual exertion or the unavoidable postponement of a meal. The Committee stresses that a very considerable proportion of the burden of responsibility in this connexion rests with the patient himself; in other words, the most likely interference with safety might come from failure of the patient to observe the rules. The Committee also agrees that a doctor who is not satisfied that a particular patient is able to recognize the symptoms of hypoglycaemia should advise that patient strongly against applying for a driving licence.

Other Conditions

51. In addition to the diseases which are mentioned above the Committee has considered certain other conditions which might interfere with safety in driving. The Committee reviewed such conditions as clouded judgment and general ineptitude or inefficiency, which can be induced, for example, by the taking of drugs. The Committee believes that such factors should be taken into account in any medical standard. It noted with interest that one undertaking debar from

driving any person who takes phenobarbitone or anti-histaminic drugs. In the case of the former there is an obvious double danger in that the individual might be an epileptic taking a maintenance dose of phenobarbitone. Another point on similar lines was made by the mention of exhaustion. The Committee was informed that a driver of a Continental holiday bus might be required to drive 300 miles in a day, as the national restrictions on the permissible number of hours' driving do not apply abroad. The Committee felt that the attention of the Ministry of Transport should be drawn to the possibility of dangerous fatigue occurring in drivers under such conditions.

Research

52. The Committee noted that there was almost no evidence available as to the relationship between medical conditions and accidents. In the standard accident coding form used by the police and prepared by the Ministry of Transport there are spaces for recording illness in the driver(s) concerned, but it is doubtful whether this would give any clear evidence. The Committee considered that research should be intensified into the relationship between accidents on the roads and the physical and mental fitness of drivers, possibly by the detailed investigation of a relatively small number of drivers concerned in accidents, and that the views of the Medical Research Council should be sought on this matter.

Summary of Recommendations

Public Service Vehicle Drivers

1. It is recommended that the attention of all medical practitioners should be drawn to the contents of this Memorandum. (Para. 11.)

2. It is recommended to the Ministry of Transport that:

(a) Question 2 on Form P.S.V. 15 should include a reference to "blackouts," petit mal, and diabetes, and be reworded in order to cover past as well as present disabilities. (Para. 14.)

(b) Question 3 on Form P.S.V. 15B should be similarly revised. (Para. 14.)

(c) A note be added to Form P.S.V. 15A inviting the examining practitioner to recommend a second opinion in cases where he considers this is necessary and stating the reasons for making this suggestion. (Para. 16.)

(d) A question be added to Form P.S.V. 15A inviting the examining practitioner to indicate those cases in which he considers re-examination should take place at periodic intervals. (Para. 16.)

(e) Forms P.S.V. 15 and P.S.V. 15A, the latter amended in the form set out in the Sub-appendix, should be on a combined perforated form, in order to ensure that the applicant's statement is seen by the examining practitioner. (Para. 18.)

(f) Form P.S.V. 15A when completed by the examining practitioner should be detached and sent by him direct to the Licensing Authority, by whom the fee for the examination and report should be paid. (Para. 18.)

3. It is recommended that the following standards should apply in regard to applicants for Public Service Vehicle Driving Licences:

(a) Where a hand-confrontation test suggests that there is any serious diminution in the normal visual field, applicants should be referred to an ophthalmologist. (Para. 29.)

(b) The minimum visual acuity, corrected with spectacles if necessary, should be 6/9 in one eye and 6/24 in the other. Though new applicants with only one eye should not be accepted, the position of experienced drivers who gradually lose the sight of one eye should be dealt with individually, on merit. (Paras. 32, 34.)

(c) Applicants for licence renewal who suffer from defective hearing should be subjected to a careful driving test. (Paras. 37-41.)

(d) Applicants who have been the subject of a confirmed coronary thrombosis, or who suffer from aortic regurgitation or recurring sudden vertigo, should not be accepted. (Paras. 45, 46.)

(e) Applicants with blood pressure above the normal limits should be given careful and repeated assessment. (Para. 47.)

4. It is recommended to the Ministry of Transport that medical re-examinations for Public Service Vehicle drivers should take place throughout the country on the lines

applied by the Licensing Authority in London. In addition, examinations of the eyesight of P.S.V. drivers every five years would be a further step in the direction of safety. (Paras. 20, 22, and 32.)

5. It is recommended that transport undertakings outside the London Area which do not at present have such standards for periodic medical and eyesight examinations might usefully adopt those of the London Transport Executive. (Paras. 12, 13.)

Heavy Goods Vehicle Drivers

6. It is recommended to the Ministry of Transport that applicants for a heavy goods vehicle driving licence should be medically examined before the initial licence is granted, and be re-examined periodically; both examinations being on the same basis as recommended for Public Service Vehicle drivers. (Para. 24.)

Private Car Drivers

7. It is recommended to the Ministry of Transport:

(a) That Question 15 on Form D.L. 1 be amended to include a specific reference to "blackouts," petit mal, and diabetes, and to cover past as well as present disabilities. (Para. 25.)

(b) That increased publicity should be given to the need for private car drivers to seek a medical opinion when in any doubt about their fitness to drive. (Para. 27.)

(c) That sufferers from aortic regurgitation should be advised by their medical practitioner not to drive when the severity of the condition constitutes a possible danger to other road users. (Para. 46.)

General

8. It is recommended that where a driving licence has been suspended, the Courts be given power to require a medical certificate of fitness to drive before the licence is restored, and that such certificates be required as a routine. (Para. 28.)

9. It is recommended that where the uncorrected vision of a P.S.V. driver is less than 6/12, 6/36, he should carry a spare pair of spectacles, particularly on long-distance driving. (Para. 30.)

10. It is recommended to the British Standards Institution that a British Standard for traffic-light colours be prepared, and consideration be given to the suggestion that the green light should contain a strong blue component. (Para. 35.)

11. It is recommended to the Ministry of Transport that where a deaf person elects to take up driving, both training and testing should be given by deaf drivers of experience. (Paras. 37-41.)

12. It is recommended to the Ministry of Transport that no person who is subject to epileptic fits, whether grand mal or petit mal, or recurring sudden vertigo, should be permitted to drive any type of vehicle. (Paras. 48, 49.)

13. It is recommended that facilities should be made available for the obtaining of a neurologist's opinion after accidents where a sufficiently strong suspicion of epilepsy exists. (Para. 48.)

14. Persons suffering from diabetes and receiving insulin injections should not be accepted for driving passenger or heavy goods vehicles in the first instance; when trained and experienced drivers develop diabetes which is treated with insulin, each individual case should be treated on its merits. (Para. 50.)

15. It is recommended that the Diabetic Association and the Ministry of Transport be informed of the Committee's view that diabetics wishing to drive require careful individual consideration and should be kept under periodic medical review. (Para. 50.)

16. It is recommended to the Ministry of Transport that attention be directed to the possibilities of danger arising due to fatigue occurring in Continental holiday bus drivers who may drive for abnormally long hours. (Para. 51.)

17. It is recommended that the views of the Medical Research Council be sought on the advisability of research being intensified into the personal factors responsible for accidents on the road. (Para. 52.)

SUB-APPENDIX

Form P.S.V. 15A.

NOTE.—This form, when completed, must be detached and forwarded by the medical practitioner to the Licensing Authority.

ROAD TRAFFIC ACTS, 1930 to 1947

I CERTIFY that I have to-day submitted myself for medical examination and agree that the report shall be submitted to the Licensing Authority.

Signature of applicant

(To be signed in the presence of the Medical Practitioner signing the report.)

Application by
residing at
for a LICENCE TO DRIVE A PUBLIC SERVICE VEHICLE.

DESCRIPTION OF APPLICANT

These particulars must be filled in before the Certificates below are completed.

Age Height
Colour of eyes Colour of hair
Complexion

CERTIFICATE OF PRESENT OR LAST EMPLOYER

NOTE.—If this certificate is not completed, the applicant must give the reason. If inability to complete this certificate is due to service in H.M. Forces you should forward your documents of release or discharge with your application; they will be returned as soon as possible.

I, the undersigned, hereby certify that the above-named applicant
* (was employed by me from to) as a
{ has been employed by me since }

*Strike out whichever is not applicable.

NOTE.—If any person for the purpose of obtaining the grant of a licence to himself or any other person knowingly makes any false statement, he becomes liable to a fine not exceeding £50 or to imprisonment for a term not exceeding six months, or to both such imprisonment and fine.

CERTIFICATE OF CHARACTER

NOTE.—If for any reason the applicant is unable to have this certificate completed, he should state the reason and forward such evidence of good character as he can.

To be completed by a householder or ratepayer, not a near relative, and by a Minister of Religion, Schoolmaster, Lawyer, Bank Officer, Senior Public Official, or other responsible person, who has known the applicant personally for the past three years.

I, the undersigned, hereby certify (see note below) that the above-named applicant has been known to me personally during the period stated opposite my name and that he is sober, honest, of good character, cleanly in his person and civil in manner and behaviour. In my opinion, he is a suitable person to be licensed to drive a public service vehicle.

I also certify that the signature of the applicant appearing opposite my name was written by him in my presence.

Signature of Applicant (to be Signed in Presence of Recommender)	Signature and Qualification of Person Recommending and Date	Address of Person Recommending (Please write clearly)	Period during which Such Person has Known the Applicant
			From To
			From To

NOTE.—If any person for the purpose of obtaining the grant of a licence to himself or any other person knowingly makes any false statement, he becomes liable to a fine not exceeding £50 or to imprisonment for a term not exceeding six months, or to both such imprisonment and fine.

MEDICAL REPORT (back of form)

(To be completed by a registered medical practitioner)

NOTE.—This report is not one which must be issued free of charge as part of the National Health Service. The Licensing Authority will pay the fee direct to the examining practitioner.

Question	Answer
1. Is the applicant, to the best of your judgment, subject to epilepsy, vertigo, sudden attacks of disabling giddiness or fainting, or any mental ailment likely to interfere with the efficient discharge of his duties as a driver of a public service vehicle?	1.
2. Has the applicant any deformity, loss of members or physical disability likely to interfere with the efficient discharge of his duties as a driver of a public service vehicle?	2.
(Special attention should be paid to the condition of the arms, hands, and joints).	
3. Does the applicant suffer from, or has he any history of, organic heart or lung disease or diabetes, likely to interfere with the efficient discharge of his duties as a driver of a public service vehicle?	3.
If so give details	
4. (a) Acuity of vision (with glasses if worn) by Snellens test type?	4. (a) Right eye Left eye
(b) Were the readings taken with the applicant's own glasses?	(b)
(c) Is the applicant's field of vision by hand test satisfactory?	(c)
(d) Do you consider that the applicant's vision is likely to cause the driving by him of a public service vehicle to be a source of danger to the public?	(d)
(This question need only be answered if the acuity with glasses, if worn, is below 6/9 with one eye and 6/24 with the other eye, or if the field of vision is unsatisfactory.)	
(e) Is there any serious defect of hearing?	(e)
5. Does the applicant show any evidence of addiction to excessive consumption of alcohol, tobacco, or drugs?	5.
6. Does the applicant appear to be suffering from any other disease or physical disability likely to interfere with the efficient discharge of his duties as a driver or to cause the driving by him of a public service vehicle to be a source of danger to the public?	6.
(If considered necessary the examining practitioner may request a second medical opinion; the reasons for such a request should be stated here.)	
7. Does the applicant suffer from any condition which makes it advisable for him to be re-examined periodically? If so, please give particulars.	7.

I certify that I have this day examined the applicant named overleaf, who has signed this form in my presence and who in my opinion is to drive a public service vehicle.

NOTE.—If any person for the purpose of obtaining the grant of a licence to himself or any other person knowingly makes any false statement, he becomes liable to a fine not exceeding £50 or to imprisonment for a term not exceeding six months, or to both such imprisonment and fine.

Signature, etc., of registered medical practitioner
Address
Date

APPENDIX V

NATIONAL INSURANCE (INDUSTRIAL INJURIES)
ACT: MEMORANDUM OF EVIDENCE TO
DEPARTMENTAL COMMITTEE

The British Medical Association is a voluntary Association to which the majority of members of the medical profession in the United Kingdom belong, including many industrial medical officers. The Association welcomes this opportunity to submit evidence to the Departmental Committee which is reviewing the present provisions of the National Insurance (Industrial Injuries) Act. Amongst its Standing Committees, the Association has an Occupational Health Committee, which is concerned with matters affecting the health and welfare of persons at work and the practice of medicine in industry and allied occupations. This Committee has appointed a special Subcommittee for the purpose of preparing this Memorandum of Evidence. Particular consideration has been given to the questions on which it is understood the Beney Committee is seeking information, namely:

1. What is likely to happen if the Industrial Injuries Act were thrown open to cover all diseases of occupational origin?

(a) Is it probable that there would be a very large increase in the number of claims under the Industrial Injuries Act?

The Association believes that the throwing open of the clauses of the Act, or any widening of its scope, would result in a very large increase in the number of claims made under the Act. There are many medical conditions which in a particular case may have no known cause or origin. The same medical conditions may arise in circumstances which offer strong presumptive evidence that the circumstances are the cause of or the exciting factor in the onset of the disease. These circumstances may occur in the occupational environment, in the home, or in other environments not associated with the individual's occupation. A simple example is the case of fibrositis, which may arise seemingly spontaneously with no apparent cause or exciting factor, or may be due to a draught or sudden chilling in either the factory or the home. In all three cases the same medical condition results. It is clear that any widening of the scope of the Act would, in fact, encourage a very large proportion of sufferers from complaints in this category to claim on the offchance of attributability being conceded. The very real clinical difficulties of declaring a condition non-attributable would be a source of embarrassment and would probably mean the acceptance of a large number of claims.

(b) In what kinds of case are there prospects that a claimant whose disease and occupation are not such as to satisfy the existing conditions for prescription laid down in section 55(2) of the Act would be able to show that in his particular instance the disease was attributable to his employment?

The Association believes there will always be types of case in which, though the disease is not prescribed, the individual could show that in his particular instance the disease is attributable to his employment. An exhaustive list would require an encyclopaedic knowledge of industry, and it should suffice to mention some examples.

Raynaud's disease can be caused by constant vibration from mechanical drills. Continued exposure to excessive noise may cause deafness, particular instances being exposure to engine noise in aero-engine test-beds and the condition commonly known as "boilermakers' disease."

As a further example the attention of the Association was drawn to the occurrence of keratitis in workers in artificial-silk factories. It appears that preventive measures taken when this condition was first recorded have virtually eliminated the incidence of keratitis, but it might well be that occasionally an individual would be affected.

The Association sought to obtain detailed information on the types of illness on which claims were put forward and subsequently rejected. Detailed information and figures were obtained on the number of claims granted and the

number of successful appeals against rejection. The Association was, however, informed that a detailed analysis of rejected claims would be of no value, because whether a man made a claim or not was often fortuitous. A man might put in a claim on his own initiative without first seeking any advice, and the claim would be rejected. Had he happened to mention his intention to someone knowledgeable, his union representative or an official at the Labour Exchange, for example, he might well have been told that his illness was not one in which there was any prospect of a claim succeeding, and he would presumably accept the advice and not make a claim.

While accepting that from a purely statistical point of view the validity of such a detailed analysis was open to question the Association believes strongly that such an analysis would be of value in another way.

The number of rejected claims is considerable. An analysis of these, over a number of years might indicate trends which could well point to a new disease that should be prescribed, or accepted in certain cases. For example, an increase in the number of claims put forward for a certain condition in a certain industry should point to a careful examination of the possible hazards associated with changed conditions of work and new processes in that industry.

The Association, therefore, urges that a full detailed analysis of all claims be made, these analyses to include the correlation between each category of claim and the occupational group at risk, and the results to be made publicly available. In making this recommendation the Association believes that the publication of such figures and analyses could well constitute a valuable factor in research in industrial medicine.

The Association would encourage the establishment of a central bureau to which cases of occupational disease could be notified. At present the number of cases of industrial disease occurring in an area remains a local matter, whereas a central bureau could perform a valuable service in advising industry and in collating information from various localities and providing material for research into occupational health problems (see Sub-Appendix).

The Association believes that there may be particular dangers of industrial diseases arising in workers engaged on new processes before any hazards of the process are known. It would be impracticable for all new processes, before being introduced, to be subjected to research and test for industrial hazards. Such a requirement would delay the introduction of new and important processes and would constitute a serious interference with industry. The Association, however, does not feel satisfied that managers, engineers, and others associated with the introduction of new processes are fully aware that dangers may follow the introduction of these processes. Members of the Association engaged in industrial medicine have experienced difficulties, from time to time, on discovering that a new process has been introduced into part of a factory without it having occurred to those responsible that the process might constitute an occupational hazard. Such discovery may well be only the result of inquiry by the medical officer or by his finding two or three workers suffering from some complaint a short time after a new process has been introduced. The Association, therefore, strongly urges that steps be taken to ensure that management, industrial engineers, industrial chemists, and others concerned should be constantly aware of the need to consider the possible hazards of a new process and seek advice. The medical officer should be informed of the proposed introduction of any new process in the factory. By this means the medical officer will be immediately on the lookout for any unusual conditions arising—and may even be able to point out an obvious hazard and its prevention before any worker is affected.

Firms should be left in no doubt that they are under a constant moral obligation to watch for dangers and to seek the help of the medical officer and of any available service of expert knowledge, such as the suggested occupa-

tional health laboratory service, in anticipating them. Full implementation of section 73 of the Industrial Injuries Act is urged.

(c) *Can any guidance be given as to the approximate number of cases where claims for benefit in respect of diseases shown to be due to employment have been defeated by the requirements of section 55 of the Act and the regulations made under it?*

The Association is unable to give any guidance on this question. Such information should be in the hands of the Ministry of Pensions and National Insurance.

(d) *What are the difficulties of proof of the medical questions involved and what would be the cost of trying to obtain such proof?*

The preparation of a report on the difficulties of proof would, in the opinion of the Association, be a lengthy task which could well be carried out by the central research organization recommended by the Association.

(e) *What proportion of the additional claims which would be made would be likely to be successful?*

The Association considers that it is quite impossible to attempt to answer this question.

2. Is there any middle way, wider than the present system but short of giving general cover for all diseases arising out of work in insurable employment, which would be practicable without producing anomalies?

In answering this question, the Association has been greatly handicapped by the lack of data, but, nevertheless, it feels that if section 55, particularly the following subsections, of the National Insurance (Industrial Injuries) Act, 1946, was interpreted liberally, anomalies would not arise:

"55. (1) Subject to the provisions of this part of this Act, a person who is under this Act insured against personal injury caused by accident arising out of and in the course of his employment shall be insured also against any prescribed disease and against any prescribed personal injury not so caused, being a disease or injury due to the nature of that employment and developed on or after the appointed day.

(2) A disease or injury may be prescribed for the purposes of this part of this Act in relation to any insured persons, if the Minister is satisfied that—

(a) it ought to be treated, having regard to its causes and incidence and any other relevant considerations, as a risk of their occupations and not as a risk common to all persons; and

(b) it is such that, in the absence of special circumstances, the attribution of particular cases to the nature of the employment can be established or presumed with reasonable certainty.

3. To what extent is it desirable to use the resources of the Industrial Injuries Fund for groups of cases where the administrative cost of settling claims is high in relation to the amount of benefit eventually awarded?

Whilst regarding this as an administrative rather than a medical question, the Association feels that where prescription of a particular disease is justified, the necessary action to secure its inclusion in the Schedule should be taken, regardless of increased expenditure from the Industrial Injuries Fund.

4. Are the present conditions for the prescription of diseases, as laid down in Section 55(2) of the Act and interpreted by the Dale Committee, satisfactory? If not, how should they be amended?

As already stated in answer to question 2 above, the Association feels that, with a liberal interpretation of section 55 of the Act, the present conditions would be satisfactory. The Association wishes to point out, however, that there have in the past been difficulties in obtaining prescription of a disease where the evidence of its attributability to employment was strong. Before tuberculosis became a prescribed disease for certain groups of doctors and nurses it was necessary to make a claim at Common Law against the employer in order to secure compensation for any injury alleged to have arisen as a result of the employment. There is doubt as to whether nurses working in fever hospitals would succeed in claims for benefit in respect of diseases contracted in the course of their work, by virtue of

the special risks they run. Similar doubts apply to nurses who contract encephalitis or poliomyelitis as a result of their ordinary duties. These conditions should be prescribed in relation to occupation.

5. Has the machinery for making additions to the list of prescribed diseases worked adequately? If not, in what respects could it be improved?

The Association appreciates that the Minister must be guided by the advice of his Industrial Injuries Advisory Council. This Council has to consider in great detail any diseases proposed for prescription, and the examination of any one disease takes a long time.

It appears to the Association that this question can be answered more fully and with wider knowledge by the Trade Unions, which are more fully informed of cases of hardship resulting from a disease which is not prescribed.

Students

The Association wishes to draw the attention of the Departmental Committee to a special class of workers exposed to certain risks and yet not covered by either the National Insurance Act or the National Insurance (Industrial Injuries) Act. The class referred to are students, not only of medicine, but also of ancillary professions, masseurs, chiropodists, and others having direct contact with patients during the course of their training. The risks to which these students are exposed are at least comparable to those run by nurses, and the Association recommends that this group should be entitled to pay contributions to qualify them for benefit under the Industrial Injuries Act.

SUB-APPENDIX

In the United States there is a central Federal Laboratory Service of the U.S. Public Health Service staffed by doctors, engineers, and chemists, and having a library, statistical staff, and very comprehensively equipped laboratories. The Bureau is able to give advice on the potential hazards of any new process about to be introduced, so far as these can be estimated from previous experience. In the case of new processes they can organize experiments and advise on safety measures. These services are fully and generally freely available to industry, and have been instrumental not only in preserving and improving health but in avoiding the loss of large sums of money through faulty installation.

The pattern of this organization has been a model for every State of the Union and many other countries. These State Bureaux are often closely associated with a University. Many of the larger firms and industries have their own laboratories on a smaller scale but still with an experienced doctor, engineer, and chemist.

There is no doubt that the benefits to industrial health have been immense. Not only may employers ask for advice, but if employees think that their health is being adversely affected they are free to report to the State Service for advice. In a number of instances the employer when contacted (without revealing the source of the information) has taken the necessary steps to safeguard health and remove hazards.

Some of the larger insurance companies have their own very comprehensive occupational health laboratory services and reduce the premiums of firms which improve their sickness and accident experience. They make good conditions pay.

In this country there is as yet no comparable system. The Ministry of Labour has a laboratory staff and information service, but the scale of equipment and personnel precludes effective detailed work on a national scale. The occupational health laboratory at the London School of Hygiene and Tropical Medicine, linked with the Slough Industrial Health Service, is a small beginning from which a valuable organization might develop.

It is suggested that a system in this country might be developed parallel to the Public Health Laboratory Service, with regional occupational health teams and fully equipped laboratories linked to a teaching hospital and university

in each region under the National Health Service. This service would be intimately connected with the Medical Inspectorate of Factories, but the primary association with a teaching hospital and university would provide stimulus for research and training of all members of the health team.

Some of the State Bureaux are under the State Department of Labour and have legal powers and can apply sanctions. In most States they are under the State Department of Health and only advisory, leaving sanctions to the Department of Labour. There is much to be said for both arrangements, though perhaps the latter is less likely to make employers hesitant in seeking advice, and readiness to seek advice is of fundamental importance.

APPENDIX VI

THE GENERAL PRACTITIONER AND THE HEALTH VISITOR

The need for the closest co-operation between general practitioners and health visitors is fully accepted by the Association, and, in conjunction with the Society of Medical Officers of Health, detailed consideration has been given to the most effective means of securing this co-operation.

It is appreciated that in many areas reasonably satisfactory arrangements already exist with resultant benefit to all concerned, but it is apparent that in other areas the necessary degree of co-operation has yet to be attained.

It is the view of both bodies that harmonious relations can be established if good will and interest are shown by all concerned and if the following principles are accepted:

1. Co-operation between general practitioners and the medical officer of health and his staff regarding the health, care, treatment, and aftercare of all patients is essential.

2. The local health authority has certain statutory obligations regarding the health of the community, and the health visitor who is employed by the local health authority is under the direction of the medical officer of health. This, however, in no way prevents the health visitor from working closely with the general practitioner and under his guidance in the care of individual patients.

3. Direct consultations should take place between general practitioners and health visitors with a view to the exchange of information regarding individual patients.

4. The general practitioner is primarily responsible for the health of the individual and the family, while the health and welfare of the family in relation to the community is a responsibility of the medical officer of health and his staff. The close association of all concerned, as members of one team, is of vital importance if these responsibilities are to be adequately fulfilled.

The Association and the Society realize that to a great extent the question of co-operation is a local problem and the means by which such co-operation can be obtained are for local consideration and arrangement. It is strongly recommended that urgent consideration be given to this matter in all areas. It is only in this way that the general practitioners, medical officers of health, and health visitors can work in partnership towards that co-operation which will ensure efficient and all-embracing care for the patient, whatever his age or state of health.

Appendix

The following suggestions of some of the ways by which greater co-operation between general practitioners and health visitors could be better understood and improved may be helpful:

1. In the first place discussions to this end should take place between the medical officer of health of the local health authority, together with senior members of his staff, and representatives of the B.M.A. Branch or Division and the local medical committee.

This is essential, for the detailed arrangements will vary, not only between local health authorities but in different parts (i.e., rural and urban) of a local health authority.

Agreement on the principle of co-operation at this level should ensure full implementation elsewhere.

2. Close personal contact and exchange of information between individual general practitioners and health visitors is essential.

In this way both parties will understand and appreciate the other's duties and responsibilities.

In rural areas where the one individual is home nurse, midwife, and health visitor, there is usually that understanding between her and her G.P. colleagues. In urban areas, particularly in the large towns and cities, and where in most cases the health visitor does not act as home nurse or midwife, general practitioners do not know personally the health visitors working in the area.

3. Complaints have been made by general practitioners that at times contradictory advice is given to patients by health visitors. It is clear that this must be avoided and here close consultation and co-operation between general practitioners and health visitors is essential.

4. In addition to their statutory duties, health visitors are available, at the discretion of the medical officer of health, for visiting patients when requested by general practitioners. Full consultation between the parties will result in efficient and economic use of health visitors.

5. Many general practitioners are unaware of the many facilities which can be made available for their patients through the local authority health and welfare services. Some medical officers of health regularly circulate all general practitioners in their area with detailed information, and it is strongly recommended that this should be done in all areas. It can be of great value to the general practitioner to know what assistance can be provided by his local authority. The full use of health visitors would tend to obviate repeated visits on the part of the general practitioner and would facilitate his work by securing rapid assistance through the local authority.

In all these ways the health visitor can supplement the service of the general practitioner, and by working in partnership they can weld together both the clinical and the preventive aspects of the service, within the existing arrangements under Parts III and IV of the National Health Service Act.

6. In certain areas a health visitor has been allocated by the medical officer of health to work with a group of general practitioners. This has proved to be a satisfactory arrangement, but its practicability depends on local circumstances. It is recommended that this arrangement could well be extended wherever possible.

Scottish News

INCREASED COST OF HOSPITAL PATIENTS IN SCOTLAND

The weekly average cost of maintaining a patient in hospital in Scotland, excluding specialists' salaries and overhead charges for unoccupied beds, was £7 18s. 9d. for the year ended March 31, 1953. An analysis of the running costs of Scottish hospitals, recently published by the Department of Health, shows that £4 1s. of this sum was spent on staff salaries, food, laundry, etc., and that the patient's food, drugs, laundry, etc., cost £1 15s. 9d. The remaining £2 2s. was spent on maintenance and administration. During this period the average number of in-patients increased by nearly 1,500 (2.8%) over the previous year and the average cost of treatment increased by 54%.

More Beds, More Cost

The cost of maintaining and treating a patient in 1952-3 was highest in the maternity hospitals, with a national average of £15 7s. 3d. a week—an increase of about £1 over the previous year. The lowest costs were in the mental and mental deficiency hospitals (£4 14s. 2d. and £4 7s. 7d. a week respectively, compared with £4 8s. 1d. and £3 19s. 4d. during 1951-2). At the small general hospitals with under 50 beds the average cost per patient per week was £9 10s. 2d., while in the general hospitals with over 300 beds the cost was £11 10s. 3d. The same costs in 1951-2 were £8 16s. 9d. and £11 4s.

The average cost of treating out-patients at hospitals was 17s. 8d. per case, or 4s. 11d. per attendance. The total number of attendances was 4,989,373.

¹ *Analysis of Running Costs of Hospitals in Scotland, 1954.* H.M.S.O., price 8s. 6d.

PARTNERSHIP LISTS AND NATIONAL SERVICE

If a member of a partnership in general practice is called up for National Service, the calculation of the maximum lists for the partnership should not be affected, provided that adequate arrangements have been made for a deputy or assistant to care for the patients of the practitioner who is away. In giving this information the Ministry of Health circular to executive councils (E.C.L. 11/54) also states that, in the Minister's view, there would be no need to terminate any existing arrangement for payment on notional lists should the arrangements for a deputy prove satisfactory.

RETURN OF GOODWILL LIVERPOOL L.M.C.'S OPINION

The Liverpool Local Medical Committee has been considering the desirability of the return of doctors' practice goodwill to their private ownership. The February issue of the *Liverpool Local Medical Committee Bulletin* reports that, after obtaining an opinion as representative of the practitioners in the area as possible, and after a discussion at which a representative of the local registrars' group was invited to attend, the Committee took the view that, although in theory the restitution of goodwill was an attractive idea, the practical difficulties and probable anxieties and hardship involved were so real that the scheme must be regarded as quite impracticable. The *Bulletin* adds that the registrars' representative was against the return of goodwill because he felt it would make entry into general practice for members of his group even more difficult than at present.

Employment of General Practitioners in Hospitals

The Committee has also discussed the staffing difficulties of some of the hospitals in Liverpool—the urgent need being for cover to be provided in the evenings in the absence of members of the junior staff. Representatives of the Committee met the regional hospital board in association with officers of the Bootle Medical Committee, and the Committee has agreed in principle to an experiment lasting for one year of employing general practitioners for terms of four guineas for a four-hour session.

PUBLIC HEALTH SERVICE DISPUTE REFERRED FOR ARBITRATION

The Renfrew County Council has agreed to refer the unresolved dispute about the status and remuneration of one of its medical officers for arbitration under the Industrial Courts Act. The Trustees of the Public Health Service Defence Trust have instructed their solicitor to take the necessary action. Costs of the case will be borne by the Public Health Service Defence Trust.

REGIONAL APPEAL ON CONDITIONS OF SERVICE

The first regional appeal regarding a condition of service was heard recently. The case, which was presented by the Association on behalf of the medical officer of health, involved the refusal by a Metropolitan Borough to accept one of the conditions of service for medical officers of health, promulgated in M.D.C. Circular No. 16.

The ruling of the Appeals Committee was in favour of the medical officer, the appeal being allowed.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

PRESCRIBING FOR PRIVATE PATIENTS

At Cardiff in 1953 the Representative Body reaffirmed the Association's policy that every effort should be made to secure the right for the private patient to obtain his medicines free under the National Health Service.

Last week representatives of the Private Practice and General Medical Services Committees met officers of the Ministry of Health to discuss this matter. A promise was given that the Association's views on this issue and the many points raised would be placed before the Minister.

REMUNERATION OF HOSPITAL MEDICAL STAFFS

SOUTHAMPTON GROUP MEETING

At the annual meeting of the senior medical staff of the Southampton Group on March 18 the present state of the negotiations for the implementation of the Spens Report was under discussion. No member was able to express satisfaction with either the method or progress of the negotiations, and it was unanimously agreed to support the Liverpool Region and to forward for publication the following resolutions:

- (1) That this Meeting is of the unanimous opinion that the Association should publish a frank statement outlining the results of their negotiations to date regarding the implementation of the Spens Report as it affects the remuneration of hospital medical staffs.
- (2) Further, that if there appears no reasonable hope of obtaining a settlement which can be considered comparable to that of the general practitioners, the Staff Side should immediately withdraw from Whitley negotiations and take every step in their power to refer the case to arbitration and to ensure that such an action should in future negotiations be our right.
- (3) Finally that the demand for full and retrospective implementation of the Spens Report is merely asking that the promises under which we entered the Service should be honoured.

Members hoped that the action of the Liverpool Region would stimulate hospital medical staff committees throughout the country to take similar action and to use the columns of the *Journal* in order to publicize their views.

MARYLEBONE DIVISION ANNUAL MEETING RETURN OF GOODWILL

In view of the Representative Body's decision last year to instruct the Council to produce a scheme for the return of goodwill, and because the possibility of the return of goodwill to doctors has aroused a good deal of interest in certain quarters of the profession, the Marylebone Division has asked Dr. H. Guy Dain and Dr. H. H. D. Sutherland to speak on this subject at the Division's annual general meeting on April 5. The meeting will be held at 9 p.m. at 11, Chandos Street, W.1 (Medical Society of London), and the Marylebone Division will welcome any members of other Divisions who would like to come.

Notes and News

Hospitality.—A Belgian doctor's son, aged 17, would like to receive hospitality in a British medical family, preferably with several children, for nine or twelve months, after Easter, 1954, in exchange for similar hospitality in Belgium to a British boy or girl.

A French doctor would like his daughter, aged 14, and son, aged 12, to stay with a medical family in Britain during July, and in return offers hospitality to two children before mid-June or after September 1; or the use of a house during June on the north coast of France; or to send his children as paying guests.

Anyone interested should contact Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Correspondence

Hospital Staff Appointments

SIR,—It is now several years since procedure was laid down by Statutory Instrument (1950, No. 1258) for the formation, by regional hospital boards and boards of governors, of advisory appointments committees when consultant and S.H.M.O. appointments are to be made. Such committees consist of seven members, of whom only one is a member of the medical or dental staff of the hospital concerned. A similar sort of arrangement was later made for senior registrar and registrar appointments. Enough time has now elapsed to suggest that a review of these arrangements is due or overdue.

The motives which led to this procedure were presumably to avoid favouritism, to allow all candidates a fair field, and to ensure due consideration being given to special ability from whatever quarter it might come. One may, however, question whether, in being fair to the candidate, the regulations are also fair to the hospital and its patients. One may even doubt whether the arrangements do in fact achieve their objects. It is not for an outsider like myself to say whether favouritism may occur in such committees, and, in any case, favouritism is often a thoroughly good and sensible thing. But, on the other hand, one may suggest that such a committee interview, even when fortified by the opinions of referees, is not a particularly good way of gauging a candidate's clinical capacities, and still less of assessing how he or she will co-operate with colleagues of whom only one has had any say in his appointment. Staff harmony would seem, *prima facie*, to be at a discount in these regulations.

A further criticism is the lack of incentive which such a system provides for junior staff at a hospital. In peripherally situated hospitals especially, such junior staff may readily have the paralysing feeling that, no matter how hard they work, how helpful and obliging they may be, how diligent in study, it will all count for virtually nothing in the struggle for promotion. For they know how small a voice their hospital has in the appointments committees. What standard of work can then be expected from them? And how attractive are such hospitals when they need junior staff?

Surely the time has come to allow hospital staffs a larger, and a fairer, share in the appointment of their own future colleagues and assistants.—I am, etc.,

Wirral.

DAVID WILKIE.

Remuneration of Hospital Medical Staff

SIR, Contributors to the correspondence on this subject have raised several points which should be emphasized. Of first importance, I think, is the fact that the negotiations affect not only established consultants and specialists but also those "in training." The outcome is therefore certain, provided only that we remain united and adamant on full implementation of the Spens recommendations. In addition we must realize that the N.H.S. is here to stay, and that the attitude of the Ministry of Health to our successors will be governed by the firmness of our present stand; if we give an inch of ground now, a yard will be taken in 10 years' time.

The point most consistently made by contributors is that there should be free choice of the right to demand arbitration on disputes over terms and conditions of service. The importance of this is emphasized by the fact that even now, almost six years from the inception of the N.H.S., we are not receiving adequate remuneration, and by Dr. W. A. Bourne's suggestion (*Supplement*, March 6, p. 66) that the Ministry's attitude over the past 16 months of "active" negotiation has been governed by political expediency. Only arbitration can protect us against the dead-hand control of the Treasury and the tactics of opportunist politicians. It is interesting to note that the Parliamentary committee ap-

pointed last November to consider the salaries of Members of Parliament produced its report and recommendations in less than four months.

Some contributors have questioned the fitness of our negotiators for their task, and the *British Medical Journal's* leading article (February 27, p. 507) reinforces this doubt by remarking that consultants and hospital medical staffs have very much less experience in negotiation than do general practitioners. Confidence in their ability to represent all members of hospital medical staffs is not strengthened by consideration of the facts that the average age of the 18 members of the Staff Side of the Medical Whitley Council "B" is in the region of 52 years, that 11 of the 18 are Londoners, and that only two are from small provincial centres. It is difficult to see why anyone should find the leading article "singularly unhelpful." On the contrary, it makes a positive reaffirmation of B.M.A. policy—namely, Spens, the whole of Spens, and Spens undiluted by the corruption of political jockey and expediency. If we abandon Spens—either wholly or in the smallest part—we discard the only standard by which our financial worth can at any time be assessed. Any of our present negotiators who are not wholly Spens-minded will serve us best by resigning at once. In the minds of many of us, the Spens recommendations on salaries are statements of bread-and-butter requirements, and the "certain new features . . . which make comparison with 1939 difficult—for example, payment of clinical teachers and merit awards"—are merely well-flavoured red herrings. Whole-time clinical teaching salaries are payable by universities, as also is remuneration for part-time clinical teaching undertaken by N.H.S. hospital staffs; both of these, but especially the former, will automatically become tied to N.H.S. remuneration—and neither of them was the concern of the Spens Committee (see paragraph 14 of Report: "We did not regard it as within our terms of reference to make recommendations regarding the remuneration of specialists holding whole-time teaching appointments"). Merit awards should be just what the term implies, not a matter of grace and favour, and, as such, should be subject to the same "betterment" as the basic salaries.

Some contributors have suggested that there should be a public statement of the present stage of the negotiations. Such a statement would, one hopes, give the lie to some of the rumours referred to in the *British Medical Journal's* leading article, and which may have originated in a meeting here last October. At that meeting consultants and specialists were told by an influential member of the profession that within six weeks of that date we would receive an offer from the Government. This offer was, we were told, the result of a behind-the-scenes effort to break the Whitley Council deadlock, and represented the furthest the Government—unpleasantly surprised as it was by the Danckwerts award—would go towards implementing the consultants' Spens. It would consist of a differential increase in salary, the increase being greater for younger than for older consultants, and we would be well advised to accept it. The statement appeared authentic, but I was relieved to learn in two letters from the Secretary of the B.M.A. (dated October 28 and November 5) that the Association had no knowledge of any intention by the Government to depart from the Spens recommendations, and that the Association was strongly in favour of adherence to the Spens recommendations. I was further relieved to learn in a letter from the Minister of Health (dated November 12) that the speaker referred to above was in no sense a Government spokesman and that the views which he expressed on that occasion were therefore entirely personal.

In summary the important matters for which we must press are: undisputed right to arbitration; full adherence to Spens; disclosure of the present stage of negotiations. In addition, the Association's Public Relations Officer should open a campaign designed to make the public realize that we are not making "just another wage-claim." It should not be difficult to present to the public the comparison between present hospital salaries and wages in general in relation to 1939 and 1954 levels and values, and to convince the public that the present salary level has resulted in genuine distress and hardship among younger consultants, specialists, and trainees. I am, etc.,

Bristol.

V. TORRY BAXTER.

SIR,—Whilst appreciating the points made in Dr. W. A. Bourne's letter (*Supplement*, March 6, p. 66), I cannot help hoping that our present negotiators have a more critical attitude to published statistics than he apparently has. I

quote from his letter. "We cannot really expect the Government to suggest this [an 80% salary increase for hospital medical staff] straightaway to an electorate of whom 80% earn little more than a tenth of it, and 38% a twentieth." Since when was the electorate of this country composed of 23½ million wage-earners? And surely many of the 38% in the under £250 per annum group are also in the under 21 age group, and are thus not entitled to vote; more important, they are not all "principal wage-earners," but many are youngsters who provide an addition to the family income. Dr. Bourne's preoccupation with percentages does not, it appears, extend to the professional side of the picture. He does not stress or even state how small is the percentage of medical men in the hospital service receiving £2,700 per annum. He, like the general public, seems to regard this figure as a basic medical salary. May I be permitted to point out that a by no means negligible proportion of his own profession help to swell the number of unfortunates attempting to exist in the under £500 per annum group of "the electorate"?

I cannot believe that our negotiators negotiate only for the benefit of a handful of men at the top of the profession, and that for all those below the rank of senior consultant the answer will always be that time-honoured but fallacious chestnut: "It was worse in our day."

No, we are faced with many problems and I do not know all the answers to them, but I think I know one of the most important; and that is for each member of the profession to be a little more concerned with the welfare of sections other than his own; to become a little less like your correspondent (Dr. A. E. Nicholls, p. 66), who asserts unashamedly that he "presumes" S.H.M.O.s are people intermediate between housemen and recognized specialists; fancy a doctor admitting such a "presumption" in print. Before we attempt to "make good our case to the public"—which of course we must—we could make a start by trying to understand the problems of our immediate, and particularly our less fortunate, associates.—I am, etc.,

London, W.14.

MICHAEL P. COPLANS.

SIR.—The Spens Report laid down a basic salary scale for whole-time consultants ranging from £1,500 to £2,500 a year in terms of the 1939 value of money. This scale was to be adjusted to the "present-day value of money." It is important to consider the effect of taxation on the present-day value of money earned by all sections of the community and the extent to which this has been met by pay increases. Cogent arguments have been advanced to show that income tax is not a separate item in the cost of living (memorandum by Mr. George Schwartz, Association's supplementary memorandum of evidence to the Isle of Man Commission on Salaries and Emoluments, *Supplement*, September 5, 1953, p. 95), and that the general level of prices and incomes in the community is not affected by income tax which transfers money to the State, which thereupon rediscurses it on behalf of the taxpayer.

It is difficult to see why indirect taxation should not be regarded in exactly the same light, because all forms of taxation transfer some of the spending power of the individual to the State. If we compare the two chief methods of raising money we find that during the financial year ended March 31, 1953, income tax collected amounted to £1,682 million. During the same period Britain's overtaxed people paid out the all-time record total of £1,764 million in taxes on such things as clothing, boots and shoes, matches, beer, tobacco, and entertainments. These figures show that a larger sum of money is actually raised by indirect taxation than by direct taxation. Moreover, indirect taxation affects the consumer in two ways, (a) directly when he pays purchase tax or other form of tax on consumer goods or entertainment, (b) indirectly when he pays an enhanced price for articles because, for example, of increased transport charges due to the heavy tax on petrol. Incidentally, income tax also affects the citizen-consumer indirectly because the price he pays for goods and services includes not only the

cost of production but also covers the income tax which the manufacturer pays out of his profits.

In calculating the cost-of-living index I do not think that deductions are made for the various forms of indirect taxation, which must in the aggregate represent a very considerable factor. In any case, most of the lower-paid sections of the community have received pay increases which bear a close relation to the increased cost of living; in other words, indirect taxation which they pay in various ways has been regarded as an item in their cost of living. The average pay of adult male workers is more than two and a half times the level of 1938. One of your correspondents, Dr. B. Sugden (*Supplement*, January 31, 1953, p. 34), states that prices are at least 100% over pre-war. This is an understatement. Whole-time consultants have to pay three times the pre-war prices for heavy and essential items such as cars, children's schooling, domestic help, clothing, house-purchase, and rates (perhaps the latter, like income tax, is not to be regarded as an item in the cost of living, as the local council merely rediscurses the money on behalf of the ratepayer). No tax concessions can be obtained on any of these items, which have to be paid for after taxation (usually including super-tax) has been paid.

Mr. A. J. Cummings, in a recent article in the *News Chronicle*, quoted Mr. Attlee writing to *The Times* (February 18) in support of increased pay for Members of Parliament. Mr. Attlee pointed out that "having regard to the rate of income tax [£1,500 a year to-day] is not more attractive than was £400 in 1911." It is evident that the Leader of the Opposition believes that income tax should be taken into account when claims for salary increases are considered. We may think that he is mistaken, and personally I do not complain about the "levelling-down" process of income tax and I am in agreement with Mr. Schwartz to the extent that salary increases which fully compensated for a rise in income tax would lead to catastrophic inflation. It should be made plain, however, that a betterment factor of even 100% applied to the salary scale of consultants and hospital medical staff, fixed in terms of the 1938 value of money, not only takes no account of income tax but is actually less than the average increase already obtained by other sections of the community who pay relatively little income tax and whose indirect taxation has been met by their pay increases.

I think that your correspondent, Dr. W. A. Bourne (*Supplement*, March 6, p. 66), is mistaken in calculating that an 80% "betterment factor" would raise the annual income of a whole-time consultant from £2,750 to £4,950. The "betterment factor" is based on £2,500 and includes the Government's contribution of 8%. On this calculation the consultant's salary would be raised from £2,750 to £4,170. From this would be deducted superannuation contribution of £250, giving a net figure of £3,920. —I am, etc.,

Newcastle-upon-Tyne.

RICHARD NORTON.

SIR.—As one who also, like your correspondent Dr. W. A. Bourne (*Supplement*, March 6, p. 66), was concerned at the start in the discussions on the conditions of service of hospital staffs, I have been surprised at the contents of some of the letters you have published on this matter and indeed also of your leading article (*Journal*, February 27, p. 507). The terms of remuneration are just one of the conditions in the N.H.S. due to unwise decisions at the beginning which are making the lot of doctors (and patients) in hospitals hard. The facts, as the records of the time show, are that the Ministry, advised hospital staffs to enter into permanent contracts in an unbusinesslike way before a number of important points were settled. It made no mention of the decision of the Central Consultants and Specialists Committee that that factor should be not less than 35%. It merely accepted the general assurance of the Ministry that, "save in exceptional circumstances, and after the conciliation machinery of Whitley has been exhausted, issues of remuneration remaining in dispute will go either to arbitration or for

inquiry and report by a Committee." Apparently it was not until three years later, after urging by individual specialists in your columns and through the Regional and Central Consultants and Specialists Committees, that the matter of remuneration was reopened in the Whitley Committee "B," to which the Joint Committee had appointed itself as the Staff Side. It may have been too late in 1949 for the salaries for specialists to be settled with the full betterment which the Spens report presumed, for the economic and social changes in this country since the Spens investigation year of 1939 had altered both the position of specialists and the nation's ability to pay. But by 1952 it was surely too late, as it is now, to argue for an increase in the levels of remuneration by any higher adjustment of the betterment factor; for a contract had been signed without objection to the offered betterment factor of 20%, and even such a peculiar and timeless kind of contract as that for hospital staffs is still a contract.

What could be properly claimed now is an adjustment of remuneration on the basis of the rise of the cost of living since July, 1949, when the contracts were accepted. In that way the claim of specialists would be understandable and probably acceptable, being the same sort of claim as employees in other occupations are making. It is questionable, however, whether, if accepted, specialists would really be better off, for they would incur increased liability to taxation, and the increased cost on the N.H.S. would have the same effects of rise in the cost of living and reduction in the value of pensions and savings that other such increases are producing.

This matter is perhaps more important to the whole-time than to the part-time specialist; for the part-timer should have the alternative of private practice by which to augment his income. It seems to be forgotten that the Spens investigation was based on the total professional incomes of specialists and that the recommendations of the Spens Committee as to remuneration in the Service and the terms of service themselves were based on the assumption that private practice would continue. That is why it was so essential for specialists that the safeguards for private practice, such as certainty of provision of private wards in hospitals and fixing of the charge for such wards not on the general cost for a hospital bed plus a premium but only on the premium itself, removal of the Minister's powers to acquire nursing-homes compulsorily, and the right of private patients to free drugs and appliances, should be assured before their contracts were signed.

None of these safeguards were in fact assured, and at least partly in consequence private practice has declined and with it the total income of specialists. He would be an optimist to expect that those safeguards for private practice will still be provided or that the decline in income from private practice would be considered, as it should be, as an argument for increasing the salaries of part-time specialists in the Service. But specialists can do much to ensure the re-growth of private practice, and thereby of their total professional incomes, by seeing that nursing-homes are retained in their areas, and by helping to make known the benefits of membership of a provident association. The rapidly rising membership of provident associations shows that many people of small and moderate means still wish for privacy and selectiveness and prompt attention when they are seriously ill, which the N.H.S. with its deficiencies often cannot give them, and are willing to join an insurance scheme for that purpose. Here is the way, which has been found realizable in this area and I suppose elsewhere, for revival of private practice and for increase in the incomes of part-time specialists towards their former levels without adding to public expenditure. Continuance of private practice is of course important not merely for the part-time specialists' incomes but also as giving an alternative to the Service and preventing it from becoming a fully whole-time one in which the incomes of all as well as their freedom might eventually be impaired.—I am, etc.,

Bournemouth.

N. ROSS SMITH.

SIR.—Dr. W. A. Bourne's interpretation of the mind of the Ministry on the remuneration of hospital staffs (*Supplement*, March 6, p. 66) is a true one in that the Government is anxious about its votes. So far as the profession is concerned, I imagine that many medical men would hesitate to ask for more on moral grounds, since the average income of the population is circumscribed, if the Treasury could not be trusted to keep their consciences most scrupulously year by year and ease them of any superfluity of wealth. Yet the Government shows no sign of a tender conscience in dividing a profession on the interior matter of its income.

The Spens recommendations were for all, and they have been applied to a proportion only. This is the offence which Dr. Bourne should recognize as the cause of so much indignation. The present situation has been engendered by the politicians, it is repellent to the profession, it is contrary to the ordinances of justice, and by this token the Government must provide a righteous solution.—I am, etc.,

Worcester.

P. W. HOUGHTON.

Whole-time Specialist Appointments

SIR.—The tone of your leading article under the above heading (*Journal*, March 13, p. 634) is very surprising. It demands the right to dictate a policy which many regional boards are finding increasingly expensive. Our profession would do well to consider the effect this attitude is having on those who attempt to administer the service at various levels. Chairmen of many committees often feel that the advice given by consultants, particularly those in part-time practice, is not always impartial. In some quarters this is leading to a demand that doctors shall only hold positions on advisory committees at regional and management level. Should this change eventually commend itself to Parliament its effect will be unfortunate. Leading articles such as the one mentioned will only tend to hasten such a decision.—I am, etc.,

HORACE JOULES.

London, N.W.10.

Waiting for the Ambulance

SIR.—In a recent report about the Surrey Medical Services Committee's recommendation that a doctor should be censured for "a serious failure" to comply with his terms of service it adds: "... he telephoned for an ambulance and left before it arrived." Without wishing to extenuate the gravamen of the charge, am I correct in inferring that it is considered the doctor's duty to await the arrival of an ambulance?—I am, etc.,

London, N.W.6.

W. LEVY.

Dismissal of Senior Registrars

SIR.—The Registrars Group is anxious to know how many senior registrars have completed, or are likely to complete within the next six months, their four years' appointments as senior registrar, and now find themselves in danger of having to change from their chosen career to some other field of work.

In May, 1953, transitional posts were authorized by the Ministry of Health which permitted the creation of extra senior-registrar appointments outside the regional establishment. It has been suggested that some regional boards have not taken full advantage of this scheme. These posts were designed for senior registrars who had completed four years' training and could be held for a maximum of two years, thus giving such senior registrars further time in which to obtain consultant or specialist appointments. I should be grateful if any senior registrar so affected would write to me personally, giving full details of his case, particularly where his post has been abolished or changed in character and no transitional post created in its place.—I am, etc.,

Clatterbridge Hospital,
Bebington, Cheshire.PHILIP L. ROBINSON,
Chairman, Registrars Group.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). The only charge made is for postage of books. A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Alexander, L.: Treatment of Mental Disorder. 1953.
Allen, F. M. B., and Fisher, O. D.: Aids to Diagnosis and Treatment of Diseases of Children. Ninth edition. 1953.
Ashdown, M., and Brown, S. C.: Social Service and Mental Health. 1953.
Bauer, M. (Editor): Die entschädigungspflichtigen Berufskrankheiten. 1953.
Birch, C. A.: Common Symptoms Described and Explained for Nurses. 1953.
Brockington, C. F.: Health of the Community: Principles of Public Health for Practitioners and Students. 1954.
Brown, V. L.: New Way to Better Hearing Through Hearing Re-education. 1953.
Cannon, I. M.: On the Social Frontier of Medicine. 1952.
Cappelli, B.: Diagnostica Differenziale Meccanica. 1953.
Carrington, H., and Fodor, N.: Story of the Poltergeist Down the Centuries. 1953.
Cimnana, A.: Scritti Critici di Chirurgia Clinica. 1953.
Cozen, L.: Office Orthopedics. Second edition. 1953.
Crispolti, G.: La Malattia Reumatica. 1953.
Curran, S. C.: Luminescence and the Scintillation Counter. 1953.
Federn, P.: Ego Psychology and the Psychoses. Edited with an introduction by E. Weiss. 1953.
Ferenczi, S.: First Contributions to Psycho-analysis. 1952.
Frankl, V. E.: Ärztliche Seelsorge. 6. Auflage. 1952.
Gaddum, J. H.: Pharmacology. Fourth edition. 1953.
Gardner, E.: Fundamentals of Neurology. Second edition. 1952.
Geldard, F. A.: The Human Senses. 1953.
Greenacre, P.: Trauma, Growth, and Personality. 1953.
Hiller, A.: Practical Clinical Chemistry: A Guide for Technicians. 1953.
Imperati, L.: Trattamento del Malato Chirurgico. 1953.
Johns, H. E.: Physics of Radiation Therapy. 1953.
Johnstone, R. W.: The Midwife's Textbook. Sixth edition. 1953.
Law, W. A.: Osteoarthritis of the Hip. 1952.
Leff, S.: Social Medicine. 1953.
Martius, H.: Die geburtshilflichen Operationen. 7. Auflage. 1953.
Menninger, K. A.: Manual for Psychiatric Case Study. 1952.
Moustakas, C. E.: Children in Play Therapy. 1953.
Page, E. W.: Hypertensive Disorders of Pregnancy. 1953.
Pace, H.: Playtime in the First Five Years. Second edition. 1953.
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Symposium on Static Electrification held at the Institute of Physics in London on March 25, 26, and 27, 1953.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Lieutenant-Commander G. Hayes, R.N.V.R., has been entered on the Permanent List in the rank of Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieutenant-Commander G. Hayes, V.R.D., has terminated his commission.

Surgeon Lieutenant L. A. Cruttenden to be Surgeon Lieutenant-Commander.

Temporary Surgeon Lieutenant G. A. Dingemans has been granted an Honorary Commission in the Permanent R.N.V.R. in the rank of Honorary Surgeon Lieutenant-Commander.

ARMY

Colonel G. Moulson, late R.A.M.C., has retired on retired pay.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel R. L. Whittaker has retired on retired pay and has been granted the honorary rank of Colonel.

Majors A. W. Box and P. R. Wheatley, D.S.O., to be Lieutenant-Colonels.

Captain D. Olliver to be Major. (Substituted for the notification in a Supplement to the London Gazette dated November 13, 1953.)

Captain W. S. Miller to be Major.
Short Service Commission.—Captain R. W. Doy has retired with a gratuity, and has been granted the honorary rank of Major.

Association Notices

Diary of Central Meetings

MARCH	
30 Tues.	Working Party, G.M.S. Committee, 2 p.m.
30 Tues.	Waverley Evidence Committee, 11 a.m.
31 Wed.	Rehabilitation Committee, 2 p.m.
31 Wed.	Amending Acts Committee, 10.30 a.m.
APRIL	
1 Thurs.	Central Consultants and Specialists Committee, 10.30 a.m.
2 Fri.	Science Committee, 2 p.m.
3 Sat.	Hypnotism Subcommittee, Psychological Medicine Group Committee, 10 a.m.
6 Tues.	Constitution Committee, 2 p.m.
6 Tues.	Planning Subcommittee, Occupational Health Committee, 10 a.m.; Joint meeting with Occupational Health Committee, Society of Medical Officers of Health, 2 p.m.
7 Wed.	Central Ethical Committee, 2 p.m.
7 Wed.	Film Committee, 2 p.m.
9 Fri.	Public Health Committee, 2 p.m.
9 Fri.	Scholarships Subcommittee, Science Committee, 2 p.m.
13 Tues.	Joint Conference of Advisory Councils on Occupational Health, 12 noon.
14 Wed.	Occupational Health Committee, 10.30 a.m.
14 Wed.	Private Practice Committee, 2 p.m.
21 Wed.	G.M.S. Committee, 11.30 a.m.

Branch and Division Meetings to be Held

- CAMBERWELL DIVISION.—At St. Giles' Hospital, Camberwell, S.E., Tuesday, March 30, 8.45 p.m., meeting. Address by Sir Heneage Ogilvie: "Advances in Surgery."
- CITY DIVISION.—At Hackney Hospital, Homerton High Street, E., Wednesday, March 31, 2 p.m., films: "Cardiac Arrhythmias"; (2) "Cardiac Output in Man."
- CORNWALL DIVISION.—At Royal Cornwall Infirmary, Truro, Thursday, April 1, 8.30 p.m., Annual B.M.A. Lecture by Dr. B. E. Schlesinger: "The Primary Complex in Childhood."
- DORSET DIVISION.—At "The Clinic," Glyde Path Road, Dorchester, Wednesday, March 31, 8.30 p.m., meeting. Dissertation by Dr. J. A. G. F. Rose: "The Radiology of the Gastro-intestinal Tract."
- FINCHLEY DIVISION.—At Finchley Memorial Hospital, Granville Road, North Finchley, N., Friday, March 26, 8.45 p.m., meeting. Talk by Mr. Robert Lund: "Recent Advances in Chest Surgery."
- HALIFAX DIVISION.—At Royal Halifax Infirmary, Halifax, Wednesday, March 31, 8.30 p.m., meeting. Annual B.M.A. Lecture by Mr. W. Mortimer H. Shaw: "Experiences of a Plastic Surgeon," illustrated by lantern slides and films.
- HAMPSTEAD DIVISION.—At Westfield College, Kidderpore Avenue, N.W., Thursday, April 1, 8.30 p.m., meeting. "Brains Trust": Mr. A. Dickson Wright, Mr. R. S. Murley, Dr. I. P. F. Laurent, Dr. Lindsey W. Batten, and Miss Maighamta Taski. Members' friends are invited.
- LANCASTER DIVISION.—At Lancaster Royal Infirmary, Saturday, April 3, meeting. B.M.A. Lecture by Dr. R. W. Fairbrother: "Antibiotics in General Practice—Their Use and Abuse."
- LEWISHAM DIVISION.—At St. John's Hospital, Morden Hill, Lewisham, S.E., Sunday, April 4, 10.45 a.m., clinical meeting.
- MID-HERTS DIVISION.—At Hill End Hospital, St. Albans, Thursday, April 1, 4 p.m., clinical meeting.
- NORFOLK BRANCH.—At Nurses' Lecture Hall, Norfolk and Norwich Hospital, Norwich, Wednesday, March 31, 3.15 p.m., meeting. B.M.A. Lecture by Dr. W. G. Marley, M.Sc., Ph.D.: "The Development of Atomic Energy for Peaceful Purposes and Some Medical Implications."
- NORTH WALFS BRANCH.—At Ruthin Castle, Thursday, April 1, 3 p.m., spring meeting. Short papers by Dr. E. Clifford-Jones, Mr. W. Skyrme Rees, and Dr. B. Samet. A discussion will follow each paper. Dr. S. W. Patterson has invited members and their wives to take tea with him at the conclusion of the meeting.
- NUNFATON AND TAMWORTH DIVISION.—At Red Lion Hotel, Atherstone, Tuesday, March 30, 8 p.m., informal supper; 8.45 p.m., talk by Dr. J. A. L. Vaughan Jones: "Occupational Health and the Hazards of the Housewife." Members' wives are invited.
- RICHMOND DIVISION.—At Royal Hospital, Richmond, Tuesday, March 30, 9 p.m., general meeting. Illustrated lecture by Dr. J. G. Scadding: "Bronchial Carcinoma."
- SOUTH-WEST WALES DIVISION.—At Black Lion Hotel, Cardigan, Saturday, April 3, 7.30 p.m., meeting. Dr. A. Barham Carter: "Functional Symptoms Occurring in Organic Disease."
- SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Monday, March 29, 8.30 p.m., annual general meeting.
- WEMBLEY DIVISION.—At Wembley Hospital, Tuesday, March 30, 9 p.m., film show: (1) "Marrow Puncture"; (2) "Gastric Secretion." Both sound and colour films.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 10 1954

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REMUNERATION OF HOSPITAL MEDICAL STAFF
STATEMENT BY SIR RUSSELL BRAIN, CHAIRMAN OF STAFF SIDE OF
COMMITTEE "B" OF THE MEDICAL WHITLEY COUNCIL

NEW INCREASES AGREED

Committee "B" of the Medical Whitley Council has reached agreement on increases in the rates of pay of hospital medical staff which have been in operation since 1948.

The agreement, which has effect from April 1, includes the following provisions:

- The basic scale for consultants is to be £2,100, rising by annual increments of £125 to £3,100. This new scale gives an increase over the 1948 scale of £400 at the minimum and of £350 at the maximum.
- The new basic scale applies to consultants with C distinction awards, who therefore obtain the same increase as consultants without distinction awards.
- The increases for consultants with B and A distinction awards are, however, limited to £150 and £50 respectively.
- The basic scale for senior hospital medical officers is to be £1,500, rising by annual increments of £50 to £1,950, an increase of £200 over the 1948 scale.
- Senior registrars will receive £1,100, £1,200, £1,300, or £1,400, according to their year of service, an increase of £100 over the 1948 rates.
- Registrars will receive £850 or £965, according to their year of service, an increase of £75 over the 1948 rates.
- Junior hospital medical officers will receive a scale of £775, rising by annual increment of £50 to £1,075, an increase of £75 over their 1948 scale.
- Senior house officers will receive £745, an increase of £75 over their 1948 salary.
- House officers are to receive an annual rate of £425 for the first, £475 for the second, and £525 for the third and subsequent posts, an increase of £75 over the 1948 rates, but the annual charge made to them for residence is to be increased by £25.
- A maximum of three-quarters of a session is to be placed on the weighting that part-time consultants and senior hospital medical officers are allowed when their salaries are calculated. This replaces the present maximum weighting of one and one-quarter sessions.
- There is a protection against any individual losing pay on the coming into operation of the new agreement.

The details of the new arrangements are being worked out by the two sides of Committee "B," and the full agreement will be transmitted to the Minister of Health and the Secretary of State for Scotland as soon as it is ready.

These increases are the final outcome of lengthy negotiations, and should be judged in the light of the following background and history of events.

History

Before the introduction of the National Health Service it was agreed that the range of remuneration for both general practitioners and consultants in that Service should be determined by two interdepartmental committees, both under the chairmanship of Sir Will Spens. The Minister of Health and Secretary of State for Scotland on the one hand, and the profession on the other, agreed to accept the recommendations of these committees, which became in effect the basis on which professional income in the National Health Service was fixed.

The recommendations of the Spens Committees were framed in terms of the 1939 value of money, and both committees explicitly stated that they "left it to others to make the necessary adjustment to present-day values, such adjustment to have regard not only to changes in the value of money, but to increases in income which had in fact taken place in other professions since 1939." The Consultant Spens Committee went further and stated that the adjustment should have regard to changes in income in other branches of the medical profession.

The Consultant Spens Report was not published until May, 1948, and when the National Health Service was introduced in July of that year hospital staff entered the new Service on interim terms, relying on the assurance that the Minister had accepted the findings of the Spens Committee and would incorporate them in the new terms of service.

Subsequently the Government submitted the draft terms of service for hospital staff, which, although following the recommendations of the Consultant Spens Committee, applied to them the same betterment factor as was given to general practitioners (20%). This betterment factor of 20% was not accepted by the profession as being an adequate or realistic adjustment of the 1939 figures to post-war conditions, and as early as January, 1949, a deputation from the Joint Consultants Committee and the General Medical

Services Committee made joint representations to the Ministry on the subject. The Ministry's attitude at that time was wholly influenced by the White Paper on National Expenditure, and it declined to make any upward adjustment to the betterment factor.

In July, 1949, following discussions on the terms and conditions of service for hospital medical staff, the Joint Committee received certain assurances from the Ministry, among which were the following:

1. That no changes would be made in the terms and conditions of service without discussions in the appropriate part of the Whitley machinery;
2. That remuneration was regarded as a subject suitable for arbitration; and
3. That save in exceptional circumstances, and after the conciliation machinery of Whitley had been exhausted, issues of remuneration remaining in dispute would go either to arbitration or for inquiry and report by a committee.

Thereupon the Joint Committee advised hospital staff to accept permanent contracts on the basis of the terms and conditions of service then offered.

Meanwhile there was growing unrest amongst general practitioners about the inadequacy of the capitation fee, and after prolonged negotiations the Ministry in October, 1951, agreed to refer the question of the size of the Central Pool to arbitration, on the understanding that whatever the result of the arbitration might be no additional moneys would be paid unless agreement was reached upon a redistribution of the Central Pool.

Mr. Justice Danckwerts was appointed adjudicator, and his award was published in March, 1952.

A Claim Submitted

In June, 1952—shortly before Parliament approved the necessary Supplementary Estimate to implement the Danckwerts award—the Staff Side notified the Management Side of Committee "B" of its intention to submit a claim for increased betterment for hospital medical staff in the light of the Danckwerts award.

At the outset of negotiations, and before detailed discussion had begun, the attention of the Staff Side was directed to the following statement by the Chancellor of the Exchequer in the House of Commons on July 2, 1952:

"I want to make it clear that the terms of reference of Mr. Justice Danckwerts's award were confined solely to the question of the remuneration of general practitioners in the National Health Service and his award has no wider application. In accepting the results of the adjudication, which was of an exceptional nature, the Government have by no means adopted the view that similar adjustments in other fields should follow. In their view there is no justification for any assumption that the appropriate standard of remuneration for the professional classes is a rate of 100% above that in force in 1939. They consider that remuneration should be determined in the light of all relevant circumstances."

The Staff Side was left in no uncertainty as to the Government's policy in the matter, and the attitude of the Management Side. It was quite clear that in no circumstances could a claim be considered for hospital staff based on the Danckwerts award, nor could there be any agreement to submit any such claim to arbitration.

Legal Advice Sought

At this stage the Staff Side decided to take legal advice and consulted Mr. F. Grant, Q.C., who had presented the general practitioners' claim at the Danckwerts adjudication. Amongst other things Mr. Grant was asked whether there were arguments to support a legal claim that the Minister's promise to implement the recommendations of the Spens

Committee was implicit in the contracts which consultants had accepted with hospital boards. After studying all the available files, records of past meetings with the Ministry, and other relevant documents, Mr. Grant reached the conclusion that the Staff Side had no claim which was enforceable at law. He did not think that it could be argued that an undertaking by the Ministry to implement the terms of the Consultant Spens Report was a part of the contract on which consultants entered the Service. But even if it could be so argued the Minister could claim that the terms of the contract also included an agreement between the Minister and the consultants' representatives that a dispute about outstanding matters concerning the terms and conditions of service should be referred either to arbitration or to a committee of inquiry.

In view of the Government's known attitude towards arbitration, Mr. Grant pointed out that if negotiations broke down in Whitley the Minister could fulfil his undertaking by referring all aspects of consultant remuneration to a committee of inquiry. The results of such an inquiry could not be foreseen, but one danger was that the findings could in effect replace the Spens Report as the basis of consultant remuneration for the future.

Basis of Claim

During the course of negotiations it became clear that, while there was no question of departing from the Chancellor's statement on the application of the Danckwerts award, there seemed to be a realization that the balance between general-practitioner and consultant remuneration had been disturbed, that this factor alone might have an adverse effect on the future recruitment of hospital staff, and that a claim based on such considerations might well form a basis for discussion and possibly agreement. Thus the Staff Side was faced with two alternatives: either, despite the Chancellor's statement, to press its claim for a strict application of the Danckwerts betterment, or to examine the increases which general practitioners had in fact received as a result of the Danckwerts award, and to see how far these had disturbed the balance of remuneration.

After very careful consideration the Staff Side reached the conclusion that it had very little choice in the matter. The Government, it was clear, had no intention of departing from the Chancellor's statement and the profession in spite of continuous pressure has still been denied the right of unilateral arbitration. Again, because of the different methods of remuneration in general practice and consultant practice, a straightforward application of the Danckwerts "betterment" of 100% to the "Spens salaries" would have meant that a consultant aged 32 would start at £3,000 per annum and rise automatically to £5,000. Again, a consultant holding an A merit award would receive £10,000. Apart from the fact that a claim of this magnitude would have been totally unacceptable to the Management Side the effect would be again to upset the balance of remuneration between the two branches of the profession.

There were also the inescapable facts that the Government acceptance of the Danckwerts award had been conditional upon an agreed redistribution of general-practitioner income, and that the effect of the award, coupled with the redistribution scheme, had not been to increase the remuneration of individual general practitioners by 100%. For all these reasons the Staff Side considered that the only practicable course was to examine the effects of the Danckwerts award in the general-practitioner field and to relate them to the position of hospital staffs.

It accordingly looked at the percentage increases of remuneration received by general practitioners with varying sized lists, in order to compare them—so far as it was possible to do so—with hospital staff at different levels on the salary scales. Of necessity the comparison could not be precise because of the fundamental differences in the two methods of remuneration.

In the general-practitioner field the effect of Danckwerts had been that the most financially successful general practitioners, with the largest lists, gained virtually no increase of income; again, at the other end of the scale practitioners with very small lists received only a small percentage increase. Practitioners with medium-sized lists, on the other hand, received the greatest benefit from the award.

It proved far from easy to translate the comparison into salary increases for hospital staff. The Staff Side felt, however, that, as in the case of general practitioners, if recruitment to the hospital service was not to be affected the major benefit must be applied to the basic consultant grade in which the majority of hospital staff would make their permanent career rather than to the highest grades in which, in any case, taxation would largely nullify the effect of any increase, or to the lower grades in which most practitioners would not expect to have their permanent career.

Whole-time Consultants

The Staff Side had for some time been pressing the Management Side to review the position of whole-time consultants in the light of the recommendation of the Spens Committee that, in addition to their salary, consultants should receive allowances to cover the expenses reasonably incurred by them in connexion with their duties (e.g. car, telephone, membership of learned societies, and purchase of necessary textbooks). Few of these expenses had been met under the terms and conditions of service, and none of them adequately, and it was the intention of the Staff Side that in the claim for increased remuneration the opportunity should be taken of meeting the just grievances of the whole-time consultant.

The solution proposed to the Staff Side for meeting the whole-time consultant's difficulties was that as part-time consultants and S.H.M.O.s were enjoying disproportionate advantages in the calculation of their salaries the weighting of sessions should be entirely abandoned, all future part-time consultants and S.H.M.O.s and existing part-time men on promotion to a higher scale being paid unweighted elevenths of the full-time scale.

Apart from the fact that a proposal of this nature would not result in any addition to the whole-time scale, but merely a relative advantage at the expense of his part-time colleagues, the Staff Side felt that it would involve an abandonment of one of the vital principles of the Spens Report to which it could in no circumstances agree. After a very long discussion, the Staff Side agreed that a case had been made for modifying the Spens weighting which at 5 and 6 sessions rises to 14 elevenths, and that a ceiling of 4 eleventh for weighting should in future be applied. Existing hospital officers would, however, be fully protected against any loss of salary.

Pressure will continue to be exerted on the Management Side to improve the allowances for whole-time consultants.

The Spens Report

The Staff Side is satisfied that the settlement it has achieved does in fact restore the balance between consultant and general-practitioner remuneration which was upset by the Danckwerts award. The differential increases now to be enjoyed by members of hospital staff are a result of a new system of distribution and are no more a departure from the Consultant Spens Report than were the differential increases enjoyed by general practitioners as a result of their new distribution scheme a departure from the General Practitioner Spens Report. In the face of strong pressure to have it abolished the principle of weighting for part-time consultants has been retained. The small modification agreed is but a part of the general redistribution of incomes.

The Staff Side is therefore satisfied that the agreement it has made with the Management Side in no way weakens the Spens Report as the basis of consultant remuneration. In

its view Spens remains the yardstick of consultant remuneration and either Side of Committee "B" is free to seek future adjustments in any grade, if experience shows that the present settlement is working unfairly.

Consultation with the Profession

The Staff Side confidently hopes that hospital staffs will regard these increases as satisfactory. Consultants and other members of hospital staffs are, however, entitled to know why it was not found possible to consult them upon the outcome of the negotiations before agreement was reached. This is a difficulty which must always be faced when major issues are at stake. It is implicit in the Whitley machinery that representatives of both Sides have authority to negotiate and eventually to reach agreement. Failure to reach a settlement in Whitley without reference to the profession would undoubtedly have led to the appointment of a committee of inquiry into the question of hospital staff remuneration in all its aspects. This would have delayed a settlement for a very long time and would not necessarily have led to a final agreement better than the one now reached. Moreover, the Staff Side was told that, as an inquiry would probably follow any breakdown in negotiations, it was impossible for the proposed terms of a settlement to be made public, because, if they were rejected, the position of one or other party to the inquiry would be severely prejudiced.

Full consultation with the profession even had it been possible would therefore have meant interminable delays and possibly a hardening of the Government's views. Again, the Staff Side was informed that one of the bodies represented upon it, the Central Consultants and Specialists Committee of the British Medical Association, had in July, 1953, passed the following resolution:

That the Central Consultants and Specialists Committee expresses its appreciation of the efforts of the Staff Side of Committee "B," and of the Central Committee's representatives on the Staff Side, in the matter of the remuneration of hospital medical staffs, and gives such representatives full authority to agree, should they think fit, to such terms as the Staff Side can obtain; provided always that the principles embodied in the Report of the Consultant Spens Committee are maintained, and that the Committee's representatives will act without further reference to this Committee only in case of necessity.

The Staff Side, being satisfied that its negotiations had safeguarded Spens and knowing that it could not refer the terms of the settlement to its constituent bodies, none the less feels confident that the profession will agree that it took the right course in reaching agreement on the new increases. It realizes that hospital staffs will be disappointed to find the increases in remuneration are not retrospective, but the Staff Side was convinced that insistence on retrospective application would have led to a complete breakdown in negotiations.

The Staff Side's task over the past 18 months has been far from easy. It has had to press its claim during a period of national retrenchment and in the face of the Government's declared policy on the implications of the Danckwerts award. Only experience can show how far the increases obtained will improve recruitment in the hospital field, but in all the circumstances the Staff Side is satisfied that hospital staffs will welcome them as a reasonable adjustment to the position as it exists to-day.

A leading article appears at page 860 of the Journal

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

DISCUSSION ON ITS CONSTITUTION

An all-day meeting of the Central Consultants and Specialists Committee was held on April 1, with Dr. T. ROWLAND HILL in the chair. The Committee spent most of the morning considering its own constitution. A report on the subject was presented by Mr. H. H. LANGSTON, who proposed a number of recommendations, the principal of which was the deletion of the provision in the constitution for the appointment of one representative from each of the specialist Group Committees. At present 32 members (nearly half the total membership of 70) are appointed by the regional consultants and specialists committees and 10 by the committee for Scotland. The committees of the Consulting Pathologists, Ophthalmic, Psychological Medicine, Tuberculosis and Diseases of the Chest, and Venereologists Groups had written in opposition to the proposal to discontinue Group membership; the Dermatologists Group had acquiesced in the proposal only if a substantial reduction was made in the size of the Central Committee.

Mr. LANGSTON said that his committee had been guided by the strong feeling in every regional committee that the representation of special groups should be discontinued and that the basis of membership should be regional representation. They felt that they would get better unification if the representation of special interests took place first at regional level. It was recognized, however, that the Groups had their special problems and it was agreed that if this proposal were carried the agenda of every meeting of the Central Committee should be sent to the Chairmen of the Group Committees and their representatives could attend if desired.

Mr. HOLMES SELLORS thought the first question to determine was the optimum size of the Central Committee. Was anyone prepared to say what it was? Mr. C. E. KINDERSLEY said that the Committee should be a forum for debate for the entire consulting profession rather than an executive. He felt that large numbers of the profession would be offended if Group representation were eliminated or reduced. Mr. STAVELEY GOUGH said that there was nothing essential to Group interests which could not be dealt with by the committee without special Group representation. Dr. PETER EDWARDS pointed out the undesirability of antagonizing the Groups.

The CHAIRMAN suggested that this question should not be concluded that day and that the subcommittee should discuss it with representatives of the Groups themselves in the hope of an agreed representation.

Mr. A. LAWRENCE ABEL urged an immediate decision and asked the Committee to declare against the proposal to eliminate Group representation. Mr. LANGSTON said that they could not settle the question that day in view of the evident feeling in many of the regions, and the CHAIRMAN added that an immediate decision would be premature and might have to be reconsidered.

It was agreed that the question be referred back for further consideration.

Functions of Regional Committees

A number of proposals concerning the constitution and functions of regional consultants and specialists committees were also brought forward by Mr. LANGSTON. Criticism was made of one of the proposed functions—namely, "To make representations to regional hospital boards or boards of governors regarding the arrangements for the staffing or efficient running of hospitals in the region, and to give advice on the organization of the hospital services in the region if requested to do so." Mr. ABEL and others took exception to the last five words, which they construed as referring to requests from the boards, but Mr. LANGSTON explained that what his subcommittee had in mind were requests from hospital medical staff committees. It was agreed for the sake of clarity to delete the words "if requested to do so."

Another suggested function: "To establish informal and unofficial machinery to ensure the highest level of ethical behaviour among members of hospital staffs" was the subject of some criticism. Mr. LANGSTON said that the subcommittee had thought it would not be right to suggest that regional committees should set up official technical bodies for this purpose. On the other hand it was known that on certain occasions regional committees or their subcommittees had been able to help in a local problem at group level, and it was that sort of unofficial action as a means of solving ethical problems which they had had in mind.

After discussions the proposed functions, with one or two verbal alterations, were agreed to, and it was also agreed to urge that regional committees should be invited to nominate members to medical advisory committees of regional hospital boards and that there should be at regional board level machinery for joint consultation comparable to that of the Joint Consultants Committee at Ministry level.

Hospital Junior Staff

Professor G. I. STRACHAN presented a report on hospital junior staff. He said that there was general agreement in his subcommittee that there was need for a long-term or career grade below the consultant in certain types of hospital. Bearing in mind the experience of the S.H.M.O. and J.H.M.O. grades, it was felt that the title of such appointment was of considerable importance; some such title as Senior Medical (or Surgical) Officer would be more attractive and suitable as a name for a career post than that of Registrar. Although short-term appointments would probably continue to suit the needs of the teaching hospitals the posts between house officer and consultant in the non-teaching hospitals should offer better prospects of promotion than at present, also a greater degree of security and the likelihood of a permanent career. It should be possible, particularly at the higher levels, for posts to be held on a part-time basis and combined with other forms of medical practice. The senior registrar post should be retained, though it would probably be held more particularly in the teaching hospitals and should remain a post of limited tenure.

In the discussion some objection was taken to the title S.M.O., in view of the associations of S.H.M.O. Mr. KINDERSLEY said that S.H.M.O.s were supposed to work under the aegis of consultants; but how many in fact did? Were they not really underpaid consultants? The creation of a grade S.M.O., not very different from S.H.M.O., would present an opportunity for a board to use underpaid personnel to do consultants' jobs. If this was so the number of consultant posts would be reduced and the number of S.H.M.O. posts would be increased and that would be a disaster.

Professor STRACHAN replied that one of their great considerations had been that the number of consultant posts should not be reduced. The CHAIRMAN called attention to the statement in the proposals that the ultimate responsibility for the treatment of patients in hospital must remain in the hands of practitioners of full consultant status.

Dr. COCHRANE SHANKS congratulated the subcommittee on what it had achieved and moved that general approval be given to the proposals. This was seconded by Mr. NICHOLSON-LAILEY and was carried by a very large majority.

The CHAIRMAN said that this would mean that the Joint Committee would have the opportunity of examining the proposals in detail, and he knew that the Ministry of Health was also interested. Professor STRACHAN suggested that a meeting be arranged between the Joint Committee and the members of his subcommittee.

Legal Actions

Dr. COCHRANE SHANKS reported that the Ministry had approved the draft memorandum on the procedure for dealing with legal actions involving hospitals and doctors on their staffs, together with the addition of a paragraph to the effect that the provisions should be applied to all proceedings from

April 1 and also, if it was agreed by and on behalf of the hospital authority and doctors concerned, it should be applied to any proceedings which were pending on that date and in which judgment had not been given. He said that this would mean that from now onwards the hospital and the doctor would never, save in exceptional circumstances, fight each other in open court.

A procedure for investigating complaints relating to personal conduct or professional competence of members of hospital medical staffs, which had been adopted at the last meeting, again came forward after certain suggestions made by the Council had been incorporated in it, and it was agreed that, subject to the acceptance of the proposals by the Minister, consideration should be given to the details of procedure, disciplinary action, and the like.

Public and Professional Relations

Professor P. C. P. CLOAKE presented a report on behalf of the Public and Professional Relations Subcommittee. This contained certain recommendations as to means of improving public relations which it was suggested should be sent to regional committees and to the hospital group medical committees. These were agreed to and it was also agreed to recommend to the Joint Committee that the Ministry be urged to arrange for copies of the report of the Central Health Services Council on the reception and welfare of hospital in-patients to be issued to all members of hospital medical staffs and to new officers at the time of their appointment. The Public Relations Officer was asked to bear in mind the possibility of securing more publicity for the various aspects of hospital work in the national press and in radio and television programmes.

Other Business

Attention was drawn to the second issue of the *Central Consultants and Specialists Committee Bulletin*. The CHAIRMAN said that the *Bulletin* had been welcomed in many quarters, and it was hoped that it would now become a regular feature in the consultant machinery and be an effective instrument in maintaining close relationships between consultants up and down the country. It would be issued about four times a year.

A useful memorandum was placed before the Committee by the Association's solicitor (Mr. Leigh Taylor) on the assessment of income tax on remuneration of part-time consultants. The advice of the Association's solicitor was also forthcoming on complaints which had been received from whole-time officers, who were required under their contract to have a telephone at their homes and who had been refused relief from income tax in respect of the expense involved.

A memorandum of evidence to be submitted to the Health Visitors Working Party was considered, also resolutions on various subjects from regional committees, and other routine business was transacted.

LOSS OF PRESCRIPTIONS CHARGES DOCTORS RESPONSIBLE

The General Medical Services Committee of the B.M.A. has heard recently of a case where a dispensing doctor had a considerable sum of money, collected from prescription charges, stolen from his surgery. Responsibility for such sums of money rests with the doctor concerned, and legally he is liable to make good any loss incurred if money or stamps are lost or stolen in the post. He is also responsible if he sends stamps by post without paying a sufficient registration fee to cover the value, and the Post Office will not accept liability.

The Committee suggests, therefore, that dispensing practitioners should insure against possible losses of this kind, and has asked local medical committees to recommend this to dispensing doctors in their areas.

Scottish News

SCOTLAND'S HEALTH SERVICES

REPORT BY DEPARTMENT OF HEALTH

The Department of Health for Scotland in its report¹ for 1953 states that, of 2,527 doctors taking part in the National Health Service in Scotland as principals at the end of the year, 1,427 were in partnership practice. The marked increase in the numbers of doctors practising in partnership is attributed to the introduction of the new system of general-practitioner remuneration, which has also contributed to a more even distribution of patients.

The report refers to the "purely experimental" health centres at Sighthill and Stranraer, which it says do not represent the first steps in a settled policy of health-centre provision. Until experience has been gained of the working of arrangements for encouraging partnerships and group practices, no further experiments are contemplated, with the possible exception of setting up a small health centre in a new town.

Expenditure

Expenditure on general medical services during the year ended March 31, 1953, amounted to £9,296,073. Of this sum, payments against executive council remuneration pools, including retrospective Danckwerts award payments, accounted for £7,944,500; mileage payments to rural doctors £430,416; inducement payments (including retrospective increases), £34,478; maternity medical services, £355,338; and grants for training of assistants, £97,278.

The estimated number of prescriptions dispensed in 1953 was 2,049,500, an increase of 106,000 over the 1952 figure. The report notes an apparent reduction in the average cost of prescriptions since publication of the findings of a committee on prescribing, indicating proprietaries not of proved therapeutic value.

Hospitals

The number of whole-time consultants in the N.H.S. in Scotland at December 31, 1953, was 384 as compared with 372 at December 31, 1952; part-time consultants totalled 384 in 1953 and 378 in 1952. There were 249 whole-time and 111 part-time senior hospital medical officers in the Service at the end of 1953, and 219 whole-time and 111 part-time at the end of 1952.

The report says that in some parts of Scotland hospitals found it difficult to obtain sufficient numbers of junior staff, particularly house officers, during 1953. This could partly be attributed to a temporary fall in the number of graduates from the Universities of Edinburgh and St. Andrews, where a five-year course of studies has been changed to a six-year course. But, even when the transition phase has passed, the number of graduates from Scottish universities will still be below the high level of the post-war years.

The Department regards the linking of general practice with the hospital service as important, both for the hospitals and for domiciliary practice. Arrangements were therefore put in hand during the year for pilot surveys of selected areas to discover the extent to which suitable openings for part-time assistants are available in general practice, preferably with a view to partnership, with the idea of introducing hospital doctors, mainly in the registrar grade, to general practice as a part-time occupation. The Eastern Regional Board has drawn up a comprehensive complementary scheme to encourage the appointment of general practitioners to hospital posts.

Numbers Employed

About 66,000 people were employed in the N.H.S. in Scotland at September 30, 1953, of whom about 53,000 were employed whole-time or substantially so. The main groups are: doctors, 5,200; dentists, 1,400; nurses and midwives,

¹Report of the Department of Health for Scotland for the Year 1953. 1954 H.M.S.O.

26,900; pharmacists, 2,800; opticians, 950; medical auxiliaries, 1,500; administrative and clerical, 3,900; ancillary and domestics, 22,500.

The total number of approved posts in hospitals for the purpose of the pre-registration year for newly qualified doctors was increased during the year from 557 to 559. There was an excess of posts over applicants, so that these doctors had no difficulty in obtaining suitable appointments.

TOUR OF DENMARK FOR SCOTTISH DOCTORS

Applications for the tour by Scottish doctors to Denmark in September, 1954, can still be entertained. The first announcement giving preliminary details appeared in the *Supplement* on March 13, 1954.

The tour will extend from August 31 to September 13, and will include visits to hospitals, universities, and medical institutes, as well as sightseeing excursions. The cost of the tour will be approximately £40, including travel Newcastle-Copenhagen and the stay in Denmark. All expenses of travelling in Denmark will be met by the Danish Society.

Doctors in Scotland who are interested in this tour should communicate with the Scottish Secretary, British Medical Association, 7, Drumsheugh Gardens, Edinburgh, 3, without delay.

NATIONAL HEALTH SERVICE ESTIMATES, 1954-5

It is estimated¹ that £384,215,685 will be required during the year ending March 31, 1955, for the provision of a comprehensive health service for England and Wales, and other connected services, including medical services for pensioners, treatment abroad of respiratory tuberculosis, purchases of equipment, etc., and certain civil defence expenses. This is an increase over the 1953-4 estimates of £11,683,365. The corresponding estimate for Scotland in the same period is £48,917,800, an increase of £1,773,242 over 1953-4.

Mostly Up

The estimates provide for an extra £9,670,590 (£284,463,525) for hospital, specialist, and ancillary services in England and Wales, and an extra £1,310,432 (£37,029,000) in Scotland. Increased figures are also given for the general medical, dental, and supplementary ophthalmic services in England and Wales—a total of £124,882,900, which is £4,107,400 more than last year. A reduction of £154,000 in the pharmaceutical service is, however, listed. In Scotland an extra expenditure in these services is estimated at £973,080, and here there is no reduction in the pharmaceutical service.

Grants to local health authorities in England and Wales rise by £1,663,500 to £21,277,510. Similar grants in Scotland are reduced by £23,510 to £1,920,500.

Notes and News

Hospitality.—Two Norwegian doctors would like to arrange exchanges for their daughters, both aged 16, for the summer of 1954, and in return British girls could go to Norway in 1955. One family live in the country near Oslo, and the other family, who live in Oslo, spend part of the summer in their mountain hut. Would anyone interested please contact Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

¹1954-55 Civil Estimates, 1954, Class V: Health, Housing, and Local Government. H.M.S.O., London. See *Journal*, p. 864.

REVISED ALLOWANCES FOR MEMBERS OF LOCAL AUTHORITIES

New maximum rates for subsistence and travelling allowances and financial loss payments of local authorities and certain other bodies under the Local Government Act, 1948, are laid down in regulations¹ which came into force on March 30.

Rates of subsistence allowances are increased from 5s. to 7s. 6d. for a period of between four and eight hours; from 10s. to 12s. 6d. for a period of between 8 and 12 hours; and from 15s. to 20s. for a period of more than 12 hours. For absence overnight from the usual place of residence the rate is raised from 32s. 6d. to 42s. The supplementary allowance for stay in London or for the purpose of attending certain specified annual conferences is reduced from 9s. 6d. a night to 8s. a night. Mileage allowances for members using their own motor vehicles will now vary between 9½d. a mile and 2d. a mile, instead of between 9d. and 2d. a mile.

The Financial Loss Allowance Regulations² increase the daily rates of reimbursement under this heading from 10s. to 15s. where the period of time over which earnings are lost or additional expense is incurred is not more than four hours; and from 20s. to 30s. where the period is more than four hours.

INTERNATIONAL RELATIONS BRITISH DOCTORS IN THE U.S.A.

The International Relations Committee of the B.M.A. has considered the position of members of the Association who are resident, permanently or temporarily, in the U.S.A. They are not attached to any Branch of the B.M.A., and they are frequently not eligible for membership of the State Medical Societies, which constitute the American Medical Association, because some of these societies require American citizenship. The Committee asked the American Medical Association whether it could introduce some form of membership for these doctors on the lines of the associate or complimentary memberships of the B.M.A., which are available for American and other foreign doctors while resident in the United Kingdom. The American Medical Association has replied that such membership cannot be provided under its constitution. It has offered, however, "the courtesies of the Association, including attendance at all scientific sessions" to any member of the British Medical Association in America who writes to the Secretary of the American Medical Association, 535, North Dearborn Street, Chicago, 10, Ill., stating that he is a member of the B.M.A., and indicating how long he intends to remain in the U.S.A.

Letters of Introduction for Doctors Going Abroad

The International Relations Committee has been informed that the West German Medical Association issues identity cards, printed in four languages, for the use of its members when visiting foreign countries in which the national medical association is a member of the World Medical Association. The card is issued to the doctor on production of evidence "that he is in good standing with his local medical society," and is intended to serve both as a means of identification and as an introduction to colleagues in the country visited. The West German Medical Association invites other member associations of the W.M.A. to assist German doctors presenting the card, and promises in its turn to help foreign doctors visiting West Germany who can be similarly identified.

While the Committee does not consider it desirable to issue identity cards, it wishes to draw the attention of mem-

¹The Local Government (Allowances to Members) Regulations, 1954. S.I. 1954, No. 397. H.M. Stationery Office, price 4d.

²The Local Government (Financial Loss Allowance) Regulations, 1954. S.I. 1954, No. 398. H.M. Stationery Office, price 2d.

bers of the B.M.A. to the practice which has been satisfactorily followed by the B.M.A. for many years, and which serves the same purpose. Any member going abroad may apply to the Secretary of the Association for a letter of introduction, and this will readily be given. The letter will be suited to the individual purposes of the member. It may, for example, be an introduction for general use, or it may introduce the member to a particular foreign doctor or to a particular hospital or clinic.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Hospital Staff Appointments

SIR,—Mr. David Wilkie in his letter about hospital staff appointments (*Supplement*, March 27, p. 127) raises important issues. I have had some experience of serving on appointments advisory committees both in England and in Scotland, and I think he can rest assured that the greatest possible weight is given to the views of the hospital concerned, when those views can be clearly expressed. The candidate's academic qualifications and research achievements can be assessed fairly easily, and some hints as to his personality may emerge at the interview; but an estimate of his clinical ability and of his attitude to patients and staff can only be obtained by a colleague in his own branch who has observed his work over a period. It follows that, unless there happens to be on the committee one qualified so to report on the candidate, the committee have to rely on the information supplied by a referee.

Now to make adverse comments in writing about a man who has worked with one is repugnant to most of us; the worst the committee can expect to hear is "faint praise"; and if the referee is too laudatory the committee may wonder if his chief might be not unwilling to part with his marvellous young colleague. I have even heard it suggested that, because a particular referee gave a candidate a poor report, that candidate was probably very good. Personally I have come largely to discount such references. I feel with Mr. Wilkie that the present procedure is unsatisfactory in the case of those candidates whose work is not personally known to at least one suitable medical member of the committee.

The remedy which I suggest consists in ensuring that the committee will have assisting it, for each interviewed candidate, a suitable consultant who can speak from personal knowledge of the candidate's work and character. This might be achieved by appointing as the two consultants from other regions persons with such knowledge and, in the case of candidates not so covered, by sending a suitable consultant, who might well be from the hospital concerned, to pay a private visit to the hospital employing the candidate to see his work and make local inquiries, and, without informing the candidate of the purpose of his visit, reporting verbally to the committee.

After all, these appointments are virtually permanent, and the appointment of a consultant or of an S.H.M.O. of less than the necessary clinical standard, or with a personality unsuitable for the post, may cause endless friction over a period of years, not to mention the risks of patients receiving sub-standard treatment, with the possibilities and liabilities involved. I feel that what is needed is not so much increased representation of the hospital concerned as the placing before the committee of observed facts on the candidate's clinical ability and character by a consultant, who can be asked to amplify and if necessary clarify his observations at the meeting.—I am, etc.,

Aberdeen.

R. R. M. PORTER.

Remuneration of Hospital Medical Staff

SIR,—In the *Daily Express* of April 2 there appeared an article which states that the nation's income for 1953 was the highest in history. "Everybody shared in the prosperity—soldiers, sailors, tinkers, tailors. Wages of the workers and salaries of the black-coated . . . bounded £475m. The men in the Forces pulled in £13m. more. Farmers earned £397m., a gain of £4m. Theirs was the smallest gain of all. Professional men, doctors, dentists, lawyers, collected £8m. more in fees. . . ." I hope that our Public Relations Officer will take steps to remind the Press and the public that doctors in the hospital service have received no benefit so far from this prosperity wave. Our case for the implementation of Spens for the hospital services now seems unanswerable.—I am, etc.,

Beckenham.

A. J. MERRY.

Life Assurance Fee

SIR,—With reference to paragraph 106 of the Annual Report of Council (*Supplement*, March 27, p. 99), I was surprised to read that the Life Assurance Officers' Association have notified the Council that the fee of £1 11s. 6d. is regarded as adequate when an examination and report is carried out.

Some time ago, in conversation with the London general manager of one of the largest insurance companies, he stated that it was up to the doctors to make representations for an increase in this fee. To-day I received a request from the Prudential Assurance Company for an attendance report, for which is offered a fee of £1 1s. Completion of such a report from my records never takes more than five minutes, whereas an examination and report I find necessitates a minimum of 40 minutes, with, on occasions, a further 5-10 minutes if the applicant has been unable to pass a specimen at the first consultation. It seems to me that 10s. 6d. for a full examination is completely inadequate, and that the fee for an examination and report should be a minimum of £3 3s.—I am, etc.,

Gravesend.

H. RICHARDSON GRAY.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). The only charge made is for postage of books. A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Aberle, S. D., and Corner, G. W.: *Twenty-five Years of Sex Research: History of the National Research Council Committee for Research in Problems of Sex, 1922-1947*. 1953.
- Austin, R. G.: *Aids to Inorganic Chemistry*. Second edition. 1953.
- Bertram, F.: *Die Zuckerkrankheit*. 4 Auflage. 1953.
- Bosselman, B. C.: *The Troubled Mind: A Psychiatric Study of Success and Failure in Human Adaptation*. 1953.
- Bower, A. G., and Pilant, E. B.: *Communicable Diseases: A Textbook for Nurses*. Seventh edition. 1953.
- Castellanos, I.: *Dermopapiloscopia Clinica*. 2 Volumes. 1953.
- Clinical Orthopaedics. Edited by Anthony F. DePalma. No. 1. 1953.
- Colby, F. H.: *Essential Urology*. Second edition. 1953.
- Corman, L.: *Conseils Pour la Guérison du Surmenage Nerveux*. 1953.
- Crofton, F. E.: *Elementary Statistics with Applications in Medicine*. 1953.
- Dameshek, W., and Welch, C. S.: *Hypersplenism and Surgery of the Spleen*. 1953.
- De Gennaro, G.: *Mezzi per Svelare le Simulazioni della Visione*. 1953.
- Detrick, J. E., and Berson, R. C.: *Medical Schools in the United States at Mid-Century*. 1953.
- Dukes' *Bacteria in Relation to Nursing*. Second edition revised by Stanley Marshall. 1953.
- Etheredge, M. L.: *Health Facts for College Students*. Sixth edition. 1953.
- Expectant Mother. The: *A Practical Handbook of Advice to the Expectant Mother and to the Newly Married*. 1953.
- Fattorusso, V., and Ritter, O.: *Atlante di Elettrocardiografia*. 1953.
- Fromme, A.: *The Psychologist Looks at Sex and Marriage*. 1952.
- Furneaux's *Human Physiology*. New edition completely revised by W. A. M. Smart. 1953.
- Gardiner, M. D.: *Principles of Exercise Therapy*. 1953.
- Gigli, G., and Giovannetti, S.: *Semelologia Funzionale del Rene*. 1953.
- Glickman, I.: *Clinical Periodontology*. 1953.
- Goodman, J. I., et al.: *The Diabetic Neuropathies*. 1953.
- Goodnow, M.: *Nursing History*. Ninth edition. 1953.

Grant, J. C. B.: *Method of Anatomy: Descriptive and Deductive*. Fifth edition. 1952.
 Gullity, P.: *L'Age Critique*. 1953.
 Hagen, W.: *Vorbeugende Gesundheitsfürsorge*. 1953.
 Halpern, F.: *Clinical Approach to Children's Rorschachs*. 1953.
 Hardy, G. M.: *Yes, Mstron*. 1953.
 Harrower, M.: *Appraising Personality*. 1953.
 Haugstad, N., and Marsh, J. B.: *Action of Insulin*. 1953.
 Judovich, B., and Bates, W.: *Pain Syndromes: Diagnosis and Treatment*. Fourth edition. 1953.
 Lichtman, S. S.: *Diseases of the Liver, Gallbladder and Bile Ducts*. Third edition. 2 Volumes. 1953.
 Marmont, A., and Fusco, F.: *Il Problema Terapeutico delle Leucemie Acute*. 1953.
 Rendle-Short, J.: *Synopsis of Children's Diseases*. 1954.
 Sexton, W. A.: *Chemical Constitution and Biological Activity*. Second edition. 1953.
 Shaffer, G. W., and Lazarus, R. S.: *Fundamental Concepts in Clinical Psychology*. 1952.
 Starr, I.: *Physiologic Therapy for Obstructive Vascular Disease*. 1953.
 Swartz, J. H.: *Dermatology in General Practice*. 1953.
 Symposium: *Gegenwartspole der Ernährungsforschung*. Basel, 1-4 Oktober, 1952. 1953.
 Tasaki, I.: *Nervous Transmission*. 1953.
 Thomas, K. H.: *Oral Surgery*. Second edition. 2 Volumes. 1952.
 Tooley, M.: *Medicine for Nurses*. 1953.
 Traut, E. F.: *Rheumatic Diseases: Diagnosis and Treatment*. 1952.
 Weider, A. (Editor): *Contributions Towards Medical Psychology*. 2 Volumes. 1953.

Association Notices

ELECTION OF MEMBER OF THE COUNCIL BY THE FAR EASTERN BRANCHES

Dr. J. W. Winchester (Omagh, Co. Tyrone) is the only candidate nominated to represent the Far Eastern Branches on the Central Council, in place of the late Professor Kenelm H. Digby. Accordingly, Dr. Winchester is hereby declared elected for the remainder of the term of office—that is, until the close of the Annual Representative Meeting, 1955.

A. MACRAE,
Secretary.

Diary of Central Meetings

APRIL

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| 12 Mon. | Anaesthetists Group Committee, 10.30 a.m. |
| 13 Tues. | Waverley Evidence Committee, 11 a.m. |
| 13 Tues. | Joint Conference of Advisory Councils on Occupational Health, 12 noon. |
| 14 Wed. | Occupational Health Committee, 10.30 a.m. |
| 14 Wed. | Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m. |
| 14 Wed. | Joint Subcommittee on the Training of District Nurses, Central Consultants and Specialists, G.M.S., and Public Health Committees, 2 p.m. |
| 14 Wed. | Private Practice Committee, 2 p.m. |
| 21 Wed. | G.M.S. Committee, 11.30 a.m. |
| 21 Wed. | Dain Fund Trustees, 1 p.m. (Date changed from April 15.) |
| 21 Wed. | Financial Advisory Committee, 2 p.m. |
| 22 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 22 Thurs. | Public Relations Committee, 2 p.m. |
| 22 Thurs. | Registrars Group Executive Committee, 2 p.m. |
| 27 Tues. | Estates Committee, 2 p.m. |
| 27 Tues. | Joint Formulary Committee, 2 p.m. |
| 28 Wed. | Finance Committee, 2 p.m. |
| 30 Fri. | Welsh Committee (at Raven Hotel, Shrewsbury). 2.15 p.m. |

MAY

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| 5 Wed. | Office Committee, 11 a.m. |
| 5 Wed. | Council, 2 p.m. |
| 6 Thurs. | Council, 10 a.m. |

Branch and Division Meetings to be Held

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, April 13, 8.30 p.m., meeting. Address by Mr. Samuel Davidson.

BURTON-ON-TRENT DIVISION.—At Bretby Golf Club, Ashby Road, Burton-on-Trent, Tuesday, April 13, 8 p.m., dinner, followed by lecture by Dr. W. Carey Smallwood: "Some Corticoids and their Uses."

EAST YORKSHIRE BRANCH.—At Quern House, Park Street, Hull, Wednesday, April 14, 8.30 p.m., meeting. Dr. J. Hunt (Secretary, College of General Practitioners): "Progress in General Practice and the new College of General Practitioners."

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, April 15, 8.30 p.m., meeting. Mr. Philip Wiles: "Osteoarthritis, with Special Reference to the Hip."

HASTINGS DIVISION.—At Out-patient Department, Bexhill Hospital, Tuesday, April 13, 8.15 p.m., clinical meeting.

KINGSTON-ON-THAMES DIVISION.—At Epsom District Hospital, Dorking Road, Epsom, Tuesday, April 13, 7.45 p.m., joint clinical meeting with Surrey Medical Society.

SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, April 9, 9 p.m., meeting. Discussion on Annual Report of Council.

SOUTH-WEST ESSEX DIVISION.—At Wanstead Hospital, Hermon Hill, Wanstead, E., Wednesday, April 14, 8.30 p.m., meeting. Lecture by Dr. Oswald A. Savage: "New Treatments in Rheumatism." A discussion will follow.

SOUTH MIDDLESEX DIVISION.—At Anchor Hotel, Shepperton, Monday, April 12, 9 p.m., meeting.

STRATFORD DIVISION.—At Queen Mary's Hospital, West Ham Lane, E., Tuesday, April 13, 9 p.m., general meeting.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Tuesday, April 13, 8.30 p.m., clinical meeting. Dr. F. E. Camps: "A Trace of Arsenic, Murder."

WEST BROMWICH AND SMETHWICK DIVISION.—At the Sandwell Hotel, West Bromwich, Wednesday, April 14, 8.15 p.m., supper meeting. Talk by Mr. W. E. Wimberger: "Transatlantic Journey."

WEST SUSSEX DIVISION.—At 73, Richmond Road, Worthing, Sunday, April 11, 4 p.m., annual general meeting.

Meetings of Branches and Divisions

BRITISH GUIANA BRANCH

At a general meeting held on January 29, 1954, at the Public Hospital, Georgetown, a resolution was unanimously passed expressing the Branch's thanks to Dr. H. Ho for his services to the Association as President, Secretary, and member of the Branch Council of the British Guiana Branch. Dr. Ho has left the colony to practise elsewhere.

HAMPSTEAD DIVISION

At a meeting of the Hampstead Division on March 3, 1954, with Dr. Lena Williams in the chair and 23 members and 14 other guests and members of the legal profession present, Dr. Desmond Curran opened a discussion on "Insanity and the Law." Speaking as an expert witness as a psychiatrist and with exceptional experience in criminal cases, Dr. Curran found that there was very much that was unsatisfactory in the psychiatrist's position in law. The law was confused in its own mind. The first thing that the court wanted to know was whether the accused suffered from a disease of the mind, but there was no definition of what was a disease of the mind. In the case of Straffen, he was mentally defective, but this was not regarded as a disease of the mind. The M'Naghten rules, which still acted as a guide in criminal matters, formed a fair working rule in capital cases, but were less applicable in other cases. If the death penalty was to be abolished there would be little point in their retention. Both Dr. Curran and subsequent legal speakers felt that the best possible psychiatric advice was not always available to the court, and Dr. Curran thought it was wrong that solicitors should tout round psychiatrists and other medical men until they found one whose opinion fitted the plea they wished to put forward for their client. Dr. Curran was followed by Mr. Henry Elam, who related many interesting cases out of his wide experience in the criminal courts, and by his colleague, Mr. Hugh Park, who contributed further details of the cases of Straffen and Giffard. A number of members and legal guests contributed to the subsequent discussion.

KENYA BRANCH

The annual general meeting was held on January 15, 1954. The following officers were elected:

President.—Mr. W. E. Powell.
 Vice-president.—Dr. A. T. G. Thomas.
 Hon. Secretary.—Mr. Andrew Hicks.
 Hon. Treasurer.—Dr. J. A. Carman.

MOMBASA DIVISION

The annual general meeting was held at the Pandya Memorial Clinic on January 28, 1954. Dr. C. Cochrane took the chair and there were nine members present. The following officers were elected:

President.—Dr. Cochrane.
 Vice-president.—Dr. Karve.
 Secretary and Treasurer.—Dr. A. U. Sheth.

WEST SUFFOLK DIVISION

The annual meeting was held at Everards Hotel, Bury St. Edmunds, on February 9, 1954. Dr. M. G. St. M. Rees took the chair, and there were fifteen members present. The following officers were appointed for the ensuing year:

Chairman.—Dr. R. H. Clayton.
 Vice-chairman.—Dr. H. G. St. M. Rees.
 Hon. Secretary and Treasurer.—Dr. J. W. E. Cory.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 17 1954

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British Medical Association

GENERAL MEDICAL SERVICES COMMITTEE

REPORT OF THE GENERAL MEDICAL SERVICES COMMITTEE TO THE ANNUAL CONFERENCE OF REPRESENTATIVES OF LOCAL MEDICAL COMMITTEES, 1954

PERSONNEL OF GENERAL MEDICAL SERVICES COMMITTEE, 1953-4

Ex officio: J. W. Tudor Thomas, Cardiff (President); S. Wand, Birmingham (Chairman of Representative Body); E. A. Gregg, London (Chairman of Council); A. M. A. Moore, Upminster, Essex (Treasurer); W. M. Knox, Glasgow (Chairman of Conference of Local Medical Committees).

Elected by A.R.M. of B.M.A. (1953): England and Wales: J. C. Arthur, Gateshead; A. Brown, Linton, Cambs; J. A. Brown, Birmingham; H. Guy Dain, Birmingham; Scotland: J. T. Baldwin, Milton Bridge, Midlothian; Northern Ireland: J. Bleakley, Belfast (Deputy: J. H. Cronhelm).

Direct Representatives of Local Medical Committees: W. Neil Darling, Edinburgh (Group "A.1"); C. J. Swanson, Aberfeldy, Perthshire (Group "A.2"); J. R. Langmuir, Glasgow (Group "A.3"); R. C. Hamilton, Kilmarnock (Group "A.4"); F. Lishman, Bishop Auckland, and D. T. McDonald, Belford (Group "B"); H. F. Hollis, Leeds, and H. Thorp, Todmorden, Yorks (Group "C"); A. Campbell, Accrington, Lancs, F. S. Catto, Manchester, and P. J. Gibbons, Liverpool (Group "D"); Miles Parkes, Crewe (Group "E"); T. J. Hargest, Swansea, and G. P. Williams, Holyhead (Group "F"); E. W. Goodwin, Leicester, and A. S. Wilson, Gosberton, Lincs (Group "G"); A. B. Davies, Walsall (Group "H"); F. A. Smorffitt, Southam, Warwickshire (Group "I"); C. F. R. Killick, Williton, Somerset (Group "J"); R. W. McConnell, Wendover, Bucks (Group "K"); J. D. R. Murray, Exmouth, Devon (Group "L"); K. S. Maurice-Smith, Ely, Cambs (Group "M"); H. S. Howie Wood, Isle of Wight (Group "N"); D. F. Whitaker, Guildford (Group "O"); A. W. Gardner, Lewes (Group "P"); A. T. Rogers, Bromley, Kent (Group "Q"); D. F. Hutchinson, Middlesex, and A. N. Mathias,

Cricklewood, N.W.2 (Group "R"); J. L. McKenzie Brown, London, and C. M. Scott, New Barnet, Herts (Group "S"); H. H. D. Sutherland, London, and Max Sorsby, London (Group "T"); J. B. Young, Belfast (Group "U").

Elected by Annual Conference of Local Medical Committees, 1953: A. Beauchamp, Birmingham; J. A. Gorsky, London; I. G. Innes, Hull; J. A. Pridham, Weymouth; F. M. Rose, Preston; W. Woolley, Bristol.

Nominees of Other Bodies: T. Rowland Hill, London, W.1, and L. Dougal Callander, Doncaster (Central Consultants and Specialists Committee); Kate Harrower, Glasgow (Medical Women's Federation); H. D. Chalke, London, N.W.3 (Public Health Committee and Society of Medical Officers of Health); Bruce Cardew, London, W.C.1, and H. C. Faulkner, London, N.W.5 (Medical Practitioners' Union).

Co-opted Members: O. C. Carter, Bournemouth; A. Joffe, London, W.1, and L. Russell, London, N.W.10 (Assistants and Young Practitioners Subcommittee); D. C. Bowie, London, W.C.1.

Observer from the British Dental Association: G. M. Hickley, London, S.W.9.

CHAIRMAN

1. A. Talbot Rogers was appointed Chairman for the session 1953-4.

THE WORK OF THE COMMITTEE

2. The past session has again proved a busy period for the Committee and meetings have been frequent.

3. Negotiations with the Ministry of Health on the application of the principles established by the Danckwerts award to the calculation of the size of the Central Pool have occupied much of its time, and, inevitably, the new distribution scheme itself has given rise to a number of administrative

tive problems during the year. Happily, the new scheme seems to have operated smoothly, though there remains the major problem of the practitioner with the small list. Here again the Committee has been active in obtaining information which is so vital to the Working Party in its review of the situation. Discussions in the Working Party have continued, and an account of the investigation into the problem appears elsewhere in the Report.

4. Another major task which the Committee has undertaken during the year has been the preparation of a memorandum which the Council of the Association has incorporated in its evidence to the Guillebaud Committee, set up by the Minister to examine the cost and efficiency of the Health Service.

5. In addition, the report by the special subcommittee on the Service Committees and Tribunal Regulations has been revised in accordance with the wishes of last year's Conference and is now being discussed with the Ministry.

6. Comprehensive reviews have also been made of the maternity service and of methods of facilitating the means by which established general practitioners can change their areas of practice.

7. Throughout the year representatives of the Committee have met officers of the Ministry at regular intervals to discuss the many detailed points of day-to-day administration of the Service which continue to arise. These discussions have been of great value and have enabled many minor faults in the Service to be put right.

8. A close liaison has been maintained with the Medical Practices Committee and matters of mutual interest have been discussed to the advantage of both bodies. Close contact has also been maintained with the organizations representing other professions engaged in the Health Service.

9. A list of attendances at various meetings has been given as a further Appendix (Appendix A) which appears in the copies of the Report that have been sent to local medical committees.

REPRESENTATION ON B.M.A. COMMITTEES

10. The G.M.S. Committee is represented on the following B.M.A. Committees: Private Practice (A. N. Mathias: Deputy—C. M. Scott); Public Health (C. M. Scott: Deputy—K. S. Maurice-Smith); Central Consultants and Specialists (A. Talbot Rogers and D. F. Hutchinson: Deputies—F. A. Smorffitt and J. D. R. Murray); Ophthalmic Group (M. Sorsby); Occupational Health Committee (F. Lishman: Deputy—A. Brown); Public Relations (A. Talbot Rogers, D. F. Hutchinson, F. M. Rose, and W. Woolley: Deputies—J. T. Baldwin, P. J. Gibbons, R. W. McConnel, and H. H. D. Sutherland); Compensation and Superannuation (A. B. Davies, A. N. Mathias, and W. Woolley); Joint Committee of B.M.A. and Pharmaceutical Society (A. Talbot Rogers, F. Gray, and E. W. Goodwin); Consultants, General Practitioners, and Public Health Liaison Committee (A. Talbot Rogers, H. S. Howie Wood, D. F. Hutchinson, A. W. Gardner, J. D. R. Murray, S. Wand, and D. F. Whitaker); Joint Formulary Committee of the B.M.A. and the Pharmaceutical Society (H. Guy Dain, M. Sorsby, D. F. Whitaker, and A. B. Davies); Arrangements Committee (A. Talbot Rogers, I. G. Innes, and F. M. Rose: Deputy member—A. Beauchamp); Pharmacopoeia Subcommittee of Science Committee (A. B. Davies); Committee on the relation of Drunkenness and Alcohol to Road Accidents (A. B. Davies).

LIAISON BETWEEN THE GENERAL MEDICAL SERVICES, CENTRAL CONSULTANTS AND SPECIALISTS, AND PUBLIC HEALTH COMMITTEES

11. It will be remembered that last year the Committee welcomed a proposal that the Public Health Service representative on the General Medical Services Committee should be jointly nominated by the Public Health Committee and

the Society of Medical Officers of Health, and that a direct representative of the G.M.S. Committee should be appointed to the Public Health Committee. This arrangement has been put into effect during the past session and has done much to promote a closer liaison between the two branches of the Service.

12. For some years past liaison with the Central Consultants and Specialists Committee of the Association has been maintained by means of a small joint subcommittee. On a number of occasions the matters under discussion were found to be of interest not only to general practitioners and consultants but also to medical officers engaged in the public health service. It was therefore felt that it would be most useful if the membership of this joint subcommittee were enlarged to include representatives of the Public Health Committee, and the necessary arrangements have now been made.

13. It is believed that this standing arrangement will greatly facilitate discussion upon matters which are of vital interest to the three main branches of the profession.

NOMINEES ON MINISTRY OF HEALTH DISTRIBUTION COMMITTEES

14. The following nominees were accepted by the Ministry for appointment on Central Distribution Committees for 1953-4:

International Distribution Committee: F. Gray (London), E. R. C. Walker (Scottish Secretary), G. P. Williams (Holyhead), and D. P. Stevenson (Deputy Secretary).

Distribution Committee for England and Wales: A. Talbot Rogers (Bromley, Kent), F. Gray (London), W. Woolley (Bristol), G. P. Williams (Holyhead), and D. P. Stevenson (Deputy Secretary); together with A. Brown (Linton, Cambs), J. D. Wells (Billericay, Essex), and C. F. R. Killick (Williton, Somerset) when questions concerning mileage are under consideration.

BRITISH DENTAL ASSOCIATION'S GENERAL DENTAL SERVICES COMMITTEE

15. A close liaison has been maintained with the General Dental Services Committee of the British Dental Association, and an observer from the B.D.A. (G. M. Hickley, London) has attended meetings of the Committee. F. Gray (London) has attended meetings of the General Dental Services Committee of the B.D.A.

16. This cross representation has enabled the two bodies to discuss and reach agreement on a number of matters of mutual interest.

REMUNERATION

Size of the Central Pool

17. The principles established by the Danckwerts award make it necessary for the Committee to reach agreement with the Ministry each year on the detailed application of the variable factors which are involved in calculating the size of the Central Professional Pool. The number of doctors in the Service, the level of practice expenses, and the amount of the earnings of general practitioners from sources outside the general medical services vary from year to year and so necessitate an appropriate adjustment to the amount contributed by the Ministry of Health to bring the Pool up to the required level. Precise information on these points is not available until after the end of the financial year, and the Pool is therefore calculated initially on a provisional basis and a final settlement is made when the full picture emerges.

18. It is hoped that the final settlement in respect of the financial year 1952-3 will be distributed very shortly.

19. The Committee has devoted a good deal of time to discussions upon the best method of assessing these variable factors, and the following paragraphs set out the action which is being taken in respect of each.

Number of Doctors in the Service

20. Detailed discussions have taken place with officials of the Ministry on the method of calculating the precise number of doctors in the Service. To base the calculations on the number of doctors on the lists of executive councils at either the commencement or the end of the year would obviously be inequitable, and it has been agreed that there should be a count on January 1 and July 1 of each year; the mean of the two figures being taken for the purpose.

21. It has also been agreed that the count should not be confined solely to those whose names appear on the medical lists at the relevant dates but that due regard should be paid to applications for admission to the list which are under consideration at the time that the count is taking place.

22. In the case of single-handed doctors appointed to advertised vacancies the Ministry will take into account those who find their way to the medical list of any area by the end of the calendar month commencing with the date of the count, provided that the original doctor died or retired before the date of the count and was not therefore included in it.

23. Those entering partnership practice have been dealt with by including in the count doctors who satisfy the following conditions:

(1) they were on the date of the count effective members of a partnership which provided services under Part IV of the Act;

(2) they had made application by the date of the count for their names to be included in an executive council's medical list;

(3) their names had, during the calendar month commencing with the date of the count, been included in the medical list as partners as a result of these applications, and the numbers of partners in the partnerships concerned, who were providing services under the Act, had not been reduced again during the month by the retirement of one of the original doctors.

24. These methods adequately safeguard the position of doctors who are admitted to the Service during the financial year in question but after the date of either count.

25. The Ministry for its part felt that there were four groups of practitioners whose position should be considered before they were included in the calculation. These groups are:

(1) those practitioners with no patients at all;

(2) doctors with very few N.H.S. patients;

(3) salaried partners; and

(4) partners whose share in the practice is less than one-third of the share of any other partner.

26. As far as the first group is concerned, the Committee felt that as these doctors had been included for the purposes of the original Spens calculations they should likewise be included for the purpose of calculating the size of the Pool. The Ministry was unable to accept this point of view, and as a compromise it has been agreed that the count will exclude any single-handed doctor who at the material date has no patients on his list and who has been on an executive council's list for a year or more.

27. The Ministry is obtaining further information about doctors in the second group, and further discussions will then take place.

28. In the case of salaried partners, the Committee has agreed that they should be excluded so long as care is taken that the share of practice expenses attributable to them are, in fact, included as such.

29. Both the Ministry and the Committee have agreed that doctors in the fourth category should be included in the count.

Practice Expenses

30. It will be remembered that Mr. Justice Danckwerts accepted an expense ratio of 38.7%, and this percentage has so far been used in calculating the size of the Pool. Clearly it is desirable that this figure should be brought up to date, and arrangements were made for a further review of the level of practice expenses, including an inquiry undertaken

by the Board of Inland Revenue based upon accounts for financial years ended during the March quarter of 1952. This inquiry is now complete and its results are to be discussed with the Ministry of Health. The resultant expense ratio will be applied retrospectively to the 1952-3 Pool.

Receipts from Private Practice

31. The Ministry suggested that the Inland Revenue inquiry into practice expenses should be used to obtain an estimate of the receipts of general practitioners from private practice. The actual method which the Ministry proposed to use made it obvious to the Committee that there was no possibility of any accurate assessment being made in this way.

32. The Committee does not dispute that an accurate figure for private practice must be obtained, but it was unable to agree that the practice expenses inquiry, framed to elicit such different information, should also be used for this purpose.

33. These views have been accepted by the Ministry, and further thought is being given to possible ways and means of obtaining an accurate estimate of total receipts from private practice. In the meantime, both sides have agreed that the figure of £2,000,000 accepted by Mr. Justice Danckwerts should be used as a provisional basis for the calculation of the Pool for 1952-3, and that an adjustment either way should be made when a more detailed assessment of this source of income is made.

The Distribution Scheme

Appeals Machinery

34. It will be remembered that the Committee felt that it was necessary to provide means whereby an appeal could be made against:

(1) the rejection of any application for an initial practice allowance;

(2) the refusal of a hardship payment; and

(3) the refusal of an application to be paid on the basis of "notional lists."

35. It has now been agreed that in these circumstances the practitioner concerned will have a right of appeal to the Minister, and in reaching a decision the Minister will be advised by a committee consisting of equal numbers of representatives of the Ministry and of general practitioners from a panel nominated by the G.M.S. Committee.

Notional Lists

36. It will be remembered that the original E.C.L. on the subject made specific provision that, where a new partnership had recently been formed but one of the partners would not be admitted to the list under the existing procedure until some time in April, 1953, executive councils would be given discretion to determine the number of loadings due to the partnership as if the name of the incoming doctor had been included in the list on April 1, 1953.

37. The Ministry has now agreed that a similar concession should be granted in the first month of any quarter. In other words, where an executive council is satisfied that a partnership was in fact effective from the beginning of a quarter but that there is some delay in the admission of the new member of the partnership to the medical list, so that inclusion in the list actually takes place at a date between the first and last days of the first month of a quarter, the executive council can agree to calculate the number of loadings due to the partnership as if the name of the incoming doctor had been included in the medical list from the beginning of the quarter.

38. It has also been agreed that in future the Medical Practices Committee when granting a partnership application will indicate the date on which they have been informed the partnership became effective.

Maximum Lists

39. Although normally most general practitioners complete their National Service immediately after registration, occasionally call-up is deferred until after the practitioner

concerned has become established as a principal in general practice. The position of partnerships where one member might be called up for National Service has been discussed with the Ministry. The Ministry has agreed that where a member of a partnership is called up for National Service it should not affect the calculation of the maximum lists for the partnership, provided that adequate deputizing arrangements have been made for the care of the patients of the practitioner who is away on National Service. In addition, the Ministry agreed that there would, in the circumstances, be no need to disturb any arrangement for payment on notional lists which might then be in existence, since the deputizing arrangements should normally be accepted as complying with the requirements of the distribution scheme.

Initial Practice Allowances

40. Attention was drawn to an anomaly in the method of assessing income in connexion with claims for Initial Practice Allowances. In the case of doctors filling vacancies in small single-handed practices executive councils are required to take dispensing payments into account, and the Committee felt that some allowance should be made for the fact that the amounts involved include a considerable element in respect of the actual cost of the drugs supplied.

41. Following consultation with the Ministry, it has been agreed that the total sums paid for dispensing should be disregarded.

School Medical Officers

42. The Committee has received representations from the Medical Officers of Schools Association against the provision in the model distribution scheme whereby a 20% reduction is made in the capitation fee in respect of limited lists.

43. Full consideration has been given to this matter on a number of occasions, but the Committee does not feel that it is able to take any action on a national basis to alter the present arrangements in favour of the whole-time school medical officer.

44. Subject to the Ministry's consent local medical committees, in consultation with local executive councils, have discretion to vary the model distribution scheme should this be necessary to meet the needs of their own areas, and the Committee feels that this possibility safeguards the position of the medical officer of a school who can show that the present arrangements are inequitable in his particular case.

Back Debts and Back Credits

45. The Committee's attention has been drawn to a problem which arises from the provisions in the regulations which govern the retrospective adjustments which sometimes prove necessary to the amounts paid to the general practitioner by way of quarterly capitation fees. Whereas there appears to be no limit placed upon the period in respect of which either back debts or back credits can be made, in practice, retrospective debts are more easily applied than adjustments in the practitioner's favour. The Committee is to discuss this matter with the Ministry of Health.

THE DANCKWERTS AWARD AND THE SMALL-LIST PRACTITIONER

46. It will be remembered that the Special Conference, held on May 5 last year, not only reaffirmed its support of the new distribution scheme but endorsed to the full the action which the Committee proposed to take to give effect to the rider passed by the Conference in 1952, when the Working Party's proposals were originally approved. The sense of the rider was briefly that, if after the new scheme of distribution had been endorsed by both parties it was found in the light of experience that certain groups who might have been expected to have benefited had, in fact, not done so, it should be left to the Working Party provisionally to allocate an appropriate proportion of the final settlement moneys for the purpose of remedying any obvious defects in the distribution scheme.

47. Clearly, the wishes of the Conference could be implemented only after the new distribution scheme had been in operation for some time and its effects assessed in the light of experience. Again, the Committee felt that a comprehensive inquiry into the position of practitioners with small lists would be necessary before any revision of the distribution scheme in favour of this particular section of the profession could be justified.

48. For these reasons the Committee, in consultation with the Ministry, called the Working Party together again to investigate the problem and to initiate an official inquiry designed to reveal both the number and groups of general practitioners who might in the light of experience have been found to be adversely affected by the new distribution scheme. The Committee felt that such a step would not only safeguard the accuracy of the information which was being sought but would also have the advantage that the Ministry would be aware of the Committee's intention to examine the situation and would be prepared, in advance, for any adjustment in the Working Party's scheme which might prove necessary.

49. At the same time, the Committee secured the inclusion in the regulations of a provision whereby, should it be decided to revise the distribution scheme in any way, the steps taken to this end could be applied retrospectively.

50. As a first step the Ministry prepared a list of single-handed practitioners who on January 1, 1953, were recorded as having lists of not more than 1,200 patients, and executive councils were asked to supply certain particulars about these doctors from their own records.

51. Although this official information gave the Working Party a good deal of information about the circumstances of the practitioners concerned, it was thought to be desirable to invite local medical committees to supply other information mainly concerning the work which those within the scope of the survey were undertaking outside the provision of general medical services under the Act.

52. These two inquiries have now been completed, and the results analysed. A further meeting of the Working Party has been held and a full account of the progress which has been made will be included in the Committee's Supplementary Report.

MONTHLY PAYMENTS TO GENERAL PRACTITIONERS

53. The question of monthly payments to general practitioners has been discussed with the Ministry of Health. Although the Committee does not consider it necessary to make special provision in the distribution scheme itself, it felt that it should be possible to arrange monthly payments to general practitioners who so wished without placing upon them the necessity of proving that hardship would otherwise arise.

54. The Ministry fully accepted the Committee's view, and, in a letter to the Executive Councils' Association published in their Journal, has suggested that requests for monthly payments should be interpreted in a reasonable way and without insistence upon detailed proof of the nature of a practitioner's difficulty.

55. The Committee believes that these new arrangements should be given a trial, and hopes that local medical committees will report any cases of difficulty which may arise in their areas.

INDUCEMENT PAYMENTS

56. Discussions have taken place with the Ministry on the new levels of income which should be taken into account in deciding upon the future scale of inducement payments, with special reference to the position in Scotland, where it was agreed that an income level of £1,400 should be taken into account when considering the provision of inducement payments. As a result of the Danckwerts award the Inducement Fund, as such, no longer exists, but the Committee secured an assurance from the Ministry that it was its intention to continue to make grants of this nature. In future,

they will be made upon an enhanced scale to take account of the increased level of remuneration established by the award, and although no specific figure has been laid down for England and Wales, the amounts will not be lower than the Scottish scale. Instructions to this effect have been issued to executive councils.

GROUP PRACTICE

57. As soon as the definition of group practice formulated by the Committee on General Practice of the Central Health Services Council was available the Committee, in conjunction with the Ministry, discussed possible ways of allocating the sum of £100,000 set aside by the Working Party to encourage group practice. A proportion of this sum will be set aside for use in Scotland, where a separate but similar scheme will operate.

58. In brief, Sir Henry Cohen's committee has defined group practice as a practice carried on by several general practitioners working together in close association, consulting one another about their patients, and doing their surgery work in whole or in part in a common building controlled by the members. Normally a group will consist of between three and six members, who may or may not be in partnership but who will have a proper understanding between them on the sharing of the earnings of the group and of their expenses.

59. The Ministry has agreed with the Committee's view that while a group will not normally consist of less than three persons, in exceptional cases, particularly in rural areas, two will be recognized as a sufficient number. Financial assistance to a group will take the form of an interest-free loan which will be recoverable by quarterly deductions from the remuneration payable by executive councils to individual members of the group. Loans will be available for the purposes of the erection of new buildings, the acquisition of existing buildings and their conversion into surgery premises, or the conversion of buildings already owned by members of the group.

60. A Committee—the Group Practice Loans Committee—has been set up consisting of four members of the Committee and four officers of the Ministry of Health, together with legal advisers, to consider applications for loans. This Committee will advise the executive council, to whom the application will in the first instance have been submitted, whether a loan should be made, and, if so, the amount which should be lent. Normally, the period of the loan will be not less than 10 years and not more than 20, although no standard term has been prescribed.

61. The Committee's representatives, in consultation with the Ministry, have also considered what security should be taken by the executive council for the repayment of the loan. It was decided not to require a mortgage to be taken out on the group premises, as, while this would afford good security, it was felt that it might unduly restrict the operation of the scheme. The model agreement has accordingly been drawn to provide for the joint and several liability of the various members of the group, and, in order to cover the possible contingency of one member leaving the group before the expiry of the loan period, it is a requirement of the issue of the loan that the various members will enter into some formal agreement between themselves defining their respective rights and liabilities.

62. The Committee has also discussed with the Ministry and the Medical Practices Committee the question of the admission of a new member of the group to the medical list for the area. It was agreed that in a closed area, while the group should have the right to replace an outgoing member, they should not have a similar right to add to their numbers by taking in an additional member. In any open area both replacements and additions will, of course, be without restriction.

63. In order to regulate the position in a closed area it has been decided that where a group wish to admit a new member, either as an addition to the existing group or to fill a vacancy, whether in formal partnership or not, admission to the medical list will be as if the group were in

formal partnership. It would be necessary for the members of the group to reach agreement as to the new member's share of liability for the outstanding or continuing loan. Full details of the scheme have now been sent to executive councils and individual general practitioners.

THE COST OF THE NATIONAL HEALTH SERVICE

64. As local medical committees are aware, the Minister of Health in 1953 established a committee under the Chairmanship of Mr. C. W. Guillebaud, a Cambridge economist, to review the present cost of the National Health Service and to suggest means—whether by modifications in organization or otherwise—of ensuring the most effective control and efficient use of Exchequer funds and to advise how a rising charge upon the Exchequer could be avoided while still providing for the maintenance of an adequate Service.

65. The Association was invited to give evidence to the Guillebaud Committee, and the Council, in turn, invited the G.M.S. Committee to consider what evidence should be given on those aspects of the National Health Service with which the Committee is directly concerned. In common with the other Standing Committees of the Association the Committee was also invited to comment as it saw fit upon any other aspect of the Service.

66. A special subcommittee was set up to prepare a draft memorandum of evidence and local medical committees were invited to suggest any points which they felt should be included.

67. The Committee wishes to thank local medical committees, who, in spite of the very short time available, responded so readily to its request for suggestions as to ways and means of securing economies in the Service. Many of the suggestions made were included in the Committee's memorandum, which has been accepted by the Association and incorporated in the main body of evidence to the Guillebaud Committee.

68. The evidence was, of necessity, confined to recommendations and observations of a general character based almost entirely upon policy which has already been determined either by the Conference or by the Representative Body. The Guillebaud Committee has been asked to receive a deputation from the Association to give oral evidence, and the memorandum of evidence will be published in the *British Medical Journal* at a later date.

ADMISSION OF STUDENTS TO MEDICAL SCHOOLS

69. It will be remembered that in its report to the last Annual Conference the Committee announced that a special subcommittee had been established to investigate the number of students entering medical schools, the number qualifying from the schools, and the number of newly qualified practitioners likely to be absorbed into the various branches of the profession.

70. The decision to investigate this problem was originally taken by the Council of the Association, but the Committee felt that for a number of reasons this was a matter of particular concern to general practitioners. Firstly, Mr. Justice Danckwerts had expressed the view at the Adjudication that it might be necessary to reconsider his decision that the Central Pool should be based on the number of doctors in the Service if the number of new entrants to general practice subsequently proved to be disproportionately high. Secondly, although the new distribution scheme with its system of Initial Practice Allowances and notional lists had eased the problem of new entrants there was no doubt that practitioners were finding it increasingly difficult to establish themselves in general practice.

71. Nevertheless, the reduction in the registrar establishment—a step which had aggravated the difficulties in general practice—and the many problems of those wishing to enter other branches of the profession, made it essential that the investigations should not be confined solely to general practice, and in consequence representatives of the Central

Consultants and Specialists, Public Health, Overseas, and Armed Forces Committees were invited to participate in the discussions.

72. As a first step consideration was given to the various available sources of information on which the investigation could be based. Inquiries were made as to the data which could be obtained both from the Association's own records and from a number of outside bodies, such as the General Medical Council, the Medical Practices Committee, the Ministry of Labour, etc., and, since the inquiry which was envisaged involved an estimate of how the future output of the medical schools should be related to the recruiting needs of the various branches of the profession over a period of years, expert actuarial advice was also sought at an early stage in the proceedings.

73. As a result of these preliminary investigations the experts advised that before any attempt could be made to relate the output of doctors to the opportunities which would be open to them, an estimate would first have to be made of the medical needs of the country and, in the case of the National Health Service, the requirements for medical personnel in all its branches. The acceptance of this view clearly involved consideration of matters of the highest policy. For example—at what point could it be said that general practice was likely to reach saturation? What should be the average doctor-patient ratio throughout the country, and, on a long-term basis, was there a possibility that the maximum number of patients which a single-handed practitioner might have on his list (at present 3,500) would be revised?

74. Again, not only had the needs of the public to be met in peace, but an allowance had to be made for the overall medical manpower likely to be necessary to meet the needs of both the Services and civilian community in time of total war. The first considerations were matters of concern to the profession and the Ministry of Health; the latter was one of national policy which could presumably be resolved only at the highest Government level.

75. Another problem was the overall establishment of hospital officers and the question of senior hospital staffing generally. The Ministry has made it quite clear that there is no possibility of any substantial increase in the number of consultant posts, and over the next ten years there would inevitably be numbers of senior registrars and registrars unable to achieve consultant appointments. In consequence, fewer practitioners would be prepared to extend their hospital appointments, and this, in time, would necessitate their absorption, as well as that of the redundant registrars, into other branches of the profession.

76. Two other fields can be quoted as examples of the complexity of the problem. Firstly, could it be argued that the Colonial Service establishment was likely to decline because of the move towards self-government in the Colonies which are at present manned by British doctors? Secondly, how wide were likely to be the recommendations of the Waverley Committee, which was examining the requirements of the Services in peace and war?

77. Having given all these factors full consideration, it became obvious that, as so many outside interests were involved, no one organization could solve so complex a problem or obtain, with any pretence of accuracy, the statistical data which alone could give the general picture upon which an estimate of future requirements of medical personnel could be based.

78. The question then arose as to whether, taking all these factors into account, it would not be in the best interests of the profession for the Council of the Association to invite the Ministry of Health to co-operate in the establishment of a Working Party to examine on a long-term basis and with the widest possible terms of reference the future number of medical practitioners likely to be required in all branches of the profession, and to correlate the intake of students to the teaching schools to the estimated needs. Even so, before putting forward a recommendation on these lines, it was felt that every effort should still be made to secure some data which would indicate the extent of the problem and support

the fear that there was likely to be a substantial excess of doctors over the number of openings available over the next few years.

79. Unfortunately, because of the limited data available, it was not practicable to secure a strictly actuarial picture of the situation, but it nevertheless proved possible to produce estimates based on the Association's own records which more than substantiated the view that if existing trends continued a surplus of doctors qualifying over the number needed each year would inevitably appear within a very few years.

80. The Council was therefore recommended to invite the Ministry of Health to set up a Working Party to study the whole problem.

81. In making this suggestion it is envisaged that the Working Party would, in addition to the members of the Ministry of Health and the Association, include officers of the Colonial Office, the Ministry of Defence, the Ministry of Labour, the Home Office, the General Medical Council, and Deans of Medical Schools, etc. By so doing the statistical resources of all these bodies could be made available and examined, and consultation between the parties concerned and their constituent bodies could take place on the matters of future policy which would inevitably arise.

82. This recommendation was accepted by the Council and the Minister's reaction to the proposal is now awaited.

ENTRY OF EX-REGISTRARS INTO GENERAL PRACTICE

83. The reduction in the registrar establishment in hospitals had inevitably led to an increase in the number of ex-registrars seeking openings in general practice, and the Committee has been asked to do what it can to encourage executive councils to give equal consideration with other applicants to doctors who have spent several years in hospital, provided that they have also had adequate experience in general practice. The difficulties of the ex-registrar entering general practice are very real. There is a feeling among registrars that their hospital experience goes against them when they apply for vacancies in general practice. The Committee, however, from the experience of its members, claims that, provided an ex-registrar also has adequate experience in general practice, there is no question of executive councils discriminating against him. Obviously, a single-handed vacancy with a large list of patients demands the appointment of a doctor who already has good general practice experience. The registrars themselves are often unwilling to accept a reduction in income which is inevitable where succession is to a small practice, or where entry to general practice is sought via an assistantship.

84. This matter has been discussed with the Ministry of Health and every effort will be made to overcome the present difficulties. The Ministry is to ask hospital authorities to consider ex-registrars wherever possible in their plans for the junior staffing of hospitals. A further approach is to be made both to the Medical Practices Committee and local executive councils to see that ex-registrars with suitable experience in general practice are given every opportunity of applying for suitable vacancies when they arise.

APPOINTMENTS TO PRACTICE VACANCIES AND JUNIOR HOSPITAL APPOINTMENTS

85. The Committee's attention has been drawn to a suggestion which if adopted might help the hospital service in overcoming the shortage of junior hospital staff. The suggestion is that where there is a vacancy in the medical list either for a successor to a practice declared vacant or for an additional doctor in a designated area, and where at the same time there is a vacant hospital appointment, the advertisement for the appointment to the practice should, in addition, state that there is a hospital appointment which might be available to a suitably experienced applicant for the practice.

86. The Medical Practices Committee, who asked for the Committee's views on the subject, have been informed that

in the opinion of the G.M.S. Committee such a scheme has considerable possibilities and might well be tried out experimentally.

CONSOLIDATION OF THE NATIONAL HEALTH SERVICE (GENERAL MEDICAL AND PHARMACEUTICAL SERVICES) REGULATIONS

87. The National Health Service (General Medical and Pharmaceutical Services) Regulations were originally published in 1948, and since that time they have been considerably amended to meet changing conditions in the Service. The Ministry has now incorporated these various amendments in the new regulations and will shortly issue them in consolidated form. The draft of the new regulations was submitted to the Committee and various minor alterations have been suggested to, and accepted by, the Ministry.

88. The considerable amendments which have been made to the original regulations have also necessitated a revision of the Ministry's handbook for general practitioners. This is now under way, and the Committee hopes that it will be possible to issue the amended handbook in the near future.

CIRCULATION OF AMENDING REGULATIONS

89. The Ministry of Health put forward a suggestion that amending regulations should no longer be circulated to individual practitioners, but rather that minor amendments should be dealt with by means of circular letters. The Committee, however, takes the view that it is important that every general practitioner should be kept fully aware of all alterations which are made to his terms of service. The Ministry has been informed of this view and has agreed to make no change in the existing practice.

MACHINERY FOR FILLING PRACTICE VACANCIES

90. Last year the Annual Conference, and subsequently the Representative Body of the Association, gave approval to the Committee's recommendation that the machinery for filling practice vacancies should be overhauled and improved. It will be remembered that briefly the Committee proposed: firstly, that the executive council itself, after consultation with the local medical committee, should be responsible for appointing a successor; secondly, that the decision as to whether a practice is to be dispersed or a vacancy to be declared and advertised should remain with the executive council in consultation with the local medical committee; and, thirdly, that the Medical Practices Committee should act as an appeals body.

91. Although these proposals have now been discussed with the Ministry it was pointed out that as the Committee on General Practice of the Central Health Services Council is expected to report in the near future, and as this report may well recommend changes in the existing methods of filling practice vacancies, it would be preferable to defer consideration of this question until their views are known. The Committee has therefore agreed that further discussion on this matter should be resumed when the report is available.

SUCCESSION TO A VACANT MEDICAL PRACTICE BY A PARTNER

92. The Conference last year referred to the Committee an amendment to a section of its Report which dealt with the agreement reached between the Ministry and the Committee on the steps to be taken to regulate the position of short-term partnerships.

93. It will be remembered that the Committee had agreed that, in the absence of special circumstances, the Medical Practices Committee should not accept one partner as a logical successor to another unless the partners had been in active practice together for about a year. Some doubt had been raised as to the position of local medical committees in giving advice of this nature to the executive council when considering a particular case, and it was suggested that the decision by a local medical committee not

to accept a practitioner as a logical successor might be challenged in the Courts.

94. The Committee has now examined this question in detail with the Ministry and, after careful consideration and in the light of the views expressed by legal advisers, it is confident that provided the local medical committee acts in good faith there are no grounds for the fear that it might be liable to damages. In the circumstances, the Committee has reaffirmed its view that the agreement reached with the Ministry and the Medical Practices Committee on this issue should not be modified.

CHANGE OF PRACTICE

95. The Committee has for some time been conscious of the difficulties experienced by general practitioners who wish to change the area of their practice, and attention was once again drawn to this problem at last year's Annual Representative Meeting. Although efforts have been made in the past to facilitate the exchange of practices, the results have so far been disappointing.

96. The Committee therefore established a special sub-committee to examine the problem, and its report is set out in Appendix B. The Committee fully concurs with the suggestions outlined in this report and preliminary discussions upon them are taking place with the Medical Practices Committee.

97. Should these proposals be acceptable to the Annual Conference, steps will then be taken to give wide publicity among local medical committees and executive councils to the methods which are available for overcoming this problem.

REMOVAL FROM THE "MEDICAL REGISTER"

98. Although arrangements already exist with the General Medical Council for the Association to check the last known address of any practitioner whom the Council proposes to remove from the Register under Section 14 of the Medical Act, at least one case has come to light in which a general practitioner still in practice was removed from the Register because of his failure to notify the General Medical Council of a change of address. The legal implications of this position will be obvious to all.

99. The Committee would like to take the opportunity of emphasizing the fact that doctors who change their permanent address should always notify the General Medical Council, and that failure to do so may result in deletion of their registration if the Council is unable to trace them.

ALLOCATION OF PATIENTS TO GENERAL PRACTITIONERS

100. The Committee's representatives have once again discussed with the Ministry the considerable disquiet which still exists about the position of a general practitioner who may be required to provide medical attention for a patient already receiving treatment from an unqualified practitioner.

101. The Ministry is appreciative of the profession's point of view, but it appears that the only effective solution to the problem is an amendment of the N.H.S. Act. Unfortunately there is little hope of any early legislation in the health field, and the political difficulties of an amendment on the lines required are considerable. The Ministry felt, therefore, that at this stage it could only repeat its suggestion that a suitable reference should be made in the "Notes for Guidance of Service Committees," advising these committees that the attitude of the General Medical Council to "covering" should be borne in mind when a practitioner is required to appear before them as a result of refusing attention to a patient who is also receiving treatment from an unqualified practitioner.

102. The Committee has accepted this proposal as an interim solution but has reiterated its firm view that, ultimately, this anomaly must be corrected by a suitable amendment of the Act itself. The position will be kept under constant review.

**REINSTATEMENT OF EX-SERVICE MEN ON
DOCTORS' LISTS**

103. The Committee has again made representations to the Ministry of Health to make provision for the automatic reinstatement of demobilized Services personnel. It will be remembered that the Ministry had previously undertaken to amend Form E.C. 13 (the application form for inclusion in a doctor's list which is used by a person discharged from the Services) so as to ensure that the discharged person is reminded not only to reinstate himself on a doctor's list but also to hand the form to his former doctor if he wished once again to become his patient.

104. This leaflet has now been redrafted on these lines and the Ministry does not propose to take further action in the matter until it is seen whether the amended Form E.C. 13 has the desired effect. The Committee will continue to watch the position closely.

105. The Committee also drew the Ministry's attention to the danger that, where an ex-Service man fails to apply for reinstatement upon discharge from the Forces, his medical records may sometimes be destroyed. Arrangements have now been made to ensure that the medical records of persons enlisting in the Forces are retained by the Central Register pending notification of the acceptance of the ex-Service man by a doctor on his return to civilian life. They will be retained for a period of 10 years.

REDUCTION OF LISTS

106. The Committee's attention was drawn to difficulties which had arisen in one area in connexion with the notice which is sent by the executive council to a patient who is to be removed from the list of a doctor in consequence of the reduction of lists under the distribution scheme. The notice used gave the impression that the doctor himself was for some reason or other taking the opportunity of ridding himself of a particular patient. Although the executive council was appreciative of the doctor's point of view, it nevertheless felt that it must include in its notice some indication of the fact that the doctor himself had nominated the patient as one to be removed from his list, and that the council had no part in deciding upon the actual patients who were to be transferred to another doctor.

107. Consultation on this problem has taken place with the Executive Councils Association, and the Committee is giving further consideration to the wording of a model form which might be unexceptionable and which would be capable of national application.

ELIMINATION OF INFLATION

108. The recent large-scale operation to eliminate inflation from doctors' lists proved effective in reducing it to a very low level. The Committee is anxious to ensure that an unsatisfactory situation should not arise again. It is essential to the distribution scheme that full accuracy of lists should be maintained. If any substantial degree of inflation should occur, the profession might once again be faced with a recurrence of the fluctuating capitation fee and the variations between different areas which gave rise to so much difficulty in the past, and which prevented an equitable distribution of the Pool.

109. With these considerations in mind, the Committee is disturbed to find that there is evidence of inflation beginning to creep in again. Moreover, with the end of national registration, it will be impossible to carry out any detailed check on the same lines as the recent "purge" when executive council indexes were compared with national registration records. The Central Register in its present form cannot entirely eliminate the danger of inflation, and the machinery must be extended and made fully comprehensive. To this end, it will be remembered that the Committee, as it reported to the last Conference, has for some time been pressing for the introduction of a central alphabetical index to complement the present numerical Central Register. This essential adjunct to the Central

Register machinery is now a matter of urgency, and strong representations are being made to the Ministry.

110. The Committee has also discussed a proposal that in order to curb inflation instructions should be printed on the medical card requiring the patient to notify the executive council of any change in name or address. The Ministry maintained that there are considerable difficulties in placing any requirement of this nature on the patient and has been unable to accept the suggestion.

**ACCEPTANCE OF PATIENTS OF A VACANT
PRACTICE**

111. The Central Ethical Committee of the Association sought the views of the General Medical Services Committee on the ethical considerations which arise when the patients of a vacant practice seek acceptance by other doctors in the vicinity temporarily looking after the practice. The main problem which confronted both Committees was the difficulty of reconciling the right of the patient to select his own doctor with the obligation of the acting practitioner to hold the practice together for the eventual successor. The Central Ethical Committee felt that, following the appointment of a successor, it was, in general, undesirable on ethical grounds for the acting practitioner, without the consent of the successor, to accept as his patient anyone to whom he had been introduced or with whom he had been in professional relationship while acting in the capacity of a locum.

112. In the case of a whole-time locum tenent specially engaged for the purpose of keeping the vacant practice in being, the Central Ethical Committee put forward the view that if the locum was not appointed as the successor he would be bound by the ordinary ethical rules, and in the absence of the consent of the successor should not within a period of five years from the termination of the locum-tenency set up in opposition in the area of the practice concerned. The Committee fully accepts the principle behind this suggestion, but feels that a definite prohibition for so long a period as five years might bear harshly on those seeking to establish themselves in practice.

113. In many cases, however, vacant practices are looked after by colleagues in the neighbourhood, and the Committee did not feel that it was practicable to impose any absolute prohibition on the acceptance of patients by other practitioners in the neighbourhood who had acted as locums once the successor had been appointed. It feels rather that the best way of dealing with the position is to leave it to the discretion of the practitioner concerned rather than place him under any definite obligation, and by the issue of a general statement that a locum, by reason of the advantages he enjoys through his introduction to patients of the vacant practice, should, in fairness to the incoming practitioner, exercise the utmost discretion in the acceptance of patients of the vacant practice.

114. Discussions are continuing with the Central Ethical Committee.

**TREATMENT OF SERVICES PERSONNEL ON
LEAVE**

115. It will be remembered that the Committee had already expressed its general agreement with a proposal made by the Service departments that Services personnel on leave should be treated as temporary residents under the National Health Service. Before these arrangements could be put into effect, however, the Committee sought certain assurances concerning the position of private practitioners who undertook this work. The Committee understands that, although the matter is still under consideration by the Service departments, the outstanding difficulties will soon be resolved.

**TEMPORARY RESIDENT FEES FOR PATIENTS
IN COTTAGE HOSPITALS**

116. The Committee's attention has been drawn to the question of the payment of temporary resident fees in

respect of patients who are receiving treatment from general practitioners on the staffs of cottage hospitals. The situation has arisen because temporary resident claims had been submitted in one area by general practitioners on the staffs of cottage hospitals in respect of patients who were not normally resident within the area of the executive council and who had therefore applied to be treated as temporary residents by general practitioners on the medical list within the council's area.

117. The terms of service for hospital medical staff make it clear that remuneration from the Bed Fund is for services rendered to patients other than those paid for by the executive council, and the Ministry's explanatory circular on the subject stipulates that the services which are, in fact, paid for by the Bed Fund are those within the scope of a general practitioner and given to non-paying hospital patients other than those on the list of the doctor concerned or on the list of either his partner or assistant. No differentiation is drawn between patients from inside the area of the executive council and those from outside the area. Furthermore, the regulations for the payment of temporary resident fees do not stipulate domiciliary treatment, the only condition being that treatment shall actually have been given.

118. The Committee is strongly of the opinion that although the regulations might not specifically exclude payment of temporary resident fees in such cases, it is clearly intended that they should not be paid, and this view has also been taken by the Ministry's auditors, who have refused to pass the temporary resident claims concerned for payment.

119. The Committee deprecates the submission of temporary resident claims in respect of patients receiving treatment in cottage hospitals, and the matter is to be discussed with the Ministry of Health.

MILEAGE

120. The Government Mileage Committee, upon which the Committee is represented by members of its Rural Practices Subcommittee, has now completed the first phase of its work—namely, its review of the adequacy of the Mileage Fund. After an initial delay, caused by lack of accurate information and subsequent adjustments which had to be made to the available data as a result of the Danckwerts award, the Mileage Committee prepared certain statistics which purported to show that there was a case to reduce the total size of the Mileage Fund. These figures were considered by the Rural Practices Subcommittee, and a memorandum was prepared pointing to fallacies in the Mileage Committee's statistics and recommending that the Fund be retained at its present size.

121. The Subcommittee's views were endorsed by the G.M.S. Committee, and its report has now been accepted by both the Mileage Committee and the Ministry itself. As a result, the Fund will remain at £2,000,000.

122. It does appear, though, that in spite of the interim redistribution of the Fund which was carried out in April, 1950, and the subsequent withdrawal of a number of predominantly urban areas from the mileage scheme, there remain a number of anomalies in the payment of mileage in different parts of the country which can be remedied only by a detailed examination of the whole basis of present mileage payments.

123. It is upon this task that the Mileage Committee is now engaged, and executive councils are already providing the data necessary for the survey. Unfortunately, this means that it will still be some little time before the Mileage Committee is in a position to come forward with definite proposals which can be considered by the Conference. Although the Committee naturally regrets the slow progress which has been made, it has not been possible for very many years to carry out a detailed survey of this nature, and the Committee feels that it is only by this lengthy process that it will be possible to secure an equitable scheme of distribution based upon a full knowledge of all the facts.

MEDICAL SERVICES FOR LIGHTHOUSES

124. Further discussions have taken place on the question of payment for medical services given to personnel on lighthouses. In the area of an executive council having a mileage scheme in operation, mileage will be paid at the ordinary rate as far as the shore. The cost of sea transport will be met by an *ad hoc* payment from the Central Pool. The special payment which is made in the case of doctors called to attend lighthouses is also met from the Central Pool. The amount involved throughout the course of a year is, of course, extremely small.

ARBITRATION

125. The Committee has given full support to the Association's Arbitration Committee in its efforts to secure completion of the Whitley Arbitration Agreement. The view is held that there must be an established Court of Arbitration as a top tier to the Whitley Council, to which either side can submit a case for arbitration without the consent of the other.

**REPORT BY THE MEDICAL RESEARCH COUNCIL
ON CLINICAL RESEARCH IN RELATION TO THE
NATIONAL HEALTH SERVICE**

126. The Committee was disturbed to see that the recent White Paper on the subject of clinical research in the National Health Service contained no specific provision for general practitioners to avail themselves of the funds which were being provided for this purpose. The Committee also felt it unfortunate that it had not been possible to provide direct general-practitioner representation on the Clinical Research Board.

127. This matter was discussed with the Ministry of Health and the Committee emphasized its view that the White Paper did not fully recognize the important and vital role which the general practitioner could play in this field. Representatives of the College of General Practitioners were invited to take part in these discussions.

128. The Ministry maintained that the terms of the White Paper did not exclude general practitioners from participating in the funds to be provided for research purposes, but it was not prepared to support the suggestion that a general practitioner should be nominated to sit on the Research Board as of right, although it conceded that if there were a vacancy there was no reason why a general-practitioner nominee should not be considered.

129. Subsequently, the Board was set up but contained no general practitioner amongst its members. Joint representations were made by the College of General Practitioners and the Committee; firstly, with a view to securing an adequate allocation of available funds for research in general practice, and, secondly, to press the rightful claim of the general practitioner to be represented on the Board itself.

130. The Chairman and Secretary of the Committee, accompanied by representatives of the College of General Practitioners, have had informal discussions with Sir Harold Himsworth, Secretary of the Medical Research Council, on all aspects of this important matter, and this had led to a wider understanding of the problems involved. The matter is now under further review by the Committee and the College, and it is hoped to arrange a further meeting with Sir Harold Himsworth in the near future.

**STANDARD OF ACCOMMODATION IN SURGERIES
AND WAITING-ROOMS**

131. It will be remembered that when the Minister of Health addressed the Annual Conference of Local Medical Committees last year he paid tribute to the unique position of the general practitioner as the leader of the clinical team in the health field. The Committee felt considerable satisfaction at this public recognition of the general practitioner's

work and felt that everything possible should be done to maintain and enhance the status of this section of the profession.

132. The Committee felt that one important factor which, in the mind of the public, reflected directly on the status of the individual doctor was his surgery and waiting-room accommodation, and although in spite of post-war difficulties the general standard was of a high order, a number of general practitioners had, by reason of building restrictions and the high cost of repairs and maintenance, been prevented from doing all that they would have wished in this respect.

133. In consequence, the Chairman of the Committee issued a circular letter to every general practitioner in the National Health Service drawing attention to the necessity for maintaining a high standard of surgery and waiting-room accommodation. At the same time, a circular letter was sent to local medical committees explaining the reasons why the Committee had found it necessary to issue such a letter and seeking their co-operation in assisting individual practitioners in their own areas to maintain surgery and waiting-room accommodation of a high order.

SERVICE COMMITTEE AND TRIBUNAL REGULATIONS

134. Subject to certain minor amendments, the Annual Conference and the Annual Representative Meeting last year approved the recommendations made by the special subcommittee which was established to review the disciplinary machinery. The Report has been brought into line with the decisions of the Conference and its recommendations are being discussed with the Ministry of Health. Representatives of the British Dental Association and the National Pharmaceutical Union are taking part in these discussions.

135. The Ministry itself has put forward a number of additional suggestions for amending the regulations, and these are being carefully examined in conjunction with the Committee's own recommendations. A large measure of agreement has now been reached. The next step is for the Ministry to seek the views of the Executive Councils' Association, who are primarily responsible for the administration of the disciplinary machinery and who, it is felt, should have an opportunity of commenting upon the proposed amendments from the point of view of the patient. If the outcome of this consultation with the Executive Councils' Association is not available in time for inclusion in the Committee's Supplementary Report, it is intended that an oral report should be given at the Conference itself.

RESPONSIBILITY FOR THE ACTS AND OMISSIONS OF A PARTNER

136. Further consideration has been given to the anomalous position which arises under the terms of service whereby a general practitioner is responsible for all acts and omissions of any practitioner acting as his deputy or assistant. While this provision is equitable in the case of assistants and locums, in the case of members of a partnership the Committee held that each partner should be held responsible for his own acts as is the position under the Partnership Act.

137. The matter was accordingly discussed with the Ministry of Health and the Ministry suggested that the Committee's objection to the present arrangements would be largely overcome if partners were treated as jointly responsible for the acts and omissions of one in treating the patients of the other. The executive council would then be entitled to take action for a breach of the terms of service against the person who was in actual fact responsible for the treatment of the patient at the time when the complaint was lodged.

138. The Committee felt that the new draft regulation went part of the way to meeting its objections to the present

position, but there was the risk that, if the action against one practitioner failed, the Service Committee might then proceed against his partner.

139. The attention of the Committee has also been focused on the larger question of the responsibility of individual principals in contract with an executive council who deputize for other principals with whom they are not necessarily in formal partnership.

140. Prior to making a further approach to the Ministry the whole position was discussed with the Medical Defence Societies. The meeting formulated the following proposals as a basis for a revision of the regulations, bearing in mind the need to reconcile the personal responsibility of the deputy with the contractual relationship which exists between doctor and patient:

(1) That a practitioner should remain responsible for the acts and omissions of any other practitioner acting as his deputy where the deputy is an assistant or a locum-tenent not on the medical list of an executive council.

(2) Where the deputy is also a principal on the medical list, in any executive council area, whether as a partner or not, the deputy should be responsible for his own acts and omissions, unless it can be shown that there is prima facie evidence that the principal upon whose list the name of the patient appears had himself acted in breach of his terms of service.

(3) That in the event of a complaint being made it should be the duty of the Chairman of the Service Committee before a case is heard to decide (upon the advice of a panel) whether there is a prima facie case against the first principal or whether he had been cited in the complaint merely because the name of the patient appeared on his list. In such an event, provided he was able to show that he had made proper and adequate deputizing arrangements, no further action should be taken against him and only the deputy should be required to appear before the Service Committee.

141. The Committee is of the opinion that the acceptance of the principles outlined above would do much to obviate the present unsatisfactory situation. It therefore recommends that an approach be made to the Ministry of Health to secure an amendment both to the Service Committees and Tribunal Regulations and to the terms of service for general practitioners on the lines indicated in para. 140 above.

APPOINTMENT OF PROFESSIONAL MEMBER OF THE TRIBUNAL

142. It will be remembered that provision is made in the Act whereby the "practitioner" member of the Tribunal is appointed by the Minister from a panel established for the purpose. With the death of S. A. Winstanley (Urmston), the Committee nominated F. M. Rose (Preston) and I. G. Innes (Hull) for membership of this panel. These nominations were accepted by the Minister.

EMPLOYMENT OF GENERAL PRACTITIONERS IN HOSPITALS

143. In its Report to the last Annual Conference the Committee gave a detailed account of the negotiations which had been taking place between the Joint Committee for Consultants and the Ministry of Health on the terms upon which general practitioners should be employed in hospitals.

144. It will be remembered that the Ministry's proposals entailed the classification of general practitioners working in hospitals into several categories according to the work undertaken and the responsibilities involved. The Committee took the view that this subdivision was unnecessary as, with the exception of a small number of posts of a purely training nature, the vast majority of posts of a general practitioner working in hospitals, although undertaking duties of a diverse character, carried a comparable degree of responsibility. Exceptionally, however, the Committee agreed that

posts which could legitimately be held to be of a training nature should not carry a salary, although if they involved work over and above that which would normally be expected of a post of a training nature an honorarium of, say, £50 should be paid. The Committee therefore informed the Joint Consultants Committee, firstly, that no agreement on principles should be reached with the Ministry which might subsequently prejudice negotiations in Whitley Council on the remuneration of clinical assistants; and, secondly, that no practitioner working as a clinical assistant under supervision should be paid less than the rate laid down in paragraph 10 (b) of the terms and conditions of service for hospital staff—i.e., £175 per annum per weekly half-day.

145. The Ministry had previously held that the rate of £175 per annum per weekly half-day should apply only to those practitioners in independent charge of hospital units who were not directly responsible to a consultant or S.H.M.O. in a specialty, and that a suitable rate for general practitioners working under supervision would have to be negotiated through the Whitley machinery. Subsequently the Ministry put forward a proposal that a rate of pay of £125 per annum per weekly session would be appropriate.

146. In view, however, of the fact that negotiations are now proceeding in Committee "B" of the Whitley Council for a review of the remuneration of hospital medical staffs, it has been agreed between the Staff and Management Sides that the actual rate of payment for general practitioners working as clinical assistants should be left until the major question is resolved.

JUNIOR STAFFING OF HOSPITALS

147. The views of the Committee were sought by the Joint Consultants Committee on a memorandum prepared by the Ministry of Health on the subject of the junior staffing of hospitals. Briefly, the Ministry's view was that the present acute shortage of junior hospital staff could be met only by the complete reorganisation of hospital staffs generally and by a far wider employment of general practitioners in hospitals. This question is, of course, of particular significance in view of the negotiations which are taking place through the Joint Consultants Committee on the remuneration of general practitioners employed in hospitals, and the matter has been fully examined with the Joint Consultants Committee. Apart from the remuneration aspect, both Committees are in agreement with the broad outline of the Ministry's views, and discussions are proceeding.

PROVISION OF DIAGNOSTIC AND ANCILLARY FACILITIES

148. The Committee has once again drawn the attention of the Ministry to the urgent need to provide direct access for all general practitioners to diagnostic and ancillary facilities in hospitals. The Ministry has given an assurance that it will continue to make every effort to improve the facilities available to general practitioners.

REPRESENTATION OF GENERAL PRACTITIONERS IN HOSPITAL ADMINISTRATION

149. The Committee has again taken up with the Ministry of Health the question of general-practitioner representation on regional hospital boards. The Committee is glad to be able to report that there is now at least one general practitioner on every board, but it was, nevertheless, perturbed that in some instances the general practitioners appointed were not those nominated by the general practitioners in the area. The Committee holds that it is essential that the general-practitioner representatives should always enjoy the confidence of their local colleagues.

150. Whilst the Ministry appreciated the Committee's views in this matter, during the course of discussion it emerged that certain of the nominations made by the Association in particular instances had been rejected

primarily for geographical reasons and in order to preserve the balance of areal representation on the board. To overcome this difficulty the Ministry has suggested that the Association should make more than one nomination for any particular vacancy, so that if the first nomination is unacceptable for geographical or similar reasons there will be other nominations available. The Committee is in full agreement with this suggestion.

151. The Committee, through its liaison with the Central Consultants and Specialists Committee, has also considered the problem of obtaining adequate general-practitioner representation on other hospital administrative bodies. In the case of staff committees of the individual hospitals, the Committee feels that they should consist of all the members of the hospital medical staff, and if there are general practitioners on the staff, then they would be so included. On group medical committees or on local medical advisory committees, whether constituted by the hospital staffs or by hospital management committees, there should be adequate representation both of general practitioners, whether employed in the hospital or working outside, and of the public health service.

152. As far as the regional medical advisory committees are concerned, the Committee feels that the establishment of adequate general-practitioner representation on the boards themselves would equally ensure adequate representation on the advisory committees. The Ministry itself endorses this policy, and the Committee will continue to press for its full implementation.

REPORTS TO GENERAL PRACTITIONERS ON THE DEATH OR DISCHARGE OF HOSPITAL PATIENTS

153. Both the Conference and the Representative Body last year stressed the need for hospitals to send an immediate notification to the family doctor on the death or discharge of his patient from hospital. The Representative Body suggested that the Ministry should be pressed to send appropriate instructions to hospital authorities.

154. The Committee feels, in common with the Central Consultants and Specialists Committee, that this is a question for professional co-operation rather than for instruction on the part of the Ministry of Health, and accordingly the matter has been discussed in the liaison committee between the two bodies with a view to overcoming the difficulties which are now experienced.

155. As a result of these discussions it has been agreed that a letter will be sent by the chairmen of the two committees to the chairmen of hospital group medical advisory committees drawing attention to the importance of ensuring that general practitioners are promptly notified of the death or discharge of hospital patients. Copies of this letter will also be sent to the secretaries of boards of governors and hospital management committees, and to the senior administrative medical officer of each regional hospital board.

156. The Committee intends to keep this matter under review, and, if the action which has been taken does not produce an improvement in the situation, further consideration will be given to other methods of facilitating the transmission of this information.

MATERNITY MEDICAL SERVICES

Review of the Maternity Service

157. The Annual Conference last year called upon the Committee to review the whole question of the maternity medical service with particular reference to the relation of fees to work done and to the obligations of the general practitioner under the regulations. The Committee accordingly established a special subcommittee for the purpose which, at the same time, was asked to pay special attention to the problem of properly co-ordinating the different sections of the maternity service. This subcommittee has now completed its work and its report is set out in Appendix C.

158. It will be seen that the conclusion has been reached that, although the present framework of the Act and regulations is in some ways cumbersome, generally speaking a very satisfactory service is given to the public. Certain suggestions have also been made where, by local action on a voluntary basis, it would be possible to secure the greater integration of the three branches of the service. No definite recommendations have been made for any variation in the fees at the present time, but should any alteration be made in the requirements made of the general practitioner providing maternity medical services, the question of the adequacy of the fees now paid would require re-examination. The Committee is in full agreement with the findings of its subcommittee.

Ante- and Post-natal Care

159. It will be remembered that special provision has been made under the arrangements for maternity services whereby, although the patient elects to be confined in hospital, in exceptional cases where, in the opinion of the general practitioner, it is inconvenient for the patient to attend the hospital for her antenatal or post-natal care or where at the hospital's request the general practitioner undertakes these services, the latter is entitled to claim appropriate fees from the executive council.

160. Difficulties have arisen in a number of areas on this point and, although the request has come from the hospital authorities in the first place, the validity of the claim on the executive council has been questioned.

161. The Committee is firmly of the opinion that, in the circumstances outlined above, there is no doubt that the general practitioner should receive a fee for the services which he provides, and the matter is to be taken up with the Ministry of Health.

Drugs and Dressings for Maternity Patients

162. The Ministry's attention has been drawn to the fact that, in spite of circulars which have been issued to local health authorities, general practitioners in some areas were still being asked to supplement the contents of the maternity packs. The Ministry maintained that considerable emphasis has been given to the fact that the general practitioner should not be asked for additional supplies and that in any particular case where this has happened the attention of the local medical officer of health should immediately be drawn to its own instructions on the subject. The Ministry for its part has undertaken to investigate any cases in which difficulty is experienced in this respect in the future.

163. In addition, the Committee has again sought the provision of maternity packs for patients who elect to be confined in private nursing-homes, particularly as the decision not to be confined at home is often taken on social grounds rather than as a matter of choice. The Ministry, however, feels that, in the present circumstances of financial stringency, it cannot envisage any extension of existing arrangements.

Analgesia in Domiciliary Midwifery

164. The Ministry after consultation with the Committee is undertaking a small sampling inquiry into analgesia in domiciliary midwifery, for the purpose of ascertaining why some patients do not have gas-and-air analgesia. Medical officers of health from selected local authorities are participating in the inquiry.

General Practitioners and Institutional Midwifery

165. The Committee has again emphasized to the Ministry its view that the expectant mother should be referred to hospital only with the knowledge and consent of her family doctor. It must be said that the Ministry for its part fully supports this policy, but, unfortunately, it is apparent that in some parts of the country the practice of making a direct reference from the antenatal clinic or the out-patients'

department without prior consultation with the patient's general practitioner still persists. The Ministry has therefore agreed that further efforts should be made to bring this undesirable procedure to an end, and an appropriate paragraph will be included in a future Ministry circular. In addition, the Ministry has undertaken to investigate any individual cases which are brought to its notice.

166. Strong protests are being made to the Ministry against the decision to close the Springfield Maternity Home at Blackburn, and the proposal to close the Parsons Green Maternity Home at Fulham. The Committee strongly deprecates these attempts to reduce the number of beds available for general-practitioner institutional midwifery, and in particular is disturbed about the manner in which patients were transferred from the Springfield Maternity Home without, in some cases, the consent of the practitioner-in charge.

CARE OF THE ELDERLY SICK

167. The Representative Body of the Association last year passed a resolution to the effect that, having regard to the present need for co-ordination of the various authorities caring for the aged, the Minister should be urged to consider the establishment of geriatric units for the purpose under the guidance of an experienced physician.

168. This matter was considered by the Liaison Committee with the Central Consultants and Specialists Committee, and it was decided to establish a special subcommittee jointly with the Central Consultants and Specialists and Public Health Committees to give further study to the question of the establishment of an integrated service for the treatment and rehabilitation of chronic disablement arising from either age or illness. This special subcommittee has commenced consideration of the problems involved.

CO-OPERATION BETWEEN GENERAL PRACTITIONERS AND HEALTH VISITORS

169. Following consideration of a resolution passed by the Representative Body welcoming health visitors working under the guidance of general practitioners as a means whereby practitioners might increase the help they can give to their patients, a special subcommittee was set up jointly with the Public Health Committee to see what steps could be taken to further this policy.

170. The Joint Subcommittee prepared a statement which has since received the approval of both parent bodies and which emphasizes the need for close co-operation between general practitioners and health visitors. Harmonious relations can always be established if good will and interest are present, and the Subcommittee suggested that the acceptance of the following principles would do much to this end:

(1) Co-operation between the general practitioners and the medical officer of health and his staff regarding the help, care, treatment, and aftercare of all patients is essential.

(2) The local health authority has certain statutory obligations regarding the health of the community, and the health visitor who is employed by the local health authority is under the direction of the medical officer of health. This, however, in no way prevents a health visitor from working closely with the general practitioner and under his guidance in the care of individual patients.

(3) Direct consultation should take place between general practitioners and health visitors with a view to the exchange of information regarding individual patients.

(4) The general practitioner is primarily responsible for the health of the individual and the family, while the health and welfare of the family in relation to the community is a responsibility of the medical officer of health and his staff. The close association of all concerned as members of one team is of vital importance if this responsibility is to be adequately fulfilled.

171. In addition, the Subcommittee put forward the following suggestions of ways in which greater co-operation might be achieved:

(1) In the first place discussions to this end should take place between the medical officer of health of the local health authority, together with senior members of his staff, and representatives of the B.M.A. Branch or Division and the local medical committee.

This is essential, for the detailed arrangements will vary, not only between local health authorities but in different parts—that is, rural and urban—of a local health authority.

Agreement on the principle of co-operation at this level should ensure full implementation elsewhere.

(2) Close personal contact and exchange of information between individual general practitioners and health visitors is essential. In this way both parties will understand and appreciate the other's duties and responsibilities.

In rural areas where the one individual is home nurse, midwife, and health visitor, there is usually that understanding between her and her G.P. colleagues. In urban areas, particularly in the large towns and cities, and where in most cases the health visitor does not act as home nurse or midwife, general practitioners do not know personally the health visitors working in the area.

(3) Complaints have been made by general practitioners that at times contradictory advice is given to patients by health visitors. It is clear that this must be avoided, and here close consultation and co-operation between general practitioners and health visitors is essential.

(4) In addition to their statutory duties, health visitors are available, at the discretion of the medical officer of health, for visiting patients when requested by general practitioners. Full consultation between the parties will result in efficient and economic use of health visitors.

(5) Many general practitioners are unaware of the many facilities which can be made available for their patients through the local authority health and welfare services. Some medical officers of health regularly circulate all general practitioners in their area with detailed information, and it is strongly recommended that this should be done in all areas. It can be of great value to the general practitioner to know what assistance can be provided by his local authority. The full use of health visitors would tend to obviate repeated visits on the part of the general practitioner and would facilitate his work by securing rapid assistance through the local authority. In all these ways the health visitor can supplement the service of the general practitioner, and by working in partnership they can weld together both the clinical and preventive aspects of the service within the existing arrangements under parts III and IV of the National Health Service Act.

(6) In certain areas a health visitor has been allocated by the medical officer of health to work with a group of general practitioners. This has proved to be a satisfactory arrangement, but its practicability depends on local circumstances. It is recommended that this arrangement could well be extended wherever possible.

172. Copies of this statement have been sent to the secretaries of local medical committees and Branches and Divisions of the Association and to medical officers of health of local health authorities.

173. The Joint Subcommittee has also prepared a memorandum of evidence for submission to the Working Party which was established by the Minister on the work, recruitment, and training of health visitors.

HEALTH CENTRES

174. Two questions have arisen in connexion with the London County Council's health centre at Woodberry Down, upon which the advice of the Committee has been sought. Firstly, it looked at the advisability of the county council's policy not to employ any general practitioner who is working at the centre on a part-time sessional basis in their wel-

fare clinics which operate at Woodberry Down. Secondly, the Committee's views were sought on the desirability of providing physiotherapy and pathological laboratory facilities at the centre.

175. The Committee, for its part, can see no objection to doctors working at the centre being employed by the county council upon a part-time sessional basis at these welfare clinics, although, of course, they should not receive preferential treatment compared with general practitioners from outside the centre who also wish to take these posts. Similarly, the Committee can see no objection to the provision of physiotherapy and pathological facilities at the centre, provided that they are not restricted merely to general practitioners working in the centre.

176. The Committee is, of course, conscious of the experimental nature of health-centre practice as a whole, and it has recommended the local medical committee to proceed on the lines envisaged above and to review the situation in the light of experience.

NURSING SERVICE

177. Following a resolution passed by the Conference last year the Committee has made inquiries of the Ministry of Health as to the possibility of making increased use of assistant nurses in connexion with the home nursing service.

178. The Ministry is in full agreement with this policy, and, indeed, the number of assistant nurses both full-time and part-time employed in the home nursing service is steadily rising. Every opportunity will be taken to make use of assistant nurses in this capacity.

TRAINING OF DISTRICT NURSES

179. The Minister of Health has established a Working Party to consider the question of the training of district nurses. The Committee supported the nomination of J. Stanley Thomas (East Ham) to serve on the Working Party.

MEDICAL EXAMINATION OF STUDENT NURSES

180. As a result of representations by the Committee the Ministry has now reconsidered the arrangements whereby the fee for the medical examination of student nurse candidates is paid by the candidate to the doctor, the former being reimbursed by the hospital. The position varies in different parts of the country, and in many cases the hospital authorities do not require a report from the candidate's own doctor.

181. The Ministry is unwilling to issue any circular to hospital authorities which might have the effect of encouraging them to require a medical report from the candidate's family doctor, but it has agreed that hospital authorities shall be reminded that where such a report is called for, the hospital authorities have power to pay a fee of up to a maximum of one guinea, and that there is no reason why this should not be paid direct to the doctor furnishing the report.

182. The Ministry has agreed to look into any difficulties which may arise in any particular area.

CERTIFICATION

Standard of Certification

183. The Committee's attention was drawn to one or two isolated instances where the accuracy of medical certificates given by general practitioners had been called to question and, indeed, the validity of the certificates themselves challenged by regional medical officers of the Ministry of Health. The Committee was in no doubt as to the high standards which the vast majority of general practitioners have set themselves in issuing certificates, but it felt the increased call for certificates resulting from the National Insurance scheme and the rising tendency of employers to demand

certificates for even short periods of absence had considerably added to the difficulties of general practitioners in this respect.

184. It is, in the Committee's view, of the greatest importance that the public should continue to have a proper respect for the value of certificates which are issued by general practitioners, and it therefore sought the assistance of local medical committees not only in drawing the attention of practitioners in their areas to their obligations in this matter but to take up on their behalf any cases where it would appear that unreasonable demands had been made by a patient.

Explanatory Leaflet on Certification

185. As is mentioned elsewhere in this Report, the Ministry of Health is now in the process of revising its handbook for general practitioners. Subsequently the Ministry of National Insurance suggested that the present explanatory leaflet on National Insurance certification should similarly be revised and issued in the form of a supplement to the Ministry of Health handbook.

186. The Committee is fully in agreement with this suggestion and has had an opportunity of considering in detail the revised draft of the certification leaflet, which it considers will be of considerable use to general practitioners.

Revision of Form Med. 1

187. The Committee has agreed to the amendment of the part of the first medical certificate which the insured person fills up as his claim form. The reason for the amendment is that it will obviate further inquiries being made in respect of claimants who have no dependants. The part of the certificate used by the doctor is not affected in any way by this revision.

"Vague" Certificates

188. The Committee examined a suggestion that, as an economy measure, the one copy of Form Med. 6 (the "vague" certificate) which is included in every pad of medical certificates should be omitted and that special pads of Form Med. 6 should be made available.

189. The Committee, after consultation with the Ministry of National Insurance, did not feel that much saving would accrue from this proposal, nor did it feel that general practitioners would welcome the issue of separate pads of these forms. The use at present made of Form Med. 6 is small, and the Committee would like to take this opportunity of pointing out that a wider use of this form would do much to prevent unnecessary references to regional medical officers, particularly in the case of those claimants for insurance benefit who are much more ill than the cause of incapacity given on the medical certificate would normally suggest.

Certificates for Patients in Convalescent Homes

190. It was pointed out to the Committee that much of the attendance on temporary residents in convalescent homes was for the sole purpose of issuing a formal certificate of incapacity, when the mere presence of the patient in such a home was reasonable evidence of this fact. It was therefore suggested to overcome this unnecessary burden of certification, firstly, that responsible persons in recognized convalescent homes should be permitted to issue certificates of residence, which would be accepted by the Ministry of National Insurance in place of the usual medical certificate; and, secondly, that doctors should be allowed to issue convalescent certificates after a period of illness shorter than the 28 days at present in force.

191. The Committee feels that these proposals have much to commend them, and they are being discussed with the Ministry.

Certification for Surgical Corsets

192. Although the Committee was successful in securing a reduction in the number of prescribed diseases for which tax-free corsets could be obtained, and so reducing this form

of certification, it still felt that the only solution to the problem lay in the total abolition of certificates for this purpose. The Committee therefore made strong representations to the Board of Customs and Excise that further consideration should be given to the early removal of the need to obtain a certificate before a surgical corset could be secured free of purchase tax.

193. The Board is fully in sympathy with the Committee's views that it was difficult to prevent abuse of the present arrangements, but the whole question of surgical corsets was part of the wider problem of surgical appliances as a whole, and it felt that the Committee would not object in principle to a scheme of purchase-tax exemption for any necessary surgical appliances. Whilst in the case of most appliances it would be readily apparent that they were required purely on medical grounds, in the case of corsets there was frequently room for doubt, and it was for this reason that a certificate was required as evidence of medical need. To withdraw the concession *in toto* would fall hardest on private patients and on those N.H.S. patients who prefer to buy their own appliances and corsets rather than get them through the National Health Service.

194. Nevertheless, the Board was concerned to prevent unnecessary demands and abuse of any scheme for purchase-tax concessions, and it felt that the best course would be for any condition which might easily give rise to abuse to be deleted from the prescribed list. The Committee was provided with figures which showed that the demand for corsets supplied free of tax had shown a considerable drop since the list of certifiable conditions was reduced last year. Since then, the Board had itself removed "severe splanchnoptosis" from the list.

195. The Committee, at the invitation of the Board of Trade, will continue to keep the list of prescribed diseases under review, and should it become apparent that there is any abuse of the scheme, steps will be taken to revise the list further. It is hoped that, by so doing, the demand for medical certificates for this purpose will continue to fall.

NOTIFICATION OF CAUSE OF DEATH

196. The attention of the Ministry was drawn to the doubt which existed in some quarters as to whether it was part of a practitioner's terms of service to obtain details of the cause of death and to insert these on the medical record envelope in particular, in those cases which were reported to the coroner by the general practitioner.

197. The Ministry's view is that there is no definite obligation on doctors to obtain such details, and that in these circumstances they should merely record such information as they have at their disposal.

COMPENSATION

198. It will be remembered that the Annual Conference last year called upon the Committee to press for the payment of compensation at an early date. With the support of the G.M.S. Committee, the Compensation Committee of the Association is continuing to make strong representations on this subject to the Ministry of Health.

PRESCRIBING AND DISPENSING

Discount on Drugs

199. The Annual Conference last year again expressed concern that dispensing doctors paid on the basis of the Drug Tariff should continue to sustain financial loss when supplying a number of proprietary preparations. The Committee has therefore made further attempts to overcome this grossly inequitable situation, and a joint meeting was held with representatives of the National Pharmaceutical Union and the Association of the British Pharmaceutical Industry.

200. The matter was discussed in great detail, and arrangements have been made for information to be obtained as to the amount of money involved and the precise extent of the loss. The Committee, for its part, has agreed to consider

possible safeguards which, if a revised discount allowance were agreed, might be introduced to restrict such an allowance to those doctors who were dispensing under the National Health Service.

201. Negotiations continue, but the complexity of the problem makes it difficult to attain rapid progress.

List of Appliances

202. The Ministry has agreed to the inclusion of one-inch plastic strapping in one-yard and two-and-a-half-yard lengths in the list of appliances which may be prescribed by general practitioners in the National Health Service.

203. As from July 1, 1953, a syringe manufactured in accordance with B.S. 1619/1950 will normally be supplied whenever an insulin syringe or a hypodermic syringe with insulin is ordered. The Standard provides for a Luer nozzle to the syringe, and each outfit will include two Luer mount needles and an adaptor for the use of Record-pattern needles if these are desired. If a doctor does not wish a patient to have a syringe of this type he is free to specify on the prescription that the alternative Record pattern is to be supplied, although at some future date the Ministry intends that the Luer mount pattern will be the only type to be included in the Drug Tariff. The new standard type has the support of the Diabetic Association.

204. The Committee has sought to make it possible for a practitioner to prescribe diagnostic tuberculin jelly and control jelly for administration by him to his patients. Part 2 of the third schedule to the National Health Service (General Medical and Pharmaceutical Services) Regulations specifies those chemical reagents which may be prescribed, but tuberculin-test materials, together with one or other diagnostic reagents, cannot properly be described as chemical reagents. The Ministry has therefore agreed to regard these reagents as drugs and executive councils will reimburse the cost which the general practitioner incurs in supplying them for his patients.

205. Representations were also made for the inclusion of catheter lubricant. The question of finger-cots and eye-pads is also under consideration.

206. The Ministry of Health has also added to the list masks intended to protect persons suffering from cardiac and respiratory diseases from the effects of smoke-polluted fog. The Chairman of the Committee was informed of the proposed action as soon as the decision to issue the masks had been taken, and he made it clear to the Ministry that, whilst in the special circumstances he could raise no objection to the issue of the circular without prior consultation and discussion with his Committee, he was not in any way departing from the Association's view that the most important step to be taken was to tackle the fog nuisance at source by the prevention of smoke pollution. A statement to the press was issued on behalf of the Committee stressing this point and also reminding the general public of the fact that the masks were only intended for persons suffering from cardiac or respiratory diseases, and not as a general issue. At the same time, it was emphasized that those persons who were entitled to masks should be guided by their general practitioner as to whether or not such masks would be beneficial in their own case, and the public was asked to minimize the calls made on the doctor's time by not asking him to make a special visit for the sole purpose of prescribing the mask.

207. The Committee feels that the Government acted with unnecessary haste, particularly as adequate supplies of the mask were not available at the time that the Ministry's circular was issued.

Prescribing of Elastic Hosiery

208. It appears that on a number of occasions patients have expressed their dissatisfaction with elastic hosiery supplied by a chemist. It has been suggested that the doctor might, in these circumstances, be called upon to decide as to whether or not the hosiery supplied by the chemist is in accordance with the prescription which he has given. The

Committee has accepted this suggestion, but pointed out to the Ministry that in its opinion the original prescription should be returned to the doctor should he be called upon to adjudicate in a particular case.

Prescribing of Disinfectants

209. Following representations by the Committee the Ministry informed Pricing Bureaux that, in the case of disinfectants, only prescriptions ordering more than 16 fluid ounces should be referred to executive councils for subsequent investigation by local medical committees.

210. Although the Committee felt that this step would greatly diminish the number of prescriptions referred, unfortunately this has not been the case, and the Committee therefore suggested that the instructions to Pricing Bureaux should be amended so that normally only prescriptions for over 1 pint of disinfectant should be subject to examination. Many practitioners were in the habit of prescribing in this manner. The Ministry is looking into the quantities of disinfectants which are normally ordered, and discussions are proceeding.

Prescribing of "Casilan"

211. The Committee has received a number of requests for advice on the subject of the prescribing of casilan. This substance is, of course, not one of those which have been classified as foods by the Joint Committee on the Definition of Drugs, and, in pursuance of its policy that every case must be considered on its merits, the Committee does not feel able to give any general guidance on the subject. It is firmly of the opinion that local medical committees must themselves continue to decide such questions in the light of the full circumstances appertaining in each case.

Aureomycin

212. The Committee has asked the Ministry whether aureomycin, which is at present available only through the hospital service, might not be made more freely available to general practitioners. The difficulty is that the supply of aureomycin is still essentially a problem of finding dollars to meet the cost of bulk importation of the crude drug. Nevertheless, the Ministry has given an assurance that it will be freely available as soon as supplies warrant such a step.

List of Specially Expensive Drugs and Appliances

213. Following representations by the Committee, the Ministry has added, or agreed to add, the following drugs and appliances to the specially expensive list: penicillin tulle; sulphonamide compound preparations; porous "elastoplast" bandage; urine sugar analysis sets with refills of diagnostic solution—tablets of copper; and phenylbutazone ("butazolidin"). The Committee has also asked for the inclusion of erythromycin.

214. It is understood that the Ministry proposes to publish a revised list which will take account of the various amendments which have from time to time been made.

Prescriptions for Items on the Specially Expensive List

215. The Committee's attention was drawn by the Ministry to the fact that on a number of occasions prescriptions have been issued by general practitioners to their dispensing patients for items which were not included in the special list and for which payment of the capitation fee was intended to cover. In view of the complexity of these lists it is hardly surprising that such occurrences should sometimes arise.

216. The Ministry suggested that similar errors in the future could be prevented if prescriptions issued by general practitioners for items on the special list could in some way be made distinguishable from ordinary prescriptions. The Committee has accepted this proposal and the method to be adopted will be the use of Form E.C. 10 printed on coloured paper.

242. It will be remembered that, in addition to increasing the maternity benefit in certain circumstances, the Act also

abolished the condition that payment of a maternity grant was dependent upon the production of a medical certificate that the confinement had taken place, and substituted merely the requirement that the woman had been confined. Similarly, in the case of the maternity allowance it abolished the need for a certificate of expected confinement within a stated number of weeks and substituted a requirement that the applicant was pregnant and had reached a stage in pregnancy not more than a prescribed number of weeks before the expected date of confinement. This has the effect that, although the certificate of confinement and expected confinement will normally be required, the statutory authorities will be able to accept other evidence in support of claims to maternity benefit. In particular, it will not normally be necessary for a doctor who has given a certificate of expected confinement to give a certificate in respect of the same confinement when benefit is claimed after confinement.

243. Regulations have now been made to give effect to these changes and the certificates revised accordingly.

VACCINATION AND IMMUNIZATION

244. The Committee was disturbed to learn that a number of local authorities were proposing to discontinue the payment of fees for records of successful vaccination in the case of adults. The Committee felt that this action was a radical departure from the tripartite agreement which was reached by the Committee with the Ministry of Health and the Local Authorities Associations. Accordingly, representations were made to the Ministry of Health, and, whilst the Committee accepts the view that local authorities do not require records for the vaccination of persons going abroad, it strongly opposes any suggestion that other adult records should no longer be required. The Ministry, for its part, has stated that there has been no change in its policy but that, nevertheless, local authorities could only be required to act in accordance with the schemes originally approved by the Minister for carrying out their duties under section 26 of the Act. Whilst the Minister would not approve amendments which would allow the authorities concerned to exclude payment for adult records, in a number of cases the schemes do not specifically call for these records and the Ministry has no power to require local authorities to pay for them.

245. Nevertheless, in order that there shall be no misunderstanding on the subject, the Ministry is proposing to issue a circular setting out its policy on vaccination. This will be submitted to the Committee in draft form.

Vaccination Pad

246. The Committee's attention was drawn to the unsatisfactory nature of the present vaccination pad, and the Ministry has been urged to introduce an improved design.

THE ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

247. The Assistants and Young Practitioners Subcommittee has considered a number of problems during the session.

248. Firstly, the Subcommittee has been concerned with the method of its own election. Although steps were taken to enlarge the electoral rolls last year, it has still proved difficult to secure the adequate representation of all areas on the Subcommittee itself. New methods of compiling the rolls and of keeping them up to date have therefore been devised. In addition, to stimulate interest in the Subcommittee, a short report of its work is to be sent to each member of the electorate when nominations are next sought.

249. The Subcommittee is continuing to examine those problems which particularly affect the assistant and the new entrant into practice. It is particularly interested in the investigation which the Working Party is carrying out into the problem of the small-list practitioner, and its views are being sought by the Amending Acts Committee of the Association on the practicability of reintroducing the right to buy and sell the goodwill of medical practices.

250. Two other major problems are now under consideration. Firstly, whether any alteration should be made to the size of the extra list of patients which a principal is permitted by virtue of the employment of an assistant. Secondly, whether any change should be made in the present requirement that a patient wishing to change his doctor, in the absence of the consent of the two doctors concerned, must give 14 days' notice in writing to the executive council. The Subcommittee's views on both these matters will be reported to the parent committee in due course.

PENSION SCHEME FOR MEDICAL AND DENTAL EMPLOYEES

251. The Committee has previously reported that a scheme was in course of preparation to provide for superannuation and death benefits for employees of doctors. The scheme provides for, *inter alia*:

(a) Pension on retirement at 65, or 60 in the case of a woman, based on salary and length of service with, in the case of men, the option of a "survivor" pension for widows;

(b) death benefits for women, and

(c) return of contributions on withdrawal from the scheme on death or retirement.

252. The Council of the Association has accepted office as Trustees to the scheme through the medium of a small committee appointed for the purpose of its administration. Full details can be obtained from the Medical Insurance Agency, Tavistock House North, Tavistock Square, London, W.C.1.

SPONSORED TELEVISION

253. In view of the many exhortations which are made to the general practitioner to reduce prescribing costs, the Committee felt apprehensive at the possible effect of sponsored television on the public demand for various proprietary medicaments and the consequent rise in the Drug Bill. Accordingly, the Committee drew the Minister's attention to this problem.

TRAINEE GENERAL PRACTITIONER SCHEME

254. Following the approval given by the Conference to the Report prepared by a special subcommittee on the operation of the Trainee General Practitioner Scheme, the Committee discussed the recommendations contained in the Report with the Ministry. It is pleased to be able to report that the Ministry was in full agreement with the recommendations made by the Subcommittee, and the Report has now been circulated to executive councils, who are being urged to consider the implementation of the various proposals made in it in the light of local circumstances.

255. In its report to the last Annual Conference the Committee referred to its proposal to discuss with the Ministry the remuneration of trainee general practitioners in the light of the standards of remuneration established by the Danckwerts award. Preliminary discussions have taken place with the Ministry, and the Department is now in the process of collecting information as to the extent to which the scheme is being used. The Committee, for its part, is awaiting some evidence as to the effect of the Danckwerts award on the salaries paid to ordinary assistants before proceeding any further in this matter.

HOSPITAL REPORT SHEETS

256. The Conference last year called upon the Committee to secure the adoption by all regional hospital boards of a standard size and form of hospital report sheet which would fit a standard medical record envelope.

257. This matter has now been discussed with the Ministry, which is itself in favour of some measure of standardization, but the difficulty is that, at the present time, various hospital authorities are using their own types and styles of stationery and it is difficult to secure uniformity without considerable local opposition. The differing types of office equipment also create problems so far as standardization is concerned.

Nevertheless, the question of standardized reports will be fully considered by the Ministry in connexion with the wider problem of economy in the use of paper, and the difficulties of general practitioners in this respect have been brought to the notice of regional hospital boards through their senior administrative medical officers.

MEDICAL RECORDS

258. Prior to July, 1948, local insurance committees were sent reminders where medical records were required following transfer from one area to another if the records were not promptly forthcoming. At present there is no follow-up of applications to transfer records between one executive council and another, and the failure to pursue initial applications often results in some deterioration in maintaining and transferring records.

259. This matter was accordingly brought to the notice of the Ministry of Health, and whilst the Ministry feels that it is unnecessary, as a matter of routine, for executive councils to send reminders to other executive councils, there is no reason why the clerk of one council should not approach another if there appears to be any obvious delay in transmitting individual records. In any area where delay is experienced, the Committee hopes that local medical committees will be able to take this matter up with the executive council on the lines indicated above.

ACCIDENTAL POISONING OF CHILDREN BY MEDICINAL PREPARATIONS

260. It will be remembered that in recent years a number of discussions have taken place with the Pharmaceutical Society on the measures which might be taken to protect children against accidental poisoning by medicinal preparations. Unfortunately it has not been found practicable to find any method by which the professions themselves could supply any absolute safeguard. Rather, the main duty of protection must always rest with the parents or guardians of the children, and it has been decided that the situation could best be met by instigating some form of publicity campaign emphasizing the known dangers to children. Discussions on this proposal are still in progress.

HEALTH EDUCATION SCHEMES—CANCER

261. The Committee was invited to comment on a draft circular which the Ministry of Health has since issued to local health authorities on the subject of cancer education. It informed the Ministry that it was not convinced of the wisdom of instituting any campaign of this nature, but that, if the Ministry felt that such a campaign should be launched, then it should be confined to education in the more easily accessible cancers. At the same time, it was emphasized that any scheme should be of an exploratory nature and that any scheme should be reviewed in the light of experience after a relatively short period. The Ministry was also informed that general practitioners should be represented on any committee which was formed to sponsor work on cancer education.

262. Subsequently, it appeared that the Ministry was confining itself in the present instance to inviting local health authorities to explore the possibilities of launching local cancer education schemes and that it was not proposed to institute a general campaign but to gain such experience from a few local schemes as will enable the Minister to decide whether to proceed further.

263. The Ministry, while welcoming the suggestion that general practitioners should be represented on any Committee which is formed, was unable to accept the Committee's suggestion that schemes should be limited to easily accessible cancers, as it hoped that education would lead to early diagnosis in all sites. Nevertheless, emphasis in education will be laid on the more easily diagnosed cancers where the possibility of cure is greater.

264. No objection has therefore been raised to the operation of a pilot scheme in a limited number of areas, but

the Committee has stated its wish to be consulted again, in the light of experience of the pilot survey, before any general scheme for cancer education is inaugurated.

CENTRAL COUNCIL FOR HEALTH EDUCATION

265. In its last Annual Report the Committee referred to discussions which had taken place with the Central Council for Health Education with the object of securing a closer liaison between the Central Council and the Committee on matters affecting the general practitioner. As a result of these discussions the Committee is pleased to report that arrangements were made for it to see in draft form existing pamphlets which the Council proposed to reprint and new pamphlets before issue. The Committee has been able to suggest a number of amendments to the council's pamphlets to bring them more into line with the viewpoint of the general practitioner.

THE DEFENCE TRUSTS

266. The Balance Sheets and Statements of Income and Expenditure of the National Insurance Defence Trust and the General Medical Services Defence Trust for the year ended December 31, 1953 (Appendices D and E), will appear in next week's Supplement.

267. A statement showing the contributions so far received from each area is being circulated to local medical committees.

A. TALBOT ROGERS,
Chairman.

General Medical Services Committee.

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

Chairman and Vice-chairman

268. J. T. Baldwin and C. J. Swanson were reappointed Chairman and Vice-Chairman respectively for the Session 1953-4.

Subcommittees

269. The following Subcommittees were appointed for the session: Chairman's, Rural Practitioners', Colliery Practitioners', Dispensing Capitation Fee, Joint Subcommittee with the Central Consultants and Specialists Committee (Scotland) on Relation of General Practitioners to Hospitals, and a Special Subcommittee to consider the effect of the Working Party's Proposals on General Practitioner Remuneration in Scotland.

Representation

270. Representatives of the Subcommittee were appointed to the following committees: Central Consultants and Specialists Committee (Scotland) and their Anaesthetic Services, Ophthalmic Services, and Radiological Services Subcommittees; Maternity Services, Public Health, Partnership Advisory, and N.H.S. (Scotland) Review Subcommittee of Scottish Committee; Assistants and Young Practitioners Subcommittee of G.M.S. Committee; N.H.S. (Scotland) Subcommittee of G.M.S. Committee; Staff Side of Medical Sub-Drug Accounts Committee (Whitley); committee of Scottish Advisory Committee (Whitley); Liaison Committee with Scottish Association of Executive Councils; International and Scottish Advisory Distribution Committees; Editorial Committee of *Prescribers' Bulletin*; Scottish Central Medical Recruitment Committee; Medical Advisory Committee under Regulation II of the Medical and Pharmaceutical Committees and Tribunal Regulations; and Pharmaceutical Committees and Tribunal Regulations; Scottish General Dental Services Committee of the British Dental Association.

Meetings

271. In order to overtake the increasing amount of work falling to the Subcommittee, meetings are being held once a month instead of every other month until such time as it is

no longer necessary. For the convenience of members in the West of Scotland, every third meeting is being held in the Glasgow Regional Office.

Admission of Assistants to Executive Council Lists

272. The question of the admission of a full-time assistant as a principal to the executive council list appears to be presenting some difficulty, and the Subcommittee has been examining the position. There is some doubt as to whether an assistant, on being admitted to the list, is admitted as an assistant or as a principal, and this has been one of the points under discussion. The Subcommittee has taken the matter up with the Department in an endeavour to clarify the general question of the inclusion of assistants in medical lists.

"Restricted" Lists

273. An anomalous situation has arisen concerning the remuneration of practitioners with "restricted" lists who have other patients outside the establishment to which their restricted lists apply. The Subcommittee is examining this position in consultation with the Department, and figures are being obtained showing the size of the problem. On receipt of these figures, further meetings will be held in an endeavour to rectify any anomalies which may exist at present.

Group Practice

274. The Subcommittee has completed its discussion with the Department on the subject of group practice loans, and a memorandum explaining details of the scheme has been issued by the Department to every general practitioner.

275. In the first year of the scheme approximately £12,000 will be available for loans in Scotland, and these will be granted, interest free, towards the cost of providing premises for group practice. The Cohen Committee's definition of group practice for the purpose of the fund, while not being accepted rigidly in Scotland, will form the basis on which claims will be considered—the intention in Scotland being that the availability of such loans should be on as wide a basis as possible. The fund will be administered by a joint committee with representatives of the Department and the Subcommittee. Plans carried out since April 1, 1953, are eligible for assistance on an equal footing with plans to be carried out in the future; plans carried out before that date will be eligible if resources permit.

Partnership Practice

276. A small Subcommittee has been set up to revise and redraft the Partnership Memorandum which was prepared by the G.M.S. Subcommittee in 1951. This subcommittee has met once when various suggestions were made for the improvement and amplification of the memorandum in the light of experience. The Association's legal adviser in Scotland is being consulted with particular regard to the difficult question of restrictive covenants, and the views of the Scottish Medical Practices Committee are also being sought.

Guillebaud Committee

277. After it was announced that the Guillebaud Committee, set up to inquire into the cost and efficiency of the National Health Service, intended to take separate evidence in Scotland, the Scottish Committee of the Association arranged to give evidence to that Committee on behalf of the Association in Scotland. The Scottish Committee consulted the General Medical Services Subcommittee (Scotland) in connexion with the evidence to be submitted and the Subcommittee held a special meeting to consider any recommendations and/or comments it had to make to the Scottish Committee.

Handbook on General Practice

278. A handbook for general practitioners has been prepared by the Department and will be printed in loose-leaf form so that it can more easily be kept up to date. The

Chairman, the Vice-Chairman, and the Secretary, who undertook to examine the handbook in detail, reported to the Subcommittee that, in their view, it was a most helpful document. The handbook sets out very clearly the many administrative details which a general practitioner working in the National Health Service ought to know. It is felt that it will be a most useful book for reference.

Medical Service Committee and Tribunal Procedure

279. The Department has been reviewing the provisions of the National Health Service (Medical and Pharmaceutical Service Committees and Tribunal) (Scotland) Regulations, 1948, in the light of experience over the past five years. It has suggested certain amendments designed to make the intentions of the regulations more clear and to simplify the procedure. The Subcommittee decided to defer consideration of the procedure from the Scottish point of view and the Department's suggested amendments to the regulations until the G.M.S. Committee has completed its negotiations with the Ministry concerning the position in England and Wales.

Ambulance Service

280. The Subcommittee has had several discussions with the Department regarding the Ambulance Service. The discussions have covered the administrative arrangements together with certain suggestions that the Subcommittee has had to make for improving the service. In addition, both the Department and the Subcommittee have paid considerable attention to the marked increase in the use of the Ambulance Service and have agreed on certain steps to be taken to prevent any possible abuse.

National Union of Mineworkers—Counter Certificates

281. The Subcommittee, through its Colliery Practitioners' Subcommittee, has completed satisfactorily its negotiations with the National Union of Mineworkers (Scottish Branch) in connexion with the form of "Counter Certificate" and the fee to be paid. Agreement has been reached on this matter and practitioners in colliery areas have been notified regarding the form of certificate and the fee to be paid.

Maternity Record Card

282. The Maternity Services Subcommittee of the Scottish Committee has agreed with the Department that certain small alterations should be made in the maternity record card. The Subcommittee also approved of the modifications.

Mileage

283. The Mileage Subcommittee of the Scottish Advisory Distribution Committee is still considering the distribution of the Mileage Fund in Scotland and the Department is being pressed to pursue the matter actively. Certain proposals have been forwarded by the Stirling and Clackmannan Local Medical Committee, and these have been passed to the Mileage Subcommittee for consideration. It has been agreed that any proposals from the Department should, in the first place, be submitted to the Rural Practitioners' Subcommittee of the General Medical Services Subcommittee (Scotland) for consideration.

Highlands and Islands Practice

284. Representatives of the Subcommittee had a meeting with certain practitioners from the Highlands and Islands areas to discuss various points which seemed to be causing those practitioners some concern. Some of the practitioners in the more remote areas felt that they were not being adequately compensated for the disadvantages and difficulties borne by them in their particular type of practice—for example, the higher cost of living, practice expenses, housing and transport difficulties. They also expressed concern at the present unsatisfactory position regarding mileage and indicated that a definite mileage scheme would go a long way towards meeting some of their grievances.

Another point brought to the Subcommittee's attention was that, owing to the difficulty of attending meetings of local medical committees, those practitioners felt that they were not adequately represented and that consequently their problems and views did not reach the central administration.

285. There seemed to be considerable doubt in the minds of many remotely placed practitioners regarding the purpose of inducement payments, and to try to clear up any misunderstanding about them an explanatory communication was issued to all practitioners in the Highlands and Islands areas. It is intended to hold further discussions on general topics in the near future, particularly when more definite progress has been made with regard to mileage payments. It is also hoped to consider the preparation of a report for submission to the General Medical Services Subcommittee incorporating a detailed statement on the question of the representation of the views of these practitioners. The suggestion was made that the General Medical Services Subcommittee might set up a special Subcommittee, but, before doing this, the Subcommittee wishes to have a written report as to the actual position.

Trainee General Practitioners' Scheme

286. A note of guidance for trainers under the above scheme, which has the approval of the Subcommittee, has been issued by the Department to all trainers. It is hoped that this memorandum, which contains items of administrative interest, will prevent the recurrence of some minor difficulties which have arisen.

Prescribing

287. The Subcommittee has had several discussions with the Department on the question of the investigation of extravagant and excessive prescribing. Areal statistics will again be available and it is hoped that these will ease the work of local medical committees in their investigations, and enable practitioners to keep an eye on their own area, since they will know the average for their own area. The question of the examination of prescriptions for drugs listed in Categories 5 and 6 of the Cohen Committee's Report has also been discussed, and the Subcommittee did not agree to the Department's proposal that these prescriptions should automatically be referred to local medical committees for investigation. The Department has agreed, therefore, to reconsider this proposal on the following conditions:

- (1) The Department has undertaken to collect statistics over a period in an endeavour to ascertain the number of prescriptions containing items listed in Categories 5 and 6.
 - (2) The Department will review its proposal with the Subcommittee when the above statistics are available.
 - (3) In the meantime prescribing of such items will not automatically lead to the scripts being referred to local medical committees for investigation.
 - (4) The Subcommittee has agreed, however, that the Department shall not be precluded meanwhile from referring to an executive council for investigation by a local medical committee any unduly frequent prescribing of such items by a practitioner. It is understood, however, that such reference may only be made in exceptional circumstances.
288. Further discussions will be held with the Department in due course.

Filling of Small Practice Vacancies

289. The Subcommittee has been consulting with the Scottish Association of Executive Councils and the Scottish Medical Practices Committee regarding the question of a small practice vacancy and the most expedient method for filling it when it was felt that the practice would only

survive if filled immediately. The adoption of the method used in England, whereby executive councils are encouraged to deal with nucleus vacancies by direct approach to the Medical Practices Advisory Bureau in order that valuable time would not be lost by advertising, is under consideration.

J. T. BALDWIN,
Chairman,

General Medical Services Subcommittee (Scotland)

Owing to shortage of space the Appendices to this report and the financial statement of the National Insurance Defence Trust and of the General Medical Services Defence Trust (Appendices D and E) will be published in next week's "Supplement."

EVIDENCE TO GUILLEBAUD COMMITTEE

MEDICAL PRACTITIONERS' UNION

The Medical Practitioners' Union has added its views on the financial aspects of the National Health Service to those of many other bodies who have already submitted evidence to the Guillebaud Committee. Taking a long-term view, the Union believes that a fully efficient Service will be developed only when there is complete administrative integration of the three branches of the Service at a regional level. What is termed "a democratically based regional health authority," financed by a system of block grants, should be responsible for all aspects of health that now come under the National Health Service, with the addition of occupational and school health services. Block grants should be for running costs and capital expenditure, the first on the basis of a two- or three-year programme, the second for five years. Regions with high morbidity rates should attract higher grants.

Health an Investment

Pointing out that wise spending can, in effect, save money, the Union in its memorandum says that the failure to appreciate "the great economic costs of ill-health" has sometimes led to short-sighted economies and failure to spend money where it would give the greatest return. The Union believes that in comparison with health expenditure in other countries, and with our own pre-war expenditure, the present costs of the Service are not excessive.

Too Many Doctors?

The Union believes that with proper practice organization it is possible for a doctor to give good service to 2,400 patients, but it looks forward to a gradual increase in the number of general practitioners so that as time goes on the average list will be 2,000 or less. As redistribution takes place there will be a strong case for reducing the maximum list to 3,000, and later perhaps still lower. It is considered that the proper approach to this "rather difficult question" is to plan a gradual small increase in the number of general practitioners over the years.

Organization of General Practice

Generally speaking, the Union regards the single-handed practitioner as an uneconomic unit. He cannot afford to employ adequate ancillary help. The Union's support of the health centre policy is referred to and meanwhile it believes that group practices should be encouraged in every way. The policy advocated by the Union "on a number of occasions" that general practitioners should be paid for practice expenses apart from their remuneration is restated. Practice expenses, the Union feels, should be repaid on the basis of actual expenditure because this system would encourage expenditure where it leads to efficiency.

The Union maintains its opposition to charges in the Health Service.

HOSPITAL MEDICAL STAFF REMUNERATION SCALES

We set out below figures which illustrate some comparisons between new and old salary scales for hospital medical staff as affected by the recent award.

Whole-time Consultants			
	Spens	Old	New
Minimum	1,500	1,700	2,100
Increments	125	3 × 125, 2 × 150, 3 × 125	125
Maximum	2,500	2,750	3,100

Effect of Awards				
Year (From Top of Scale)	No Award	C Award	B Award	A Award
<i>Spens Scale</i>				
3	2,125	2,625	3,625	4,625
2	2,250	2,750	3,750	4,750
1	2,375	2,875	3,875	4,875
0	2,500	3,000	4,000	5,000
<i>Old Scale</i>				
3	2,375	2,875	3,875	4,875
2	2,500	3,000	4,000	5,000
1	2,625	3,125	4,125	5,125
0	2,750	3,250	4,250	5,250
<i>New Scale</i>				
3	2,725	3,225	4,025	4,925
2	2,850	3,350	4,150	5,050
1	2,975	3,475	4,275	5,175
0	3,100	3,600	4,400	5,300

Hospital Medical Staff

The Table below shows the actual increases and percentage increases. In the last two columns the percentage increase over Spens scales of the old scales and the new scales are shown.

Grade	Increase in £	Percentage Increase	Spens Betterment ²	
			Old Scale	New Scale
Consultant (A award)	50	1.2-0.95	13-13	15-14
" (B ")	150	4.7-3.5	15-15	21-19
" (C ")	400-350	18.2-10.8	19-17	40-30
" (no ")	400-350	23.5-12.7	22-19	51-34
S.H.M.O. ¹	200	15.4-11.4	20-20	38-34
Senior registrar	100	10.0-7.7	20-17	32-26
Registrar	75	9.7-8.4	20-20	31-30
J.H.M.O. ¹	75	10.7-7.5	20-20	33-29
Senior H.O.	75	11.2	21	34
House officer ^{1,3}	75	21.4-16.7	20-20	46-40

¹ The grades of S.H.M.O., J.H.M.O., and House Officer were not provided for in the Spens Report. The figures shown under "Spens" for these grades are the "Spens equivalents"—i.e., five-sixths—of the old salary scales.

² The figures under "Betterment" show, separately for the old and the new scale, the percentage addition to the Spens (or "Spens equivalent") figure both at the minimum and at the maximum of the scale. The 8% Government superannuation contribution has been added to the salary figures in the calculation of "betterment."

³ In the new scale for House Officers the actual increase in the amount paid as salary is less than the increase shown in the table, since the sum deducted in respect of residential emoluments has been increased from £100 to £125.

House Officers

Spens Scale	Old Scale	New Scale
—	350-100=250	425-125=300
—	400-100=300	475-125=350
—	450-100=350	525-125=400

Registrars

Grade	Spens Scale	Old Scale	New Scale
3	600	670	745
2	700-800	775-890	850-965
1	900-1,100	1,000-1,300	1,100-1,400

J.H.M.O.s and S.H.M.O.s

Grade	Spens Scale	Old Scale	New Scale
J.H.M.O. ...	—	700-1,000	775-1,075
S.H.M.O. ...	—	1,300-1,750	1,500-1,950

THE PREVENTION OF TUBERCULOSIS MEMORANDUM TO LOCAL AND HOSPITAL AUTHORITIES

Deaths from tuberculosis have been falling rapidly during the last five years. For instance, there were 9,335 deaths in 1952 and 7,911 in 1953—a difference of 1,424. At the same time the incidence of the disease has not fallen to a comparable extent. It is believed that this may be due in part to better diagnosis bringing to light cases which were formerly undiagnosed and therefore unnotified; but the very slight improvement in notification rates in comparison with the dramatic improvement in mortality emphasizes the importance of renewed effort to bring the incidence of tuberculosis finally under control. These remarks preface a call for action in a memorandum on the prevention of tuberculosis circulated by the Minister of Health to local authorities and hospital authorities and prepared in consultation with the Minister's Standing Tuberculosis Advisory Council and the Central Health Services Council.

Tracing Contacts

The memorandum suggests that, while there are no entirely new methods of controlling the spread of tuberculosis, recent developments and improvements in methods should be a stimulus to each local authority to look at its preventive programme, and that the same epidemiological approach which has brought other infectious diseases under control might be applied to tuberculosis. Referring to tracing of contacts, for instance, the memorandum says that it is rarely possible to trace them all, but it is believed that tracing can and should be carried further than it is now in many areas, if not in all. The investigation of family contacts of school entrants found tuberculin positive has yielded a high proportion of cases of pulmonary infection among the adults so investigated.

Other aspects covered include employment of the tuberculous, home conditions, and use of B.C.G. vaccine. One of the points made regarding employment is that it is obviously far better that the infectious patient should be placed in suitable work where he would not be a danger to others than that he should be allowed to find his own employment without precaution. He should be given every help to secure suitable employment. It is considered that there is much to be gained by the selective use of mass radiography for groups which show some evidence of special risk rather than for the re-examination of large groups of employed persons.

The General Practitioner

Saying that the prevention of tuberculosis depends on a number of people, the memorandum puts the primary responsibility on the medical officer of health working with and through the chest physician, family doctor, and industrial medical officer. The role of the general practitioner is stressed and he should be fully informed of what measures are being taken. It is stated that "no campaign which is not fully explained to and supported by the general practitioners can succeed." Copies of the memorandum have not been sent to local medical committees.

Notes and News

Paying Guests.—Requests are received from French doctors who wish to send their children to medical families in Great Britain as paying guests. Anyone who is willing to receive these children on these terms is asked to communicate with Brigadier H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

APPROACH TO MINISTRIES ON MEAT CONTROL

DISAGREEMENT WITH VETERINARY SURGEONS

As reported in the *Supplement* (March 20, p. 77) the Council of the Association at its meeting on March 9 agreed to the recommendation of the Public Health Committee that a formal protest should be sent to the British Veterinary Association about that Association's recent memorandum on meat production and control. An important implication of the Veterinary Association's plan was that the medical officer of health's supervision over meat inspection should be removed. The B.M.A., the Society of Medical Officers of Health, and the Sanitary Inspectors Association have now sent the following agreed statement about the Veterinary Association's memorandum to the Ministries of Health, Food, and Agriculture and Fisheries:

"The British Medical Association, the Society of Medical Officers of Health, and the Sanitary Inspectors Association have jointly considered the recent memorandum prepared by the British Veterinary Association on Meat Production and Control (1953). While concurring with much of the contents of the memorandum the three bodies above mentioned dissent from certain views expressed and desire to draw attention to four principles, the application of which is considered essential in connexion with any arrangements now in force or under consideration for the future in connexion with meat inspection and control.

"(1) *Health.*—The close association between animal and human disease must be fully appreciated at all times, but the fundamental purpose of meat inspection is to safeguard the health of the individual consumer and the community as a whole. All other considerations must be regarded as secondary to this main purpose. It is therefore necessary that all action with regard to these matters should be considered as an intrinsic responsibility of the public health service.

"(2) *Administration.*—The British Veterinary Association memorandum recommends that in future meat inspection should be the responsibility, both administrative and executive, of the Animal Health Division of the Ministry of Agriculture. Here the British Veterinary Association has failed to appreciate the fundamental principle that meat inspection is primarily concerned with the health of the community, not with meat production. The three bodies are unanimous in stating that in their view the central government department responsible for general supervision and advice should be the Ministry of Health, acting jointly with the Ministry of Food.

"(3) *Local Responsibility.*—The British Veterinary Association memorandum envisages that all meat inspection shall be 'under the direction and control of the Animal Health Service of the Ministry of Agriculture and Fisheries' and includes the 'taking over of the existing staffs.' This implies that the responsibilities which at present lie with local authorities shall be removed. The three bodies cannot agree with this recommendation and would urge most strongly that the responsibility for local administration shall remain with the local authorities.

"(4) *Medical Responsibility.*—Meat inspection is only one part of the public health supervision of food in this country, and any suggestion that the control of meat should be divorced from that exercised over other foodstuffs is strongly to be deprecated. All those at present associated with these duties fully appreciate the importance of this service to the public health. The British Veterinary Association has apparently ignored this important principle and in particular the general responsibility of the medical officer of health for the prevention and control of disease, including that transmissible by meat, in so far as local government administration is concerned. It is the unanimous view of the three bodies that this responsibility should continue.

"According to the Interdepartmental Committee on Meat Inspection, 'the great majority of meat inspectors will, no doubt, continue to be sanitary inspectors trained in meat inspection, and we regard this as a satisfactory arrangement.' The three bodies are confident that this is a satisfactory arrangement and see no justification for the British Veterinary Association's insistence that veterinary inspectors should be appointed to supervise and control this service.

"The British Veterinary Association further suggests that non-veterinary inspectors should function merely as detention officers. The Interdepartmental Committee on Meat Inspection considered this system of inspection, and concluded that such a system should not be adopted in England and Wales, a conclusion with which the three bodies agree."

RISING COST OF AMBULANCE SERVICE

MINISTRY SURVEYS TO BE UNDERTAKEN

The Ministry of Health has sent a circular (No. 7/54) to all local health authorities in England and Wales notifying them of advisory surveys to be made into all aspects of the ambulance service, because of the rising cost. A limited series of local surveys, covering both the authorities' organization of the ambulance service and the demands made on it by the hospitals, will be carried out by one of the Minister's ambulance advisers and one of his medical officers. Any conclusions reached, together with any recommendations, will be passed on to both the authorities and the hospitals concerned.

The rules on the use of local ambulance services are reprinted in an appendix to the circular.

HOSPITAL SERVICE REFORM IN NEW ZEALAND

MINISTERIAL DIRECTION

According to the April issue of *Forefront* (published by the office of the High Commissioner for New Zealand in London) widespread changes in the administration of New Zealand's hospital services are recommended by the Consultative Committee on Hospital Reform which recently reported to the Minister of Health for New Zealand.

In its report the committee points out that the present hospital system is a relic of the days when the country was sparsely populated, communications were slow and inadequate, and such hospital services as existed were the result of the activities of more or less isolated groups of people who took their own measures to provide for their own needs. The hospitals were largely financed by voluntary contributions and locally imposed rates. "From 1957 and onwards the State will be entirely responsible for financing the service," the report says.

Changes Recommended

The recommended changes include the reversal of the present policy of placing the responsibility of providing hospital services primarily on local boards. It is suggested that five regional boards, under the direction of the Minister of Health, be set up to co-ordinate and control the activities of the hospital boards in their particular regions, and that the Minister should appoint the members of the regional authorities. Other recommendations are the contraction of the Dominion's present hospital boards by amalgamation from 37 to 23; the immediate appointment of a special investigator to report on hospital costing to overcome "serious defects" in the present system of hospital board finance; the replacement by a commission, for

up to three years, of boards which exceed their approved estimates plus additional sums allowed them for emergencies; and payment of increased subsidies to private hospitals without applying a means test to either hospital or patient.

Ministerial Responsibility

Commenting that there is already little that a hospital board can do or spend without the sanction in some form of the Minister of Health, the report says that the frustration and confusion resulting from the present system could be obviated if the initial responsibility and authority rested with the Minister instead of with the board. This would leave the boards to carry out their task in accordance with a policy already determined from time to time by the Minister.

THE RECENTLY QUALIFIED PRACTITIONER WINCHESTER MEETING

On the initiative of Dr. Ronald Gibson, the member of the B.M.A. Council for the Southern, Dorset, and West Hants Branches of the Association, provisionally registered practitioners, fully registered practitioners holding junior house appointments, and those doing National Service were invited to an informal conference at the Royal Hampshire County Hospital, Winchester, on April 3. Dr. L. S. Potter, Assistant Secretary of the Association, attended the meeting, and an attempt was made to find out what were the particular problems and anxieties facing those recently qualified, and also how they could be brought under the Association's organization both locally and centrally.

Hospital Posts

A question which came to the fore at the meeting was that of the difficulty of filling appointments on the junior staffs of hospitals. Some hospital residents have to "double up," and many are overworked. Leisure is curtailed, and there is little or no time for reading or postgraduate study. There is, however, an apparent paradox in that provisionally registered practitioners are complaining of the difficulty of obtaining appointments, or of long waiting periods during which they are virtually unemployed and may suffer financial hardship. While more evidence is needed, the discussion at Winchester showed that both points had substance and that the period that has elapsed since the inauguration of the pre-registration year has disclosed new and serious problems.

Dr. Gibson reported that a number of Divisions in his constituency had decided to elect or appoint to their executive committees a hospital resident or a doctor on National Service. It was hoped this move would help to foster unity in the profession locally and assure young doctors that the Association's interest is by no means confined to those who are established in practice.

The Organization Committee of the B.M.A. is at present considering the question of the representation of the recently qualified practitioners.

B.M.A. ANNUAL MEETING—GLASGOW, JULY 1-9, 1954

TRAVEL RESERVATIONS

Members are reminded that accommodation on trains and on aircraft between London and Glasgow during July is booked at a very early date. It is advisable to make reservations as soon as possible. The programme of the Annual Meeting was published in the *Supplement* to the *British Medical Journal* of April 3 (p. 131).

GROUP PRACTICE LOANS

The Scottish Group Practice Loans Committee has discussed the procedure to be adopted in granting loans under the arrangements set out in Memorandum E.C.S. (M) 3A/1954 (*Supplement*, February 27, p. 56). In order to ensure that the limited funds available are allocated fairly, the committee will meet twice yearly to consider applications received during the previous six months, and it is proposed that the first meeting should be held in May.

Practitioners who wish their applications to be considered at this May meeting should make sure that their proposals are in the hands of the clerk to the executive council by April 30 at the latest. Applications after that date will be considered by the Committee at its second half-yearly meeting. Proposals submitted to the council should be as full as possible and accompanied by such detailed information as will enable the Committee to consider the application on its merits.

Practitioners are reminded that plans carried out since April, 1953, are eligible for assistance on an equal footing with plans to be carried out in the future and that plans carried out before April, 1953, will also be eligible if resources permit. Practitioners seeking a loan who have already carried out their plans should make application to the council as soon as possible.

Correspondence

Remuneration of Hospital Medical Staff

SIR,—The medical profession entered the National Health Service in July, 1948, after having been promised the remuneration proposed in the Spens Report, which specifically stated that its figures were in terms of 1939 money values and must be adjusted in accordance with the rise in the cost of living. Once the profession had agreed to serve it found that its official betterment factor was only 20% (half of which is used by the Government for its superannuation contribution, and is therefore not recoverable on leaving the Service. It is consequently nonsensical to include it in our betterment factor).

In 1952 Mr. Justice Danckwerts after a most painstaking inquiry into the facts of the situation awarded 100% betterment to the general practitioners, but up to now this has been refused to all those in the hospital service, from consultants down to housemen. The issue is quite clear. The profession was inveigled into the Health Service by a device which most closely resembles a confidence trick. The Government's honour is at stake, and we are waiting to see whether it is prepared to go on employing its doctors almost under false pretences for reasons of political expediency.

We have been waiting 18 months now, Sir, and, at a time when the average income of the workers in this country stands at 201% above the pre-war level, it behoves us to consider seriously what action we should take to remedy this gross injustice. If the Government continues adamant in its refusal to honour its pledged word, then we have no alternative but to demand as of right to put our case before an impartial arbitrator. If this is refused, then we cannot but make use of the powerful weapons at our disposal. This would be distasteful to professional people, but when elementary justice is denied there can unfortunately be no alternative. May I suggest that all your readers who feel as I do should write to their Members of Parliament and put the facts to them, asking at the same time that justice should not be denied to us?—I am, etc.,

Walton-on-Thames.

A. ARNAUD REID.

SIR,—A letter of mine in the *Supplement* of March (p. 66) has caused discussion. I would be glad to explain that I wrote because I felt that negotiators with the

Ministry on behalf of hospital staffs were getting less than justice (unless they have changed very much since I knew them). It was my intention to suggest reasons why their results must seem small and slow, as factually as anyone can who discusses the working of the British Constitution and quotes percentages from the public press. It was not my intention to set out my own views, an occupation which has long wearied me and others.

These views are, however, very like those of Dr. J. H. Middlemiss (*Supplement*, April 3, p. 143). I certainly do not wish to stabilize hospital staffs' pay at its present level. I differ, however, from some others in thinking that young consultants should get better betterment than established ones, except perhaps those close to retirement, who get no pension. I think that would get good young men on to hospital staffs just now, and help old ones going off. I know that means departing from Spens, and to that extent I do.—I am, etc.,

Hove.

W. A. BOURNE.

The Election of Committees

SIR,—In this committee-ridden world, in medical and many other spheres, we have the useful democratic principle that the same caucus of individuals should not serve and control too long. Four years should be the limit, although a few members may be usefully eligible for re-election. For the latter, the choice is often difficult, and the following suggestions may be useful.

(1) The number of attendances at committees is often recorded. I suggest that the number of speeches per attendance should also be before us. Apart from the chairman and people asked to speak by him, the highest scores in speeches should be ineligible for re-election. (2) I suggest also that sound-recordings of audible range be taken, and, if these do not extend beyond the lowest waistcoat button of the nearest ears in front, re-election should be ruled out. This would eliminate 60% of most large committees. The same should be applied rigorously to the chairman. (3) Apart from the above, it is perhaps too much to suggest that the lowest scorers in attendance and speeches should automatically be re-elected, but this possible advantage should be borne in mind. With such a reconstituted committee, the real business and work would move apace.

This question might well be examined by the Constitution Committee of the B.M.A.—I am, etc.,

London, W.1.

R. D. LAWRENCE.

Parking Facilities

SIR,—The question of parking facilities in the Harley-Wimpole Street area for those doctors who practise in that district is one of increasing difficulty. Regularly when visiting my consulting-room I am obliged to circle the block several times, and then, in all probability, I am forced to leave my car a considerable distance from my destination.

Were all the parking spaces being used by my colleagues the position would be less intolerable, but observation shows that Oxford Street shoppers are using these streets for their own convenience. Would it not be possible to devise some method, or to issue some form of priority badge, whereby the medical confraternity might be allowed some priority in their own district?—I am, etc.,

London, W.1

J. LYLE CAMERON.

Service Recruitment

SIR,—I have followed the recent correspondence on Service recruitment with some interest. Anyone with illusions that the modern Army M.O. can prescribe such treatment for his patients as he personally considers most suitable should consider the latest circular from G.H.Q. (Middle East Land Forces), which states: "The strictest economy will be exercised in the use of antibiotics, and especially in the use of aureomycin and chloromycetin, both of which are very expensive. Administrative officers will

supervise and control issues to medical centres, and O.C.s medical units will supervise and control the use of these drugs within these units."

The situation becomes ludicrous when an R.M.O. has literally to "wangle" a supply of wide-spectrum antibiotic to treat his own dysentery. Here, therefore, is one example of the red tape which is the main reason for my refusing to consider for one moment making the Army my career.—I am, etc.,

"HARVEY."

Whole-time Specialist Appointments

SIR,—It is strange to hear Dr. Horace Joules (*Supplement*, March 27, p. 129) accusing others of partiality. One is justified in asking him what evidence there is that the employment of part-time specialists is "increasingly expensive." Judged from a purely quantitative point of view a careless or doctrinaire regional hospital board could waste money on both part-time and whole-time specialists, either by oversessioning the former or underworking the latter. Examples of both types of wastage can be observed, but neither is susceptible to any accurate assessment. Judged from the more important viewpoint of quality of service (a matter scarcely mentioned by advocates of money-saving), surely the most important thing is to have contented doctors. If a majority of specialists prefer to be part-time (and of this there can be no possible doubt), then any reasonable regional hospital board should recognize that the patient and the service will gain if specialists are allowed to exercise that preference.

Dr. Joules says "chairmen of many committees often feel that advice given by consultants, particularly those in part-time practice, is not always impartial." I fancy that this may be an example of the wish being father to the thought, for Dr. Joules is evincing considerable partiality in the views which he expresses in his letter. It surely would be a peculiarly spunkless and worthless committee whose members did not show partiality in one direction or another. Or does Dr. Joules want all committees to consist of those who will support his particular line?

If in "some quarters" there is a demand that doctors should only hold advisory positions at regional and management level it is likely that this emanates from those who dislike hearing any viewpoint but their own. It is because the majority of specialists have no faith in such people that they will support your leading article (*Journal*, March 13, p. 634) as being both timely and reasonable. The independence and freedom of medicine will be preserved in many ways, not the least important of which is by protecting the profession from the introduction of a whole-time salaried service.—I am, etc.,

Radlett, Herts.

R. S. MURLEY.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). The only charge made is for postage of books. A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Davis, D. M.: Mechanisms of Urologic Disease. 1953.
- Davis, L. J., and Brown, A.: The Megaloblastic Anaemias. 1953.
- Freeman, P., and de Meillon, B.: Simuliidae of the Ethiopian Region. 1953.
- French's Index of Differential Diagnosis. Seventh edition edited by Arthur H. Douthwaite. 1954.
- Hochrein, M., and Hochrein-Schleicher, I.: Leistungssteigerung. 3 Auflage. 1953.
- Holt's Pediatrics. Twelfth edition by L. E. Holt, jun., and R. McIntosh. 1953.
- Ingals, R. G.: Tumors of the Orbit and Allied Pseudo Tumors. 1953.
- Jaensch, P. A.: Einführung in die Augenheilkunde. 2 Auflage. 1953.
- Johnston, J. A.: Nutritional Studies in Adolescent Girls and their Relation to Tuberculosis. 1953.
- Karpovich, P. V.: Physiology of Muscular Activity. Fourth edition. 1953.
- Kessler, H. H.: Rehabilitation of the Physically Handicapped. Revised edition. 1953.
- Koller, T., Held, E., and Neuweiler, W. (Editors): Lehrbuch der Geburtshilfe. 2 Auflage. 1953.
- Kyser, F. A.: Therapeutics in Internal Medicine. 1953.

Association Notices

COUNCIL OF THE B.M.A.

Election of 40 Members by Grouped Branches in the British Isles, of 2 Public Health Service Members, and of 1 Woman Member

The following have been elected unopposed for the session 1954-5:

North of England and Tees-side Branches:	J. C. Arthur, Gateshead.
East Yorkshire and Yorkshire Branches:	Weldon P. T. Watts, Newcastle-upon-Tyne.
North Lancashire and Westmorland Branch:	L. Dougal Callander, Doncaster.
Divisions in Cheshire—Birkenhead and Wirral; Chester; Crewe; Hyde; Macclesfield and East Cheshire; Mid-Cheshire; Stockport; Wallasey:	W. E. Dornan, Sheffield.
Lancashire Divisions of Merseyside Branch—Liverpool; St. Helens; Southport; Warrington. Isle of Man Branch:	Ian G. Innes, Hull.
Lancashire Divisions of South Lancashire and East Cheshire Branch—Ashton-under-Lyne; Bolton; Bury; Leigh; Manchester; Oldham; Rochdale; Salford; Wigan:	F. M. Rose, Preston.
Derbyshire, Leicester and Rutland, Lincolnshire and Nottinghamshire Branches:	D. R. Owen, Chester.
Midland Branch:	David Brown, Liverpool.
Staffordshire and Worcester and Hereford Branches:	J. I. Milne, Manchester.
Berks, Bucks and Oxford and Northamptonshire Branches:	
Cambs and Hunts, Norfolk and Suffolk Branches:	
Divisions of Metropolitan Counties Branch in Middlesex:	
Marylebone Division:	
City, South-West Essex, Stratford and Tower Hamlets Divisions:	J. Cottrell, Grimsby.
Hampstead, St. Pancras and Westminster and Holborn Divisions:	E. C. Dawson, Derby.
Chelsea and Fulham, Kensington and Hammersmith and Paddington Divisions:	D. S. Pracy, Atherstone.
Camberwell, Greenwich and Deptford, Lambeth and Southwark, Lewisham, Wandsworth and Woolwich Divisions:	A. V. Russell, Wolverhampton.
Bedfordshire, Essex and Hertfordshire Branches:	S. F. Logan Dahne, Caversham.
Surrey Branch:	Alexander Brown, Linton, Cambs.
Kent Branch:	D. F. Hutchinson, London, W.C.1.
Sussex Branch:	Angus Weston, Greenford.
Dorset and West Hants and Southern Branches:	R. Hale-White, London, N.W.1.
South-Western Branch:	J. Arthur Moody, Ilford.
South Wales and Monmouthshire Branch:	F. Gray, London, W.C.1.
Edinburgh and South-East of Scotland and Fife Branches:	H. H. D. Sutherland, London, W.10.

Glasgow and West of Scotland Branch (Glasgow Division):
Glasgow and West of Scotland Branch (County Divisions), Stirling and Border Counties Branches:
Northern Ireland Branch:

The following candidates have been nominated for the Groups in which there are contests:

Bath, Bristol and Somerset, Gloucestershire and Wiltshire Branches (two seats):
North Wales and Shropshire and Mid-Wales Branches (one seat):
Aberdeen, Dundee, Northern Counties of Scotland and Perth Branches (one seat):

Voting papers will be issued to the members of these Groups on April 24, 1954.

Public Health Service

The following have been elected unopposed:

H. D. Chalke (London, N.W.4), Kenneth Cowan (Chelmsford)

Woman Member

Annis Gillie, London, W.2, has been elected unopposed.

A. MACRAE,
Secretary.

Diary of Central Meetings

APRIL

21 Wed. G.M.S. Committee, 11.30 a.m.
21 Wed. Dain Fund Trustees, 1 p.m. (Date changed from April 15.)
21 Wed. Financial Advisory Committee, 2 p.m.
21 Wed. Registrars Group Executive Committee, 2 p.m. (Date changed from April 22.)
22 Thurs. G.M.S. Committee, 10.30 a.m.
22 Thurs. Public Relations Committee, 2 p.m.
27 Tues. Questionnaire Subcommittee, Constitution Committee, 10.30 a.m.
27 Tues. Estates Committee, 2 p.m.
27 Tues. Joint Formulary Committee, 2 p.m.
28 Wed. Finance Committee, 2 p.m.
30 Fri. Welsh Committee (at Raven Hotel, Shrewsbury), 2.15 p.m.

MAY

5 Wed. Office Committee, 11 a.m.
5 Wed. Arbitration Machinery Committee, 1 p.m.
5 Wed. Council, 2 p.m.
6 Thurs. Council, 10 a.m.

Branch and Division Meetings to be Held

CHELSEA AND FULHAM DIVISION.—At Fulham Town Hall, London, S.W., Friday, April 23, 9 p.m., annual general meeting.
CROYDON DIVISION.—At The Greyhound, Croydon, Thursday, April 22, 7.30 for 8 p.m., annual dinner and dance.
DARTFORD DIVISION.—At Nurses' Home, West Hill Hospital, Dartford, Wednesday, April 21, 8.45 p.m., meeting. Talk by Dr. Alan Stoddard: "The Place of Osteopathy in Medicine."
KESTEVEN DIVISION.—At Red Lion Hotel, High Street, Grantham, Thursday, April 22, 7.15 for 7.30 p.m., dinner. 9 p.m. address by Mr. Richard S. Handley: "Doctors among the Pirates and Privateers of the Spanish Main," illustrated by slides.
SCUNTHORPE DIVISION.—At Scunthorpe and District War Memorial Hospital, Sunday, April 25, clinical meeting.
TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tuesday, April 20, 8.30 p.m., annual general meeting.
WESTMINSTER AND HOLBORN DIVISION.—At Lamb Public House, 94, Lamb's Conduit Street, London, W.C., Thursday, April 22, 7 p.m., short business meeting; 7.30 p.m., dinner; 8.30 p.m., film, to be introduced by Dr. A. A. Bradley: "Chemotherapy of Tuberculosis." Discussion to be opened by Dr. A. J. Morland.

SUPPLEMENT TO THE
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A DOCTOR LOOKS AT CRIME

BY

OLIVER GRAY, M.B.E., M.A., M.D., J.P.

It is natural that a doctor should regard the antisocial behaviour of his fellow mortals with an outlook somewhat different from others; when the layman talks of motive and guilt the doctor is thinking more in terms of human frailty, realizing that deficiencies in man's nature may be related to weaknesses of the body, and that the behaviour of the mind is compounded of infinitely subtle determinants not the least of which is the influence of heredity. His training teaches him to search deeply for the causes that bring disaster to the human frame, and his experience tells him that without knowledge of these causes he can do little to relieve suffering and bring back health. Seated on the magistrate's bench he is puzzled by the recurrent delinquent and the habitual criminal, and a little dubious of the facile explanations of what leads a juvenile repeatedly to commit larceny, while the older lag has a lengthy and shocking crime sheet. He is not alone in discovering that punitive measures, however expedient, provide little hope for reform in the individual, and prove of small value as a deterrent to others.

Nature and Nurture

The seed from which we all derive contains within its tiny bulk all those genetic factors that make Tom so different from Harry. It has been estimated that the infant at birth is approximately three million times the size of the unit of heritable life from which it originated. Yet within this infinitely small entity we know that the genetic factors exist which predetermine the functional behaviour as well as the nature of the individual. What is inherited is particulate and quantitative and is derived in equal proportions from the father and the mother—a fixed and durable reality. Upon this unalterable complexity, known as the genotype, environment proceeds to influence growth and development till we get what is called the phenotype, the consequence of the interaction between the genotype and his or her ecological surroundings.

In simpler language, there is the seed and the soil, the struggle between nature and nurture; and of these two enormous influences on human behaviour—and particularly in relation to crime—I believe that, of the two, heredity plays the greater part. There is a third mysterious factor which cannot, in any way, be measured or defined. A man

may be exceptionally endowed and fortune may have provided him with the most favourable upbringing, yet, when faced with a choice between good and evil, he may act nobly or basely, with courage or with cowardice. Because he was favourably gifted and conditioned to resist temptation, his offence might, under certain circumstances, constitute more of a moral lapse, because standards must be gauged by such matters.

The problem child, found in the progeny of the rich and poor, the surprise black sheep in families of exemplary behaviour, are reminders, and often very sad reminders, that nature is stronger than nurture. The delinquent, thus constitutionally disposed, may be saved by a constant favourable environment, but he is always liable to fall from grace if ill fortune deprives him of those who have hitherto given him help.

I may be wrong, for it is difficult to estimate these things scientifically, but I believe that much crime originates from genetically unstable personalities whose instability is not pathological, but who are not built to conform to the social restrictions which are accepted by convention or laid down by law. Some confirmation of this comes from the knowledge that similar crimes have been perpetrated by similar (uniovular) twins brought up in different countries. It is as well, therefore, to make what allowances we can, remembering that "to step aside is human."

Prevention and Cure

The greatest factors in the prevention of crime are wise upbringing and education, using the word education in its widest sense. It is here that the greatest hope lies. The precious relationship between parent and child is obviously beyond the scope of this short monograph, as, also, is education; but I am an advocate of teaching the youth of our country something about the law, partly for the reason that the fear of the consequences of breaking that law is the greatest deterrent that we possess. To the average citizen, being detected, and eventually convicted of an offence, is anticipated with dread. Even the most trivial matter, such as a fine for a minor motoring transgression, is a thing that Mr. Everyman would wish to avoid. The disgrace and humiliation which might result from the detection of a graver offence must, on many occasions, help the irresolute to resist temptation. It is, however, questionable whether the fear of punishment enters much into the calculation of those who embark, for the first time, on serious crime, and it is even more doubtful if it counts for much as a deterrent to the constant offender.

This is not to say that punishment is therefore illogical. It is quite logical to include it in any sentence so long as it is related to the nature of the crime. It may sometimes be quite irrational, as, for instance, to impose a fine for a homosexual offence. In cases of this sort the dread of exposure may by itself act as a deterrent, especially to those younger members of West End society to whom it appears to be a special temptation, and in whom the indulgence has not yet become a habit; for this reason, perhaps, it is best kept on the statute book as a recognized crime. This inexplicable urge is common, and, under certain conditions, may become a real problem. In little ships, particularly during hostilities, sodomy is the commonest major crime on the charge sheet.

To regard punishment as in any way retributive, in the retaliatory sense, is wrong. It is often, however, the only way of dealing with an awkward situation, and then it should be dealt out as a hint that worse is in store for any further transgressions—a threat that may end in the deprivation of liberty. The psychological effect of any threat of something sinister and ill-defined which has, as yet, not been experienced may prove effective in certain forms of wrongdoing. In practice, punishment is the only weapon that the magistrate holds as a sanction against those who flout the law, and perhaps this is its chief justification.

Responsibility

Frankly admitting that he had no experience or first-hand knowledge of penal procedure or of the psychological treatment of delinquency, Professor Guisberg, in his recent Clarke Hall Lecture,¹ attacked the present system of the assessment of responsibility as illogical. Much of what he infers about retributive measures and punishment in dealing with criminals is a scholarly if theoretical attack on present-day methods, some of which is justified; much of it is inconclusive.

It is rather easy to point out where justice as now administered fails in that quality of mercy which we would all desire. Such individualism as he advocates cannot be achieved for two reasons. First, personnel, money, and time are involved beyond our present means. Secondly, and this is more fundamental, it is impossible to measure the degree of temptation to which a delinquent has been exposed considering all the factors conditioned by his environment and his inherited weakness, together with the genuine effort he may have made, but in which he has failed, to put aside temptation.

I am thinking of a man of otherwise good behaviour who was on probation for interfering with boys. On the same afternoon of the day in which he had an interview in the morning with his probation officer he visited the house of the lad he had previously assaulted, induced his brother to come for a drive in his car, and committed a similar offence, to which he confessed.

I can think of no satisfactory way of dealing with a case such as this. He knew that what he was doing was wrong, he could easily calculate the obvious risk he was running, and he must have foreseen the disgrace and ostracism that would ensue as a result of his detection. The conclusion must be that his resistance had sunk so low that he was past all hope of reform. Yet the man was a good worker with a good record in all other respects. In law he must be held responsible, but the assessment of his culpability is difficult, and there is at present no satisfactory way of dealing with him.

I am also thinking, by way of contrast, of an unctuous and plausible type who is constantly coming up before the bench for arrears of payment of maintenance, the type who lives on public assistance because he will not demean himself to menial employment. The threat of imprisonment in such cases has a most salutary effect.

¹Guisberg, M., "The Nature of Responsibility," Nineteenth Clarke Hall Lecture, 1953.

The M'Naghten Rules

The M'Naghten rules are seldom invoked in a magistrate's court. They come into action in capital offences when the mental state of the accused is in question. Indeed, the bench has no rules restricting it in coming to a conclusion in this matter, and must decide each case on the facts laid before it, together with the medical opinion put forward in a plea of not guilty, or when mental instability is proffered by way of mitigation after conviction. At present, these rules are thought by many to be out of date, but it is noteworthy that they have survived for over a hundred years in this country where they originated. They are used in the United States to this day, where certain individual states modify them or apply them differently. These rules require that the defendant must show "that he was labouring under such a defect of reason from disease of the mind as not to know the nature and quality of his act, or, if he did know it, that he did not know he was doing what was wrong."

In law the question of responsibility hinges very largely on what was decided in the famous M'Naghten case and what has been said since. Reading these classic utterances may help a magistrate in the many cases in which he must be ready to reach a decision on responsibility and culpability. In the great majority of individuals the inherent tendency towards crime is not pathological—the temperament varies greatly, some people being docile and amenable, while others are passionate, volatile, temperamental, or what you will. There is no borderline between the "normal" and the type whose mental state is in doubt, and one medical opinion is as good as another. The inherited morbid predisposition varies, and environment acts upon the latent tendencies for better or for worse.

Certifiable lunacy as a cause of crime is usually traceable to inborn defect, the exceptions being the general paralysis of the insane due to syphilis, alcoholism when it directly impairs the brain, and less common conditions such as encephalitis. In psychopaths, in whom the predisposition is great, it is clear, in crimes related to the mental state, that criminal responsibility is proportionately less.

Culpability

Decisions as to responsibility should not often present difficulty. The mere fact that the accused is unstable may have, and often has, little to do with the question of irresponsibility. It is extremely important that this should always be borne in mind, and it may assist to ask oneself in each case: How much did the accused profit by his action? What did he do to avoid detection? Are his replies to questions simple or elaborate? In crimes that can be decided in a magistrate's court there cannot be many cases in which the temptation was quite irresistible on account of the mental condition of the offender, and it is inconsistent to accept a plea of not guilty on this account. It is far otherwise when it comes to an assessment of the degree of culpability. Every effort should be made to collect and weigh all the evidence before deciding what should be done after guilt has been established.

The further happenings in court are not quite within the scope of this article. The protection of society must be the first consideration, and the redemption of the offender, if this be possible, is the best way of achieving this end. In suitable cases the probation officers can bring this about, and it is refreshing to find how many men and women they once more set upon the right road.

If I have made it appear that because heredity plays such an important part it is therefore more influential than anything else, I must correct this impression. Environment is almost as great, but greater than either is character, that spiritual attribute that we create for ourselves, one ingredient of which is conscience. And every time we fail in this respect we stoop to kiss the devil's feet.

MEDICAL PRACTICES COMMITTEE

CLASSIFICATION OF AREAS

The Committee has reconsidered the classification of areas for England and Wales as a result of further reports furnished by executive councils. These classifications are up to and including April 1, 1954, and supersede those previously published. They come into force forthwith. A doctor who is proposing to enter practice in a particular district should apply for up-to-date information from the executive council for the district in question before taking positive steps to secure surgery and waiting-room accommodation.

The numerals I, II, and III denote Designated, Intermediate, and Restricted areas respectively. In those Designated areas marked with an asterisk, the admission of one or two doctors may result in reclassification of the area.

In urban areas the designation does not necessarily apply to any part where the population density is lower than in the area generally—for example, the rural fringe of many urban areas. In rural areas the designation applies to the centres of population only.

ENGLAND: COUNTIES

Bedfordshire.—I: Luton. II: Barford, Eaton Socon, Sandy and Potton; Barton and Shillington; Bedford; Biggleswade; Dunstable; Harrold; Sharnbrook, Riseley and Turvey; Leighton Buzzard; Shefford and Arlesey; Woburn, Toddington, Ampthill and Cranfield. III: Nil.

Berkshire.—I: Nil. II: Borough of Maidenhead; Borough and Rural Districts of Windsor; Wokingham; Urban and Rural Districts of Abingdon; Newbury; Wallingford; Wantage (except Brightwalton); Rural Districts of Bradfield; Cookham; Easthampstead; Faringdon. III: Rural District of Hungerford; Brightwalton (Wantage Rural District).

Buckinghamshire.—I: *Slough and Cippenham. II: Aylesham; Aylesbury; Blechley; Buckingham; Burnham and Taplow; Chalfont St. Giles, Chalfont St. Peter, and Gerrards Cross; Chesham; Colnbrook; Datchet; Eton; Flackwell Heath; High Wycombe; Iwer; New Bradwell and Wolverton; Newport Pagnell; Olney; Princes Risborough and Hampden; Stony Stratford; Wendover; Whitchurch and Cublington; Wing; Winslow; Woburn Sands; Wraybury. III: Beaconsfield and Seer Green; Bourne End; Great Missenden and Prestwood; Haddenham; Hambleton; Hanslope; Horsley Green; Lane End; Long Crendon; Marlow; Steeple Claydon; Stokenchurch; Waddesdon.

Cambridgeshire.—I: Nil. II: Whole area (except Isleham). III: Isleham.

Cheshire.—I: Chester (sub-districts of *Ellesmere and Whitby); Crewe and Nantwich (*Crewe and Haslington); Runcorn (*Run-corn); Wirral (*New Ferry and Bebington). II: Altrincham (Altrincham, Bowdon, Broadheath and West Timperley, Hale, Timperley); Bredbury and Romiley (Bredbury, Romiley and Timperley); Hazel Grove and Bramhall, Marple and Marple Bridge, Disley and High Lane); Cheadle and Gatley (Cheadle and Gatley, Cheadle Hulme); Chester (Hoole and Newton, Little Sutton, Tarporley); Congleton (Congleton); Crewe and Nantwich (Nantwich, Sandbach, Alsager); Hoylake and West Kirby (Hoylake and Meols, West Kirby and Caldys, Heswall, Irby and Pensby); Hyde, Dukinfield, and Stalybridge (Hyde, Dukinfield, Stalybridge); Knutsford and Wilmslow (Knutsford, Lymm, Styal); Macclesfield (Macclesfield, Poynton); Mid-Cheshire (Northwich and Weaverham with Cuddington, Sandiway and Rudheath, Winsford, Middlewich); Runcorn (Frodsham, Stockton Heath); Sale (Sale); Wirral (Bromborough and Eastham, Neston, Parkgate and Willaston). III: Chester (Upton-by-Chester and Bache, Farndon, Malpas, Tattenhall); Crewe and Nantwich (Audlem, Wrenbury, Holmes Chapel, Shavington); Nantwich (Audlem, Wrenbury, Holmes Chapel, Shavington); Hoylake and West Kirby (Greasy); Hyde, Dukinfield, and Stalybridge (Hollingworth and Mottram); Knutsford and Wilmslow (Wilmslow and Handforth, Alderley Edge, Chelford, Mobberley, Warford, and Great Warford); Macclesfield (Bollington); Mid-Cheshire (Great Budworth, Davenham); Runcorn (Helsby, Stretton, Grappenhall).

Cornwall.—I: Nil. II: Albaston, Callington and Calstock; Bodmin; Bude; Bugle and St. Dennis; Camborne; Carn Brea; Falmouth; Helston; Launceston; Liskeard; Newquay; Penryn; Penzance; Perranporth; Porthleven; Port Isaac; Redruth; St. Agnes; St. Austell; St. Blazey; St. Columb; St. Ives and Carbis Bay; St. Just; Saltash; Truro. III: Boscawen; Camelford; Cawsand; Chacewater; Constantine; Constantine Bay; Dela-

*For meaning of asterisk, see preamble.

bole; Downderry; Fowey; Grampound; Hayle; The Lizard; Looe; Lostwithiel; Marazion; Mevagissey; Millbrook; Mullion; Padstow; Perranarworthal; Pensilva; Polperro; Polyphant; Praze; Probus; Rock; Ruanhighlanes; St. Germans; St. Keverne; St. Mawes; St. Stephens; Tintagel; Torpoint; Townshend; Tywardreath; Upton Cross; Wadebridge; Widemouth Bay.

Cumberland.—I: *Cockermouth; *Whitehaven. II: Aspatria; Brampton; Cleator Moor; Egremont; Keswick; Longtown; Maryport; Millom; Penrith; Silloth; Wigton; Workington. III: Alston; Bootle; Caldbeck; Dalston; Distington; Gosforth; Harrington; High Hesket; Kirkbride; Kirkoswald; Ravensglass; Rowrah; Wetheral.

Derbyshire.—I: Borough of *Chesterfield. Urban Districts of *Long Eaton; *Swadlincote. Rural Districts of *Blackwell; Chesterfield. II: Boroughs of Buxton; Glossop; Ilkeston. Urban Districts of Alfreton; Bolsover; Clay Cross; Dronfield; Heanor; New Mills; Ripley; Staveley; Wirksworth. Rural Districts of Chapel-en-le-Frith; Clowne; Repton; Shardlow. Urban and Rural Districts of Ashbourne; Bakewell; Belper. III: Urban District of Whaley Bridge.

Devon and Exeter.—I: Nil. II: County Borough of Exeter. Boroughs of Barnstaple; Bideford; Dartmouth; Honiton; Okehampton; South Molton; Tiverton; Torquay. Urban Districts of Ashburton and Buckfastleigh; Axminster; Brixham; Crediton; Dawlish; Exmouth; Ilfracombe with Combe Martin and Woolacombe; Kingsbridge; Newton Abbot with Kingsteignton; Northam with Appledore; Paignton; Tavistock. Rural District of Plympton St. Mary (except Newton Ferrers and Yealmpton); Kingskerswell and Ipplepen (Newton Abbot Rural District); Topsham (St. Thomas' Rural District); Cullompton (Tiverton Rural District). III: Boroughs of Great Torrington; Totnes. Urban Districts of Budleigh Salterton; Holsworthy; Lynton with Lymouth; Ottery St. Mary; Salcombe; Seaton with Colyton; Sidmouth with Sidbury; Teignmouth with Shaldon and Bishops-teignton. Rural Districts of Axminster; Barnstaple; Bideford; Crediton; Holsworthy; Kingsbridge; Newton Abbot (except Kingskerswell and Ipplepen); Okehampton; St. Thomas (except Topsham); South Molton; Tavistock; Tiverton (except Cullompton); Torrington; Totnes; Newton Ferrers and Yealmpton (Plympton St. Mary Rural District).

Dorset.—I: Nil. II: Bournemouth; Blandford and district; Bridport and district; Dorchester and district; Poole with Branksome, Canford Cliffs, Parkstone and Sandbanks; Portland; Shaftesbury and district; Sherborne and district; Sturminster Newton, Marnhull and district; Swanage and district; Wareham and district; Weymouth with Broadway, Chickerell, Preston and Wyke Regis; Wimborne and district. III: Abbotsbury; Bere Regis; Broadstone and district; Cerne Abbas and district; Charmouth, Lyme Regis and district; Childe Okeford and district; Corfe Castle and district; Cranborne and district; Evershot and district; Ferndown and West Moors; Gillingham, Bournemouth and district; Glanvilles Wootton, Buckland Newton and district; Handley and district; Maiden Newton and district; Milton Abbas and Winterborne Stickland; Puddletown and district; Stalbridge and district; Verwood and district; Winfrith, Wool and district; Yetminster and district.

Durham.—I: *Billingham Urban District; *Bishop Auckland Urban District (except Bishop Auckland Town); *Bishop Auckland Town; *Blaydon Urban District; *Brandon and Byshottles Urban District; *Chester-le-Street Rural District; *Easington Rural District; *Felling Urban District; *Hebburn Urban District; *Hetton Urban District; *Houghton-le-Spring Urban District; *Seaham Urban District; *Sedgefield Rural District (except Sedgefield village and Stillington); *Spennymoor Urban District; *Stanley Urban District; *Dunston. II: Barnard Castle Urban District; Boldon Urban District; Chester-le-Street Urban District; Consett Urban District; Crook and Willington Urban District; Darlington Rural District; Durham Municipal Borough; Durham Rural District; Evenwood, Cockfield and Butterknowle (Barnard Castle Rural District); Hartlepool Municipal Borough; Jarrow Municipal Borough; Ryton Urban District; Shildon Urban District; Stockton-on-Tees Municipal Borough with Norton-on-Tees; Sunderland Rural District; Tow Law Urban District; Washington Urban District; Whickham. III: Gainford (Barnard Castle Rural District); Lanchester Rural District; Middleton-in-Teesdale (Barnard Castle Rural District); Sedgefield village (Sedgefield Rural District); Stillington (Sedgefield Rural District); Stockton-on-Tees Rural District; Weardale Rural District.

Essex.—I: Municipal Boroughs of Barking; Dagenham; *Harwich; *Ilford; Romford (excluding Harold Hill Estate). Urban Districts of *Billericay (excluding Basildon New Town Development Area); *Braintree and Bocking; *Canvey Island; *Hornchurch; *Basildon New Town Development Area (Billericay

Urban District). II: Municipal Boroughs of Chelmsford; Chingford; Colchester; Leyton; Maldon; Saffron Walden; Walthamstow; Wanstead and Woodford. Urban Districts of Benfleet; Brentwood; Burnham-on-Crouch; Chigwell; Clacton-on-Sea; Epping; Halstead; Rayleigh; Thurrock (except Aveley Housing Estate); Waltham Holy Cross; Witham. Rural District of Chelmsford; Epping (excluding Harlow New Town Development Area); Great Dunmow; Halstead; Lexden and Winstree; Ongar; Rochford; Saffron Walden; Tendring (except Great Bentley, St. Osyth and Thorpe-le-Soken); Aveley Housing Estate (Thurrock Urban District); Harlow New Town Development Area (Epping Rural District); Harold Hill Housing Estate (Romford Municipal Borough). III: Urban Districts of Brightlingsea; Frinton and Walton; West Mersea; Wivenhoe. Rural Districts of Braintree; Maldon; Great Bentley, St. Osyth, Thorpe-le-Soken (Tendring Rural District).

Gloucester County and City.—I: *Dursley, Uley and Wootton-under-Edge. II: Almondsbury; Olveston and Patchway; Bishops Cleeve, Cleeve Hill and Winchcomb; Bourton-on-the-Water and Stow-on-the-Wold; Brockworth, Churchdown and Hucclecote; Charlton Kings, Cheltenham and Prestbury; Chipping Sodbury; Cinderford and Drybrook; Cirencester and Rendcomb; Coleford and Parkend and Yorkley; Filton, Little Stoke and Stoke Gifford; Frampton Cotterell, Hambrook and Stapleton; Gloucester; Hanham, Kingswood and Warmley; Lydbrook and Ruardean; Lydney; Mangotsfield; St. Briavels; Stonehouse; Stroud; Tetbury; Tewkesbury; Tidenham. III: Berkeley; Bitton, Oldland and Oldland Common; Blakeney; Blockley and Moreton-in-Marsh; Bream; Brimscombe (Burleigh) and Minchinhampton; Chalford and Eastcombe; Chipping Campden and Mickleton; Corse and Newent; Cranham and Painswick; Fairford and Lechlade; Frampton-on-Severn; Marshfield and Wick; Mitcheldean; Nailsworth; Newnham and Westbury-on-Severn; Northleach; Pilning; Thornbury.

Hampshire.—I: Municipal Borough of *Aldershot. II: Municipal Boroughs of Christchurch; Gosport; Eastleigh; Lymington. Municipal Boroughs and Rural Districts of Andover; Basingstoke; Romsey. Municipal Borough and Northern half of Rural District Winchester; Urban Districts of Fareham; Farnborough; Havant and Waterloo (except Leigh Park Housing Estate). Rural Districts of Droxford; Kingsclere and Whitechurch; New Forest; Ringwood and Fordingbridge; Winchester (Southern half). Urban and Rural Districts of Alton; Petersfield; Hartley Wintney Rural District and Fleet Urban District. III: Leigh Park Housing Estate (Havant and Waterloo) Urban District; Rural District of Stockbridge.

Herefordshire.—I: Nil. II: Bromyard and district; Hereford and district; Ledbury and Malvern (except Cradley and Colwall); Leominster and district; Ross and district; Vowchurch (with Grosmont which is situated in Monmouthshire). III: Cradley and Colwall; Eardisley; Kington and district; Leintwardine (and South Shropshire); Pembridge; Weobley.

Hertfordshire.—I: Urban Districts of *Cheshunt and Goff's Oak. II: City of St. Albans; Boroughs of Hemel Hempstead; Hertford; Watford. Urban Districts of Baldock; Barnet and East Barnet; Berkhamsted; Bishops Stortford; Bushey; Chorley Wood; Harpenden; Hitchin; Hoddesdon; Letchworth; Rickmansworth; Royston; Sawbridgeworth; Stevenage; Tring; Ware; Welwyn Garden City. Rural Districts of Braughing; Elstree and Boreham Wood; Hatfield; Hemel Hempstead; Hertford; Hitchin; St. Albans; Watford. District of Waltham Cross. III: Rural Districts of Ware; Welwyn.

Huntingdonshire.—I: Nil. II: Districts of Huntingdon; Kimbolton; Ramsey; St. Ives; St. Neots; Warboys; Yaxley. III: Districts of Alconbury Weston; Buckden; Somersham.

Isle of Ely.—I: *March; *Whittlesey. II: Chatteris; Doddington; Ely; Haddenham; Littleport; Parsons Drove; Sutton; Wisbech. III: Manea; Thorney.

Isle of Wight.—I: Nil. II: Cowes district; Newport district; Ryde district (including Seaview and St. Helens); Sandown and Shanklin district; Ventnor district. III: Rural District Totland, Freshwater and Yarmouth; Bembridge; Niton; Shorwell; Limerstone.

Isles of Scilly.—I: Nil. II: Nil. III: Whole area.

Kent and Canterbury.—I: Boroughs of *Bexley; *Dartford; Erith; Gravesend; *Strood (North of River Medway). Urban Districts of *Crayford; *Northfleet. II: Boroughs of Beckenham; Bromley; Canterbury; Chatham; Deal; Dover; Faversham; Folkestone; Gillingham; Hythe; Maidstone; Margate; Ramsgate; Rochester (South of River Medway); Tenterden; Royal Borough of Tunbridge Wells. Urban Districts of Ashford; Broadstairs and St. Peters; Chislehurst and Sidcup; Herne Bay; Orpington; Penge; Sittingbourne and Milton Regis; Southborough; Swanscombe; Tonbridge; Whitstable. Rural Districts of Dartford; Estry (except Estry and Minster); Hollingbourne;

Maidstone; Malling (except East Peckham); Strood (except Halling); Swale; Tonbridge (except Brencley, Langton and Pembury). District of Otford and Shoreham (Sevenoaks Rural District); Isle of Sheppey. III: Boroughs of Lydd; New Romney; Sandwich. Urban Districts of Sevenoaks. Rural Districts of Ashford East; Ashford West; Bridge Blean; Cranbrook; Dover; Elham; Romney Marsh. Rural Districts of Sevenoaks (except Otford and Shoreham); Tenterden. Districts of Brencley (Tonbridge Rural District); Estry and Minster (Estry Rural District); East Peckham (Malling Rural District); Halling (Strood Rural District); Langton (Tonbridge Rural District); Pembury (Tonbridge Rural District).

Lancashire.—I: Districts of *Ashton-under-Lyne; *Ashton-in-Makerfield; *Bacup; *Barrowford; *Chadderton; *Chorley; *Denton; *Droylesden; *Farnworth and Kearsley; *Haydock; *Hindley; *Leigh; *Litherland; *Middleton; *Prescot; *Radcliffe; *Swinton and Pendlebury; *Westhoughton; *Whitworth; *Widnes; *Worsley; *Wigan Rural District. II: Districts of Abram; Accrington; Adlington; Aspall; Atherton; Billinge and Winstanley; Brierfield; Carnforth; Clayton-le-Moor; Clitheroe; Colne; Crompton; Crosby; Dalton-in-Furness; Darwen; Eccles; Failsworth; Fleetwood; Formby; Fulwood; Golborne; Great Harwood; Haslingden; Heywood; Horwich; Huyton with Roby; Ince-in-Makerfield; Irlam; Kirkham; Lancaster; Leyland; Littleborough; Lees; Little Lever; Longridge; Lytham St. Anne; Milnrow; Morecambe and Heysham; Mossley; Nelson; Newton-le-Willows; Ormskirk; Orrell; Oswaldtwistle; Padiham; Poulton-le-Fylde; Prestwich; Ramabottom; Rawtenstall; Rishton; Royton; Skelmersdale; Standish with Langtree; Stretford; Thornton Cleverleys; Toddlington; Turton; Tyldesley; Ulverston; Upholland; Urmston; Walton-le-Dale; Wardle; Whitefield; Withnell; Rural Districts of Blackburn; Burnley; Chorley; Garstang; Lancaster; Preston; Warrington; West Lanes; Whiston. III: Districts of Blackrod; Church; Grange; Preesall; Rainford. Rural Districts of Clitheroe; Fylde; Lunesdale; Ulverston.

Leicestershire and Rutland.—I: Districts of *Ashby-de-la-Zouch; *Loughborough Borough. II: Districts of Coalville; Hinckley; Leicester (surrounding places); Loughborough Rural District; Lutterworth (except Peatling Magna); Market Harborough (except Hallaton); Melton Mowbray (except Batters Market Overton and Uppingham). Rutland (except Mowbray); Hallaton (Market Harborough); Market Overton (Rutland); Peatling Magna (Lutterworth); Somerby (Melton Mowbray); Uppingham (Rutland).

Lincolnshire (Holland).—I: Nil. II: Whole area. III: Nil. Lincolnshire (Kesteven).—I: Districts of *Grantham; *Sleaford. II: Districts of Bourne; Market Deeping; North Hykeham; Sleaford. III: Districts of Ancaster and Caythorpe; Bassingham; Billinghay; Castle Bytham; Colsterworth; Corby; Heckington; Heighington; Horbling and Billingborough; Long Bonnington and Bottesford; Martin; Metheringham; Navenby; Rippingale; Ropsley; Ruskington and Leasingham; Woolsorpe-by-Belvoir.

Lincolnshire (Lindsey).—I: Brigg area (*Barton-upon-Humber Urban District; *Brigg Urban District; *Broughton, Granford Brigg Rural District). II: Brigg area (Granford Brigg Rural District, except Broughton; Scunthorpe Borough); Gainsborough area (Gainsborough Urban District and Rural District, except Willingham-by-Stow and Newton-on-Trent); Grimsby area (Cleethorpes Borough; Grimsby Rural District); Horncastle area (Horncastle Urban District and Rural District, except Tetford); Isle of Axholme area (Isle of Axholme Rural District); Louth North; Spilsby area (Spilsby Rural District, except Thoresby Alford Urban District; Skegness Urban District; Welton area (Welton Rural District, except Bardney). III: Caistor Rural District (Caistor Rural District; Market Rasen Urban District); Gainsborough Rural District; Willingham-by-Stow; Newton-on-Trent; castle Rural District); Louth area (Mablethorpe and Sutton Urban District; Thoresby North, Louth Rural District); Spilsby area (Hogsthorpe, Spilsby Rural District); Welton area (Bardney, Welton Rural District).

London.—I: Boroughs of Greenwich (Wards of *St. Nicholas, North-West, West, and South); Hackney (Wards of *Kingsmead and *Wick); Lambeth (Wards of *Prince's and Central, North-West, and North-East); Poplar (Wards of *Bronley (Ward of *Clapham North); Southwark; Wandsworth St. Mary's, River, St. George's and Herbert, *Central and St. Nicholas, and Abbey Wood). II: Boroughs of Battersea; Bermondsey; Bethnal Green; Camberwell; City of London and Shoreditch; Deptford; Finsbury; Fulham; Greenwich (except

Wards of St. Nicholas, North-West, West and South); Hackney (except Wards of Chatham, Kingsmead and Wick); Hammer-smith; Hampstead (except Wards of Town, Central); Holborn; Islington; Lambeth (except Wards of Prince's and Oval, Lansdowne and Springfield); Lewisham; Paddington, North and South; Poplar (except Wards of Bromley Central, North-West, and North-East); St. Marylebone North; St. Pancras; Stepney; Stoke Newington; Wandsworth (except Ward of Clapham Stoke Newington); Westminster (Wards of Covent Garden, Charing Cross and Strand; St. John's, Victoria); Woolwich (except Wards of Dockyard, St. Mary's, River, St. George's and Herbert, Central and St. Nicholas, and Abbey Wood). III: Chelsea; Hampstead (Wards of Town, Central); Kensington, North and South; St. Marylebone, South; Westminster (except Wards of Covent Garden, Charing Cross and Strand, St. John's, Victoria).

Middlesex.—I: Boroughs of Brentford and Chiswick (combined Wards of *Brentford East, Brentford West, Chiswick Park, and Grove Park); Hendon (*Burnt Oak Ward); *Southall; Tottenham (*Coleraine Ward, *Park Ward, *Stamford Hill Ward); *Twickenham; Willesden (*Carlton Ward, *Stonebridge Ward); Wood Green (*Town Hall Ward). Urban Districts of Enfield (combined Wards of *Bush Hill Park, Enfield Wash, Ordnance and Ponders End); Harrow (*Harrow Weald Ward, *Roxeth and Roxbourne Wards); Hayes and Harlington (*East Ward, *West Ward); Staines (*Staines Ward); Yiewsley and West Drayton (*Harmondsworth Ward). II: Boroughs of Acton; Brentford and Chiswick (Brentford Central, Gunnersbury, and Turnham Green Wards); Ealing; Edmonton; Finchley (Glebe, Moss Hall, St. Pauls, Tudor, and West Hendon Wards); Heston and Isleworth; Hornsey; Southgate; Tottenham (Bruce Grove and Central, Chestnuts, Green Lanes, High Cross and Stoneleigh, Seven Sisters, Town Hall, West Green, and White Hart Lane Wards); Wembley; Willesden (Brentwater, Brondesbury Park, Church End, Cricklewood, Gladstone, Harlesden, Kensal Rise, Kilburn, Manor, Mapesbury, Roundwood and Willesden Green Wards); Wood Green (Alexandra-Bowes and Noel Park Wards). Urban Districts of Enfield (Cambridge Road, Chase, Green Street, Town, West and Willow Wards); Feltham; Friern Barnet; Harrow (Belmont, Harrow-on-the-Hill, Headstone, Kenton, Pinner North and Hatch End, Pinner South, Queensbury, Stanmore North, Stanmore South, Wealdstone North, Wealdstone South and West Harrow Wards); Hayes and Harlington (South Ward); Potters Bar; Ruislip (Northwood); Staines (Ashford, Laleham and Stanwell Wards); Sunbury-on-Thames; Uxbridge; Yiewsley and West Drayton (West Drayton and Yiewsley Wards). III: Boroughs of Brentford and Chiswick (Bedford Park and Old Chiswick Wards); Finchley (Manor, St. Mary's, and The Bishop's Wards); Hendon (Edgware, Garden Suburb and Golders Green Wards); Hayes and Harlington (Harlington Ward).

Norfolk.—I: Nil. II: Boroughs of King's Lynn; Thetford; Urban Districts of Cromer; Diss; Downham Market; North Walsham; Sheringham; Swaffham and Swaffham Rural District; Wymondham. Rural Districts of Blofield and Flegg; Depwade; Docking; Downham; Erpingham; Forehoe and Henstead; Loddon; Marshland; Mildford and Launditch and East Dere-don; Norwich; St. Faiths and Aylsham; Smallburgh; ham Urban District; Walsingham; Wayland. III: Urban Districts of New Hunstan-ton; Wells-next-Sea. Rural District of Freebridge Lynn.

Northamptonshire.—I: Districts of *Burton Latimer and Finedon; *Corby; *Irthlingborough; Kettering; *Welling-borough. II: Districts of Brackley; Daventry; Desborough and Rothwell; Oundle; Paulerspury; Rushden and Higham Ferrers; Thrapston; Towcester. III: Districts of Blisworth and Roade; Brixworth; Bugbrooke and Kissingbury; Byfield and Woodford Halse; Cold Ashby; Crick and West Haddon; Earls Barton; Flore; Guilsborough; Islip; Kingscliffe; Long Buckby; Moulton; Raunds; Weedon; Welford; Wollaston; Yardley Hastings.

Northumberland.—I: Ashington (including Newbiggin-by-the-Sea); *Hollywell and *Shiremoor (Seaton Valley district). II: Sea; *Hollywell and *Shiremoor (Seaton Valley district); Alnwick (including Alnwick); Bedlingtonshire; Berwick-on-Tweed and Norham and Islandshires Blyth; Castleward Rural District; Gosforth; Haltwhistle; Hexham; Longbenton; Morpeth; New-prudhoe; Seaton Valley (except Hollywell and Shiremoor); burn; Walsend; Whitley Bay. III: Belford, Bellingham; Glendale; Rothbury.

Nottingham County and City.—I: Nottingham City (District No. 2, District No. 4). Borough of *Workop. Districts of *Carlton and Netherfield; *Eastwood; *Stapleford; *Sutton-in-Ashfield; *Warsop. II: Nottingham City (District No. 1, Ashfield; District No. 3, District No. 5). Boroughs of Mansfield; Newark; Retford. Districts of Arnold; Beeston; Bingham; Blidworth and Rainworth; Carlton-in-Lindrick; Costock and Ruddington; Edwinstowe and Ollerton; Harworth; Hucknall; Kimberley;

Kirkby-in-Ashfield; Mansfield Woodhouse; Selston; Southwell; Sutton Bonington; West Bridgford. III: Districts of Carlton-on-Trent; Colston Bassett and Keyworth; Gringley-on-the-Hill; Lowdham; Misterton; North Clifton; North Collingham; North Leverton; Tuxford.

Oxford County and City.—I: Nil. II: Banbury and district; Bicester; Burford and district; Charlbury and district; Chipping Norton and district; Deddington and district; Eynsham and district; Henley-on-Thames and district; Oxford (West of the River Cherwell); Oxford (East of the River Cherwell); Wheatley; Witney; Woodstock. III: Bampton and district; Chinnor; Clifton Hampden; Dorchester-on-Thames; Filkins district; Goring-on-Thames and district; Islip; Kidlington; Little Milton; Shipton-under-Wychwood; Thame; Watlington.

Shropshire.—I: *Wellington Town. II: Bridgnorth; Chir-bury; Cleobury Mortimer; Ellesmere; Ludlow; Market Dray-ton; Newport; Oswestry; Shifnal; Shrewsbury; Wellington Rural District; Wenlock; Whitchurch. III: Cleobury North; Clun.

Soke of Peterborough.—I: Nil. II: Whole area. III: Nil. Somerset.—I: Nil. II: Boroughs of Chard; Glastonbury and Street; Taunton; Weston-super-Mare; Yeovil. Urban Districts of Bridgwater; Burnham-on-Sea; Clevedon; Crekerne; Frome; Keynsham; Midsomer Norton; Portishead; Radstock; Shepton Mallet; Wellington; Wells. Rural Districts of Axbridge; Bath-avon; Bridgwater; Chard; Clutton; Frome; Long Ashton; Taunton; Wellington; Wincanton; Yeovil. III: Urban Districts of Minehead; Watchet. Rural Districts of Dulverton; Lang-port; Shepton Mallet; Williton.

Staffordshire.—I: City of *Lichfield. Boroughs of Bilton; Rowley Regis; *Stafford; Tipton; Wednesbury. Urban Districts of *Amblecote; *Brierley Hill; *Brownhills; *Darlaston; *Kiddsgrove; *Sedgley. II: Boroughs of Newcastle; Tamworth. Urban Districts of Aldridge; Biddulph; Cannock; Coseley; Leek; Rugeley; Stone; Tettenhall; Uttoxeter; Wednes-field; Willenhall. Rural Districts of Cannock; Cheadle (except Waterhouses); Lichfield (except Armitage); Newcastle (except Ashley, Market Drayton and Betley); Seisdon; Stafford (except Great Haywood); Stone (except Sandon); Tutbury. III: Rural Districts of Leek; Uttoxeter. Districts of Armitage (Lichfield Rural District); Ashley, Market Drayton (Newcastle Rural Dis-trict); Betley (Newcastle Rural District); Great Haywood (Stafford Rural District); Sandon (Stone Rural District); Waterhouses (Cheadle Rural District).

Suffolk (East).—I: Nil. II: Blyth district (excluding Earl Soham, Peasenhall, and Yoxford); Deben district (excluding Alderton and Orford); Gipping district (excluding Debenham); Hartismere district (excluding Fressingfield, Hoxne and Strad-broke); Lotherland district (excluding Kessingland); Samford district; Wainford district. III: Blyth district (Earl Soham, Peasenhall; Yoxford); Deben district (Alderton, Orford); Gipping district (Debenham); Hartismere district (Stradbroke, Fressingfield, Hoxne); Lotherland district (Kessingland).

Suffolk (West).—I: Borough of *Bury St. Edmunds. II: Borough of Sudbury. Urban Districts of Hadleigh; Haverhill; Newmarket. Rural Districts of Clare; Cosford; Mildenhall; Thedwastre; Thingoe. III: Rural District of Melford.

Surrey.—I: Nil. II: Boroughs of Barnes; Beddington and Wallington; Epsom and Ewell; Godalming; Kingston-upon-Thames; Malden and Coombe; Mitcham; Reigate; Richmond; Surbiton; Sutton and Cheam; Wimbledon. Urban Districts of Carshalton; Caterham and Warlingham; Chertsey; Coulsdon and Purley; Dorking; Egham; Esher; Farnham; Frimley and Camberley; Leatherhead; Merton and Morden; Walton and Weybridge; Woking. Rural Districts of Bagshot; Dorking and Horley; Godstone; Guildford; Hambledon. III: Urban Dis-tricts of Banstead; Guildford; Haslemere.

Sussex (East).—I: Nil. II: Boroughs of Hove; Lewes. Urban Districts of Burgess Hill; East Grinstead; Newhaven; Portslade; Seaford. Rural Districts of Chailey; Hailsham; Uckfield. Urban and Rural Districts of Cuckfield. The Rural District of Battle and the Borough of Rye. III: Borough of Bexhill.

Sussex (West).—I: Nil. II: Angmering, Rustington and East Preston; Arundel; Billingshurst; Bognor Regis; Chichester; Cowfold; Emsworth; Haslemere (area adjoining the Surrey border); Horsham; Lancing; Littlehampton; Midhurst; Pul-borough; Shoreham and Southwick; Steyning; Worthing. III: Barnham; Eastgate and Yapton; Crawley Development Area; Harting and Rogate; Henfield; Loxwood; Petworth; Rudgwick and Slinfold; Selsey; Storrington; West Wittering.

Warwickshire.—I: Boroughs of *Nuneaton. II: Boroughs of Leamington Spa; Rugby; Stratford-on-Avon; Sutton Coldfield; Warwick. Urban Districts of Bedworth; Kenilworth; Solihull. Rural Districts of Alcester (except Alcester); Atherstone; Meri-

Yorkshire (W.R.) Executive Council.—I: Borough of *Ossett; Urban Districts of *Adwick-le-Street; *Bentley with Arksey; *Bingley (South and East Wards); *Conisborough; *Maltby; *Mexborough; *Royston; *Sowerby Bridge; *Stanley. Urban and Rural Districts *Hemsworth; *Penistowe. Rural Districts of *Kiveton Park; *Thorne (Parishes of Hatfield and Stainforth); *Wortley. II: City of Ripon; Boroughs of Batley; Brighouse; Harrogate; Keighley; Morley; Pontefract; Pudsey; Todmorden. Borough and Rural District Goole. Urban Districts of Aireborough; Baildon; Barnoldswick and Earby; Bingley (Central, North, West, Cullingworth, and Wilsden Wards); Castleford; Colne Valley; Cudworth; Darfield; Darton; Dearne; Denby Dale; Dodworth; Elland; Featherstone; Garforth; Hebden Royd; Heckmondwike; Holmfirth (except Scholes, near Huddersfield); Horbury; Horsforth; Hoyland Nether; Ilkley; Kirkburton; Knaresborough; Knottingley; Meltham; Mirfield; Normanton; Otley; Queensbury and Shelf; Rawmarsh; Ripponden; Rothwell; Saddleworth; Shipley; Silsden; Spenborough; Stocksbridge; Swinton; Tickhill; Wath-on-Deane—Wombwell (including Brampton Bierlow Parish in Rotherham Rural District); Worsborough. Urban and Rural Districts of Selby; Skipton (except Grassington and Addingham). Rural Districts of Doncaster; Hepton; Osgoldcross; Rotherham (except Brampton Bierlow Parish and Wentworth Parish); Tadcaster (except South Milford); Thorne (Parishes of Fishlake, Sykehouse and Thorne); Wakefield;

Sunderland (I). Tynemouth (II). Wakefield (II). Wallace

wellty; *Risca; Tredegar. Urban and Rural District of *Pontypool. II: County Borough of Newport. Municipal Borough and Rural District of Abergavenny. Urban Districts of Abercarn; Abertillery; Bedwas and Machen; Blaenavon; Cwmbran.

Swansea.—I: Swansea East. II: Swansea West. III: Nil.

When local food offices close at or about the end of June this year, the local health authorities will take on the distribution of National dried milk, orange juice, cod-liver oil, and vitamin A and D tablets to those who are entitled to them under the welfare service. The local health authorities will have no responsibility at all in the provision of liquid milk, which will continue to be distributed through retail dairymen.

MEDICAL PRACTICES ADVISORY BUREAU ANNUAL REPORT FOR THE YEAR ENDING DECEMBER 31, 1953, BY THE MEDICAL DIRECTOR

During the year 1953 the four main branches of the Bureau have continued to work at high pressure. The records of appointments and vacancies successfully filled do not give a reliable indication of the work entailed, since each one may mean the dispatch of anything up to 200 circular letters. These records show, however, that over the past three years a fairly constant level has been maintained. It seems probable that the demand on the agency services of the Bureau has been stabilized following the rapid expansion in the first two years, which reached a peak in the middle of 1950. A temporary falling off in the Manchester branch following the death of Mr. Beedle was more than offset by the increase in Scotland following the establishment of the additional branch in Glasgow. The following table shows the analysis and totals of the Bureau's work in the three main types of appointments in general practice:

	1951	1952	1953
Prospective partnerships (Assistants with view)	211	213	175
Assistants and Trainees*	435	450	483
Locums	2,452	2,395	2,465
	3,098	3,058	3,123

*The proportion of trainees represents about 40%.

Entry into General Practice

Contrary to expectation, there has been no increase in the number of assistantships with view to partnership, and the trend which was apparent before the new distribution scheme came into effect in April, 1953, has continued. The number of vacancies in this category has continued to fall (with periodic fluctuations) since the peak figure attained in the second quarter of 1950, whereas the number of vacancies for assistants has steadily increased, reaching its peak in December, 1953.

In my last report I suggested that there was evidence that a large number of new partnerships were being formed and that it was justifiable to assume that principals were entering into agreements with assistants already engaged without view rather than making new appointments. This was subsequently borne out by figures published by the Medical Practices Committee. It seems likely that this will continue for some time. Though it would be difficult to produce factual evidence, my experience, and that of my staff, is that the great increase noted last year in the number of requests for advice on the procedure for forming partnerships, and the drawing up of partnership agreements, is likely to continue.

Locums

A great deal of the work associated with the supply of locums is done by telephone, and, owing to short notice, it is not always easy to complete the routine formalities. Very occasionally this gives rise to difficulties which could have been avoided if the appointment had been confirmed to the Bureau. If, as should happen in every case, the Bureau is notified that an appointment has been made, a "Contract Note" confirming the terms agreed and containing a brief summary of the obligations accepted by both principal and locum is sent to both parties. This acts as a protection to both in the event of a dispute. Unfortunately, once the introduction is effected, the parties all too frequently make their own arrangements; the Bureau is not informed, and the contract note cannot then be sent. Considering the number of introductions made and the volume of work involved, complaints and disputes are very few—but they do occur, and will inevitably occur in the future. Many difficulties, even amounting to threatened litigation, could be avoided if the normal procedure could be followed in every case.

There is a period each year covering the holiday months when the demand for locums is very much in excess of the supply. During these months a locum is in a position to pick and choose, and there is little likelihood of his facing a waiting period between successive appointments. For this reason there is an understandable reluctance on the part of prospective locums to make firm engagements in advance, for fear that the dates of other posts will clash, or that they may miss the opportunity of accepting more attractive alternatives. This leads, on occasion, to much anxiety and occasionally disappointment to principals who have taken the precaution of registering their dates with the Bureau many weeks or even months ahead. It is embarrassing to the Bureau, which may be suspected of discrimination. The shortage of locums during this period also has the effect of introducing competitive rates for holiday locums to the disadvantage of practitioners in industrial areas.

Other Appointments

The help of the Bureau is sought for a very wide range of appointments both at home and overseas. Those abroad comprise mainly short-term or long-term specialist and industrial appointments (usually renewable), and also openings in general practice, most of which, of course, involve the sale of goodwill. Great care is taken to ensure that the applicant is in possession of full information, and, where possible, a contract or agreement in writing. I should like to take this opportunity of acknowledging the help received by the Bureau from Overseas Branches of the Association and affiliated associations with which we are in close touch.

Exchange of Practices

During the past four years the Bureau has made over 2,000 introductions under a scheme for the exchange of practices sponsored by the Medical Practices Committee with the assurance of co-operation from the majority of executive councils. The results have been extremely disappointing. Recently, as part of an attempt to facilitate freer movement among general practitioners, a list comprising some 70 practices available for exchange was advertised in the *British Medical Journal*, care being taken to avoid disclosing the exact locality of the practice and the identity of the practitioner. This stimulated inquiries temporarily, but, to judge by the progress of such negotiations as have followed, the results have continued to be disappointing. I am satisfied, however, that the machinery for dealing with this problem is adequate.

Advisory Services

The advice given by the Bureau covers a great variety of personal problems, by far the larger proportion being questions concerning relationships between doctors, and contracts and agreements arising therefrom. As already mentioned, the formation of new partnerships has been a predominant feature during 1953. Experience has proved the value of a disinterested opinion from the point of view of the doctor rather than the lawyer. For instance, it has been possible to find common ground and reach an acceptable compromise when the exchanges between the solicitors, acting in the interests of their respective clients, threaten to widen the disagreement and cause an impasse. Advice is sought with increasing frequency by solicitors at the request of members on such questions as the criteria for payment on notional lists, the methods of dealing with superannuation contributions, the effect of the ban on the sale of goodwill on existing partnership agreements, and many other similar problems. There is no doubt that the close personal relationship which the Bureau is able to establish, both in correspondence and especially by interview, is much appreciated by members of the Association.

British Medical Association

GENERAL MEDICAL SERVICES COMMITTEE

REPORT OF THE GENERAL MEDICAL SERVICES COMMITTEE TO THE ANNUAL CONFERENCE OF REPRESENTATIVES OF LOCAL MEDICAL COMMITTEES, 1954 (continued)

APPENDIX B REPORT OF THE EXCHANGE OF PRACTICES SUBCOMMITTEE

Preliminary

1. The Subcommittee was appointed by the General Medical Services Committee on September 17, 1953, with the following terms of reference and personnel:

Resolved: That a special subcommittee be set up to consider the following resolution of the Annual Representative Meeting:

219. Resolved: that the following motion be referred to the Council:

That ways and means be explored to make it easier for general practitioners to change practice.

and the personnel be the Chairman, B. Cardew, H. Guy Dain, C. J. Swanson, and G. P. Williams.

Chairman

2. H. Guy Dain was appointed Chairman of the Subcommittee.

Meetings

3. The Subcommittee has met on two occasions: November 3, 1953, and January 14, 1954.

Change of Practice

4. The Subcommittee is fully conscious of the efforts which have been made in the past to facilitate the exchange of practices, but unfortunately the results so far have proved somewhat disappointing. In view of the wording of the resolution passed by the Annual Representative Meeting, it has not confined itself to possible methods of improving the existing machinery for direct exchange between two practitioners, rather has it approached the problem from the point of view of the establishment of a general "clearing house" through which the differing requirements of practitioners might be met—in other words, machinery whereby those wishing to change their area of practice would be able to do so by a number of alternative methods.

5. In the view of the Subcommittee there are three possible lines of approach to the problem: (1) Direct exchange of practices between established practitioners. (2) The appointment to small vacancies from a panel of practitioners who have notified their desire for this type of opening. (3) Exchange of vacancies by arrangement between executive councils whereby two applicants may both gain advantages.

6. At its first meeting the Subcommittee was presented with a memorandum by the Medical Director of the Medical Practices Advisory Bureau which set out in detail both the machinery which has been established and the results which have been achieved in regard to direct exchanges. This memorandum is reproduced in Sub-appendix (i). The Subcommittee for its part has not suggested any radical improvements but has accepted the suggestions made by Dr. Potter

(1) That the Editor of the *British Medical Journal* should be asked to publish from time to time summaries of the advertisements now appearing each week with possibly an annotation to give additional publicity to the facilities available, and (2) That complete lists of all practices available for exchange should be sent to doctors registered with the Bureau for this purpose rather than merely a list of those which appear to meet the requirements of the individual concerned.

7. With regard to the second method, Dr. Potter has shown in a further memorandum (Sub-appendix (ii)) that machinery exists for this, but that although attractive in theory it has not proved effective in practice. Thus the first two methods were to some extent covered and there remained the third method visualized by the Subcommittee—an exchange of vacancies by arrangement between executive councils. A general practitioner who wished to change the area of his practice would, when applying for the vacancy of his choice, be given special consideration on the grounds that he would be surrendering an equivalent or better practice in another part of the country, thus leaving an opening for another practitioner. Such a proposal would in no way imply that the vacancies would not be advertised in the normal way, but merely that an applicant with a practice to offer in exchange would have that fact taken into account.

8. The Subcommittee fully concurs with the view that the success of such a scheme would depend on the full co-operation of executive councils and the Medical Practices Committee on the one hand, and the maintenance of a central bureau on the other. The Subcommittee feels that there is much to be said for exploring the possibilities of such a scheme and accordingly recommends:

Recommendation: That the Medical Practices Committee be asked to discuss the proposal outlined above that additional machinery should be established to facilitate the exchange of vacancies by executive councils.

SUB-APPENDIX (I)

MEMORANDUM BY THE MEDICAL DIRECTOR OF THE MEDICAL PRACTICES ADVISORY BUREAU

1. Very soon after the appointed day it was apparent that the ability of practitioners to change the areas of their practices would be very much restricted. This was a direct consequence of the ban on the sale and purchase of goodwill.

2. Before the appointed day a doctor wishing, for instance, to reduce his work could sell his practice with the reasonable certainty that he would be able to purchase another without a waiting period which would strain his resources unduly. After July, 1948, although on resignation from the list a doctor could obtain payment of his compensation, the only way he could resume general practice in another area was by applying for a vacancy. There is reason to believe that a number of doctors do try this method of effecting an exchange: they apply for suitable vacancies, intending, if successful, to resign from the list, affording cover by deputy until the vacancy can be filled. The Bureau has little evidence that those on the list for exchange who have tried this method have been successful, and, in any case, under these circumstances compensation would not be payable immediately.

3. During 1949 the opinion of the Medical Practices Committee was sought on a possible mechanism, acceptable to executive councils and local medical committees, whereby exchanges could be facilitated or even encouraged. As a result, the Medical Practices Committee sent a letter to executive councils, and this was published in the *Supplement* to the *B.M.J.* on March 18, 1950, in the following form:

"The following is a circular letter which has been addressed to executive councils (and local medical committees) by the Medical Practices Committee after discussions with representatives of the G.M.S. Committee and the Medical Director of the Medical Practices Advisory Bureau. The Bureau is anxious to play its part in this field, and the suggested procedure should be of help to the profession. Clearly, the greater the number of practitioners who are registered with the Bureau for this purpose, the greater the opportunity of effecting suitable introductions. The fullest possible information concerning the doctor's present practice and his wishes for the future should be given. The letter is, of course, self-explanatory and needs no further comment.

Exchange of Practices

"Prior to July 5, 1948, general practitioners who desired for some reason, personal or domestic, a change in the type of

practice or area they worked were able as one method of achieving this to arrange mutually with other practitioners an exchange of practices. Thus the practitioner with years of industrial practice behind him, who naturally desired less arduous practice in rural surrounds or coastal resort, could exchange with the younger man who found his family commitments beyond the scope of any possible expansion of the practice he had in such an area. These arrangements were the occasion of minimum disturbance and worked well to the advantage of the public and the doctors alike.

* Since the appointed day only two such exchanges have been made. In each instance the arrangements were made between the doctors provisionally and completed by the assent of the executive councils concerned, recognizing the advantages of such an arrangement, without any difficulty.

"The Medical Practices Committee is informed that there is still a desire among practitioners that exchanges should go on, and holds the view that normally no difficulty should be experienced in making the necessary arrangements. We believe that it is the apparent difficulty only that has deterred practitioners from taking such steps. Obviously it would be an essential prerequisite that, before either of two practitioners who had made provisional arrangements to exchange practices resigned from the list of their present executive councils, not only the admission of both of them to the new council's lists, but the transfer of the patients of each to the other must be assured. Only in very exceptional cases should such assurance be withheld by the executive councils concerned in consultation with their local medical committees (the actual committee being preferably the local consultative committee comprised of members of each of these statutory bodies). They can be certain that the Medical Practices Committee would endorse the action they took in any recommended case. The fact that either area had been declared a 'closed area' by the Medical Practices Committee should not generally affect the decision to agree to an exchange.

"The initiative must of course be taken by the doctors themselves. The normal channels would be by advertisements in the journals or through the Bureau at B.M.A. House.

"The Medical Practices Committee requests the observations of your council and the local medical committee upon the suggestions outlined above, which it is hoped will be effective immediately.

"A copy of this letter is enclosed for transmission to the local medical committee."

4. The results have been very disappointing, but although few exchanges have actually been effected, there are a number of cases in which preliminary steps have been taken. In no instance has there been reason to doubt the full co-operation of executive councils.

5. Between January 1, 1950, and October, 1953, there have been 275 doctors registered with the Bureau for exchange. In all 2,290 introductions have been given (1,145 cases each involving two doctors). Only 7 exchanges have been completed—that is, 14 doctors have exchanged practices.

6. A recent review of the register held by the Bureau has suggested some of the reasons for this. At the beginning of October, 1953, there were 158 names on the register. These have been circularized with a view to revising the particulars, thus giving an opportunity of "pruning" the list. More than half have not replied, but those who have, together with a number with whom there has been recent correspondence, make a total at present of 68 who definitely desire exchange.

7. Of these, 16 are in practice in the Midlands or northern industrial areas, but only six are prepared to face a real sacrifice of income in order to secure a practice in the South. Two are restricting their search to London only.

8. Of those in the southern half of the country only three are prepared to go to the North or Midlands, and of the remainder 29 want exchange but will not go north or to industrial areas of the Midlands, and are not prepared to make any sacrificial reduction of income.

9. Consideration of this analysis suggests that there are two main attractions which prompt the wish to exchange practices—area and income. A doctor who wishes to move from an industrial to a country or seaside area must be prepared to offer a substantial inducement if he is to be successful. In other words, he himself must face a substantial drop in income. The evidence suggests that few

are prepared to do this, and, by inference, that the majority on the list are prepared to wait until an opportunity for a really good bargain occurs. As each exchange involves two practitioners, each seeking an advantage, it is not surprising that a scheme which in theory sounds attractive and feasible should prove disappointing in practice. There are, of course, other factors, such as exchange of houses, the lack of educational facilities, social amenities, etc., but experience suggests that if the need to move is urgent, these secondary difficulties can be surmounted.

10. The question arises: Could an improvement in the position be obtained by wider dissemination of information? It has been suggested, for instance, that a complete list of practices with essential particulars briefly set out should be published from time to time in the *Journal*, giving for each a reference number which could be used in the initial correspondence with the Bureau. This would not replace the small advertisements appearing each week under the title Exchange in the general practice section. These average 2-3 each week, the majority being inserted by the Bureau. It must be borne in mind, however, that most doctors when initiating inquiries stress the need for strict secrecy. It is common knowledge that a rumour of a doctor's impending departure can affect adversely his practice, although no doubt this effect is often exaggerated. Apart from publication in the *Journal*, a full list can, of course, be sent by post with supplements from time to time to all doctors registered for exchange with the Bureau.

SUB-APPENDIX (II)

SUPPLEMENTARY MEMORANDUM BY THE MEDICAL DIRECTOR OF THE MEDICAL PRACTICES ADVISORY BUREAU

1. The memorandum submitted to the Subcommittee on November 3, 1953, dealt mainly with the direct exchange of practices between doctors wishing to change their areas or to reduce or increase their commitments. It has been suggested that there is a distinction between exchange of practices and change of area in that the former implies a transaction between two practitioners, whereas in the latter only one is involved. This is only partially true, because by leaving one practice to take up another the doctor concerned is creating a vacancy which will presumably be filled, if not by a colleague who is also relinquishing a practice, by a new entrant. A change of practice area, therefore, really involves an exchange of vacancies, and it may be that the machinery already set up to deal with practice exchanges could be extended and adapted to cover also exchange of vacancies. It is, of course, essential that any scheme should have the fullest co-operation of executive councils and the positive support of the Medical Practices Committee.

2. It can, I think, be assumed that a doctor wishing to change his area either wishes to reduce his commitments or, if he wishes to move to a locality more suitable for health or other reasons, faces a drop in income by so doing. This means that it is the vacancy in the small or medium-sized practice which will attract the doctor wishing to change his area.

3. In the early days of the National Health Service a scheme was evolved to deal with vacancies in small practices which, in the ordinary way, would be dispersed. Set out below is a copy of a memorandum by the Medical Practices Committee which was sent to executive councils and local medical committees on May 3, 1949. Briefly this suggests that when faced with a vacancy with a list of between 400 and 1,000 the council, before deciding to disperse the practice, should ask the M.P.A.B. whether they had on their register any practitioner seeking such a vacancy. It must be borne in mind that this scheme covers a wider field than those wishing to change their areas. It includes, for example, doctors completing service abroad and others wishing to enter general practice after some years in salaried appointments.

4. The suggestion has not been very widely adopted. A few executive councils refer to the Bureau when they wish to fill this type of vacancy. Some councils form their own panels and one at least invites, by advertisement in the *Journal*, doctors seeking small vacancies to enter a panel for the purpose. While there is no need to discourage the formation of local panels, they have disadvantages in that the field is likely to be restricted. It would be preferable if this scheme could be dealt with, as originally suggested, through a central exchange of information such as the Bureau.

5. Thus there are two schemes sponsored by the Medical Practices Committee which, if used effectively, would facilitate change of area. Both, though attractive in theory, have proved disappointing in practice. Probably the reason lies in the fact that the new entrant and the doctor wishing to change are both seeking the same thing—a medium-sized practice with a list of 1,000 to 2,000 in a non-industrial area—though there is probably a point below which the size of the list is more likely to attract those wishing to limit their commitments than new entrants into practice who, if given the choice, would be more likely to apply for the vacancy created by the change.

6. The vacancy with a medium-sized list is almost certain to be advertised, and in open competition with new entrants a practitioner already established is unlikely to succeed unless the selection committee can be satisfied that, if appointed, he will create a vacancy even more desirable from the point of view of the new entrant. Even so, this implies an exchange of vacancies between executive councils and also their willingness to consider favourably an applicant who has himself a desirable practice to offer.

7. To sum up, there are three methods of approach to the problem: (1) Direct exchange of practices between established practitioners. (2) The appointment to small vacant practices from a panel of practitioners who have notified their desire for this type of opening. (3) Exchange of vacant practices by arrangement between executive councils where by two applicants may both gain advantages.

8. For success, all three methods require: (1) the co-operation of executive councils and the sponsorship of the Medical Practices Committee (in respect of the first two these are already assured); and (2) a central bureau of information. Granted these two considerations, there is nothing difficult or impossible in the administration of such a scheme. The Medical Practices Advisory Bureau already has facilities. Time alone will show whether the results, which have so far been disappointing, would justify the very considerable amount of additional work involved.

Memorandum by Medical Practices Committee Regarding the Dispersal of Small Practices

(See para. 3 above)

The Medical Practices Committee has been concerned about the position of young doctors wishing to enter into practice as principals for the first time and the lack of opportunities for them to do so since July 5.

Entry by succession to substantial practices is not possible (or desirable), such vacancies are usually awarded to more experienced men. Partnership arrangements, usually after preliminary assistantships, are more readily available, but are still too few and in any case do not satisfy the man who wishes to practise single-handed.

"Squatting" in an area deemed suitable remains. Even if the basic salary is awarded, much financial stringency inevitably follows for a number of years, the earlier ones at least being a period of enforced idleness at a time when the doctor ought to be occupied in learning the art of general practice and seeing his patients. The lack of these latter prevents his achieving either object.

The Committee has noted that many vacancies following upon the death or retirement of practitioners, even in areas where an executive council with the local medical committee would agree

that the numbers of patients on the lists of neighbouring doctors are high, are frequently not filled and the list is dispersed.

This is particularly noticeable where the list is of 400-1,000 units. The reason for this is that it would not be economic to appoint a locum to run it temporarily, and if continued at all it is by the good offices of the neighbouring doctors, who inevitably absorb the patients and indeed could scarcely avoid doing so.

To go through the routine of selection, after advertisement and appointment by the Medical Practices Committee, would manifestly be a waste of effort. By the time a successor was appointed the practice in most cases would have melted away.

Nevertheless where the executive council, after consultation with the local medical committee, agrees that it would be better if a new doctor should, if possible, be appointed right away, it is very desirable that this should be done. Alternatively, rather than dispersal, the executive council might invite one or more practitioners in the neighbourhood who have small lists to take over.

Names of young practitioners in a position to and desirous of taking up such vacancies at short notice may already be in the hands of the executive council or local medical committee. Alternatively such might be obtained by telephone from the new Bureau established at British Medical Association House and Branch Offices.

The Medical Practices Committee would, if the applicant was not already on the list (without restriction), endorse any such appointment to a vacancy of this sort which an executive council might make. Appointment to such a list would represent vast advantages and probably avoid two to three years' distress to many doctors who otherwise must start from scratch.

APPENDIX C

REPORT OF THE MATERNITY SUBCOMMITTEE

Preliminary

1. The Subcommittee was appointed on July 23, 1953, with the following reference and personnel:

Resolved: That a special subcommittee be appointed to consider the question raised in the following Conference resolution, and that the Subcommittee be asked also to investigate the co-ordination of the maternity services and the existing obligations of general practitioners who undertake this work.

Resolved: That this Conference instructs the General Medical Services Committee to review the whole question of the Maternity Medical Service with particular reference to the relation of fees to the work done.

Personnel: K. Harrower, J. C. Arthur, A. N. Mathias, D. F. Hutchinson, H. S. Howie Wood, I. G. Innes, A. Beauchamp, and S. Wand.

2. The Subcommittee appointed K. Harrower as its Chairman, and has met on two occasions—October 20 and November 26, 1953.

Memorandum from the Middlesex Local Medical Committee

3. At its first meeting the Subcommittee considered a memorandum submitted by the Middlesex Local Medical Committee. It also had the advantage of hearing R. B. L. Ridge, of the Middlesex Local Medical Committee, who attended the first meeting by invitation to elaborate the views summarized in the Middlesex memorandum. The Subcommittee wishes to record its appreciation of the work which has been done by the Middlesex Local Medical Committee in its survey of the maternity service.

Obstetric List

4. The Subcommittee has had referred to it by the G.M.S. Committee the following resolution of the A.R.M., 1953, with regard to the obstetric list.

192. **Resolved:** That Council be asked to report the steps that have been taken to secure the abolition of the obstetric list.

5. The views of the Association on this subject, which were formulated by the A.R.M. in 1952, have been expressed on a number of occasions. Quite recently, in a memorandum of evidence which was submitted to the Committee of the Central Health Services Council on General Practice, it was pointed out that every general practitioner was qualified in law to practise midwifery, and that the artificial distinction imposed by the present regulations had done little to raise the standard of practice. It was submitted that what the general practitioner required was the opportunity to gain experience and so further his skill in obstetrics, both domiciliary and institutional, and that this would never be achieved by the purely administrative and artificial device of an obstetric list—particularly as the standards imposed by local obstetric committees for admission to the list were by no means uniform. The Association saw considerable advantages in the procedure followed in Scotland and Northern Ireland, where every registered medical practitioner is entitled without further question to contract to provide maternity medical services and to receive the full fee for so doing; or, if he so desires, to provide maternity medical services solely for patients on his own list, at a reduced fee. In other words, he has the right to take part in the maternity service of his own volition, without having to satisfy a committee as to his professional experience and qualifications.

6. Apart from the A.R.M., the Subcommittee was aware that similar views had been advanced by its parent Committee and by the Conference. As recently as February, 1953, at the time that the Ministry issued a circular of guidance to the chairmen of obstetric committees, the Committee's representatives reaffirmed their desire to extend the Scottish system to England and Wales. The Subcommittee considers, therefore, that an appropriate opportunity should be sought again to remind the Ministry of the Association's view that the obstetric list as it now exists should be abolished, and that every general practitioner should be allowed to practise domiciliary midwifery as of right. As, however, the Ministry will in all probability wish to await the report of the Committee of the Central Health Services Council on General Practice, the Subcommittee recommends that no action be taken with the Ministry until that report is available.

Fees for Maternity Medical Services

7. The Subcommittee wishes to stress that in any discussions with the Ministry it should be a *sine qua non* that the abolition of the obstetric list will not result in the reduction of the present 7-guinea fee which covers an initial medical and obstetric examination and an examination at or about the thirty-sixth week of pregnancy, together with such other examination and antenatal care as the practitioner thinks necessary, attendance at the confinement (if necessary), a medical and pelvic examination of the mother between six and twelve weeks after confinement, and the medical care of the mother and child for 14 days after the confinement. The present regulations also provide that if a doctor does not give the complete service, the payment for the initial examination and supervision to the end of pregnancy shall be 3½ guineas (Period 1) and for attendance at the confinement, during the puerperium, and for post-natal supervision, 4½ guineas (Period 2). A fee of 10s. 6d. attaches to a single antenatal examination where only one such examination is given, and a fee of one guinea where post-natal supervision only is carried out.

8. Although to qualify for the prescribed fee only two antenatal examinations at specified times are necessary, most practitioners see the patient at frequent intervals during pregnancy. While the Subcommittee would be opposed to the imposition of further statutory requirements, it does consider that every encouragement short of financial inducement should be given to practitioners to see their maternity patients at regular and frequent intervals, and it recom-

mends that an early opportunity be taken to bring home to general practitioners their responsibility in this connexion. In fact, the Subcommittee believes that the majority of doctors already undertake more examinations than are, by regulation, required and it is only the minority of patients who receive less than adequate attention.

9. Statistics show that there is a definite correlation between the number of antenatal examinations made and the maternity morbidity and mortality rates. The Subcommittee cannot express too strongly its disagreement with the view expressed by the Minister when the regulations governing the maternity medical services were framed, that two examinations only would normally discharge the obligation of the doctor with regard to antenatal care. While the Subcommittee does not at the present wish to make any recommendations as to the adequacy of the present fees for maternity medical services, it is of the opinion that, should these be the subject of examination at a later date, the fact that the great majority of general practitioners undertake the fullest antenatal care should be borne in mind.

Co-ordination of the Maternity Medical Services

10. The Subcommittee's terms of appointment made specific reference to the co-ordination of the maternity medical services. As the Committee will be aware there are three authorities with statutory responsibilities—namely, the executive council and the local health authority, which are concerned with domiciliary midwifery; and the regional hospital board, which is concerned with institutional midwifery. The local health authority has a duty to make arrangements for the care, including dental care, of expectant and nursing mothers, and of children who have not attained the age of 5 years and are attending primary schools maintained by a local education authority. In addition, they have power to provide domestic help where such help is required owing to the disability of the mother during her pregnancy and following her confinement. It is thus essential that the closest co-operation should exist between the general practitioner, the midwife, and the consultant. For example, where a woman wishes to book a midwife in anticipation of a domiciliary confinement, the general practitioner should be advised of the fact, and of any action taken by the staff of the local health authority's clinic. In this way the general practitioner can keep in touch with his patient, and with the midwife, during the course of pregnancy, and is able to retain full responsibility for the care and safety of his patient. It could not happen then, as has occurred in the past, that a woman becoming pregnant could book a midwife for her confinement, and that the general practitioner could be called to the confinement by the midwife in an emergency, without being previously aware that his patient was pregnant. Again, it is most desirable that if a woman approaches the antenatal clinic in the first instance, she shall be left in no doubt of her right to book a general practitioner of her own choice. If it is necessary for the clinic to refer the woman to a consultant, the general practitioner should be promptly advised and, where practicable, should make the necessary arrangements. The Subcommittee has received samples of clinic doctor, the midwife, and the general practitioner. These forms can and do serve a useful purpose, provided that it is remembered that wherever possible the patient should be referred to her own doctor.

11. The Subcommittee has been particularly heartened to learn of several excellent schemes for co-ordination which are in force in different areas, largely as a result of friendly discussions between the local medical practitioners, the schemes, though varying in minor detail, are based upon record cards which pass to and fro between the general practitioner, the clinic doctor, the midwife, and the consultant, and which, augmented by verbal instructions or

written communications where necessary, have been found to be of the greatest practical value.

12. The following scheme, based on one actually in operation, is put forward as an example of good planning and is designed to ensure the antenatal and post-natal care of the mother with the minimum of overlapping between the three branches of the maternity medical services. It is based on the following ideal considerations:

(1) That normally, where home conditions are satisfactory, the proper place for the confinement is the patient's own home.

(2) That the person who conducts the confinement should also be responsible for antenatal care. Where this is not practicable for any reason, the antenatal examinations should be carried out by the practitioner who is at risk for the patient during the period of pregnancy—that is, the family doctor.

(3) That the antenatal clinic should provide certain facilities for educational work such as the teaching of mothercraft and of relaxation exercises; and that, by arrangement, it should offer facilities to the general practitioner who wishes to conduct his own antenatal clinic at the centre in preference to his own surgery. The Subcommittee considers that vacancies on the clinic medical staffs should wherever possible be filled by general practitioners working on a sessional basis. Wherever practicable, the midwife who has been booked for the confinement should be present when the practitioner conducts his antenatal clinic.

13. The details of a general scheme of this kind should be worked out by the medical officer of health in consultation with the local medical committee and representatives of the regional hospital board and boards of governors, and should be widely circulated so that every doctor is aware of its provisions.

Model Scheme for Antenatal Care

Every woman on first suspecting pregnancy should consult her own doctor. If pregnancy is confirmed the doctor will ascertain whether the patient wishes to book a midwife. The midwife, if she has been consulted first, will advise the patient's doctor. The patient should be aware of her right to book her own doctor.

The doctor and midwife should then meet and plan out the next few months, deciding from their combined knowledge of the patient's environment where the confinement is to take place.

Then follows a joint interview of patient, doctor, and midwife at which the patient can be advised, after the first joint antenatal examination,

(1) That as normally, where home conditions are satisfactory, the proper place for a confinement is in the patient's own home, if it has been decided to advise a domiciliary confinement (if the patient raises objections to a domiciliary confinement because she has no help at home she can be advised about the home help service of the local health authority); or

(2) That owing to adverse home conditions or for some medical reason admission to hospital is advised.

Should a domiciliary confinement be decided on then the doctor will arrange with the midwife how often he wishes to see the patient during the pregnancy, arrange for the necessary blood tests either by himself or through the local health authority clinic, and he or the midwife will inform the woman of the facilities available at the local health authority antenatal clinic.

If admission to hospital is recommended on either ground then the necessary forms should be completed and forwarded to the county medical officer.

The midwife should make herself responsible for filling up the preliminary pages of the main antenatal card and the patient's travelling card, the doctor making the necessary medical entries. If the woman is to attend the health authority's antenatal clinic then the main card should be retained by the midwife, who will be responsible for producing it either the next time the patient sees her own doctor or goes to the clinic.

If the hospital accepts the case the midwife or doctor will forward the woman's antenatal card to the consultant, who will make the necessary entries and return the card to the midwife or doctor. The woman will then continue to receive the same routine antenatal care as if she were to be confined at home, returning to the specialist's clinic at stated intervals only. If, however, the woman approaches the hospital in the first instance, she should be referred to her own doctor.

If at all these interviews appropriate entries are made on both the antenatal card and the patient's personal card, then in an

emergency (if the main record is for any reason not immediately available) sufficient information will be found on the personal card.

N.B.—It should be the midwife's responsibility to ensure that the woman realizes the importance of the personal card.

14. The success of a scheme of this kind depends obviously to a large extent on the existence of a good professional relationship between the midwife and the doctor. The Subcommittee feels that it cannot do better than to reiterate the views which the Association expressed on this subject in 1949 when considering the Report of the Working Party on Midwives:

The Association considers that it must be made clear to both doctors and midwives that they form a team. Both doctor and midwife have a complementary function, neither alone can give a complete service. The report seems unsound in speaking of the midwife as the practitioner of *normal* midwifery, just as it would be unwise to call a doctor the practitioner of *abnormal* midwifery.

A balanced judgment of what constitutes the abnormal can only be gained by experience of and familiarity with the normal, and to attempt arbitrarily to apportion the sphere of activity of the midwife and the doctor into "normal" and "abnormal" cases would deprive the doctor of the opportunity of gaining knowledge of the variations of normality and a consequent lessening of his value to the midwife as a consultant. The report tends to lose sight of the fact that there is a part helpful to the mother to be played in every case by both midwife and doctor, and that it is only the degree of activity of each which varies in various types of case.

It should be appreciated by the midwife, the medical profession, and the public, that where doctor and midwife are working together, this in no way relegates the midwife to an inferior status. She is a midwife and is working as such and at any time may be called upon to act as such. The Association feels strongly that this situation is not fully appreciated either by doctors or midwives and has an important bearing on the present confused ideas as to the correct professional relationship between midwife and doctor.

There is tending to grow up a feeling of "competition" between the two professions, and this is fostered by recommendations which attempt to define or divide up the spheres of activity of either.

15. The Association also recommended that the Central Midwives Board should drop the use of the term "maternity nurse" for a midwife working with a doctor.

16. The Subcommittee appreciates that some opposition exists to the presence of the doctor at normal confinements on the ground that the greater the number of cases booked by the doctor, the fewer are available for the midwife. The Subcommittee takes the view, however, that if the distinction between booked and unbooked cases were abolished and the midwife and the general practitioner co-operated on all cases, the midwife would take part in a greater number of cases than under the old system, and the risk of a doctor receiving a medical aid call from the midwife to a case of which he had no previous knowledge would be greatly diminished. General practitioners should, however, encourage the attendance of medical students and pupil midwives at confinements. Every doctor present at a confinement might well consider the desirability of allowing the conduct of a normal delivery to remain with the midwife, he himself only giving such advice and help as may appear necessary. Such an arrangement is, generally speaking, in the best interests of both the doctor and the midwife as well as of the patient.

17. The Subcommittee is in full agreement with this concept of the doctor-midwife relationship and, for this reason, has rejected the suggestion which was made to it that while the doctor's attendance at the actual confinement should remain optional it should attract a special fee. The Subcommittee feels that the doctor is himself the best judge of whether or not his presence is required and that whenever he feels that he can be of assistance, irrespective of whether or not he actually conducts the labour, he will be present as a matter of course, and the question of his rendering an additional service which will attract an additional payment will not arise.

Postgraduate Education of the General-practitioner
Obstetrician

18. It will be remembered that the Central Health Services Council recently advised the Minister on the procedure for admission to the obstetric list. This advice was communicated to local obstetric committees in the form of a circular letter addressed to the chairmen, and therefore had no mandatory force behind it. The circular contained the advice that, in considering future applications for admission to the obstetric list, local obstetric committees should apply the criterion that the applicant should have held a six months' resident appointment in an obstetric unit. In the Subcommittee's view it would clearly not always be practicable for a busy general practitioner to acquire experience in this way, and, indeed, there might not always be a sufficient number of suitable vacancies to cover all needs. The Subcommittee realizes that there are many young doctors entering general practice to-day who are inexperienced in obstetrics. It considers that every facility should be given to them to improve their knowledge and that the General Medical Council might well consider a revision of the medical curriculum to this end.

19. The Subcommittee feels that, whatever changes might be made in the medical curriculum, it is still essential that there should be ample facilities for postgraduate instruction to enable general practitioners to keep abreast of modern knowledge and developments. One of the ways in which this can best be effected is by the closer association of the general practitioner with hospital life, and the Subcommittee would here emphasize the view, which has been put forward on many occasions, that there should be an adequate number of general-practitioner beds in hospital maternity units where a general practitioner could conduct the confinement of his own patients. The employment of the general practitioner as a part-time clinical assistant in a maternity department also affords valuable postgraduate training.

20. The Subcommittee has emphasized already the need for a high standard of antenatal care. This is largely a matter of education—both of the practitioner in making him aware of the value of such matters as regular antenatal visits, the instruction of the mother in mothercraft and relaxation exercises, and routine blood testing; and of the patient in securing early co-operation with the doctor.

21. The encouragement of the mother to attend for a post-natal examination as a matter of routine in all maternity cases is a comparatively recent development, and it is largely due to the efforts of the general-practitioner obstetrician that its value has now been widely recognized even by those mothers who, in the past, would not have bothered to present themselves for examination. Many general practitioners, in order to encourage attendance, are prepared to visit the mother at home when her domestic commitments make it difficult for her to come to the surgery.

22. The Subcommittee is of opinion that a blood test should be carried out as a matter of routine in every first pregnancy, and that in addition every rhesus-negative woman should be tested on the occasion of subsequent pregnancies. With this in mind, it suggests that blood should be tested wherever the following indications exist: (1) In every first pregnancy. (2) Where there is a history of a previous transfusion. (3) Where from previous blood examination there is evidence of the presence of antibodies. (4) Where there is a history of abortion or, more particularly, habitual abortion. (5) Where there is a history of one or more stillbirths and particularly where there is associated abnormality such as hydrops foetalis, etc. (6) Where there is a history of neonatal death accompanied by jaundice, etc. (7) Where surviving children have shown jaundice or anaemia in the first few weeks after birth.

23. It is appreciated that these tests may place a considerable burden upon the shoulders both of the doctors and of the laboratory staff, and the Subcommittee has considered with interest a report that, following extensive

inquiries in Scotland, it was found that routine blood testing was by no means impracticable. In many areas it was reported that a good deal of additional work would be involved, but in no area was it found that it could not be accomplished.

Maternity Packs

24. A number of local health authorities in pursuance of the general powers given to them under Section 20 of the National Health Service Act, 1946, have submitted to the Minister of Health schemes which have included the provision of maternity packs. The actual conditions under which these packs are supplied vary according to the precise wording of the individual scheme, and the situation has therefore arisen that in some areas they are supplied free of charge to all pregnant women, irrespective of whether they are confined at home or in a nursing-home, while in others the issue is restricted to those who have booked the services of a local authority midwife. Others restrict them to all domiciliary cases.

25. In this connexion the Subcommittee has considered the following resolution of the A.R.M.:

191. **Resolved:** That the maternity pack supplied by the local authority for use in domiciliary confinements be also supplied for confinements in nursing-homes.

While it is appreciated that the onus necessarily rests with the local authority either to frame or amend its scheme in such a way as to secure the wider distribution of the maternity outfits which the A.R.M. desires, it is unlikely that the Minister would sanction any amendment widening an authority's powers in this respect. The position is therefore likely to remain that those authorities who took the necessary powers in the first instance will continue to exercise them, but that it will not be easy for any authority to take fresh powers. Nevertheless, the Subcommittee considers that, as and when possible, pressure should be brought to bear on local authorities to implement the resolution of the A.R.M., and that no charge should be made for the outfits, wherever supplied. At the same time the Subcommittee endorses the view already expressed by the parent committee, that doctors should not be expected to prescribe items additional to the standard pack on Form E.C. 10, but that where these are required, they should be obtained from the local authority. Many local authorities in consultation with the local medical committees provide a pack superior to the minimum standards laid down by the Ministry of Health in Circular 99/50, and this is a practice which should be encouraged.

Conclusion

26. The discussions have ranged widely over the various aspects of the maternity medical services, and the Subcommittee has reached the conclusion that, although the present framework of the Act and the regulations is in some ways cumbersome, generally speaking a very satisfactory service is given to the public. The Subcommittee does not therefore wish to put forward any specific recommendations for amending the Act or the regulations. It has confined its recommendations to measures designed to secure greater co-ordination between the three branches of the service as they now exist. This is a matter which is best dealt with on a local and voluntary basis, and one already interested themselves to good effect.

27. The second point which the Subcommittee wishes to stress is the need for more widespread postgraduate education, for which it believes the parent committee will wish to press.

28. On the specific question raised by the Conference of the relation of fees to work done, it does not wish to put forward any definite recommendation for a variation in fees at the present time, but merely to enter a caveat that, should the statutory requirements governing participation by general practitioners in the maternity medical services be reviewed at some future date, consideration should then be given to the adequacy of the fees paid.

APPENDIX D
National Insurance Defence Trust

Income and Expenditure Account for the Year ended December 31st, 1953

	1953	1952		1953	1952
Conferences of Representatives of Local Medical Committees	£	£	Dividends and Interests Received (gross)	£14,462	£14,346
Railway Fares	2,456	2,897	Income Tax recoverable	—	6,516
Printings	485	3,894	Deficit for 1952 transferred to Accumulated Fund Account	—	8,085
Postages	95	—			
Hire of Hall	52	—			
Sundries	45	—			
Railway Fares	3,133	2,897			
Contribution towards Committee Expenses	3,126	3,894			
Honoraria to members of Central Medical Advisory Committee	2,940	3,501			
Payments in connexion with the retirement of aged and infirm practitioners	226	74			
Public Relations Department—	280	240			
Proportion of cost	2,882	3,469			
Small List Inquiry	67	—			
Surgery Accommodation Circular	273	—			
Legal and other charges—Adjudication	269	13,792			
Charges incurred in purchase of investments	158	—			
Legal Charges	73	—			
Audit Fee	52	62			
Sundries	122	27			
Income Tax based on surplus for year	731	—			
Surplus for year transferred to Accumulated Fund	130	—			
	<u>£14,462</u>	<u>£27,946</u>		<u>£14,462</u>	<u>£27,946</u>

Balance Sheet as at December 31st, 1953

	1953		1953
Accumulated Fund—	£	Investments in Government and other Trustee Securities—at cost	£455,961
Balance—January 1st, 1953	475,226	(Market Value at December 31st, 1953, £437,084)	
Add: Surplus for year	130	Inland Revenue: Estimated claims for recovery of income tax	16,501
Balance—December 31st, 1953 (subject to depreciation of £18,927 in market value of investments)	475,356	Balances at Bank—	
Sundry Creditors	3,417	Deposit Account	5,500
		Current Account	811
			<u>6,311</u>
	<u>£478,773</u>		<u>£478,773</u>

In our opinion and to the best of our information and according to the explanations given to us the above balance sheet and income and expenditure account give a true and fair view of the state of the affairs of the National Insurance Defence Trust as at December 31st, 1953, and of its income and expenditure for the year ended on that date.

(Signed) PRICE WATERHOUSE & CO.
Chartered Accountants.

8, Frederick's Place,
Old Jewry, London, E.C.2.
March 20th, 1954.

APPENDIX E
General Medical Services Defence Trust

Income and Expenditure Account for the Year ended December 31st, 1953

	1953	1952		1953	1952
Grants to practitioners affected by floods	£72	—	Subscriptions Received	£37,601	£31,110
Charges incurred in purchase of investments	96	25	Dividends and Interests Received (Gross)	1,601	1,079
Income Tax based on Surplus for year	13,943	11,392			
Surplus for the year transferred to Accumulated Fund	24,791	20,772			
	<u>£39,202</u>	<u>£32,189</u>		<u>£39,202</u>	<u>£32,189</u>

Balance Sheet as at December 31st, 1953

	1953		1953
Accumulated Fund—	£	Investments in Government and other Trustee Securities—at Cost	£54,663
Balance—January 1st, 1953	48,515	(Market value at December 31st, 1953, £54,812)	
Add: Surplus for year	24,791	Loan—British Medical Association	25,000
Balance—December 31st, 1953	73,306	Balances at Bank—	
Amount set aside for future taxation (1954-55 Assessment)	13,205	Deposit Account	2,000
		Current Account	4,848
			<u>6,848</u>
	<u>£86,511</u>		<u>£86,511</u>

In our opinion and to the best of our information and according to the explanations given to us the above balance sheet and income and expenditure account give a true and fair view of the state of the affairs of the General Medical Services Defence Trust as at December 31st, 1953, and of its income and expenditure for the year ended on that date.

(Signed) PRICE WATERHOUSE & CO.
Chartered Accountants.

8, Frederick's Place,
Old Jewry, London, E.C.2.
March 26th, 1954.

CIVIL SERVICE MEDICAL OFFICERS' PAY

The pay of three grades of medical officer in the Civil Service has now been revised and the new scales are to operate as from January 1, 1952. The details are as follows:

Grade	Age	Salary Scales (Basic plus Pay Addition)	
		Old Scale	New Scale
Basic grade	35	£ 1,331 5 0	£ 1,500
	36	1,382 10 0	1,575
	37	1,433 15 0	1,650
	38	1,485 0 0	1,725
	39	1,536 5 0	1,800
	40	1,600 0 0	1,900
		1,675 0 0	2,000
		1,750 0 0	2,100
		1,825 0 0	
Senior Medical Officer, £1,900 × 100—£2,100			2,200
Principal Medical Officer £2,250			2,300

The negotiations which have led up to this conclusion have been carried out by the Civil Service Medical Officers Joint Committee, which is a committee of the British Medical Association and the Institution of Professional Civil Servants.

The Howitt Committee

A claim was first presented to the Treasury in August, 1949. In February, 1950, it was rejected. The Chancellor then decided to appoint a committee (the Howitt Committee) to consider the remuneration, structure, and organization of the medical Civil Service. The members of this committee were Sir Harold Howitt (chairman), Mr. S. A. Bailey, Sir Harold Boldero, Dr. C. J. T. Cronshaw, Sir Thomas Gardiner, Sir Walter Haward, Sir Wilson Jameson, and Dr. Andrew Topping.

Advertisements Refused

The committee reported to the Chancellor of the Exchequer on August 31, 1951. The proposed scales of the Howitt Committee were those shown in the column headed "Old Scale" in the Table above. They were not accepted by Civil Service medical officers or the B.M.A., and in July, 1952, the Representative Body of the British Medical Association decided not to publish further advertisements for Civil Service medical officers until a satisfactory agreement had been reached.

A steady campaign was carried out by the Civil Service Medical Officers Joint Committee, and eventually, after much discussion, the Treasury agreed to make fresh proposals. The new scales that have now been agreed are the result.

Understanding with Treasury

The scales are accompanied by a set of "understandings" which are set out in the following letter from the Treasury:

"(1) The Treasury propose that, with effect from January 1, 1952, the salary scales of the undermentioned grades of the Medical Officer class shall be:

Medical Officer, £1,500 by £75 to £1,800 by £100 to £2,100.
Senior Medical Officer, £2,200.
Principal Medical Officer, £2,300.

"(2) The above scale for the Medical Officer grade is not a consolidated scale, but one in which pay addition is assumed to be included. It does not, therefore, attract pay addition.

"(3) The minimum of the Medical Officer scale (£1,500) is linked to age 35, and is subject to an increase of one increment for each year above that age up to and exceeding 40. For each year of age below age 35 it is subject to a deduction of £50.

"(4) The scale and rates above set out are the same for women as for men and are subject to provincial differentiation in accordance with Estacode C c 2.

"(5) Agreement on these terms would be entered into by both parties on the following understandings: (a) both parties remain free to ask the Royal Commission on the Civil Service to con-

sider any proposals they think fit to make about the remuneration of all grades in the medical officer class. This particularly applies to the rates of pay for senior and principal medical officers the increases in which both sides regard as purely token; (b) the scale now agreed for the basic grade cannot be regarded as establishing any particular relativity between that grade and any grade or grades in other classes in the Civil Service; and (c) no new arrangements made in the remuneration of medical work outside the Civil Service—for instance, in the remuneration of consultants or other hospital medical staff in the National Health Service—will be made the basis of a claim to the Treasury prior to the publication of the Report of the Royal Commission, but this in no way limits either party's freedom of action in using any such factors in its submissions to the Royal Commission, or in using any other new considerations in fresh representations either before or after the Royal Commission has reported."

It will be seen from the above letter from the Treasury that the Civil Service Medical Officers Joint Committee is free to ask the Royal Commission on the Civil Service to consider its full claim for the Medical Officer class. That claim is that medical officers in the Civil Service should be given salaries that equate with the remuneration of the medical profession generally, following on the reports of the Spens Committees and the negotiations and decisions which have taken place since then.

PENSION AND SICKNESS BENEFITS FOR
DOCTORS' EMPLOYEES

SCHEME SPONSORED BY B.M.A.

Many practitioners have felt the need for a uniform plan which will provide reasonable pension and death benefits for their employees. Such provision, quite apart from its ethical aspect, does much to foster a sense of loyalty among employees and thus helps to bring about a continuity of service and interest of great value to the busy practitioner.

Tax Concessions

The question of cost is, of course, of paramount importance, but where the employer's contribution is allowed to rank as a business expense the position is much improved. A plan has now been approved by the Inland Revenue which not only allows the employer's contribution to be treated as a business expense, but under which the employee also receives substantial tax concessions. Further, the scheme allows for the transfer of employees from one practitioner to another without loss of pension rights and thus provides for succession in the case of single-handed practice or within a partnership. The Council of the British Medical Association has approved the terms of the pension plan and has agreed to act as trustees of the scheme, which will be operated solely by the Medical Insurance Agency on behalf of the Association. It is known as "The Medical and Dental Employees Pension Scheme." The M.I.A. negotiated the scheme from its inception and secured Inland Revenue approval. The terms of the trust deed provide that dental practitioners in addition to all medical practitioners can secure the benefits offered by the scheme.

Supplementary Sickness Scheme

Apart from providing for pension or death during service, every employer is faced from time to time with the question of what should be done for an employee during periods of sickness. Most employers feel that payment of salary should continue for a time, but this can prove expensive and sometimes embarrassing if sickness is prolonged. A supplementary plan has been arranged which caters for this problem at reasonable cost. It can be effected in conjunction with, or quite separately from, the pension scheme already mentioned. However, it should be made clear that while overall Revenue authority has been given to the major scheme—i.e., for the provision of pension and death bene-

Correspondence

Remuneration of Hospital Medical Staff

SIR,—As the first Chairman of the Central Consultants and Specialists Committee and a member of the original Joint Committee which negotiated the Terms and Conditions of Service for Hospital Medical Staff, I feel forced to comment on the report of Sir Russell Brain on the recent negotiations with the Whitley Council (*Supplement*, April 10, p. 145).

I know that the Staff Side of the Medical Whitley Council have had a difficult time, as they presumably set out to get an implementation of the Spens Committee Report. It is true that they have gained some concessions for the staff below S.H.M.O. and consultant level, which no doubt will be very welcome. But what about the consultants? Here they have indeed gained for them an Irishman's rise.

The weighting factor for the part-time consultant has been reduced to a maximum of $\frac{1}{2}$. What the minimum may be we do not yet know. Consider a consultant who undertakes only five sessions. What is his position?

No award			
Present basis	6½ at £2,750	=	£1,562 10 0
5 sessions	11		
Proposed basis	5½ at £3,100	=	£1,620 9 1
5 sessions	11		
		Gain	£57 19 1
C award			
Present basis	6½ at £3,250	=	£1,846 11 10
5 sessions	11		
Proposed basis	5½ at £3,600	=	£1,881 17 7
5 sessions	11		
		Gain	£35 5 9
B award			
Present basis	6½ at £4,250	=	£2,414 15 4
5 sessions	11		
Proposed basis	5½ at £4,400	=	£2,300 0 0
5 sessions	11		
		Loss	£114 15 4
A award			
Present basis	6½ at £5,250	=	£2,982 19 0
5 sessions	11		
Proposed basis	5½ at £5,300	=	£2,770 9 0
5 sessions	11		
		Loss	£212 10 0

I of course assume that such a consultant would be granted the maximum weighting factor.

It is a great pity that the negotiators, as you point out in your leading article (p. 860), "were not armed with the facts and advice that an expert economist and statistician might have given them." It is truly a Gilbertian situation that when negotiating for a betterment factor a clause should have to be inserted stating: "There is a protection against an individual losing pay on the coming into operation of the new agreement."

After our strenuous time during the negotiations in the early days I feel that the present settlement between the Staff and Management Sides of Whitley Committee "B" is a betrayal of our agreement and totally disregards the Spens Report. In saying this I am not suggesting we should have had a 100% betterment factor, but the result of the negotiations will satisfy neither the part-time nor the whole-time consultants. The consultants' Spens Report recommended that consultants' and hospital staffs' remuneration should be adjusted both to the altered value of money and to increases in income in the medical and other professions. A careful analysis of these factors should have been made before our negotiators entered into discussions. But this apparently was not done.

I hope the Central Consultants and Specialists Committee will not accept these terms without obtaining an assurance

fits, thus allowing the employer's contribution to rank as a business expense—the same authority does not extend to the supplementary sickness scheme. The additional premium required for that purpose would have to be the subject of individual negotiation by the practitioner with the Inland Revenue, but likewise there is no reason to suppose that it would not be allowed as a business expense.

Full details of the major and supplementary schemes can be obtained from the Chief Office of the Medical Insurance Agency, B.M.A. House, Tavistock Square, London, W.C.1, or from any of the Agency's branches in Birmingham, Cardiff, Edinburgh, Glasgow, Leeds, Manchester, and Newcastle.

TERMS AND CONDITIONS OF SERVICE OF
HOSPITAL MEDICAL STAFF

TENURE OF POST

The Medical Whitley Council (Committee "B") has agreed that, where a local change of organization in the hospital and specialist service involves displacement or serious disturbance of a senior hospital medical officer's services, the provision of the second sub-paragraph of paragraph 16 of the Terms and Conditions of Service of Hospital Medical and Dental Staff (England and Wales) or of the second sub-paragraph of paragraph 16 of the Terms and Conditions of Service of Hospital Medical and Dental Staff (Scotland) should apply to him as to a consultant.

To meet this the existing second sub-paragraph of paragraph 16 of the Terms and Conditions of Service of Hospital Medical and Dental Staff has been deleted and the following substituted:

"It is understood that, where a local change of organization in the hospital and specialist services involves displacement or serious disturbance of the services of a consultant, a senior hospital medical officer, or a senior hospital dental officer, the board recognizes that it has a moral obligation to render the greatest possible assistance to the officer, with a view to his obtaining comparable work in another hospital."

THE PRESIDENT'S TOUR
STAY IN BAGDAD

The honorary secretary of the Middle East Branch of the Association reports that the President of the B.M.A. and Mrs. Tudor Thomas left for Beirut by air on March 17 after a four days' stay in Bagdad. Mr. and Mrs. Tudor Thomas were the guests of H.E. the British Ambassador and Lady Troutbeck, who also gave a dinner in their honour on the first evening. The following three days were a busy mixture of official calls, lunches, cocktail parties, B.M.A. business meetings, and lectures to medical audiences and to students of the Royal Medical College. Judging from the number and diversity of people that the President met in the short time available, it would seem that the good will of the Council of the B.M.A. towards its Middle East Branch was also felt in circles other than medical in the capital of the kingdom of Iraq.

The President has now completed his tour and is expected back in this country this week-end.

B.M.A. CHARITIES BALL, MAY 6, 1954

The B.M.A. Charities Ball, organized by the Metropolitan Counties Branch, will be held in B.M.A. House on Thursday, May 6. It is hoped that as many members of the profession as possible, including those outside the Branch area, will attend and thus enable the Branch to make a handsome contribution to the medical charities. Dancing to the music of the Sydney Lipton Ballroom Orchestra; buffet and bars. Tickets £2 2s. each, or six for £11 11s. Further particulars will be issued in due course.

from the Minister of Health that the consultant Spens Report still constitutes the basis for all future negotiations on remuneration.—I am, etc.,

Manchester, 13.

R. L. NEWELL.

SIR,—The Chairman of the Staff Side of Committee "B" of the Medical Whitley Council confidently hopes that hospital staffs will regard their increases as satisfactory. Expressed as percentages over 1948 earnings, these increases are set out in the following Table :

Grade	Position on Scale	Percentage Increases in Remuneration over 1948
Consultant (A award)	Top	0.9
" (B ")	"	3.5
" (C ")	"	10.7
" basic	Bottom	12.7
		23.5
S.H.M.O.	Top	11.4
	Bottom	15.4
Senior registrar	Top	7.7
	Bottom	10.0
Registrar	Top	8.4
	Bottom	9.7
J.H.M.O.	Top	7.5
	Bottom	10.7
S.H.O.	Through-out	11.2
House officer	Top	16.7
	Bottom	21.4
Average for all grades		11.3

It can be seen that the average increase is 11.3%, and it is interesting to note that the Management Side have been more realistic by slipping in a less out-of-date adjustment (25%) to the residential charges for house officers. (Either the Staff Side negotiators were sound asleep when this was done, or they were so busy shouting the odds about part-time weighting that the significance of this little item passed unnoticed.) We are asked to accept this 11.3% increase as a fair upward adjustment to compensate for a 30% plus rise in the cost of living (since 1948), in spite of the fact that wages generally have more or less kept pace with the rising living costs.

The agreement, then, is completely unsatisfactory from the pure cost-of-living point of view, and if we dare look back at Spens it is even worse. But the very worst feature of all is the claim by the Chairman of the Staff Side that the negotiators have safeguarded Spens; one or two of the frills of Spens, such as part-time weighting, may have been preserved in a diluted form, but the meat in Spens—the hard cash which we all understand—is certainly not visible in the agreement. To crown it all, whole-timers are told that this same Staff Side will continue to exert pressure on the Management Side to improve the allowances for whole-time consultants. As a whole-time consultant I would much prefer to think that this matter of allowances will be considered by a Committee of Inquiry, remembering that a similar committee recently spent only four months to determine that the 1954 remuneration of a Member of Parliament should be £1,500 per annum, representing a "betterment factor" of 150% and 50% over 1939 and 1947 respectively.—I am, etc.,

KENNETH W. BEETHAM.

SIR,—Is everybody happy? They should be, for the windfall which Sir Russell Brain and his friends have struggled for twenty months to secure for us (*Supplement*, April 10, p. 145) is surely the laugh of the year. Everybody is now on the pig's back except the junior hospital doctor, who is obviously the animal in question.

This is wage negotiation at its lowest level. There is not a trade union leader in the country that would dare accept such a settlement on behalf of his members. However else we like to think of it, we are now all employees of the State negotiating for higher wages. The unfortunate thing is that we have got amateurs doing the job, in addition to which, when it comes to pressing wage claims as a profession, we

are too respectable. If we are not to continue the 1948 practice of sitting back and taking what is given us, the B.M.A. must stop being an association of professional gentlemen and become a militant trade union. Sectional representation such as registrars' committees, etc., is useless. The consolation prize is knowing how much is our worth. Mr. Macleod is casting no pearls away.—I am, etc.,

Norwich.

J. M. BROWNLEE.

SIR,—While appreciating the difficulties of the situation and the strenuous efforts of the Staff Side of Whitley "B" on behalf of both whole- and part-time specialists, most of us feel profoundly disappointed with the settlement reached. Since July, 1948, the cost of living has risen by 30%, so even if we consider the 20% betterment factor given in 1948 adequate, a rise of 30% on our present salaries would be required to restore them to the 1948 level. Yet the rise in consultant's salary is only 22% at the bottom of the scale and 12% at the top. Does this make sense?

A salary of £3,000 gross to-day is equivalent to £1,000 gross in 1939, yet the whole-time specialist's maximum according to the Spens Report should be £2,500 in terms of the 1939 values of money. As a whole-time consultant has to meet most of his expenses out of his salary, which is only 40% of what it should be, and is then denied income-tax relief on them, his present salary is equivalent to about one-third of what he is entitled to. Would any other section of the community tolerate this? It is to be hoped that whole-time specialists will be given adequate representation on the Staff Side for the future negotiations for expense allowances and domiciliary visiting.—I am, etc.,

Farnborough, Kent.

LEO GILCHRIST.

SIR,—I am sure my fellow part-time consultants will be "thrilled to bits" at the result of the agreed salary scale for hospital staff. Their rightful claim was for an implementation of Spens, and the result of all these months of negotiations is Section XI of the agreement: "There is protection against any individual losing pay. . . ."

I do not doubt that the Staff Side did their best, but one wishes they would sound apologetic rather than satisfied when the outcome of their endeavours for many of their colleagues was so nearly a decrease in pay rather than a negotiated increase. One knows now how a mother feels who has a difficult pregnancy, and a protracted labour, and produces a living monster—an early abortion would have been a blessed release.—I am, etc.,

Hove.

PAUL F. B. GILLET.

SIR,—No doubt there will be many comments about the Whitley award to hospital staff, especially in relation to the size [sic] of the award, the fact that it is retrospective to eight days, and the fact that house officers have to pay income tax at a relatively higher rate. I wish to raise the question of the S.H.M.O. As a "passed-over S.H.M.O." I wish to protest in the strongest manner at the differentiation in the agreed scales between S.H.M.O.s and consultants. Sir Russell Brain, in his statement (*Supplement*, April 10, p. 145), says that "the major benefit must be applied to the basic consultant grade in which the majority of hospital staff would make their permanent career. . . . The majority will probably agree with the principle; but the Staff Side of Whitley "B" does not appear to appreciate that their agreement *does* apply to the past, as opposed to the present and the future. Any individual who applies for an S.H.M.O. job knows the terms and the risks; but those who were transferred in 1948 did not do so, and only of the bitterness felt by ourselves on this matter.

This award could have reduced that ill-feeling; instead it has widened the gap between the S.H.M.O. and the consultant and has advertised to the G.P. and to the public that an S.H.M.O. can *not* be regarded as being in any way com-

parable to the consultant in ability, experience, or status: these factors do not appear to have been taken into consideration in grading, in this region at least, and the fact that this award has made the difference more obvious not only reflects upon Whitley "B," hard as they have worked, but is not likely to make passed-over S.H.M.O.s less bitter or more likely to make them participate in the Service as they do, at heart, wish to do.

I put forward three constructive suggestions: (1) the Staff Side of Whitley "B" should immediately open negotiations designed to close the increased gap between S.H.M.O. and consultant; the burden to the Treasury would be infinitesimal; (2) executive councils should obtain lists of "passed-over" S.H.M.O.s and recommend those whom they regard as of consultant status to be graded as such; and (3) should no action result from 1 or 2, at least those posts graded as consultant posts, but held by S.H.M.O.s, should be advertised and filled by consultants.—I am, etc.,

Portsmouth.

J. D. LENDRUM.

SIR,—I hope that this letter is but one of many. Your readers should strongly approve of the leading article (*Journal*, April 10, p. 860) regarding the remuneration of hospital medical staff. It shows a sense of responsibility sadly lacking in our negotiators. If it has taken these gentlemen 18 months to obtain such ridiculous increases they have been wasting their time. Surely it was obvious to them months ago that they were gaining no advantage? They should have walked out and told us why.—I am, etc.,

Aberdeen.

SENIOR REGISTRAR.

Work of the S.H.M.O.

SIR,—Dr. J. J. Bell (*Supplement*, April 3, p. 142) is to be commended on his moral courage, not only in enlightening Dr. A. E. Nicholls (*Supplement*, March 6, p. 66) on the duties of the S.H.M.O. in general, but in laying his own cards on the table and enumerating his own duties as a full-time S.H.M.O. surgeon. All other S.H.M.O.s in a similar plight must now follow suit and expose this iniquitous grading without further ado.

The fact is, of course, that our leaders should never have agreed to this grade in the first place. We all know that it was nothing less than an economic manoeuvre—a money-saving device—at the expense of men who should have been graded consultants. The rot set in with the grading fiasco of 1949—surely the most disgraceful episode in the history of the profession—when eminent people succeeded, heaven knows how, in neatly pigeon-holing hundreds of their colleagues into "grades" without knowing half of them and without reference to testimonials, referees, or anything else. It was a remarkable feat, but one which brought about considerable injustice, untold frustration, and permanent bitterness. It is highly probable that of those qualifying for consultancies the unlucky ones, not known personally to the graders, were relegated to the S.H.M.O. class. For if there had to be economy in this matter, how else could the graders have acted, human nature being what it is? In surgery, as in other specialties, there still remain many highly experienced men who must now be permanently condemned to this status, and their maximum salary will not rise above £1,950 per annum. Compared with the lot of these people, the part-time consultants are in clover.

A colleague of mine, a married man with two children, was graded S.H.M.O. in 1949. He was then 41 years of age, had 20 years' continuous experience in surgery, including several years' continuous experience in surgical fellowships and had contri- buted at least four original articles to the medical journals. In 1950 he deputized for twelve months for a consultant surgeon who was ill. As a full-time S.H.M.O. he received no extra remuneration for this, yet at the final review of grading in 1951 he was still not upgraded. Needless to say, his efforts to ascertain the reasons for this most unjust decision were met with a stony silence and skilful evasion characteristic of the medical bureaucrat.

One of the most distressing factors in the whole business is the complete absence of any court of appeal. The machinery set up to deal with "those who were aggrieved" was a complete farce. As a matter of fact, the S.H.M.O. can now only acquire consultant status by open competition. On the surface, this may seem a fair proposition. In practice, however, this is by no means the case, for he must now compete against young senior registrars from teaching schools, and in this respect he is in the same boat as senior registrars from non-teaching hospitals. The implication of this statement will be evident to all who have studied the system of appointing consultants in recent years.

The facts must now be faced. Here is a specialist group being treated as registrars, used as consultants, and paid as S.H.M.O.s. No trade union would ever tolerate such a monstrous situation in industry. The continued employment of the S.H.M.O. at his present salary is nothing other than professional exploitation. Both the Minister and the regional boards are well aware of this fact. Under the present set-up what incentive has he to do his work happily and efficiently? He is, in fact, in the same position as an aggrieved employee working in a nationalized industry without a trade union to protect his rights. Has the B.M.A. completely given up hope of getting the Ministry to re-examine the desperate plight of this group? Is anything going to be done for this grossly underpaid and permanently exploited section of our profession?—I am, etc.,

Macclesfield.

E. W. THOMAS.

Whole-time Medical Officers in the Public Health Service

SIR,—In reply to Dr. E. D. Irvine's letter (*Supplement*, April 3, p. 143), I am quite in agreement and would like to make a few more comments. The possession of the D.P.H. is essential and compulsory for a medical officer of health's appointment; yet this is about the only postgraduate diploma where a year's full course at a medical school is required prior to the candidate being admitted to the examination. In addition, the examination is far from easy—in fact, it is more difficult than the majority of other diplomas. Furthermore, many candidates possess other postgraduate degrees. Many medical officers of health, prior to 1948, were superintendents of infectious diseases hospitals, sanatoria, etc. In some cases, mine for instance, pulmonary collapse therapy was performed twice weekly on out-patients and others in wards, the indications for such therapy being definitely a matter of experience. Unfortunately, the majority of medical officers of health lost their hospitals at the change-over, to the regret of the local health committees. To this latter regressive step I attribute the unwillingness of local authorities in some cases to implement the 1951 award.

Many medical officers, now middle-aged, find themselves with a salary of a registrar's grade, yet are unable to improve their status. In my view the time is now ripe for the Association to press forward for a salary in keeping for the specialists in public health. If the medical officer of health, with his experience of fevers, preventive medicine, is not a specialist in these, then who is? Naturally, many local authorities take the view that, since the hospitals have gone over to regional boards, much responsibility has been removed from the M.O.H., therefore an increase of salary is not justified. That is merely begging the question; the M.O.H. was not responsible for such moves. A possible remedy is that a medical officer of health with special experience in a specialty—tuberculosis, fevers, etc.—shall work on a sessional basis, as a specialist, in such hospitals; be paid for doing so; and therefore increase his salary. Those with no such experience should be given the choice of learning a specialty and be paid as a clinical assistant.

There is still a shortage of doctors in hospitals, sanatoria, etc., and the extra help in such institutions would not only prove an asset but would improve the status of many medical officers of health, as well as from a monetary angle.—I am, etc.,

Sunderland.

R. C. F. SMITH.

Association Notices

Diary of Central Meetings

APRIL

- 27 Tues. Questionnaire Subcommittee, Constitution Committee, 10.30 a.m.
 27 Tues. Estates Committee, 2 p.m.
 27 Tues. Joint Formulary Committee, 2 p.m.
 28 Wed. Central Consultants and Specialists Executive, 10.30 a.m.
 28 Wed. Central Consultants and Specialists Committee, special meeting, 12 noon.
 28 Wed. Finance Committee, 2 p.m.
 29 Thurs. Liaison Committee of G.M.S. Committee and representatives of College of General Practitioners, 3 p.m.
 30 Fri. Psychological Medicine Group Committee, 2 p.m.
 30 Fri. Welsh Committee (at Raven Hotel, Shrewsbury), 2.15 p.m.

MAY

- 4 Tues. Evidence Committee on Divine Healing, 1.30 p.m.
 5 Wed. Consultants, General Practitioners, and Public Health Liaison Committee, 11 a.m.
 5 Wed. Office Committee, 11 a.m.
 5 Wed. Arbitration Machinery Committee, 1 p.m.
 5 Wed. Council, 2 p.m.
 6 Thurs. Council, 10 a.m.
 10 Mon. Subcommittee on Diagnosis of Eye Diseases, Ophthalmic Group Committee, 2 p.m.
 12 Wed. Central Consultants and Specialists Executive, 12 noon.
 12 Wed. Medico-Legal Subcommittee, Central Consultants and Specialists Committee, 4.30 p.m.
 13 Thurs. Physical Medicine Group Committee, 2 p.m.
 19 Wed. Conference of Honorary Secretaries, 10.30 a.m.
 20 Thurs. Radiologists Group Committee, 12 noon.
 28 Fri. Conference of Regional Officers, 12 noon.

Branch and Division Meetings to be Held

CITY DIVISION.—(1) At Hackney Hospital, Homerton High Street, E., Wednesday, April 28, 2 p.m., films: (a) "Physiology of the Kidney"; (b) "Humoral Transmission of the Sympathetic Impulses." (2) At Institute of Laryngology and Otology, Gray's Inn Road, W.C., Friday, April 30, 3.30 p.m., clinical meeting. Mr. W. D. Doey: "The Indications for Tonsillectomy."
CORNWALL DIVISION.—At Red Lion Hotel, Truro, Tuesday, April 27, 3.30 p.m., annual general meeting.
DARTFORD DIVISION.—At Bexley Maternity Hospital, Laverstock Road, Bexleyheath, Kent, Friday, April 23, 8.45 p.m., annual general meeting.
FINCHLEY DIVISION.—At Finchley Memorial Hospital, Bow Lane, N., Friday, April 30, 8.45 p.m., annual general meeting.
GREENWICH AND DEPTFORD DIVISION.—At St. Alfege's Hospital, Vanbrugh Hill, Greenwich, S.E., Wednesday, April 28, 8.30 p.m., clinical meeting.
HENDON DIVISION.—At Hendon Hall Hotel, Ashley Lane, N.W., Tuesday, April 27, 7.30 for 8 p.m., annual dinner. Members' wives, relatives, and friends are invited.
HYDE DIVISION.—Wednesday, April 28, 9 p.m., visit to the offices of the *Manchester Guardian*, 3, Cross Street, Manchester.
LAMBETH AND SOUTHWARK DIVISION.—At Lambeth Hospital, Brook Drive, S.E., Tuesday, April 27, 8.30 p.m., A.G.M.
LINCOLN DIVISION.—At County Hospital, Lincoln, Thursday, April 29, 8 p.m., meeting.
MID-ESSEX DIVISION.—At Out-patients Department, Chelmsford and Essex Hospital, London Road, Chelmsford, Wednesday, April 28, 8.15 p.m., meeting. Address by Sir Ernest Rock Carling: "Medicine After the Atomic Bomb." Questions and a general discussion will follow.
MID-HERTS DIVISION.—At Red Lion Hotel, St. Albans, Friday, April 30, 8.45 p.m., annual general meeting.
NORTH-WEST WALES DIVISION.—At the Clinic, Sackville Road, Bangor, Saturday, April 24, 4 p.m., annual meeting. Election of Officers; consideration of Annual Report of Council, etc.
NOTTINGHAMSHIRE BRANCH.—At 64, St. James's Street, Nottingham, Thursday, April 29, 8.30 p.m., meeting. B.M.A. Lecture by Mr. Harold Dodd: "The Perils of Thrombosis."
OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Oldham, Monday, April 26, 9 p.m., meeting. Professor R. E. Lane: "Industrial Medicine and the General Practitioner."
ROCHDALE DIVISION.—At Kingsway Hotel, Rochdale, Monday, April 26, 8.30 p.m., meeting.
SOUTH BEDFORDSHIRE DIVISION.—At Luton and Dunstable Hospital, Friday, April 30, 8.30 p.m., clinical meeting.
SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, April 23, 9 p.m., meeting. Dr. R. M. B. MacKenna: "Dermatology in General Practice."
SOUTH MIDDLESEX DIVISION.—At Red Lion Hotel, Hounslow, Wednesday, April 28, 8.45 p.m., meeting. Talk by Dr. Gerald M. J. Slot: "Recent Advances in Therapy with Special Reference to Antibiotics and Chemotherapy" (illustrated by a cinematograph film). A discussion will follow.

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, E., Friday, April 30, 3 p.m., clinical meeting.
WEST MIDDLESEX DIVISION.—At Paul's Restaurant, New Broadway, Ealing, W., Wednesday, April 28, 8.30 p.m., annual general meeting. Members' wives are invited.
WEST SOMERSET DIVISION.—At Musgrove Park Hospital, Taunton, Thursday, April 29, 7.30 p.m., annual general meeting.
WOOLWICH DIVISION.—A refresher course has been arranged by the Dartford Hospital Group, from April 23 to July 2.

Meetings of Branches and Divisions

CHELSEA AND FULHAM DIVISION

A general meeting was held at the West London Hospital, W.6, on March 19, 1954. Lectures were given by Dr. Geoffrey Konstam ("Some Factors Predisposing to Myocardial Ischaemia"), Dr. L. P. Laurent ("Management of Thyroid Disorders"), and Mr. H. Burge ("Dysphagia").

HOLLAND DIVISION

A meeting was held at the Peacock and Royal Hotel, Boston, on March 27, 1954. Dr. Gibson Barrie took the chair and there was an attendance of 43. Dr. D. Evan Bedford gave a lecture on "Common Difficulties in Diagnosis of Heart Disease," illustrated by lantern slides. He also answered a considerable number of questions.

MARYLEBONE DIVISION

After the main business of its annual general meeting on April 5, the Marylebone Division held a discussion on the optional right to sell the goodwill of medical practices. Dr. H. Guy Dain, Dr. H. H. D. Sutherland, and Dr. E. C. Warner were the principal speakers. Dr. Dain, speaking first, outlined the history of events which led up to the loss of the right to sell goodwill in the N.H.S. Remarking that it had been said that it was immoral to buy and sell patients, Dr. Dain pointed out that that is exactly what the State does now when it transfers blocks of patients from one doctor to another. Dr. Dain went on to mention some of the effects which the loss of the right to buy and sell goodwill had had on the profession. The argument had been put forward that a return of the right to buy and sell goodwill would affect the number of doctors entering practice and therefore upset the Danckwerts award, but Dr. Dain said that the Ministry would never agree to any scheme where there was a possibility of this happening.

Dr. Sutherland spoke next, and briefly outlined the scheme for buying and selling goodwill in the N.H.S. which the Amending Acts Committee of the B.M.A. (of which Committee he is Chairman) had prepared for the Council of the Association on the instructions of the Representative Body. He said that his Committee had been working on the problem for a long time and was still finding out new points. It was for the Representative Meeting at Glasgow to decide what was the right thing to do and whether the right to goodwill should be regained. Dr. E. C. Warner, the third speaker, said that he would like to see the young man of to-day invest in himself and in his ability to stand on his own feet. Drs. H. B. Woodhouse, Elizabeth Jacobs, A. C. E. Breach, C. Watney Roe (who put in a word of caution), R. Hale-White, W. M. Levitt, R. Cove-Smith, A. G. Manley, Alistair French, and R. H. Moore were among those who spoke in the ensuing discussion. Dr. Hale-White and Mr. Lawrence Abel proposed and seconded the vote of thanks to the speakers.

SARAWAK BRANCH

A meeting was held on February 16, 1954, with Dr. P. M. Philpott in the chair. There were eight members present. A general discussion took place on fixing a programme for the stay of the President of the Association, Mr. J. W. Tudor Thomas, in Kuching from April 6 to 8. The meeting closed with a clinical session at which three cases were presented—osteogenesis by Dr. Elsie Wong, osteosarcoma by Dr. T. M. Kraszewski, and hydronephrosis also by Dr. Kraszewski.

SOUTH STAFFORDSHIRE DIVISION

A meeting was held at the Bradmore Hotel, Wolverhampton, on February 19, 1954. Mr. Leslie Thomas took the chair, and there were 45 members present to hear a lecture on "Obesity" given by Dr. J. H. Sheldon. Another meeting was held in the Royal Hospital on March 24, when Mr. Leslie Thomas again took the chair. Mr. Robert D. Owen gave the B.M.A. lecture on "Diagnosis and Treatment of Cancer of the Lower Pharynx and Upper Oesophagus." Twenty-eight members attended.

WEST LOTHIAN DIVISION

The new West Lothian Division has made a successful start as an active Division of the B.M.A. Since its inaugural meeting on October 29, 1953, monthly meetings have been held, and speakers at these meetings have included Dr. E. R. C. Walker ("History of the B.M.A. in Scotland"), Mr. Peter F. Hamilton ("Aspects of the Law in Relation to the Doctor"), Dr. G. A. G. Peterkin ("Pruritus Ani et Vulvae"), Dr. T. N. MacGregor ("Modern Trends in Treatment with Steroid Hormones"), and Mr. L. H. Daiches ("The Link between Law and Medicine"). The first annual dinner dance was held on April 9 at Lea Park Hotel, Grangemouth.

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THE CITY OF GLASGOW

BY
ARCHD. L. GOODALL, M.D., F.R.C.S.Ed., F.R.F.P.S., D.P.H.

Honorary Librarian, Royal Faculty of Physicians and Surgeons

"Let Glasgow flourish by the preaching of the Word and praising Thy name"

Those of us who advocate a return to the unshortened version of Glasgow's motto remember with pride that our city had been for a thousand years a centre of learning and piety before it was engulfed by industrialism within comparatively recent times.

In fact, the only continuing factor in her history has been her cultural activity, and the joke of the raffle where the first prize was a week in Glasgow and the second prize two weeks in Glasgow could not have been made when Pepys described her as "a very extraordinary town for beauty and trade much superior to anything to be seen in Scotland" (1682).

It is probable that the Romans had a fort there to protect the crossings of the Clyde and that one of their roads followed the line of the present Rottenrow and Drygate. Maybe the Druids carried on their rites on the hill behind the Cathedral.

The first Christian impact on Glasgow came about 397, when Ninian travelled from his settlement in Whithorn, the Candida Casa, and consecrated a burying-ground there. The next Christian visit is recognized as the true foundation of the city, and the story of the kindly founder is sufficiently unfamiliar to allow its retelling.

Owen, nephew of King Arthur, had had an affair with Thenau (commemorated as St. Enoch), daughter of Loth, King of Lothian. Her barbaric father, finding her pregnant and, furthermore, a Christian, had her cast from his fort on Traprain Law, and when she was saved by a miracle had her cast on the Firth of Forth in a coracle. She was carried

to Culross, where her son was born and taken into the care of St. Serf. He flourished under the patronage of the old saint and was called Kentigern, which means "chief lord." We prefer his pet name of Mungo, which means "beloved one." But his pre-eminence aroused jealousy and his fellow acolytes made life uncomfortable for him. On one occasion they killed one of St. Serf's favourite robins, but it was brought to life again by Mungo. On another, they destroyed all the lamps and Mungo brought in a frosted twig of oak (or hazel) which lit the whole shrine. These miracles are commemorated on our coat of arms.

The jealousy of the novices of Culross drove Mungo and a few companions westward in 543. One night they sheltered at Carnoch with an old saint called Fergus, who, Simeon-like, was awaiting the revelation before he died. In a vision Mungo was instructed to place Fergus's body on a cart and hitch it to two wild cattle, allowing them to wander where they would. They stopped on the bank of the Molendinar and there Mungo established his settlement. The story is commemorated on the roof of the Blacader aisle of the Cathedral, where Fergus is buried.

The Molendinar Burn has since disappeared into a sewerage pipe under Wishart Street, but is visible at two points. It is long since

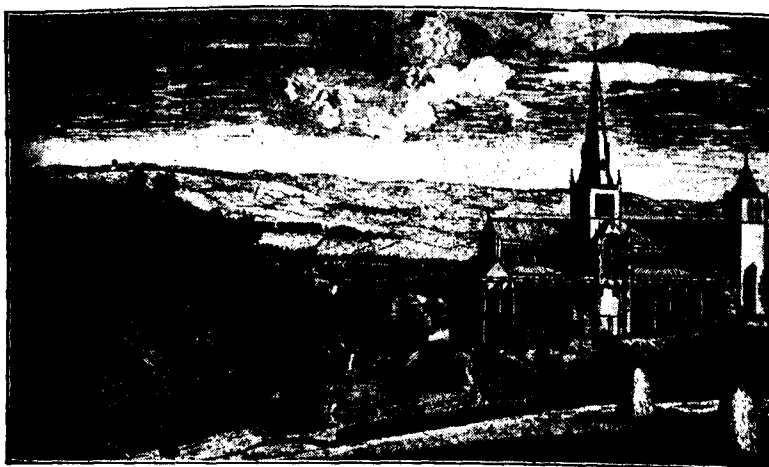
"The good St. Mungo smiled and said, 'No prospect could be finer: We'll build our cell by this crystal well On the banks of the Molendinar.'"



The University of Glasgow.

Still Mungo had not yet reached peace and he was driven out by Morken to Wales. He was brought back by Rydderch Hael, whose castle was at Partick and whose queen was saved by another miracle of Mungo when her betrothal ring was found in the mouth of a salmon.

Mungo died in 603 and joined the Christian saints; his tomb is in the lower church of Glasgow Cathedral, and in St. Giles he had an altar, for the maintenance of which the Royal College of Surgeons of Edinburgh was first



View of the Cathedral from the north (from an old engraving by R. Paul, a pupil of the Fowles Academy of Art).

chartered. The name of our city may come from eglais-acha (*ecclesiae ager*) or from glas gu, "beloved green place."

Ecclesiastical Rule

There is no more word of Glasgow for five hundred years, but there must have been a Christian settlement there, for the next record is an inventory ordered by David I, the "sair sanct for the Crown." David, under the influence of his mother, Margaret, replaced the Culdee Church with a Roman priesthood and established feudalism. He endowed the Cathedral with the income from the lands of Govan. At this time Glasgow was a prosperous little town, living entirely upon its ecclesiastical functions. Shopkeepers, fishermen, and building tradesmen would be kept busy by the clerical authorities. The Wars of Independence touched her; Wallace had a tuzie with the English at the Bell of the Brae in 1296, and the Bishop of Glasgow, Wishart, absolved Bruce for his murder of the Red Comyn.

Irritated by the behaviour of some of his neighbouring Royal Burghs, Bishop Turnbull applied to the Pope in 1450 for certain privileges. These included the setting up of a university in 1451, an occasion duly celebrated 500 years later in 1951. The first building, "the auld pedagogy," was in Rottenrow, but soon the College moved to the High Street, where it remained for 400 years. A plate records the site.

Mary, Queen of Scots, paid several visits to Glasgow. On one occasion she probably stayed in Provand's Lordship while visiting the dissolute Darnley one week before his violent death. One of the "casket letters," used at the time and since to prove her complicity in Darnley's murder, was written from Glasgow. Her last visit was with her army to try her strength against James, her half-brother, at Langside, from which battle she fled to England and the block.

The Reformation changed the whole character of the city. The ecclesiastical foundations were seized by greedy nobles; the main employer of labour, the Church, was displaced. The Merchants and Crafts set up protective guilds, consolidated by the foundation of the Merchants and Trades Houses in 1605. From that time trade took an increasing part in directing Glasgow's development.

In 1638 the General Assembly, meeting in Glasgow Cathedral, passed the resolutions which established Presbyterianism as the church form of Scotland, and started the bloody fifty-year struggle of the Scots for religious freedom.

Charles Edward Stuart had no great popularity in Glasgow and he fined the citizens for their lukewarm support in 1745. The sack of the city was prevented by the gentle Lochiel, whose descendants are still honoured in Glasgow for his clemency. A plate on the wall at the corner of Glassford Street and Trongate records the site of Charles's lodging in Shawfield House.

The Growth of Trade

The native genius for trade began to turn the clerical centre into a mercantile town. Port Glasgow was opened in 1668 to allow direct trade with the countries beyond the seas. The Darien scheme might have set up Glasgow as the greatest seaport of Britain, but its failure with the loss of half of Scotland's capital resources, mainly due to English jealousy, postponed this realization.

The most important clause of the Treaty of Union of 1707 is number IV, which allows "freedom of intercourse of trade and navigation to and from any part or place within the said United Kingdom and the Dominions and Plantations thereunto belonging," to all subjects of the United Kingdom. Glasgow merchants seized this opportunity with both hands, and in fifty years had established an exceedingly prosperous tobacco trade with America. This trade collapsed after the American Rebellion, but, before that, steps had been taken to deepen the Clyde, the first steps in Glasgow's expansion. An Act of Parliament was passed in 1759 authorizing the deepening of the river. Another was passed in 1770 and the Clyde became navigable to the Broomielaw.

With the collapse of the tobacco trade, the Glasgow merchants turned to sugar and the manufacture of linen. Linen manufacture was introduced by a surgeon and a physician, William Stirling and John Gordon. The latter is "Potion" of *Roderick Random*, and it was to him that Tobias Smollett was apprenticed. Robert Owen's social experiment at New Lanark stands out for its far-seeing partnership between employer and worker.

Already in 1760 the Carron Iron Works had begun to produce the best ironware in the country, and the development of the Forth and Clyde Canal and the Napoleonic Wars spread industrialization to Glasgow. Steamships were developed under the lead of Symington and Bell. Railways flourished, and, to meet the demands for labour, the Highlands were depopulated and there began the Irish



The Trongate in 1774.

immigration, which has not yet ceased. In the past hundred years dependence on heavy industry has led to the acme of prosperity and the nadir of depression. Recent efforts will, we hope, insulate us against any repetition of the early thirties.

Glasgow as an Educational Centre

The first educational institution of Glasgow was probably the Grammar School, still in existence as the High School of Glasgow. Its origin is lost in the mists of antiquity, but it probably predates the University.

The University had a shaky beginning and was for a hundred years financially embarrassed and unsuitably housed. The *nova erectio* of 1577 changed these circumstances, and thenceforth the University has given more than its share of famous names to the world of learning. The names on the quincenary gates range from the great lawyer, Stair, to the great surgeon, Lister. What diverse fields of thought and achievement are epitomized in the names Adam Smith, Lord Kelvin, William Hunter, Joseph Black, Joseph Hooker, Robert Henryson, Joseph Coats, William Macewen, William Cullen, John Caird, James Boswell, James Watt, Robert and Andrew Foulis, and Gilbert Murray. The history of the University impinges on the history of the city at every point. The citizens supported the University, and in many ways the University's work supported the citizens. This symbiosis is still evident. William Hunter's museum and library are in some ways more outstanding than those of his brother.

The Royal Faculty of Physicians and Surgeons was founded in 1599 by a grant from James VI to Maister Peter Lowe and Maister Robert Hamilton. It was the first teaching and examining body in the West of Scotland, and for many years it scrutinized the credentials of Glasgow medical men for the good of the lieges. Its Fellowship Roll contains the names of William Cullen, Joseph Black, Thomas Graham, William Smellie, Joseph Lister, William Macewen, David Livingstone, Robert Watt, and Robert Perry among many other national and international figures.

The only large part of the grandiose plans of John Anderson which still survives is the Royal Technical College, Glasgow the first and largest technical college in Britain. Glasgow also boasts a School of Dentistry and a Veterinary College (both under the wing of the University); a School of Art; an Agricultural College; a College of Domestic Science; and the Scottish Academy of Music. The Art Gallery contains the finest collection of pictures in Britain, outside London.

Glasgow Medicine

Glasgow Medicine began before records were kept. City surgeons are recorded in the mid-sixteenth century, but only after the Royal Faculty had been founded in 1599 was there efficient oversight of the profession begun. This Royal Faculty is unique in that both physicians and surgeons have been amicably incorporated during its whole history. Its present function is largely the encouragement of post-graduate education and organization and the maintenance of a first-class library. The University began teaching medicine at the beginning of the eighteenth century, but provided a surgical course only in 1815. After various vicissitudes, the University now provides the only medical teaching in Glasgow and it has recently incorporated the dental and veterinary schools.

The hospitals of Glasgow began as clerical almshouses, one of which still stands. This is the Hospital of St. Nicholas, also known as Provand's Lordship, in Cathedral Square. The Town's Hospital was the name applied in 1734 to the poorhouse, but it had an attached infirmary in which Fellows of the Faculty gave their services and medicines free of charge.

The first of the modern hospitals was the Royal Infirmary, founded in 1792 and rebuilt in 1912. It was closely associated with medical education from its beginnings and housed most of Glasgow's medical history in the making. The

Western Infirmary became necessary after the removal of the University to Gilmorehill from High Street in 1870. It opened its gates in 1874 and, after a quiet start, is now a busy teaching and research institution. With the growth of the city southward, the need for the Victoria Infirmary arose and it was opened in 1890. The hospitals previously administered by the Corporation include Stobhill, Southern General, Eastern District, and Western District as general hospitals; Belvidere, Knightswood, and Ruchill as fever hospitals; Woodilee, Gartloch, Stoneyetts, Hawkhead, and Lennox Castle as mental hospitals; and Robroyston and Mearnskirk as tuberculosis institutions. The specialist hospitals include the Royal Mental Hospital (1810); the Eye Infirmary (1824); the Royal Maternity and Women's Hospital (1834); the Ophthalmic Institute (1869); the Ear, Nose, and Throat Hospital (1872); the Eastpark Home for Infirm Children (1874); the Royal Beatson Memorial Hospital (1890); Redlands Hospital for Women (1903); and the Homoeopathic Hospital (1914).

This profusion of teaching hospitals and clinical material has made Glasgow a centre of clinical study and research second to none other in the country. This alliance of the academic centre with the large commercial city, the union of Town and Gown, has produced nothing but good.

It is often said that one of Glasgow's great advantages is the ease with which one can get out of it. Certainly it is within easy reach of Loch Lomond, the Clyde Estuary, Ayrshire, and the West Highlands. It is surrounded by good golf courses and by centres of all forms of sport. Perhaps the most pleasing of the commonly heard remarks of the visitor to Glasgow is that the people are amongst the kindest and most hospitable in the world. We shall attempt to justify this tradition in July.

[The illustrations in this article are reproduced from photographs by Annan, Glasgow]

OCCUPATIONAL HEALTH

JOINT CONFERENCE OF ADVISORY COUNCILS

A Joint Conference of Advisory Councils of Occupational Health was held on April 13 at B.M.A. House, London. It was sponsored by the Occupational Health Committee, whose Chairman, Dr. J. A. L. VAUGHAN JONES, presided. The Conference was attended by representatives of ten advisory councils, and, as observers, by representatives of the British Employers' Confederation, the Occupational Health Section of the Royal College of Nursing, the Industrial Welfare Society, the Institute of Personnel Management, and the Society of Medical Officers of Health.

Chairman of Council's Welcome

Dr. E. A. GREGG, Chairman of Council, in welcoming the Conference, said that the British Medical Association's interest in occupational health went back now for some years. In 1945 the Annual Representative Meeting instructed the Association to promote local advisory committees, representing doctors, employers, and employed. In 1948 all Divisions were circularized with a view to the establishment of joint councils of industrial medicine (as they were called then), and in 1951 a model constitution for advisory councils was drawn up by the Committee. For many years there had been a Joint Committee of the B.M.A. with the Trades Union Congress. Up to the present moment liaison with the British Employers' Confederation had not been effected, but he hoped this would come about before long. Finally, it gave him pleasure to see Dr. Vaughan Jones in the position of Chairman. On the Council of the Association he had fought for the recognition of occupational health, and it was thanks to his efforts that the Occupational Health Committee was formed.

Dr. VAUGHAN JONES, from the Chair, said that it was 11½ years since the first advisory council was formed, and ten years since, at Leeds, the first conference was held.

Doctors in industry had realized that they could not get very far unless the point of view of employers and employees was appreciated in addition to their own. Progress had been slow, sometimes owing to the apathy of doctors. Altogether 17 councils had been formed, although only ten were represented in the present Conference. Twenty-one other Divisions had considered the question, but had decided for various reasons not to set up advisory councils. The arrangement of central conferences had been a difficulty in view of the isolated character of the organizations. Conferences had been held at Leeds, Burton-on-Trent, and Derby, but it had now been decided that they would like to have a conference with the B.M.A. as host and at its headquarters. He looked forward to an accession of strength at future conferences. He suggested also that advisory councils might widen their invitation list, bringing in factory inspectors, medical and lay, and representatives of the industrial section of the Royal College of Nursing and of the Institute of Personnel Management, and that a medical officer of health, if not elected in the usual way, should be invited. Occupational health to-day was on the verge of considerable expansion. In this movement they served industry and each other, and helped to make a happy working community.

Central Federation Proposed

Mr. C. F. GOTHARD (Burton and District) moved a recommendation in favour of some form of voluntary federation or association of all advisory councils of occupational health, to provide a centre for the co-ordination, expansion, and consolidation of the work of the councils. This Conference, he said, might well mark the end of a probationary period. The foundation of the movement had been excellent. On the one hand it had been fostered by the B.M.A. with its expert knowledge, and on the other by the employers and the trade unions. There was every reason for setting up some form of central organization. Its exact character remained to be worked out by the B.M.A. through its appropriate committees. The motion was seconded by Mr. W. G. M. TWIGG, also from Burton, who pointed out the need for co-ordination and distribution of knowledge, functions which could only properly be discharged by a central body.

Mr. A. E. GREGORY (Southampton) said that the central organization should be on tripartite lines. He also suggested that the Associated Chambers of Commerce was one of the bodies which should be brought into the picture.

Dr. H. ALEXANDER (Wandsworth and Battersea) urged that new methods should be devised for implementing the recommendations or decisions reached by the councils. He asked in particular for more frequent meetings of the joint B.M.A. and T.U.C. Committee, that advisory councils should have freedom of approach to their local authorities, and that in the personnel of advisory councils there should be included the medical officer of health or his deputy.

A long discussion followed in which representatives of advisory councils from Leeds, Coventry, York, Brighton, Derby, and Wolverhampton took part.

The CHAIRMAN pointed out the alternatives which had been proposed: a central organization composed of bodies representing employers, employees, and doctors; a committee of existing advisory councils; a central organization with direct representation, in the first instance, of each advisory council and, at a later stage, representatives elected from an annual conference.

When it came to voting it appeared that all but two representatives were in favour of the Burton resolution that some form of voluntary federation or association of all advisory councils should be set up to provide a centre for co-ordination and expansion. It was also agreed that it should be formed on tripartite lines. It was further agreed that the central body should consist of representatives of the B.M.A., the British Employers' Confederation, and the Trades Union Congress plus a representative from each Advisory Council, and that an annual conference of Advi-

sory Councils should be held. The next conference is to be held in London in a year's time. Mr. Gothard, of Burton and District, was elected Chairman of the next Conference.

Publicity

The Conference next turned to the question of publicity. It was proposed by Wandsworth and Battersea that in order to promote the closest possible liaison between advisory councils each council should send copies of its minutes to the other councils. Wandsworth and Battersea also asked that steps should be taken to make the public aware of the existence and work of advisory councils by means of public meetings, with films, demonstrations, and local press publicity. This last matter proved more difficult owing to a paragraph in the model constitution which laid it down that there should be published in the local press only agreed reports of advisory councils' proceedings, and then only provided that the decisions were unanimous. The feeling of the Conference was against the admission of the press to advisory councils' meetings. So far as national publicity was concerned it was the feeling of the Conference that representations should be made to the T.U.C., the employers' organizations, and the B.M.A. to endeavour to secure the formation of further advisory councils.

OCCUPATIONAL HEALTH SERVICES

Another all-day meeting of the Occupational Health Committee of the Association was held on April 14, Dr. J. A. L. VAUGHAN JONES presiding.

The Memorandum on the Future of Occupational Health Services was again the subject of detailed discussion in connexion with a report by representatives of informal discussions with other interested bodies.

It was understood that the Trades Union Congress would like to discuss the memorandum through the medium of the Joint B.M.A. and T.U.C. Committee, and it was agreed to ask the Council of the Association to arrange for this meeting in the near future. It was mentioned that the B.M.A. side of the Joint Committee, apart from the Chairmen (or their nominees) of the Central Consultants and Specialists, General Medical Services, Public Health, and Occupational Health Committees, included members chosen by the Chairman of Council for their familiarity with the subject to be discussed at a particular meeting. It was agreed that the names of Drs. H. Alexander, M.E.M. Herford, and L. G. Norman should be recommended to the Chairman of Council for inclusion amongst the B.M.A. representatives on this occasion.

Administration of Morphine by Nurses

A letter was read from the medical adviser of a large industrial concern stating that he had been informed by the Medical Protection Society that the practice of issuing supplies of morphine to nurses in factories for administration to patients other than under the direct personal supervision and in the presence of a medical practitioner was a criminal offence under the Dangerous Drugs Act. In his view it was time the law was changed in this respect.

It was reported that the Public Health Committee at its meeting the previous week had considered this matter from a wider point of view—namely, the injection by nurses of any substance into the blood stream directly or indirectly—and had decided to await a report by the Royal College of Nursing following a conference on the subject. The Royal College itself had written expressing its concern about the legal position of the occupational health nurse with regard to the administration of dangerous drugs in cases of emergency. The Occupational Health Section of the Royal College desired an opportunity of discussing the matter with the Occupational Health Committee of the B.M.A. It was agreed to accept this invitation for an informal discussion and to report back to the Committee.

Medical Standards in Transport

Dr. L. G. NORMAN, referring to the notes for the guidance of practitioners examining applicants for public service vehicle driving licences, said that a member of the subcommittee, who was out of the country when the recommendations were framed, had sent certain suggestions for modification of the notes, in particular with regard to heart disease, diabetes, and albuminuria.

The suggestions were accepted, and the Committee reconsidered the notes again, making certain revisions, which will be reported to the Council.

Advisory Councils

A report was made on the Joint Conference of Advisory Councils which had been held on the previous day (see this Supplement, p. 201). Representatives of ten advisory councils attended, together with members of the Committee and observers from the British Employers' Confederation, the Industrial Welfare Society, the Royal College of Nursing, the Institute of Personnel Management, and the Society of Medical Officers of Health. Various recommendations from the Conference regarding the extension of the work of the Advisory Councils and the setting up of a central body were discussed by the Committee, and a full report will be submitted to Council at its next meeting. Representatives of the British Employers' Confederation had attended on the previous day, and it was hoped to have informal discussions with the Confederation with a view to securing close liaison, such as already exists between the British Medical Association and the Trades Union Congress through the Joint B.M.A. and T.U.C. Committee.

Remuneration of Industrial Medical Officers

The Remuneration Subcommittee presented a report covering several matters. The Subcommittee had considered the advisability of revising the wording of the Association's scale of remuneration for industrial medical officers to facilitate its adoption by all sections of industry. A revised draft was submitted, and after some discussion a statement was agreed for submission to the Council.

It was felt that a survey of the present remuneration in different industries was now necessary, and it was agreed that the Subcommittee be instructed to examine the whole subject in the light of recent increases in professional remuneration and of the probable extension of the occupational health services. It appeared that much detailed information was required and the offer of co-operation from members of the Association of Industrial Medical Officers was gratefully accepted.

Other matters discussed included Mule Spinning (Health) Special Regulations, 1953; Part-time Industrial Medical Officers; and the matter of the examination of applicants for public service vehicle driving licences.

N.H.S. COSTS IN SURREY

The estimated population of the Administrative County of Surrey on June 30, 1953, was 1,359,672; 1,284,228 names were included in the Health Service lists of general medical practitioners at January 1, 1954.

During the year ended March 31, 1954, the cost of the services administered by the Surrey Executive Council was £4,584,048. Of this amount, general medical services accounted for £1,556,016, pharmaceutical service £1,212,826, dental service £1,306,432, ophthalmic service £442,360, and administration £66,414. Pharmaceutical charges to patients during the year were £172,422 (about 14% of the cost), dental charges £276,023 (21% of cost), and ophthalmic charges £170,380 (38.5%). The net cost to the Exchequer was £3,965,223.

These figures were given in a statement presented by the chairman of the Surrey Executive Council at its annual meeting on April 14.

PRIVATE PRACTICE COMMITTEE

The Private Practice Committee at its meeting on April 14, with Dr. Ian Grant in the chair, was as usual confronted by a long and varied agenda. Tributes were paid to a member of the Committee, Dr. T. W. Morgan, whose death had occurred since the last meeting.

A report was made on the present position of bonus shift certificates. The National Coal Board had stated that, apart from one Division, the tightening up of administrative procedure in connexion with these certificates had not given rise to any appreciable difficulty. From the general discussion it appeared that in some areas individual miners were not yet aware of the need to see their doctor on the day on which they were unable to work. It was agreed that a watchful eye be kept on the situation. An assurance from the National Coal Board relating to the benefits to be paid in the event of any medical practitioner being killed or injured when called to a colliery was considered satisfactory.

Drugs for Private Patients

Representatives of the Committee and of the General Medical Services Committee had recently met officers of the Ministry of Health to discuss the possibility of prescribing for private patients on Form E.C.10. It was stated that the promise had been given that the case would be put before the Minister.

It was agreed to discuss with the Home Office the possibility of securing an agreed scale of minimum allowances for professional witnesses to fact at all criminal courts.

The Committee was informed that the Hearts of Oak Benefit Society had now agreed to pay a fee of one and a half guineas for medical reports when the sum assured exceeded £300. For policies below this sum the approved "short form" would be used and the agreed fee of 15s. would be paid.

Correspondence concerning cremation fees was laid before the Committee. The Association's Solicitors, who had been consulted on the question, gave the opinion that no member of a hospital medical staff signing Certificate B was entitled to charge for it. The Committee of the Registrars Group had asked that representations be made to the Home Office to recommend that when Certificate B was given by a house-officer Certificate C should be accepted if signed by a registrar of the requisite standing. It was stated that this was already an accepted practice in a number of areas. The view of the Central Consultants and Specialists Committee is to be sought.

Remuneration of Ship Surgeons

The Committee devoted some time to the consideration of a letter from a member of the Association, a ship surgeon, who stated that he had served his company for a number of years, that his salary was £65 per month, and fees received from passengers in addition to salary did not average more than £250 per annum. It had been ascertained that the salary was about average, but that a surgeon serving in a large passenger liner would receive at least £500 a year in fees. The Committee recalled that five years ago it had put forward certain basic proposals which had not been acceptable to the employers. It was stated that the shipping companies had no difficulty in obtaining ship surgeons at current rates. It was agreed that this matter should be referred to a meeting of the Maritime Subcommittee.

The final matter considered by the Committee concerned freedom of choice of doctor. A correspondent had drawn attention to a practice, which he said was on the increase, whereby employers tried to insist that their staffs should be on the list of a National Health Service general practitioner. A similar situation, he said, occurred in certain public and preparatory schools where the pupils were obliged to be attended by the school doctor under N.H.S. arrangements even though their parents might prefer them to receive attention from the school doctor under private arrangements. Further information is to be sought.

British Medical Association

GENERAL MEDICAL SERVICES COMMITTEE

SUPPLEMENTARY REPORT OF THE GENERAL MEDICAL SERVICES COMMITTEE TO THE ANNUAL
CONFERENCE OF REPRESENTATIVES OF LOCAL MEDICAL COMMITTEES, 1954

REMUNERATION

Size of the Central Pool

(Paras. 17-33 of Report)

290. In its main report the Committee gave a detailed account of the way in which the size of the pool is calculated afresh each year and the various steps which must be taken before the precise amount of the final settlement can be determined.

291. The very detailed information which must be sought before the size of the pool can be calculated means inevitably that some considerable interval must elapse between the end of the financial year in question and the payment of the final settlement moneys. This is particularly true of the year 1952-3, during which lengthy investigations and discussions with the Ministry on such matters as the number of doctors in the Service, the level of practice expenses, and the extent of receipts from private practice and from other sources have been conducted.

292. Agreement has, however, now been reached on most of the outstanding points, and it is hoped to reach final agreement on the pool for that year in the very near future. The Committee would, however, like to give early notice that, on the basis of the data now available, the size of the final settlement for 1952-3 will be negligible. This is not altogether unexpected, as in that year, the final year of the old distribution scheme, the capitation fee was deliberately augmented to the full extent of the additional moneys made available by the award—in other words, the total amount of the increased pool, so far as it could then be calculated, was distributed within the year, as a percentage increase on capitation fees and fixed annual payments.

293. It is expected, however, that the following year when a change was made to payment by fixed capitation fee and by loading, and when an increase took place in the number of doctors in the Service, will show a balance remaining to be distributed to the profession as final settlement. The task of negotiating this final settlement for 1953-4 is already under way, though it will necessarily be some time before agreement can be reached.

Back Debits and Back Credits

(Para. 45 of Report)

294. The Ministry has accepted the Committee's view that it would be reasonable to impose an overall time limit equally on both back debits and back credits. In future it is proposed that retrospective adjustments either way will not be made for more than two years, and by way of further simplifying the present procedure they will be calculated on the same basis as the capitation fees for the quarter in which any adjustment takes place.

THE DANCKWERTS AWARD AND THE SMALL-LIST
PRACTITIONER

(Paras. 46-52 of Report)

295. The Working Party has now completed its detailed examination of the effects of the new distribution scheme on the small-list practitioner, and its report on the subject is set out in Appendix F.

296. The findings, based upon a careful survey of the facts, happily show that the number of cases in which there is a loss of income solely attributable to the new scheme is very small.

297. The Committee is satisfied that the new proposals which operate retrospectively to April 1, 1953, will deal equitably with the position as it is now shown to exist. In recommending these proposals it wishes to draw particular attention to the following considerations. Firstly, the proposals will secure the principle of "no detriment"; secondly, they avoid any question of a "means test"; and thirdly, in assessing hardship no account will be taken of outside sources of professional remuneration; above all, the basic principles of the distribution scheme, accepted by both the profession and Parliament, will remain undisturbed and the cost of the new scheme met out of the final settlement moneys in each year, as was intended by the Conference. The Committee therefore recommends:

Recommendation: That the report of the Working Party be approved.

RESTORATION OF THE RIGHT TO BUY AND SELL
GOODWILL

298. It will be remembered that the Conference last year passed the following resolution on a proposal for the optional return of goodwill put forward by the Amending Acts Committee of the Association:

"That the Conference of Local Medical Committees, representing National Health Service Practitioners throughout the country, having considered the memorandum prepared by the Amending Acts Committee and the comments of the General Medical Services Committee and the Compensation and Superannuation Committee upon it, is not in favour of the optional return of the right to buy and sell goodwill of practices, which it believes to be impracticable."

299. Subsequently the Representative Body of the Association at its meeting in Cardiff in 1953 passed the following resolution:

"That the Amending Acts Committee having recommended the restoration of the right to sell goodwill, this Representative Meeting instructs the Council of the Association to produce a scheme for the return of goodwill and to report to the Representative Body in 1954."

300. At the commencement of the present session the Council instructed the Amending Acts Committee to prepare a detailed scheme for the restoration of goodwill and a great deal of thought has since been given by that Committee to the many difficult problems involved.

301. At its meeting in March the Council received a draft scheme, together with a memorandum on the economic difficulties involved, prepared by Mr. A. N. Dixon, the General Manager of the Medical Insurance Agency. The Council decided that the scheme prepared by the Amending Acts Committee should be submitted to the Representative Body at its meeting in Glasgow, but that in the first place the views of the General Medical Services Committee should be sought on the general principles of the scheme and in particular its practicability. The Committee has once more given most careful consideration to the whole problem of the restoration of goodwill and detailed study to the scheme submitted.

302. Any scheme for the restoration of goodwill must be examined in the light of present-day economic circumstances, and the Committee is in no doubt that a return to the buying and selling of goodwill has become economically impossible to-day. If the purchase of practice goodwill became compulsory to the future generation of doctors

(now students)—a generation who have taken up the study of medicine in the knowledge that they would not be required to enter practice by purchase—real hardship would be caused.

303. The Committee, after careful consideration, has informed the Council that, whilst it wished to pay tribute to the constructive efforts of the Amending Acts Committee to produce a scheme for the restoration of the right to buy and sell goodwill, it did not support the scheme which had been submitted. This view has also been expressed by the Assistants and Young Practitioners' Subcommittee and by the British Medical Students Association. Further, the Council has been informed that, from the information contained in a memorandum prepared by the General Manager of the Medical Insurance Agency on the possibility of loans for the purpose, the Committee has reached the firm conclusion that the very difficult economic circumstances which have developed since 1948, in addition to the many other practical difficulties involved, would render it impossible to carry out this or any similar scheme for the restoration of goodwill.

304. The Committee sees nothing in the present proposals which would justify asking the Conference to modify the view it took last year. It is not possible to submit the detailed scheme and its appendices to Local Medical Committees before the Council has met in May to consider its own final attitude to the proposals. It is expected that the proposals and the Council's report on this subject will be published on May 22 in the Supplementary Report of the Council to the Representative Body. The fact that the General Medical Services Committee cannot recommend any change of policy to the Conference does not prevent any Local Medical Committee putting down a motion on the subject if it so wishes. Should the outcome of the discussion on the report of the Amending Acts Committee in Council, or in the Representative Body, make it seem desirable, the General Medical Services Committee would always be willing to discuss the advisability of calling a Special Conference to obtain the considered views of Local Medical Committees on this important matter.

MATERNITY MEDICAL SERVICES

Ante- and Post-natal Care

(Paras. 159-161 of Report)

305. Following representations by the Committee, the Ministry has now agreed to issue a memorandum which will make it quite clear that the general practitioner is entitled to claim the appropriate fees when he provides maternity medical services for a woman who has arranged to be confined in hospital when exceptionally either he himself decides that it would be inconvenient for her to attend at the hospital for her ante- or post-natal care, or where the hospital itself requests him to undertake this work.

306. It is hoped that the Ministry's memorandum will avoid the difficulties referred to in the main body of the Committee's Report.

General Practitioners and Institutional Midwifery

(Paras. 165-166 of Report)

307. Representations have been made to the Ministry about the decision to close the Springfield Maternity Home at Blackburn. Not only was the decision to close Springfield taken without adequate consultation with local general practitioners, but the actual evacuation of the patients was carried out with complete disregard for their responsibility for the patients then in the home. This Maternity Home played an essential part in the maternity services of the area, and the alternative accommodation offered was neither convenient nor practicable for the doctors in Blackburn itself.

308. The Ministry has now given an assurance that this aspect of the problem will be given careful consideration with a view to providing alternative and conveniently situated institutional maternity accommodation for the doctors in Blackburn.

309. The Committee took the opportunity during the course of these discussions of stressing the need for maintaining an adequate number of general practitioner maternity beds throughout the country, and emphasized that, should it be found necessary to divert maternity beds to other uses, then the proportion of general practitioner to consultant maternity beds should not be reduced.

DRUGS PRESCRIBED BY DISPENSING DOCTORS
OVER PROLONGED PERIODS

(Paras. 218-219 of Report)

310. In its main Report the Committee referred to the compromise which had been reached with the Ministry on the question of putting these claims on a three-monthly as opposed to a strict quarterly basis. In effect the Ministry has agreed that, whilst the present quarterly basis will be retained for normal cases and for claims that have been continuous for some time, special arrangements will be introduced to cover exceptional cases where drugs costing more than £1 have been supplied during a period of three consecutive months, not comprising a calendar quarter.

311. The procedure which the Ministry now suggests for the purpose is that individual practitioners should continue to submit all claims at the end of each quarter, but that, in these exceptional cases, separate claims would be made for expensive drugs supplied in any three-month period which began in the previous quarter. In sending in claims for the March quarter, for instance, separate claims would be made for cases in which the cost of dispensing for a particular patient exceeded £1 during the period December to February. The special payments will not be made for consecutive three-month periods for the same patient, as, here, the normal quarterly basis will continue to operate.

ECONOMY IN PRESCRIBING

(Para. 231 of Report)

312. The Committee has now had an opportunity of considering the terms of reference and constitution of the new standing joint committee on the classification of proprietary preparations which is taking the place of the original Joint Committee on Prescribing on Form E.C.10.

313. The Committee had originally been uncertain as to whether the work of the new joint committee would be solely concerned with the classification of new proprietary preparations or whether it would be called upon, as was its predecessor, to consider the desirability of restricting or discouraging prescribing by general practitioners in the National Health Service. An assurance has now been received that the function of the new committee will be purely to classify proprietary preparations into the six categories already laid down by the previous Committee on Prescribing on Form E.C.10. The Committee feels, however, that as the work of the new Committee primarily affects those in general practice the proposed general practitioner representation is inadequate, and it is inviting the Council of the Association to press for the appointment of a greater number of general practitioners.

GRANTS FOR LOCUMS DURING REFRESHER
COURSES

(Para. 239 of Report)

314. Discussions have taken place with the Ministry on the question of increasing the payment made to general practitioners attending postgraduate courses in order to defray the cost of employing locums during their absence. The Committee has evidence that the current rate for locums is in excess of the amount of the present grant, and it is asking the Ministry to make the necessary adjustment.

315. In addition, the Committee has once again pressed the claim of assistants in general practice to take part in these courses. The Ministry, though foreseeing difficulty, is looking into the possibilities of such a proposal.

VACCINATION AND IMMUNIZATION

(Paras. 244-245 of Report)

316. The Committee has now had an opportunity of studying a draft circular prepared by the Ministry setting out its policy in regard to vaccination. The Committee hopes that the issue of this circular will do much to remove some of the difficulties which have arisen in some parts of the country over the payment of notification fees for vaccination of adults.

317. The Committee is to invite the Ministry of Health to consider the initiation of a national publicity campaign to encourage vaccination and immunization.

TEMPORARY RESIDENT FEES—HOLIDAY CAMPS

318. Under the arrangements for temporary residents Executive Councils, in consultation with Local Medical Committees, are required to classify holiday camps and institutions so that, under certain circumstances, the residents attract a temporary resident fee of 5s. only as compared with the normal temporary resident rate of 17s. The decision as to whether an institution is to be classified for the purposes of payment at the lower rate depends largely upon whether the doctor is in regular attendance and has facilities for seeing a number of patients at a fixed time and place. Difficulties have arisen over the application of this criterion, and the Committee is to discuss the matter with the Ministry of Health.

JOINT FORMULARY COMMITTEE OF THE B.M.A. AND THE PHARMACEUTICAL SOCIETY

319. Although the Committee is represented on the Joint Formulary Committee, since the constitution of that Committee was originally devised, events have made it necessary for other interested bodies to appoint members to it—with a consequent reduction in the proportion of general practitioner representatives to other members. This situation has been met in agreement with the Joint Formulary Committee by enlarging the general practitioner representation on its Executive Subcommittee which undertakes much of the work which is of importance to general practitioners.

APPENDIX F

DISTRIBUTION OF REMUNERATION AMONG
GENERAL PRACTITIONERS

SECOND REPORT OF WORKING PARTY

Introduction

1. In order that the matters dealt with in this Report may be seen in proper perspective, it may be helpful to recapitulate the circumstances which have led up to it.

The original terms of reference of the Working Party were:

"To secure an equitable distribution of the Central Pool based upon the recommendations of the Spens Committee, the object being to enable the best possible medical service to be available to the public, and to safeguard the standard of medical service by discouraging unduly large lists; at the same time, to bring about a relative improvement in the position of those practitioners least favourably placed under the present plan of distribution, to make it easier for new doctors to enter practice, and to stimulate group practice."

These terms of reference were a condition of the acceptance of the award of Mr. Justice Danckwerts and were binding on the Working Party in all their deliberations, those subsequent to their first report as well as those preceding it. The scheme of distribution recommended in the Working Party's first report was accepted by the Government and has been put into effect by arrangements embodied in Regulations laid before Parliament.

2. The Working Party have carefully considered the following resolution passed by the Special Conference of Local Medical Committees on June 26, 1952:

"That if, when the new scheme of distribution has been endorsed by both parties, it is found in the light of experience that certain groups of practitioners who under the terms of reference of the Working Party might have expected to have benefited have, in fact, not done so, it be left to the Working Party provisionally to allocate an appropriate proportion of the final settlement moneys for the purpose of remedying any obvious defects in the distribution scheme, such allocation to be subject to confirmation by the next Conference before it becomes a permanent feature of the scheme."

It has been claimed by some practitioners with small lists that, to give effect to the Conference rider, comparison must be made between the amount received under the arrangement introduced in 1953 and that received before that date when taking into account the retrospective payments under the award.

The implementation of the award by Parliament was contingent upon a new scheme of distribution which was to be largely aimed at improving the relative position of the practitioner with the medium-sized list. It is in these middle ranges that the greatest benefit now accrues.

Clearly, given a fixed sum to distribute, any system of priorities necessarily means that certain classes must secure relatively greater advantages than others from the award. The Working Party originally concluded that the requirements of their terms of reference would best be implemented by the loading of capitation rates for lists between 500 and 1,500, and later considerations have not led them to think that on merits there is a case for any general additions to the capitation rate for lists either below 500 or above 1,500. It must be stressed that any modification of the scheme of distribution in favour of any section of practitioners must necessarily mean less money for other groups of practitioners and would undoubtedly lead to other claims, the justice of which it might be difficult to deny.

In the view of the Working Party it is also not proper to make a comparison between remuneration under the arrangements introduced in April, 1953, and the augmented capitation fee which, under the retrospective provisions of the award, was paid at a flat rate in respect of the years prior to 1953-4. Arrears of money due under the award had, of necessity, to be related to the actual capitation payments made to general practitioners in each of these preceding years, as it was not practicable to calculate the arrears by reference to the new method of distribution.

For these various reasons the Working Party have confined themselves to considering the distribution of the moneys set aside from the Central Pool in accordance with the recommendation in paragraph 19 of the first report, which referred to the possibility of hardship arising under the new arrangements, particularly for elderly practitioners losing a fixed annual payment.

Possible Reasons for Hardship under the Present
Distribution of Remuneration

3. The effects of the arrangements introduced in April, 1953, could be assessed only in the light of practical evidence of their operation, and a comprehensive inquiry was therefore put under way as soon as practicable. This inquiry was designed to reveal both the number and groups of general practitioners who might, in the light of experience, be found to have been adversely affected, and went into the remuneration of single-handed doctors with National Health Service lists of less than 1,200 patients.

It showed that only two groups could be said to have been placed at a disadvantage: the first, a small group of doctors who had not been able to counteract the adverse effect on them of the replacement of the fixed annual payment by initial practice allowances, and the second, the elderly doctors who comprise the largest category of practi-

tioners with small lists of patients. The latter, for practical reasons, as well as the former, had not been able to take sufficient advantage of the opportunities and incentives offered by the new scheme of distribution for building up their lists and for becoming members of partnerships. To some extent, the two groups overlap.

The Application of the Proposed Scheme of Supplementary Payments

4. The Working Party have designed a scheme to apply to both the groups referred to in paragraph 3 (which might altogether cover as many as 500 to 600 doctors with lists of up to 1,200 patients). Of this number it is likely that about half, say, some 300, will have lists of under 700, representing something like one-third of the doctors with lists below 700. In drawing up the scheme outlined below, the Working Party considered that payments should be made without regard to the doctor's total professional income but should be related to the size of a practitioner's list. Without disturbing the main scheme of distributing the Central Pool, which has been accepted by the profession and has been in operation for a year, the supplementary payments now recommended should ensure that the main scheme will not operate to the detriment of any individual practitioner.

Details of the Supplementary Payments and Eligibility

5. (i) Outline of the Scheme

The recommended scheme for supplementary payments provides, subject to one or other of the two sets of conditions described below, a basic payment of £250 per annum for single-handed doctors with lists of not less than 300 and not more than 1,200 patients. For each patient, a normal capitation fee would be payable and there would be a special additional fee of 10s. for each patient above the three hundredth and up to the five hundredth. No loadings under the usual arrangements would be payable. A table showing the practical application of this scheme is appended to this paper.

The Working Party recommend that central committees (for England and Wales, and Scotland respectively) should be established which should be solely responsible for exercising any discretion on questions arising out of the application of the criteria referred to below. These central committees should be composed equally of representatives of the Health Departments and of the profession.

(ii) Conditions Applicable to Doctors Previously in Receipt of a Fixed Annual Payment

The duration of payment according to this scheme should be five years at most. Doctors in this category who are to become eligible under the scheme must fulfil the following conditions:

(a) They must be single-handed practitioners who, on March 31, 1953, were under 60 years of age and were then in receipt of a fixed annual payment. Subject to condition (b), they would become eligible to apply to be paid under this scheme as from April 1, 1953.

(b) The doctor should normally have an increasing list, and payment would be withdrawn if his list gradually decreased over four consecutive quarters by more than 10% in all.

(iii) Conditions Applicable to Doctors aged 60 and Over

Doctors aged 60 years and over who are to become eligible under the scheme must fulfil the following conditions:

(a) The doctor should normally have been in single-handed practice for at least ten years in the area in which he is now practising.

(b) Doctors aged 60 or over at April 1, 1953, should be entitled to claim a payment for the year 1953-4.

(c) Doctors who attain the age of 60 years subsequent to April 1, 1953, should be allowed to claim a payment as from the next succeeding quarter.

(d) The payments should cease if the doctor's list drops below 300 and remains below 300 for four consecutive quarters.

(e) Payment under the scheme would be reviewed when the doctor reaches the age of 70. Payment would not cease automatically, and it would be open to the doctor to apply annually for continued payment on the grounds that he is still efficiently providing the full range of general medical services. Such a claim should be submitted to the appropriate local medical committees to advise whether they consider the doctor is continuing to provide effective medical services. These applications should be passed to the central committee, which, after consultation with the local medical committee, should if they see fit authorize payment from year to year.

Future of the Present Hardship Scheme

6. The proposed scheme should ultimately replace the present hardship scheme. It could not, however, do so immediately on the introduction of the proposed scheme, and the change-over would have to be gradual.

The central committees should review all payments under the present hardship scheme with a view to merging them over a period into the proposed new scheme. The committees should be directed to work on the general principle that doctors with lists below 300 should not be eligible for payments, but should ensure that the change-over did not work out to the detriment of the individual. The committees should for some years be given latitude in dealing with individual cases.

The Operation of the Proposed Scheme Compared to the Normal Capitation and Loading Payments

No. of Patients on List	Payments under Proposed Scheme				Normal Capitation Fees and Loadings	Excess of Payment under Proposed Scheme over Normal Capitation Fees and Loadings (Col. 5 minus Col. 6)
	Capitation Fees	Basic Pay	Special Additional Fees	Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
100	85	—	—	85	85	—
200	170	—	—	170	170	—
300	255	250	—	505	255	250
400	340	250	50	640	340	300
500	425	250	100	775	425	350
600	510	—	350	860	560	300
700	595	—	350	945	695	250
800	680	—	350	1,030	830	200
900	765	—	350	1,115	965	150
1,000	850	—	350	1,200	1,100	100
1,100	935	—	350	1,285	1,235	50
1,200	1,020	—	350	1,370	1,370	—

April, 1954.

B.M.A. CHARITIES BALL, MAY 6, 1954

The B.M.A. Charities Ball, organized by the Metropolitan Counties Branch, will be held in B.M.A. House on Thursday, May 6, 1954. It is hoped that as many members of the profession as possible, including those outside the Branch area, will attend and thus enable the Branch to make a handsome contribution to the medical charities. Dancing to the music of the Sydney Lipton Ballroom Orchestra; buffet and bars. Tickets £2 2s. each, or six for £11 11s.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

Scottish News

SIR ANDREW DAVIDSON

The following letter from Sir Andrew Davidson, Chief Medical Officer of the Department of Health, has been received by the Scottish Secretary of the B.M.A.

"The date of my retirement as Chief Medical Officer is rapidly approaching: but, before it is actually upon me, I would like the Scottish Committee of the B.M.A. to know how much I have valued their help and guidance during the past strenuous, if most interesting, period of thirteen years spent in that appointment. I have always realized how fortunate it was for me to have such an understanding and co-operative group of colleagues; and my not insignificant experience of other countries has frequently strengthened that view. Scotland is fortunate in many respects, not least in its high tradition of medical practice, and its understanding leaders.

"Please convey my personal thanks to the Chairman and members of the Committee for the consistent support they have given to me and for the unfailing consideration they have shown to me. At the same time I would like you to help yourself to more than a modicum for the many little kindnesses you have done me, especially in dealing with foreign guests interested in our National Health Service. The friendly relationship between your office and mine is best typified by the two visitors from a Scandinavian country who, returning to me after a session with you and some members of the Committee, observed: 'We couldn't do that in our country.' The best assurance for the future is a strengthening of that happy relationship.

"Again, very many thanks to the Committee and to yourself."

THE ASSOCIATION AND PUBLIC HEALTH IMPLEMENTATION OF INDUSTRIAL COURT AWARDS

A meeting of the Public Health Committee of the Association was held on April 9, with Dr. Kenneth Cowan in the chair. Dr. T. H. Parkman, M.O.H., Hastings, was welcomed as a new member.

The Secretary of the Committee (Dr. Kelynack) reported on the position regarding the industrial court awards. Following agreement with Renfrewshire County Council, a dispute notified to the Minister of Labour under the Industrial Courts Act about the status and remuneration of a medical officer had been referred to the Industrial Court for Arbitration. The hearing had been fixed for April 27.

What the Chairman described as a very satisfactory solution of a difficulty was reported in the form of correspondence between the Secretary of the Association and the Secretary of the Ministry of Health and Local Government, Northern Ireland, concerning the status of certain medical officers employed by the County Down Health Committee. The salary scale, method of assimilation, and incremental date in the case of these officers had been agreed. The Northern Ireland Branch Council had also expressed its satisfaction of the settlement of the long-drawn-out discussions.

It was reported that Award No. 2452 for assistant medical officers had been accepted and implemented by all local health authorities. With regard to Award No. 2321, only one authority was outstanding.

Appeals Machinery

It was reported that the discussions regarding appeals machinery in Northern Ireland were progressing, and it was hoped that an agreement on this matter would be concluded in the near future.

Legal Position of Nurses

Dr. John Fenton reported on a Joint Conference which he had attended on behalf of the Association to discuss the legal position of the nurse who was sometimes called upon to undertake procedures such as immunization, the giving of anaesthetics, and the reading of skin tests, which were normally outside her professional scope. The Joint Conference was also attended by representatives of the Medical Defence Union, the Society of Medical Officers of Health, and the Institute of Hospital Administrators. Some divergent views had been expressed. Dr. Fenton's own view was that there was no good reason why either hospital or home nurses should have to carry out immunization procedures and Mantoux testing, for adequate medical help appeared to be available to local health authorities and to hospitals.

Dr. R. Forbes, who attended the Committee for this item, put forward the contention which he had made at the conference, that it was undesirable, except in emergency, that a nurse should be allowed to participate in any procedure whereby something was put into the blood stream either directly or indirectly, though this, he said, was not the unanimous view of the profession.

The Chairman pointed out that as the Royal College of Nursing, which had called the conference, had agreed to draw up a comprehensive memorandum which would form the subject of further discussion it might be well for the Committee to await the publication of this memorandum and then to make detailed comments upon it. Dr. Mary Esslemont, on the other hand, said that the nurses were anxiously awaiting some help from the medical profession, and she urged that the Committee make its own comments now. After discussion, however, the view of the Chairman prevailed.

Health Visitors

The draft memorandum of evidence for submission to the Health Visitors Working Party, drawn up by the Joint Subcommittee of the General Medical Services, Central Consultants and Specialists, and Public Health Committees, was considered and approved. The memorandum has also been approved by the other two parent committees and now goes forward to Council for formal approval.

Meat Inspection

At the last meeting, when a memorandum from the British Veterinary Association urging that meat inspection should in future be the responsibility of the Animal Health Division of the Ministry of Agriculture was considered, the Committee had recommended action by Council to counter and clarify certain points. A statement drawn up jointly by the British Medical Association, the Society of Medical Officers of Health, and the Sanitary Inspectors Association (*Supplement*, April 17, p. 175) was received and was regarded by the Committee as an excellent one. The Chairman said that there appeared to have been considerable misunderstanding on the part of the British Veterinary Association. It would be regrettable if anything occurred to impair the good relationship between that body and the British Medical Association, and it was hoped that the statement and any subsequent discussions would clarify the points of principle on which the B.M.A. felt strongly.

Vaccination

A letter from the Brighton Division on the subject of vaccination came before the Committee. This drew attention to the low level of the infancy vaccination figure,¹ and urged that representations be made to the Ministry of Health for more intensive propaganda on the subject, and for

¹The number of persons under 1 year who were primarily vaccinated in England and Wales in 1952 was 206,131; the number of births during the 12 months ended June 30, 1952, was 669,832, so that the acceptance rate was 30.7%. The corresponding rates for 1950 and 1951 were 23.8% and 29.6% respectively.

Notes and News

Hospitality.—The following requests have been received from the Continent:

Spanish doctor in Madrid requires exchange for son, aged 14, during summer.

Norwegian doctor in Bergen requires exchange for daughter, aged 15, with girl living near London, for two or three weeks during summer.

Austrian doctor in Tyrol requires exchange for daughter, aged 11.

Austrian doctor in Vienna requires exchange for daughter, aged 13.

Swedish dental surgeon's son, aged 15, would like to stay as paying guest in family for two months from June 15, preferably near sea.

French doctor's son in Paris, aged 15, would like to stay as paying guest during July with family having son of similar age.

French doctor's daughter would like to stay *au pair* for one year in family.

French girl student would like to stay *au pair* with family in or near London during summer vacation.

Would anyone interested in these requests please contact Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Questions Answered

Appropriate Schedule for Locumtenent Work

Q.—My income-tax liability is assessed under Schedule E for the salary I receive as a consultant from regional hospital boards, and under Schedule D for receipts from private practice. Under which Schedule should sessional fees which I receive from regional boards as a locumtenent be assessed?

A.—The Income Tax Acts bring under Schedule E all the earnings of employment, and sessional fees payable by regional hospital boards for locumtenent work would legally be assessable under Schedule E. "Employment" assumes the existence of the relationship of master and servant, and the above assumes that that relationship would apply to such locumtenent work—for example, that the work would be performed subject to similar control by the board to that exercised (or exercisable) in the case of the work for which the salary is paid. It is, of course, true that remuneration for doing locumtenent work for a general practitioner is usually assessed under Schedule D, but that seems to be customary not so much because "employment" is not involved as from the greater convenience, both for the individual and the revenue, of the Schedule D assessment, where, as is usually the case, a locumtenency is one of a number of temporary professional activities in the same year, but often in different places.

Regimental Dinner Nights

Q.—Regulations state that resident officers must attend regimental dinner nights while living in an Army mess. An extra charge is made in the accounts for these functions. Can a claim for income-tax allowance for these extra charges be made on the grounds that they are "expenses which you were necessarily obliged to incur, and bear yourself out of your earnings"?

A.—Two cases were heard in the High Court last year which have a bearing on the questioner's inquiry. The officers were in the Territorial Army and claimed to deduct certain mess expenses—for example, mess subscriptions and shares of mess guest expenditure—on the grounds that they were required by Queen's Regulations to be members of a mess, and that failure to make the payments in question were breaches of Army discipline. The contention put forward by the revenue was that only expenses incurred wholly, exclusively, and necessarily in the performance of their

action by the B.M.A. centrally and locally. The Committee expressed entire agreement with the Brighton point of view, and it was agreed to call the attention of the Brighton Division to action which had already been taken, and which was covered in the Annual Report of Council on the subject (*Supplement*, March 27, p. 83).

Other matters placed before the Committee included a memorandum regarding the Fever Nursing Register, certain correspondence on the revised draft of the Local Government Superannuation (Benefits) Regulations, and points in connexion with the work of the School Health Service.

A meeting of the trustees of the Public Health Services Defence Trust was also held, and formal matters were approved.

MEDICAL ETHICS

The Central Ethical Committee met on Wednesday, April 7. The chairman, Dr. Robert Forbes, gave an account of a recent meeting between representatives of the B.M.A. and the B.B.C. He indicated that there had been, among other things, an exchange of views on the subject of anonymity of medical practitioners taking part in radio or television programmes. Following a later agenda item it was also decided to communicate with the General Medical Council about the Association's policy of anonymity in medical broadcasting and to ascertain the G.M.C.'s attitude towards the matter.

The Committee also reaffirmed its view that it is unethical for a practitioner to participate in sound or television programmes which are being presented for or on behalf of firms using sponsored radio as a means of advertising.

Ethics of Therapeutic Trials

Representatives of the Research Committee of the College of General Practitioners attended to discuss the kind of ethical problems which might arise in the course of conducting therapeutic trials of proprietary substances, and how ethical difficulties could be avoided.

A meeting between representatives of the medical staffs of the Seamen's Hospitals, the Shipping Federation, a shipping line, and the chairman of the Committee had been held to discuss special ethical problems connected with the disclosure of information concerning seafaring patients of the Seamen's Hospitals; a report was received by the Committee.

Community Centre Surgeries

A proposal that doctors should seek to have their surgery hours published in telephone directories was not approved and was considered impracticable. In considering a number of matters relating to the use of premises in community centres, the Committee endorsed the decision given at a previous meeting deprecating the use of surgery accommodation in community centres where by so doing individual doctors or a group of doctors obtained an unfair advantage over colleagues in the neighbourhood.

Advice had been sought whether it was justifiable for a general practitioner to refuse to retain a patient on his list unless all members of the family came under his care. The Committee disapproved of any discriminatory attitude by a medical practitioner that would interfere with a patient's freedom of choice of doctor.

A number of other items were considered, dealing with such varied matters as colour-vision tests, dental anaesthetics, medical representatives of pharmaceutical firms, and epileptic drivers. The session closed soon after 6 p.m.

Mixed Metaphor.—From a speech at a World Health Day celebration in London: "The World Health Organization holds the key because it is the pivot around which everything circulates and it has a finger in every pie."

duties were allowable and that the expense claimed did not come within that category; in addition there was an element of private benefit resulting from the payments. Vaisey J. upheld the revenue view and decided against the allowance of the mess expenses. The questioner's claim may have some points of difference from the claims referred to above, but I think it is unlikely that he would be able to obtain a favourable decision on appeal.

Taxation on Wife's Income

Q.—My wife and I practise in partnership and are taxed and surtaxed as one person. Could my wife be taxed separately on her private income? If my wife retires from the Service is her superannuation taxable?

A.—The incomes of husband and wife are required by law to be aggregated and the amount of surtax payable for any financial year is calculated on the aggregate amount—each item of income being computed on the basis laid down by statute for that class of income. The amount of superannuation payable to a wife is chargeable to tax. Unless separate assessment has been claimed (and there is little or no financial advantage in such claims) the husband will be assessable on that income, but the special reliefs granted for the earned income of a wife will be due.

Wife's Assistance in Practice Work

Q.—I employ a resident maid and am allowed a third of her wages for answering the door and telephone. I pay my wife £120 a year for answering the door and telephone when the maid is not available, and for minor secretarial work. I am in partnership with three other doctors, and we have combined surgery premises where we employ a dispenser and assistant for the major day work. The inspector of taxes has offered to allow only £13 a year for my wife, which I feel is an absurd sum. Could you give me a guide to what is commonly paid to doctors' wives in the circumstances?

A.—It seems to be generally agreed by inspectors of taxes that in cases where a practitioner's wife deals with personal and telephone calls during the absence of the maid some remuneration for such service is a reasonable expense in calculating income-tax liability. The question of how much should be allowed is difficult—particularly where, as in this case, the partners have a combined surgery—and it is not possible to suggest any standard amount. Clearly the amount allowable must depend to a large extent on the number of calls of all kinds on the wife's time and the degree of interference with her other activities and relaxations. The revenue authorities usually claim—and not without some grounds—that what the employment of some other person would cost is not necessarily a fair criterion; the amount should be what is reasonable remuneration in view of the actual circumstances. But it is considered that £13 per annum would in general be an inadequate allowance.

Telephone Expenses

Q.—As a full-time assistant chest physician my duties include being on call to two sanatoria. There is no mention as to my providing a telephone at my house in my contract, but as I live several miles from both institutions it seems to me the only reasonable way of contacting me after my clinic is closed. Can I claim the telephone rent as an expense on my income-tax return?

A.—The question as to whether an individual whose working conditions made it necessary for him to have a private telephone connexion so that he could be contacted by his employer was the subject of a judicial decision in the case of *Nolder v. Walters* some years ago. Rowlatt J. pointed out that the statutory rule applying to the remuneration of an employment required that to be allowable expenses should be incurred "wholly, exclusively, and necessarily in the performance of the duties," and held that "in the performance of the duties" meant "in doing things

which it is his duty to do while doing the work of the office." In his opinion which has not been overruled by a subsequent judgment expenses incurred in getting to the work were not incurred in the performance of the duties even though the employee was obliged to incur them. In view of that decision the questioner cannot be advised to press his claim to a part of his telephone expense.

Board and Lodging Expenses

Q.—I am a full-time S.H.M.O., and I am specifically required to live in my hospital for a certain number of nights, for which I am charged £30 per annum board and lodging. I am also charged £10 per annum for garaging my car in a shed in the hospital grounds. Can I claim part or whole of this compulsory addition to my cost of living from the inland revenue as justifiable expenses?

A.—The questioner is assessable under Schedule E, and the relevant statutory rule requires that to be allowable expenses shall be incurred "wholly, exclusively, and necessarily in the performance of the duties." The expenses in question are evidently necessarily incurred, but I fear do not meet the other requirements of the rule. There is some analogy with the mess expenses (or some of them) incurred by officers serving in H.M. Forces, the deduction of which is refused on the authority of a High Court decision. An appeal against the refusal to allow the deduction of the sums in question is not advised.

CORBY DIAGNOSTIC CENTRE NEW "SOCIAL ADVENTURE" OF NUFFIELD PROVINCIAL HOSPITALS TRUST

A diagnostic centre sponsored by the Nuffield Provincial Hospitals Trust and the Oxford Regional Hospital Board was opened at Corby, Northamptonshire, on April 23 by Lord Nuffield. Until the thirties Corby was a small farming village of 1,500 inhabitants. Then some large steelworks were established which brought an accession of population, and in 1950 a Development Corporation was set up under the New Towns Act with a view to the creation of a new town of 40,000 people. Already the population is half that number, an increase of 8,000 since 1947. The new town is rising rapidly, with dual carriage-ways stretching over the area.

The new diagnostic centre is the product of a survey of the medical needs of Corby organized by the Nuffield Trust in 1949. The basis of the plan was that no general hospital for Corby was likely to be built for many years, and meanwhile the general practitioners of the area felt that they lacked proper facilities for diagnosis, minor operative treatment, and ready consultation with specialists. The arrangement is that the family doctors of Corby will retain their existing surgeries, but patients needing more complete examination or investigation will be given appointments at the Diagnostic Centre, where the general practitioners will rent some of the consulting-rooms. The bodies also co-operating in the scheme are the Regional Hospital Board, Northamptonshire County Council (the local public health authority), Corby Urban District Council, the Development Corporation, and the local practitioners, and the owners of the local steelworks, Messrs. Stewarts and Lloyds, Ltd., have assured financial support towards the running costs of the centre during the early years of the experiment.

Inaugural Ceremony

Presiding at the opening ceremony, the Hon. Geoffrey C. Gibbs, chairman of the Nuffield Provincial Hospitals Trust, recalled that, from the moment in 1939 when Lord Nuffield established the organization, the Trust had tried to work for integration. It had always hoped for close liaison between the three arms of the National Health Service, and it would be foolish to deny that the Trust, in common with others, had at times tempered its enthusiasm for the Health Act

with regret that the Act in some respects should have emphasized the isolation of the different branches of the Service. It might well be that diagnostic centres, of which Corby was a prototype, would prove to be the link between these branches.

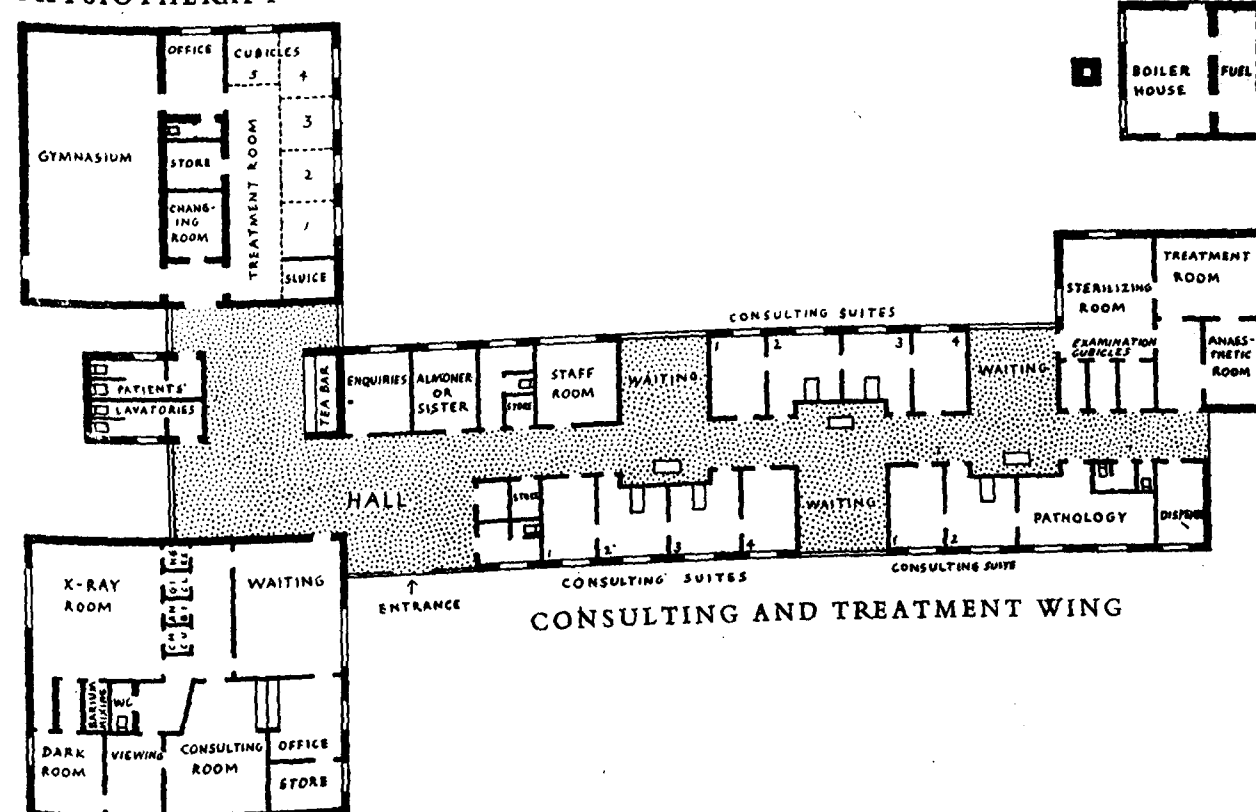
Sir George Schuster, chairman of the Oxford Regional Hospital Board, said that the most significant part of the experiment was the provision of an opportunity for general practitioners and consultants and specialists to get together and know each other. He welcomed it also as a result of co-operation between a great State service and the enterprise and initiative of an individual (Lord Nuffield). He hoped that the centre would do something to help to diminish the load put on hospital services. In the Oxford Region one in every 12 of the population became an in-patient every year and one in 7.5 a new out-patient.

Lord Nuffield, in declaring the centre open, said that it had always been his pleasure to help anything in the way of

centre now provides examination and treatment rooms for general practitioners and visiting consultants; a small pathological laboratory; a chest clinic and x-ray department; and a physiotherapy department. At a later stage a unit of maternity beds will be added. A unit of general-practitioner beds may also be included, and when the need arises for additional local authority clinics in the area the county council has agreed that they can best be sited on the diagnostic centre.

The regional board is providing and staffing the chest clinic and x-ray and physiotherapy departments, and its consultants will use some of the consulting-rooms, for which the board will pay. The specialist clinics are medical, surgical, obstetric and gynaecological, paediatric, chest diseases, physical medicine, psychiatric, ear, nose, and throat, radiological, dermatological, ophthalmological, and orthopaedic. Both the pathology and x-ray services will operate under the control of specialists from Kettering;

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health services. He hoped that these institutions would be followed all over the country very soon, to the great advantage of the health of everyone concerned.

Dr. W. P. Blackstock, a member of the local Joint Management Committee, speaking on behalf of the local practitioners, said that the centre had been planned in accordance with the views and convenience of the people of Corby. Every suggestion or request which the general practitioners had made throughout the planning had been most generously conceded. He hoped that the centre would prove to be a successful experiment in the integration of the health services.

The ceremony concluded with a short dedicatory service.

Design of the Centre

The diagnostic centre, designed by Mr. R. Llewelyn Davies, A.R.I.B.A., is a single-story building situated in ample grounds. The existing building represents the first stage of a scheme. Up to the present patients have had to travel 8 miles to Kettering or 25 to Northampton for out-patient investigations, consultations, and treatment. The

some of the simpler pathological investigations will be carried out by the general practitioners themselves. Antenatal consultative clinics may be held at the centre both for normal and for abnormal cases.

The three blocks of the centre—the consulting and treatment wing, the physiotherapy department, and the combined chest clinic and x-ray department—are grouped around a central entrance hall. Each department and each consulting suite has its own small waiting space for patients. One of the objects of the experiment has been to demonstrate that the essential requirements of a diagnostic centre could be provided at a reasonable cost. Economy has therefore been practised, both in design and in the choice of materials and finishes.

To measure the effect of the centre the Trust organized in the late summer of 1953 a sample survey of the domestic, social, and economic difficulties arising from the lack of a hospital and out-patient clinics in Corby. The survey will be repeated approximately one year and two years after the opening of the centre to ascertain how far these difficulties have disappeared.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Remuneration of Hospital Medical Staff

SIR,—I should be grateful if you would allow me space in your columns to record a few observations on the statement by Sir Russell Brain on remuneration of hospital staff (*Supplement*, April 10, p. 145). Few will share the frequently expressed confidence and satisfaction of the Staff Side in its own activities during the recent discussions. House officers will wonder why the annual charge for residence is to be raised for them but not, apparently, for registrars and other residents. Registrars will have plenty to say for themselves regarding their share of the increases. Senior hospital medical officers may confidently prophesy that the oft-repeated charge that this grade was invented as a means of getting a consultant's work done at a cheap rate will now be repeated twice as often and twice as justifiably. And I think all grades will take exception to the theory that "... if recruitment to the hospital service was not to be affected the major benefit must be applied to the basic consultant grade. . . ." First, if the way to the stars is unbearably difficult, then merely making them brighter will not swell the numbers of those who try to reach them. Secondly, the statement suggests that the main incentive to specialization is, and should be, mercenary. Even in this day and age I do not believe one is being too naive in denying this suggestion. In the consultant grade itself the principle has been reversed, and those with higher distinction awards are to receive smaller increases. One is forced to the conclusion that on achieving consultant status incentive is unnecessary for obtaining the so-called distinction awards—which resurrects the old bogey of how exactly these awards are made. The committee's excuse for this anomaly is that in the higher grades "taxation would largely nullify the effect of any increase." But financial incentives are judged on their gross value. Moreover, since the committee raises the point, taxation makes all the increases sillier in fact than they look on paper, even taking into account the extra benefits from superannuation.

In the final section of the statement, headed with such tasteless irony "Consultation with the Profession," the Staff Side makes its excuses for not consulting the members of hospital staffs after discussions were started. But the tragedy is that they were not consulted before discussions started. The general practitioners were first circularized to find out how many were prepared to go so far as resigning from the Health Service to attain their objective, and provision was made for financial aid should this extreme become necessary. In this light our negotiators resemble an army starting a war without a hydrogen bomb, and it is small wonder that they suffered such heavy defeats in so one-sided a battle.

Unfortunately, the Staff Side were apparently unconvinced that we had a just claim. Certainly they rejected "a straightforward application of the Danckwerts betterment of 100% to the Spens salaries" because "apart from the fact that a claim of this magnitude would have been totally unacceptable to the Management Side the effect would be again to upset the balance of remuneration between the two branches of the profession." If Spens was considered so impracticable and undesirable, it is futile for the Staff Side to inform us that "in its view Spens remains the yardstick of consultant remuneration" and that it was "satisfied that its negotiations had safeguarded Spens"; and why was it so intent on avoiding any move which "would undoubtedly have led to the appointment of a committee of inquiry into the question of hospital staff remuneration in all its aspects"? It is true that the results of such an inquiry "would not necessarily have led to a final agreement better than the one now reached," but at least it could

hardly have been worse for many of us. And one would think that the committee would have welcomed the chance of finding a workable "yardstick of consultant remuneration." As for the Staff Side's preoccupation with avoiding "interminable delays," we would have preferred to have waited even longer than we have for a more satisfactory outcome, and above all for an outcome that did not appear to have shattered hopes for the future.

Now that all is over bar the shouting, it would be interesting if the names of the members of the Staff Side could be published together with their grading and information as to whether they are employed in a whole-time or part-time capacity. I am sure all will join with me in expressing sympathy with these gentlemen whose "task over the past 18 months has been far from easy." But I hope they will remember that many of their lesser colleagues have been finding things far from easy for much longer than 18 months and will now have to continue the struggle.

The committee believes that "only experience can show how far the increases obtained will improve recruitment in the hospital field." I believe the house officers, junior hospital medical officers, and registrars can give the answer immediately. And I think the answer will be a very bitter lemon.—I am, etc.,

Southampton.

C. J. S. HOLDSWORTH.

SIR,—As one of the pioneers of the struggle to obtain an equitable adjustment of salary for hospital medical staffs, I was bitterly disappointed and disgusted when the results of nearly two years of negotiation were announced. I would urge that this "medical Munich" is not accepted as the final chapter but as the prologue to the real battle for justice.

Although the Joint Committee have tried their best to justify their surrender to the all-powerful Ministry, the results when carefully analysed are a hollow mockery of all that the Spens Report recommended. Whether the Spens Committee visualized tax assessment of salary under Schedule E, or whether this has been a cunning move of the Exchequer to take back that which the Ministry of Health gives, I do not know, but I do know that the Spens figures transposed to 1948 values was the intention of all parties as the basis for our salaries. In my own case (maximum part-time) the award amounts to a total 35% betterment over 1939 values, which, when compared with the Government's own cost-of-living index, is ludicrous.

When the new method of tax assessment of salary under Schedule E is in action specialists will experience some very nasty shocks. I have taken accountant's advice, and in spite of an increase in salary of £300 I find to my horror that, depending upon the leniency or hardness of the inspector of taxes in respect of allowable expenses, the best I can hope for is a net gain of £40 per annum, but if the last drop is extracted the result is a net loss of £70 per annum. What sort of readjustment of salary is it which results in an increased income of £300 offset by the possibility of an increased tax demand of £370?

There has been no attempt on the part of the Association to put the results of recent negotiations to the lay press in their proper perspective. The adjustment was announced as a simple increase of salary, but no mention has been made of nearly six years during which we have tried to live as specialists and to prepare for enforced idleness at the age of 65 on a salary based on 1939 values plus the iniquitous 20%. Either let us have an honest Spens salary or tear the Report up and start from scratch. The latter action would be unlikely to prove to our detriment provided we have unity, for we have learned much in the last six years as to the trust which can be placed in ministries.

The Joint Committee have tried, failed, and surrendered. Therefore, not only for our own sake but for those who follow us, must we refuse to bow down in defeat to this farcical salary settlement. Unless we obtain the right to unilateral arbitration there will be more and more "territorial demands." The guilty party only fears unbiased justice, therefore the refusal of the Ministry to allow arbitration

tration condemns them without trial. Soft words, pleas, and kid gloves are no weapons to fight dictators. Therefore, if we value our heritage, some form of strike mechanism must be built up at once, no matter how obnoxious this may be, in order to obtain an equitable settlement for our underpaid services during the last six years and to ensure security for the future.—I am, etc.,

Southampton.

BERNARD SUGDEN.

SIR,—Dr. A. Arnaud Reid's letter (*Supplement*, April 17, p. 176) brings the current situation into brilliantly sharp focus when he states: "The profession was inveigled into the Health Service by a device which most closely resembles a confidence trick."

In my own case, I received an assurance in writing that my interim salary at the commencement of the National Health Service would be reviewed not later than March, 1949, in the light of the Spens Report, and all the salary derived from the increase would be back-paid to July, 1948. In actual fact, I was employed for fifteen months at a salary approximately 25% below the recommended minimum of the Spens scale in terms of 1939 monetary values. Having come out of the Services with very little capital, and with a rapidly growing family to maintain, I was obliged to overdraw by several hundred pounds. When the new (1948) rates were announced and back-pay given in 1950 the 13.3% effective increase did not clear the over-draft. This has continued to increase with the cost of living and the growth of one's family, but the feeling of insecurity this created was to some extent offset by the Danckwerts award to the general practitioners, and the comparatively prompt settlement of their back-pay. Believing as I then did in the complete moral integrity of the Government, my wife and I felt that it was only a matter of time before similar justice was done to the claims of hospital medical staff.

Our simple child-like trust has been very rudely shattered by the totalitarian technique of the recent award. The *Daily Telegraph* of April 15, under the heading, "Cost-of-Living Index Goes Up," states that the Ministry of Labour announced that the interim index of retail prices was 141 on March 16 against 100 on June 17, 1947. This starkly realistic index makes an interesting comparison with the percentage increase over the 1948 level to be given to hospital medical staff as from April 1, 1954. The highest increase shown is only 23.5% for consultants at the lower end of the scale, and the average increases are approximately 10%. To add the grossest insult to injury, no back-pay is to be awarded, although many, like myself, have faithfully waited six years for an equitable fulfilment of our hopes and aspirations. No valid explanation of the rationale of the negotiations has been given, no doubt for the very good reason that there is none.

We, who accepted the Government's bond in 1948, are faced with the inescapable fact that we have subsidized the commencement of the hospital service from our own pockets, and sacrificed the happiness of our families to boost the political ego of the current party in power. We have little hope of buying a house or making proper provision for the future, unless a just increase in pay, with full back-pay, is given without further delay. The puerile explanations of our previous so-called representatives concerning their weak-kneed ineptitude can be best summarized by the well-known quotation from *Macbeth*: "It is a tale told by an idiot, full of sound and fury, signifying nothing."—I am, etc.,

"CYCLOSTOME."

SIR,—With many members of the Association I feel the utmost distress over the result of the deliberations of the Staff Side of Committee "B" of the Medical Whitley Council. It is quite clear that consultants and specialists had a very difficult problem to contend with, and over and above that the medico-political field was new country to them. It is not so much the inadequacy of the increased rates of pay which have been accepted, but, far more

important still, the complete abandonment of the principles underlying the Spens Reports, implications which have been accepted both by the Ministry and by the profession.

I was a member of the first Spens Committee, and it was quite clear to everyone—as indeed it was stated in the Report—that recommendations with regard to remuneration were made in terms of 1939 value of money, and that the appropriate adjustments had to be made for increases in the cost of living and expenses and also for the increases which other sections of the profession had received. These Spens Reports were the Magna Charta of each section of the profession, and in abandoning the principles enunciated in the Spens Specialist Report the consultants and specialists have sold their birthright for a mess of pottage, and this is bound to have repercussions on every section of the profession. I would like to come down on the side of those who express their complete dissatisfaction with the outcome of the negotiations.—I am, etc.,

Bournemouth.

O. C. CARTER.

SIR,—The consultant body has a threefold duty to secure the interests (and primarily, perhaps, the adequate remuneration) of our juniors on the hospital medical staff, of ourselves, and of our successors in this, the most learned and exacting role in medicine.

We have been singularly ill-served by our negotiating bodies, and I feel that the sooner consultants in each hospital group take a direct interest—as suggested by the Southampton Group (*Supplement*, March 27, p. 126)—the better. The discharge of the Staff Side of Whitley "B" Committee would follow almost automatically. That these representatives should accept such paltry remuneration for their brethren is sufficiently damning. But the reasons advanced to justify not putting the figures forward for our consideration are so specious as to be absurd. With two-thirds of our consultants paid less than the equivalent of £1,000 per annum in 1939, with no power and no right to arbitration, we are about as far from the dignified position envisaged by the Consultant Spens Report as we can well be. There is no fear that an independent inquiry would make things worse.

The crucial figure in remuneration is the whole-time specialist's maximum without merit awards. All ranks below are adjusted to this. By refusing anything less than £5,000 per annum we secure proper remuneration for a learned, arduous, and responsible post, proper treatment for our juniors, and a decent future for our successors.—I am, etc.,

RANDLE LUNT.

Littleover, Derby.

SIR,—I am glad to read in the leading article in the *Journal* (April 10, p. 860) that the Association is not directly responsible for the disastrous agreement with the Ministry by Whitley Council Committee "B," announced to operate, most appropriately one feels, from April 1. Again it seems that we have seen the key points to our position given away, and although I have read with care the apologia written by the Chairman of the Committee (*Supplement*, April 10, p. 145) I feel myself unable to agree with his reasonings. Dr. Rowland Hill at the A.R.M. last year, and a leading article in the *Journal* only a few weeks ago (February 27, p. 507), showed strength and determination, but apparently they were but "sound and fury, signifying nothing" when we hear of the pathetic surrender of our negotiators, who, after elephantine labour, have delivered a mouse.

I think, incidentally, that all fair-minded consultants will feel rather ashamed of themselves when they read that most of them will receive a 20% increase, whereas their registrars and housemen, whose need is surely greater, will receive only 10%. I find myself unable to agree with Sir Russell Brain's apparent contention that a registrar or house officer is in any way equivalent to an unpopular G.P., and should therefore be given a lower proportional increase. Nor is the total amount to be paid in hospital salaries to be

doubled as it was in the case of the G.P.s' central pool, so it is difficult to accept his argument that we have received parallel treatment. Of course, as we registrars and house officers received little or no representation at the negotiations it is hardly surprising that our terms of service were decided in a most cavalier manner to anything but our advantage. We are told that adequate betterment of the Consultant Spens was not legally enforceable. Since when has any section of the community other than doctors ever been inhibited by this? Wages have increased by up to 200% without the help of any "legally enforceable" agreements. It is time our profession woke up to the fact that asking for one's rights is futile in present-day society. Only those who are prepared to be unpleasant if necessary, and who possess the power to do so, get much consideration. Disabled ex-Servicemen and the clergy, who cannot, or will not, take strong action to better their conditions, illustrate this point. Furthermore, if our seniors actually signed a blank contract with Mr. Bevan—on the face of it an action not without risk—is that any reason why we, the majority of hospital doctors who have done no such ill-advised thing, should in perpetuity be denied the Spens which we were promised and which was designed to give all, irrespective of private means, an equal chance to specialize? A High Court judge has decided that in the case of the general practitioners the Spens figures must be increased by 100%, and the present miserable award which we have received is not Spens by any stretch of the imagination. The Government's fair promises remain dishonoured.

The profession has been outmanoeuvred again and again by the Ministry, and its biggest recent mistake was not to demand arbitration, a demand which all fair-minded citizens would have understood. In view of the Danckwerts award, no reasonable and fair judge would have awarded as little as the present miserable *pourboire*. The Minister has very cleverly kept wasting time for two years at our expense, and we are told that if we had insisted on retrospective application negotiations might have broken down. What a pity they did not! We would have been better as we were, with an unprejudiced case. As it is, we are still 15% behind 1949 money values, and 70% or 80% behind 1939, and for this we have yielded the vital principle of Spens. We must formally and publicly announce that the Spens Report remains dishonoured, that we regard the present agreement as only an interim one, and that we propose further negotiations at once. Let us forcefully demand the right to arbitration and see we get it; let the registrars and housemen have some say in their own fate; and let us, above all, choose other negotiators than those who are responsible for the present ignominious surrender.—I am, etc.,

Walton-on-Thames.

A. A. REID.

SIR.—Registrars, J.H.M.O.s, and house officers alike must view with dismay the outcome of the Whitley Council's deliberations, which compare almost unfavourably with our international conferences with slavonic delegates as to protraction and progress.

If an attempt was being made to meet changes in the cost of living, why was not a set percentage increase applied to the group mentioned above? I fail to see the equity of adding a fixed sum of £75 to annual amounts ranging from £350 to £1,000 unless it was considered that all these salaries were originally in error; in which case retrospective adjustment is the logical remedy. But the adjustment goes back only a few days; and to a singularly appropriate date, in view of these considerations.

Can it be that the Ministry, being not legally bound to what would be fair play in light of the Danckwerts award, and not yielding to the sweet reasonableness of our respected Whitley representatives, might respond to a little pressure? If hospital medical staff refused collectively to put pen to paper on any but the most essential documents, such pressure might be felt, and a "paper strike" might obtain for us the arbitration which is the only just mode of settlement of problems like ours.—I am, etc.,

Buckhurst Hill, Essex.

J. D. KEITH PALMER.

Pre-registration Appointments

SIR,—I recently applied for a hospital post which was "recognized for the purpose of pre-registration service, preference being given to provisionally registered persons who have served six months in a medical or surgical post since qualification." At interview there were three applicants for the appointment, two of us, with satisfactory testimonials, fulfilling the requirements as advertised. The post, however, was given to the third applicant, who qualified in 1950.

It does seem to be most unfair that advertisements should be worded as giving preference to a certain class of applicant who is then, following interview, completely cut out by other applicants who, though better qualified by experience, do not fulfil conditions as set out in the advertisements. I do feel that this form of procedure on the part of selection committees is extremely wasteful in time and money, both to the State and the individual. Junior colleagues to whom I have spoken recount similar experiences to that of my own.—I am, etc.,

"PRE-REGISTERED."

MAY 1, 1954

CORRESPONDENCE

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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Life Assurance Fee

SIR,—I support Dr. H. Richardson Gray's observations (*Supplement*, April 10, p. 151). I, too, find that an examination and report take me a *minimum* of 40 minutes to complete, and I agree that the present fee of £1 11s. 6d. is completely inadequate.

I had occasion to protest against the many extra questions on the form supplied by a well-known air transport company in connexion with employees joining their superannuation scheme. In reply, their medical officer informed me that over 1,100—I believe that was the figure, it may have been more—examinations had been made by other doctors without protest. I promptly asked the B.M.A. to investigate. The result was an agreement with the firm that in future a fee of £2 2s. would be paid for an examination and report on that particular form.

An irritating point about many examinations is the accompanying request to do the examination urgently—one suspects that either the agent fears to lose the business or the candidate's birthday is imminent. Also the answers to all these preliminary family and medical questions should be filled in before the form is passed to the doctor.

Finally, why cannot "life" offices standardize their forms? After all, the actuarial information on which they are presumably based is the same.—I am, etc.,

Maldon, Essex.

IVAN PIRRIE.

Grading of S.H.M.O.s

SIR,—Since the publication of my letter (*Supplement*, November 14, 1953, p. 201) I have received a number of letters from S.H.M.O.s, not only from my own constituency but from all over the country. Each letter confirms my already strongly held opinion that there is still a vast amount of injustice and hardship among these medical officers, some considering leaving the country, several living on capital, and all suffering from a strong sense of being unfairly treated. Politicians and lawyers say that hard cases make bad law, but surely here it is a bad law that is making hard cases.

I consider that each S.H.M.O. who has written to me has a genuine and strong grievance, and I am taking the liberty of sending their names and relevant details to the secretary of the Central Consultants and Specialists Committee, especially now that the Minister has agreed to consider selected names. So something has been achieved at last, but the pressure must be kept up, and, though the recent increase in remuneration of all medical members of hospital staffs is also a success to be grateful for, it is, as your leading article clearly points out, not enough. It is not Spens. It does not remove the gross medical and financial injustices put upon this particular group of medical practitioners. Meanwhile, until full justice is done, and seen to be done, I recommend certain interim measures. (a) A special meeting of the Central Consultants and Specialists Committee and a selected group of S.H.M.O.s to discuss the problem; (b) an increase of S.H.M.O. representation on the Central Consultants and Specialists Committee; (c) the abolition of the hateful letters S.H.M.O. (they cannot be dignified as a title) for those who only practise their specialty, and the substitution of the appropriate assistant surgeon or physician, etc. I have heard a rumour that this is in fact legal, and that the Minister has agreed to it. I would be most grateful if Dr. Rowland Hill would be kind enough to answer this point in the *Journal*, as, if it is true, I suggest that all S.H.M.O.s at once drop this style, and call themselves by their proper medical titles, and, further, that regional hospital boards be instructed to do so too; (d) an annual, or at least biennial, review of all of this grade, thus breaking this "dead end"; (e) support for the Central Consultants and Specialists Committee in its fight for the full and pledged implementation of the Spens Report.

I am sure all realize that Dr. Rowland Hill and his committee have a very difficult task in dealing with the Treasury and the fixed ideas of the Minister's advisers, so, although continuing to keep up the pressure, all in this grade will,

at both the inquest and the inquiry that part of the reason she did not admit the case was she did not consider it advisable for so ill a patient to travel a distance of several miles. At the second hospital, I was told by the telephonist that the receiving officer had given her instructions to say that the medical beds were full and that therefore they were not admitting any further cases.

How, therefore, the bed bureau could obtain a bed in these circumstances is beyond my comprehension. In fact, at the same day and hour, another local practitioner was faced with the same emergency. He contacted a local hospital and then a bed bureau—but no bed was obtained and this patient died. A year ago a woman in her 40's also died in very similar circumstances in this area. The "Bed Bureau" is, in fact, one of a series of red herrings produced "out of the bag" by the hospital management committees concerned to create a diversion and confuse the issue.

The point at issue is the autocracy of receiving officers and the wisdom with which this autocracy is exercised. How widespread is this defect, which concerns every doctor in the country?—I am, etc.,

S. STOWE.

Wolverhampton.

SIR,—You report (*Journal*, April 17, p. 940) the findings of an investigating committee of the Birmingham Regional Hospital Board into the case where a local general practitioner had failed to gain hospital admission for a patient dying from haematemesis. In view of the rather adverse publicity which the general practitioner has received owing to the statement that his failure to use the Bed Bureau was partially responsible, I think it is only fair to communicate the following information.

At no time have general practitioners in this area been informed that the Bed Bureau was in operation after 6 p.m. Indeed, most of them will have had the experience of being advised, when trying to get the Bed Bureau's help after this time, that it was closed.—I am, etc.,

R. S. V. MARSHALL.

Hon. Secretary,
Wolverhampton Local Medical Committee.

Building in Islay

SIR,—With reference to the vacancy in Islay, advertised by the Argyll and Bute Executive Council in the *B.M.J.* dated April 10 (advertisement page 22), where there is no house available for doctor, I think it but right that anyone interested should know that building costs on the island of houses of traditional type are at least 50% higher than on the mainland.

Council houses at present being built in Islay cost over £3,000 per house as against around £2,000 for similar type on the mainland.

In 1952 I proposed to build a modest dwelling—three bedrooms, with professional accommodation—and went through the necessary preliminaries, but abandoned the project, as the estimated cost of between £5,000 and £6,000 rendered it impracticable.—I am, etc.,

Isle of Islay.

ALASDAIR McI. SMITH.

Service Recruitment

SIR,—Your correspondent "Harvey" (*Supplement*, April 17, p. 177) is surely wide of the mark in his estimation of clinical freedom. Freedom to prescribe what one thinks best is always subject to the availability of the treatment and the ability of someone to pay for it, whether this be the State or the patient himself. Clinical freedom is the right to use available resources as one thinks fit, without let or hindrance.

Both as a taxpayer and a doctor I am glad to know that wide-spectrum antibiotics are subject to control. "Harvey" can treat his own dysentery with them—not mine!—I am, etc.,

Church Crookham, Hants.

C. R. TILLY.

Emergency Admissions

SIR,—With reference to your summary of the findings of the Birmingham Regional Hospital Board inquiry, headed "Lack of Hospital-G.P. Liaison" (*Journal*, April 17, p. 940), may I make the following observations?

I spent over an hour contacting the four hospitals suitable for so grave an emergency as a severe haematemesis following a protracted melaena associated with a duodenal ulcer. I then considered it advisable to visit my patient, whom I found moribund and who died shortly after. I spoke on two separate occasions to the two local hospitals—they at least can hardly claim that I failed to impress the seriousness of the case. Of the two more distant hospitals, the receiving officer of one was so "impressed" that she said

I am certain, give due credit to him and his committee for what has already been achieved. What is needed in simple justice is the total abolition of the grade, with the automatic granting of consultant status to all, except those who may wish to remain in the grade, solely because they are in the main general practitioners and have not the time to become fully consultant. Then, in my view, those not in senior posts would accept the title of assistant consultant willingly, and there would no longer be this sense of injustice, of being fixed in a dead-end job, of being degraded in status in a profession which above all others should be without such stigma and admit only to eminence.—I am, etc.,

Reading.

S. F. LOGAN DAHNE.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Lieutenant H. A. Wismayer to be Surgeon Lieutenant-Commander.

Temporary Surgeon Lieutenant B. V. Jones, R.N.V.R., has been re-entered on the Permanent List, R.N., in the rank of Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Commanders H. E. Holling, V.R.D., and A. L. Gunn, V.R.D., have retired.

Surgeon Lieutenant S. P. C. O'Reagan to be Surgeon Lieutenant-Commander.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: R. H. Bland, M.D., M.R.C.P., Director of Medical Services, Singapore; R. G. Ladkin, M.B.E., B.M., B.Ch., D.P.H., Senior Medical Officer, Uganda; H. T. Laycock, M.B., F.R.C.S., Surgeon Specialist, Nyasaland; D. P. Bowler, M.B., B.S., M.R.C.P., Medical Officer, Federation of Malaya; E. N. F. Browne, M.B., B.Ch., Medical Officer, Hong Kong; P. D. Grant, B.M., B.Ch., Medical Officer, Tanganyika; Z. Lett, M.D., D.A., Specialist/Anaesthetist, Hong Kong; M. G. Rogoff, M.B., Ch.B., Medical Officer, Kenya; B. T. M. Aboko-Cole, M.B., Medical Officer, Sierra Leone; C. A. Cusack, L.R.C.P.&S.I., and E. Taylor, M.B., B.Ch., B.A.O., Medical Officers, Northern Rhodesia; I. A. Moolan, M.B., B.S., Medical Officer, Mauritius; J. D. Vervoon, M.D., P. A. Ruggli, M.D., and Miss M. A. Schaefer, M.D., Medical Officers, Gold Coast; T. H. L. Montgomery, M.B., B.Ch., B.A.O., D.P.H., D.T.M.&H., Director of Medical Services, Western Region, Nigeria; J. D. Arneaud, M.B., B.S., D.C.P., Pathologist, Grade B, Trinidad; Mary M. Bools, M.B., B.Ch., B.A.O., Pathologist, Sierra Leone; G. F. Grave, M.B., B.S., and D. G. G. Greenaway, M.R.C.S., L.R.C.P., Medical Officers, Falkland Islands; A. J. Hibell, M.B., B.S., Medical Officer, South Pacific Health Service; J. B. David, M.B., F.R.C.S., D.L.O., Ear, Nose, and Throat Specialist, Gold Coast; R. S. Francis, L.M.P., Medical Officer, Seychelles; J. W. Gabrynowicz, M.B., B.Ch., B.A.O., Medical Officer, Nigeria; J. E. Latham, M.B., B.Ch., B.A.O., Resident Medical Officer (Intern), Kenya; A. G. Leacock, M.B., B.Chir., F.R.C.S., Surgeon Specialist, Barbados; B. E. R. Symonds, M.D., M.R.C.P., D.C.H., Medical Officer, Grade A (Physician), Health Department, Trinidad; A. G. E. Fung-a-Fat, M.B., B.S., Medical Officer, British Guiana; J. Taylor, M.B., Ch.B., D.P.H., D.T.M.&H., Deputy Director of Medical Services, Sarawak; E. C. Vardy, M.D., B.S., Deputy Director of Medical Services, Sarawak (Brunei); J. G. Cameron, M.B., Ch.B., M.R.C.O.G., Specialist (Obstetrician and Gynaecologist), Medical Department, Gold Coast; F. S. MacMahon, M.B., B.Ch., B.A.O., House Physician, Colonial Hospital, Windward Islands.

Association Notices

ELECTION OF MEMBER OF THE COUNCIL BY THE WEST INDIAN BRANCHES

Mr. C. Belfield Clarke (London, S.E.1) is the only candidate nominated to represent the West Indian Branches on the Central Council in place of Mr. Aubrey Leacock, who has resigned. Accordingly, Mr. Belfield Clarke is hereby declared elected for the remainder of the term of office—that is, until the close of the Annual Representative Meeting, 1955.

A. MACRAE,
Secretary.

Diary of Central Meetings

MAY

- 4 Tues. Evidence Committee on Divine Healing, 1.30 p.m.
5 Wed. Consultants, General Practitioners, and Public Health Liaison Committee, 11 a.m.
5 Wed. Office Committee, 11 a.m.
5 Wed. Arbitration Machinery Committee, 1 p.m.
5 Wed. Council, 2 p.m.
6 Thurs. Council, 10 a.m.
7 Fri. Anaesthetists Group Committee, 2 p.m.
10 Mon. Subcommittee on Diagnosis of Eye Diseases, Ophthalmic Group Committee, 2 p.m.
11 Tues. Joint Consultants Committee (at Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.), 10.30 a.m.
12 Wed. Central Consultants and Specialists Executive, 12 noon.
12 Wed. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
12 Wed. Medico-Legal Subcommittee, Central Consultants and Specialists Committee, 4.30 p.m.
13 Thurs. Physical Medicine Group Committee, 2 p.m.
17 Mon. Joint meeting of B.M.A. and British Veterinary Association, 4 p.m.
19 Wed. Conference of Honorary Secretaries, 10.30 a.m.
20 Thurs. Radiologists Group Committee, 12 noon.
20 Thurs. Organization Subcommittee, Central Consultants and Specialists Committee, 2 p.m.
21 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.
21 Fri. Medical Witnesses Subcommittee, Private Practice Committee, 2 p.m.
21 Fri. Overseas Committee, 2 p.m.
28 Fri. Conference of Regional Officers, 12 noon.

Branch and Division Meetings to be Held

- BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Bournemouth (i) Friday, April 30, 8.15 p.m., meeting. Address by Dr. A. T. Roden: "Recent Developments in the Work of the annual meeting." (2) Friday, May 7, 8.15 p.m.
CITY DIVISION.—At Old Library, B.M.A. House, Tavistock Square, London, W.C., Tuesday, May 4, 8.30 p.m., A.G.M.
COVENTRY DIVISION.—At Gymnasium, Coventry and Warwickshire Hospital, Tuesday, May 4, 8.30 p.m., annual general meeting. Film: "Radiography of the Vertebrae."
DORSET DIVISION.—At Oak Room, Antelope Hotel, Dorchester, Tuesday, May 4, 7.45 for 8 p.m., dinner; 9 p.m., meeting.
HARROW DIVISION.—At Rayners Hotel, Rayners Lane, Tuesday, May 4, 8.30 p.m., clinical meeting. Address with colour-film by Professor Ian Aird: "The Joined (Siamese) Twins."
HOLLAND DIVISION.—At Peacock and Royal Hotel, Boston, Saturday, May 8, 7.15 for 7.45 p.m., supper; 9 p.m., annual meeting.
ISLE OF WIGHT DIVISION.—At St. Mary's Hospital, Newport, Thursday, May 6, 8.30 p.m., meeting. Lecture by Mr. David Problem? "The Gastric Ulcer—a Medical or Surgical Problem?" All Island medical practitioners are invited.
KENSINGTON AND HAMMERSMITH DIVISION.—At St. Mary's Hospital, Marlborough Road, Kensington, W., Friday, May 7, 8.30 p.m., annual general meeting.
LAMBETH AND SOUTHWARK DIVISION.—At Belgrave Hospital for Children, Clapham Road, London, S.W., Tuesday, May 4, 3 p.m., clinical meeting.
LEWISHAM DIVISION.—At Lewisham General Hospital, High Street, S.E., Friday, May 7, 8.30 p.m., annual general meeting.
METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., (1) Thursday, May 6, 8.30 p.m. to annual general meeting. President's address by Dr. D. F. Hutchinson.
REIGATE DIVISION.—At Redhill County Hospital, Tuesday, May 4, 8.30 p.m., meeting. Discussion to be opened by Dr. Liaison.
RUGBY AND SOUTH WARWICKSHIRE DIVISIONS.—At Grand Hotel, Rugby, Thursday, May 6, 8 for 8.30 p.m., informal supper; 9.15 p.m., joint meeting.
SOUTH STAFFS DIVISION.—At Bell Library, Royal Hospital, Wolverhampton, Tuesday, May 4, 8.30 p.m., annual general meeting.
SWINDON DIVISION.—At Swindon and North Wilts Victoria Hospital, Wednesday, May 5, 8.30 p.m., A.G.M.
WEMBLEY DIVISION.—At Wembley Hospital, Fairview Avenue, High Road, Wembley, Tuesday, May 4, 9 p.m., A.G.M.

Meetings of Branches and Divisions

ISLE OF WIGHT DIVISION
The first of the spring series of clinical meetings was held in St. Mary's Hospital, Newport, on April 7. Mr. E. F. Chin lectured on "Some Common Entities in Thoracic Work." The meeting ended with an open discussion. The meeting was attended by the majority of the Isle of Wight practitioners.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 8 1954

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UNDERGRADUATE COURSE IN GENERAL PRACTICE

PRELIMINARY OBSERVATIONS

BY

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General Practitioner

WITH THE CO-OPERATION OF

A. P. ARDOUIN

Undergraduate, Charing Cross Hospital Medical School

"General practice; keystone of medicine": some believe it, many pay it lip-service, few refute it.

Of recent years, medical schools have attempted to give their students an insight into general practice by lectures or visits to general practitioners. Since 1952 Charing Cross Hospital Medical School has included in its curriculum compulsory attendance at a general practice for its final-year students (who have passed Part I M.B., B.S.). The student resides with the general practitioner for three weeks and accompanies him on all his work. This is termed a general-practice firm.

The scheme is still very much in its infancy. Little has been written on how this project is being tackled or how it may be improved so that the student can obtain the maximum benefit from his brief contact with general practice. For the general practitioner this is also a new problem, and several years will be required before the different methods and ideas crystallize.

The general-practice firm will of necessity, and we think with advantage, always be highly individualistic. As experience grows the teachers will be able to incorporate not only their own improvements but those of others into the running of this scheme. Regular conferences of general-practice teachers and the staff of the medical school are essential for the interchange of ideas and the eventual success or failure of the project.

This report reviews the ground covered on such a firm, and in no way attempts to define what a general-practice firm should aspire to.

GENERAL CONSIDERATIONS

The method of introducing the student to the patient is important. We think the term "student doctor" is best;

it is both truthful and ethical, and at the same time maintains professional dignity. The student examines all patients, both in the surgery and on visits, and, so far, on no occasion has a patient raised any objection. The general practitioner has to work more slowly than usual, but if properly organized his actual day's work need not be prolonged by more than a fifth. This can be increased according to the circumstances, so that the student may obtain the maximum experience.

The general practitioner must also be willing, after the day's work (i) to discuss in more detail the patients seen; (ii) to debate non-clinical medical problems (as shown below); and (iii) to study academic medicine with the student. It was impossible to fulfil the last-mentioned requirement during this particular firm, but it was carried out by one of us (E. A. W. M.) on a previous firm and will be reintroduced. We consider it most important, as the student is in the middle of his final examinations, and it is exhilarating to the general practitioner to pit his memory and experience against the more theoretical knowledge of the student.

It is difficult to give a complete list of what is learnt in general practice, but the following, we believe, are the main aspects (excluding those mentioned later) with which the student becomes acquainted: (1) co-ordination of general medical care; (2) doctor-patient relationship; (3) medical ethics; (4) application of theoretical medicine to general practice; (5) care of the young and aged; (6) midwifery; (7) common ailments; (8) early symptoms of serious disease; (9) treatment of serious disease in the home; (10) emergencies in general practice; (11) use of hospital and ancillary facilities; (12) preventive, social, and industrial medicine; and (13) health education.

Quantitative Data

One of us (A. P. A.) attended 16 morning, 12 evening, and three antenatal surgeries. Table I shows the quantitative work done in these surgeries, and the breakdown into new and repeat cases both for adults and for children.

TABLE I.—Surgery Visits

	Adults	Children	Total
No. of consultations	363	95	458
Repeat cases	218	28	246
New	128	67	195
Attending for certificates only ..	17		17

Table II is similar, but deals with patients visited in the home. It is to be noted that all new cases were new

TABLE II.—Home Visits

	Adults	Children	Total
No. of visits	101	113	214
Repeat cases	89	88	177
New	12	25	37

diagnoses to the practice, although many of the repeat cases were new to the student. During the three weeks of the firm we saw 674 patients. Of those seen at the surgery, the following were referred elsewhere for diagnosis or treatment:

	Adults	Children
To hospital for diagnosis	12	2
" " treatment	18	2
" dentist	2	—
" chest clinic for routine x-ray examination	5	4

Of the patients visited the following were referred to hospitals:

	Adults	Children
Emergencies	3	—
To out-patient department for treatment	2	—
" " " " diagnosis	—	1

The high proportion of patients referred to hospital for diagnosis is due to the fact that no open x-ray facilities exist and that those sent for exclusion of fractures, etc., are included. In those referred for treatment the diagnosis was firmly made, but treatment could be carried out only in hospital—for example, operative intervention, physiotherapy. The period under review occurred at the tail-end of a mild epidemic of pertussis, and all these cases have a routine x-ray examination on clinical recovery. The adult routine x-ray films of the chest are O'Delea films, while those requiring a large film after a serious lung condition are included under cases sent to hospital for diagnosis.

The three emergencies were a case of peritonitis due to a ruptured ectopic gestation, and two cases of inevitable abortion; while cases referred to the out-patient department were a case of recurrent subacute appendicitis for interval appendectomy and a case of hysteria for a psychiatric opinion.

The following case report on one of these emergencies is included because the family doctor often feels a sense of inferiority when he receives the hospital report giving a precise diagnosis after full investigation.

Case Report.—A woman aged 37 had symptoms suggestive of gastric ulcer in October, 1950. This was confirmed radiologically. There was no other relevant past history. In the early hours of the morning of December 1, 1953, she awakened with severe central abdominal pain and vomiting. Later shoulder-tip pain developed. She looked ill, with ashen-grey complexion and cold sweat. Her pulse was 88, temperature 99.4° F. (37.4° C.), and blood pressure 116/82. No abnormality was detected on examination of the throat and the respiratory, cardiovascular, and central nervous systems. The abdomen revealed generalized tenderness with guarding. There was no board-like rigidity or diminution of liver dullness. On palpation the impression was gained that the site of maximum tenderness was in the hypogastrium, but no mass was found. Micturition and bowel action were normal and the urine was clear. Her menses had been entirely regular and normal, and on direct questioning she denied any intermenstrual bleeding and thought it most unlikely that she was pregnant. Her last menses had started a fortnight previously, there was no vaginal discharge, and rectal examination revealed tenderness only. The clinical diagnosis made was peritonitis with diaphragmatic irritation, ? perforated ulcer, ? pelvic cause.

We telephoned the hospital the following day to find out the correct diagnosis. The patient had a ruptured ectopic gestation, but on inquiry the doctor stated frankly that this had not been diagnosed pre-operatively. The hospital report, after discharge of the patient, stated: "On admission she was found to have a ruptured ectopic gestation. At laparotomy . . ." Had we not previously made inquiries we should have believed our diagnostic ability to have been lacking.

Table III shows the analysis of the consultations and visits into system groups. The high incidence in the upper

TABLE III.—Analysis of Consultations and Visits

	Consultations				Visits			
	Adults		Children		Adults		Children	
	New	Re-peat	New	Re-peat	New	Re-peat	New	Re-peat
Upper respiratory virus infection	28	7	21	4	2	3	7	9
E.N.T.	10	16	11	3	3	5	5	23
Chest disease	4	11	7	4	1	37	4	20
Cardiovascular disease	7	31	1	1	1	12	0	0
Alimentary system	11	22	3	1	2	9	0	1
Skins	9	10	1	0	0	0	2	0
C.N.S.	2	14	0	1	1	2	0	2
Psychiatric	9	21	0	0	0	2	0	1
Obstetric and gynaecological	11	9	2	0	2	11	0	0
Orthopaedic	13	28	1	0	0	4	1	1
Ophthalmic	6	9	2	0	0	1	1	2
Injuries	3	5	4	0	0	—	—	—
Infections	4	5	1	3	—	—	—	—
Infectious disease	1	0	3	2	0	1	2	27
Public health	1	4	3	6	—	—	—	—
Genito-urinary	0	2	5	2	1	1	1	1
Miscellaneous	9	24	2	1	1	1	2	1
Certificates only	—	17	—	—	—	—	—	—
Total	128	235	67	28	14	89	25	88

respiratory virus infections and the E.N.T. group is to be expected in the late autumn, and the large number of orthopaedic cases is explained by the inclusion in this group of disorders of the locomotor system.

The "psychiatric" group comprises less than 10% of all cases seen in consultation; this is much lower than expected, but no importance can be attached to a percentage obtained in this short period. The immense importance of the family doctor in this field is well shown in the following case report.

A married woman moved into the area of the practice about three and a half years ago. She had received psychotherapy without much improvement. A report in 1948 stated: "She is a very determined neurotic, and one who would not respond readily to psychotherapy." She had attended the practice frequently since 1950.

The following history was elicited at an appointment two days before the arrival of the student. The mother of the patient (whom we shall call Mrs. A.) was deserted by her husband before our patient was born. Mr. A. went to live with another woman (whom we shall call Mrs. B.). Mrs. A. contacted Mr. B., who was then serving in France, to tell him the state of affairs. Eventually Mrs. A. and Mr. B. met, and after a time tried unsuccessfully to obtain their respective divorces, and then lived together as man and wife. Mrs. A. had two children and Mr. B. also had two. Mrs. A. then had two children by Mr. B. out of wedlock (the patient and a younger sister). The patient's mother was good to them but very strict. The children were often left alone, and the patient and her sister were put to bed by the elder children, who, to amuse themselves, used to tell the youngsters never go to bed without first looking underneath it.

At the age of 7 or 8 one of the boys (a son of Mr. and Mrs. B.) used to interfere with her. She did not know what it all meant, but "used to wonder where the mess came from." At school she used to feel that she was not the same as the other children, because her sisters and brothers had different surnames.

She met her husband at the age of 15½ and married him at the age of 20. She was constantly afraid that on her honeymoon adolescent she had severe dysmenorrhoea, but defied everyone, including the family doctor, by refusing to go to hospital because of the same fear.

When she was a married woman her parents obtained their respective divorces and became legally man and wife. At this time she had been at one firm for 14 years and liked it very much. One of her friends saw notices of the divorce, and it became known at the firm. Until this time the patient had no idea she had been born out of wedlock, and it was a great shock to her. She left the firm where she had been happy for so long.

Apart from the patient and her family doctor no other person knows this distressing story of her childhood, any part of which would be sufficient to produce a neurosis in later life.

Additional Activities

Two factories were visited—one manufacturing plastics from the basic material, the other manufacturing end-products. The factories provided, apart from general interest in plastic manufacture, excellent examples of the application of some of the principles of industrial medicine—in particular (1) pre-placement examinations and their importance; (2) rehabilitation of sick or injured back to full routine or work suitable to their functional capacity; (3) safety devices on machinery; (4) local exhaust ventilation, protective barrier creams, and protective clothing in dermatitis-risk occupations; (5) respirators and protective clothing in the formaldehyde sheds; (6) precautions in the cyanide processes; and (7) routine lay-out and ancillary services of an industrial medical department.

A meeting between the medical officer of health, the general-practitioner obstetricians, and the midwives, to improve and co-ordinate their efforts in domiciliary midwifery, took place during the three weeks under review, and the opportunity was taken for the student to be present. It is interesting, if not amusing, to record that one of the main points of the discussion was the correct designation of status of midwives on a particular form.

Two lectures were attended: one dealt with the relationship between sinus infection and lung lesions; the other was of a non-medical nature, and other professions were invited. The meeting was mainly attended by doctors, magistrates, and the teaching profession, and the motion was put that "Corporal Punishment has no Place in the Penal Code of an Enlightened Civilization."

The value of a courteous and helpful pathologist, who affords every facility that he and his laboratory can provide, was demonstrated to the student. A completed request form is all that is required for ambulant patients, who then attend the local hospital laboratory on any day between 10 a.m. and 2 p.m., where a technician takes the samples for the doctor. For the non-ambulant patient ill at home, a specially constructed case with dry sterile syringes and the necessary equipment has been designed by one of us (E. A. W. M.), and is always kept in the car. When investigations are required on a patient visited, all the doctor has to do is to walk to the car for his case and take the sample—a matter of minutes. A relative takes the specimens at once to the laboratory.

It is often thought that the general practitioner's work is mainly concerned with trivial ailments, and, although these do form a part (often an important part towards maintaining positive health), the keeping of the records gives a clear indication of the interesting clinical material seen in so short a period as three weeks. The following is an example of only some of this material: *acute otitis media; *atypical pneumonia; *severe hypochromic anaemia, presenting as cardiac pain; *Raynaud's disease; *thrombophlebitis; *carcinoma of oesophagus; idiopathic mesenteric adenitis; *pityriasis rosea; *cholecystitis; *malignant pleural effusion; *pleural tap in the home; severe hypertensive retinitis; multiple myelomatosis; myeloid leukaemia; *Manson's wood dermatitis.

Non-clinical Subjects

We considered and discussed a broad range of subjects appertaining to general practice. Often the student had not even heard about some of these, let alone given them serious thought. These discussions took the form of "armchair talks" after the day's work, the general practitioner and the student obtaining each other's opinions and reasoning. The subjects were considered in a broad sense, and any tendency to become entangled in detail was avoided.

Many hours were spent in discussion, and it is impossible without going into lengthy detail, to give any real indication of the ground covered. The subjects are therefore grouped for convenience under the following main headings, with only occasional comment.

*These were new diagnoses occurring in the period under review.

Surgery.—(1) Surgery lay-out; (2) ideal surgery for single-handed practices; (3) ideal surgery for group practices; (4) ancillary services (secretary, receptionist, nurse, laboratories, x rays); (5) financial considerations. The planning of the general practitioner's own surgery; the good points, the deficiencies, and the improvements required are shown. The student proves very interested in the running of the surgery, and the general practitioner must be on his guard not to omit this, although to him it is ordinary routine. A general outline of the many articles on surgery planning are conveyed to the student, and one of the evenings ended by planning and drawing sketches of how to adapt an imaginary double-fronted house. We consider that one of the prime needs of general practice to-day is, without doubt, well-designed premises and full ancillary services. The office worker has a "pending" tray, and the hospital doctor an appointment system to buffer any sudden increase in work, but the general practitioner has to deal forthwith with the work to hand. Therefore it is all the more necessary that lay help should be available to relieve him of non-clinical duties. The young general practitioner not only wishes to learn the art and skill of his older colleagues, but desires, and justly considers it his right, to have readily available the modern scientific aids, which in hospital he has taken for granted, to maintain a high and satisfactory standard.

National Health Service Administration.—(1) Advantages and disadvantages of present organization. (2) Integration of the three services. (3) Modifications and alternatives to the N.H.S. (4) Executive council, terms of service. The administration of the general medical services is explained to the student and discussed with him.

Group Practice or Health Centres.—(1) Ideal health centre: lay-out and number required; financial impracticability. (2) Group practice: advantages and disadvantages.

Financial Considerations in General Practice.—(1) Present method of payment. (2) Disadvantages of capitation system: lack of financial inducement to better medical practice, lack of incentive to develop ancillary services, non-provision for capital expenditure. (3) Alternatives. It is thought that the *per capita* method of payment can never take into account the conscientiousness, skill, experience, and amount of work of a particular doctor. It is purely a quantity payment, and as such cannot provide a financial inducement (theoretically unnecessary) to higher standards of practice. All the alternatives we have discussed presented difficulties and flaws on detailed examination, but their consideration is stimulating and tempers one's criticism.

Paper Work.—(1) Records. (2) Certificates. (3) Letters to hospital. (4) Miscellaneous. The student obtains an insight into this when with the firm, but one evening is set aside to talk about it. Medical note-keeping is of prime importance, and can, in general practice, so easily become a voluminous jumble among which the important data are difficult to locate. The back of the medical record envelope is used only for major diagnoses, and not, as so often at present, for entering trivial detail of no future significance. If a patient is a potentially dangerous schizophrenic it is obviously desirable that this little detail should catch the doctor's eye immediately he takes out the record envelope, and not the various placebos which in long past years have served to facilitate the patient's egress from the surgery. On the continuation cards are entered the medical notes, divided into years by an ink line, while the diagnoses are underlined with red ink, and investigation results entered in red. Reports, when they become bulky, are filed in a separate filing cabinet, after a précis of them has been entered and a distinguishing mark to note the fact added to the top left-hand corner of the face of the record envelope.

Midwifery.—(1) Antenatal and post-natal care. (2) Delivery: home or hospital. (3) Liaison with consultants and midwives. (4) N.H.S. regulations. Normal pregnancy, as a natural phenomenon and dealt with in its natural environment when this is suitable, is seen.

Public Health.—(1) Preventive medicine; notification. (2) District nurses and midwives. (3) Welfare centres; school medical service. (4) Ancillary services: health visitors; domestic help; meals on wheels; tuberculosis aftercare committee. (5) Sanitary considerations. The student, who has mainly learnt his public health from a course of lectures, sees the practical application of this branch of medicine. He sees that practically the whole of public health is closely connected with the work of the family doctor, who often needs one or other of its services to bring to his patient comprehensive care and treatment.

Industrial Medicine.—(1) Industrial medical service. (2) Pre-placement examination. (3) Ancillary services. (4) Rehabilitation. On this particular firm we spent an evening discussing industrial medicine because one of us (E. A. W. M.) is interested in this branch. On other firms some subject the general practitioner has a detailed knowledge about would doubtless be substituted. The general practitioner is the ideal person, if he is willing to acquire the knowledge and experience, to furnish the part-time personnel for this service.

Postgraduate Study in General Practice.—(1) Public lectures, local B.M.A. lectures. (2) Local medical societies. (3) N.H.S. courses: part- and full-time. (4) Home reading. (5) College of General Practitioners/research in general practice. (6) Access to cases in local hospitals. Ample facilities exist in most areas for the general practitioner to keep abreast with the advances in medicine, but the single-handed doctor must experience difficulties in finding the necessary time. General practice is an exacting and time-consuming occupation and, even in the less busy part of the year, the day's work is usually so arranged (for the convenience of the patient) that the family doctor has never more than two or, at the most, three consecutive hours free at any time of the day or evening.

Conclusion

We feel that this course has something to offer to the student. It widens his field of vision beyond the boundaries of the hospital, he sees the only branch of "medicine" left in which he can obtain an overall picture, and he also realizes the value of continuous care with intermingling of early diagnosis, curative, preventive, social, and occupational medicine, and public health. He should become increasingly aware that the patient is not a case; that the patient is indivisible, and therefore "medicine" is also indivisible; that specialization can fulfil its proper aims only when co-ordinated with the general care of the patient.

This report relates to the student in his final year; the course lasts three weeks, and usually begins at the end of November. We realize that many arguments can be made against these present arrangements, but, in this experimental stage, we feel they should not be changed until more experience is gained.

The type of practice the student attends is important. We have no knowledge which is the most suitable, but this will become evident at the conferences. One thing, however, is certain: if the general practitioner believes that he has a service to give and is enthusiastic the student's time will not be wasted.

Summary

The undergraduate course in general practice is a compulsory part of the curriculum of Charing Cross Hospital Medical School. The final-year student resides with the general-practitioner teacher for three weeks.

The ground covered, the material seen, and the methods adopted are recorded.

We regard the scheme as a useful one, and urge the interchange of ideas and experience.

We wish to thank Dr. F. Sanders, the other principal and partner in the practice concerned, for his help and advice at all times.

GENERAL MEDICAL SERVICES COMMITTEE DISTRIBUTION OF REMUNERATION

A meeting of the General Medical Services Committee lasting a day and a half was held on April 21 and 22 under the chairmanship of Dr. A. TALBOT ROGERS. The Committee dealt with a number of matters which will be included in the Supplementary Annual Report to the Conference.

The second report of the Working Party on the distribution of remuneration among general practitioners (published in the *Supplement*, May 1, p. 206) was presented. The CHAIRMAN said that this report—an agreed one—followed upon the resolution passed by the Special Conference in 1952 that if, in the light of experience, it was found that the new scheme of distribution arrived at after the Danckwerts award left certain groups of practitioners—small-list men—without the benefit to be expected under the terms of reference of the Working Party, an appropriate proportion of the final settlement moneys might be allocated for the remedying of any such obvious defects.

By passing this resolution, the Chairman went on, the Conference desired that help should be given to men in practice who were doing a good job of work but with very small lists. Obviously the lower limit had to be drawn somewhere, and the Working Party had drawn it at a list of 300. It proposed, in addition to the ordinary capitation fee, a basic payment of £250 per annum for doctors with lists of not less than 300 or more than 1,200, together with a special additional fee of 10s. for each patient above the 300th and up to the 500th. It was believed that the number of single-handed practitioners to whom the scheme would apply would be between 500 and 600.

Asked for an estimate of the cost of the new proposals, the Chairman said that the gross sum would be about £120,000 a year at present. It was expected that this would be a diminishing amount as some of the elderly doctors—who comprised the largest category of practitioners with small lists—retired from practice. He pointed out that this was not new money; it was part of the total amount allocated to all practitioners.

Dr. WOOLLEY suggested certain anomalies in the scheme. The practitioners who would gain most advantage would be those with lists of 500. They would receive an additional £350 a year, an amount per patient which compared rather sharply with the smaller amount received per patient by practitioners with larger lists. After all, nobody suffered under the redistribution, not that certain groups were enriched.

The CHAIRMAN mentioned the numbers of single-handed practitioners graded according to size of lists, and said that there was a fairly even spread from the lowest to the highest numbers. The amount of money which had to be paid out in the last financial year because of the extra claiming payment on the basis of notional lists had come already to a very considerable sum—a good deal more than was paid out in the previous financial year. This number of principals, and there was more than enough to cover the extra amount of money already absorbed and extravagant scheme might not have been possible to maintain for years ahead. Another point was that there was no means test in relation to the scheme. Further, the modification proposed was not a major change necessitating parliamentary approval.

Dr. BRUCE CARDEW said that the Working Party had done a good piece of work, and even if it had been a little over-generous it entailed a very small sacrifice for others spoke to the same effect, and the scheme was accepted by the Committee.

Scheme for Restoration of Goodwill

The Committee discussed at length the scheme for the restoration of the right to buy and sell goodwill. The scheme had been worked out by the Amending Acts Committee on the instruction of Council, following the resolution of the Representative Body.

The CHAIRMAN said that the scheme had occupied the Amending Acts Committee for a considerable time, and its discussions had been attended by observers from the G.M.S. Committee. All that the G.M.S. Committee was asked to do was to say whether or not this was a practicable scheme on which further negotiations might proceed. It was not asked to say what should be done with the report. That was for the decision of the Council.

The committee's conclusions were expressed in the following resolution:

"The General Medical Services Committee, whilst paying tribute to the constructive efforts of the Amending Acts Committee to produce a scheme for the restoration of the right to buy and sell goodwill, does not support the scheme which has been submitted. This view is endorsed by opinions expressed by the Assistants and Young Practitioners Subcommittee and by the British Medical Students Association. Further, from the information contained in the memorandum by Mr. Dixon [Medical Insurance Agency] the Committee has reached the firm conclusion that the very difficult economic circumstances which have developed since 1948, in addition to the many practical difficulties involved, would render it impossible to carry out this or any other similar scheme for the restoration of goodwill."

Central Pool Calculations

A report was given of a meeting between representatives of the Committee and officers of the Ministry of Health for the discussion of the calculation of the size of the central pool. The CHAIRMAN said that he and the other representatives, as well as the experts who had accompanied them, had urged that the expenses ratio of 32.23% which had emerged from the inquiry by the Inland Revenue was for a number of reasons lower than the actual expense ratio for the period. The exclusion of non-typical practices from the accounts upon which the survey had been based was one of these reasons. He contended that an appropriate adjustment was necessary, and in this he was supported by Professor Allen, the economist, who gave grounds for the opinion that an addition of between 0.5 and 0.8% should be made.

The Ministry had since written to the effect that they would like to do a little research into the sort of doctors who had been omitted from the sample before making any reply to the proposal that the ratio used in the calculations should be higher than the figure set out. It will probably be some time before a final answer can be given.

It was also stated that, although both sides had agreed to accept the continuation of the use of the figure of £2m. for private practice pending a more accurate assessment of this source of income, the Ministry felt that a start should be made with a view to obtaining further information on this subject. The Committee's representatives had pointed out the obvious fallacy in using the practice expenses inquiry for this purpose, the sample on which the inquiry had been based not being sufficiently representative. This might very well result in a distortion of the picture, and here again they had been supported by Professor Allen, who said that, in his view, if private practice earnings were to be revealed by any form of survey this should be on a very much broader basis. The Chairman said that some of them felt that nothing short of an inquiry of all doctors in the country could give the real answer, but it seemed to be felt by the Ministry that such an inquiry would be too expensive and time-consuming for the offices of inspectors of taxes. He added that it was for the Committee to say whether it insisted on a 100% inquiry or whether anything short of it was acceptable in the interests of an agreed settlement which would continue for a period of years. A factor to be borne in mind was that the amount which practitioners were earn-

ing from private practice was steadily diminishing and would continue to diminish as older patients died and were not replaced by younger.

After some discussion it was agreed that the matter be taken up with the economics experts who had been concerned in these discussions, and that a report should be made again to the Committee.

Miscellaneous Business

The composition of the Joint Committee on Prescribing again came forward. Dissatisfaction was expressed with the extent of the general-practitioner representation. It was felt that this was far too small and it was agreed to submit a recommendation to this effect to the Council.

A highly detailed question was brought forward by the London Local Medical Committee concerning the succession to a vacant practice by a partner. This led to a long discussion, and in the end it was suggested that the Local Medical Committee should seek an interview with the Medical Practices Committee, and, if still dissatisfied, reopen the matter with the General Medical Services Committee.

The question of eligibility of general practitioners for grants to attend courses on occupational health arose on a case from Scotland, in which the Ministry of Health was quoted as having given the opinion that general practitioners were not eligible. It was agreed that the general position should be explored with the Ministry.

On the question of the legal position of nurses in respect of giving injections—a subject which has been before other committees of the Association following a conference called by the Royal College of Nursing at which the Association was represented—it was decided after discussion to await a memorandum from the Royal College.

A request was received from the Yorkshire Local Medical Committee that whenever a recruit was rejected by the medical board his own doctor should be notified and given the reasons for the rejection. Dr. Knox pointed out that if the patient's own doctor had any difficulty in learning why a patient had been down-graded he had only to write to the board and he would receive a reply from the chairman. It was agreed to discuss the matter with the Ministry and see if anything could be done to improve the position.

PROPOSED TAX RELIEFS

Some tax relief would be given, especially to married people, if the Government were to put into effect the proposals made in the second report of the Royal Commission on the Taxation of Profits and Income (H.M.S.O., 4s. 6d.). The proposals are an attempt to give some relief to the hard-pressed middle-class. And, while this may be difficult to define, most doctors would probably own, if pressed, to belonging to it. Certainly many would have less income tax to pay if the commission's recommendations were adopted.

Five of the thirteen recommendations are on child allowances. The main one is that the child allowances should vary within limits with the taxpayer's income. Up to £850 the allowance would remain at £85 as at present; between £850 and £1,000 it would be 10% of income; and for incomes over £1,000 it would be £100 plus 6% of the excess of the income over £1,000, but subject to a maximum of £160.

Surtax, which now begins at £2,000, should according to the commission begin at £1,500 for a single man, at £2,000 for a married man without children, and for a married man with children at £2,000 plus £160 for each child. The earned income relief of two-ninths of the income at present reaches a maximum of £450 at an income of £2,025. The commission recommends raising the limit of £2,025 to £2,500 and extending the relief at half the full rate to incomes between £2,500 and £3,000. A minority report signed by four members of the commission dissents in some respects from the report.

British Medical Association

ANNUAL MEETING—GLASGOW, JULY 1-9, 1954

President-Elect: Emeritus Professor Sir JOHN McNEE, D.S.O., M.D., D.Sc., F.R.C.P., F.R.F.P.S.

Joint General Secretaries: J. INGLIS CAMERON, M.B., Ch.B., F.R.F.P.S.; J. T. McCUICHERON, M.A., L.R.C.P., L.R.C.S., L.R.F.P.S.

Science Secretary: J. BASIL RENNIE, M.D., F.R.C.P., F.R.F.P.S.

Executive Officer: G. A. PECK, B.Sc., British Medical Association, Glasgow Regional Office, 234, St. Vincent Street, Glasgow, C.2.

PROGRAMME

The 122nd Annual Meeting of the British Medical Association will be held in Glasgow from Thursday, July 1, to Friday, July 9, 1954, inclusive.

On the evening of Wednesday, June 30, there will be a Cocktail Party for Representatives and their Ladies, arranged by the Glasgow Division.

The Annual Representative Meeting will begin on Thursday, July 1, and continue on Friday, Saturday, and Monday, July 2, 3, and 5.

The Representatives' Dinner and Ladies' Dinner will take place on Thursday, July 1, followed by a dance.

The Overseas Luncheon has been arranged for Friday, July 2.

On Sunday, July 4, an all-day sail on the Firth of Clyde has been arranged, and this will be followed by a concert in the evening.

The Adjourned Annual General Meeting and President's Address will take place in the Kelvin Hall on the evening of Monday, July 5, and the President's Reception, which follows, will be held in the Bute Hall, at the University.

The Annual Scientific Meeting and associated functions occupy the period from Tuesday morning, July 6, to the evening of Friday, July 9.

The Official Religious Service will be held in Glasgow Cathedral on the afternoon of Tuesday, July 6, and arrangements for a Roman Catholic Service, on the same day, are also being made.

The Annual Dinner of the Association will be held in the Central Hotel on Thursday, July 8.

A full social programme is being arranged, including a Civic Reception on Tuesday evening, July 6, and a University Reception on Wednesday evening, July 7. There will also be a dance on Friday evening, July 9.

Several special functions have been arranged for ladies accompanying members, including visits to Loch Lomond, Lake of Menteith and Stirling, the Burns Country, and Edinburgh. Also included among these is an all-day excursion to Loch Katrine and the Trossachs.

The usual golf competitions will take place.

The Overseas Conference will be held on the afternoon of Wednesday, July 7, and there will also be an "At Home" for Overseas Visitors given by the Empire Medical Advisory Bureau on Thursday, July 8.

The Reception Room for Registration will be open in the Kelvin Hall on Monday, July 5, at 9 a.m.

Three Plenary Scientific Sessions have been arranged as follows: Tuesday, July 6, at 9.30 a.m., subject "The Problem of Sleep"; Wednesday, July 7, at 3 p.m., subject "Food and Disease"; Thursday, July 8, at 9.15 a.m., subject "The Problem of Pulmonary Tuberculosis To-day."

Seventeen Scientific Sections have been arranged, the meetings to take place on Wednesday morning, July 7, Thursday afternoon, July 8, and Friday morning and afternoon, July 9 (details are given below).

The Scientific Exhibition will be held in the Kelvin Hall, and will be open daily from July 5 to 9. Demonstrations will be given at fixed advertised times and a wide field of medical interests will be covered. For details see page 226.

The Annual Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications will also be housed in the Kelvin Hall. The Exhibition will be open from 9 a.m. to 6 p.m. from July 5 to 9 inclusive.

The Ladies' Club will be situated in the College Club, University, and will be open throughout the Meeting.

REGULATIONS REGARDING DRESS

Academic Dress is to be worn at the President's Address, the President's Reception, the Official Religious Service, the Roman Catholic Service, the Civic Reception, and the University Reception.

Robes may be hired from Messrs. Ede and Ravenscroft, Ltd., 93, Chancery Lane, London, W.C.2, or, in the case of Glasgow graduates, from Messrs. Thomson, Sons and Wright, Ltd., 173, St. Vincent Street, Glasgow, C.2. Early application is advised, as the supply of gowns is limited, and it is suggested that the gowns be sent to the home address of the individual concerned.

Evening Dress (Tails or Dinner Jacket), with Decorations, is to be worn at the President's Reception, Civic Reception, University Reception, and Annual Dinner. Evening Dress without Decorations should be worn at the Representatives' Dinner, the Representatives' Dance, and the Dance in the Union on July 9.

REGISTRATION FEE

Members attending the Annual Meeting (other than members of the Representative Body and overseas visitors) are required to pay a fee of one guinea towards the expenses of the Meeting. The fee will be payable when members register at the Reception Office.

TICKETS

All tickets for functions up to Sunday, July 4, will be available for Representatives at the A.R.M. Inquiry Office at the Bute Hall, University, on June 30, July 1, 2, and 3, and for ladies at the Ladies' Club, the College Club, University.

Tickets for all other functions after Sunday, July 4, will be available from Monday, July 5, at the Reception Office, Kelvin Hall, or at the Ladies' Club.

BADGES

Members will not be admitted to Plenary Sessions, Scientific Sections, or Exhibitions unless wearing badges. They should therefore visit the Reception Office, Kelvin Hall, on the first day of the Annual Meeting to obtain their handbook, badge, registration card, and tickets.

Officers of Scientific Sections and other office-holders should inquire for special badges at the Reception Office.

HOTEL ACCOMMODATION IN GLASGOW

The following is a list of hotel and hostel accommodation still available for the Glasgow Meeting.

For hotel accommodation, reservations should be made direct with the hotels and not through the B.M.A.

For hostel accommodation, all requests should be made to the Executive Officer, B.M.A. Glasgow Regional Office, 234, St. Vincent Street, Glasgow, C.2, and not direct to the hostels.

REVISED HOTEL LIST

Name and Address of Hotel	Tel. No.	Distance from University	Rooms Available	Tariff, 1953 B.B.
*Buchanan St. Station Hotel, Buchanan St., Glasgow, C.2	Douglas 9016	1½ miles	Single Double	24/- 48/-
*Central Hotel, Glasgow, C.1	Central 9680	1½ "	Double	60/-
*St. Enoch Hotel, St. Enoch Sq., Glasgow, C.1	Central 7033	1½ "	Single Double	35/- 60/-
Y.M.C.A. Club, 100, Bothwell St., Glasgow, C.2	City 0388	1½ miles	Single (men)	12/6
<i>Hostel Accommodation</i>				
MacBrayne Hall, 11, Park Circus Place, C.3	Douglas 5626	½ mile	Men (share twin-bedded rooms)	12/6 p.p.
Douglas House, Jordanhill College, Southbrae Drive, W.3	Scotstoun 2694	2½ miles	Men or women (single rooms)	14 6

* Licensed hotels.

TRAVEL RESERVATIONS

Accommodation on trains and on aircraft between London and Glasgow during July is booked at a very early date. It is advisable to make reservations as soon as possible.

ABERDEEN GRADUATES' DINNER

A dinner arranged by the Glasgow Aberdeen University Association will be held in the North British Hotel, Glasgow, on Saturday, July 3, 1954, at 7.30 p.m. Tickets will be 25s.

All Aberdeen graduates and their ladies attending the Annual Representative Meeting will be welcome. Those intending to be present should apply by the end of May to Mr. W. E. S. Thomson, 23, Thorn Drive, Bearsden, Glasgow, for further information.

GLASGOW GRADUATES' DINNER

The Glasgow Graduates' Dinner will be held in the Royal Faculty of Physicians and Surgeons of Glasgow, 242, St. Vincent Street, Glasgow, C.2, on Saturday, July 3, at 7 for 7.30 p.m. The dinner is open to Glasgow graduates and their ladies who are attending the Annual Representative Meeting.

The cost is 30s. each, including aperitifs. Numbers are limited, and early application, with appropriate remittance, should be made to Dr. J. C. Macarthur, Roadmeetings House, Carlisle, Lanarkshire.

CHRISTIAN MEDICAL FELLOWSHIP ANNUAL BREAKFAST

The Annual Breakfast of the Christian Medical Fellowship will be held in the Students' Union, University Avenue, Glasgow, on Wednesday, July 7, at 8.15 a.m. The chairman will be Sir John McNece, and the speaker Mr. Howard Somervell. The proceedings will terminate at 9.15 a.m. Those intending to be present are asked to notify the local secretary, Dr. J. C. Eaton, 19, Boclair Road, Bearsden, Glasgow.

SCIENTIFIC MEETING

PLENARY SESSIONS

Tuesday, July 6, 9.30 a.m.: "The Problem of Sleep"

Chairman: Professor Sir DAVID CAMPBELL (Aberdeen).
Speakers: Professor Sir GEOFFREY JEFFERSON (Manchester), Professor D. M. DUNLOP (Edinburgh), Dr. J. O. McDONAGH (Stanley), Dr. A. H. DOUTHWAITE (London), Dr. MACDONALD CRITCHLEY (London).

Wednesday, July 7, 3 p.m.: "Food and Disease"

Chairman: Dr. W. G. CLARK (Edinburgh).
Speakers: Dr. C. METCALFE BROWN (Manchester), Professor B. S. PLATT (London), Dr. JOAN TAYLOR (London), Dr. J. S. K. BOYD (London), Professor R. CRUICKSHANK (London), Mr. A. E. BURDETT (London).

Thursday, July 8, 9.15 a.m.: "The Problem of Pulmonary Tuberculosis To-day"

Chairman: Sir ANDREW DAVIDSON (Edinburgh).
Speakers: Dr. PETER MCKINLAY (Edinburgh), Dr. A. B. SEMPLE (Liverpool), Dr. J. R. LANGMUIR (Glasgow), Dr. W. D. W. BROOKS (London), Mr. T. HOLMES SELLORS (London), Dr. R. R. TRAIL (London).

SCIENTIFIC SECTIONS

All sessions will be held in the University and details are given of the lecture theatres where the sessions are to be held.

*The names of additional speakers in some sessions will be published later.

MEDICINE

President: G. E. BEAUMONT, D.M., F.R.C.P., D.P.H. (London).

Vice-Presidents: Professor S. ALSTEAD, M.D., F.R.C.P., F.R.F.P.S. (Glasgow); Professor L. J. DAVIS, M.D., F.R.C.P., F.R.C.P.Ed., F.R.F.P.S., F.R.S.Ed. (Glasgow); Professor S. J. HARTFALL, T.D., M.D., B.Sc., F.R.C.P. (Leeds); W. R. SNODGRASS, M.A., M.D., B.Sc., F.R.F.P.S. (Glasgow).

Hon. Secretaries: JOHN H. HUNT, D.M., M.R.C.P., 54, Sloane Street, London, S.W.1; E. G. OASTLER, T.D., M.A., M.B., Ch.B., F.R.C.P., F.R.F.P.S., 4, Woodside Terrace, Glasgow, C.3.

Sessions

Physiology Lecture Theatre.
Wednesday, July 7.—9.30 a.m., Management of Old Age in General Practice, Dr. TREVOR HOWELL (London).
Prevention and Treatment of Respiratory Infection in Old Age, Sir GEOFFREY MARSHALL (London), Dr. NEVILLE OSWALD (London), Dr. T. McEWAN (Glasgow).
Treatment of Parkinsonism, Dr. H. G. GARLAND (Leeds), Dr. H. G. MILLER (Newcastle-upon-Tyne).
Treatment of Peripheral Vascular Disease in Old Age, Professor E. J. WAYNE (Glasgow), Professor MICHAEL BOYD (Manchester), Dr. WM. FERGUSON ANDERSON (Glasgow), Dr. O. T. BROWN (Dundee).
Thursday, July 8.—2.30 p.m., Medical Treatment of Hypertension, Dr. GEOFFREY BOURNE (London), Dr. J. GIBSON GRAHAM (Glasgow), Dr. GAVIN SHAW (Glasgow).
Anticoagulants in Coronary Thrombosis, Dr. RAE GILCHRIST (Edinburgh), Professor R. B. HUNTER (Dundee), Dr. A. BROWN (Glasgow).
Anticoagulants in Thrombophlebitis, Dr. BODLEY SCOTT (London), Mr. R. S. MURLEY (London), Mr. R. B. WRIGHT (Glasgow).

SURGERY

President: Sir HENEAGE OGILVIE, K.B.E., M.A., M.D., M.Ch., F.R.C.S. (London).

Vice-Presidents: JOHN DUNBAR, M.B., F.R.F.P.S. (Glasgow); Professor C. F. W. ILLINGWORTH, C.B.E., M.D., Ch.M., F.R.C.S.Ed., F.R.F.P.S. (Glasgow); T. MURRAY NEWTON, M.B., F.R.F.P.S. (Glasgow); Sir ARTHUR PORRITT, K.C.M.G., C.B.E., M.Ch., F.R.C.S., LL.D. (London).

Hon. Secretaries: A. B. KERR, O.B.E., T.D., M.B., F.R.F.P.S., F.R.C.S.Ed., 5, La Belle Place, Glasgow, C.3; IAN M. ORR, O.B.E., M.D., Ch.M., F.R.C.S.Ed., Brooklands, Garstang, Preston, Lancs.

Sessions

Zoology Lecture Theatre.
Wednesday, July 7.—9.30 a.m., The Surgical Treatment of Peptic Ulcer. Panel discussion: Mr. JOHN BRUCE (Edinburgh).

Botany Lecture Theatre.
Friday, July 9.—2 p.m., *Symposium on Occupational Neurological Diseases*. Pressure Neuropathy, Dr. H. G. GARLAND (Leeds); Metallic Poisons and the Nervous System, Dr. J. W. ALDREN TURNER (London); Damage to the Nervous System from Gas Poisoning, Dr. R. S. ALLISON (Belfast); The New Insecticides and the Nervous System, Dr. A. M. G. CAMPBELL (Bristol). Cerebral Abscess, Mr. J. E. PATERSON (Glasgow); Mr. W. S. LEWIN (Oxford).

President : W. S. TEGNER, B.M., B.Ch., F.R.C.P. (London).
Vice-Presidents : P. BAUWENS, M.R.C.S., L.R.C.P. (London); H. A. BURT, M.A., M.B., B.Ch., F.R.C.P. (London); DONALD WILSON, M.B., B.S., M.R.C.P. (Chichester).

Hon. Secretaries: A. C. BOYLE, M.D., M.R.C.P., D.Phys.Med., Department of Physical Medicine, the Middlesex Hospital, W.1; T. N. FRASER, M.D., F.R.C.P., F.R.F.P.S., 112, Southbrae Drive, Glasgow, W.3.

Session

Zoology Lecture Theatre.

Friday, July 9.—2 p.m., Recent Developments in Rehabilitation. Group Captain C. J. S. O'MALLEY (London), Dr. F. S. COOKSEY (London), Lieutenant-Colonel J. FRASER (Inverness). Management of Degenerative Joint Disease, Dr. H. A. BURT (London), Dr. LOGIE S. BAIN (Aberdeen), Dr. DONALD WILSON (Chichester). Electro-Diagnosis, Professor A. E. RITCHIE (St. Andrews), Dr. A. T. RICHARDSON (London), Squadron Leader C. B. WYNN PARRY (Farnham Common).

PREVENTIVE MEDICINE AND INFECTIOUS DISEASES

President: T. ANDERSON, M.D., F.R.C.P.Ed., F.R.F.P.S. (Glasgow).

Vice-Presidents: C. METCALFE BROWN, M.D., D.P.H., Barrister-at-Law (Manchester); S. C. GAWNE, M.D., B.S., M.R.C.S., L.R.C.P., D.C.H., D.P.H., Barrister-at-Law (Liverpool); STUART LAIDLAW, J.P., O.St.J., M.D., B.Sc., F.R.F.P.S., D.P.H., B.L., D.P.A. (Glasgow); LLYWELYN ROBERTS, M.D., M.R.C.P., D.P.H. (Sheffield).

Hon. Secretaries: JAMES H. LAWSON, M.D., D.P.H., Ruchill Fever Hospital, Glasgow, N.W.; J. B. S. MORGAN, M.B., B.Sc., M.R.C.S., D.P.H., County Health Department, County Offices, St. Mary's Gate, Derby.

Sessions

Chemistry Lecture Theatre.

Wednesday, July 7.—9.30 a.m. (Joint Session with Section of Microbiology and Pathology). Poliomyelitis: Recent Advances in Knowledge of the Virus, Dr. ALLAN P. GOFFE (London); Epidemiology, Dr. W. H. BRADLEY (London); The Acute Case, with Special Reference to Respiratory Failure, Dr. A. B. CHRISTIE (Liverpool).

Thursday, July 8.—2.30 p.m., The Epidemiology of Non-Infectious Diseases: The Epidemiological Method, Dr. J. N. MORRIS (London); The Epidemiology of Old Age, Dr. W. FERGUSON ANDERSON (Glasgow); The Epidemiological Approach to Obstetric Medicine, Dr. ANGUS M. THOMSON (Aberdeen); The Role of the Medical Officer of Health, Dr. JOHN RIDDELL (Edinburgh).

PSYCHIATRY

President: Professor T. FERGUSON RODGER, M.B., F.R.C.P.Ed. (Glasgow).

Vice-Presidents: MURIEL BARTON HALL, M.D., Ch.B., (Liverpool); Professor ALEXANDER KENNEDY, M.D., F.R.C.P. (Newcastle-upon-Tyne); DAVID YELLOWLEES, M.B., Ch.B. (Glasgow).

Hon. Secretaries: T. C. N. GIBBENS, M.D., D.P.M., Institute of Psychiatry, Maudsley Hospital, Denmark Hill, London, S.E.5; HUNTER GILLIES, M.D., F.R.C.P.Ed., D.P.M., Psychiatric Unit, Stobhill General Hospital, Glasgow, N.

Session

Natural Philosophy Lecture Theatre (new buildings).

Friday, July 9.—9.30 a.m., Depression: The Diagnosis of Depression, Dr. W. MAYER-GROSS (Dumfries); The Risks of Suicide in States of Depression, Dr. E. STENGEL (London); The Treatment of Depression, Dr. I. R. C. BATCHELOR (Edinburgh); The Rationale of Electrical Convulsion Treatment, Dr. D. A. POND (London); Failures with Electrical Convulsion Treatment, Dr. J. L. CAMERON (Glasgow); The Effects of Depression on Industrial Efficiency, Dr. M. MARKOWE (London); Depression in Relation to Crime, Dr. J. C. M. MATHESON (London).

RADIOLOGY

President: Professor B. W. WINDEYER, M.B., B.S., F.R.C.S., F.F.R., D.M.R.E. (London).

Vice-Presidents: Professor ROBERT McWHIRTER, F.R.C.S.Ed., F.F.R., F.R.S.Ed. (Edinburgh); JOHN R. NUTTALL, M.D., F.F.R., D.M.R. (Leeds); S. D. SCOTT PARK, M.B., Ch.B., D.M.R.E. (Glasgow).

Hon. Secretaries: DAVID STENHOUSE, M.B., F.R.F.P.S., F.F.R., D.M.R., X-ray Department, McAlpin Nursing Home, 121, Hill Street, Glasgow, C.3; J. J. STEVENSON, M.D., D.M.R., The Royal Cancer Hospital, Fulham Road, London, S.W.3.

Session

Natural Philosophy Lecture Theatre (new building).

Friday, July 9.—2 p.m., Carcinoma of Bladder, Mr. A. H. JACOBS (Glasgow), Dr. G. W. BLONFIELD (Sheffield), Leukaemia, Dr. R. BODLEY SCOTT (London), Dr. A. A. CHARTERIS (Glasgow), Dr. S. P. RAWSON (Glasgow).

SCIENTIFIC EXHIBITION

Kelvin Hall, July 5-9, 1954

The Exhibition will be open each day at 9 a.m. and will close on the first three days at 6 p.m. and on the last two at 5 p.m.

The following list gives brief details of the exhibit:

Royal Samaritan Hospital for Women and the Royal Infirmary, Glasgow. Diagnostic survey of the infertile marriage.

Department of Ophthalmology, University of Glasgow. Eye changes in vascular disease with examples of clinical retinal photographs. Retrolental fibroplasia.

Scottish National Blood Transfusion Association, Edinburgh. Economical production in the laboratory of useful plasma fractions and illustrations of their use.

Department of Pharmacology and Therapeutics, University of Sheffield; National Centre of Radiotherapy, Sheffield; Department of Medicine, Royal Infirmary, Glasgow; and Department of Therapeutics, University of Edinburgh. The role of radioactive iodine in modern medicine.

Departments of Pathology and Surgery, Glasgow Royal Infirmary. Phaeochromocytosis: clinical aspects, diagnosis by adrenergic blocking drugs, treatment, and pathology, with special reference to malignancy.

Department of Anaesthesia, Glasgow Royal Infirmary. Hand plethysmography unit for use during surgical anaesthesia, with charts illustrating results.

Department of Child Health, University of Glasgow, and Hospital for Sick Children, Glasgow. (1) Radioactive iodine studies in familial cretinism. (2) Chromatography, bio-assay, and electrophoresis in the hormone treatment of nephrosis. (3) Fibrocystic disease of the pancreas.

Department of Health for Scotland. Statistical presentation of certain topics within the interest of the department. Rowett Research Institute, Bucksburn, Aberdeenshire. The effect on the skeleton of different levels of dietary calcium during pregnancy and lactation, in experimental animals.

Department of Dermatology, Leeds General Infirmary. Some mycotic infections of the smooth skin and nails.

Department of Child Health, University of Sheffield. Tuberculous meningitis.

Nuffield Department of Clinical Medicine, Radcliffe Infirmary, Oxford. The stomach in anaemia: (1) histology; (2) studies on the intrinsic factor of Castle; and (3) estimation of pepsin and uropepsinogen.

Nuffield Orthopaedic Centre, Oxford. (1) The aetiology of osteoarthritis of the hip. (2) Research on the clinical characteristics of scoliosis.

Departments of Medical Art, Neuroradiology, and Neurosurgery, Manchester Royal Infirmary. The radiological diagnosis of brain tumour.

Liverpool Psychiatric Clinic. Demonstration of modern techniques in child psychiatry.

PROVISIONAL TIME-TABLE OF MEETINGS

R.—Events available for members of Representative Body and Ladies accompanying them.
L.—Events primarily arranged for Ladies.
U.—Events for all Members and Ladies accompanying them.
*Academic Robes should be worn.

Wednesday, June 30

4.30 to 6.30 p.m.—Annual Representative Meeting Inquiry Office opens at Bute Hall, University.
8.30 to 10.30 p.m.—R. Cocktail Party (by invitation of the Glasgow Division), Trades House, Glassford Street, Glasgow, C.1.

Thursday, July 1

9.00 a.m.—Annual Representative Meeting Inquiry Office opens at Bute Hall, University.
9.00 a.m.—Ladies' Club opens, the College Club, University.
10.00 a.m.—Annual Representative Meeting commences, Bute Hall, University.
11.00 a.m.—Welcome by the Right Honourable the Lord Provost of Glasgow to Annual Representative Meeting.
2.00 p.m.—L. Excursion to Loch Lomond (afternoon tea by kind invitation of Lady Colquhoun of Luss and Major-General A. P. D. Telfer-Smollett, Lord Lieutenant of Dunbartonshire).
7.30 p.m.—R. Representatives' Dinner, Central Hotel, Gordon Street, Glasgow, C.1.
8.00 p.m.—L. Representatives' Ladies' Dinner, Central Hotel, Gordon Street, Glasgow, C.1.
9.30 p.m.—R. Representatives' Dance, Central Hotel, Gordon Street, Glasgow, C.1.

Friday, July 2

9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Annual Representative Meeting.
9.30 a.m.—L. All-day excursion to the Trossachs, returning via Duchray Valley, including the State Forest (Sail on Loch Katrine and luncheon by kind invitation of Glasgow Corporation).
1.00 p.m.—Overseas Luncheon, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.
2.00 p.m.—L. Visit to Livingstone Memorial, Blantyre; Clyde Valley and Lanark (afternoon tea at Clydesdale Hotel by kind invitation of the Lanarkshire Division).
5.00 p.m.—Cocktail Party for Women Representatives and medical women accompanying Representatives, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2 (by invitation of the Medical Women's Federation, Scottish Western Association).
8.00 p.m.—Reception and Demonstration by Director and Staff at Glasgow Art Gallery, Kelvingrove.

Saturday, July 3

9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.00 a.m.—Council Meeting, Forchall, University.
9.30 a.m.—Ladies' Club open.
10.00 a.m.—Annual Representative Meeting.
10.30 a.m.—L. Excursion to the Lake of Menteith and visit to Stirling Castle. Luncheon at the Lake of Menteith Hotel or the Lion and the Unicorn, Thornhill. (Tea by kind invitation of the Stirling Branch.)
7.30 p.m.—Aberdeen Graduates' Dinner, North British Hotel, George Square, Glasgow, C.2.
7.30 p.m.—Edinburgh Graduates' Dinner, Grosvenor Restaurant, Gordon Street, Glasgow, C.1.
7.30 p.m.—Glasgow Graduates' Dinner, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.
7.30 p.m.—Welsh Dinner, Grosvenor Restaurant, Gordon Street, Glasgow, C.1.
8.30 p.m.—R. Block Booking, "Half-past Eight" (Summer Revue), Alhambra Theatre, Wellington Street, Glasgow, C.2.

Sunday, July 4

10.15 a.m.—All-day sail on the Firth of Clyde with luncheon and afternoon tea.
8.30 p.m.—Concert, Kelvin Hall, Kelvingrove, specially arranged by the B.B.C. and to be broadcast on the Scottish Home Service from 9.15 to 10.15 p.m.

Department of Psychological Research, Crichton Royal Hospital, Dumfries. Demonstration of psychometric testing.
Department of Psychological Medicine, King's College Medical School, Newcastle-upon-Tyne, and Biophysics Unit, Crichton Royal Hospital, Dumfries. Portable E.E.G. equipment.

The National Maternity Hospital, Dublin. Medical conditions complicating pregnancy.

Cancer Research Department, Royal Beatson Memorial Hospital, Glasgow. (1) Atmospheric pollution tests for (a) arsenic, (b) benzpyrene, (c) radioactivity. (2) Analysis of tobacco smoke. (3) Liver cancer in animals.

Urological Units, Victoria Infirmary, Glasgow, and Hairmyres Hospital, Lanarkshire. (1) Prostatic obstruction. (2) Carcinoma of bladder. (3) Cases of aberrant ureter in the female causing incontinence.

Department of Pathology, Glasgow Royal Infirmary. The effect of A.C.T.H. and cortisone on repair of lesions induced experimentally in animals—for example, in peptic ulceration, hepatic cirrhosis, and quartz granuloma.

Department of Pathology, Glasgow Royal Infirmary. Pituitary and adrenal changes in pathological conditions of man and animals.

Royal Infirmary, Glasgow. Mitral disease. Pre-operation investigation, especially cardiac catheterization and auricular puncture. Comparison of operation findings with pre-operation assessment. Post-operation assessment. Auricular biopsy findings. Pathological specimens showing complications of interest.

Department of Infectious Diseases, University of Glasgow. (1) and Public Health Department, City of Glasgow. (1) Statistics of the City of Glasgow for acute respiratory diseases during the last 25 years. (2) Results of bacteriological examination. (3) Results of virological examination.

Department of Pathology, Western Infirmary, Glasgow. Studies on iron metabolism in man and experimental animals, illustrated by colour photography.

Royal Army Medical College. Mite-borne (scrub) typhus. National Coal Board Medical Service. Research into the physiological and psychological effects of work in hot and humid atmospheres.

The Royal Cancer Hospital, London. Demonstration of cancer of the breast.

St. Bartholomew's Hospital, London, and the Royal Cancer Hospital. Portal hypertension; distribution, effect of different treatments on prognosis, liver function, blood counts.

Rehabilitation Committee of B.M.A.; Ministry of Labour. Scope and facilities for rehabilitation.

Food Hygiene Laboratory of the Central Public Health Laboratory, Colindale. Bacterial food-poisoning and other food poison disease.

The Wright-Fleming Institute of Microbiology, St. Mary's Hospital, London. Demonstration of basic mechanisms of immediate (pollen) and delayed (tuberculin) reactions and their clinical significance.

British European Airways, with the Scottish Air Ambulance Scheme of the Department of Health for Scotland. Medical aspects of the Highlands and Islands Air Ambulance Service.

Royal Air Force, Directorate General of Medical Services. Recent advances in electrodiagnosis and electrotherapy.

Royal Navy (Royal Naval Personnel Research Committee, Naval Life Saving Committee, and Director of Victualling). Advances made since the 1939-45 war on survival at sea and cold- and foul-weather clothing.

SPECIAL EXHIBITIONS

Kelvin Hall, July 5-9, 1954

Royal Faculty of Physicians and Surgeons of Glasgow. Glasgow in the history of medicine.

Pharmaceutical Society of Great Britain. Recent advances in pharmaceutical science; objects of historical interest.

Royal Photographic Society, Medical Group. One hundred years of medical photography.

"It was made plain in the Committee Stage of the Amending Bill that no party in the House of Commons will allow either side to compel arbitration. The Joint Committee may be congratulated on having secured from the Ministry agreement that remuneration is open to arbitration, and it is reasonable to assume that in the event of serious disagreement neither the Minister of Health nor the medical profession would in practice fail to seek the obvious and fair method of resolving a dispute—arbitration or a committee of inquiry."

In June, 1952, the Staff Side notified the Management Side of Committee "B" of its intention to submit a claim for increased betterment in the light of the Danckwerts award to general practitioners. There was some opposition within the profession itself to pressing the claim at that moment. It was pointed out that doctors, including consultants, were well paid in comparison with members of other professions and that nothing could be worse than for the profession to press the claim at that time. Nevertheless it was resolved in July, 1952, to go on with the claim. Sir Russell said that one of the great obstacles to obtaining what consultants regarded as proper remuneration was the Danckwerts award. This was nobody's fault, but an agreement was reached by which general practitioners should go forward alone with their claim in the first place and the consultant side should await events. That episode was surely a lesson from which they could all profit in the future. The effect of it was that as soon as the consultants put up their case they were referred to a statement by the Chancellor of the Exchequer that there could be no implementation of anything corresponding to the Danckwerts award for them. The Management Side refused to discuss the betterment factor in relation to consultants' pay. The only claim which it was prepared to discuss was one which aimed at restoring the balance between G.P. and consultant remuneration which had been disturbed by the Danckwerts award, particularly as this might affect recruitment to hospital medical staffs. Any appeal to arbitration was refused. The Joint Committee was left in this confined field to make a claim on its merits. An alternative offered was an inquiry. But, Sir Russell stated, this inquiry would have been a kind of Guillebaud Committee. It would not have concerned itself with cost-of-living betterment but would have looked into the earnings of part-time consultants. Sir Russell implied that this might have had unfortunate results. The committee of inquiry might have taken the line that here were consultants earning money for services for which they had not been paid before, and still allowed to carry on private practice. It must be remembered also that those in whole-time service before the war were not very well remunerated, and there were many whose incomes had increased very greatly.

In the face of all this, and the political situation being what it was, Sir Russell Brain believed that they had achieved in these new terms something very substantial. In particular, they had restored the balance between the income of the general practitioner and that of the consultant and specialist. Moreover, this agreement was not likely to be thrown over within a short period of years. He was not satisfied even in this agreement with the award

They had claimed from the very beginning that they ought to have arbitration, but even if they got it it would not follow at all that they would get another Danckwerts Arbitration was a double-edged weapon. Sir Russell stated categorically that neither side had repudiated Spens in the settlement and that "Spens still remains our (the Staff Side's) charter." The Staff Side were free to open negotiations at any time on any point, including betterment "Politics," said Sir Russell in conclusion, "was the art of the possible," and they had always to bear that in mind. The important thing was that they should go forward unitedly as they had done in the past, and he hoped for their confidence and support in the battles that lay ahead.

In reply to one member, who asked if it would not have been better if the negotiations had been conducted on a wider basis, and that a combined approach should have been made on behalf of the consultants by an organization representing the whole profession, Sir Russell said that the existing negotiation arrangement had worked very well.

Mr. C. E. KINDERSLEY also expressed thanks to Sir Russell Brain and his committee. He believed that there was some feeling that on the Joint Committee the representatives of the Central Consultants and Specialists Committee were outvoted, but the question of being outvoted had never arisen; they had worked harmoniously together. Sir Russell Brain agreed with this view.

In some general discussion, after Sir Russell Brain had left the meeting, Mr. NICHOLSON LAILEY said that he came from an area containing a number of consultants practising in small towns. It was important that the views of these people should be clearly heard in this committee. He agreed on the absolute necessity of keeping a united front in the profession, particularly among consultants in the hospital service. If they separated into a number of parties the Government would play off one against the others. He was sure that Sir Russell Brain and those associated with him had done their best, but there were various criticisms as to the secrecy with which the negotiations had been conducted. The people at the periphery did not believe this secrecy to have been necessary, though reasons had been given for it.

Dr. Stevenson in his calculations seemed to have overlooked one point—namely, that consultants began their career at a later age than general practitioners and retired at an earlier age. They were compulsorily retired at 65, whereas the general practitioner in many instances went on for ten or more years longer. Also he was sure that income from private work had dropped far more than some people thought. Some allowance should be made for the relative shortness of the consultant's career. Mr. Nicholson Lailey went on to ask that there should be an examination of hospital staff remuneration in relation to Spens by experts and the result put before hospital staffs throughout the country. He did not think that the agreement was entirely satisfactory as an implementation of Spens. He would

9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.00 a.m.—Scientific Exhibition opens at the Kelvin Hall, Kelvingrove.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications, opening by the President-Elect, Kelvin Hall, Kelvingrove.
9.00 a.m.—Reception Room for Registration opens at Kelvin Hall, Kelvingrove.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—L. Visit to Falkland Palace, via Kincardine Bridge, coffee at the Green Hotel, Kinross, Loch Leven, and luncheon at Auchtermuchty by kind invitation of Mrs. H. B. Muir and the Fife Branch.
10.00 a.m.—Annual Representative Meeting.
11.00 a.m.—L. Notts Ladies' Challenge Cup Golf Competition at Buchanan Castle Golf Club (non-golfers also invited).
12.30 p.m.—Annual General Meeting, Bute Hall, University.
p.m.—Council Meeting, Forehall, University (at conclusion of Annual Representative Meeting).
8.15 p.m.—U.* Adjourned Annual General Meeting and President's Address, Kelvin Hall, Kelvingrove.
9.30 p.m.—U.* President's Reception, Bute Hall, University.

9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 12 noon.—Scientific Plenary Session—"The Problem of Sleep."
10.30 a.m.—L. Visit to the grounds of Eastwood Park, Renfrewshire, and coffee by kind invitation of Viscountess Weir.
2.30 p.m.—Robing for Religious Service, Royal Infirmary.
3.00 p.m.—U.* Official Religious Service, Glasgow Cathedral.
3.00 p.m.—U.* Roman Catholic Service, St. Andrew's Cathedral, Glasgow.
5.00 p.m.—Reception by Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.
8.00 p.m.—U.* Reception and Dance by invitation of the Right Honourable the Lord Provost of Glasgow and Magistrates at the City Chambers, George Square, Glasgow, C.2.

8.15 a.m.—Annual Breakfast of the Christian Medical Fellowship, the Union, University Avenue, Glasgow.
9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 12.30 p.m.—*Scientific Sections*.
10.00 a.m.—Leinster and Childs Cup Golf Competition at Western Golf Club, Gailes, Ayrshire.
10.00 a.m.—L. All-day excursion to Burns Country (morning coffee at the Dutch House by kind invitation of the Ayrshire Division). Luncheon at the Burns Monument Hotel. (Tea by kind invitation of Mrs Kennedy, of Doonholm.)
1.00 p.m.—Irish Graduates' Luncheon.
2.00 to 3.00 p.m.—President and Party, Official Tour of Scientific Exhibition.
3.00 p.m.—Overseas Conference, Forehall, University.
3.00 to 5.30 p.m.—*Scientific Plenary Session*—"Food and Disease."
8.00 p.m.—U.* Reception and Dance in the Bute Hall by invitation of the University of Glasgow.

9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.15 to 11.45 a.m.—*Scientific Plenary Session*.—"The Problem of Pulmonary Tuberculosis To-day."
9.30 a.m.—Ladies' Club open.
9.30 a.m.—L. All-day excursion to Edinburgh. Visit to Castle St. Giles' Cathedral, John Knox's House, Holyrood Palace. Return via Forth Bridge and Linlithgow (Luncheon by kind invitation of the Edinburgh Division. Tea by kind invitation of Mrs. David Band.

10.00 a.m.—Treasurer's Cup Golf Competition at Old Prestwick Golf Club, Prestwick, Ayrshire.

12.15 p.m.—University Meeting in the Butte Hall for the conferring of honorary degrees.

2.30 to 5.30 p.m.—*Scientific Sections.*

3.00 p.m.—U. Garden Party in the grounds of the Glasgow Royal Mental Hospital, Gartnavel, 1055, Great Western Road, Glasgow, W.2. by invitation of the Medical Superintendent and the Board of Management.

5.00 p.m.—“At Home” for Overseas Visitors given by the Empire Medical Advisory Bureau, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.

7.30 p.m.—U. Annual Dinner, Central Hotel, Gordon Street, Glasgow, C.1.

9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments,
Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 12.30 p.m.—*Scientific Sections*.
2.00 to 5.00 p.m.—*Scientific Sections*.
8.00 p.m. to 1.00 a.m.—U. Dance, the Union, University
Avenue, Glasgow.

**SPECIAL MEETING OF CENTRAL CONSULTANTS
AND SPECIALISTS COMMITTEE**

A special meeting of the Central Consultants and Specialists Committee was held on April 28 under the chairmanship of Dr. T. ROWLAND HULL to discuss the statement by Sir Russell Brain, Chairman of the Staff Side of Committee "B" of the Medical Whitley Council, on the remuneration of hospital medical staff. The statement appeared in the *Supplement* of April 10 (p. 145). Forty-five members of the Committee were present. Sir Russell Brain himself attended the first part of the meeting.

Dr. D. P. STEVENSON, Deputy Secretary, made a preliminary statement. He said that since the publication of the new increases there had been remarkably little correspondence on the subject, a fact which might argue contentment or apathy. From such correspondence it seemed that complaints were on two scores: that Spens had not been implemented, and that the comparison between what hospital medical staff had now obtained and what general practitioners had obtained thanks to the Danckwerts award was unfavourable to the former.

It was difficult to make a valid comparison between the remuneration of consultants and general practitioners, but he presented to the Committee a rough analysis comparing the remuneration of general practitioners and consultants respectively. Broadly speaking, so far as it was possible to make a comparison between the two groups, there was a very close approximation in the actual increases which each side had received on the basis of the 1939 figures submitted by Professor Bradford Hill.

The CHAIRMAN said that a high tribute should be paid to Dr. Stevenson for the skill and care with which he had assembled the facts and figures in these negotiations.

Sir RUSSELL BRAIN reminded the Committee that in 1949 certain terms and conditions of service for consultants and specialists were put forward by the Ministry. How these were received by the profession might be judged from a leading article in the *British Medical Journal* of June 11, 1949, which said:

"It is questionable whether these terms adequately translate the Spens recommendations into present-day values, since the

like to see a statement go out from the Central Consultants and Specialists Committee that it accepted the agreement as an interim award; that the award went some way but did not implement Spens; and that there should be reconsideration of the award in the light of careful examination. Mr. Lailey said that it was their duty to convince the Government of the justice of their case. If they had a good case, why be afraid of a committee of inquiry?

No Reference Back

Dr. J. G. M. HAMILTON said that what had been given to hospital medical staff was not an award. It was an agreement in Whitley and nothing more. It was too small, and the distribution of the money was not the best. He complained that at no time did the rank and file know what was taking place. During last winter it had been confidently expected that a draft agreement would be available for discussion. The Central Consultants and Specialists Committee had been assured by its chairman that the terms would be referred back to them before acceptance. The Staff Side had no remit to carry on without reference back. He thought that the Staff Side should have sought fresh instructions from its constituents in 1952 when the Government refused to discuss betterment. The Joint Committee had gone into these negotiations on the basis of something which had not come up from below. He particularly drew attention to the passage in Sir Russell Brain's published statement which, after saying that consultants and all hospital staffs were entitled to know why it was not found possible to consult them upon the outcome of the negotiations before agreement was reached, added, "This is a difficulty which must always be faced when major issues are at stake." He objected to the implication of those words. He wanted to know if it meant that the greater the issue the greater the secrecy? Dr. Hamilton concluded with a plea that in future all negotiations should be conducted with the support and knowledge of those below.

The CHAIRMAN thought that this matter should have been brought forward while Sir Russell was present. He proceeded to read a long extract from the minutes of the meeting of the Central Consultants and Specialists Committee of July 30, 1953, which gave the Staff Side a free hand, but with certain provisos, to proceed and take decisions. Dr. Hamilton intervened to say that he was talking about 1952, not 1953.

Dr. S. R. F. WHITTAKER, expressing support of the agreement, said that any reference back to the constituent bodies of the Staff Side before the agreement would have had its disadvantages. It would have meant giving similar information to the Management Side and its constituent bodies, and a consequent risk of rousing opposition which might have resulted in a less favourable agreement or no agreement at all. Since becoming a member of the Joint Committee he realized the difficulties in negotiation.

Mr. D. W. C. NORTHFIELD agreed that Dr. Hamilton's criticism about the failure to refer the question back in 1952 was a valid one, but did not think the result would have been different. He could not agree that there should have been reference back once the negotiations had started in the Whitley Council.

A speaker asked the Chairman whether the question of betterment was now finished with. Dr. HILL replied that in his view betterment had been legally finished with in 1949.

Resolution of Confidence

Dr. S. COCHRANE SHANKS commended the work of the Staff Side of Committee "B." One of the outstanding obstacles to agreement had been the Government's desire to abolish the weighting factor, but he thought this had been fairly dealt with. He moved a resolution in two parts, and the first part read as follows:

Bearing in mind the difficulties under which the negotiations have been conducted, the Central Consultants and Specialists Committee approves the action of the Staff Side representatives on Committee "B" of the Medical Whitley Council in agreeing to the terms of remuneration recently announced. In particular, it notes the view of the Staff Side that the Spens Report remains

the yardstick of remuneration of hospital staffs and that they hold themselves free to seek future revisions thereof.

This was seconded by Professor G. I. STRACHAN and supported by several members, including representatives of the Registrars Group, who stated that although they were still not satisfied with the position of junior hospital staff they realized that this question was still under consideration.

Mr. C. E. KINDERSLEY said the profession should trust its elected representatives. He hoped that the regions would trust the Committee to represent them in the future.

This first part of the resolution was carried *nemine contradicente*.

The second part of Dr. Shanks's resolution was carried, again without dissent, in the following form:

The Central Consultants and Specialists Committee in particular notes with satisfaction the intention of its Staff Side representatives to seek further improvement in the salary scales of S.H.M.O.s and to press for payment of allowances and domiciliary consultation fees to whole-time officers.

Some resolutions from regional committees expressing dissatisfaction with the agreement were received but were not discussed specifically.

In closing the discussion the CHAIRMAN reminded the committee of the origin of the Joint Committee. It was initiated by the British Medical Association, whose Chairman of Council at the time started informal discussions to establish machinery whereby the views of consultants and specialists could be heard. The Joint Committee was concerned not only with remuneration but with policy and the development of the health services. Since it was set up its components, the representatives of their own committee and of the royal colleges and corporations, had worked in the greatest harmony, and he trusted that the spirit in which the Joint Committee had been initiated would be borne in mind and that they would continue to build upon its past achievements.

Journal Criticized

At the end of the meeting Mr. LANGSTON remarked that a leading article in the *British Medical Journal* had been critical of the agreement reached on the remuneration of hospital medical staff, and he feared that some people might regard this as the official view of the British Medical Association, which it was not. Mr. NORTHFIELD said that the leading article was reprehensible and irresponsible, and the Chairman added that it contained substantial factual inaccuracies.

Questions Answered

Building Outlay

Q.—The inspector of taxes has refused to agree to an allowance for depreciation of a building erected, at my own cost, on a plot of land under a 21-year lease, and used for a waiting-room for patients. No compensation for the building may be claimed at the end of the lease, and in fact I may be required to restore the land to its former state, so that the money spent on the building will be lost. Is the inspector of taxes justified in his refusal?

A.—The expenditure is undoubtedly capital outlay, and the Income Tax Acts do not provide any form of allowance of that expenditure. The building is clearly outside the category of "machinery and plant" and is not within the definition of an "industrial building."

Car Depreciation

Q.—I am a whole-time consultant and have never attempted to claim tax relief for depreciation of my car. If I purchase a new car would normal annual depreciation be allowed or is depreciation supposed to be covered by the travelling allowance, which averages about 7½d. per mile, whereas the true cost is almost double?

A.—It is understood that the mileage allowances paid by employing authorities are intended to cover depreciation and

Correspondence

Remuneration of Hospital Medical Staff

SIR.—What with weighting, allowances for travelling time, and for duties at hospitals with which we are not in sessional contract, increments, statutory deductions and the like, most of us accept our salary cheque and leave its calculation to the regional treasurer. It appears to me that it is impossible for part-time consultants to forecast the effect of the recent award on their pay, and that no good purpose is to be served by bursting into denunciation at this stage. Whilst comment may well be withheld meanwhile, my view is that for men to accept the admittedly thankless office of negotiators and then accept without prior reference to their fellows an award which demands a saving clause to the effect that as a result no one shall suffer loss is to invite well-merited criticism.

Let us therefore hold our hands—and our pens and tongues—until we can talk facts and not surmises. We know our gross pay for the month of March. Soon we shall know our gross pay as the result of the award. May I suggest that the B.M.A. circularize all members of hospital staffs and ask them to return (a) their grade, (b) their sessional duties, (c) their emoluments prior to the award, (d) their pay for the month of March, and (e) their gross and net pay for the first month during which the effects of the award are shown on their pay slips? Let the B.M.A. then collate and publish these figures.

If, as a result of analysis, the award is to our advantage, let us be gratefully silent. If not, then let us leave our affairs in the hands of the Association with instructions to bring their propaganda department into the fullest and most militant blast.—I am, etc.,

Hull.

R. D. MILLER.

SIR.—May I, as a junior consultant, add my protest against these ludicrous and insulting salary increases? May we hope that the storm they have raised among consultants young and old will ensure that they are not final, and that those to whom we have entrusted not only our own future but the future of our profession will be able to convince those in authority that the increases are unrealistic?

We can all write letters to your eminent journal, but it seems that we can do very little to help ourselves, and, even more sadly, it seems that our seniors are also powerless. Surely there is some strength in the profession still. Cannot we refuse to accept these increases and insist on reopening negotiations? We could not be worse off than we are left now, at least before we had hope.—I am, etc.,

London, W.1.

DOROTHEA HALSTEAD.

SIR.—"Divide and rule" has been the policy of many regimes from the time of the Roman Empire and probably before it. This policy, whether adopted intentionally or not in the present case, has undoubtedly been so far successful. Junior hospital staff, part-time consultants, whole-time consultants, S.H.M.O.s, etc., have all made pleas for special consideration for their own particular group. The G.P.s have been divided off from the specialists right from the beginning. The time has now come for us to cease our internecine strife, and to realize that we are all in the same box, the only solution to the problem which will satisfy everyone being a rigid implementation of the recommendations of the Spens Committee. Notwithstanding that those recommendations were not embodied in our contracts, the fact remains that there was a gentlemen's agreement between the medical profession and the government of the day that such recommendations would be carried out.

I am sure that everyone feels very grateful to Sir Russell Brain and the members of the Negotiating Committee for their efforts on our behalf, and sympathizes with their

are so regarded by the inland revenue officials. So far as income tax is concerned, the matter is governed by the statutory rule which requires expenses to be incurred "wholly, exclusively, and necessarily in the performance of the duties." If the amount of the expenses (including the appropriate depreciation allowance) exceeds the amount of the mileage allowance the taxpayer is entitled to claim the excess as an expense. But it should be borne in mind that the rule quoted above is strictly construed, and that for instance the expense of travel between residence and the main place where the work is done has been held not to be incurred "in the performance of the duties," and also that if a car is used which is of higher standard or power than is "necessary" some proportion of the expense incurred will be disallowed. Experience suggests that it is very difficult to convince one authority (the inland revenue) that an expense allowance given by another authority is inadequate to comply with the terms of the income-tax rule.

Treatment of Tuberculosis in Switzerland under N.H.S.

Q.—Are there any facilities available under the N.H.S. for the treatment of cases of tuberculosis in Swiss sanatoria, and, if so, which patients are considered suitable for such treatment?

A.—There are facilities available under the National Health Service for treatment of cases of tuberculosis in Switzerland. Particulars in each hospital region are obtainable from the senior administrative medical officer, who should be approached initially. Adult cases appropriate for this type of treatment go to Switzerland. Children are sent to Denmark by arrangement with the Anglo-Danish Society.

Wife's Remuneration

Q.—I allow my wife a certain sum every week for answering the telephone at my residence, as distinct from the partnership surgery at the senior partner's house. My accountant tells me that the inspector of taxes requires that this sum, which I claim as an allowance for income-tax purposes, should be included in the practice accounts. Is this necessary?

A.—The Income Tax Acts require partnership profits to be assessed in one sum on the partners jointly. In the case of a medical firm the assessment is usually calculated by deducting from what may be called the "surgery" profit by deducting from what may be called the "surgery" profit the allowable expenses of each partner. Presumably what the questioner has done in the past is to deduct in his return his wife's remuneration from his share of the firm's profit, but if effect has been given to the claim it can only have been in the working out of the partnership assessment. It seems that it should make no difference whether the wife is regarded as employed by the questioner or by the firm, provided that the tax assessed on the firm is correctly allocated between the partners.

REGISTRARS GROUP COUNCIL DINNER

The Registrars Group Council's annual dinner will take place at the Connaught Rooms, Great Queen Street, Kingsway, London, W.C.2, on Friday, May 14, at 7 for 7.30 p.m. (dress informal). Any senior registrar or registrar who would like to attend the dinner and meet the members of the Group Council will be most welcome, and should notify the Secretary of the Association as soon as possible. The cost will be £1 (exclusive of wines and gratuities).

AMERICAN DELEGATE

Dr. R. L. MacCormack, of Wisconsin, U.S.A., has been elected to represent the American Medical Association at the B.M.A. Annual Meeting in Glasgow from July 5-9.

natural desire to produce some tangible results from their labours, especially in the face of increasingly urgent demands for settlement. The absence of any proposal to make retrospective payment is a poor reward for the patience displayed by that Committee, and the profession as a whole, in the attempts to settle their differences in a constitutional manner. Any settlement should surely take into account the time spent in the negotiation, otherwise the use of "Molotov" to clog the negotiating machinery is inevitable.

Are we being unreasonable or avaricious in our demands? We are certainly open to such accusations, and are therefore placed in a very invidious position *vis-à-vis* the general public and our own consciences. Why then not do the reasonable thing and submit the whole matter to an impartial judge? Refusal of one party to agree to this can surely mean only one thing—namely, that it believes itself to be in the wrong.—I am, etc.,

Birmingham, 15.

ROBERT EVANS.

Remuneration in the Public Health Service

SIR,—I have watched with mixed feelings the correspondence on pay in the hospital service, but have withheld any contribution of my own until the negotiations reached a conclusion. The burden of this correspondence has been the difficulty of keeping the wolf from the door, and the unfairness of the Minister of Health in refusing to give the same betterment factor that general practitioners secured in the Danckwerts award. No doubt this correspondence has been conducted in good faith, and under a sense of grievance, because general and hospital practitioners alike secured the promise of Spens conditions, including betterment. There can be no doubt, either, that general practice and hospital medical practice now provide careers with great financial possibilities for able and ambitious practitioners.

May I therefore point out that general and hospital practitioners have acquiesced in very inferior rates of pay for doctors in public health? The first error was to fail to secure the promise of Spens conditions for the public health service. This has led to a very raw deal for that branch, in spite of a valiant but belated effort by the B.M.A. before the Industrial Court. In Scotland, for instance, there are about 260 doctors in public health appointments. Of these, some 65 have £1,400 per annum or more, and about a dozen of these 65 have £2,000 per annum or more. There is therefore no career in public health comparable with the opportunities in general or hospital practice. Yet the public health training follows a pattern identical with that of the consultant—undergraduate training, postgraduate hospital posts, an additional qualification, followed by posts of gradually increasing responsibility. If, therefore, it is necessary for a doctor to follow a specialist training to do public health, surely it is necessary to offer him the same financial reward as hospital practice offers. Otherwise public health does not justify, as a career, the time and money spent on the training.

I am therefore putting forward a plea for more active support of the Public Health Service by the B.M.A. I call for a policy declaration that pay in public health should be brought into line with that of consultants and specialists. And I am asking that this should be done immediately—very soon it will be too late. If something on these lines is not done at once, one effect might well be a substantial breakaway from the B.M.A. by the public health doctors, with consequent loss of subscriptions. Another might be that the Society of Medical Officers of Health would disavow the B.M.A. as the body entrusted with pay negotiations. Hitherto the B.M.A. has acted for the Society in order to present a united medical front. This unity has led to a good deal of hardship to the public health doctors, who might well feel they could do better on their own—*divide et impera*. Can't you imagine an ambitious politician throwing a spanner in the works with the catch-phrase "What's good enough for the M.O.H. is good enough for the Consultant"? I repeat, therefore, my earnest plea for the whole-hearted support of the Association. We in public

health are doctors, and have done our best to uphold the interests of the profession. Is it too much to ask for reciprocal treatment by our professional brethren?—I am, etc.,

Elgin

I. C. MONRO.

Armed Forces Medical Officers' Pay

SIR,—I was interested to see the rates of pay for Civil Service medical officers in the basic grade (*Supplement*, April 24, p. 194). It may be of interest to readers to see the following tables, which compare the basic pay and the basic pay plus maximum marriage allowance of a medical officer in any of the armed Forces with the pay of a Civil Service M.O. of the same age.

Age	Civil Service Basic	Service M.O. Basic	Service M.O. Basic + Marriage	
35	£ 1,500	£ s. d. 1,222 15 0	£ s. d. 1,560 7 6	Lt. Cdr., Maj.-Sqn. Ldr. (4 years in rank)
36	1,575	" " "	" " "	" " "
37	1,650	1,277 10 0	1,615 2 6	" " "
38	1,725	" " "	" " "	" " "
39	1,800	" " "	" " "	" " "
40	1,900	1,332 5 0	1,669 17 6	Cdr., Lt. Col., W. Cdr. (2 years in rank)
41	2,000	" " "	" " "	" " "
42	2,100	1,441 15 0	1,825 0 0	" " "

It will be seen that the armed Forces M.O. is £60 better off at age 35 if he has the good fortune to be married; at age 42 he is £275 worse off if he is married, and lags £658 behind if he is unmarried. I have no doubt that these comparisons are already being made by the appropriate B.M.A. committee. It is to be hoped that they will also have the opportunity of putting these figures to the Waverley Committee which has been appointed "to review the arrangements for providing medical and dental services for the armed Forces at home and abroad in peace and war; and to make recommendations."

Whatever other factors may have some bearing on the present grave manning situation in the armed Forces, there can be no doubt that basically no doctor is going to be persuaded to undergo the many inconveniences of discipline, frequent movements all over the world, and time rather than merit promotion, without a financial reward at least comparable on a reasonable scale with the salaries of his colleagues in other spheres of medicine.—I am, etc.,

REGULAR MEDICAL OFFICER.

A Doctor Looks at Crime

SIR,—Dr. Oliver Gray's paper (*Supplement*, April 24, p. 179) is of great interest, not only for what it says but for what it leaves unsaid. The main theme is the old one of heredity and environment, and the chief remedy for crime appears to be education. It is implicit in Dr. Gray's context that he means education as moral learning. Clearly, a man may be a leading mathematician or a nuclear physicist, the product of half a lifetime of modern education, and have no more sense of right and wrong than he had when he learned the alphabet. Dr. Gray looks to education to form character—i.e., the ability to recognize right and wrong and the strength to resist temptation to do wrong. But who decides what should be taught about moral values? I doubt whether the director of education for Moscow would reach full agreement with Miss Florence Horsbrugh in this matter.

We thus come to the very kernel of our dilemma. Western civilization is running on the failing momentum of Christian morality, and the generally accepted idea that we can keep the morality and abandon the faith is the most pathetic of modern delusions. This should surprise nobody. The old belief that man was made in the image of God, that materialism was spiritual death, and that temptation should be resisted, have given place to the theory of evolution, dialectical materialism as a faith, the belief that repression of natural instincts is harmful. The attempt to run these horses in harness with old-fashioned religious morality is

what causes the laughter known as Homeric. It may well be that man needs a religion and a faith; that without either he is in a vacuum which will in the end be filled. A faith he must have. It may be communism, devil worship, or a hundred others. It was rash to abandon the old religion without having something ready to put in its place—i.e., a better religion, more up to date, more in keeping with Darwin and Freud, elastic, expandable, constantly conforming to the latest science, a common religion for the age of the common man. Anyone who is keeping this new religion up his sleeve because it still lacks the finishing touches or because there are one or two dark places of the soul unilluminated by science, should be warned that time is running short.

Dr. Gray deserves our thanks for so ably and subtly posing the problem. His final conclusion that every time conscience is flouted we kiss the devil's feet is striking. God may have been blotted out of the modern curriculum, but it is cheering to know that the devil is still alive.—I am, etc.,

R. W. COCKSHUT.

Hendon.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonels H. R. Sheppard, O.B.E., and H. C. M. Walton have retired on retired pay.
Lieutenant-Colonel T. McEvel has retired with a gratuity.
Majors W. M. McCutcheon and W. J. A. Craig to be Lieutenant-Colonels.
Captains L. J. F. Warnants and A. O. Nichols to be Majors.
Short Service Commissions.—Major M. S. C. Rooney has retired with a gratuity. Captains M. S. Howe, M.C., and T. I. Palmer to be Majors.

REGULAR ARMY RESERVE OF OFFICERS

Colonel (Honorary Brigadier) V. J. Perez, O.B.E., late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the R.A.R.O.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel E. G. Dalziel, M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.
Majors (Honorary Lieutenant-Colonels) L. C. F. Chevens and C. A. G. Duffy, having attained the age limit of liability to recall, have ceased to belong to the R.A.R.O.
Captain (Honorary Major) V. Bennett has ceased to belong to the R.A.R.O.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS
Lieutenant-Colonels (Acting Colonels) J. A. Hooker, T.D., and G. T. Hanky, O.B.E., T.D., to be Colonels.
Majors (Acting Colonels) E. J. Sibley, F. W. A. Warren, O.B.E., T.D., and P. R. Mitchell, O.B.E., T.D., to be Colonels.
Lieutenant-Colonel F. J. Manning, T.D., from T.A.R.O., to be Lieutenant-Colonel.
Majors (Acting Lieutenant-Colonels) A. H. Charles, T.D., J. A. Ross, M.B.E., S. T. Anning, G. M. Warrack, D.S.O., O.B.E., T.D., G. F. Edwards, M.B.E., A. McC. Campbell, D.S.O., O.B.E., T.D., K. W. N. Palmer, T.D., and E. M. Elmhirst, T.D., to be Lieutenant-Colonels.
Major A. J. Webster, T.D., to be Lieutenant-Colonel.
Captain B. Holden to be Lieutenant-Colonel.
Captain I. P. Todd, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.
Captain W. A. H. Stevenson, T.D., from T.A.R.O., to be Captain, and has been granted the acting rank of Major.
Captain F. S. Mooney to be Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS
Colonel J. F. Fraser, T.D., having exceeded the age limit, has retired, retaining the rank of Colonel.
Lieutenant-Colonel (Brevet Colonel) O. G. Prosser, M.C., from T.A.R.O., to be Acting Colonel.
Lieutenant-Colonel (Acting Colonel) W. D. F. Lytle, O.B.E., T.D., to be Colonel.

Lieutenant-Colonel E. H. Evans has been granted the acting rank of Colonel.

Lieutenant-Colonels H. D. Chalke, O.B.E., T.D., and M. J. Lindsey, M.C., T.D., to be Brevet Colonels.

Major (Honorary Colonel) H. H. Kenshole, D.S.O., T.D., from T.A.R.O., to be Major, and has relinquished the honorary rank of Colonel.

Major (Acting Lieutenant-Colonel) J. A. Dudgeon, M.C., T.D., has been granted the acting rank of Colonel.

Major (Acting Lieutenant-Colonel) R. W. Biagi, M.B.E., to be Lieutenant-Colonel.

Major (Honorary Lieutenant-Colonel) M. I. Silverton, from T.A.R.O., to be Major, relinquishing the honorary rank of Lieutenant-Colonel, and has been granted the acting rank of Lieutenant-Colonel.

Major J. B. Mackay, M.B.E., T.D., has been granted the acting rank of Colonel.

Major T. F. Redman to be Lieutenant-Colonel.

Major M. N. S. Duncan has been granted the acting rank of Lieutenant-Colonel.

Major K. C. MacKellvie, from T.A.R.O., to be Major.

Captain (acting Lieutenant-Colonel) D. L. Nicholls to be Major.

Captains (Acting Majors) D. L. Nicholls, A. J. Bathurst, and C. O. Carter have been granted the acting rank of Lieutenant-Colonel.

Captains (Acting Majors) J. C. Fulford and A. A. Guild to be Majors.

Captains D. J. Ellison, G. A. Gresham, R. G. Tasker, A. E. W. Gregson, G. D. Teague, and G. J. Hadfield have been granted the acting rank of Major.

Captains R. W. J. Naismith, H. Grylls, R. M. S. Parker, and F. G. Morse to be Majors.

Lieutenant (War Substantive Major) J. L. D. Roberts, from Emergency Commission, to be Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel A. Swindale, C.B.E., T.D., from the Active List, to be Colonel, and has been granted the honorary rank of Brigadier.

Colonels D. P. Holmes, T.D., and G. E. Parker, D.S.O., from Active List, to be Colonels.

Lieutenant-Colonel (Brevet Colonel) M. J. Lindsey, M.C., T.D., from the Active List, to be Lieutenant-Colonel (Brevet Colonel).

The notification concerning Lieutenant-Colonel M. J. Lindsey, M.C., T.D., in a *Supplement to the London Gazette* dated February 16 has been cancelled.

Lieutenant-Colonel F. D. Murphy, O.B.E., from Active List, to be Lieutenant-Colonel.

Majors (Honorary Colonels) N. Heath, T.D., and R. K. Hanlin, T.D., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O.

Majors W. F. Mair, T.D., and J. C. Fulford, from Active List, to be Majors.

Captain (Honorary Major) R. Selby, having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Captain (War Substantive Major) C. E. Sykes, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., and has been granted the honorary rank of Lieutenant-Colonel.

REGULAR ARMY: EMERGENCY COMMISSIONS

ROYAL ARMY MEDICAL CORPS

Lieutenant (War Substantive Captain) D. R. Brown has relinquished his commission, and has been granted the honorary rank of Major.

ROYAL AIR FORCE

Air Commodore E. C. K. H. Foreman, C.B.E., has retired.

Group Captain J. Hill to be Air Commodore.

Wing Commander K. L. G. Nobbs, G.M., has retired on account of medical unfitness for air force service.

Wing Commanders A. W. Smith, L. E. A. Dearberg, and H. E. Bellringer to be Group Captains.

Wing Commander G. H. J. Williams has retired.

Squadron Leaders A. C. Camm and M. W. L. White to be Wing Commanders.

Flight Lieutenants T. C. D. Whiteside, D. G. V. Whittingham, I. M. Perkins, W. J. L. Harries, J. M. Cuthill, P. D. Sutton, J. A. Wheeler-Bennett, C. G. White, P. J. R. Nichols, S. J. Krister, R. E. Woolley, G.M., I. H. Mercer, T. C. Nicol, R. C. Robb, and W. E. Hassan to be Squadron Leaders.

Flight Lieutenant J. M. Cuthill has been transferred to the Reserve, retaining the rank of Squadron Leader.

Flight Lieutenant C. E. Law has relinquished his Short Service Commission on account of medical unfitness for air force service, retaining the rank of Squadron Leader.

Flying Officer H. B. Kelly to be Squadron Leader.

F. L. A. Vernon, P. W. Robertson, and D. O. Williams to be Squadron Leaders (Permanent).

Woman Medical Officers (Employed with the R.A.F.).—Flight Lieutenant B. M. Parker to be Squadron Leader. Marie D. McCabe to be Squadron Leader.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). The only charge made is for postage of books. A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Marocco, N.: *Le Infiltrazioni Anestetiche in Urologia*. 1953.
 Marois, M.: *Contrôle Hormonal de la Ceinture Pelvienne et Endocrinologie Sexuelle*. 1953.
 Martius, H.: *Die Kreuzschmerzen der Frau*. 4. Auflage. 1953.
 Mela, B.: *Manuale di Stomatologia*. 1953.
 Mitchell-Heggs, F.: *Hernia: A Manual for Truss Fitters*. 1953.
 Molino, F.: *Manuale di Medicina del Lavoro*. 1953.
 Montgomery, G. L.: *Pathology for Students of Dentistry*. 1953.
 Moskov, V. N.: *Liečebná Teložycha*. 1952.
 Myles, M. F.: *Textbook for Midwives*. 1953.
 New York Heart Association, Criteria Committee: *Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Blood Vessels*. 1953.
 Nichtenhauser, A., et al.: *Films in Psychiatry, Psychology, and Mental Health*. 1953.
 Noble, F. W.: *Electrical Methods of Blood-pressure Recording*. 1953.
 Nonidez, J. F., and Windle, W. F.: *Textbook of Histology*. Second edition. 1953.
 Oberling, C.: *The Riddle of Cancer*. Revised edition. 1952.
 Petrie, G. F.: *British Medical Science and Practice: An Anthology*. 1953.
 Piets, G., and Singer, M. B.: *Shame and Guilt: A Psychoanalytic and a Cultural Study*. 1953.
 Polizzi, A.: *Fisiologia della Masticazione nell'Uomo*. 1953.
 Porot, A.: *Les Toxicomanies*. 1953.
 Portis, S. A.: *Diseases of the Digestive System*. Third edition. 1953.
 Powdermaker, F. B., and Frank, J. D.: *Group Psychotherapy: Studies in Methodology of Research*. 1953.
 Puestow, C. B.: *Surgery of the Biliary Tract, Pancreas, and Spleen*. 1953.
 Sammis, F. E.: *The Allergic Patient and His World*. 1953.
 Schenck, M.: *Grundriss der physiologischen Chemie*. 1953.
 Schlosser, R. O., and Gehl, D. H.: *Complete Denture Prosthesis*. Third edition. 1953.
 Schröder, F.: *Kosmetische Chirurgie*. 1953.
 Schwenzer, A. W.: *Die Erythroblastose im Lichte der neuen Rh-Forschung*. 1953.
 Scott, G. R.: *The Quest for Youth: A Study of all Available Methods of Rejuvenation*. 1953.
 Scuderi, G.: *Fisiopatologia del Ricambio Idrico della Cornea*. 1953.
 Sellow, G., and Pepper, M. F.: *Nursing of Children*. Seventh edition. 1953.
 Selye, H.: *Einführung in die Lehre von Adaptationssyndrom*. 1953.
 Serafini, U.: *La Polinosi*. 1952.
 Smart, M., and Smart, R.: *Introduction to Family Relationships*. 1953.
 Stopes, M.: *Birth Control To-day*. Tenth edition. 1953.
 Stopes, M.: *Enduring Passion*. Seventh edition. 1953.

Association Notices

Diary of Central Meetings

MAY

- 10 Mon. Subcommittee on Diagnosis of Eye Diseases, Ophthalmic Group Committee, 2 p.m.
 11 Tues. Joint Consultants Committee (at Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.), 10.30 a.m.
 12 Wed. Central Consultants and Specialists Executive, 12 noon.
 12 Wed. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
 12 Wed. Medico-Legal Subcommittee, Central Consultants and Specialists Committee, 4.30 p.m.
 13 Thurs. Physical Medicine Group Committee, 2 p.m.
 14 Fri. Registrars Group Council, 2 p.m.
 17 Mon. Joint meeting of B.M.A. and British Veterinary Association, 4 p.m.
 18 Tues. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 2 p.m.
 18 Tues. Full-time Non-professional Medical Teachers and Research Workers Group Committee, 2 p.m.
 19 Wed. Conference of Honorary Secretaries, 10.30 a.m.
 20 Thurs. G.M.S. Committee, 10.30 a.m.
 20 Thurs. Radiologists Group Committee, 12 noon.
 20 Thurs. Organization Subcommittee, Central Consultants and Specialists Committee, 2 p.m.
 20 Thurs. Tuberculosis and Diseases of the Chest Group Committee, 2.30 p.m.
 21 Fri. Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.
 21 Fri. Ophthalmic Qualifications Committee, 1.45 p.m.
 21 Fri. Medical Witnesses Subcommittee, Private Practice Committee, 2 p.m.
 21 Fri. Ophthalmic Group Committee, 2 p.m.
 21 Fri. Overseas Committee, 2 p.m.
 28 Fri. Conference of Regional Officers, 12 noon.

JUNE

- 2 Wed. Film Committee, 11 a.m.
 9 Wed. Central Ethical Committee, 12 noon.
 10 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.

JULY

- 1 Thurs. Annual Representative Meeting (at Glasgow), 10 a.m.
 2 Fri. Annual Representative Meeting (at Glasgow), 9.30 a.m.
 3 Sat. Council (at Glasgow), 9 a.m.
 3 Sat. Annual Representative Meeting (at Glasgow), 10 a.m.
 5 Mon. Annual Representative Meeting (at Glasgow), 10 a.m.
 5 Mon. Annual General Meeting (at Glasgow), 12.30 p.m.
 5 Mon. Council (at Glasgow), at conclusion of A.R.M.
 5 Mon. Adjourned Annual General Meeting and President's Address (at Glasgow), 8.15 p.m.

Branch and Division Meetings to be Held

- ALDERSHOT AND FARNHAM DIVISION.—At Aldershot Civil Infectious Diseases Hospital, Wednesday, May 12, 8.30 p.m., meeting. Two films and a discussion.
 BURNLEY DIVISION.—At Sparrow Hawk Hotel, Burnley, Friday, May 14, 8.30 p.m., annual general meeting.
 BURTON-ON-TRENT DIVISION.—At Stanhope Arms Hotel, Bretby, Burton-on-Trent, Tuesday, May 11, 7.45 p.m., dinner, followed by annual general meeting. Address by Dr. R. Mitchell: "The General Practitioner and the Health Visitor."
 CAMBERWELL DIVISION.—At Dulwich Hospital, East Dulwich Grove, London, S.E., Tuesday, May 11, 8.30 p.m., annual meeting and Guest Night. Talk by Mr. G. Salter (Detective Superintendent, Police Laboratories, Scotland Yard): "Methods of Detection—Can Crime be Hidden?" Members' wives and friends are invited.
 CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, May 11, 8.30 p.m., annual general meeting. Film: "Senile Obliterative Arteritis of the Leg" (Its Course, Diagnosis, and Management).
 DONCASTER DIVISION.—At Danum Hotel, Doncaster, Friday, May 7, 8 p.m., annual meeting.
 EAST HERTS DIVISION.—At Hertford County Hospital, Thursday, May 13, 8.30 p.m., annual general meeting.
 EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, May 13, 7.30 p.m., dinner; 8.45 p.m., business meeting.
 GREENWICH AND DEPTFORD DIVISION.—At Miller General Hospital, Greenwich High Road, S.E., Wednesday, May 12, 8.30 p.m., annual general meeting.
 GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, May 13, 8.15 p.m., general practitioners' clinical meeting.
 HAMPSHIRE DIVISION.—Thursday, May 13, 8 for 8.30 p.m., dinner and tour of London Airport.
 HASTINGS DIVISION.—At Royal East Sussex Hospital, Hastings, Tuesday, May 11, 8.15 p.m., annual meeting. Film: "Polio—Diagnosis and Treatment."
 KINGSTON-ON-THAMES DIVISION.—At Nurses' Home, Kingston Hospital, Wotton Avenue, Kingston-on-Thames, Tuesday, May 11, 8 for 8.30 p.m., annual general meeting. Film by Professor Ian Aird: "Conjoined Twins of Kano." (Sound and colour).
 MARLBORNE DIVISION.—At Old Library, B.M.A. House, Tavistock Square, London, W.C., Tuesday, May 11, 5 p.m., general meeting. Discussion: "The Restoration of the Right to Buy and Sell the Goodwill of Medical Practices." Opening speakers, Dr. E. C. Warner, and Dr. F. G. Tomlins.
 METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Wednesday, June 2, 3 p.m., annual general meeting. President's address by Dr. D. F. Hutchinson.
 NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, May 11, 8.45 p.m., meeting. B.M.A. Lecture by Mr. W. W. Davey: "Is Your Gastroscopy Really Necessary?" Members of Enfield and Whittington Hospital are welcome. The lecture will be illustrated by lantern slides and other demonstrations.
 SCUNTHORPE DIVISION.—At Blue Bell Hotel, Scunthorpe, Wednesday, May 12, 8.30 p.m., general meeting.
 SHEFFIELD DIVISION.—At University Medical Library, Wednesday, May 12, 8 p.m., meeting.
 SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, May 14, 9 p.m., clinical meeting.
 TOWER HAMLETS DIVISION.—At St. George-in-the-East Hospital, Raine Street, Wapping, E., Friday, May 14, 8 p.m., clinical meeting.
 WIGAN DIVISION.—At Haigh Hall, Thursday, May 13, 8.15 p.m., annual general meeting.
 WILLESDEN DIVISION.—At Rehabilitation Department, Willesden General Hospital, Harlesden Road, N.W., Friday, May 7, 9 p.m., meeting. Discussion: "The Health Visitor and the General Practitioner." The annual general meeting will follow.

Meetings of Branches and Divisions

- CAMBRIDGE AND HUNTINGDON DIVISION
 At the annual general meeting on April 9, 1954, the following officers were elected for 1954-5:
 Chairman.—Dr. A. Brown.
 Vice-chairman.—Dr. C. W. Walker.
 Secretary and Treasurer.—Dr. J. A. Sadler.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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British Medical Association

PROCEEDINGS OF COUNCIL

SCHEME FOR RESTORATION OF "GOODWILL"

Amending Acts Committee's Proposals

A meeting of the Council was held on the afternoon of May 5 and the morning and afternoon of May 6. Dr. E. A. GREGG presided.

A warm welcome was given to the President of the Association, Mr. J. W. Tudor Thomas, on his return from his visit to the Middle and Far Eastern Branches. The CHAIRMAN said that the Council and the whole Association were very grateful to Mr. Tudor Thomas for undertaking a journey which must have meant great personal inconvenience in order to discharge his duties to the Association. A new member of Council was welcomed in Dr. C. Belfield Clarke, who had been elected to fill the vacancy in the representation of the West Indian Branches.

The members stood in silence as a tribute to the late Dr. Colin D. Lindsay, whose death was recently announced, and who was President of the Association at the Plymouth Meeting in 1938.

The congratulations of the Council were accorded to two of its members—Dr. Mary Esslemont, who has been chosen to receive the Hon.L.L.D. of the University of Aberdeen, and Dr. H. D. Chalke, the first recipient of the Mitchiner Medal of the Royal College of Surgeons for distinguished services to military medicine; also to Professor Bradford Hill, not a member of Council but one who had been closely connected with the Association's work, on becoming a Fellow of the Royal Society.

The Council discussed the duration of future Council meetings. It appeared that one additional Council meeting in the year was required in order to cope with the increasing volume of business, and it was decided that, in addition to the two short meetings at the Annual Meeting, five meetings should be held in the year.

After inspecting a coloured drawing of the proposed Coat of Arms for the Association, the device, which includes the figures of Hippocrates and Harvey, was approved. The CHAIRMAN said that they were specially grateful to Dr. S. F. L. Dahne and Dr. O. C. Carter for their work in connexion with this matter. On the motion of Dr. DAHNE, seconded by Dr. F. M. ROSE, it was agreed that the members of Council should offer to present the Coat of Arms to the Association, and that it be submitted to the Representative Body.

The Council considered at length the scheme prepared by the Amending Acts Committee for the restoration of the right to buy and sell goodwill, together with a statement, also prepared by the Committee, on the advantages and disadvantages of the scheme. Dr. H. H. D. SUTHERLAND, chairman of the Committee, introduced the subject. He acknowledged the great help which the Committee had received from certain co-opted members—Drs. A. Brown, S. F. L. Dahne, A. B. Davies, I. D. Grant, and R. Hale-White. Mr. A. N. Dixon, general manager of the Medical Insurance Agency, had also assisted the Committee on the financial aspects of the scheme, and Mr. Leigh Taylor, solicitor, on the legal aspects.

Opening an interesting debate, Dr. W. WOOLLEY said that, apart from the pros and cons of this particular scheme, the first decision the Council should take was whether or not it should give a lead to the Representative Body. If it was not going to give a lead there was no reason to embark upon a discussion of the document. The Council must say whether or not it believed this to be a workable scheme.

The CHAIRMAN said that the Representative Body would expect a lead from the Council. They must first look at the statement and then make a decision as to whether they should commend the scheme.

Dr. VAUGHAN JONES asked how the Committee had arrived at the figure of 1.25 years as representing the purchase price at or below which practices producing smaller incomes than £1,750 would probably remain. This figure, he said, had never been suggested before, and, having regard to the fact that the purchaser would be buying a practice with a larger stable portion than in pre-N.H.S. days, it seemed to him that the figure was ridiculously low. Dr. SUTHERLAND explained how the figure had been arrived at as a result of calculations by a co-opted member of the Committee, Dr. A. B. Davies, who had taken into account the effect of the Dankwerts award, but he himself thought that 1.5 years might be nearer the mark. Dr. TALBOT ROGERS said that the original figure was 1.57, but it was considered that it could be reduced to 1.25 in view of the

Danckwerts award. Dr. VAUGHAN JONES still maintained that 1.25 was entirely illusory.

Dr. FRANK GRAY said that one of the advantages mentioned in the scheme was that the restoration of goodwill would be advantageous to the Government in relieving it of a substantial portion of the £66m. set aside under the Act to compensate practitioners for the loss of their right to sell their goodwill. But he thought that to this should be added the corresponding disadvantage from the Government's point of view that it would be left to pay the remaining portion of the £66m. in return for nothing whatever.

Dr. A. V. RUSSELL: Except the existence of a more contented profession.

A Lead to the Representative Body

Dr. E. C. DAWSON then moved the following resolution:

That the scheme as presented by the Amending Acts Committee is the best that can be devised in present conditions, but that in view of (a) the practical difficulties of implementing the scheme, (b) the high capital outlay required by young practitioners to launch into practice, (c) the divided opinion in the profession as to the desire to introduce such a scheme, and (d) the known political resistance to such a scheme, the Council recommend to the Representative Body that no further action be taken.

Dr. S. F. L. DAHNE, opposing the motion, said that freedom was the most important thing in the world, and he did not think general practitioners would ever get back their freedom unless they got back their goodwill. There were far more complicated issues involving the return of some form or other of goodwill now being negotiated by the present Government in other connexions than this relatively simple one concerning medical practices. Why should they not have such courage as was exhibited by the profession in Australia in standing up to any political party on this issue?

Dr. D. F. HUTCHINSON, who seconded Dr. Dawson's motion, said that there was no freedom in this scheme for future doctors. If the scheme came into force as from an appointed day three years hence no man thereafter could go into practice in the manner in which present-day medical students had been given to understand that they could enter. There would be freedom for doctors at present in practice, but no freedom for their successors, and the freedom of their successors was perhaps more important than their own.

Dr. TALBOT ROGERS said that the General Medical Services Committee had studied the proposals and the statement. Any scheme for the restoration of the right to buy and sell goodwill must be examined in the light of present-day economic circumstances, and his Committee believed that a return to the buying and selling of goodwill had become economically impossible to-day. If the purchase of practice goodwill became compulsory to the future generation of doctors who were now students—a generation who had taken up the study of medicine in the knowledge that they would not be required to enter practice by purchase—real hardship would be caused. Whilst wishing to pay sincere tribute to the constructive efforts of the Amending Acts Committee to produce a practical scheme, his Committee could not support the proposals. This view had also been expressed by the Assistants and Young Practitioners Subcommittee and by the British Medical Students Association, both bodies being vitally concerned with the question of entry into practice. Further, from the information contained in the financial memorandum which was appended to the scheme, the Committee had reached the firm conclusion that the very difficult economic circumstances which had developed since 1948, in addition to the many other practical difficulties involved, would render it impossible to carry out this or any similar scheme for the restoration of the sale and purchase of goodwill. Dr. Rogers added that the General Medical Services Committee did not want to be regarded as opponents of the scheme. They would support a workable scheme if it were produced. But he thought they were unanimous in their inability to support the present scheme. At the same time should the Council or the Repre-

sentative Body decide otherwise his Committee would certainly look at the scheme in the light of the new situation and probably call a Special Conference.

The Scheme Defended

Dr. A. V. RUSSELL said that Dr. Hutchinson would have them believe that the Amending Acts Committee had been preparing a scheme to sell future generations of doctors into slavery. This was not a scheme which would deny liberty to individual doctors. Once again he must emphasize that, even as things were, nobody could go into practice without a certain amount of capital. It was true that those who were in practice when the Service came in in 1948 could say that at the end of their professional lives they would draw compensation. But there would be no compensation at all for the following generations; these younger doctors would be tenants in their practices however hard they worked and however much they built their practices up. They all knew of ailing and elderly practitioners who would like to get out of their busy urban practice and take up a small practice in some quiet part of the country, but they could not do it as things were now, they had to stay where they were planted. He believed that if the right to buy and sell goodwill were returned the profession would rise to true independence. For that reason alone certain sacrifices were worth making. Much had been made of the hardship for the young man in finding the necessary capital to purchase a practice. For his own part he did not believe it was a bad thing for a young man to have to work and save to acquire something of his own. Those who in the Amending Acts Committee had drawn up this scheme were sincere in their beliefs, and he begged the Council not to send this scheme to the Representative Body damned from the word "Go."

Dr. O. C. CARTER, in supporting the scheme, reminded the Council that in the days of the Negotiating Committee five points were formulated on which they were not prepared to give way. But they went one by one and the last to go was this right to buy and sell goodwill. He hoped that the scheme now submitted would be amended and improved.

Dr. G. W. IRELAND said that the arguments had rather centred on financial and political details. The question should be approached from a wider aspect. There were a great many people who did not share the views of the Amending Acts Committee but had as great a regard for freedom.

Dr. SUTHERLAND said that they were all aware of the practical difficulties in implementing the scheme, but he thought some of the difficulties had been overstressed. It had been stated that the British Medical Students Association was opposed to the scheme, but he thought that what the student body wanted was, not this particular scheme, but the setting up of another. They were not wholly on the side of the General Medical Services Committee.

After Mr. DAWSON had replied on the discussion on his motion, Dr. RUSSELL desired to move an amendment, but the Chairman said that it would not be fair to accept it at that stage. Dr. DAVID BROWN moved that the question be now put, and this was agreed to.

On Dr. Dawson's motion proposing to recommend to the Representative Body that no further action be taken there voted: In favour, 26; against, 16, with five abstentions.

REMUNERATION OF HOSPITAL MEDICAL STAFF Whitley Committee "B" Agreement

Dr. T. ROWLAND HILL, chairman of the Central Consultants and Specialists Committee, presented to the Council the recent Whitley Council agreement on increases in the remuneration of hospital medical staff. The details of the increases appeared in the *Supplement* of April 10 (p. 145), and a report of the discussion in the Central Consultants and Specialists Committee on May 8 (p. 228). Dr. Hill summarized the terms of the agreement and the events which had led up to it, following the lines of Sir Russell Brain's

exposition to the Central Committee. Dr. Hill also referred to the historical background, and in particular to the part taken by the Association in the organization of consultants and specialists. When the Central Consultants and Specialists Committee has been set up by the B.M.A. the need was felt for bringing in in some way the Royal Colleges and the Royal Scottish Corporations, and this was solved by the setting up of a Joint Committee, the initiative for which came from the Chairman of Council at that time. Informal discussions took place with a view to the interpretation of consultant opinion through the one channel. The Ministry was persuaded to recognize the Joint Committee. It was part of the agreement that where any one of the constituent bodies disagreed with the Joint Committee it had the right of individual approach to the Government. But the important thing was to keep a united front, and now for five or six years this had been done. It was felt that one constituent body should not override the others, and in these matters a reasonable compromise had been achieved.

Dr. ROWLAND HILL then proceeded to outline the circumstances which led up to the present agreement on remuneration. In 1949 consultants entered the N.H.S. on a permanent basis—on permanent contracts—and from that time onwards all legal rights in Spens disappeared. The consultants had been told that there could be no implication of anything corresponding to the Danckwerts award for general practitioners. The Management Side had refused to discuss practitioners. The betterment factor in relation to consultant pay. The only claim which could be discussed was one to restore the balance between general practitioner and consultant remuneration which had been upset by the Danckwerts award. Any appeal to arbitration was refused. A fresh examination by a court of inquiry might have been made, but, as Sir Russell Brain had said, this inquiry would not have concerned itself with cost-of-living betterment, it would have gone into much wider questions.

Immediately following the Danckwerts award the consultants had been concerned to get their moral right to betterment recognized, but had agreed not to press their claim at that moment. Later when the formal claim was presented they were met with these refusals. They were left, as Sir Russell Brain had said, to make a claim on its merits. Dr. Hill said he had forecast a four or five years' struggle, but they then heard the Government was prepared to give an immediate advance. Certain strings were attached to the new proposals, but after careful examination the Staff Side had come to the conclusion that these were not sufficient to warrant a decision against the proposals, which would have the effect of delaying a considerable improvement in remuneration for hospital medical staffs. He reminded the Council that this was not like a court award: they were not prevented from pursuing their full claims. Their position would not be weakened by the acceptance of this new proposal. The Staff Side would be free to reopen negotiations at any time; they were not precluded from reasserting their claim for betterment.

Could they rely upon Spens being continued? This question was put direct to the Minister of Health at a meeting between him and a group of consultants. Referring to an agreed minute of this meeting, Dr. Hill said that the Minister concurred fully with the importance attached to the Spens report; he, Dr. Hill, saw no reason why this should not be fully reported.

[The agreed minute reads as follows.—Ed., B.M.J.]
"SIR RUSSELL BRAIN asked the Minister to clarify some matters. He said that, leaving aside the actual level of remuneration, the profession felt that the Spens Report was in several other respects fundamental to the welfare of the Service. Could they rely upon its being continued? The Minister said that the only point he was now dealing with was the actual level of remuneration. On other matters he agreed fully with the importance attached to the Spens Report, which must continue to occupy the same place as before in any discussions the Government had with the profession about the consultant and specialist service."

What they had secured, continued Dr. Hill, was an immediate noncommittal *ad hoc* increase. There was no

finality in the agreement reached. As a permanent settlement it was thoroughly inadequate. But they had no legal rights under Spens, only a moral right. In response to a subsequent question, Dr. Hill agreed he should have said they had no legal right to betterment.

The following were the resolutions which had been adopted by the Central Consultants and Specialists Committee at its meeting the previous week:

(1) Bearing in mind the difficulties under which the negotiations have been conducted, the Central Consultants and Specialists Committee approves the action of the Staff Side representatives of Committee "B" of the Medical Whitley Council in agreeing to the terms of remuneration recently announced. In particular it notes the view of the Staff Side that the Spens report remains the yardstick of remuneration of hospital staffs, and that they hold themselves free to seek future revisions thereof.

(2) The Central Consultants and Specialists Committee in particular notes with satisfaction the intention of its Staff Side representatives to seek further improvement in the salary scales of S.H.M.O.s, and to press for payment of allowances and domiciliary consultation fees to whole-time officers.

Dr. Hill insisted that the door to further negotiation was left open. Spens, as the resolution stated, remained the yardstick. Although there were things which Spens had never taken into account, it embodied the principles which they would continue to seek to have established.

Criticisms of the Agreement

A succession of members criticized the terms of remuneration and the manner in which the negotiations had taken place, but all of them congratulated Dr. Rowland Hill on his presentation of the subject. Dr. A. V. RUSSELL confessed to a certain amount of uneasiness, especially with regard to the reply given by Sir John Hawton (see *Supplement*, p. 240), secretary of the Ministry of Health, to an inquiry by the secretary of the Association, in which he spoke deprecatingly of "a mere reference back to the contents of Reports which were produced years ago" (a reference to Spens). He felt that the agreement was unfortunate and might have equally unfortunate repercussions in other directions.

Dr. O. C. CARTER said that Dr. Rowland Hill's eloquent speech was an apology for what had been done. He was surprised to hear him refer to this agreement as a major triumph. The fact was, whether the Central Consultants and Specialists Committee liked it or not, Spens had been thrown to the four winds. As a correspondent in the *Journal* had said, what had been done meant the undermining of Spens. He urged that negotiations should be undertaken immediately to restore the Spens position. He went on to ask whether the Joint Consultants Committee under its terms of reference, which were to represent consultants and specialists and to negotiate for them, was entitled to agree to certain terms on their behalf. Negotiation was one matter and agreement another. He would have thought the Committee should have said, "We can do no more; we must go back to our constituent bodies." Dr. Rowland Hill had referred to a clause in the terms of reference whereby the constituent bodies which formed the Joint Committee could, in the event of disagreement, themselves make representations. But how could any individual constituent of the Joint Committee take exception to what was going on if it was not told of it? So far as he knew there had been complete secrecy from beginning to end. He was perfectly certain that this agreement would be received with the utmost dissatisfaction by members of hospital staffs, and, whatever might be the true position with regard to the responsibility of the Association in the matter, it would be judged to some extent responsible. The Central Consultants and Specialists Committee was an autonomous body, but he had supposed that no autonomous body would enter into an agreement which would have unfortunate repercussions on other sections of the

INTERNATIONAL RELATIONS

Dr. J. A. FRIDHAM, chairman of the International Relations Committee, proposed that the Council approve in principle the establishment of a supporting committee or league of friends for the World Medical Association. He said that some such proposal had been in his mind for several years, and the present was a particularly apposite moment to bring it forward, when there was special need to enhance the status of the W.M.A. in relation to the W.H.O. He reminded the Council that increasingly, through international bodies like the W.H.O. and the I.L.O., medicine was being brought into international politics, and it was necessary to know what was going forward. If the W.M.A. were not in existence the B.M.A. would require to have a section of staff to study these matters. The responsibility for countries without such a high standard of service as our own had also to be borne in mind. Moreover, what happened to doctors in one country would eventually affect those in others. The B.M.A. was the oldest and the second largest medical association in the world; it took the initiative in forming the W.M.A., and it had something to give to other countries.

The motion was agreed to.

REPORT ON GENERAL PRACTICE

The CHAIRMAN reminded the Council that it had been agreed eighteen months ago that a comprehensive report on general practice should be prepared and submitted at a later date for approval by the Representative Body and by the Conference of Representatives of Local Medical Committees, with a view to ultimate publication in book form.

Dr. VAUGHAN JONES urged that this should be done as quickly as possible. Any committee set up for this purpose should be asked to report within a year. Dr. HUTCHINSON suggested that the views of the General Medical Services Committee should be elicited as to the proper time for the publication of such a report.

The CHAIRMAN said that his own view was that the Council should have before it all the recent reports on general practice, and that a comprehensive book should be prepared dealing with general practitioners' problems, and also with the training of the doctor, with a view to getting something really authoritative emanating from the Association—the last word from the profession itself. It should not be done hurriedly and they should take the profession with them in doing it.

It was agreed to postpone further action until the first meeting of the Council after the Annual Meeting at Glasgow, and in the meantime to ask the General Medical Services Committee and the Private Practice Committee for their views on the projected publication.

Reporting for the Private Practice Committee, Dr. GRANT said that the Committee had viewed with concern the possibility that the Home Secretary might be asked to prescribe the maximum fees for cremation certificates, and had decided to draw the attention of the profession to the policy approved by the Annual Representative Meeting in 1951 that a suitable fee for the completion of certificate B or C was two guineas, plus mileage where applicable.

Dr. VAUGHAN JONES, for the Occupational Health Committee, brought forward a recommendation, which was agreed to, that an early meeting of the Joint B.M.A. and T.U.C. Committee be called to discuss the memorandum on the future of occupational health services. Dr. Vaughan Jones also spoke of the value of the recent joint conference of Advisory Councils on Occupational Health, held at B.M.A. House, and the Council agreed that the Association should sponsor another such conference in 1955.

OTHER COMMITTEES

Dr. DAIN, in presenting the report of the Public Relations Committee, made a brief statement on the manner in which the views of the profession on the Television Bill now before Parliament were being conveyed to those respon-

sible for the measure. This matter also figured in the report of the Central Ethical Committee, submitted by Dr. R. FORBES, who said that his Committee had decided to send to the General Medical Council the memorandum on indirect methods of advertising, and to inquire whether, in view of the popularity of television and the possibility of commercial television, there was any likelihood of a revision of the resolutions passed by the General Medical Council in 1934 regarding the anonymity of medical broadcasters.

Dr. D. F. HUTCHINSON submitted a draft memorandum of evidence which had been prepared by the special committee concerned for the Forces Medical and Dental Services Committee (the Waverley Committee). He said that the evidence committee had come to the conclusion that if the armed Forces wanted medical officers they must enter for them in a competitive market.

On behalf of the Science Committee Dr. NOY SCOTT brought forward a number of recommendations relating to the medical students' essay competition, the B.M.A. research scholarships, and other Association prizes, and these were approved.

Reporting for the Finance Committee in the absence of the Treasurer, Dr. IAN GRANT said that practically all the standing committees had kept well within their budget, and the prospects for the end of the financial year were good.

In reporting for the Scottish Committee, Dr. J. G. M. HAMILTON said that the Association's pamphlet on "The Recognition of Intoxication" had attracted the interest of the Crown Agent, who had requested a number of copies of it for study. The SECRETARY stated that 5,000 copies of the pamphlet had been printed; all had been disposed of, and reprinting was now taking place.

Preliminary or routine reports were presented from the Welsh Committee, the Film Committee, the Charities Committee, the Office Staff Superannuation Committee, the Overseas Committee, and the Evidence Committee on Divine Healing.

HOSPITAL STAFF REMUNERATION

CORRESPONDENCE BETWEEN B.M.A. SECRETARY
AND PERMANENT SECRETARY, MINISTRY
OF HEALTH

The following correspondence about the recent Medical Whitley Committee "B" agreement on the remuneration of hospital medical staff took place between Dr. A. Macrae, the Secretary of the B.M.A., and Sir John Hawton, Permanent Secretary to the Ministry of Health. On April 15 Dr. Macrae wrote to Sir John Hawton as follows:

"It has been the policy of the Association, as determined by the Representative Body, to secure 'an adequate betterment factor' for consultants and specialists in conformity with the intention of the Spens Report. At its meeting during the first week in May, the Council will receive a report of the recent agreement in Committee 'B' of the Medical Whitley Council and will have to decide what statement about this is to be included in its report to the Annual Representative Meeting in July. I shall be grateful if you will kindly give me an answer to the question which is asked below, as this, I think, will help the Council to express an informed opinion on the matter.

"The following is a quotation from Sir Russell Brain's published account of the Committee 'B' agreement: 'The Staff Side was left in no uncertainty as to the Government's policy in the matter and the attitude of the Management Side. It was quite clear that in no circumstances could a claim be considered for hospital staff based on the Danckwerts award.'

"I am slightly puzzled by this statement of Government policy, for I understand that the Committee 'B' agreement is in a sense 'based on the Danckwerts award.' Indeed, Sir Russell Brain writes, 'the Staff Side is satisfied that the settlement it has achieved does, in fact, restore the balance between consultant and general-practitioner remuneration which was upset by the Danckwerts award.' At the same time, it is quite clear that, whereas the Danckwerts award went a very long way towards full implementation of the one Spens Report, the Committee 'B'

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agreement falls very far short of full implementation of the other Spens Report.

"The recommendations of the two Spens Reports, considered together, present a proposed relationship between the financial rewards of general practice on the one hand and consultant practice on the other. My question is this. Would I be right in concluding that Government policy, while favouring the maintenance of an equitable relationship between the financial rewards of general practice and of hospital practice, is opposed to the recognition of what I may call the Spens relationship as the equitable one? Is this a correct statement of the view of the Government or of the view of the Minister of Health?

"I hope that Mr. Macleod will see no objection to your giving me a clear answer to this question, because I think that the profession is entitled to know what his attitude is."

Sir John Hawton replied on April 26 as follows:

"Thank you for your letter of April 15 about the recent pay agreement.

"The short answer to your question might best be put this way: that the Minister is certainly of the opinion that there should be a proper relationship between the financial rewards of general practice and of hospital practice; and that what constitutes a proper relationship must be determined in the light of all the relevant factors obtaining at any given time rather than by a mere reference back to the contents of Reports which were produced years ago and before there had been any experience of the working of the Service under modern conditions."

Dr. Macrae sent the following letter to Sir John Hawton on May 6:

"Your letter of April 26 was considered by the Council of the Association at its meeting to-day.

"I was asked to inform you that the Council repudiates the suggestion as to the present status of the Spens Reports which appears to be implied in your letter, and that it has adopted the following resolution:

"That the Council reaffirms its policy to adhere to the basis of remuneration enunciated in the Spens Reports."

THE B.M.A. IN AUSTRALIA

ANNUAL REPORT OF FEDERAL COUNCIL

The Report of the Federal Council of the British Medical Association in Australia has just been received. It covers the year ending December 31, 1953. The Council met twice, the year ending February for three days, and at Adelaide in October for four days. The Council consists of four representatives of New South Wales (Drs. A. J. Collins, W. F. Simmons, H. R. R. Grieve, and A. J. Murray), two from Queensland (Drs. A. E. Lee and H. W. Horn), two from Tasmania (Drs. T. Giblin and J. B. G. Muir), two from South Australia (Drs. L. R. Mallen and C. O. F. Rieger), three from Victoria (Drs. H. C. Colville, C. Byrne, and R. Southby), and two from Western Australia (Drs. H. Leigh Cook and D. E. Copping). Dr. A. J. Collins was elected President, Dr. H. C. Colville Vice-president, and Dr. W. F. Simmons Honorary Treasurer. Dr. J. G. Hunter, who is well known at B.M.A. House in London, is General Secretary.

The report records a year's work of a kind which is familiar to anyone connected with the work of a national medical association. With the National Health Bill in the offing, not unexpectedly much space is devoted to recounting activities in the field of medical planning. Several conferences were held with the Minister for Health (Sir Earle Page). A close working relationship between the Minister and the Federal Council exists. Among other things, the Council urged the Minister to place in the National Health Act the following provisos: (1) That the combined Government and organization benefit be never in excess of 90% of the doctor's account for the particular item concerned. (2) That except when hardship is involved, payment be made to the patient as a refund on presentation to the medical benefit organization of the doctor's receipted account.

Stabilization of Fees

Branch Councils were informed that the Federal Council was concerned with the need for stabilization of medical fees,

especially in view of the fact that the success of the National Health Service would depend on such stabilization, and they were requested to give serious thought to means of achieving this purpose.

In view of the fact that the Royal Australasian College of Physicians had written to the Minister for Health complaining of anomalies in the schedule of benefits in the health scheme, the Federal Council decided to reaffirm its previous policy that the Federal Council of the British Medical Association should be the one negotiating body to act on behalf of the profession and that letters be sent to all colleges and associated bodies drawing their attention to this.

Hospital Policy

The Council reaffirmed its hospital policy as laid down at the meeting on March 1, 1949, "that the Branch Councils be informed that it is the opinion of the Federal Council where public hospitals are available free to all members of the community and the whole financial responsibility for their upkeep has been accepted by the Government, no reason exists for the continuation of honorary services; and that the Federal Council is of the opinion that public hospitals should be open to and provide accommodation for all classes of patients—public bed, intermediate, and private, according to their means—and that intermediate and private patients should pay for medical attention. That all reputable medical practitioners should be entitled to render services to intermediate or private patients in all public hospitals, and that Branch Councils be asked to implement this policy."

The Minister for Health was advised that the Council was willing to co-operate in genuine tuberculosis case-finding schemes of the general population, provided its administration was entirely dissociated from hospital x-ray clinical departments. The examination should be confined to the primary detection of cases of pulmonary tuberculosis, and the report should be limited to those usually given in such case-finding schemes.

General Matters

The Council's gratitude and appreciation were conveyed to the Medical War Relief Fund Committee of the B.M.A. for its generous action in donating £500 sterling to the Federal Medical War Relief Fund.

The board of directors of the Australasian Medical Publishing Company advised that as from January 1, 1953, the per capita payment in respect of the supply of the *Medical Journal of Australia* would remain at £1 per annum, 10s. of which would be in payment for the Journal and 10s. towards the purchase of Series "E" Debentures.

The Federal Council decided to establish a fund, the Federal Council Medical Monograph Fund, the object of which would be the publication of monographs of a high standard on the medical and allied sciences on behalf of authors unable to bear the cost of publication. An appeal to members would be made through a letter published in the *Medical Journal of Australia* under the President's signature.

The Western Australia Branch had asked the Council to consider the ethical and legal implications of bilateral vasectomy, with a view to making a recommendation to Branches. The Branch was informed that the Council endorsed the opinion of the Victorian Branch's legal adviser that the sterilization of the male or female was unlawful except for adequate therapeutic reasons.

The Royal College of Obstetricians and Gynaecologists Regional Council in Australia sought the help of the Federal Council in an approach to the Queensland Government to alter the legislature so that medical practitioners whose only qualification was the D.Obst.R.C.O.G. should not be registered as specialists, and was informed that, as the D.Obst.R.C.O.G. is granted by the College following the fulfilment of prescribed conditions and examination, the Federal Council could not agree to recommend to the Queensland Government that it be not recognized for the purpose of specialist registration.

WORLD MEDICAL ASSOCIATION COUNCIL MEETING, APRIL, 1954

[FROM A CORRESPONDENT]

The Council of the W.M.A. held its annual spring meeting in Zurich at the end of last month under the chairmanship of Dr. DAG KNUTSON, of Stockholm. After an initial meeting of the council as a whole, the various council committees met and got through their very heavy agendas in time to present their respective reports to the council when it again met in full session. Most of the meetings were conducted in French and in English. Spanish is the third official language of the W.M.A., but the Spanish-speaking members of the council could follow the proceedings in either French or English, thus effecting a great saving of time.

The treasurer, Dr. OTTO LEUCH, of Zurich, was able to record an increase in receipts over the budgeted sum; among other things this was because of increased membership, payment of arrears, and, in the case of Switzerland, a rise in voluntary subscriptions.

International Occupational Health Committee

A full report of the Secretary-General, Dr. LOUIS H. BAUER (New York) showed that the activities of the W.M.A. have during the past year increased in scope and in intensity, though many member national medical associations are still tardy in supplying information asked for, especially when it comes to giving answers to questionnaires. For example, the question of a surplus or shortage of doctors especially concerns some countries, and it is difficult for the W.M.A. to ascertain the facts if member associations do not supply them when asked to do so. Dr. Bauer gave a report of steps taken to implement the General Assembly's resolution that a study be made of the feasibility of organizing a committee or conference on industrial and occupational medicine. Meetings had been held in New York of interested persons, including a representative of the World Health Organization. It was proposed that the term "Occupational Health Service" would be preferable to "Industrial and Occupational Medicine," and that an international committee on this subject should be set up by the World Medical Association. Such a committee would make contact with existing international organizations in this field, and recommend that member associations of the W.M.A. should establish Occupational Health Committees, and that such national committees should supply the international committee with required information. This move should bring within one focus much useful information on this important subject, and make it possible to formulate recommendations and principles on occupational health services.

Support for W.M.A.

The W.M.A. has now developed close contact with many international organizations, and its observers in different countries attend most international medical meetings held throughout the year. It has lent its active support to the International Federation of Medical Students Association. Perhaps its most important contact is with the World Health Organization, and in view of the growth of W.H.O. supporting committees in different countries the W.M.A. has informed its member associations of the resolution "that the Council of the W.M.A. respectfully suggests to the W.H.O. that the desired co-operation might best be encouraged by the W.H.O. proposing to each member government that there be included among the delegates to the World Health Assembly a representative of the organized medical profession of the country." The council of the W.M.A. considers it is the first duty of the national member associations to establish supporting committees for the World Medical Association.

Social Security

One of the most important committees of the W.M.A. is that dealing with the medical aspects of social security,

and at the meeting in Zurich much time was spent considering the conclusions drawn up last September by the International Social Security Association on the relations between social security institutions and members of the medical profession. The I.S.S.A. is an autonomous organization with which the International Labour Office co-operates by furnishing secretarial services. The 15 "conclusions" of the I.S.S.A. were published in its *Bulletin* last October. I.S.S.A. has in its membership 40 countries and 100 member institutions representing some 200,000,000 insured persons. Its views and attitude therefore carry great weight. It cannot be said that the attitude of I.S.S.A. to W.M.A. is one of cordiality. It is hoped that further reference to the "conclusions" of I.S.S.A. will be made in a future issue of the *B.M.J.*

Medical Ethics

The committee on medical ethics, under the chairmanship of Dr. P. CIBRIE (Paris), considered the General Assembly's resolution that an additional "chapter" on the social duties of doctors should be added to the International Code of Medical Ethics adopted by the W.M.A. General Assembly in 1949. Various drafts were considered, and the matter will be reported to the Rome General Assembly this autumn. The committee heard further of the claims of other international organizations to establish a code of international medical law, and of the W.M.A.'s strong contention that this came principally within its province, in view of its widely accepted code of ethics. A long discussion was also held on the ethics of experiments conducted on human beings, of which further will be heard in Rome this autumn.

Medical Education

The Committee on Medical Education and the Conference Education Committee were amalgamated into one new committee, and the chairman of the former, Dr. J. A. Pridham, proposed that the chairman of the new committee should be Sir Lionel Whitby, who presided over the First World Conference on Medical Education held by the W.M.A. last August. Under Sir Lionel Whitby the new committee received a report that the full proceedings of the conference would be published in October by the Oxford University Press. It had not proved practicable to publish it in the spring, as had been hoped. The committee agreed to recommend that a Second World Conference on Medical Education should be held in 1958, and it seems probable that this will be in North America. It was provisionally suggested that the second conference would be based on world regional studies of topics selected from the work of the first conference.

Miscellaneous Matters

The council discussed the resolution of the General Assembly that the W.M.A. should undertake the publication of future revisions and editions now published jointly by W.H.O. and Unesco. Both these organizations had agreed to relinquish their publishing rights to W.M.A., and the council agreed to be responsible for future revisions and editions, acknowledging, in doing so, the helpful co-operation of W.H.O. and Unesco in facilitating this decision. The council gave its approval to the new appearance of the *World Medical Journal*, which, under the editorship of Dr. Austin Smith, Editor of the *J.A.M.A.*, now appears six times a year instead of four. Plans for its continued improvement were discussed. The council was informed of the growing co-operation between the medical editors' section of the W.M.A. and the International Union of the Medical Press, whose representatives it hopes to see at the meeting in Rome this year.

Towards the end of the council meeting Dr. J. A. Pridham said that for personal reasons he had to retire from council before the expiry of his term of office. The council unanimously nominated Sir Lionel Whitby to fill the vacancy thus created, and at the same time placed on record its deep appreciation of the faithful and devoted service Dr. Pridham had for so many years rendered the World Medical Association.

APPOINTMENTS TO CHAIRMANSHIP OF REGIONAL BOARDS AND BOARDS OF GOVERNORS OF TEACHING HOSPITALS

The Minister of Health has made the following appointments or reappointments as chairmen of regional hospital boards and boards of governors of teaching hospitals. The appointments, which date from March 31, 1954, are for three years, the only exceptions being one or two instances where the new chairman has already served less than three years as a member of the board. Chairmen appointed for the first time are indicated by an asterisk.

South-west Metropolitan Regional Hospital Board.—Mr. Arthur George Linfield. Oxford Regional Hospital Board.—Sir George Schuster. Birmingham Regional Hospital Board.—Mr. V. M. Grosvenor. United Newcastle-upon-Tyne Hospitals.—Mr. Robert Muckle. United Leeds Hospitals.—Sir George W. Martin. United Sheffield Hospitals.—Mr. A. Ballard. United Cambridge Hospitals.—Mr. Thomas Knox-Shaw. United Oxford Hospitals.—Sir David Lindsay Keir. United Bristol Hospitals.—*Colonel H. Bland Stokes. United Cardiff Hospitals.—*Alderman Thomas Evans. United Birmingham Hospitals.—Mr. Evan A. Norton. Royal Hospital of St. Bartholomew.—Sir George Aylwen. The London Hospital.—Sir John Mann, Bt. The Royal Free Hospital.—Mr. Geoffrey Bostock. Eastman Dental Clinic.—*Mr. A. D. Page. University College Hospital.—Sir Alexander Maxwell. The Middlesex Hospital.—Colonel the Hon. John Jacob Astor. Charing Cross Hospital.—The Rt. Hon. Lord Inman. St. George's Hospital.—Sir Malcolm Trustram Eve, Bt. Westminster Hospital.—The Rt. Hon. the Lord Nathan of Churt. St. Mary's Hospital.—Mr. Anthony G. de Rothschild. Guy's Hospital.—The Rt. Hon. Lord Cunliffe. King's College Hospital.—The Marquess of Normanby. St. Thomas's Hospital.—The Hon. Sir Arthur J. P. Howard. The Hammersmith, West London and St. Mark's Hospitals.—*Major Sir Desmond Morton. The National Hospital for Nervous Diseases.—Sir Ernest Gowers. The Royal National Throat, Nose and Ear Hospital.—Mr. Ernest Edward Taylor. The Moorfields, Westminster and Central Eye Hospital.—Lieutenant-Colonel the Rt. Hon. Lord Luke. St. John's Hospital for Diseases of the Skin.—Mr. J. A. M. Ellison-Macartney. The Royal National Orthopaedic Hospital.—Mr. H. R. Kincaid Floyd, Bt. The National Heart Hospital.—Mr. J. M. Oakley. St. Peter's and St. Paul's Hospital.—Mr. Laurence E. D. Bevan. The Royal Cancer Hospital.—Sir Edward Stewart Cripps. Queen Charlotte's and Chelsea Hospitals.—*Mr. A. J. Espley.

ANGLO-AUSTRIAN HOLIDAY EXCHANGE

The Anglo-Austrian Society, whose presidents include the Earl of Harewood and the Austrian Ambassador, is again arranging exchange holidays for British and Austrian schoolchildren during the summer of 1954. Last year the exchange proved very successful, and over 850 boys and girls took part. Applications can still be accepted from British children for 1954, as many applications have been received from children of Austrian doctors in the Tyrol, Salzburg, Carinthia, the Austrian Lake District, Styria, and Vienna. Participants should be between 12 and 18 years of age. The principle of the exchange is that a suitable Austrian child, carefully selected by the Anglo-Austrian Society, comes to stay for a month, beginning about the middle of July, with the family of the British exchange partner. The two children then go to Austria about the middle of August to spend another month together at the Austrian family's home.

The Society makes all arrangements on a personal basis; organizes the journeys; and provides responsible escorts, who keep in touch with the children in Austria. The inclusive costs this year amount to £18 10s. Full particulars may be obtained from the secretary, Anglo-Austrian Society, 139, Kensington High Street, London, W.8.

TEES-SIDE CONSULTANTS MEETING

At a meeting of the Tees-side Hospitals Consultants and Specialists Committee held on May 5, 1954, the following resolution was carried unanimously:

"That this meeting, being disappointed at the outcome of the Whitley negotiations, wishes to take steps to review the whole of the negotiating machinery for consultants and specialists."

PRESCRIBING INVESTIGATION UNIT

The following information appears in the current issue of *Prescribers' Notes*.

A small pricing staff is set up in England and Wales to examine the prescriptions of doctors whose prescribing is above the average in cost. Where it seems justified a regional medical officer visits the doctors concerned, and as a result of discussion most practitioners are able to reduce their costs very appreciably without detriment to treatment.

In approximately 100 cases examined in this way, the average excess cost of the doctor's prescriptions over those of his fellow practitioners in the area was found to be £168 per month. After a visit by the regional medical officer and a sufficient lapse of time to allow them to modify their prescribing methods, most doctors had reduced their cost so that the average excess was £86 per month—a saving of about £100,000 a year.

Different arrangements for checking on excessive prescribing have been made in Scotland (see *Supplement*, March 6, p. 64).

ANNUAL MEETING, GLASGOW, 1954

IRISH GRADUATES' LUNCHEON

The Irish Graduates' Luncheon will be held at the Students' Union, University Avenue, Glasgow, on Wednesday, July 7, at 1 p.m. at a cost of 7s. per person (excluding wine). This luncheon is open to all Irish graduates and their ladies attending the Annual Meeting, and those intending to be present are asked to notify in advance the manager of the Students' Union. No tickets will be issued, and payment will be made at the luncheon.

EDINBURGH GRADUATES' DINNER

The Edinburgh Graduates' Dinner will be held at the Grosvenor Restaurant, 74, Gordon Street, Glasgow, on Saturday, July 3, at 7.30 for 8 p.m. It is hoped that all Edinburgh graduates and their ladies attending the Annual Representative Meeting will be able to be present. Tickets, price 30s. each, inclusive of aperitifs, may be obtained from Dr. J. Cottrell, Flottergate House, Grimsby.

GLASGOW ROTARY CLUBS

The Glasgow Rotary Club meets at 1 p.m. on Tuesdays in the Grosvenor Restaurant; the Govan Rotary Club meets in the Bella Houston Hotel on Mondays at 12.45 p.m.; the Queens Park Rotary Club meets on Wednesdays at 12.45 p.m. in the Ewington Hotel; and the Kelvin Rotary Club meets on Thursdays at 1 p.m. at the Grand Hotel. Rotarians visiting Glasgow during the period of the Annual Meeting will be welcomed at these clubs.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

culosis officers under the same local authority. Our work and our responsibilities were identical—and so were our status and salaries. Our work and our responsibilities are still identical, but now I am an S.H.M.O. island surrounded by an ocean of consultants. I do not wish to enter into competition with the Mad Hatter's tea party, but I would like to add that two of my consultant neighbours have seconds-in-command who are graded (and quite rightly) as consultants, while I, as an S.H.M.O. in charge, have a full-time assistant whose grading is the same as mine. In view of these facts, may I suggest that it might be more appropriate if we were first to demand instead of justice a return to sanity. The next step should be a return to decency—for to demand equal pay for equal jobs of identical responsibilities is again not a matter of justice but of elementary decency. If there should be any S.H.M.O.s left after our return to sanity and decency, then I would willingly join forces with Dr. S. F. Logan Dahne to invoke the honoured conception of justice to retrieve the situation.—I am, etc.,

ANONYMOUS.

Emergency Admissions

SIR,—Your two letters in the *Supplement* of May 1 (pp. 214 and 215) under "Emergency Admissions" may be justifiable for Wolverhampton, but it is quite unfair to the Bed Bureau Service as a whole to describe it as a "red herring" of the hospital management committees. In Edinburgh and Midlothian we enjoy a perfect Bed Bureau Service. Telephone calls are answered at once; the speakers are always polite; I have never failed to get my patients admitted at once; my description of a patient's condition is never questioned; there is an all-night service. What more could a man want?—I am, etc.,

H. MAITLAND MOIR.

Currie, Midlothian.

Association Notices**ELECTION OF COUNCIL**

The following are the results of the elections for members of Council in those Groups where there were contests:

Group 23 (Bath, Bristol, and Somerset, Gloucestershire and Wiltshire Branches)	
H. G. Dowler (Churchdown, Glos.)	366
H. M. Golding (Westbury-on Trym)	546 <i>Elected</i>
J. R. Nicholson-Lailey (Taunton)	503 <i>Elected</i>
No. of voting papers issued	1,606
No. returned	778
Spoiled papers	12
Group 25 (North Wales, and Shropshire and Mid-Wales Branches)	
W. J. Grant (Shrewsbury)	129
Leslie W. Jones (Anglesey)	249 <i>Elected</i>
No. of voting papers issued	726
No. returned	378
Spoiled papers	6
Group 27 (Aberdeen, Dundee, Northern Counties of Scotland and Perth Branches)	
Mary Esslemont (Aberdeen)	479 <i>Elected</i>
Noel Nelson, Dundee	163
No. of voting papers issued	1,281
No. returned	642
Spoiled papers	3
A. MACRAE, Secretary.	

Diary of Central Meetings

MAY	
17 Mon.	Joint meeting of B.M.A. and British Veterinary Association, 4 p.m.
18 Tues.	Estates Committee, 2 p.m.
18 Tues.	Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, W.C.), 2 p.m.
18 Tues.	Full-time Non-professional Medical Teachers and Research Workers Group Committee, 2 p.m.
19 Wed.	Conference of Honorary Secretaries, 10.30 a.m.

20 Thurs.	G.M.S. Committee, 10.30 a.m.
20 Thurs.	Radiologists Group Committee, 12 noon.
20 Thurs.	Organization Subcommittee, Central Consultants and Specialists Committee, 2 p.m.
20 Thurs.	Tuberculosis and Diseases of the Chest Group Committee, 2.30 p.m.
21 Fri.	Joint Committee of B.M.A. and the Magistrates' Association, 10.30 a.m.
21 Fri.	Ophthalmic Qualifications Committee, 1.45 p.m.
21 Fri.	Medical Witnesses Subcommittee, Private Practice Committee, 2 p.m.
21 Fri.	Ophthalmic Group Committee, 2 p.m.
21 Fri.	Overseas Committee, 2 p.m.
25 Tues.	Constitution Committee, 2 p.m.
28 Fri.	Conference of Regional Officers, 12 noon.

JUNE

2 Wed.	Film Committee, 11 a.m.
9 Wed.	Central Ethical Committee, 12 noon.
10 Thurs.	Central Consultants and Specialists Committee, 10.30 a.m.
10 Thurs.	Library Subcommittee, Science Committee, 2 p.m.
16 Wed.	Occupational Health Committee, 10.30 a.m.

Branch and Division Meetings to be Held

BUCKINGHAMSHIRE DIVISION.—At Griffin Hotel, Amersham, Friday, May 21, 8.30 p.m., annual general meeting.
EAST DENBIGH AND FLINT DIVISION.—At Westminster Hotel, City Road, Chester, Sunday, May 16, 5 p.m., A.G.M.
EAST HERTS DIVISION.—At Shire Hall, Hertford, Friday, May 21, 9 p.m., supper dance.
GREENWICH AND DEPTFORD DIVISION.—Thursday, May 20, leaving Greenwich 11.45 a.m., visit to Glaxo Laboratories, Greenford.
HARROW DIVISION.—At Rayners Hotel, Rayners Lane, Tuesday, May 18, 8.30 p.m., annual general meeting.
LEICESTERSHIRE AND RUTLAND BRANCH.—At Leicester Royal Infirmary, Thursday, May 20, 8.45 p.m., annual meeting.
METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Wednesday, June 2, 3 p.m., annual general meeting. President's address by Dr. D. F. Hutchinson.
MID-HERTS DIVISION.—At Ashwell House, Verulam Road, St. Albans, Friday, May 21, 8.15 p.m., meeting. Annual B.M.A. Lecture by Dr. L. G. C. E. Pugh: "Medical and Physiological Aspects of the 1953 Everest Expedition" (illustrated with slides). Members' wives and friends and members and wives of the Baconian Society are invited. Lecture to be followed by buffet supper.
MONMOUTHSHIRE DIVISION.—At Constitution Club, Stow Hill, Newport, Wednesday, May 19, 8 p.m., joint meeting of members of the Division and the members of the Monmouthshire and Newport Chemists Association and Branch of the Pharmaceutical Society of Great Britain. Speakers: Dr. P. E. Dipple: "New Pharmaceuticals"; Dr. Hal Keane: "Proprieties"; Mr. J. B. Hough: "Matters of Mutual Interest"; Mr. E. Rees: "Pharmaceutical Problems."
NORTH STAFFS DIVISION.—At Grand Hotel, Hanley, Tuesday, May 18, 8 p.m., supper meeting, Dr. A. V. Russell: "The Return of Goodwill of Practices to Practitioners."
NORTHERN IRELAND BRANCH.—Thursday, May 20, (1) at Jubilee Hospital, Lisburn Road, Belfast, 2.30 p.m., clinical meeting; (2) at Belfast City Hospital, Lisburn Road, Belfast, 4 p.m., annual meeting.
REIGATE DIVISION.—At Redhill County Hospital, Tuesday, May 18, 8.30 p.m., annual general meeting. Films: (1) "Some Aspects of Accessible Cancers—Part IV Breast"; (2) "Marrow Puncture"; (3) "Insects as Carriers of Disease."
SCUNTHORPE DIVISION.—At Scunthorpe and District War Memorial Hospital, Sunday, May 23, 10 a.m., clinical meeting.
SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Southampton, Wednesday, May 19, 8.30 p.m., annual general meeting. Retiring Chairman's Address by Dr. W. P. Cargill: "Advisory Councils on Occupational Health."
SOUTH-WEST WALES DIVISION.—At St. David's Mental Hospital, Carmarthen, Sunday, May 16, 3 p.m., A.G.M.
SWINDON DIVISION.—At Out-patient Waiting Hall, Swindon and North Wilts Victoria Hospital, Wednesday, May 19, 8.30 p.m., annual general meeting.
WEST BROMWICH AND SMETHWICK DIVISION.—At Hallam Hospital, West Bromwich, Sunday, May 23, 11 a.m., general meeting.
WESTMINSTER AND HOLBORN DIVISION.—At Westminster City Chambers, Thursday, May 20, 7.30 p.m., ordinary meeting.
WINCHESTER DIVISION.—At Royal Hampshire County Hospital, Winchester, Friday, May 21, 8.45 p.m., general business meeting.

Meetings of Branches and Divisions**DORSET DIVISION**

A meeting was held at The Clinic, Dorchester, on February 10. Twenty-five members were present, and later attended pathological demonstrations in the laboratory arranged by Dr. T. V. Cooper and his staff.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 22 1954

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British Medical Association**SUPPLEMENTARY ANNUAL REPORT OF COUNCIL, 1953-4**

Every member is asked to keep this Supplement, with the earlier one of March 27, until the subjects have been discussed by his Division

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PRELIMINARY**Service Representatives on Council**

190. The terms of office of the present representatives of the Royal Army Medical Corps and the Medical Branch of the Royal Air Force on the Council expire at the end of this session.

Recommendation: That the following be elected as representatives of the R.A.M.C. and the Medical Branch of the Royal Air Force on the Council for the period 1954-7: Royal Army Medical Corps, Major-General J. C. A. Dowse, C.B., C.B.E.; Medical Branch of the Royal Air Force, Air Vice-Marshal W. E. Barnes, C.B.E.

Representatives at Conferences of Other Bodies

(Continuation of para. 5 of Annual Report)

191. Owing to Lord Horder's absence from Great Britain at the time of the Annual Conference of the Cremation Society, he will be unable to represent the Association at the Conference. Dr. C. F. White (London) has kindly undertaken this duty.

Lord Horder will be attending the Sixth International Cancer Congress in São Paulo, Brazil, in July, and has kindly undertaken to act as the Association's representative at that Congress.

Dr. Gerald M. J. Slot (Kew, Surrey), who will be in America at the time of the Annual Meeting of the American Medical Association in San Francisco in June, 1954, has been appointed as the Association's delegate to this meeting.

Coat of Arms

192. The Council is indebted to two of its members, Dr. O. C. Carter and Dr. S. Logan Dahne, for valuable help in its further discussion of a suitable coat of arms for the Association. Dr. Dahne's expert knowledge of heraldry has been of particular value, and the design which has now been received from the College of Arms was produced to a specification mainly suggested by him. It contains an allusion to the Founder of the Association in the form of the "maunche" of the Hastings family, and incorporates other features symbolizing the Association's position as a

During the course of these discussions the deputation stressed both the inequity of excluding from the benefits of the Service those who were forced to contribute equally to its cost and the adverse effect on private practice which resulted. It was pointed out that it was unlikely that such a concession would greatly increase the cost to the Exchequer : any rise in the Drug Bill might well be more than offset by an increase in the earnings of general practitioners from private practice, with a corresponding reduction in the Ministry's contribution to the Central Pool. Again, any possibility of abuse could be dealt with by making the private doctor subject to the disciplinary machinery of the Service for checking excessive prescribing. An assurance was given that the views put forward would be placed before the Minister.

HOSPITAL AND CONSULTANT SERVICES

Review of Consultant Organization

(Continuation of para. 53 of Annual Report)

206. The Central Consultants and Specialists Committee has reviewed—and amplified in the light of experience—the model constitution of regional consultants and specialists committees suggested by the Representative Body in 1948. The following revised model constitution has been recommended to regional committees for their guidance:

(1) Regional Consultants and Specialists Committees should be composed of members elected annually by practitioners engaged in consultant or specialist practice in the region, the relative proportions of teaching and non-teaching representatives to be determined locally in the light of conditions obtaining in the region, bearing in mind the importance of securing adequate representation of teaching interests, which should not be based on numerical considerations alone.

(2) Membership should be based upon the representation of the medical staff of each hospital group or hospital groups aggregated for that purpose.

(3) The electorate of regional committees should consist of those members of hospital medical staffs and all other specialist units in the region (for example, blood transfusion and mass radiography) who are graded as consultants and senior hospital medical officers.

(4) Where possible the staffs of mental hospitals should form a separate electorate so as to secure a reasonable representation.

(5) Each regional committee should include representatives elected by the Regional Registrars Group.

(6) Representatives of the following should be co-opted with or without voting power, at the discretion of the Regional Committee: (a) A medical officer of health elected by medical officers employed whole-time by local authorities in the region. (b) Two general practitioners elected by grouped local medical committees within the region.

(7) Regional committees should have the power to co-opt representatives of special groups, or, at their discretion, to appoint subcommittees to consider special subjects.

(8) The advantages should be borne in mind of inviting the S.A.M.O. or an appropriate representative from the board of governors to attend meetings of the regional committee on specific occasions.

(9) Regional Consultants and Specialists Committees should hold annual meetings for the purpose of electing their officers.

(10) The representatives of regional committees on the Central Consultants and Specialists Committee should be elected annually, and be eligible for re-election.

(11) Regional representatives should be entitled to send deputies to meetings of the Central Consultants and Specialists Committee when they cannot themselves attend.

The following guidance has also been given to regional committees on their functions:

1. To consider and co-ordinate professional and medico-political aspects of hospital staffing in the region.

2. To arrange for the representation of medical staffs of hospitals and of other specialist work in the region and to act as their mouthpiece.

3. To act as a collecting body for proposals, problems, difficulties, and complaints of members of hospital staffs in the region, and to make representations for individual members of hospital staffs who appear to have specific grievances.

4. To make representations to regional hospital boards or boards of governors regarding the arrangements for the staffing or efficient running of hospitals in the region, and to give advice on the organization of the hospital services in the region.

5. To elect representatives to the Central Consultants and Specialists Committee, and to inform that body of the working of the hospital service in the region.

6. To hold or arrange for the holding of meetings of members of hospital staffs in the region as required.

7. To effect liaison with the various local medical committees in the region, and with the Divisions and Branches of the British Medical Association.

8. To organize collective action if necessary.

9. To establish informal and unofficial machinery to ensure the highest level of ethical behaviour amongst members of hospital staffs.

The Joint Consultants Committee has been asked to impress upon the Ministry the importance of securing that regional consultants and specialists committees are consulted

by hospital boards in connexion with the organization and development of the hospital services, as, for instance, upon the question whether new consultant appointments should be on a whole-time or part-time basis.

Experience has shown that perhaps the weakest link in the consultant organization is between the regional committee and the individual consultant, whose interest is centred mainly around his own hospital and hospital medical committee. The recent experiment of issuing bulletins of current information to all consultants and S.H.M.O.s has been greatly welcomed, and will undoubtedly assist in developing an active organization at the periphery. The opinion is strongly held, however, that it is essential to improve the status of the hospital group medical committee, and to integrate these committees within the consultant organization. Further thought is being given to this important question.

It has been decided again this year to arrange a Conference of Honorary Secretaries of Regional Consultants and Specialists Committees for an exchange of views and discussion of problems of current interest.

Hospital Junior Staffing

(Continuation of para. 54 of Annual Report)

207. Further consideration has been given to the problem of hospital junior staffing.

With the development of the hospital services in recent years there has been a substantial increase in the number of practitioners required to carry out adequately the clinical work in teaching and non-teaching hospitals. This has been accompanied by the adoption in the non-teaching hospitals of the traditional teaching hospital practice of making all posts below the consultant (and S.H.M.O.) short-term appointments. Inevitably this has made a heavy demand on medical man-power, which must be related to the career prospects in various branches of medicine. In general the teaching hospitals experience little difficulty in obtaining an ample flow of junior staff, and probably the traditional system of short-term appointments will continue to meet the circumstances peculiar to the teaching hospitals. In the opinion of the Central Committee it does not follow, however, that the system which has proved practicable for the teaching hospital is necessarily practicable, or indeed the most suitable, to meet the staffing needs of the non-teaching hospitals. The Committee feels that some attempt must be made to increase the average period spent in hospital. At the moment, however, there is no security of tenure below the consultant and S.H.M.O. appointment, and the need would therefore appear to be to balance the attraction of junior hospital posts with those of other, and more permanent, forms of medical practice. This objective, the Committee considers, might be assisted (1) by improving the prospects of promotion through the non-teaching hospitals, and (2) by providing incentives to encourage those practitioners who intend ultimately to make their career mainly in some form of medical practice outside the hospital service to seek hospital experience beyond that provided by pre-registration appointments.

It is suggested, therefore, that—particularly in the non-teaching hospitals—there should be a much greater flexibility in the medical staffing and to some extent a departure from the strictly limited tenure of appointment. The posts in these hospitals should offer better prospects of promotion, greater security, and, indeed, the prospect of a permanent career. The present salary grades of S.H.O., J.H.M.O., Registrar, Senior Registrar, and S.H.M.O. should be replaced by two broad salary ranges, the maximum of the higher range coming close to or overlapping the minimum of the consultant scale (for example, medical officer £700 to £1,000, and senior medical officer £1,100 to £2,000), and all medical staff below the consultant should be appointed within these ranges according to the needs of the hospital. All appointments should be initially for a three- or five-year term, but thereafter the higher range should offer a permanent career to those whose talents or ambitions do not

lead to consultant rank, but at the same time the whole range should provide a stepping-stone to consultant status. At both levels, but particularly in the S.M.O. grade, it should be possible for an appointment to be held on a part-time basis, combined with other medical work—for example, general practice. It should also be possible for a practitioner with hospital experience who has become established in general practice to come back into the hospital service on a part-time basis in the S.M.O. grade, and eventually, if he so wishes, to seek a consultant post in open competition.

It is considered that the registrar, and more particularly the senior registrar system, can be retained within the suggested new salary ranges, but that where posts are so designated they should continue to be for a limited tenure. Senior registrar posts should be so restricted in number as to allow fair competition between senior registrars and other senior medical officers for consultant posts.

The Council has approved these proposals in principle, and they will now receive further consideration in the Joint Consultants Committee.

Remuneration of Hospital Medical Staff

(Continuation of para. 58 of Annual Report)

208. The following rates of remuneration of hospital medical staff have now been agreed by the Staff and Management Sides of Committee "B" of the Medical Whitley Council, and approved by the Minister of Health and Secretary of State for Scotland, with effect from April 1, 1954.

(i) The basic scale for consultants is to be £2,100, rising by annual increments of £125 to £3,100. This new scale gives an increase over the 1948 scale of £400 at the minimum and of £350 at the maximum.

(ii) The new basic scale applies to consultants with C distinction awards, who therefore obtain the same increase as consultants without distinction awards.

(iii) The increases for consultants with B and A distinction awards are, however, limited to £150 and £50 respectively.

(iv) The basic scale for senior hospital medical officers is to be £1,500, rising by annual increments of £50 to £1,950, an increase of £200 over the 1948 scale.

(v) Senior registrars will receive £1,100, £1,200, £1,300, or £1,400, according to their year of service, an increase of £100 over the 1948 rates.

(vi) Registrars will receive £850 or £965, according to their year of service, an increase of £75 over the 1948 rates.

(vii) Junior hospital medical officers will receive a scale of £775, rising by annual increments of £50 to £1,075, an increase of £75 over their 1948 scale.

(viii) Senior house officers will receive £745, an increase of £75 over their 1948 salary.

(ix) House officers are to receive an annual rate of £425 for the first, £475 for the second, and £525 for the third and subsequent years, an increase of £75 over the 1948 rates, but the annual charge made to them for residence is to be increased by £25.

(x) A maximum of three-quarters of a session is to be placed on the weighting that part-time consultants and senior hospital medical officers are allowed when their salaries are calculated. This replaces the present maximum weighting of one and one-quarter sessions.

(xi) There is a protection against any individual losing pay on the coming into operation of the new agreement.

A statement by the Chairman of the Staff Side on the history of the negotiations was published in the *Supplement* to the *British Medical Journal* of April 10.

As reported to the Representative Body in 1953, the claim originally submitted by the Staff Side of Committee "B" was that the remuneration of hospital medical staff should be reviewed in order to fulfil the intention of the Spens Committee that the salary scales recommended by the Committee and based on 1939 values of money should be adjusted to meet post-war conditions. It was, in other words, a claim for the full implementation of "betterment" in the light of the Danckwerts award.

At the outset of the negotiations, however, and before detailed discussions had begun, the attention of the Staff

Side was drawn to the Government's policy regarding the implications of the Danckwerts award as expressed in the following statement by the Chancellor of the Exchequer in the House of Commons on July 2, 1952:

"I want to make it clear that the terms of reference of Mr. Justice Danckwerts's award were confined solely to the question of the remuneration of general practitioners in the National Health Service, and his award has no wider application. In accepting the results of the adjudication, which was of an exceptional nature, the Government have by no means adopted the view that similar adjustments in other fields should follow. In their view there is no justification for any assumption that the appropriate standard of remuneration for the professional classes is a rate of 100% above that in force in 1939. They consider that remuneration should be determined in the light of all relevant circumstances."

An assurance had been given to the Joint Committee in 1949 that disputes on remuneration which could not be resolved through the Whitley machinery would normally be referred either to arbitration or to a committee of inquiry. The Council understands, however, that the Staff Side was left in no doubt whatever that in no circumstances would a claim for increased "betterment" for hospital staff on the basis of the Danckwerts award be entertained, and that the Government would never agree to refer such a claim to arbitration. Moreover, the Staff Side was unable to obtain an assurance that if—as an alternative to arbitration—a committee of inquiry was set up, it would be limited to an examination of the "betterment" aspect of the Spens Report.

The Staff Side, faced with the impossibility at this stage of forcing its claim for increased "betterment" in the absence of any unilateral right to go to arbitration, decided to pursue an alternative course offered to it by the Government, which made it known that it was prepared to consider the possibility of granting increases of salary for hospital staff designed to restore the balance between consultant and general-practitioner remuneration which had been disturbed by the Danckwerts award, and to assist recruitment in the hospital field.

The present agreement is the outcome of these later negotiations. The Council has been assured that the agreement is not a final one but only a "stepping-stone," and that the Staff Side will continue without delay to press unremittably its claim for improved remuneration for hospital medical staff, and, in particular, will seek additional improvements in the conditions of S.H.M.O.s and of whole-time officers.

It appears to the Council that the result of the negotiations conducted so far in Committee "B" goes a long way to narrow the disparity between the remuneration of general practitioners and of hospital medical staff which was caused by the Danckwerts award; and, in the light of the assurance mentioned above, the Council considers that the terms of the recent agreement are acceptable as a "payment on account." Nevertheless, the Council deplors the secrecy which has enshrouded the negotiations and hopes that such secrecy may be avoided in future negotiations with the Government on the terms and conditions of service of hospital medical and dental staff.

It has been claimed on behalf of the Staff Side of Committee "B" that, despite the refusal of the Management Side to negotiate on Spens "betterment," the Staff Side has succeeded in safeguarding Spens, which "remains the yardstick of consultant remuneration." In this connexion the Council has considered a letter written by the Permanent Secretary to the Ministry of Health in reply to an inquiry by the Secretary of the Association as to whether the explanation of Government policy given to the Staff Side means that the Government, or the Minister of Health, is opposed to the recognition of the "Spens" relationship as the equitable relationship between the financial rewards of general practice on the one hand and of hospital practice on the other. This correspondence was published in the *Supplement* to the *British Medical Journal* of May 15 (p. 240).

The answer given to the question asked is in the following terms:

"The short answer to your question might best be put this way: that the Minister is certainly of the opinion that there should be a proper relation between the financial rewards of general practice and of hospital practice; and that what constitutes a proper relationship must be determined in the light of all the relevant factors obtaining at any given time rather than by a mere reference back to the contents of Reports which were produced years ago and before there had been any experience of the working of the Service under modern conditions."

The Council has been informed also of the terms of an agreed minute which records a conversation between the Minister of Health and a group of consultants. Sir Russell Brain had asked whether, leaving aside the actual level of remuneration, the profession could rely on the provisions of the Spens Report being continued. The reply to this question is recorded as follows:

"The Minister said that the only point he was now dealing with was the actual level of remuneration. On other matters he agreed fully with the importance attached to the Spens Report, which must continue to occupy the same place as before in any discussions the Government had with the profession about the consultant and specialist service."

The Council has informed the Ministry of Health that it repudiates the suggestion as to the present status of the Spens Reports which appears to be implied in the letter from the Permanent Secretary which is quoted above, and that it has reaffirmed its policy to adhere to the basis of remuneration enunciated in the Spens Reports.

REFORM OF THE NATIONAL HEALTH SERVICE Goodwill

(Continuation of para. 82 of Annual Report)

209. The Council has now completed its consideration of the scheme prepared by the Amending Acts Committee for the restoration of the right to buy and sell goodwill, and detailed proposals are submitted for the consideration of the Representative Body. (See Appendix VIII.)

The Council is fully aware of the divergent views held on the practicability of restoring this right, and wishes to record its appreciation of the immense amount of time and trouble taken by the Amending Acts Committee in studying all aspects of a difficult problem. While appreciative of the very strong views held by the profession before the "appointed day," it has necessarily had to examine the question of the restoration of the right to buy and sell goodwill in the light of the very different circumstances which exist to-day. It believes that the scheme now submitted is the best that can be devised in present conditions, and that the Representative Body would wish to have for its guidance a statement setting out the Council's views on the advantages and disadvantages pertaining to it.

The advantages will be familiar to all practitioners who entered practice by purchase of goodwill. They will not be familiar to those practitioners who entered practice after the "appointed day" or to those now seeking openings in general practice. The disadvantages are mainly of a practical and economic nature, and must be the concern not only of unestablished practitioners and medical students yet to qualify, but the whole body of practitioners who advocate so fundamental a change in the mode of entry into general practice. These advantages and disadvantages are summarized in a statement which accompanies the scheme. The Council wishes to express its thanks for the help given by Mr. A. N. Dixon, A.C.I.L., general manager of the Medical Insurance Agency. His "Memorandum on Practice Loans," as applied to the proposed scheme, accompanies the statement.

The Council has taken legal opinion and is advised that there would not appear to be any legal objection to a scheme of the nature proposed.

Having considered all aspects of the matter, the Council recommends:

Recommendation: That in view of (a) the practical difficulties of implementing the proposed scheme for the right to buy

and sell goodwill, (b) the high capital outlay required by young practitioners to launch into practice, (c) the divided opinion in the profession as to the desire to introduce such a scheme, and (d) the known political resistance to any such proposal, no further action be taken.

ARBITRATION MACHINERY

(Continuation of para. 83 of Annual Report)

210. The Council has been informed that as a result of action by the Staff Side representatives of the Medical Whitley Council, the matter of arbitration has been further discussed by the Staff Side of the General Whitley Council, and notice has been given to the Management Side of the General Whitley Council that the question of arbitration will be raised again by the Staff Side in the near future.

The Minister of Health has been made aware of the Council's regret at the long delay in clarification of this matter and of the profession's anxiety that the principle of arbitration should be accepted by all concerned. The Council has expressed the view that it would be an encouragement to the successful completion of negotiations in every field if such a principle could be accepted. It is understood that the Minister, with the Secretary of State for Scotland, has this matter under consideration.

OCCUPATIONAL HEALTH

Future of Occupational Health Services

(Continuation of para. 84 of Annual Report)

211. The reports on surveys carried out during the past year in different types of area have been discussed with the Occupational Health Committee of the Society of Medical Officers of Health, which has kindly undertaken to obtain for the Association additional information, on a number of specific questions, from the medical officers who undertook these surveys. It is anticipated that further joint meetings will be held with the Society of Medical Officers of Health in relation to the surveys and other matters connected with the future of occupational health services.

Medical Standards for Road, Rail, and Air Transport

(Continuation of para. 85 of Annual Report)

212. The Association has not yet had an opportunity to discuss with the Ministry of Transport the implementation of the recommendations contained in its memorandum on Medical Standards for Road, Rail, and Air Transport. In connexion with completion of Form P.S.V. 15A by medical practitioners after examination of applicants for public service vehicle driving licences, it was felt that some notes for guidance on the various questions set out on the form would be helpful. With the assistance of a number of experts, some notes have now been prepared and submitted to the Ministry of Transport for its consideration. It has been suggested that, although the notes should not be seen by the applicants, they should be made available to the medical practitioner at the time of each examination. The precise method of issuing them will be discussed with the Ministry of Transport.

Remuneration of Whole-time Industrial Medical Officers

213. In 1950 the Representative Body approved a scale of remuneration for whole-time industrial medical officers which included regular annual increments of not less than 6% of the salary on appointment. It has not been possible to negotiate this scale with industry generally, as there is no single body representing all employers, but from subsequent information obtained it appears that industry finds it difficult to tie itself to such a rigid scale. The possibility of simplifying the existing recommendations, in order to assist industry to accept them in full, has now been considered by the Council. A revised statement, which is set out in Appendix IX, has been prepared as an interim measure. During the next 12 months the Council proposes to give full consideration to the whole basis of the existing scale in rela-

PUBLIC HEALTH

Salaries in the Public Health Service

(Continuation of para. 88 of Annual Report)

216. The acceptance by all local authorities in the United Kingdom of the three industrial court awards for medical officers in the public health service has now been achieved. Of the two authorities which had previously stood out, one finally agreed to implement the rulings of the regional appeals committees, which had been in favour of the two medical officers concerned, and the other consented to have the dispute, which involved a single medical officer, resolved by arbitration under the Industrial Courts Act. The Council has been informed by the Trustees of the Public Health Service Defence Trust, which acted on behalf of the medical officer, that the Court had awarded in favour of the medical officer on all three issues which were before it—viz., status, appropriate remuneration for the duties undertaken, and fully retrospective application of the salary scale to October 1, 1950, as laid down in award No. 2285.

After prolonged negotiations with the Ministry of Health and Local Government, Northern Ireland, the status and remuneration of divisional medical officers in a county in Northern Ireland have been satisfactorily settled.

Appeals Machinery

(Continuation of para. 90 of Annual Report)

217. The two appeals referred to in paragraph 90 of the Annual Report have been heard, and in both cases the rulings of the regional appeals committees were in favour of the medical officers concerned.

Superannuation

(Continuation of para. 91 of Annual Report)

218. The Council has made representations to the Ministry of Housing and Local Government in an attempt to reduce from 27 to 25 the age from which the provision for "added years" should become operative.

Infectious Diseases

(Continuation of para. 92 of Annual Report)

219. A conference of members of the Public Health and Venereologists Group Committees of the Association with representatives of the Society of Medical Officers of Health and the Medical Society for the Study of Venereal Diseases has considered the scope of the social work required in connexion with the responsibilities of local health authorities in the prevention of the spread of infectious diseases, with particular reference to venereal disease. The conference drew up the following statement of principles, which the Council has accepted and submitted to the Ministry of Health as a basis for discussion:

(1) Social work should be an integral part of the V.D. service—this principle has been expressed by a large majority of physicians in charge of V.D. clinics.

(2) The staff of every clinic should be such as to ensure that social work can be undertaken by a suitably experienced person or persons, who should remain attached to the same clinic or clinics without being changed more frequently than is absolutely necessary.

(3) Social work undertaken at the clinic should include interviewing patients at the clinic, securing the attendance, by visit or otherwise, of contacts—that is, persons known or believed to be sources of venereal infection—and securing the readmittance of persons who have discontinued treatment prematurely.

(4) Staff engaged on social work should carry out their duties in the area served by the clinic without strict regard to local authority boundaries.

(5) The cost of providing staff for social work in the V.D. service might, in certain circumstances, be apportioned between the hospital authority and the local health authority concerned, on an agreed basis. Where more than one local authority is concerned, the cost might well be shared according to population

tion to the probable expansion of occupational health services in the near future and remuneration available at the present time in industry and in other branches of the medical profession. The Council accordingly recommends

Recommendation: That the revised statement on the remuneration of whole-time industrial medical officers, set out in Appendix IX, be approved.

Joint Conference of Advisory Councils on Occupational Health

214. A Joint Conference of Advisory Councils on Occupational Health, sponsored by the Association, has been held at B.M.A. House, attended by representatives from 10 advisory councils, members of the Association's Occupational Health Committee, and observers from the British Employers' Confederation, the Industrial Welfare Society, the Occupational Health Section of the Royal College of Nursing, the Institute of Personnel Management, and the Society of Medical Officers of Health.

This conference gave representatives from advisory councils, established largely on the initiative of the Association, an opportunity to exchange opinions on the functions of their local organizations and to consider means of extending their work. It was generally agreed that the opportunity which meetings of advisory councils afforded for joint discussions between employers, employees, and doctors, on matters of mutual interest affecting the health and welfare of the worker, have proved extremely beneficial, and it had often been possible to achieve agreement even on controversial subjects. There was, however, an increasing need for a central tripartite body to co-ordinate the activities of local advisory councils and to take action on any of their recommendations of national interest. The conference recommended that this tripartite central body should include representatives of the B.M.A., the British Employers' Confederation, and the Trades Union Congress, together with direct representatives from existing advisory councils on occupational health.

The Association already has a liaison with the Trades Union Congress, through the Joint B.M.A. and T.U.C. Committee, though previous attempts to establish a similar liaison with the British Employers' Confederation have not so far proved successful. It is, however, hoped that it may now be possible to establish an effective liaison with this body. The Conference dealt with a number of other matters concerning the functions of advisory councils, and urged the Association and other interested national organizations to encourage the formation of further advisory councils on occupational health. It was agreed that similar conferences should be held annually, and a decision was taken to hold the next conference again in London with Mr. C. F. Gothard, an employers' representative on the Burton and District Advisory Council, as its chairman.

Mule Spinning (Health) Special Regulations, 1953

215. Representations have been submitted to the Ministry of Labour and National Service regarding the fee for the periodic medical examination of cotton mule spinners under the Mule Spinning (Health) Special Regulations, 1953, the operative from July 1, 1954. The Ministry proposes that the fee should be on a similar basis to that for examinations for the first examination and 2s. 6d. for additional examinations undertaken on the same occasion. In view, however, of the nature of the examination required, this fee is not regarded as adequate. The Ministry has accordingly been informed that in the Association's opinion an appropriate fee would be 12s. 6d. for the first examination and 5s. for subsequent examinations undertaken on the same occasion. Similar representations have also been made by the Association of Certifying Factory Surgeons. The Ministry of Labour and National Service has not yet accepted the Association's views on this matter, and more detailed information is being sought before submitting further representations to this Department.

(6) With the object of securing full co-operation between venereologists and medical officers of health in the prevention of venereal diseases, arrangements should be made, where possible, for venereologists in charge of clinics to be attached to the public health departments of the local health authorities of the areas served by their clinics; and that the procedure described in paragraph 6 of Ministry of Health circular 5/48 for protecting medical officers engaged in V.D. work from actions for slander, etc., be applied to venereologists attached to public health departments for the above purpose.

(7) (i) With the object of securing a further diminution in the incidence of congenital syphilis, every effort should be made in hospitals, antenatal clinics, and general practice (a) to extend the practice of blood examinations for all pregnant patients, not only in the first but also in subsequent pregnancies; (b) to seek the co-operation of the consultant venereologist in any case of doubt. (ii) Special attention should be given to the importance of avoiding delay in reporting the results of tests.

Health Visitors

(Continuation of para. 94 of Annual Report)

220. The memorandum of evidence reproduced in Appendix X has been submitted by the Council to the Health Visitors Working Party. Oral evidence will also be given by representatives of the Association.

District Nurses

(Continuation of para. 95 of Annual Report)

221. The evidence submitted by the Council to the Working Party on the Training of District Nurses is set out in Appendix XI. It is anticipated that the Association will be asked to give oral evidence.

Legal Position of Nurses

222. The Council has been considering the legal position of nurses with particular reference to their responsibilities in connexion with immunization and the reading of skin tests. The Association sent representatives to a conference convened by the Royal College of Nursing, to which other interested bodies were also invited. The Association's policy that any procedures undertaken by nurses should be under the direction and supervision of a medical practitioner was made clear, but additional matters are to be considered when a memorandum containing their views on the proper sphere of activity of a nurse is received from the Royal College of Nursing.

British Veterinary Association

223. A memorandum on Meat Production and Control (1953), prepared by the British Veterinary Association and submitted to the Ministry of Agriculture and Fisheries, outlined a plan which would have the effect of removing the responsibility for meat inspection from the local authority and would exclude entirely any supervision by the medical officer of health. The Association, the Society of Medical Officers of Health, and the Sanitary Inspectors Association have submitted a joint statement to the Ministries of Health, Food, and Agriculture and Fisheries in which they dissent from certain views expressed in the B.V.A. memorandum and set out basic principles in regard to meat inspection. The full statement is given in Appendix XII.

Public Health Representation on Regional Hospital Boards

224. The Council has agreed in principle that names of suitable members of the public health service should be included in the list of doctors nominated by the Association for membership of regional hospital boards.

MEDICAL ETHICS

Loan of Hospital Records to Government Departments

225. The Council has given further consideration to the procedure for the loan of hospital records to Government Departments, and has prepared a statement on this question, which has been approved by the Joint Consultants Committee.

Recommendation: That the following statement on the loan of hospital records to Government Departments be approved:

(a) That medical records should be lent to the medical officers employed by Government Departments only when written consent has been given by or on behalf of the patient.

(b) That the form of consent signed by or on behalf of the patient should include a statement that the patient agrees to his hospital records being made available to the medical board in order to assist them in determining the degree of disablement and whether it is related to his industrial accident.

(c) That, wherever practicable, and particularly where disclosure of information may have an adverse psychological effect upon the patient, the practitioner who compiled the record or, if he is not available, one nominated by the hospital authority for the purpose, should be consulted on the wisdom of disclosing to the patient all of the confidential information contained therein, at the same time taking the opportunity of reviewing the notes before they leave the hospital.

PRIVATE PRACTICE

Bonus Shift Certificates

(Continuation of para. 105 of Annual Report)

226. It is clear from information received from various colliery areas that the agreement between the National Union of Mineworkers and the National Coal Board on the issue of bonus shift certificates has not completely solved the problem from the medical practitioner's point of view. In some areas the Union does not appear to have circularized its local secretaries, so that miners are unaware that the Union and the Board are agreed that medical certificates should be issued only where a doctor has actually examined the patient at the time of sickness. The Council has raised this matter with the Board and will continue to watch the situation. It will also seek an agreement with the Board on the wording of a notice to miners to be displayed at pitheads and in doctors' waiting-rooms.

Death and Disablement Benefit

227. Discussions have taken place with the National Coal Board concerning the payment of death and disablement benefit in respect of doctors who are killed or injured while attending at a colliery in an emergency. The Board has given an assurance that, if any registered medical practitioner not employed by the Board on a whole-time basis is killed or injured in a colliery, the Board will treat him fairly, having regard to the merits of his case and to the benefits provided under its Supplementary Injuries Scheme for senior non-industrial whole-time staff, and to benefits to which he might be entitled under any other arrangements. The Council regards this assurance as satisfactory.

Hearts of Oak Benefit Society

228. As a result of representations on behalf of the Association, the Hearts of Oak Benefit Society has agreed to pay a fee of £1 11s. 6d. for medical reports where the sum assured exceeds £300. The "approved" short form of report will be used where the sum assured does not exceed £300, and the agreed fee of 15s. will be paid. Previously the Society had proposed to use the "approved" short form for all policies up to £500, and to pay a fee of 15s. in all such cases.

Cremation—Fees for Medical Certificates

229. The Cremation Act, 1952, empowers the Secretary of State to fix, by regulations, fees for cremation certificates "B" and "C." The Secretary of State informed the House of Commons, however, that he would prefer to settle the matter by agreement with the profession without the exercise of his statutory power.

The subsequent negotiations with the Home Office were on the basis of the policy, laid down by the A.R.M., 1951, that a suitable fee for either certificate "B" or certificate "C" is £2 2s., plus a mileage allowance, where applicable, of 1s. per mile each way outside a radius of two miles. The Department, which did not propose to seek agreement on

the fees charged for certificate "B," accepted the Council's offer to recommend £2 2s. as a suitable fee for certificate "C." The Council was informed that the possibility of prescribing maximum fees by regulation would need to be reconsidered if the recommendation made by the Association did not achieve satisfactory results. An appropriate announcement was published in the *British Medical Journal* of August 1, 1953.

Treatment of Service Personnel on Leave

230. For several years the Council has regarded the fees payable for the occasional treatment of Service personnel as unsatisfactory in view of the increased cost of the drugs now in common use, but representations to the Service Departments have been held in abeyance pending the conclusion of negotiations for the treatment of Service personnel on leave as temporary residents. As the Departments concerned have not reached a final agreement on this point, the Council is pressing for an increase in the present fees.

Coroners Bill

(Continuation of para. 116 of Annual Report)

231. The Council has been given an assurance that if the Coroners Bill is approved by Parliament the Home Office will make rules dealing with the fees and allowances payable to witnesses at coroners courts and to medical practitioners who make post-mortem examinations on the direction, or at the request, of the coroner. In view of this no action was taken to press for any amendment to the Bill, which has now received its third reading in the House of Commons.

FINANCE

232. The Balance Sheet and Income and Expenditure Account for the year 1953, as audited by Messrs. Price, Waterhouse and Co., appear as an Appendix to this Report (Appendix XIII).

SCIENCE

Association Prizes

(Continuation of para. 129 of Annual Report)

Nathaniel Bishop Harman Prize

233. The Nathaniel Bishop Harman Prize, established to promote systematic observation and research among consultant members of the staffs of hospitals who are not attached to recognized medical schools, has been awarded for 1954 to H. R. E. Wallis for his essay on "Tuberculous Mesenteric Adenitis in Children." This prize consists of a certificate and cheque for £100.

Prizes for Medical Students

234. Consideration has been given to the future form of this competition in view of the decrease in both the number and quality of entries received in the last few years. The purpose of the essay competition for medical students is to promote systematic observation, and it is felt that subjects of a more literary nature might attract better entries. In of a more literary nature might attract better entries. It previously been given of the likely value of the prizes. It is proposed, in future, to make it clear that these prizes will normally be £25 each, although the Council reserves the right to vary the number and amount of the prizes awarded.

It is also proposed, in future, to establish a similar essay competition for provisionally registered practitioners. A different subject will be set for this group, and a prize of a higher value than that awarded to the medical students will be offered. Details of the competitions for 1955 will be published in the medical press and circulated to hospitals and medical schools later in the year.

Prizes for Nurses

235. First and second prizes, consisting of a certificate and a cheque for 20 guineas and 10 guineas respectively, have been awarded in each of the following categories:

1. *Student Nurses*.—1st prize, Lesley W. Elliott (Radcliffe Infirmary, Oxford); 2nd prize, Claire B. Chetwynd (Royal Northern Hospital, London, N.7); highly commended: Mary Restell (Guy's Hospital, London, S.E.1) and Stephanie A. Harrington (General Hospital, Newmarket); commended: Eileen M. Stoneham (Lincoln County Hospital) and Kathleen Stirk (County Hospital, York).

2. *State-Registered Nurses Working in Hospital*.—1st prize, Florence I. Radley (Middlesex Hospital, London, W.1); 2nd prize, Daphne J. Bonnett (Bedford General Hospital).

3. *State-Registered Nurses Not Working in Hospital*.—1st prize, Agnes M. Dalton (Coventry); 2nd prize, Elizabeth C. Wilson (Martock, Somerset).

B.M.A. Research Scholarships

236. The following Research Scholarships, tenable for 12 months from October 1, 1954, have been awarded:

Ernest Hart Memorial Scholarship (£250).—R. M. Acheson, M.A. Dublin and Oxon., M.B., B.Ch. Oxon., for research into radiological methods in diagnosis, assessment of progress, and prognosis in tuberculous meningitis.

Walter Dixon Memorial Scholarship (£250).—G. W. Taylor, M.B., B.S., F.R.C.S., for research into the aetiology, pathology, and treatment of idiopathic lymphoedema.

Ordinary Research Scholarship (£200) (Renewal).—I. J. MacQueen, M.B., B.S., for research on the response of skeletal muscle to progressive resistance exercise in human beings.

B.M.A. Lectures

(Continuation of para. 130 of Annual Report)

237. The following kindly consented to give B.M.A. Lectures during the current session:

Mr. A. Lawrence Abel.	Dr. Hector MacLennan.
Professor Ian Aird.	Dr. W. G. Marley.
Mr. R. C. Brock.	Mr. George Mason, V.R.D.
Dr. J. C. M. Matheson, D.S.O.	Professor W. Mercer,
Dr. F. Camps.	P.R.C.S.Ed.
Sir John Charles.	Mr. J. E. A. O'Connell.
Dr. T. Christie.	Sir Heneage Ogilvie, K.B.E.
Mr. Leonard Colebrook.	Mr. R. D. Owen.
Sir Zachary Cope.	Dr. W. N. Pickles.
Dr. W. S. C. Copeman.	Sir Arthur Porritt, K.C.M.G.,
Dr. Macdonald Critchley.	C.B.E.
Dr. A. C. Crooke.	Dr. L. G. C. E. Pugh.
Dr. J. H. Cyriax.	Dr. Ffrangcon Roberts.
Mr. W. W. Davey.	Professor M. L. Rosenheim.
Sir Daniel Davies, K.C.V.O.	Dr. W. Ritchie Russell, C.B.E.
Mr. Harold Dodd.	Dr. B. Schlesinger, O.B.E.
Dr. A. H. Douthwaite.	Mr. T. Holmes Sellors.
Mr. N. L. Eckhoff.	Dr. Wilfrid P. H. Sheldon,
Dr. R. W. Fairbrother.	C.V.O.
Dr. R. Forbes.	Dr. R. A. Shooter.
Professor W. Gaisford.	Dr. G. G. E. Smyth.
Dr. H. Garland.	Dr. A. W. Spence.
Dr. J. D. Allan Gray.	Dr. A. Brian Taylor.
Professor A. Haddow.	Mr. N. Leigh Taylor, M.B.E.
Dr. John Hunt.	Dr. R. D. Teare.
Professor T. N. A. Jeffcoate.	Sir Clement Price Thomas,
Sir Geoffrey Jefferson, C.B.E.	K.C.V.O.
Dr. J. A. L. Vaughan Jones.	Sir Cecil Wakeley, K.B.E.,
Professor T. Pomfret Kilner,	C.B., P.R.C.S.
C.B.E.	Dr. S. Wand.
Dr. R. D. Lawrence.	Dr. Marjorie Warren.
Mr. Emyln Lewis.	Sir Lionel Whitby, C.V.O.,
Sir William MacArthur,	M.C.
K.C.B., D.S.O., O.B.E.	Dr. D. A. Williams.
Dr. R. M. B. MacKenna.	Mr. A. Dickson Wright.
Professor J. M. Mackintosh.	

Metric System of Weights and Measures

238. The Council has informed the Board of Trade that it considers that the abolition of the apothecaries, troy, and pennyweight systems of measurement, recommended by the Hodgson Committee on Weights and Measures Legislation, should take place over a period of ten years rather than five years.

MEDICAL BENEVOLENCE

239. The sum received during 1953 by the Charities Trust Fund of the Association for medical charities was £11,086, which is £120 more than that received during 1952. The following statement shows the amounts collected and distributed during the twelve months:

To	1953 £
Subscriptions and Donations collected for:	
(a) Distribution at the discretion of B.M.A. Charities Trust Fund	4,381
(b) Royal Medical Benevolent Fund	3,749
(c) Royal Medical Foundation of Epsom College	811
(d) Royal Medical Benevolent Fund Society of Ireland	101
Bequests received and allocated to medical charities	1,000
Subscriptions and donations in respect of 1954, paid in advance	1,044
	£11,086
By amounts distributed to:	1953 £
(a) Royal Medical Benevolent Fund:	
(i) Allocated from B.M.A. Charities Trust Fund for General Fund	1,628
(ii) Allocated from bequests for General Fund	250
(iii) Earmarked for Fund	3,749
	5,627
(b) Royal Medical Foundation of Epsom College:	
(i) Allocated from B.M.A. Charities Trust Fund for General Fund	2,128
(ii) Allocated from bequests for General Fund	750
(iii) Allocated from B.M.A. Charities Trust Fund for Sherman Bigg Fund	152
(iv) Earmarked for General Fund	792
(v) Earmarked for Sherman Bigg Fund	19
	3,841
(c) Royal Medical Benevolent Fund Society of Ireland:	
Earmarked for Fund	101
(d) Dain Fund	473
Payments in advance carried forward	1,044
	£11,086

Other Benevolent Funds

240. The Council has continued to co-operate with the other medical benevolent funds, being in close touch with the committees of the Royal Medical Benevolent Fund and the Royal Medical Foundation of Epsom College.

The Council has also received reports of the work of the Dain Fund and the Sir Charles Hastings Fund, and is gratified to note the continued support given by members of the profession. A number of urgent cases have been assisted by the trustees of the Sir Charles Hastings Fund by emergency grants, and the work of the Dain Fund in assisting in the education of doctors' children continues and develops.

The Council is hopeful that members of the Association will continue their support and interest in the medical benevolent funds.

WORLD RELATIONS

(Continuation of paras. 176-9 of Annual Report)

Supporting Committee for W.M.A.

241. The Council has expressed approval of the principle that there should be established in the United Kingdom a group of doctors, and perhaps other persons, who would take an active interest in the work of the World Medical Association. During the next few months it will prepare a detailed scheme for the formation of such a supporting body. It is becoming increasingly clear that the W.M.A., as an international organization representing national medical associations, must be in a position to give authoritative advice on behalf of the doctors of the world to the World Health Organization, which is an international Governmental body, and to other international bodies.

History of the W.M.A.

242. It is fitting that the British medical profession should give the fullest possible support to the W.M.A., which was founded in B.M.A. House. It will be recalled that in the darkest days of the second world war, when Britain was the base for Allied operations against the enemy in Europe, North Africa, and the Middle East, and when Free French, Norwegians, Dutch, Czechs, and Poles mingled on British soil with Australians, Canadians, New Zealanders, South

Africans, Britons, and Americans, doctors of many different nationalities found their way to B.M.A. House in London. Most of them had left practices and appointments behind them, and their conversations with each other and with the medical staff of the British Medical Association showed to what a great extent practitioners from all parts of the world share common interests, common problems, and common ideals. When the war appeared to be drawing to a close the officers and secretariat of the British Medical Association considered how these valuable friendships could be maintained and utilized in more normal times, and in the spring of 1945 they decided to call an informal conference of doctors of different nationalities who were in London at the time, in order to obtain their views on a proposal to create some permanent organization or liaison among the medical profession in all countries. The conference was held at B.M.A. House in July, 1945.

About the same time Dr. F. Decourt, the grand old Secretary of the Association Professionnelle Internationale des Médecins, was stirring in Paris, and sent a circular letter to his pre-war members about the revival of that association. He was accordingly invited to the British Medical Association's conference and attended with Dr. P. Cibrice, Secretary of the Confédération des Syndicats Médicaux Français. The proposal for the formation of a permanent organization was enthusiastically received, though the members of the conference, not being appointed delegates, could not commit their national bodies. It was decided, therefore, that the B.M.A., on behalf of the A.P.I.M., should invite all national medical associations to send representatives to a further conference, which was held in London in September, 1946.

This second conference was the real beginning of the World Medical Association. The chairman was Sir Hugh Lett, Bart., K.C.V.O., C.B.E., D.C.L., F.R.C.S., President of the British Medical Association, and 33 countries were represented. The representatives of Great Britain were Dr. Alfred Cox, who, with Dr. Decourt, had been responsible for the creation of the A.P.I.M. in 1926, and Dr. J. A. Pridham. Notwithstanding a little doubt and hesitancy among those who had been staunch adherents of the A.P.I.M., the meeting resolved that a new Association of national medical associations should be formed with a broader basis and wider scope than the A.P.I.M. In choosing a title, the adjective "international" was rejected in favour of "world," which emphasized the universality of medicine and the community of medical interests and ideals irrespective of national boundaries. An organizing committee, which included Dr. Pridham, was appointed to draft a constitution and to proceed with the organization of the new Association. Dr. Decourt magnanimously offered to consult the Executive Committee of the A.P.I.M. with a view to dissolving that Association, so that there should be no duplication of machinery. Eventually, the A.P.I.M. was formally dissolved and its residual funds transferred to the W.M.A.

The Organizing Committee, which elected Dr. T. C. Routley, of Canada, as its Chairman, met in Paris in November, 1946, and in London in April, 1947. At the latter meeting the Committee was joined by Dr. Louis H. Bauer, the future Secretary-General, as the representative of the American Medical Association, which had recently announced its adherence to the World Medical Association. By the time of the first Meeting of the General Assembly of delegates in Paris in September, 1947, thirty-two national medical associations had become members, and it was already evident that the World Medical Association had an important role to fulfil in the post-war world. This first Annual Meeting was an important event in medical history. The Assembly adopted a Constitution, appointed officers and a Council, and drew up a programme of work for the ensuing year. There had come into existence a forum for the exchange of views and the discussion of common professional problems and a voluntary central authority which would be competent to express world professional opinion to official international bodies.

Objects

The objects of the World Medical Association are thus defined in its Articles: (i) To promote closer ties among the national medical organizations and among the doctors of the world by personal contact and all other means available. (ii) To maintain the honour and protect the interests of the medical profession. (iii) To study and report on the professional problems which confront the medical profession in the different countries. (iv) To organize an exchange of information on matters of interest to the medical profession. (v) To establish relations with, and to present the views of the medical profession to, the World Health Organization, Unesco, and other appropriate bodies. (vi) To assist all peoples of the world to attain the highest possible level of health. (vii) To promote world peace.

Activities

There is a real need for an organization which can act as the mouthpiece for the doctors of the world, especially in relation to other international organizations. Few doctors are aware of the number of international governmental bodies or of the wide scope of their activities and influence upon governments and public opinion. The best-known examples are the United Nations Organization (U.N.O.), the World Health Organization (W.H.O.), and the United Nations Educational, Scientific, and Cultural Organization (Unesco). These international agencies formulate Conventions which are considered by the member-governments with a view to ratification. Once a Convention has been ratified the member-governments are under an obligation to promote legislation to bring it into force.

The International Labour Organization (I.L.O.) is a specialized agency of U.N.O. composed of representatives of governments, employers, and workers. In 1952 the W.M.A. received information that I.L.O. was preparing a Convention dealing with social security and medical care. In consultation with W.H.O., I.L.O. had set up an "expert committee" of doctors, which did not contain one practising doctor or any doctor who had been selected on the advice of a national medical association. This committee reported, *inter alia*, that a national health service should be staffed by whole-time salaried doctors. The W.M.A. at once drew the attention of its member-associations to the proposed Convention and asked them to take such action as was possible with their governments to prevent its ratification. This prompt intervention by the W.M.A. partially achieved its object, and in time may wholly do so.

The W.M.A. can also assist the W.H.O. and other international agencies with information and with informed opinion. The W.M.A. has liaison officers in Geneva, Paris, and Brussels, who maintain contact with the international agencies.

In addition to this representative function, the W.M.A. helps the medical profession to organize itself in countries where at present the organization is poor. If the profession is exploited or oppressed in one country this may react to its detriment in others.

The third chief function of the W.M.A. is to keep its member-associations informed of developments affecting the medical profession in other countries, such as, for example, the recent health legislation in Australia. In this way the member-associations receive information that otherwise would not be obtained at all or could be obtained only by purchasing and studying large masses of books, documents, and reports. Further, there is great value in an international medical secretariat.

The accomplishments of the W.M.A. in its short existence of 64 years include the preparation of a modern version of the Hippocratic Oath, entitled the Declaration of Geneva, and of an international code of medical ethics; the exploration of different schemes of social security; the publication of twelve principles of social security; the publication of special reports on numerous subjects; and the organization of the First World Conference on Medical Education, which was held in London in 1953.

World Health Organization

(Continuation of para. 178 of Annual Report)

243. The Council of the World Medical Association at its meeting in Zurich in April passed the following resolution:

Whereas it is in the public interest that the closest possible co-operation exist between the World Medical Association and the World Health Organization, and

Whereas United Nations Associations and World Health Organization supporting committees have suggested to the World Medical Association that it encourage the establishment of supporting committees for the World Health Organization in the respective member countries, and

Whereas the national member associations are important factors in carrying out these objectives of close co-operation between the two organizations,

Therefore, Be It Resolved, that the Council of the World Medical Association respectfully suggests to the World Health Organization that the desired co-operation might best be encouraged by the World Health Organization proposing to each member Government that there be included among the delegates to the World Health Assembly a representative of the organized medical profession of the country.

The view expressed in this resolution is shared by the Council, and, as stated in paragraph 178 of the Council's Annual Report, representations along these lines have already been made to the Ministry of Health.

OTHER ASSOCIATION ACTIVITIES

"The Recognition of Intoxication"

(Continuation of para. 180 of Annual Report)

244. The recommendations made by the Special Committee which prepared the Report on "The Recognition of Intoxication," referred to in paragraph 180 of the Annual Report, have been considered by the Council. The Committee stated that there was evidence to show that doctors inexperienced in the medical problems of alcoholic intoxication did not always assist the court as much as they might, and it is suggested that more attention should be paid to the subject in the course of medical teaching, both undergraduate and postgraduate. This recommendation is being circulated to the deans of medical schools and to other teaching authorities.

The Committee felt that doctors who were interested in the examination of intoxicated persons should receive more encouragement to undertake it, and suggested that the appropriate authorities should be invited to give more consideration to: (i) the appointment of doctors, suitably qualified for and interested in this work, to conduct the medical examinations; (ii) the need for the payment of adequate fees for medical examination, report, and attendance at court; (iii) ways of preventing unnecessary loss of time by doctors waiting in court to give evidence. These recommendations have been referred, in the first instance, to the Associations of Local Authorities.

Other recommendations concerned equipment and procedure, and these also have been brought to the notice of the Associations of Local Authorities. They are as follows:

(i) All police stations should have: (a) adequate facilities for the conduct of medical examinations; (b) the necessary apparatus for collecting and transmitting samples of urine.

(ii) The detained person should always have an opportunity of receiving part of the sample.

(iii) The "official" methods used in court work for the determination of alcohol in urine should be: (a) a precisely described and amended Cavett (micro) method; (b) a detailed and slightly modified Kozelka and Hine (macro) method.

(iv) Tests for the determination of alcohol in urine should be undertaken only in officially recognized laboratories.

(v) A copy of the report of any laboratory tests should be made immediately available to the practitioner or practitioners who conducted the clinical examination.

Salaries of Civil Service Medical Officers

(Continuation of para. 184 of Annual Report)

245. Details of the interim agreement referred to in the Council's Annual Report were published in the *Supplement to the British Medical Journal* of April 24. The new scales for the three grades of medical officer concerned have effect from January 1, 1952. They are shown, together with the former scales, in the following table.

Grade	Age	Salary Scales (Basic plus Pay Addition)	
		Old Scale	New Scale
Basic Grade	35	£ 1,331 5 0	£ 1,500
	36	1,382 10 0	1,575
	37	1,433 15 0	1,650
	38	1,485 0 0	1,725
	39	1,536 5 0	1,800
	40	1,600 0 0	1,900
		1,675 0 0	2,000
		1,750 0 0	2,100
		1,825 0 0	
Senior Medical Officer, £1,900 × 100—£2,100			2,200
Principal Medical Officer £2,250			2,300

The full agreement is set out in the following letter from the Treasury:

"(1) The Treasury propose that, with effect from January 1, 1952, the salary scales of the undermentioned grades of the Medical Officer class shall be:

Medical Officer, £1,500 by £75 to £1,800 by £100 to £2,100.
Senior Medical Officer, £2,200.
Principal Medical Officer, £2,300.

"(2) The above scale for the Medical Officer Grade is not a consolidated scale, but one in which pay addition is assumed to be included. It does not, therefore, attract pay addition.

"(3) The minimum of the Medical Officer scale (£1,500) is linked to age 35, and is subject to an increase of one increment for each year above that age up to and exceeding 40. For each year of age below age 35 it is subject to a deduction of £50.

"(4) The scale and rates above set out are the same for women as for men and are subject to provincial differentiation in accordance with Estacode C c 2.

"(5) Agreement on these terms would be entered into by both parties on the following understandings: (a) both parties remain free to ask the Royal Commission on the Civil Service to consider any proposals they think fit to make about the remuneration of all grades in the medical officer class. This particularly applies to the rates of pay for senior and principal medical officers, the increases in which both sides regard as purely token; (b) the scale now agreed for the basic grade cannot be regarded as establishing any particular relativity between that grade and any grade or grades in other classes in the Civil Service; and (c) no new arrangements made in the remuneration of medical work outside the Civil Service—for instance, in the remuneration of consultants or other hospital medical staff in the National Health Service—will be made the basis of a claim on the Treasury prior to the publication of the Report of the Royal Commission, but this in no way limits either party's freedom of action in using any such factors in its submissions to the Royal Commission, or in using any other new considerations in fresh representations either before or after the Royal Commission has reported."

The next task is the preparation, for submission to the Royal Commission on the Civil Service, of evidence relating to the entire medical class of the service. For this purpose the Council proposes to continue its co-operation with the Institution of Professional Civil Servants in the Civil Service Medical Officers Joint Committee. The Institution has expressed to the Council its cordial thanks for the powerful assistance of the Association in the recent negotiations.

Rehabilitation

(Continuation of para. 185 of Annual Report)

246. The Council has now submitted its memorandum of evidence on the rehabilitation and resettlement of disabled persons to the Interdepartmental Committee under the Chairmanship of Lord Piercy. This memorandum is being

published as a special report, and will be summarized in the *Journal* at an appropriate date after oral evidence has been given to Lord Piercy's Committee. Copies of the report will be available for distribution at the Annual Meeting in Glasgow.

"National Formulary"

(Continuation of para. 188 of Annual Report)

247. The Council has considered the following resolution of the A.R.M., 1953:

"That the metric system equivalents should be printed in parenthesis, small amounts being stated in milligrams."

In the 1952 edition of the *National Formulary*, where the normal dose is given in the metric system, the imperial value is printed in parenthesis. There appeared to be no advantage to be gained in reversing this procedure, and the Worcester and Bromsgrove Division has since confirmed that its intention in moving the above resolution was that the imperial equivalents should follow doses given in the metric system and that the metric equivalents should follow doses given in imperial units.

The Division also suggested that metric equivalents should be given against all imperial doses. The most serious difficulty which arises from this suggestion is that these equivalents are not simple numbers. For instance, the formula for mist. rhei ammoniata cum soda would read:

	Imperial	Metric
Rhubarb, in powder	4 gr.	0.26 g.
Ammonium bicarbonate	3 gr.	0.194 g.
Sodium bicarbonate	15 gr.	0.97 g.
Peppermint water	to ½ fl. oz.	to 14.2 ml.

The figures in the second column are, in fact, more complicated than shown and have been approximated so far as possible. Further approximation, by amending 0.97 to 1.0, systems, and such approximations approach the tolerances allowed by the testing authorities, so that pharmacists dispensing in the metric system might be unfairly penalized. It might be practicable to give approximate metric equivalents, but care would have to be taken to make it clear that they were approximate and should not be used for dispensing purposes. Thus, no useful purpose would be served by including the additional information.

Similar considerations apply to tablets; although 7½ grains is regarded as equivalent to 0.5 g. for dosage purposes, in fact no 7½-grain tablets of sulphadiazine exist. In addition, the "Tablet" section of the revised *Formulary* will include under each monograph a list of the different sizes of tablets available. The inclusion of equivalents in each case would make the monographs more cumbersome, without adding anything of value. As an illustration, there are four sizes of aneurine hydrochloride tablets in the *N.F.* 1952. The addition of the imperial equivalents would read—"1 milligram (0.0154 grain); 3 milligrams (0.0463 grain); 10 milligrams (0.154 grain); 25 milligrams (0.388 grain)."

The Council is satisfied with the assurance of the Joint Formulary Committee that the information requested in the foregoing resolution is already included wherever practicable.

Medical Services for the Armed Forces

248. The Council has submitted a memorandum of evidence to the Forces Medical and Dental Services Committee (of which the chairman is Lord Waverley), which has been appointed by the Government to review the arrangements for providing medical and dental services for the Armed Forces, at home and abroad, in peace and war.

Commission on Divine Healing

249. The Association has accepted an invitation to assist the Commission appointed by the Archbishops of Canterbury and York which is "to consider the theological, medical, psychological, and pastoral aspects of 'divine healing,' with a view to providing, within two or three years, a report designed to guide the Church to clearer

understanding of the subject; and in particular to help the clergy in the exercise of the ministry of healing and to encourage increasing understanding and co-operation between them and the medical profession." A special committee, composed of the Association's representatives on the Churches' Council of Healing, with power to co-opt, has been appointed to prepare a memorandum of evidence, and, as a first step, has decided to seek relevant information from all sections of the medical profession.

British Commonwealth Medical Conference, 1955

250. The fourth meeting of the British Commonwealth Medical Conference will be held in Toronto from June 14 to 16, 1955, immediately before the Joint Annual Meeting of the British Medical Association and the Canadian Medical Association. The B.M.A. delegates will be the Chairman of Council, the Chairman of the Representative Body, and the Editor of the *British Medical Journal*; and the Secretary will attend as Honorary Secretary and Honorary Treasurer of the Conference.

British Veterinary Association

251. Arrangements have been made for the British Veterinary Association memorandum on Meat Production and Control (1953), to which reference is made in paragraph 223 of this Report, to be considered by the Joint Committee of the B.M.A. and the British Veterinary Association. The Committee will also consider the joint statement (Appendix XII) submitted to the appropriate Government Departments on behalf of the Association, the Society of Medical Officers of Health, and the Sanitary Inspectors' Association.

E. A. GREGG.

Chairman of Council.

APPENDIX VII**THE DANCKWERTS AWARD AND THE SMALL-LIST PRACTITIONER—SECOND REPORT OF WORKING PARTY****Introduction**

1. In order that the matters dealt with in this Report may be seen in proper perspective, it may be helpful to recapitulate the circumstances which have led up to it.

The original terms of reference of the Working Party were:

"To secure an equitable distribution of the Central Pool based upon the recommendations of the Spens Committee, the object being to enable the best possible medical service to be available to the public, and to safeguard the standard of medical service by discouraging unduly large lists; at the same time, to bring about a relative improvement in the position of those practitioners least favourably placed under the present plan of distribution, to make it easier for new doctors to enter practice, and to stimulate group practice."

These terms of reference were a condition of the acceptance of the award of Mr. Justice Danckwerts and were binding on the Working Party in all their deliberations, those subsequent to their first report as well as those preceding it. The scheme of distribution recommended in the Working Party's first report was accepted by the Government and has been put into effect by arrangements embodied in Regulations laid before Parliament.

2. The Working Party have carefully considered the following resolution passed by the Special Conference of Local Medical Committees on June 26, 1952:

"That if, when the new scheme of distribution has been endorsed by both parties, it is found in the light of experience that certain groups of practitioners who under the terms of reference of the Working Party might have been expected to have benefited have, in fact, not done so, it be left to the Working Party provisionally to allocate an appropriate proportion of the final settlement moneys for the purpose of remedying any obvious defects in the distribution scheme, such allocation to be subject to confirmation by the next Conference before it becomes a permanent feature of the scheme."

It has been claimed by some practitioners with small lists that, to give effect to the Conference rider, comparison must be made between the amount received under the arrangement introduced in 1953 and that received before that date when taking into account the retrospective payments under the award.

The implementation of the award by Parliament was contingent upon a new scheme of distribution which was to be largely aimed at improving the relative position of the practitioner with the medium-sized list. It is in these middle ranges that the greatest benefit now accrues. Clearly, given a fixed sum to distribute, any system of priorities necessarily means that certain classes must secure relatively greater advantages than others from the award. The Working Party originally concluded that the requirements of their terms of reference would best be implemented by the loading of capitation rates for lists between 500 and 1,500, and later considerations have not led them to think that on merits there is a case for any general additions to the capitation rate for lists either below 500 or above 1,500. It must be stressed that any modification of the scheme of distribution in favour of any section of practitioners must necessarily mean less money for other groups of practitioners and would undoubtedly lead to other claims, the justice of which it might be difficult to deny.

In the view of the Working Party it is also not proper to make a comparison between remuneration under the arrangements introduced in April, 1953, and the augmented capitation fee which, under the retrospective provisions of the award, was paid at a flat rate in respect of the years prior to 1953-4. Arrears of money due under the award had, of necessity, to be related to the actual capitation payments made to general practitioners in each of these preceding years, as it was not practicable to calculate the arrears by reference to the new method of distribution.

For these various reasons the Working Party have confined themselves to considering the distribution of the moneys set aside from the Central Pool in accordance with the recommendation in paragraph 19 of the first report, which referred to the possibility of hardship arising under the new arrangements, particularly for elderly practitioners losing a fixed annual payment.

Possible Reasons for Hardship under the Present Distribution of Remuneration

3. The effects of the arrangements introduced in April, 1953, could be assessed only in the light of practical evidence of their operation, and a comprehensive inquiry was therefore put under way as soon as practicable. This inquiry was designed to reveal both the number and groups of general practitioners who might, in the light of experience, be found to have been adversely affected, and went into the remuneration of single-handed doctors with National Health Service lists of less than 1,200 patients.

It showed that only two groups could be said to have been placed at a disadvantage: the first, a small group of doctors who had not been able to counteract the adverse effect on them of the replacement of the fixed annual payment by initial practice allowances, and the second, the elderly doctors who comprise the largest category of practitioners with small lists of patients. The latter, for practical reasons, as well as the former, had not been able to take sufficient advantage of the opportunities and incentives offered by the new scheme of distribution for building up their lists and for becoming members of partnerships. To some extent, the two groups overlap.

The Application of the Proposed Scheme of Supplementary Payments

4. The Working Party have designed a scheme to apply to both the groups referred to in paragraph 3 (which might altogether cover as many as 500 to 600 doctors with lists of

up to 1,200 patients). Of this number it is likely that about half, say, some 300, will have lists of under 700, representing something like one-third of the doctors with lists below 700. In drawing up the scheme outlined below, the Working Party considered that payments should be made without regard to the doctor's total professional income but should be related to the size of a practitioner's list. Without disturbing the main scheme of distributing the Central Pool, which has been accepted by the profession and has been in operation for a year, the supplementary payments now recommended should ensure that the main scheme will not operate to the detriment of any individual practitioner.

Details of the Supplementary Payments and Eligibility

5. (i) Outline of the Scheme

The recommended scheme for supplementary payments provides, subject to one or other of the two sets of conditions described below, a basic payment of £250 per annum for single-handed doctors with lists of not less than 300 and not more than 1,200 patients. For each patient, a normal capitation fee would be payable and there would be a special additional fee of 10s. for each patient above the three-hundredth and up to the five-hundredth. No loadings under the usual arrangements would be payable. A table showing the practical application of this scheme is appended to this paper.

The Working Party recommend that central committees (for England and Wales, and Scotland respectively) should be established which should be solely responsible for exercising any discretion on questions arising out of the application of the criteria referred to below. These central committees should be composed equally of representatives of the Health Departments and of the profession.

(ii) Conditions Applicable to Doctors Previously in Receipt of a Fixed Annual Payment

The duration of payment according to this scheme should be five years at most. Doctors in this category who are to become eligible under the scheme must fulfil the following conditions:

(a) They must be single-handed practitioners who, on March 31, 1953, were under 60 years of age and were then in receipt of a fixed annual payment. Subject to condition (b), they would become eligible to apply to be paid under this scheme as from April 1, 1953.

(b) The doctor should normally have an increasing list, and payment would be withdrawn if his list gradually decreased over four consecutive quarters by more than 10% in all.

(iii) Conditions Applicable to Doctors aged 60 and Over

Doctors aged 60 years and over who are to become eligible under the scheme must fulfil the following conditions:

(a) The doctor should normally have been in single-handed practice for at least ten years in the area in which he is now practising.

(b) Doctors aged 60 or over at April 1, 1953, should be entitled to claim a payment for the year 1953-4.

(c) Doctors who attain the age of 60 years subsequent to April 1, 1953, should be allowed to claim a payment as from the next succeeding quarter.

(d) The payments should cease if the doctor's list drops below 300 and remains below 300 for four consecutive quarters.

(e) Payment under the scheme would be reviewed when the doctor reaches the age of 70. Payment would not cease automatically, and it would be open to the doctor to apply annually for continued payment on the grounds that he is still efficiently providing the full range of general medical services. Such a claim should be submitted to the appropriate local medical committees to advise whether they consider the doctor is continuing to provide effective medical services. These applications should be passed to the central committee, which, after consultation with the

local medical committee, should if they see fit authorize payment from year to year.

Future of the Present Hardship Scheme

6. The proposed scheme should ultimately replace the present hardship scheme. It could not, however, do so immediately on the introduction of the proposed scheme, and the change-over would have to be gradual.

The central committees should review all payments under the present hardship scheme with a view to merging them over a period into the proposed new scheme. The committees should be directed to work on the general principle that doctors with lists below 300 should not be eligible for payments, but should ensure that the change-over did not work out to the detriment of the individual. The committees should for some years be given latitude in dealing with individual cases.

The Operation of the Proposed Scheme Compared to the Normal Capitation and Loading Payments

No. of Patients on List	Payments under Proposed Scheme				Normal Capitation Fees and Loadings	Excess of Payment under Proposed Scheme over Normal Capitation Fees and Loadings (Col. 5 minus Col. 6)
	Capitation Fees	Basic Pay	Special Additional Fees	Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
100	£ 85	£ —	£ —	£ 85	£ 85	—
200	170	—	—	170	170	—
300	255	—	—	255	255	—
400	340	250	50	640	340	300
500	425	250	100	775	425	350
600	510	350	—	860	510	350
700	595	350	—	945	595	350
800	680	350	—	1,030	680	350
900	765	350	—	1,115	765	350
1,000	850	350	—	1,200	850	350
1,100	935	350	—	1,285	935	350
1,200	1,020	350	—	1,370	1,020	350

April, 1954.

APPENDIX VIII SCHEME FOR THE RESTORATION OF THE RIGHT TO BUY AND SELL GOODWILL

1. The following proposals are submitted as a scheme for the return of the right to buy and sell goodwill, which could be applied to the whole profession giving general medical services under the National Health Service.

SCHEME

2. For the purpose of the scheme, doctors are divided into four groups:

- Those in practice before July 5, 1948, who joined the list on the appointed day: (a) who are entitled to compensation, and (b) who have received their compensation in whole or part.
- Those who have joined the list since the appointed day: (a) by appointment, (b) by partnership, or (c) by squatting.
- Partnerships involving a mixture of the above with diverse partnership agreements.
- Those not yet in practice, but desirous of joining the list now, or at a future date.

The following paragraphs give in detail proposals applying the principle of the right to buy and sell goodwill to these four groups.

Group 1a—Pre-1948 Doctors who have Not Received their Compensation

3. This group would receive an option to take their compensation or renounce it. This option must remain open to them for a prolonged period—say, three years. If a doctor decided not to resume ownership of goodwill, or if at the end of three years he had not exercised his option, he would retain his right to compensation. If the doctor renounced his compensation he would regain the right to buy and sell his goodwill forthwith. If he decided on compensation his practice would revert to the State on his death or retirement.

4. It is assumed that the doctor who renounced his compensation and so regained the right to buy and sell his goodwill would not be called upon to repay to the State interest received in respect of compensation. In all equity no alternative could be contemplated.

Group 1b—Pre-1948 Doctors Still in N.H.S. Practice who have Received their Compensation in Whole or in Part

5. These doctors, whether they had already had all their compensation or only part, would be influenced by almost similar considerations, but their decision on the option would have different effects. If they opted for the return of goodwill, those who had received any compensation already would have to return it. If they opted for compensation, those who had not already had it in full would continue as before and retain their compensation rights, and their practices, when they became vacant, would revert to the State. The option in this group would similarly be available for three years. The method by which and the period within which the compensation would be repaid would be a matter for determination later.

Group 1c—Doctors who have Drawn their Compensation and Retired (or Died)

6. As these doctors no longer remain in practice they present no problem and have no option. Their practices have reverted to the Government and have presumably been filled by appointment. Their present incumbents will have the option to purchase the goodwill or not as they choose. In the latter case, the present incumbents will continue as they are and when they retire or die their practices will become available for sale by the Government.

Group 2—Doctors Entering Practice Since 1948 (Except those Mentioned in Group 4)

Doctors Appointed by the Selection Machinery since July, 1948—Group 2a

7. Doctors appointed by the selection machinery since July, 1948, will have to acquire full ownership of their practices, if they so desire, by purchase from the State, and they must have the same duration of option as the pre-1948 group. The price would have to be based on the number of patients on the list at the date of appointment, as any increase in value subsequent to that date must obviously be due to their efforts.

Doctors Entering Partnership Since July, 1948—Group 2b

8. A doctor who had entered a partnership since 1948, and who opted to assume the ownership of the goodwill and who had to pay a sum based on the value of his share on the date he entered into partnership either to his senior partner if he had resumed ownership of the goodwill or to the State if he had not done so.

"Squatters"—Group 2c

9. "Squatters" are in a different category, as they have been given nothing at all, and so, ordinarily, should be given the right to buy and sell what goodwill they had amassed, automatically and without payment, subject only to the repayment to the appropriate pool of such moneys as they have received under the fixed annual payment or the initial practice allowance.

Group 2d—Doctors Appointed Without a List on a New Estate

10. If they opt for goodwill, they should repay the Initial Practice Allowance or the value of their N.H.S. list after the first year at the prevailing purchase price, whichever is the greater.

Group 3—Partnerships

11. Partnerships are, of course, the biggest difficulty owing to the multitude and diversity of the provisions of the partnership agreements and the mixture of the pre-Act and post-Act members. The general principles, however, remain the same and each partner would have the same option as corresponding individual practitioners in categories 1 and 2.

Example: Let us take an example of a partnership of two—one pre-1948 and one post-1948.

Each partner would exercise the option available to him. If the pre-1948 doctor opted for the return of his right to buy and sell goodwill, it would be returned to him in respect of his share, and he would renounce that proportion of his compensation whilst receiving the proportion due in respect of his partner's share from the State.

If the post-1948 (junior) partner also opted for the right to buy and sell goodwill, the senior (pre-1948) partner would be able to renounce the remainder of his compensation and negotiate directly with his partner for payment. Alternatively, the senior partner could claim all his compensation from the State and leave the junior partner either to continue as he was, or to negotiate directly with the State for the ownership of his share of the goodwill. Non-taken-back shares would be sold by the State when they became vacant to the remaining partner or to the person approved by him at the then market value.

Group 4—New Entrants

12. This group has no vested interest at stake and no compensation to claim, and so represents the simplest problem. The problem of providing capital is common to all professions. It should be noted that, once purchased, a practice would provide capital security for a loan.

13. From an appointed day all new entrants would enter general practice by purchase or by "squatting." As a corollary there would be no classification of areas and, accordingly, the Medical Practices Committee would have no function in this particular respect. The Minister, as advised by the local executive council and the local medical committee, would, however, have power to refuse admission in very exceptional cases.

14. Subject to these remarks, arrangements for admission to the Medical List would be revised, namely:

A local executive council, advised by a local medical committee, should not unreasonably refuse an application of any registered medical practitioner for admission to the medical list in that area. A retiring practitioner could instruct a local executive council to circularize his patients as to the arrangements he was making for the succession to his practice. (Patients would be transferred to the successor according to these arrangements, subject to their overriding right to transfer to another doctor of their choice.)

Any practice which is vacant on this new appointed day would be sold by the State. A substantial number of all practices would have been compensated and would, therefore, if vacant, be immediately available for this method of disposal. With the return of free purchase and sale, payment of initial practice allowances would cease. There are, however, areas where it might not be easy to get doctors to live and practise, and, without some inducement, there might result a drift to the attractive areas with overdoctoring in these areas and an insufficiency of doctors in the unattractive or difficult areas. To overcome this, it is desirable that there should be a system of inducement payments such as were operative under the Highland and Islands Scheme in order to attract doctors to the unattractive or difficult areas.

Effect of Scheme

15. The effect of this scheme would be that at the end of the three years after the appointed day there would be two types of practitioners: (1) Practitioners who would have the right to buy and sell their practices and would enjoy full rights of ownership; and (2) practitioners who only had the right to enjoy the use of their practices, the disposal of which would be in the hands of the State on the owner's death or retirement. In the course of time this latter group would get fewer in number and gradually disappear.

ment in the minimum income by the appropriate amount. In other words, if the anticipated drop on change-over was to be of the order of 10%, then an example based on £1,500 would really require an income of some £1,650 at the date of purchase. This particular question is one on which the guidance of the profession would have to be sought in order to reach a proper conclusion.

Examples for Purchaser Aged 30-35—Married with One Child

	Practice or Share Income			
	£3,000 p.a.	£2,500 p.a.	£2,000 p.a.	£1,500 p.a.
1. Gross income	£ 3,000	£ 2,500	£ 2,000	£ 1,500
2. Expenses at 35%	1,050	875	700	525
3. Superannuation	126	105	84	63
Assessable income	1,824	1,520	1,216	912
4. Income tax assuming applicant married with one child	428	322	215	108
Net spendable income	1,396	1,198	1,001	804
5. Cost of goodwill at 1·25 years' purchase repayable over 15 years	307	256	205	154
Cost of house at £3,000, repayable over 20 years	195	195	195	195
Cost of car hire purchase—(say £400 borrowed) repayable over 3 years	153	153	153	153
Sickness policy to provide 20 guineas per week	48	48	48	48
	703	652	601	550
Net margin	693	546	400	254

Conclusions

(a) Assuming £500 per annum as acceptable margin and the borrower having only £300-£400 Initial Capital.—(i) In the worst case, that is, a borrower having to purchase a house (at £3,000), goodwill, and a car (at £400 loan), then the minimum gross income needed is approximately £2,300. (ii) If the house costs less or more than £3,000 appropriate adjustments should be made at approximately £65 per annum per £1,000 of loan. (iii) If the car costs less or more than £400 loan appropriate adjustments should be made at approximately £38 per annum for every £100 of loan. (iv) The applicant with a gross income of £1,500 per annum would only be on safe ground if there was no house to buy and he already owned a car without commitment.

(b) Assuming £500 per annum acceptable margin and the borrower having £300-£400 Initial Capital, and a further £500 free capital.—(i) In the worst case, that is, a borrower having to purchase a house (at £3,000) and goodwill, and using his £500 to purchase a car outright, then the minimum gross income needed would be approximately £1,750. (ii) Similar adjustments for variation of the loan cost for a house should be made as in (a) (ii) above. (iii) In such a case the applicant with £1,500 per annum gross income would still not have quite enough margin (even after purchasing his car outright) to contemplate house purchase (at £3,000) as well as goodwill purchase. He would need to find a practice where the house cost less or was to rent or, alternatively, the vendor required only part capital payment for the goodwill.

APPENDIX IX

REMUNERATION OF WHOLE-TIME INDUSTRIAL MEDICAL OFFICERS—REVISED STATEMENT

Starting Salary

A whole-time industrial medical officer who has had three years' experience in the practice of his profession after obtaining a registrable qualification should receive, when first appointed, a starting salary of from £1,000 to £1,800 per annum according to the degree of responsibility entailed

by the appointment; provided that (a) a whole-time industrial medical officer who holds a higher professional qualification or has had special postgraduate training in industrial medicine or more than three years' professional experience should receive, when first appointed, a starting salary at a suitable incremental point above the minimum which would otherwise be appropriate; (b) a whole-time industrial medical officer in charge should receive, when first appointed, a starting salary not less than £1,200 per annum.

Review of Salary

The salary should be reviewed at regular intervals not exceeding two years, in order to enable a medical officer, within seven years of appointment, and having regard to the nature of his responsibilities, to achieve an annual salary between £1,800 and £2,700.

Exceptional Responsibilities

A maximum annual salary in excess of £2,700 should be paid when the appointment entails exceptional responsibilities.

No Detriment

The introduction of this salary scale should in no circumstances result in the reduction of the existing salary of any industrial medical officer already appointed.

Note.—The description "medical officer in charge" refers to the medical officer who is in charge of the medical services of a firm or (in the case of a large firm) of one of its constituent units.

APPENDIX X

HEALTH VISITORS—MEMORANDUM OF EVIDENCE TO WORKING PARTY

1. The British Medical Association represents 65,000 registered medical practitioners, of whom 38,800 are working in the National Health Service.

2. The Association is glad of the opportunity of giving evidence to the Working Party, whose terms of reference are

"To advise on the proper field of work and the recruitment and training of health visitors in the National Health Service and School Health Service."

3. The Association is at all times in close touch with the Society of Medical Officers of Health, and it has had an opportunity of considering the document of evidence already submitted by the Society. The Association desires to express its agreement in principle to the Society's evidence and to inform the Working Party that on the matters of "recruitment and training of health visitors" there is full concurrence with the views of the Society. This being so, the Association does not desire to submit separate evidence on these two points.

4. The third matter on which the Working Party is asked to advise is "the proper field of work" of a health visitor. While not dissenting from the views set out in the Society's document, the Association wishes to amplify certain points and to refer particularly to the need for full co-operation between health visitors and the medical profession.

The Health Visitor as a Member of a Team

5. It is the opinion of the Association that the health visitor is an integral part of the team responsible for the care of the individual patient and the family. Her main duties are concerned with the patient in the home, though this at no time should exclude the closest co-operation with other parts of the Service, more especially the medical and nursing staff of the hospital.

The Health Visitor and the General Practitioner

6. The closest co-operation between general practitioners and health visitors is essential. This already exists to some extent, but there is room for improvement, and the establishment of harmonious relations based on good will and

mutual interest in the health, care, treatment, and aftercare of the patient can only result in great benefit to all concerned.

7. It is fully appreciated that the health visitor is employed by the local health authority and is therefore under the direction of the medical officer of health. This, however, is no bar to co-operation with the general practitioner whereby the health visitor acts under his guidance in the care of the individual patient. The interest, help, and co-operation of the medical officer of health is of course necessary, but it is the view of the Association that the majority of medical officers of health are willing and anxious to participate to the full.

8. The responsibilities of both general practitioner and medical officer of health are so closely related as to be complementary and supplementary the one to the other. The primary responsibility of the general practitioner is to the patient and the family. The responsibility of the medical officer of health and his staff involves the health and welfare of the family as a unit of the community as a whole. The responsibilities of both are of vital importance, and to fulfil these responsibilities the closest association of all concerned, being members of one team, must be appreciated and accepted.

9. The health visitor, by virtue of her training and experience, is usually already the friend of the family. With the family doctor, she is often in the position of finding the solution to a problem which, though primarily medical, may be complicated by social or psychological difficulties. At the same time she is the link with the many facilities which can be provided through the local authority, and through her such assistance can be speedily arranged when needed by the general practitioner.

10. The means whereby the co-operation suggested should be evolved must vary considerably. In many areas no special new arrangements will require to be made. In other areas it will be necessary to discuss what should be done. Much will depend on the number of health visitors available and whether some can be seconded to work almost entirely with general practitioners, whether these be in single-handed practice, partnership, or group practice. Again, integration of such co-operation with the other duties of the health visitor is a matter which must be discussed with the medical officer of health of the local health authority. It is therefore clear that local discussions must be the first step, in order that satisfactory arrangements suitable to individual authorities, or parts of authorities, can be agreed. By these means all the members of the team will fully understand the need for co-operation and each will be able to play his or her part in the successful implementation of any scheme.

11. The Working Party will have appreciated the importance which the Association places on the all-important co-operation between these two members of the Health Service and which has recently been the subject of detailed consideration. It may be of interest to the Working Party to see a statement which was approved by the Council of the Association in January, 1954, and which was published in the *Supplement to the British Medical Journal* of March 6, 1954. This statement is attached to this memorandum.

The Health Visitor and the Hospital

12. The health visitor, while mainly concerned with the patient in his home, should keep in touch with the hospital and its staff while the patient is receiving treatment in hospital. It is important, therefore, to ensure that adequate liaison exists between the health visitor and the almoner. By and this liaison should also include the home nurse. Visiting hospitals, the health visitor not only obtains detailed information regarding the individual patient, but, at the same time, gains the advantage of continuing clinical education, which will be most helpful in her general professional duties.

13. On many occasions a consultant would find it useful to have additional information regarding a patient's home and social background. This should be sought in the first place from the general practitioner, but further information possibly relating to matters which are the responsibility of

the local authority may be needed, and in such circumstances the health visitor, working in close touch with the general practitioner and the medical officer of health, may be able to provide important details.

14. The possibility of combining the functions of almoner and health visitor has been examined. It is the opinion of the Association that these dual functions can rarely be carried out by the same person, though it is understood that in certain small hospitals these arrangements do exist. While there is a degree of overlap of responsibility as between the almoner and the health visitor, the almoner is predominantly concerned with the patient in hospital while the health visitor's main concern is the patient and his family in the home.

15. The Association would urge strongly that every means whereby co-operation between the three parts of the service can be improved should receive the most careful discussion and consideration, both centrally and locally. An example of the need for full arrangements to be made is in connexion with the information given by the hospital regarding the discharge of a patient. This is an important matter which involves all members of what might be called the "domiciliary team." It is imperative that the general practitioner be informed by the hospital of the discharge of the patient. At the same time the medical officer of health should be informed of those cases where the services provided by the local authority may be required, in order that these services, which include assistance given by the health visitor, may be made available to the patient without any unnecessary delay.

Co-ordination and Co-operation

16. At the risk of repetition the Association stresses that only by the fullest co-operation and co-ordination of all parts of the Service, and of individual members of the Service, can the best use be made of many facilities available for the benefit of the patient.

Scope of Duties of the Health Visitor

17. This matter has been dealt with fully by the Society of Medical Officers of Health, but the Association desires to emphasize the following special types of cases where the help of the health visitor can play a most important part, always bearing in mind that the health visitor should be working in close, even daily, touch with the family doctor: (1) Mothers and babies (this is a statutory duty). (2) Children suffering from special diseases—for example, diabetes—where continued supervision by general practitioner and hospital are involved. (3) Handicapped children—physical and mental. (4) Adults of any age needing aftercare. (5) Chronic sick of any age. (6) Elderly and infirm. (7) Cases of tuberculosis.

18. There is a further point which the Association would like to recommend and which would extend the scope of the health visitor's work and would give her useful additional experience. The Association has already recommended to the Guillebaud Committee that research work in the field of public health and in the preservation of health and prevention of disease should be extended. In this connexion it is felt that the health visitor could and indeed should participate in such research.

The Health Visitor/Home Nurse/Midwife or "One-purpose Nurse"

19. The combination of duties of health visitor, home nurse, and midwife in one person has been known for a long time in rural areas, and as far as can be ascertained the arrangement has on the whole worked well.

20. It has been suggested that there would be saving in woman power if similar arrangements existed in towns and cities. On the other hand, it has been stated that there would be many difficulties in carrying out all the duties in a thickly populated area.

21. There are two possible but important disadvantages to such a plan. Firstly, it is inevitable that maternity cases would take priority, then cases involving nursing would fall

to be dealt with, leaving the health visiting duties to be undertaken in what time was left. Secondly, in those areas where domiciliary midwifery has declined there would be a very real danger that the "all-purpose" nurse would undertake few deliveries during the year and inevitably her skill as a midwife would decrease.

22. The Association feels that it is premature to make any definite decision either for or against the suggestion and it would recommend that a series of experiments in differing types of areas should be undertaken in order that the usefulness and efficiency of the "all-purpose" nurse may be fully investigated.

Working Party's "Schedule"

23. The Association has received the "Schedule: Matters on which evidence is particularly sought" (Doc. HV/ WP(54)3b). The comments to the specific items are set out in a separate document (Sub-Appendix B).

24. The Association appreciates that the Working Party may be limited in the amount of time which can be given to the receipt of oral evidence. It would, however, be glad if an opportunity could be given for representatives to expand the above evidence and in particular to speak on what, in the view of the Association, is the most important aspect of the health visitor's work—her co-operation with the medical profession and the other parts of the National Health Service.

SUB-APPENDIX A: THE GENERAL PRACTITIONER AND THE HEALTH VISITOR

(Here follows the statement printed as Appendix VI in the Annual Report of Council.)

SUB-APPENDIX B:—SCHEDULE: MATTERS ON WHICH EVIDENCE IS PARTICULARLY SOUGHT

Item 1.—The range of services on which health visitors are engaged, or it has been suggested they might be engaged, might be set out roughly as follows:

(a) Maternity and child welfare. School nursing. Health education (group teaching). Tuberculosis services. Venereal diseases. Infectious diseases. Mental illness. Mental deficiency. Care and aftercare of acute and chronic illnesses. Health and welfare of the aged or handicapped. Duties associated with the work of the children's department.

(b) Co-operation with general practitioners. Co-operation with hospitals. Co-ordination of family welfare services.

Comment.—(a) The Association agrees with the list as set out above, but would add under "Health education" the importance of education in accident prevention, with special reference to accidents in the home. (b) The first two matters are dealt with in detail in the Memorandum of Evidence (paras. 6-11 and 12-15). The Association has recently considered the question of co-ordination of welfare services. In evidence to the Guillebaud Committee the opinion has been expressed that integration of the services provided under Section 28 of the National Health Service Act and Sections 29 and 30 of the National Assistance Act would improve the arrangements for care and aftercare. General efficiency would accrue and national economy would result if all welfare work were to be the responsibility of the public health department of the local health authority.

Item 2.—What other duties, in addition to those mentioned in 1 above, do you consider that health visitors might carry out? Which of these duties, if any, should not be undertaken by health visitors?

Comment.—No additional duties are suggested, but the health visitor should be encouraged to take part in social investigations.

Item 3.—What are the essential duties involved in health visiting in the services set out in 1(a) above?

Comment.—It is impossible to specify "the essential duties involved in health visiting," because these will vary with every individual case or family. The Association is of the opinion that this is essentially a "Family Service." There is a continuing responsibility for the preservation or

restoration of the health of the family. The health visitor is "the educator" through whom and by whom, in close co-operation with her general-practitioner colleagues, this aim can be fulfilled.

Item 4.—In what circumstances should health visitors be employed solely in any one of the services listed in 1(a)?

Comment.—The Association concurs with the views of the Society expressed in para. 6 of its evidence. Only in exceptional cases should the duties of a health visitor be employed solely in one service.

Item 5.—Can health visiting duties be combined successfully with those of the home nurse and/or midwife, and, if so, in what circumstances?

Comment.—This point is fully answered in the Memorandum of Evidence (paras. 19 to 22).

Item 6.—To what extent does "overlapping" and duplication of effort exist in the provision to families of social services with which the health visitor is now concerned? How far can it be avoided by creating an all-purpose "family visitor"? To what extent could such a family visitor act as the co-ordinator of health and welfare services for the family? How far can purely administrative measures eliminate overlapping between health visitors and others?

Comment.—The need for co-ordination of the health and welfare services has already been mentioned—see comment on Item 1(b). The Association is anxious that unnecessary "overlapping" should be avoided, and it feels that much of the work now undertaken by "social" and other workers could be well included in the routine duties of the health visitor. There should be meetings between the voluntary and statutory workers concerned. In this way, individual cases can be discussed and decisions reached not only on the action needed to provide the necessary help but on the officer who would be responsible. Wherever possible, one senior health visitor should report to all the departments concerned, thus effecting a closer liaison within the local authority.

Items 7 and 8.—The duties at present carried out by the school nurse might be set out as follows: attendance at minor ailments and specialist clinics; preliminary inspection of children and attendance at medical examinations; nurses' surveys and inspection at schools; visits to nursery schools and classes; attendance at special schools (both day and residential); follow-up home visits; infectious disease control; health education (group teaching).

What school nursing duties other than home visiting do you consider should be carried out by a health visitor either because her skill is needed or because it provides a useful means of liaison with the child and/or his home? Which duties normally included in the range of school-nursing duties set out in Item 7 above might be carried out by lay helpers or persons with some nursing experience rather than by school nurses or health visitors?

Comment.—With reference to the list of duties set out in Item 7 the Association feels that follow-up home visits, infectious-disease control, and health education are essentially within the sphere of the health visitor.

On the question of assistance to be given by lay or semi-trained persons it is clear that much useful help can be and is being given by voluntary lay effort in many centres and clinics. Such interest and enthusiasm should be welcomed and extended, for it is obvious that in many ways the use of such personnel can save the health visitor and the doctor for their own more specialized duties. Examples are: undressing of babies and small children; weighing and measuring of children; keeping of weight and height records; filing of records; clerical assistance in note-taking; domestic duties in the clinic, etc.; sale of welfare foods.

Item 9.—Where the health visitor is not also the school nurse, what liaison is necessary in order that the health visitor may be aware of children who are handicapped, etc., and of any action that is being taken in connexion with children of school age in the families that she normally visits?

Comment.—Where the health visitor is not the school nurse it is imperative that the need for full co-ordination of their duties and exchange of information is appreciated and implemented. The two nurses must realize that they are both important members of the team, which also includes public health medical officers, general practitioners, and consultants. By administration and example the ideal of full and proper co-operation must be impressed on both health visitor and school nurse.

Item 10.—To what extent is there co-operation between health visitors and general practitioners? In what does it consist? What steps should be taken to improve it? Can health visitors help general practitioners over the whole range of their practice? Can they assist more in some fields than in others?

Comment.—The Association's views are already fully set out in the Memorandum (paras. 6 to 11). It is the considered opinion that the health visitor can and should help general practitioners over the whole range of practice.

Item 11.—How can the health visitor help to provide necessary information about new hospital patients? Can she play a part in aftercare? If so, what arrangements should be made between the local health authority, the general practitioner, and the hospital to ensure that the health visitor has the necessary information and effective knowledge of the case? Are any special arrangements necessary between the health visitor and such hospital departments as tuberculosis, maternity, and paediatric? Are special arrangements an advantage in connexion with any other hospital departments?

Comment.—Co-operation between the health visitor and the hospital is covered in paras. 12 to 15 of the Memorandum. Detailed arrangements will vary according to local circumstances, the size of the hospital, the type of hospital, etc. The health visitor should have access to information from any department if such information is helpful to her in her care and aftercare of individual patients. It is, however, particularly important that she should have a close link with those hospital departments dealing with (a) elderly and infirm; (b) chronic sick of all stages; (c) handicapped children, especially orthopaedic cases; (d) venereal diseases; (e) tuberculosis; (f) disabled persons. Here the health visitor is in a unique position whereby she can keep in touch with the patient, provide facilities available through the health department of the local health authority, and also act as a liaison with the appropriate local officer of Government departments, such as the Ministry of Labour, National Assistance Board, etc.

Items 12 to 17. Comments.—These points are fully answered by the evidence submitted by the Society of Medical Officers of Health, with which the Association concurs.

APPENDIX XI TRAINING OF DISTRICT NURSES—MEMORANDUM OF EVIDENCE TO WORKING PARTY

1. The British Medical Association represents 65,000 registered medical practitioners, of whom 38,800 are working in the National Health Service.

2. The Association is glad of the opportunity of giving evidence to the Working Party, whose terms of reference are

"To consider what training it is desirable that registered nurses and enrolled assistant nurses, respectively, should undertake prior to their employment on home nursing duties, and the means by which such training should be provided."

3. The Association has considered the questionnaire issued by the Working Party and has incorporated in one document the replies to these questions, together with its views on other points which are felt to be of importance and which are relevant to the matter under consideration.

4. The outstanding principle which has been in mind during the preparation of this memorandum is the import-

ance to the community of ensuring the highest possible standards of domiciliary nursing. It is fundamental, therefore, that the personnel, male and female, of the service must be nurses of exceptional personality, who look on their work as a true vocation, who have a real interest in social as well as individual problems, and who desire to make district nursing a career. These attributes, together with a sound training, should ensure the principle on which the Association feels so strongly.

5. Training.—This leads to the questions asked under Section I General.

Question 1.—"What should be the minimum length of the training that a nurse should undertake prior to taking up employment on home nursing duties?"

It is the view of the Association that prior to employment on home nursing duties the nurse must (a) have completed full training for and hold the qualification of a State-registered nurse; (b) have received postgraduate experience on "a case basis" of not less than one year, preferably in a responsible position in hospital such as a staff nurse or assistant ward sister; (c) have completed and qualified in a special course for district nurses of not less than four months.

Question 2.—"By what means should such training be provided—for example, by each local health authority, or group of local health authorities, or by some central body?"

Training should be provided by a central body.

The Association has always been impressed by the high standards of the training of the Queen's Institute, and would like to see the continuation of the traditions of this body. Indeed, the Association wishes to recommend that the present Queen's Institute, with additional representation on its governing body, might well be charged with the responsibilities of the central body for district nursing training.

In this connexion, however, if the above recommendation be accepted it is hoped that special consideration might be given to the Ranyard Nurses and to the excellent work which they have done in London. It is felt that in some way the Ranyard Organization should continue within any new central arrangements, so that the traditional vocational aspect of its work may be continued for the benefit of the people of London.

Question 3.—"How many training centres should be provided, where should they be located, and how should they be staffed?"

The Association has not gone into the details of the number of training centres which will be required, and it feels that at this stage any definite recommendation would be premature. It would, however, like to stress that in each centre there should be adequate arrangements whereby training in the special problems of rural areas can be included.

The present staffing arrangements of the training centres appear to be satisfactory, but it is hoped that general practitioners will always be included amongst the lecturers. Reference will be made to this point later in the document (see Sub-Appendix A, Section 1B, and Sub-Appendix B, Section 1).

Question 4.—"What should be the conditions of acceptance for training?"

The following conditions of acceptance of a student district nurse are recommended: (a) The applicant, male or female, must be a State-registered nurse. (b) There should not be any age limit. (c) The first month of training should be a probationary period. (d) If accepted on the completion of (c), and the nurse is in receipt of a training allowance, he or she should normally be required to sign an agreement and to undertake to practise as a district nurse for at least one year on completion of training. If, however, a nurse undertakes the training as an independent student, paying his or her own training fees, a binding contract for one year should not be required.

6. Pattern of Training.—The Association has given considerable thought to the appropriate time to be given to

the course. The present six months is satisfactory, but from many sources it has been suggested that there should be some reduction. The Association would accept this—subject to a definite minimum. This is dealt with in the replies to the following questions:

Question 1.—"How much of the total training time suggested at Item 1 above should be devoted to theoretical training?"

It is recommended that the period of training be not less than four months. If this be accepted the Association suggests that the theoretical training should be covered wherever practicable in one period of two to three weeks.

Question 2.—"What system of theoretical training should be adopted—for example, study days or block periods of study?"

While recommending that the theoretical training should if at all possible be in a block period of two to three weeks the Association realizes that in some of the smaller centres this might not be practicable and certain adjustments might have to be made.

Question 3.—"What should be the content of this theoretical training? Please give details under main subject headings of the number of lectures recommended and by whom it is suggested they should be given."

Before setting out the details of the theoretical training the Association wishes to stress the overriding importance of impressing on the student that the main work will involve problems in the home and in relation to other persons or bodies who may be helping, or in contact with the individual patient. It is therefore most important that the student district nurse should, throughout training, understand and appreciate the need for co-operation with the medical profession and particularly with the family doctor.

Furthermore, it must also be appreciated that a high proportion of patients will be elderly and in the infirm and chronic sick groups of the community.

In Sub-Appendix A the Association sets out its recommendations regarding the subject headings, the number of lectures, and the lecturers.

Question 4.—"What should be the extent of a student's practical work? Please give full details—for example, practical demonstrations both at the training centre and the patients' own homes, visits to hospital, clinics, etc., supervised experience, and the type of cases to be attended."

The importance of training and experience of practical nursing in the home cannot be overstressed and must take priority over all other parts of the syllabus. In addition, practical experience of other aspects of the health service must be available, and set out in Sub-Appendix B are the Association's suggestions.

7. Examinations.—It is felt that some form of examination is necessary, particularly in practical work. Detailed views are set out below.

Question 1.—"What tests should be given during the period of training?"

It is not considered necessary for there to be a formal examination during the period of training. It is however recommended that at the end of the probationary period (one month) there should be a full report on each candidate. In this way a check can be made on those students who appear to be unsuitable for the full training.

Question 2.—"Should a student district nurse be required to undergo a qualifying examination at the end of the course of training? If so—(a) What should be the extent of the final theoretical examination? (b) What should be the extent of the final practical examination?"

A qualifying examination at the end of the training is essential and should be of national standing. It must include both theory and practice, but particular stress should be laid on the practical examination.

It is suggested that the theoretical paper should be common to all student district nurses and be set at national level. The practical examination should, as at present, be taken locally at the students' training centre. The examiners for both theoretical and practical parts of the final test

should be independent persons and not associated with the teaching staff of the particular training school.

8. The Working Party requests "additional remarks," and the Association is glad of the opportunity to put forward certain additional points.

9. Economic Use of Available Woman Power.—The Association desires to draw the attention of the Working Party to the need to conserve woman power while still keeping a high standard of training in the service. It is for this reason that it has been recommended that there should be no firm age limit. It is felt that there are many older nurses, many married or widowed, who might undertake this work. They have the basic qualifications and their mature experience makes them particularly suitable to work as district nurses. The Association suggests that the Working Party should seriously consider this aspect of recruitment, but it would add that, overall and whatever the age of the candidate, the basic requirements (see Para. 5, Question 4) must be maintained.

10. Male District Nurses.—It may be thought by some that male district nurses are not needed in the service. This is incorrect. In view of the increasing number of elderly and infirm persons it is very clear that the male nurse has an important part to play in the service and every effort should be made to recruit an adequate number. One method of recruitment might be from male nurses retiring from the Forces. Family commitments may prove to be a bar to recruitment. To overcome this the Association wishes to suggest that the possibility of financial assistance to a married male student district nurse during his training should be considered. It should be added that a widowed female student district nurse may also require similar financial assistance.

11. Houses for District Nurses. The Association is of the opinion that the provision of a house for a district nurse (male or female) would undoubtedly assist recruitment. Local health authorities should wherever possible make the necessary arrangements within the district to which the nurse is appointed.

12. State-enrolled Assistant Nurse.—The Association is of the opinion that, wherever possible, a district nurse should have the full qualifications and training as set out in Para. 5, Question 1. It is agreed, however, that the State-enrolled assistant nurse has a part to play in domiciliary nursing, but it must be appreciated that here the degree of responsibility should be limited. With a modified district nursing training of not less than three months a State-enrolled assistant nurse can quite appropriately deal with elderly patients and cases of chronic illness where only simple nursing duties are required, but—and the Association cannot stress this point too emphatically—in every case the State-enrolled assistant nurse must work under the supervision of a State-registered district nurse. With regard to the arrangements for selection and training of the assistant nurse the Association recommends that the same central body should be responsible.

13. The "One-purpose" Nurse.—The combination of duties of home nurse, health visitor, and midwife in one person has been known for a long time in rural areas, and so far as can be ascertained the arrangement has on the whole worked well. It has been suggested that there would be a saving in woman power if similar arrangements existed in towns and cities. On the other hand, it has been stated that there would be many difficulties in carrying out all the duties in a thickly populated area. There are two possible but important disadvantages to such a plan. Firstly, it is inevitable that maternity cases would take priority, then cases involving nursing would fall to be dealt with, leaving the health-visiting duties to be undertaken in what time was left. Secondly, in those areas where domiciliary midwifery has declined there would be a very real danger that the "all-purpose" nurse would undertake few deliveries during the year and inevitably her skill as a midwife would decrease. The Association feels that it is premature to make any definite decision either for or against the suggestion, and

it would recommend that a series of experiments in differing types of areas should be undertaken in order that the usefulness and efficiency of the "all-purpose" nurse may be fully investigated. It should be clearly understood that, with regard to district nursing duties of the "one-purpose nurse," her training as a district nurse remains unaltered.

14. The Association appreciates that the Working Party may be limited in the amount of time which can be given to the receipt of oral evidence. It would, however, be glad if an opportunity could be given for representatives to expand the above evidence.

SUB-APPENDIX A: THEORETICAL TEACHING (25 LECTURES)

I. Nursing and Allied Services

A. District Nursing (Nine lectures, given by Queen's Nurse Teachers and Administrators):

(a) The history and development of district nursing.
(b) Administration of district nursing services by local health authorities and voluntary organizations in counties and county boroughs.

(c) The responsibilities of the district nurse to her patients, to the medical profession, and to her employing authority, and to other workers in the health and social welfare services. Ethics of district nursing.

(d) District management. Planning the day's work. Care of nursing equipment and articles loaned. Record keeping and reports on patients.

(e) The responsibilities of a district nurse in a rural area undertaking general nursing, midwifery, and health visiting duties.

(f) Barrier nursing in the home, with special emphasis on the nursing of tuberculosis. Nursing of infected maternity cases and miscarriages.

(g) Nursing and special care of those suffering from diabetes and from cancer. Special problems of the chronic sick and the aged.

(h) Special problems of the dying—last offices for the dead.
(i) First-aid in emergency midwifery. (For female nurses who are not midwives and for male nurses.)

B. Domiciliary Treatment in Relation to Special Problems.—(Three lectures given by a general practitioner.) It is suggested that these lectures might cover such diseases as diabetes, cancer, ear, nose, and throat diseases. Diseases of the aged.

C. Tuberculosis.—(Two lectures given by a chest physician.) Notification, common forms in various age groups, causes of infection, health education and preventive measures, work of chest clinic, work of tuberculosis visitors, special scales of National Assistance.

D. Physiotherapy.—(One lecture.) Facilities for and value of physiotherapy for patients in their own homes.

E. Occupational Therapy.—(One lecture.) Value for patients in their own homes, with special reference to rehabilitation of home-bound patients.

F. Prevention of Accidents in the Home.—(One lecture.)

II. Nutrition

One lecture: Practical suggestion regarding the care and preparation of food in the home.

III: Hygiene

One lecture given by a medical officer of health: General introduction to aspects of hygiene in the home.

IV. Health, Welfare, and Social Services

Six lectures. A brief introduction to constitution and development of Central and Local Government.

A. Health.—(Four lectures, given by medical officer of health.) General survey of the health and allied services before 1948 and outline of present legislation of importance to the district nurse:

Public Health Act, 1936: Part V, Regulations dealing with communicable diseases; Part VII, Notifications of Births. National Health Service Act, 1946 (particularly Parts III and V). Education Act, 1944, and School Health Service and Handicapped Pupils Regulations, 1953. Nurses Acts, 1919-49. Midwives Acts, 1902-50.

The Personal Health Services: Care of normal infant; breast and artificial feeding; weaning; infant hygiene. Care of toddler, feeding, general management, common ailments. Nursery and Child Minders Act, 1948. The unmarried mother and her child. The statutory M. & C.W., School Health, and Mental Health Services. Mental Treatment and Deficiency Acts.

Vital Statistics: Birth and Death Rates, Maternal, Infant, and Neonatal Mortality. Chief causes of death and morbidity, including those due to occupational diseases.

B. Welfare and Social Services.—(Two lectures given by medical officer of health):

Essentials for a normal family. Poverty—its causes and alleviation. Outline of main provisions of welfare and social legislation. National Insurance Act, 1946 (special reference to the benefits available). National Insurance (Industrial Injuries) Act, 1946. National Assistance Act, 1948 (special reference to the care of the aged and handicapped and help for the tuberculous). Disabled Persons (Employment) Act, 1944. Family Allowance Act, 1945. Children Act, 1948. Children and Young Persons Act, 1933. Part VII of the Public Health Act, 1936. Adoption Act, 1950.

The work of voluntary agencies and their relationship to Statutory Organizations: Council of Social Service, etc. Youth Organizations.

SUB-APPENDIX B: PRACTICAL TRAINING

1. This is to be given from the Training Centres approved for the purpose and should include: (i) Supervised practical experience of district nursing in patients' homes. (ii) Demonstrations in the district rooms on the use of equipment, care of bags, and certain nursing procedures. (iii) Experience in nursing various types of patients, including those suffering from acute medical and surgical conditions; from tuberculosis and other infectious diseases; the special requirements of children; the care of the chronic sick and of the elderly; the care of the dying and last offices for the dead. (iv) Daily report to superintendent or assistant superintendent on patient's progress, with discussion of particular needs and general welfare of family.

It is recommended that during this part of the training arrangements should be made if at all possible for the student to spend at least one day with a general practitioner, both in the surgery and on his rounds.

2. **Practical Work in a Rural Area.**—A minimum of seven days must be spent in a rural area with a fully trained district nurse assisting in routine duties, which should include general nursing, midwifery, and health visiting duties. An alternative arrangement would be to spend a similar period with a district nurse-midwife and a second period with a whole-time health visitor.

3. **Practical Visits**—including lecture demonstrations. The visits should include: A hospital for infectious diseases. Health centre—where available. Antenatal clinic. Post-natal clinic. Infant welfare centre. Day nursery. School medical inspection. Minor ailment clinic. Home for handicapped children. Child guidance clinic. Juvenile court. Chest clinic. Old people's home. Communal food centre—for example, civic restaurant, school, or factory canteen. Factory welfare department.

APPENDIX XII

BRITISH VETERINARY ASSOCIATION'S MEMORANDUM ON MEAT PRODUCTION AND CONTROL (1953)

The British Medical Association, the Society of Medical Officers of Health, and the Sanitary Inspectors Association have jointly considered the recent memorandum prepared by the British Veterinary Association on Meat Production and Control (1953).

While concurring with much of the contents of the Memorandum the three bodies above mentioned dissent from certain views expressed and desire to draw attention to four principles, the application of which is considered essential in connexion with any arrangements now in force or under

consideration for the future in connexion with meat inspection and control.

1. *Health.*—The close association between animal and human diseases must be fully appreciated at all times, but the fundamental purpose of meat inspection is to safeguard the health of the individual consumer and the community as a whole. All other considerations must be regarded as secondary to this main purpose. It is therefore necessary that all action with regard to these matters should be considered as an intrinsic responsibility of the Public Health Service.

2. *Administration.*—The British Veterinary Association memorandum recommends that in future meat inspection should be the responsibility, both administrative and executive, of the Animal Health Division of the Ministry of Agriculture. Here the British Veterinary Association has failed to appreciate the fundamental principle that meat inspection is primarily concerned with the health of the community, not with meat production. The three bodies are unanimous in stating that in their view the central government department responsible for general supervision and advice should be the Ministry of Health, acting jointly with the Ministry of Food.

3. *Local Responsibility.*—The British Veterinary Association memorandum envisages that all meat inspection shall be "under the direction and control of the Animal Health Service of the Ministry of Agriculture and Fisheries" and includes the "taking over of the existing staffs." This implies that the responsibilities which at present lie with local authorities shall be removed. The three bodies cannot agree with this recommendation and would urge most strongly that the responsibility for local administration shall remain with the local authorities.

4. *Medical Responsibility.*—Meat inspection is only one part of the public health supervision of food in this country, and any suggestion that the control of meat should be divorced from that exercised over other foodstuffs is strongly to be deprecated. All those at present associated with these duties fully appreciate the importance of this service to the public health. The British Veterinary Association has apparently ignored this important principle, and in particular the general responsibility of the medical officer of health for the prevention and control of disease, including that transmissible by meat, in so far as local government administration is concerned. It is the unanimous view of the three bodies that this responsibility should continue.

According to the Interdepartmental Committee on Meat Inspection, "The great majority of meat inspectors will no doubt continue to be sanitary inspectors trained in meat inspection, and we regard this as a satisfactory arrangement." The three bodies are confident that this is a satisfactory arrangement and see no justification for the British Veterinary Association's insistence that veterinary inspectors should be appointed to supervise and control this service.

The British Veterinary Association further suggests that non-veterinary inspectors should function merely as detention officers. The Interdepartmental Committee on Meat Inspection considered this system of inspection and concluded that such a system should not be adopted in England and Wales, a conclusion with which the three bodies agree.

[Appendix XIII, the Financial Statement, appears on pp. 273 and 274.]

NEW HEALTH CENTRES FOR HARLOW NUFFIELD PROVINCIAL HOSPITALS TRUST'S EXPERIMENT

The Nuffield Provincial Hospitals Trust is to build and equip three health centres in Harlow New Town, to meet the needs of the first 25,000 new town residents. Construction will start on all three centres in a few weeks' time, and they should be in use early in 1955. The centres will be used by general practitioners and dentists on a group practice basis, and by the Essex County health authority clinics. Health visitors and district nurses will

work with the general practitioners, who will be invited to staff some of the county council clinics. In one of the health centres there will be a county dental clinic for the "priority" classes, alongside a private dentist doing general N.H.S. dental work.

The capital cost (£60,000) of building and furnishing the three health centres will be borne by the Nuffield Provincial Hospitals Trust, and the health centres will be owned on behalf of the Trust by the Nuffield Health and Social Services Fund. The actual building and management of the health centres will be undertaken by the Harlow Development Corporation, acting as agents for the Nuffield Health and Social Services Fund. The doctors, dentists, and the county council will thus be the tenants of the Nuffield Health and Social Services Fund, which will continue in being when the Harlow Development Corporation has been wound up on the completion of the construction of the new town.

The development of further health centres in Harlow, to meet the general medical and dental needs of the town as it grows, is under consideration. The tenants of the three new centres will pay economic rents related to capital cost; after expenses have been met this money will provide a nucleus fund for further development.

Group Practice

The buildings will not be health centres of the type envisaged in the N.H.S. Act, but group practice centres with clinics attached. A temporary health centre has already been in operation at Harlow for two years. Each new centre will differ from its fellows in certain minor respects, so that as much as possible may be learnt from practical experience about health centre design. It is intended that one of the future health centres should be immediately adjacent to the future Harlow Hospital, and the Nuffield Trust hopes that it may help to provide a special link between all the general practitioners of the town and the hospital service.

Harlow has two large industrial estates. It is the wish of the Trust that in due course special steps should be taken to meet the health needs of workers and management by the establishment, on an economical scale, of an industrial health service. Again, it is intended that the general practitioners shall play a full part in this service. Thus it is hoped that Harlow may in due course provide an example to the country, and perhaps the world, of a completely integrated health service.

Successful Co-operation

In all these plans the general practitioners in the new town are co-operating to the full; those general practitioners in the old town who are not in need of group practice provision have been sympathetic and have not placed any obstacles in the way of the development. The dental surgeons also are giving their full support. The Essex local executive council has shared in each stage of the planning; the council has been consulted on the design of each health centre, and its suggestions have been embodied in the final plans.

The Health Committee of the Essex County Council, and in particular the county medical officer of health, Dr. Kenneth Cowan, have been behind the planning from its earliest stages. It was when the Ministry of Health issued its stand-still orders on health centre development that the Harlow Development Corporation, with the county council, devised the temporary scheme which has now been in operation for two years.

It was the success of the temporary health centre at Haygarth House that convinced the Trust that this was a development which should be extended. From the outset the Trust insisted that Haygarth House should have a "house committee" representing the general practitioners, the dentists, the county health authority, and the development corporation as landlords. This committee has met regularly; each party concerned has come to appreciate the problems and needs of the others, and as a result Haygarth House has developed with complete smoothness. There are now some 8,000 patients, of whom a third are children.

Appendix XIII—Financial Statement

Balance Sheet—December 31, 1953

	1953	1952	Fixed Assets at net book amount at January 1, 1947, of assets acquired before that date, with additions since at cost, less Sales, Depreciation, and Sinking Fund instalments—	1953	1952	1951
Accumulated Fund:						
Balance at January 1, 1953	408,438	406,458				
Add: Reserve for Development of Regional Offices—no longer required	89,787	99,737				
Surplus for year	118,659	—				
Balance at December 31, 1953	616,884	506,195				
Reserve for Development of Regional Offices	8,900	—				
Reserve for future taxation	2580,724	—				
Liabilities and Provisions:						
Loans	32,100	32,100				
Bank overdraft	16,078	118,588				
Creditors and accrued expenses	48,983	65,547				
Amounts received in advance (including subscriptions)	76,943	68,581				
Current Taxation	4,807	7,639				
Provisions for:						
Dilapidations and redecoration of premises	39,447	43,201				
Pensions	8,043	6,904				
	198,798	370,460				
Investments at cost—						
(a) Government and other securities (Market value at December 31, 1953, £143,786)	189,394	189,394				
(b) Sinking Fund Policies (Surrender value at December 31, 1953, £93,384)	70,989	70,989				
(c) Life Assurance Policies (Surrender value at December 31, 1953, £1,837)	1,874	1,874				
Loan to Irish Medical Association:						
Balance at January 1, 1953	8,000	8,000				
Less: Repaid during year	500	—				
Current Assets—						
Stocks of paper for publications, stationery, etc.	24,092	24,092				
Payments in advance	2,695	2,695				
Debtors (including unpaid subscriptions), less provision for losses	93,641	93,641				
Cash in hand	4,981	4,981				
	125,949	125,949				
	£785,680	£778,755				

E. A. GREGG, Chairman of Council

A. M. A. MOORE, Treasurer

ANGUS MACRAE, Secretary

AUDITORS' REPORT TO THE MEMBERS OF THE BRITISH MEDICAL ASSOCIATION

In our opinion and to the best of our information and according to the explanations given to us the above balance sheet and the annexed income and expenditure account give a true and fair view of the state of the Association's affairs as at 31st December, 1953, and of its income and expenditure for the year ended on that date. We have obtained all the information and explanations which to the best of our knowledge and belief were necessary for our audit. In our opinion the Association has kept proper books of account and received proper branch returns, and the above-mentioned accounts, which are in agreement with them, give in the prescribed manner the information required by the Companies Act, 1948.

3, Frederick's Place, Old Jewry, London, E.C.2.
11th May, 1954.

PRICE WATERHOUSE & CO.,
Chartered Accountants.

Income and Expenditure Account for the Year ended December 31, 1953

	1953	1952	1951	1950	1949	1948	1947	1946	1945	1944	1943	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891	1890	1889	1888	1887	1886	1885	1884	1883	1882	1881	1880	1879	1878	1877	1876	1875	1874	1873	1872	1871	1870	1869	1868	1867	1866	1865	1864	1863	1862	1861	1860	1859	1858	1857	1856	1855	1854	1853	1852	1851	1850	1849	1848	1847	1846	1845	1844	1843	1842	1841	1840	1839	1838	1837	1836	1835	1834	1833	1832	1831	1830	1829	1828	1827	1826	1825	1824	1823	1822	1821	1820	1819	1818	1817	1816	1815	1814	1813	1812	1811	1810	1809	1808	1807	1806	1805	1804	1803	1802	1801	1800	1799	1798	1797	1796	1795	1794	1793	1792	1791	1790	1789	1788	1787	1786	1785	1784	1783	1782	1781	1780	1779	1778	1777	1776	1775	1774	1773	1772	1771	1770	1769	1768	1767	1766	1765	1764	1763	1762	1761	1760	1759	1758	1757	1756	1755	1754	1753	1752	1751	1750	1749	1748	1747	1746	1745	1744	1743	1742	1741	1740	1739	1738	1737	1736	1735	1734	1733	1732	1731	1730	1729	1728	1727	1726	1725	1724	1723	1722	1721	1720	1719	1718	1717	1716	1715	1714	1713	1712	1711	1710	1709	1708	1707	1706	1705	1704	1703	1702	1701	1700	1699	1698	1697	1696	1695	1694	1693	1692	1691	1690	1689	1688	1687	1686	1685	1684	1683	1682	1681	1680	1679	1678	1677	1676	1675	1674	1673	1672	1671	1670	1669	1668	1667	1666	1665	1664	1663	1662	1661	1660	1659	1658	1657	1656	1655	1654	1653	1652	1651	1650	1649	1648	1647	1646	1645	1644	1643	1642	1641	1640	1639	1638	1637	1636	1635	1634	1633	1632	1631	1630	1629	1628	1627	1626	1625	1624	1623	1622	1621	1620	1619	1618	1617	1616	1615	1614	1613	1612	1611	1610	1609	1608	1607	1606	1605	1604	1603	1602	1601	1600	1599	1598	1597	1596	1595	1594	1593	1592	1591	1590	1589	1588	1587	1586	1585	1584	1583	1582	1581	1580	1579	1578	1577	1576	1575	1574	1573	1572	1571	1570	1569	1568	1567	1566	1565	1564	1563	1562	1561	1560	1559	1558	1557	1556	1555	1554	1553	1552	1551	1550	1549	1548	1547	1546	1545	1544	1543	1542	1541	1540	1539	1538	1537	1536	1535	1534	1533	1532	1531	1530	1529	1528	1527	1526	1525	1524	1523	1522	1521	1520	1519	1518	1517	1516	1515	1514	1513	1512	1511	1510	1509	1508	1507	1506	1505	1504	1503	1502	1501	1500	1499	1498	1497	1496	1495	1494	1493	1492	1491	1490	1489	1488	1487	1486	1485	1484	1483	1482	1481	1480	1479	1478	1477	1476	1475	1474	1473	1472	1471	1470	1469	1468	1467	1466	1465	1464	1463	1462	1461	1460	1459	1458	1457	1456	1455	1454	1453	1452	1451	1450	1449	1448	1447	1446	1445	1444	1443	1442	1441	1440	1439	1438	1437	1436	1435	1434	1433	1432	1431	1430	1429	1428	1427	1426	1425	1424	1423	1422	1421	1420	1419	1418	1417	1416	1415	1414	1413	1412	1411	1410	1409	1408	1407	1406	1405	1404	1403	1402	1401	1400	1399	1398	1397	1396	1395	1394	1393	1392	1391	1390	1389	1388	1387	1386	1385	1384	1383	1382	1381	1380	1379	1378	1377	1376	1375	1374	1373	1372	1371	1370	1369	1368	1367	1366	1365	1364	1363	1362	1361	1360	1359	1358	1357	1356	1355	1354	1353	1352	1351	1350	1349	1348	1347	1346	1345	1344	1343	1342	1341	1340	1339	1338	1337	1336	1335	1334	1333	1332	1331	1330	1329	1328	1327	1326	1325	1324	1323	1322	1321	1320	1319	1318	1317	1316	1315	1314	1313	1312	1311	1310	1309	1308	1307	1306	1305	1304	1303	1302	1301	1300	1299	1298	1297	1296	1295	1294	1293	1292	1291	1290	1289	1288	1287	1286	1285	1284	1283	1282	1281	1280	1279	1278	1277	1276	1275	1274	1273	1272	1271	1270	1269	1268	1267	1266	1265	1264	1263	1262	1261	1260	1259	1258	1257	1256	1255	1254	1253	1252	1251	1250	1249	1248	1247	1246	1245	1244	1243	1242	1241	1240	1239	1238	1237	1236	1235	1234	1233	1232	1231	1230	1229	1228	1227	1226	1225	1224	1223	1222	1221	1220	1219	1218	1217	1216	1215	1214	1213	1212	1211	1210	1209	1208	1207	1206	1205	1204	1203	1202	1201	1200	1199	1198	1197	1196	1195	1194	1193	1192	1191	1190	1189	1188	1187	1186	1185	1184	1183	1182	1181	1180	1179	1178	1177	1176	1175	1174	1173	1172	1171	1170	1169	1168	1167	1166	1165	1164	1163	1162	1161	1160	1159	1158	1157	1156	1155	1154	1153	1152	1151	1150	1149	1148	1147	1146	1145	1144	1143	1142	1141	1140	1139	1138	1137	1136	1135	1134	1133	1132	1131	1130	1129	1128	1127	1126	1125	1124	1123	1122	1121	1120	1119	1118	1117	1116	1115	1114	1113	1112	1111	1110	1109	1108	1107	1106	1105	1104	1103	1102	1101	1100	1099	1098	1097	1096	1095	1094	1093	1092	1091	1090	1089	1088	1087	1086	1085	1084	1083	1082	1081	1080	1079	1078	1077	1076	1075	1074	1073	1072	1071	1070	1069	1068	1067	1066	1065	1064	1063	1062	1061	1060	1059	1058	1057	1056	1055	1054	1053	1052	1051	1050	1049	1048	1047	1046	1045	1044	1043	1042	1041	1040	1039	1038	1037	1036	1035	1034	1033	1032	1031	1030	1029	1028	1027	1026	1025	1024	1023	1022	1021	1020	1019	1018	1017	1016	1015	1014	1013	1012	1011	1010	1009	1008	1007	1006	1005	1004	1003	1002	1001	1000	999	998	997	996	995	994	993	992	991	990	989	988	987	986	985	984	983	982	981	980	979	978	977	976	975	974	973	972	971	970	969	968	967	966	965	964	963	962	961	960	959	958	957	956	955	954	953	952	951	950	949	948	947	946	945	944	943	9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28. **Motion** by LONDON: That practitioners in partnership shall be allowed a fixed period of nine months to bring their individual lists within the prescribed maxima; that any extension of this period shall be permitted only with the consent of the Minister, and that during the period of grace allowed a partner shall be paid for the actual number of patients on his individual list.

Elimination of Inflation (Paras. 108-10 of Report)

29. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 108-10 of the Report of the General Medical Services Committee be approved.

30. **Motion** by LONDON: That this Conference regards the establishment of an Alphabetical Index as essential to the efficiency of the Central Registry if inflation is to be avoided and the Distribution Scheme safeguarded, and calls upon the Ministry of Health to take immediate steps to establish such an index.

31. **Motion** by KENT AND CANTERBURY: That this Conference instructs the General Medical Services Committee to press for the establishment of a Central Alphabetical Index to complement the present Numerical Register, believing that this is the only effective way by which inflation of lists can be kept in check.

32. **Motion** by WORCESTER CITY: That the Ministry be pressed again to have instructions printed on the medical card requesting the patient to notify to the executive council any change of address.

Acceptance of Patients of a Vacant Practice (Paras. 111-14 of Report)

33. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 111-14 of the Report of the General Medical Services Committee be approved.

34. **Motion** by DEVON AND EXETER: That in the opinion of this Conference the question of the acceptance of patients of a vacant practice is not the concern of the Central Ethical Committee, the maintenance or dispersal of the practice being the responsibility of the local executive council.

Treatment of Services Personnel on Leave (Para. 115 of Report)

35. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 115 of the Report of the General Medical Services Committee be approved.

36. **Motion** by NORTHAMPTON: That Services personnel on leave should be treated as temporary residents and that Service departments make contribution of a round sum to the Central Pool to cover such cases.

Standard of Accommodation in Surgeries and Waiting-rooms (Paras. 131-3 of Report)

37. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 131-3 of the Report of the General Medical Services Committee be approved.

38. **Motion** by LANARKSHIRE: That in view of the desirability of providing a higher standard of surgery accommodation and considering the total inadequacy of the monetary inducement offered to practitioners by the Group Practice Loans Fund, this Conference recommends that action be taken forthwith to secure for medical practitioners relief of income duty on a proportion of capital expenditure on new buildings and equipment as is at present enjoyed by industry.

Responsibility for the Acts and Omissions of a Partner (Paras. 136-41 of Report)

39. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 136-41 of the Report of the General Medical Services Committee be approved.

40. **Amendment** by HASTINGS: That arrangements should be made whereby the general practitioner who appoints a deputy, locum, or assistant should not be liable for any breaches of the terms of service by the deputy, locum, or assistant.

Provision of Diagnostic and Ancillary Facilities (Para. 148 of Report)

41. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 148 of the Report of the General Medical Services Committee be approved.

42. **Motion** by LANCASHIRE: That the General Medical Services Committee be requested to consider the setting up of a Central Committee or body (analogous to the Working Party) to secure that no clinical facilities available to general practitioners at any hospital or medical institution should be withdrawn without prior consultation with such Central Committee, and that the Central Committee should have power to initiate steps to secure the granting of clinical facilities to general practitioners where such facilities are non-existent.

Representation of General Practitioners in Hospital Administration (Paras. 149-52 of Report)

43. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 149-52 of the Report of the General Medical Services Committee be approved.

44. **Motion** by DORSET: That there be at least one general practitioner on all group hospital management committees selected from lists submitted by local medical committees of the areas concerned.

45. **Motion** by BERKSHIRE: That the General Medical Services Committee be asked to explore the possibility of every hospital management committee having a general practitioner as one of its members.

Maternity Medical Services (Paras. 157-66 and 305-9 of Report) Review of the Maternity Service

46. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 157 and 158 of the Report of the General Medical Services Committee be approved.

47. **Amendment** by MIDDLESEX: That the principle governing the payment of fees for maternity services be amended so that the fee paid is related to the work done; for example:

Antenatal examinations—half-guinea each up to maximum of four guineas.

Attendance at confinement—two guineas.
Medical care of mother and child for 14 days after the confinement—half-guinea per attendance, up to maximum of three guineas.

Medical and pelvic examination of the mother between six and twelve weeks after confinement—one guinea.

48. **Motion** by ISLE OF ELY: That the procedure in operation in England and Wales with regard to obstetric lists be abolished, and that the procedure at present followed in Scotland and Northern Ireland be adopted in its place.

49. **Motion** by NORTHAMPTON: That practitioners be provided with maternity record cards of a size to fit inside Form E.C.6 (medical record envelope).

50. **Motion** by YORK: That for cases confined in a private nursing home it should be within the power of the general practitioner in charge of the case to call upon the services of a specialist anaesthetist under the domiciliary arrangements of the National Health Service.

Ante- and Post-natal Care

51. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 159-61 and 305-6 of

the Report of the General Medical Services Committee be approved.

52. **Amendment** by NORTHAMPTONSHIRE: That antenatal examinations for patients booked for hospital may be undertaken jointly by the hospital services and the general practitioner concerned and that the general practitioner be appropriately remunerated.

Training of District Nurses (Para. 179 of Report)

53. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 179 of the Report of the General Medical Services Committee be approved.

54. **Amendment** by PLYMOUTH: That the Ministry of Health be pressed to appoint one or more additional general-practitioner representatives on the Working Party which has been set up to consider what training it is desirable that registered nurses and enrolled assistant nurses should undertake prior to their employment on home nursing duties, and the means by which such training should be provided.

Certification Certification for Surgical Corsets (Paras. 192-5 of Report)

55. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 192-5 of the Report of the General Medical Services Committee be approved.

56. **Amendment** by DERBYSHIRE: That doctors' certificates at present required for surgical corsets be abolished.

57. **Motion** by GATESHEAD: That every effort be made to secure the abolition of purchase tax on corsets.

Prescribing and Dispensing (Paras. 199-225 of Report) Discount on Drugs

58. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 199-201 of the Report of the General Medical Services Committee be approved.

59. **Motion** by DEVON AND EXETER: That this Conference feels that it is time that a settlement was arranged in the matter of discount on drugs to dispensing doctors, as they continue to suffer a loss when supplying proprietary preparations.

60. **Motion** by YORKSHIRE (EAST RIDING): That this Conference calls the attention of the General Medical Services Committee to the serious discrepancy which exists between the discount allowed by the wholesale drug houses to the dispensing general practitioners and that allowed to retail chemists; so far as many proprietary preparations are concerned this variation results in actual monetary loss to the general practitioner, and this situation must be remedied either by allowing a discount to the general practitioners comparable to that allowed to the chemists, or by compensating the general practitioners for the financial loss they experience.

Prescribing of Elastic Hosiery (Para. 208 of Report)

61. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 208 of the Report of the General Medical Services Committee be approved.

62. **Motion** by DERBYSHIRE: That the General Medical Services Committee approach the Ministry with a view to simplifying the prescription on Forms E.C. 10 for trusses and elastic hosiery so as to leave reasonable latitude to the fitter.

Prescribing of Casilan (Para. 211 of Report)

63. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 211 of the Report of the General Medical Services Committee be approved.

64. **Amendment** by BUCKINGHAMSHIRE: That high protein substances such as casilan and similar preparations be regarded as foods in all cases.

Form E.C. 10 (Para. 220 of Report)

65. **Motion** by the Chairman of the General Medical Services Committee: That paragraph 220 of the Report of the General Medical Services Committee be approved.

66. **Amendment** by KENT AND CANTERBURY: That in the opinion of this Conference the present type of pad of Form E.C. 10 has advantages that make its retention advisable.

Economy in Prescribing

(Paras. 228-31 and 312 and 313 of Report)

67. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 228-31 and 312 and 313 of the Report of the General Medical Services Committee be approved.

68. **Motion** by BIRMINGHAM: That this Conference instructs the General Medical Services Committee to re-examine the problem of the use of E.C. 10a in England in an effort to find a method whereby the pharmacists will not lose financially by the institution of this type of prescription.

Vaccination and Immunization

(Paras. 244-5 and 316-17 of Report)

69. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 244-5 and 316-17 of the Report of the General Medical Services Committee be approved.

70. **Motion** by WEST BROMWICH: That where local health authorities adopt with the Minister of Health's consent schemes for the immunization of children against diphtheria and whooping-cough, the Ministry of Health should supply the authorities with the antigen on the same terms that they supply antigen for schemes of diphtheria immunization, and that the G.M.S. Committee take this matter up with the Ministry forthwith.

Trainee General Practitioner Scheme (Paras. 254 and 255 of Report)

71. **Motion** by the Chairman of the General Medical Services Committee: That paragraphs 254 and 255 of the Report of the General Medical Services Committee be approved.

72. **Amendment** by WOLVERHAMPTON: That the present Trainee Assistant Scheme should be discontinued because it offers no advantages over the training given to ordinary assistants by their principals.

73. **Amendment** by COVENTRY, DUDLEY, WARWICKSHIRE, WORCESTERSHIRE, and WORCESTER CITY: That in view of the fact that the Trainee General Practitioner Scheme appears to be working with diverse success in different areas of the country, the General Medical Services Committee be instructed to re-examine the scheme in order to: (a) establish some uniformity in the suitability and commitments of the trainer practitioners, and (b) eliminate abuses.

Remainder of Annual Report of General Medical Services Committee

74. **Motion** by the Chairman of the General Medical Services Committee: That the remainder of the Annual Report and Supplementary Report of the General Medical Services Committee be approved.

MATTERS NOT REFERRED TO IN ANNUAL REPORT Election of Local Medical Committees

75. **Motion** by NEWCASTLE-UPON-TYNE: That the date for triennial elections of local medical committees should be advanced in order that the new committees may be

formed prior to the annual meetings of executive councils normally held in April.

Classification of Areas

76. **Motion** by NORTHUMBERLAND: That this Conference is of opinion that any area (not being a rural area) where the average list does not exceed 1,800 should be classified by the Medical Practices Committee as a "restricted area."

Compensation

77. **Motion** by DORSET: That the rate of interest on compensation moneys be raised to 5%.

Temporary Residents

78. **Motion** by BUCKINGHAMSHIRE: That the special temporary resident fee of 5s. for inmates of convalescent homes and similar places is inadequate and should be increased.

79. **Motion** by Lincs (LINDSEY): That this Conference asks the General Medical Services Committee to give detailed consideration to the method of payment for temporary residents in holiday camps with a view to seeking the Minister's permission to add to para. 15 (3) of the distribution scheme the following amendment: "The executive council may also, at their discretion, in consultation with the local medical committee, pay at an intermediate rate in certain cases when in their view neither the higher nor the lower rate is strictly applicable."

Dependants of American Service Personnel

80. **Motion** by YORKSHIRE (EAST RIDING): That this Conference seeks an assurance that the large numbers of dependants of American Service men resident in this country for periods exceeding three months are taken into account when determining the size of the Central Pool.

Removal of Names from Doctors' Lists

81. **Motion** by DUDLEY: That in the case of a practitioner who succeeds to a death or retirement vacancy, the responsibility for tracing patients on the list of the practice, whose addresses may have changed, shall rest not with the doctor but with the executive council, who shall satisfy themselves that all avenues of inquiry have been exhausted before removing the patient from the practice list.

Charges for Prescriptions

82. **Motion** by DERBYSHIRE: That the General Medical Services Committee asks the Ministry to alter the regulations relating to the monthly rendering of shillings by dispensing doctors paid on the drug tariff so as to align them with the regulations applied to dispensing chemists.

83. **Motion** by NORFOLK: That this Conference, believing that the collection of shilling charges by dispensing doctors is not only time-consuming but distasteful and undignified to professional men, calls upon the Minister of Health to abolish it at the earliest possible opportunity.

Prescribing of Cod-liver Oil and Malt

84. **Motion** by GATESHEAD: That only prescribed amounts of cod-liver oil and malt in excess of 4 lb. be subject to reference back by the Pricing Bureau.

Certification

85. **Motion** by NORFOLK: That in cases where it is apparent from the outset that the patient will be unfit for work for a considerable time, doctors should be able to give certificates of incapacity for longer than a week from the beginning.

86. **Motion** by NORTHAMPTON: That the Hospital In-patient Certificate Form Med. 10 be redrafted to state the fitness or unfitness for work of the patient.

Supplementary Ophthalmic Service

87. **Motion** by BLACKPOOL: That O.S.C. 1 forms should be abolished.

Registration of Babies

88. **Motion** by CUMBERLAND: That the Conference instructs the General Medical Services Committee to investigate some method whereby a baby is registered with a doctor within four weeks of birth.

Local Authority Children's Committees

89. **Motion** by WEST BROMWICH: That the General Medical Services Committee open negotiations with the appropriate Government department with a view to urging that department to do all in its power to persuade local authorities: (a) to co-opt to their Children's Committees general-practitioner representation nominated by local medical committees, and (b) to arrange for the attendance of one of the authority's medical officers at all meetings of the Children's Committee.

Road Accidents

90. **Motion** by CAERNARVONSHIRE: That as the legal obligations in road accidents, whereby doctors' fees are ultimately met by the insurance companies, seldom operate, and as in the majority of cases emergency treatment fees and costs are never recovered, the executive councils, as paying bodies, be made responsible for the administrative work involved in the recovery of fees and their payment to the doctor.

Conference Dinner

91. **Motion** by CAERNARVONSHIRE: That the sum of four guineas for the Conference Dinner is excessive and that a more reasonably priced meal could be arranged.

THE DEFENCE TRUSTS

92. **Motion** by the Chairman of the Trustees: That the Report of the Trustees of the National Insurance Defence Trust and General Medical Services Defence Trust, as to action taken since the last report to the Conference (paragraph 266 of Report), be received and approved.

93. **Motion** by the Chairman of the Trustees: That the report of contributions received from local medical committees up to March 31, 1954 (M.14), be received and approved.

CHAIRMAN OF CONFERENCE

94. Elect: Chairman of Conference for Session 1954-5. (See Standing Order 14—Nominations to be handed in not later than 11 a.m. on the day of the Conference.)

CONFERENCE AGENDA COMMITTEE

95. Elect: Three members of the Conference Agenda Committee. (See Standing Order 16—Nominations to be handed in not later than 12.30 p.m. on the day of the Conference.)

ELECTION OF SIX MEMBERS OF GENERAL MEDICAL SERVICES COMMITTEE

96. Elect: Six members of the General Medical Services Committee. (See Standing Order 15—Nominations to be handed in not later than 12.30 p.m. on the day of the Conference.)

THE CLAIRE WAND FUND

97. Elect: Six Trustees of the Claire Wand Fund.
98. Receive: Annual Report of the Trustees of the Claire Wand Fund.

THE DAIN FUND

99. Receive: Annual Report of the Trustees of the Dain Fund.

DINNER COMMITTEE

100. **Motion** by the Chairman: That five members of the Conference be appointed the Dinner Committee under Standing Order 17.

GENERAL MEDICAL SERVICES COMMITTEE ELECTION OF DIRECT REPRESENTATIVES, 1954-5

The following direct representatives upon the General Medical Services Committee have been elected unopposed for the Groups mentioned:

- Group A1
Dr. W. Neil Darling (Edinburgh).
Group A2
Dr. C. J. Swanson (Aberfeldy, Perthshire).
Group A3
Dr. W. M. Knox (Glasgow).
Group A4
Dr. R. C. Hamilton (Kilmarnock).
Group C
Dr. H. F. Hollis (Leeds).
Dr. H. Thorp (Tadmorden).
Group E
Dr. Miles Parkes (Crewe).
Group F
Dr. T. J. Hargest (Clydach, Swansea).
Dr. G. P. Williams (Holyhead).
Group H
Dr. A. B. Davies (Walsall).
Group I
Dr. F. A. Smoritt (Southam, Warwicks).
Group J
Dr. C. F. R. Killick (Williton, Somerset).
Group K
Dr. R. W. McConnell (Wendover, Bucks).
Group L
Dr. J. D. R. Murray (Exmouth).
Group M
Dr. K. S. Maurice-Smith (Ely).
Group N
Dr. H. S. Howie Wood (Shanklin, Isle of Wight).
Group O
Dr. D. F. Whitaker (Guildford).
Group P
Dr. R. Green (Lewes, Sussex).
Group Q
Dr. A. Talbot Rogers (Bromley, Kent).
Group R
Dr. D. F. Hutchinson (Middlesex).
Dr. A. N. Mathias (Cricklewood, N.W.2).
Group S
Dr. C. M. Scott (New Barnet).
Dr. H. N. Rose (Ilford, Essex).
Group T
Dr. H. H. D. Sutherland (London, W.10).
Dr. M. Sorsby (London, E.5).
Group U
Dr. J. B. Young (Belfast).
In the contested Groups—namely, B, D, and G—the results were as follows:
Group B
Dr. D. T. McDonald (Belford). Elected.
Dr. F. Lishman (Bishop Auckland). Elected.
Dr. F. J. Stevenson (Carlisle).
Group D
Dr. A. Campbell (Accrington). Elected.
Dr. F. S. Catto (Manchester). Elected.
Dr. P. J. Gibbons (Liverpool). Elected.
Dr. J. M. Dove (Blackpool).
Group G
Dr. F. W. Goodwin (Leicester). Elected.
Dr. A. S. Wilson (Gosberton). Elected.
Dr. A. D. Stoker (Winstar).

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

- Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

N.H.S. HOSPITAL ACCOUNTS SUMMARIZED ENGLAND AND WALES

The England and Wales summarized hospital accounts for 1952-3¹ show that the average net weekly cost of maintaining patients in the various types of hospital was highest in the general teaching hospitals (£30 6s. 5d.), and lowest in the mental, mental deficiency, and chronic sick hospitals (£4 8s. 6d., £4 4s. 4d., and £6 11s. 9d. respectively). In general hospitals the average cost was £19 12s. 6d.

Sir Frank Tribe, in his report on the accounts as Comptroller and Auditor-General, refers to his earlier reports which mentioned defects in the systems for paying salaries and wages in hospitals, and says that these defects have not yet been eliminated. The commonest is that the same people both prepare the wages list and pay out the wages on the list; he also mentions unsatisfactory arrangements for dealing with wages unclaimed at the normal time, and failure to certify or check pay sheets and overtime claims. Weakness in store accounting persisted during 1952-3. Checking of such inventories as existed revealed deficiencies of about £71,000—at two large hospitals the deficiencies amounted to £3,319 and £3,231, the larger part arising on bedding and linen.

Scotland

Similarly summarized accounts for Scotland for the same period follow much the same pattern. Expenditure on capital account included £1,099 (the second largest item) for alterations to a motor vessel to facilitate carrying stretcher cases from the Western Isles.

PUBLIC HEALTH SERVICE

FAVOURABLE INDUSTRIAL COURT AWARD

As reported in the Supplement (March 27, p. 126), the dispute between a medical officer employed by the Renfrew County Council and the County Council with regard to her status was notified by agreement to the Minister of Labour under the Industrial Courts Act. The Minister referred the case to the Industrial Court, and the hearing took place on April 27, 1954. The terms of reference were as follows:

"To determine a difference between Renfrew County Council and Dr. Sheila Thomson concerning the category of the appointment held by her in the Health Department of Renfrew County Council for the purpose of applying the Awards of the Industrial Court Nos. 2285 and 2327 and the decisions of Committee 'C' of the Medical Council of the Whitley Councils for Health Services (Great Britain) with effect from October 1, 1950."

The case for Dr. Sheila Thomson was presented by Counsel, Mr. S. B. R. Cooke, instructed by Messrs. Hempsons, acting on behalf of the Trustees of the Public Health Service Defence Trust. The Award of the Court has now been published in document 2508 and reads as follows:

"The Court is satisfied upon the evidence before it that, however her office may have been described by the Renfrew County Council, Dr. Thomson was at the time of her appointment, and at all material times thereafter, discharging the duties of a 'Senior Medical Officer,' and the Court find and so Award that though the population of the area in which she functions is below that of an area in which a Senior Medical Officer would in future normally be appointed, Dr. Thomson is entitled while she continues to discharge her present duties, and has been so entitled from and including October 1, 1950, to be paid on a personal basis, and in accordance with the provisions of the Industrial Court Award No. 2285 as interpreted by Industrial Court Award No. 2327, the salary applicable to a Senior Medical Officer, namely, on a scale of £1,250 per annum, rising by annual increments of £50 to £1,650 per annum."

¹Accounts 1952-3, 1954. H.M.S.O., London.

MEETING OF S.H.M.O.s

Mr. G. Waring Robinson, chairman of the S.H.M.O. Group of the Sheffield Region, is calling a general meeting of S.H.M.O.s of all Regions at B.M.A. House, London, on Saturday, May 29, at 3 p.m.

Among matters on the agenda for discussion are the following: (1) Status and future of grade; (2) the effect of the recent award on the percentage difference between S.H.M.O. and consultant salaries; (3) promotion by regular review; (4) S.H.M.O.s doing consultant work; (5) future policy—(a) short term: interim measures; (b) long term: abolition of title.

Every S.H.M.O. who can is invited to attend the meeting.

Correspondence

Remuneration of Hospital Medical Staff

SIR,—So many misconceptions have been expressed about the recent negotiations on the salaries of hospital medical staffs that I must ask to be allowed to state a few facts.

It seems necessary to recall that the negotiations were conducted, and the settlement reached, by the Staff Side of Whitley "B" Committee, which contains six members of the Consultants and Specialists Committee established by the British Medical Association. When the Staff Side is being criticized, it is only fair that it should be recognized that it was the Staff Side alone who took the initiative in putting forward a claim. Indeed, as lately as in June, 1952, the Central Consultants and Specialists Committee resolved that "a formal claim" should be lodged, "but that such claim be not pressed at the present time." If we had followed that advice, we should have got nothing now. Because the Staff Side were convinced that unless action was taken at once there was great danger that the claim of the hospital medical staffs would go by default we decided to press it in Whitley immediately.

What had happened to make it so urgent? The general practitioners, having asked to be allowed to take action independently of the consultants, had obtained the Danckwerts award, and thereby, as it turned out, made it impossible for the consultants to achieve anything comparable. For the Government's immediate reaction to the award was the statement of the Chancellor of the Exchequer in July, 1952, that it was not to be regarded as applicable to other branches of the profession. Whitley procedure made arbitration unobtainable except with the consent of the other side, which was refused. We were thus left with a moral claim which the Management Side refused to meet, and which was completely unenforceable.

By negotiations we saved from the wreck £34m., which was distributed where it was most needed to redress the balance upset by the Danckwerts award and to restore the financial attractiveness of the consultant branch. There is much confusion of thought about Spens. An agreement is not invalidated because one side repudiates it: if so, the county courts could close their doors. If it is true that "Spens has gone," it went when the Chancellor made his statement before the negotiations began. But the Staff Side has never taken that defeatist view. The settlement in no way ties our hands, and our claim to cost-of-living betterment is as valid as it was before—and as unenforceable. Finally, I hope that there will be an end to attempts to exploit the dissatisfaction, which we all feel, in order to cause dissension in the profession. Can we not continue to put unity before sectional interest?—I am, etc.,

London, W.1.

W. RUSSELL BRAIN,
Chairman, Joint Consultants Committee, and
Staff Side, Whitley Committee "B."

SIR,—Part-time consultants are no longer to be allowed, for income-tax purposes, to offset practice expenses against their total earnings—unless over 50% of those earnings be derived from private practice. This is a shrewd and calculated blow against the continuation of private practice in this country, for, although the established consultant will be undisturbed, the beginner will have his difficult task made nigh impossible.

Sessional work at hospitals is surely an integral part of consultant practice, and this principle should continue to be recognized for the struggling, as well as the established, consultant. Moreover, it is in the first years of a part-time consultant appointment that the disproportionately heavy expenses come, and this at a time when sessional payments are at the lower end of the scale and without distinction award. The private side of a consultant practice is inevitably run at a loss at first, and, in my case after three years, it is still so. There is no longer "big money" to be made in private practice except by the very few; nevertheless, the value of private practice to doctor and patient cannot be overestimated: the discipline it affords acts as a leaven in maintaining the standard of medicine.

The Spens scale, with its recent modification, was calculated under the then existing interpretation of tax regulations. Its balance has now been radically changed by this new interpretation, and negotiations should be reopened. Dr. Stevenson (*Supplement*, May 8, p. 228) should be assured that there is no contentment over the results of recent negotiations. Only two consultants out of the staff of four hospitals that I visit have expressed satisfaction, and one of these did so on the grounds that only one-fifth of his income came from the N.H.S. so that the change hardly affected him. All future negotiations with the Ministry on financial matters affecting any section of the profession should be handled by one body that has the backing of the profession as a whole—the B.M.A. Such negotiations must be carried out by experienced negotiators with skilled financial advisers.—I am, etc.,

"YOUNG CONSULTANT."

SIR,—The Medical Advisory Committee of the South Shields District group of hospitals considered at its last meeting the resolutions from the senior medical staff of the Southamptons Group, published in the *Supplement* of March 27 (p. 126).

My committee, in support of the views from Southampton, passed the following resolutions: (1) The award recently announced and agreed by our negotiators in Whitley "B" Committee fully justifies the resolutions of the Southamptons Group published in the *Supplement* to the *British Medical Journal* of March 27. (2) This Committee is of the unanimous opinion that every step should be taken to bring the question of remuneration for hospital medical staffs to arbitration.—I am, etc.,

N. STRANG,
Acting Hon. Secretary,
South Shields District Hospital Group Advisory Committee.

SIR,—The flood of letters from disgusted correspondents regarding the few crusts of bread that the Ministry has condescended to throw on the bare plates of junior hospital officers is sufficient proof of the unfairness of the new salaries.

It seems fruitless to blame the negotiators for this lean pittance—there is little else they could have done, and it is no pleasant task being a negotiator. The weakness lies with the hospital officers refusing to understand the psychology of the Ministerial beast. Professional people are too few in number and too sheepish to get increases by moral means: their few votes will not affect elections. In the eyes of politicians they count for little. The man prepared to strike for an increase of £20 per annum over his £250, to give up his holidays and to go hungry for a week, has a negotiator whom Ministries respect and treat with care. Only rough methods curb those impersonal bodies whose very salaries depend on playing up to the grinding masses.

As a casualty officer working 75 hours a week at a salary of £450 per annum I was earning less per hour than the porter who could hardly write his own name. But it matters little to the Ministry, because hospitals now have more porters than junior medical officers, not to mention the redundant administrative clerks hanging about hospital corridors.

The fact is that, unless we tell our negotiators that we stand by them, and are prepared to bring hospital work to a standstill, we shall achieve little—even if we took to a century to do it. It is no use subliming our fears by talks of immorality if a strike is suggested. We are employed by the State, whose revenues come from the public, and it is only by awaking that public to the present injustice that we shall get a redress.—I am, etc.,

Kingston-on-Thames.

L. R. CELESTIN.

SIR, I notice in the report on the remuneration of hospital medical staff (*Supplement*, May 8, p. 228) that the resolution of confidence proposed by Dr. S. Cochrane was carried *unanimously*. I am sorry to Shanks was carried *unanimously*. I think this five abstentions from the vote of confidence. I think this at least might have been added.

I have noticed in the past that there is always a considerable amount of matter, contradictory matter in particular, omitted from the report of the Central Consultants and Specialists Committee meetings.—I am, etc.,

Irvine, Ayrshire.

R. DE SOLDENHOFF.

SIR, It has been some comfort to learn that the Staff Side on Committee "B" of the Medical Whitley Council has decided not to accept the award granted to S.H.M.O.s in its present form as final, and to press on for a more equitable salary scale. There is no doubt that of all the groups of hospital medical staff the S.H.M.O.s have had the worst time in the past, and the recent award has been no exception. By granting a salary rise of 50% of what the consultants receive, the gap between the two sections has been widened.

It is to be hoped that, when the claim for a better salary scale is made, all the important facts concerning the S.H.M.O. will be marshalled to support it. The negotiating body will be able to point out that the S.H.M.O. post is not a stepping-stone in a specialist career, but a permanent dead-end job, and that consequently a large group of medical men and women are compelled never to attain a higher standard than £1,950 per annum. Just how large this group is at present, and will become in the future, is a matter of the greatest importance and should not be lost sight of in the negotiations.

The S.H.M.O. grade was originally conceived to accommodate a certain limited number of specialists with lesser responsibilities than consultants: it was to be a temporary grade which would shrink and eventually disappear with the gradual retirement of its original bearers. The Management Side was not slow to see that this grade was economically advantageous, and further recruitment was encouraged, though at first restricted to a few selected specialties. By now there is hardly any specialty without new openings for assistant physicians or surgeons, as those on the S.H.M.O. salary scale are now preferably called. The candidates for these posts will be those registrars with higher qualifications, and many years of experience who, having failed to secure a consultant post, will have to accept this inferior status if they prefer to stick to their specialty rather than start over again in general practice. But it can be said without exaggeration that "once an S.H.M.O. always an S.H.M.O." Promotion from this grade is quite exceptional. Those negotiating should know that they are speaking for a very large and growing group of specialists, whose financial standing must not be allowed to drop lower.

In fixing the new salary scale some thought should also be given to the annual increments, which at £50 are very

low. There is nothing sacrosanct and immutable about these £50, and, bearing in mind that its value has decreased by some 30% since 1948, a yearly increment of £75 would not be unreasonable. Another important feature of the S.H.M.O. grade is that most posts are whole-time, and this aspect emphasizes the importance of the further resolution which was passed, that Committee "B" of the Whitley Council is to persevere with its efforts to free whole-time officers from all the restrictions imposed on them contrary to Spens.—I am, etc.,

Leeds.

L. WITTELS.

Grading of S.H.M.O.s

SIR,—The report presented by Dr. T. Rowland Hill to the Council (*Supplement*, May 15, p. 235) on the recent increases in the remuneration of hospital medical staff has shown how timely will be the meeting of S.H.M.O.s of all regions to be held at B.M.A. House on Saturday, May 29, at 3 p.m., in Committee Room B. The agenda consists of (1) status and future of the grade; (2) the recent award which has accentuated the percentage difference between the S.H.M.O. and consultant salaries. Other matters to be discussed include S.H.M.O.s doing consultant work, and formation of future policy, including representation by S.H.M.O.s on any grading committee.

S.H.M.O.s here have an opportunity of speaking with one voice, not as a separate entity but as colleagues of the general body of specialists. Dr. S. F. Logan Dahne hopes to be present at the meeting.—I am, etc.,

G. WARING ROBINSON,
Chairman,
S.H.M.O. Groups (Sheffield Region).

Leicester.

Remuneration in the Public Health Service

SIR,—I have read with interest the letters from Drs. J. Grant (*Supplement*, May 1, p. 214), E. D. Irvine (*Supplement*, April 3, p. 143), and J. V. Walker (*Supplement*, May 15, p. 245) regarding the remuneration of medical officers in the public health service. I would like to assure your correspondents that the points which they have raised have been very much in the mind of the Staff Side of Committee "C," have already been the subject of discussion, and will certainly be taken into consideration at the meeting of the Staff Side of Committee "C" on June 11, when the main business of the meeting will be a review of the present situation in the public health service.—I am, etc.,

J. B. TILLEY,
Chairman, Staff Side of Committee "C."

SIR,—The plea put forward by Dr. I. C. Monro (*Supplement*, May 8, p. 232) that the B.M.A. should take immediate steps to remedy the "raw deal" to public health medical officers should appeal to all fair-minded members of the profession. Many of us are approaching the qualifying period for what is likely to be a grossly inadequate pension after years of valuable service to the community. It is largely due to our personal exertions that any worthwhile co-ordination of the tripartite Health Service has been achieved. The M.O.H. of a population of 50-70,000 (the ideal unit as far as a famous ex-Minister of Health is concerned) is left to the mercy of his local authority in applying a maximum salary, which in any event is now below that for S.H.M.O.s or junior Civil Service medical officers. He can only reflect ruefully that had he remained in the clinical post which he held in the nineteen-thirties his maximum would now be £3,100, or the same as his pre-1948 assistants who had the foresight or opportunity to transfer to the regional hospital boards.

In no other "service" and in no other country or industry has the normal promotion from specialist to administrator been accompanied by a penalty in terms of remuneration. The Minister of Health, who directs that every authority must appoint an M.O.H. possessing special qualifications (registrable, by the way), who holds office by his favour, and reports directly to him by statute, should have

more regard to the material position of his field officers. When the Minister appoints a permanent chief medical officer to advise him on all matters in the health services he invariably selects a medical officer of health of a local authority—and not necessarily the biggest authority. Would it be too much to expect the Minister and Committee "C" of the Whitley Council to take to heart paragraphs 50 and 51 of the memorandum prepared recently by the Scottish Committee of the B.M.A. as evidence to the Committee of Inquiry into the cost of the National Health Service (*Supplement*, March 20, p. 78)? The successive reports on health services in Scotland have always been characterized by vision and practical idealism, but the memorandum referred to echoes the fate of its precursors when it states that its emphasis on prevention and the need to attract first-class M.O.H.s "may call for something of reorientation of thought at the highest level."—I am, etc.,

Kirkcaldy.

JAMES R. W. HAY.

Association Notices

Diary of Central Meetings

MAY

- 25 Tues. Constitution Committee, 2 p.m.
26 Wed. Geriatrics Joint Subcommittee, Central Consultants and Specialists, Public Health, and G.M.S. Committees, 2.15 p.m.
28 Fri. Conference of Regional Officers, 12 noon.
28 Fri. Psychological Medicine Group Committee, 2 p.m.

JUNE

- 2 Wed. Film Committee, 11 a.m.
9 Wed. Central Ethical Committee, 12 noon.
10 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
10 Thurs. Library Subcommittee, Science Committee, 2 p.m.
11 Fri. Staff Side, Committee "C," 10.30 a.m.
15 Tues. Evidence Committee on Divine Healing, 2 p.m.
15 Tues. Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.
16 Wed. Occupational Health Committee, 10.30 a.m.
18 Fri. Public Relations Conference, 10.30 a.m.

JULY

- 1 Thurs. Annual Representative Meeting (at Glasgow), 10 a.m.
2 Fri. Annual Representative Meeting (at Glasgow), 9.30 a.m.
3 Sat. Council (at Glasgow), 9 a.m.
3 Sat. Annual Representative Meeting (at Glasgow), 10 a.m.
5 Mon. Annual Representative Meeting (at Glasgow), 10 a.m.
5 Mon. Annual General Meeting (at Glasgow), 12.30 p.m.
5 Mon. Council (at Glasgow), at conclusion of A.R.M.
5 Mon. Adjourned Annual General Meeting and President's Address (at Glasgow), 8.15 p.m.

Branch and Division Meetings to be Held

BIRMINGHAM DIVISION.—At Chadwick Manor, Knowle, Friday, May 28, 8 p.m., B.M.A. annual dinner dance.
BROMLEY DIVISION.—At the Royal Bell Hotel, Bromley, Friday, May 28, 8.30 p.m., business meeting.
CARDIFF DIVISION.—At Whitehall Rooms, Park Hotel, Cardiff, Wednesday, May 26, 8 for 8.15 p.m., supper meeting. Address by Mr. J. W. Tudor Thomas: "A B.M.A. Tour in the Middle and Far East" (illustrated by lantern slides). Members' wives are invited.
CITY DIVISION.—(1) At Hackney Hospital, Homerton High Street, E., Wednesday, May 26, 2 p.m., films: (a) "Industrial Dermatitis"; (b) "The Lymphatic System." (2) At Institute of Laryngology and Otology, Gray's Inn Road, W.C., Friday, May 28, 3.30 p.m., clinical meeting. Mr. Wallace Black: "Ulcers of the Mouth and Pharynx."
CITY OF DUNDEE AND COUNTY OF ANGUS DIVISIONS.—At Physiology Department, Medical School, Dundee, Friday, May 28, 8.30 p.m., Branch annual general meeting and Dundee Division annual general meeting.
DERBY DIVISION.—At Derbyshire Royal Infirmary, Friday, May 28, 8.30 p.m., annual meeting.

ENFIELD AND POTTERS BAR DIVISION.—At St. Michael's Hospital, Chase Side Crescent, Enfield, Wednesday, May 26, 8.30 p.m., 4th annual meeting.

FURNESS DIVISION.—At Duke of Edinburgh Hotel, Barrow-in-Furness, Tuesday, May 25, 8 p.m., annual general meeting.
GRIMSBY DIVISION.—At Scartho Road Infirmary, Grimsby, Tuesday, May 25, 8.30 p.m., meeting of all medical practitioners in the area of the Division.

HAMPSTEAD DIVISION.—(1) Joint visit with the Hampstead Medical Society to Central Public Health Laboratories, Colindale Avenue, N.W. Laboratories open from 3.30 p.m. on Tuesday and Wednesday, May 25 and 26. (2) At Central Library, Finchley Road, Hampstead, N.W., Friday, May 28, 8.30 p.m., A.G.M.
HENDON DIVISION.—At Hendon Hall Hotel, Ashley Lane, N.W., Tuesday, May 25, 8.45 p.m., medico-political meeting.

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Mary Abbots Hospital, Marloes Road, Kensington, W., Friday, May 28, 8.30 p.m., joint meeting with Chelsea and Fulham, and Paddington Divisions.

KESTEVEN DIVISION.—At Grantham and Kesteven General Hospital, Grantham, Sunday, May 23, 11 a.m., meeting.

LINCOLN DIVISION.—At County Hospital, Lincoln, Thursday, May 27, 8 p.m., annual general meeting.

METROPOLITAN COUNTIES BRANCH. At B.M.A. House, Tavistock Square, London, W.C., Wednesday, June 2, 3 p.m., annual general meeting. President's address by Dr. D. F. Hutchinson: "Chairborne."

MID-ESSEX DIVISION.—At Out-patient Department, Chelmsford and Essex Hospital, London Road, Chelmsford, Wednesday, May 26, 8.15 p.m., meeting. Dr. C. Keith Simpson: "Crime and the Doctor." Members of the Legal Profession and of the Essex Constabulary are invited.

MID-HERTS DIVISION.—At Mid-Herts Wing, St. Albans City Hospitals, Friday, May 28, 8.30 p.m., clinical meeting.
MONMOUTHSHIRE DIVISION.—At Constitutional Club, Stow Hill, Newport, Tuesday, May 25, 8.15 p.m., annual general meeting.

NORTH LANCASHIRE AND WESTMORLAND BRANCH. At Duke of Edinburgh Hotel, Barrow-in-Furness, Wednesday, May 26, 12.30 for 1 p.m., lunch, followed by 5th annual meeting. Presidential Address by Dr. J. R. Turner.

NORTH MIDDLESEX DIVISION. At Southgate Town Hall, London, N., Friday, May 28, 8.45 p.m., meeting of all medical practitioners in the area of the Division. Discussion on Health Visitors and the General Practitioner.

OXFORD DIVISION.—At Maternity Department, Lecture Theatre, Radcliffe Infirmary, Oxford, Wednesday, May 26, 8.15 p.m., meeting. Dr. Roger Ormrod: "Some Recent Cases of Medico-Legal Interest."

ST. PANCRA'S DIVISION.—At Old Library, B.M.A. House, Tavistock Square, London, W.C., Tuesday, May 25, 8.30 p.m., annual general meeting.

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Tuesday, May 25, 8.30 p.m., annual general meeting.

SOUTH MIDDLESEX DIVISION.—At Great Posters, Egham, Wednesday, May 26, 8 to 10 p.m., cocktail party with local Division of British Dental Association.

SOUTH-WEST ESSEX DIVISION. At Out-patient Department, Connaught Hospital, Oxford Road, Walthamstow, E., Wednesday, May 26, 8.30 p.m., annual general meeting.

SOUTH-WEST WALES DIVISION.—At Webley Hotel, Poppit, St. Dogmaels, Cardigan, Saturday, May 29, social meeting for members and their wives commencing with cocktail party at 6.30 p.m.

SUSSEX BRANCH.—At The Assembly Room, Town Hall, Lewes, Thursday, May 27, 12.30 p.m., 32nd annual general meeting. 1 p.m., luncheon.

TOWER HAMLETS DIVISION. At St. Andrew's Hospital, Devon's Road, Bow, E., Friday, May 28, 3 p.m., clinical meeting.

WEMBLEY DIVISION.—At Wembley Hospital, Fairview Avenue, High Road, Tuesday, May 25, 9 p.m., meeting. Dr. F. E. Camps: "The Christie Case." Illustrated by lantern slides. All medical practitioners in the area of the Division and members of the Hampstead, Willesden, and Harrow Divisions are invited.

WOOLWICH DIVISION.—At Eltham and Mottingham Hospital, Passy Place, S.E., Tuesday, May 25, 8.30 p.m., annual general meeting.

YORK DIVISION.—At 17, Stonegate, York, Saturday, May 29, 8.30 p.m., annual general meeting.

Meetings of Branches and Divisions

CHELSEA AND FULHAM DIVISION

The annual general meeting was held at Fulham Town Hall on April 23. With Dr. Harnett in the chair, there were 13 members present. The following officers were elected for 1954-5:

Chairman.—Colonel W. L. Harnett.

Vice-chairman.—Dr. G. Rosemont.

Joint Honorary Secretaries.—Drs. D. J. Thomas and C. Watney Roe.

MOMBASA DIVISION

A meeting was held at the Pandya Memorial Clinic on February 25. Dr. C. Cochran was in the chair. Dr. J. R. Harnett and Mr. D. O'Keefe presented medical and surgical cases respectively, and Dr. Sheth presented a case of Plummer-Vinson syndrome.

SUPPLEMENT TO THE
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CONFERENCE OF HONORARY SECRETARIES
OF DIVISIONS AND BRANCHES

The annual Conference of Honorary Secretaries was held in the Great Hall of B.M.A. House on May 19, with Dr. D. M. HUGHES (Hon. Secretary of the South Wales and Monmouthshire Branch) in the chair. There was a large attendance, and there was no falling off in the spate of discussion morning or afternoon. An apology for absence was reported from Dr. Gregg, Chairman of Council, who was taking a well-earned holiday.

Review of the Present Position

Dr. A. MACRAE (Secretary of the Association) reminded the Conference that it was concerned principally with the organizational side of the work, how they as secretaries could help to maintain and increase membership and make the Association of maximum benefit to every side of the profession. He went on to refer to the new plan under which annual reports of Divisions were sent to Headquarters in the summer and not as formerly at the end of the year. The new system meant that they were able to start budgeting in the early autumn so that the complete budget would be available to the Council in January. He also asked for local help in approaching members who had not paid their subscriptions and whose membership would therefore lapse at the end of the year; also those who had intimated a wish to resign. If sound reasons for resignation were given, a man should not be pressed unreasonably to reconsider his decision. Some of the reasons, however, were based on complete misconceptions.

On the subject of B.M.A. lectures, Dr. Macrae called attention to the printed rules governing them. Three months' notice must be given to Headquarters of the date on which it was desired a lecture be given.

Ethical Committees

He called attention to the new rule whereby it was necessary for the Divisions to appoint an ethical committee. Under the old rule it was possible for a Division if it had omitted to appoint an ethical committee at the annual general meeting to make use of its executive. Un- less an ethical committee were appointed the Division was not competent to handle any ethical problems in the area. A circular was going out very soon about advisory councils on occupational health. These councils, which were tripartite bodies, had been established in a relatively

small number of Divisions on the initiative of the Association. Every effort should be made to encourage the establishment of additional councils of this kind.

Headquarters hoped that honorary secretaries would get the maximum help possible from regional offices. Constructive suggestions were desired as to how the regional office might be improved and made more helpful.

Dr. Macrae said that he had offered a year ago to restart the "Occasional Letter." The majority seemed to want it, but the four letters sent out so far this session had evoked very little in the way of comment. It would help him to have criticisms and suggestions.

Discussion

In the discussion following the Secretary's address, Dr. G. C. L. WOODROFFE (South Middlesex) asked about the method of approach to those who were tendering their resignations. Should this be in the hands of the secretary or in those of the senior officers if they knew the resigning members better? The CHAIRMAN said that the great thing was that there should be contact. The best method must be left to local discretion.

Dr. S. BREST (Lambeth and Southwark) suggested that the Association subscription should be lowered in the case of the younger man. A man with large family expenses might be dissuaded from joining, especially if he was able to see his partner's copy of the *Journal*. The CHAIRMAN said that the smaller fee was not a good idea. The younger men should be told that they could spend six guineas much less profitably than on the Association. In his opinion what the Association could give was well worth six guineas for any newly qualified practitioner, whatever his domestic responsibilities.

Dr. J. A. PRIDHAM (chairman of the Organization Committee) pointed out that the subscription was a reduced one for the first five years after qualification.

In reply to a question on the non-payment of subscriptions and the method of approach to defaulters, Dr. L. S. PORTER (Assistant Secretary) said that they did all they could from Headquarters, but London was at a disadvantage when it came to approaching men on Tyneside or in Cumberland. Dr. WARING TAYLOR (Leicester and Rutland) asked whether it was possible for a member to be more than one year in arrears, and if he rejoined after an interval would he have only one year's back subscription to pay? Dr. PORTER said that it was the usual practice not to require a man to be re-elected to the Association through normal channels if, having been struck off, he paid his arrears within a reason-

able time together with any subscription then due. Discretion was used in this matter.

The Basic Unit

Mr. H. H. LANGSTON (chairman of the Constitution Committee) opened a discussion on the question: "What is the most effective area as the basic unit of the Association?" The Council, he said, had set up a Constitution Committee to review and make recommendations on the whole constitutional structure of the Association. It had the widest possible terms of reference. The Committee had decided—rightly, in his opinion—that the proper place at which to start its work was at the periphery and to look at the needs of the individual member in his local Division, instead of beginning with the Representative Body. Long discussions had already taken place on the functions of the Division. It was realized that in these days the local Division of the Association was the only place in which doctors of all types had a chance of meeting, discussing their individual problems, and informing each other about their work and the things they did. It was an ideal forum in which local difficulties could be sorted out.

He proceeded to read from what he described as a most useful memorandum which had been received from the Cornwall Division, and which set out in an admirable way the principal functions of the Association.

Mr. Langston concluded by saying that the first thing to be thought about was the size and shape of the Division from the point of view of the service which the Association could render to its members. Sizes of Divisions varied greatly. There were 17 Divisions which had fewer than 60 members; the vast majority had between 300 and 450; 13 Divisions had between 500 and 1,000 members, and one Division had over 1,000. It appeared that type of practice did not much affect attendance at divisional meetings; the size of the Division did affect it.

Views of Division Secretaries

Dr. R. B. L. RIDGE (Enfield and Potters Bar) said that his Division had adopted the principle that its function was to provide a medium for the establishment of the maximum degree of friendship and co-operation among the doctors of the area. It had been gratifying to see the development of friendship among doctors who previously had hardly recognized each other in the street. Dr. A. B. KITTLE (East Somerset) said that his was a scattered Division with 200 members, but there were large towns just beyond its border, and naturally the members preferred to go to events in those towns rather than to anything arranged locally. Dr. L. R. G. ROBERTS (Leigh, Lancs) strongly advocated the retention of small Divisions. His own was a small Division, with an average of 25% attendance at its meetings.

Dr. HOWIE WOOD (Isle of Wight) said that for geographical reasons there was little opportunity for inter-Divisional contact in his area. Other things being equal, he thought the ideal membership of a Division was, like that of the Isle of Wight, 60 or 70. Since the advent of the N.H.S. members had many more local committees to attend, and there was not so much enthusiasm for Divisional meetings as formerly.

Dr. M. E. ARNOLD (Wembley) pleaded for the retention of small Divisions which gave the ordinary member an opportunity of serving as office bearer or on the committee. Dr. ERIC TOWNSEND (Cornwall) said that his Division had some 220 members scattered over a difficult geographical area. B.M.A. lectures were well attended, but social activities did not seem to get over the difficulty. Dr. J. E. MORRISON (Stirling) uttered a warning about statistics. The bigger the Division the more "paper" members there might be so far as Divisional matters were concerned. Dr. R. P. HENDRY (Rugby) referred to the position of a Division in whose area there was another local medical society. It was well to leave clinical meetings to such a body and leave the Divisional meetings for medico-political affairs.

Dr. J. W. STARKEY (Surrey Branch and Kingston Division) said that in one of the larger Divisions in his Branch they

had tried all sorts of attractions, but succeeded in getting an attendance of only about 10%. Many of the subjects which formerly came within the sphere of Divisional meetings had now been taken over by other bodies, such as local medical committees. He thought they should hold joint meetings with local medical societies and open their own meetings to such societies. Dr. R. PETERS (Stratford) said that members in the smaller groups did get to know one another and to co-operate better than in the larger. Dr. JAMES WATSON (Dumfries and Galloway) said that his Division had been divided into east, west, and centre, and members from each of these sections in turn were elected to the chairmanship. Dr. J. M. C. GILL (Aberdeen) spoke of Divisional experience in a university city where there was a first-class medical society. He still found that clinical meetings of the Division were popular and medical film shows in great demand.

Dr. T. J. LEE (Wandsworth) said that attendance at clinical meetings was not the only criterion of Divisional activity. Every representative on his own local medical committee was a member of the executive committee of the Division. Dr. E. J. R. PRIMROSE (Sutherland) said that in his Division the attendance at B.M.A. lectures was from 65 to 75%, and at business meetings it was never less than 40% and quite frequently over 60%. Dr. G. C. L. WOODROFFE (South Middlesex) said that there were large hospitals in his area. A good plan would be to have a "cell" or nucleus in each hospital. Dr. W. WOOLLEY (Bristol) asked whether the boundary lines between Divisional areas need be quite so rigid. Members situated in contiguous Divisions were, it was true, visiting members in his own, but they had no franchise in that Division, although it was the most convenient for them from the point of view of attendance at meetings.

On a show of hands it appeared that there was a general feeling in favour of the splitting up of larger Divisions into smaller ones.

Mr. LANGSTON said that it had been a most helpful discussion. There was a strong body of opinion that the smaller Divisions were often the more active and that in them the friendly spirit was more easily evoked. In the Constitution Committee it was proposed to send out a questionnaire to Divisions on this and other subjects.

The Association and the Hospital Resident

Dr. V. COTTON CORNWALL (Merseyside Branch) opened a discussion on the service of the Association to the hospital resident. He had written to a number of his colleagues asking for the name of a house physician or surgeon who would canvass his fellows on this subject. On the opinions he had received from these people—not just their own views, but those of other people in their respective hospitals—he proposed to base his remarks. There was a feeling that the Association did much for the general practitioner and the consultant, but not much for the house officer. He dealt with certain of the complaints which appeared to be current, such as the question of off-duty time, the delay before obtaining a pre-registration post, and so on.

He suggested five ways in which Divisions could help the houseman. In centres where there were medical schools the Division might hold a reception for the newly qualified. With all these men going into hospital for their pre-registration year, Divisions might do something about making contact with them. Applications for membership should be dealt with speedily by the Branches. If it was left for the ensuing Branch Council to decide whether a person was or was not eligible there might be considerable delay before the membership went through. He suggested that Branches, when they received the list from Headquarters, if there was not going to be a Council meeting in the near future, should get the regional office to duplicate copies of the applications and send them individually to members of the Council, and elect the persons concerned in the absence of objections. It gave a bad impression if these

applications were deferred for weeks. Finally, it would be helpful if due publicity were given in the *Journal* to the fact that the Association really had the interests of these housemen at heart.

Division the Shop-window

Dr. JOAN CHAPPELL (North Middlesex Division) said that the work of Divisional secretaries was increasing at an alarming rate. She was already wondering which of her three full-time jobs to resign—honorary secretary, general practitioner, and being a wife. Headquarters sent a very adequate series of letters to the newly qualified, but more should be done at Divisional level. With regard to Dr. Cornwall's suggestions, she just could not take on any more work in her job as secretary, but if regional headquarters could supply her with addressed cards to new applicants she would insert a notice of the next Divisional meeting and perhaps a line of personal contact. The Divisional meeting should be the local shop-window of the Association, and should be worthy of more than a glance.

On the question of off-duty times, she was formerly a resident in the Merseyside area, and then they had definite off-duty times and a duty roster at the hospital. She was surprised that it did not obtain now. The Association should take it up with the Regional Hospital Board.

Dr. D. L. GULLICK (East Hertfordshire) suggested that if the members of the Branch Council were circularized with the names of candidates for election they should make a special effort to get in contact with any of them who happened to be resident in their locality.

In some general discussion Dr. M. S. ARNOLD (Wembley) urged that general practitioners might help their busy consultant colleagues by taking a little interest in the residents in the local hospital. The hospital resident was very much isolated. Dr. W. WOOLLEY (Bristol) said that his executive included one or two nominees of the local branch of the British Medical Students Association. Medical students were invited to many of their business meetings. They heard from the students about the problems which the residents themselves were rather too shy to bring forward. Dr. P. S. STERN (South Essex) said that it would be difficult to get the addresses of some members of the Division who were working in hospitals quite outside his area. Many of them were birds of passage. Dr. J. H. E. MOORE (Leeds) said that on two occasions addresses on careers in medicine had been arranged in his Division for final-year students, and there had been very large attendances. There was also a graduation lunch. He suggested a calendar of posts falling vacant which would include the dates in the year when the vacancies occurred.

Dr. H. R. FREDERICK, a member of the Organization Committee, said that he had been informed recently that there were 1,340 pre-registration house-surgeons posts, 1,100 house-physicians' posts, and something like 400 obstetricians' posts, but for some reason people as soon as they became qualified at once applied for the six months' surgical posts, and that created a lag.

Dr. J. A. PRIDHAM said that the Association was very much interested in the problem of these young people. It had been said that the hospital resident had nowhere to go to make a complaint; he was afraid to go to the management committee, and hospital administrators were laymen and would not understand his problems. He should realize that the local B.M.A. people were the ones to approach. He also reminded the meeting that the Association had a Newly Qualified and Medical Students Subcommittee. This last year or two they had been a little disturbed because the newly qualified were not joining at quite the same rate as in former years.

Other Business

Dr. J. E. MORRISON (Stirling) was unanimously elected Chairman of the Conference for 1955. It was agreed that a one-day conference should be held in 1955, and that instead of the usual dinner a rather more formal luncheon should take place.

Suggestions were invited concerning any improvement which might seem necessary in regional office machinery, but no criticisms were voiced, and Dr. G. C. L. Woodroffe (South Middlesex), who was supported from several quarters of the Conference, spoke with appreciation of the work of the Regional Offices.

The Conference concluded with thanks to the Chairman, voiced by Mr. J. D. R. Murray (South-Western Branch).

In the evening a dinner was held, under the chairmanship of Dr. D. M. Hughes, who delighted the small company with some stories of Welsh country practice. His health was proposed by Dr. J. E. Crane. Mr. H. H. Langston proposed the health of "The Ladies," to which a response was given by Mrs. James, wife of the Honorary Secretary of the Portsmouth Division. Other speeches were made by Dr. Macrae, Dr. Potter, Mr. John Pringle, Public Relations Officer, and others.

GENERAL MEDICAL SERVICES COMMITTEE

A meeting of the General Medical Services Committee was held on May 20, with Dr. A. TALBOT ROGERS in the chair. Reference was made to the death of Dr. Mabel Ramsay, the first representative of the Medical Women's Federation on the Insurance Acts Committee. It was agreed to send a message of sympathy to Dr. Ramsay's relatives.

It was reported that the Committee's accountants had examined the calculations made by the Ministry of Health into the number of doctors in the service which would be used as a basis for computing the central pool, and therefore the final settlement, for the year 1952-3, and were satisfied of the accuracy of the Ministry's figures.

The CHAIRMAN stated that the Minister had now seen the second report of the Working Party on distribution of remuneration among general practitioners and was prepared to accept it. It was the intention of the Ministry to put the scheme into operation as soon as it had been approved by the Annual Conference.

A report was received from Professor Allen, who had assisted the Association in preparing evidence for the Danckwerts inquiry, on the possibility of instituting a sample inquiry on a scale sufficient to arrive at an accurate assessment of receipts from private practice (in connexion with calculation of the size of the central pool). Professor Allen had made some suggestions and pointed out some difficulties, which will be the subject of further discussions.

Prescribing of Proprietary Preparations

A letter was placed before the Committee from the Minister of Health enclosing a draft of a letter to be sent to all practitioners asking them not to prescribe certain proprietary preparations. The CHAIRMAN said that the Minister in his speech in the House of Commons on May 10 had mentioned that he was going to ask doctors not to prescribe those preparations which fell into categories 2, 3, and 4 where it had not been possible for the Government to make suitable arrangements with the manufacturers about cost. It was felt that the way in which this question was presented in Parliament, and stressed by the B.B.C., might mean that the Minister was contemplating some restriction on doctors' powers to prescribe what they thought necessary. Accordingly, accompanied by the Deputy Secretary, he had sought an interview at the Ministry and had received an assurance that the practitioner still retained the right to prescribe such drugs as he thought proper for the care of his patients. There had been no departure from that position at all, though, as before, the practitioner might be called upon to justify the overall cost of his prescribing before the local medical committee. The Minister, however, had thought it his duty to call attention to the fact that there were certain preparations with respect to which he had completely failed to make proper costing arrangements, and therefore he was drawing attention to

these drugs to see whether doctors could not make better use of the money available by prescribing equivalents. In fairness to the drug houses the deputation had pointed out that it should be borne in mind that a number of them had used the money to carry out important research on drugs, and an assurance was given that there was no intention on the part of the Ministry to cut down the amount of money which the drug houses were prepared to spend on legitimate research, though they were rather worried about the money which drug houses were spending on advertisement in the broadest sense of the word. The CHAIRMAN thought that the practitioner's position had been safeguarded, and, to quote the words of the draft memorandum, "The Minister . . . therefore feels sure that . . . he can rely on doctors to carry on the co-operation so successfully begun."

Dr. B. CARDEW said that he was worried about this move on the part of the Ministry. The preparations which came under this restriction comprised a number of inhalants; the next group might be hormones, antibiotics, or vitamin pills in elegant form. This might have very serious ramifications so far as the profession was concerned. The Minister did not say that the drugs in these categories were unsatisfactory, only that they were too expensive.

Dr. S. WAND pointed out that the Minister was not asking them not to prescribe these drugs because they were too expensive, but because he had not been able to arrive at an agreement with the firms concerned. The words "doctors are therefore asked not to prescribe them" were the nearest thing to an order that the Minister could give them. He thought that the Committee should not associate itself with the proposed E.C.N.

Dr. H. G. DAIN said that until they were offered in the *National Formulary* the exact constituents of one or several of these drugs doctors could not be expected to prescribe something which they could not agree to be an alternative. Patients who had had these drugs already might come and say that these drugs, and these alone, relieved them.

The CHAIRMAN agreed that the wording of this E.C.N. went further than previous communications of the kind, which had said, "Save in exceptional cases where there is an overriding medical consideration, doctors should seriously consider, before ordering one of these proprietary preparations; whether there is not a standard drug to serve the same purpose," or words to that effect. He thought a case had been made for further conversations with the Ministry with a view to modification of the document to meet their position. Practitioners could give co-operation and still maintain the rights they had stood for all along.

This course was agreed to, and the Chairman, Dr. Cardew, Dr. Killick, and the Deputy Secretary were appointed as a deputation to go to the Ministry, and if necessary to the Minister himself, at the earliest possible moment.

The CHAIRMAN added that they wished to preserve the right to prescribe whatever they thought was necessary, but he hoped that doctors would keep in mind that economy was required in the Service and would not allow themselves to be encouraged to prescribe these preparations when they were satisfied that less expensive preparations were adequate.

Group Practice Loans

The question of remunerating the Committee's representatives on the Group Practice Loans Committee was considered. At the previous meeting it had been suggested that funds for this purpose might be provided from the central pool. Dr. DAIN pointed out that the guiding principle in this matter was that, whereas ordinary committee work was done voluntarily, the members of a committee being in the capacity of advisers, when representatives were appointed to a committee for a definite administrative task it was not unusual to offer them remuneration. It was also pointed out that members of the Loans Committee might be required to visit areas of certain group practices—a time-taking labour. On the motion of Dr. F. M. ROSE, seconded by Dr. FLOWIE WOOD, it was agreed to recommend to the Conference that adequate remuneration should be paid to

members of the Loans Committee, also that the Deputy Secretary should be invited to attend its meetings and give his assistance.

Reports on Schoolchildren

The Committee devoted some time to a letter from the medical officer of a local education authority stating that in the case of schoolchildren who were sent by general practitioners to consultants no report was sent to the school medical officer, who often had considerable difficulty in learning what the specialist had advised. The Committee was asked whether it would not be in the interests of the child if arrangements should be made whereby the school medical officer was informed of the contents of the report—or received a copy of it—which went to the practitioner.

The CHAIRMAN reminded the Committee of the agreement reached in 1950 with the Society of Medical Officers of Health whereby a child might be sent to a specialist by the school medical officer after prior consultation with the family doctor, to whom any special report on the child received by the medical officer should be sent.

Dr. J. C. ARTHUR said that the family doctor must be responsible for his own patients and should not divide that responsibility with the school medical officer any more than with the industrial medical officer. If the medical officer wanted information he could approach the general practitioner. The inadvisability of the automatic passing of reports was pointed out. Dr. H. D. CHAIKE suggested, after further discussion, that a good deal of heavy weather had been made about this. The Public Health Committee had approved in principle the view of the medical officer.

It was agreed that further discussion should take place in the Liaison Committee on this matter.

Three sample posters bringing to the notice of the public the need for vaccination and immunization, prepared by the Central Council for Health Education, were exhibited, and it was agreed that doctors be encouraged to exhibit some such form of poster of suitable size in their surgeries.

Other Business

Dr. G. M. HICKLEY, representing the British Dental Association on the Committee, raised certain dental matters—the reference of patients by dentists for penicillin injections, the fees payable to doctors acting as anaesthetists for dentists, and the payment of fees for arrest of haemorrhage following dental operation—and these were duly considered.

The Committee had much other business on its agenda, this being the last meeting before the Annual Conference. The business included the consideration of a draft circular from the Ministry of Health on the maternity service, a report on matters which had been the subject of discussion between representatives of the Committee and of the College of General Practitioners, and a memorandum, following a discussion at the last meeting, from the Assistants and Young Practitioners Subcommittee in support of its proposal that the regulations be amended to permit a patient to change his doctor whenever he wished.

Scottish News

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

Meetings of the G.M.S. Subcommittee (Scotland) were held on March 16 and April 29, with Dr. J. T. Baldwin in the chair.

Medical Service Committee and Tribunal Proceedings

A small Subcommittee has been appointed to consider the recommendations of the special Subcommittee of the G.M.S. Committee dealing with the question of Medical Service Committee and Tribunal procedure in England and Wales, having regard to the National Health Service

(Scotland) Act, 1947. The G.M.S. Subcommittee (Scotland) will later consult with the Department of Health on the proposed amendments submitted by the latter, together with any other proposals regarding procedure. Local medical committees will be given an opportunity of expressing their views, and the dentists and pharmacists will be invited to send observers when the matter is being discussed.

Highlands and Islands Practitioners

The Subcommittee has had under consideration for some time the possibility of setting up a special Highlands and Islands Subcommittee to look after the interests of general practitioners in the more remote areas. Consultations have been held with certain representatives from the Islands and the western seaboard for the purpose of drawing up a plan for the constitution of such a committee, and proposals have been submitted to and agreed by the G.M.S. Subcommittee. It is intended that the Highlands and Islands Subcommittee should meet in different parts of the country for the convenience of the members, and according to the nature of the business on the agenda. The procedure for the setting up of the subcommittee has commenced, and it is hoped that it will meet for the first time in the autumn.

The suggestion has been put forward that practitioners in the more isolated areas should have better opportunities for keeping their clinical knowledge up to date by an "exchange" for short periods with appropriate members of hospital staffs. It was felt that such an arrangement would benefit the practitioner and the hospital doctor, and it was decided that the Department of Health should be asked to consider the possibility of a scheme of this kind.

Inducement Payments

The following motion by the County of Orkney Executive Council was put to the Subcommittee at its last meeting:

"That the Department be urged to fulfil its promise as contained in E.C.S.(M) 2/1953, given to increase the remuneration of small island doctors from the figure of £1,000 to £1,400, as this has not been done to date."

The Subcommittee had before it a statement showing the total income of practitioners in receipt of inducement payments in certain of the Islands. It was pointed out that the Department of Health did not give an assurance that the figure of £1,000 would be increased to £1,400. Following the Dankwerts award, it was agreed "that the figure of £1,000 which has hitherto been taken in determining applications for payments as a guide to the level of net professional income normally appropriate in such cases, should be raised to £1,400." In view of the figures before it, however, the Subcommittee felt that there was good reason to discuss the matter with the Department of Health, as it appeared that in certain cases the inducement allowances being paid were inadequate.

Medical Examination of Pupil Nurses

Following representations to the Department of Health, Scottish hospitals are being authorized to pay a fee of up to one guinea for reports from general practitioners on the fitness of candidates for the nursing service. The present arrangement, however, for most of these reports to be provided by members of hospital staffs remains unaltered.

Tuberculosis Campaign

A series of propaganda drives are being held in certain areas of Scotland to encourage people to present themselves for mass radiography. The Subcommittee gave its assurance to the Department of Health that the local medical committees of the selected areas would co-operate by giving all possible support to the campaign.

Scottish Medical Practices Committee

The terms of office of Dr. A. F. Wilkie Millar as chairman and of Dr. I. D. Grant as a member of the Scottish Medical Practices Committee expired at the end

of March. Dr. Wilkie Millar was re-nominated for appointment as chairman, and Dr. J. R. Langmuir was nominated for appointment as a member of the Committee. These nominations have been accepted.

Meeting with the Department

The Subcommittee is having its next routine meeting with the Department of Health towards the end of May when the following subjects will be among those to be discussed: elimination of inflation of doctors' lists; back debits; appointment of a central committee in connexion with the recommendation in the Working Party's Second Report; admission of assistants to medical lists; removal of patients' names from lists; and remuneration of doctors with restricted lists.

Appointments to Committees

The Subcommittee's representatives on the Drug Accounts Committee for the period of three years from April 1, 1954, are Drs. A. J. Pitkeathly and Angus Cameron.

Drs. W. Gibson, I. D. Grant, W. M. Knox, and C. J. Swanson have been reappointed as the Subcommittee's representatives on the Scottish Central Medical Recruitment Committee.

PRESENTATION TO DR. A. C. BLAIR

At an informal dinner at Stirling on May 16, Dr. Andrew C. Blair, of Kilsyth, former secretary of the Stirling and Clackmannan Local Medical Committee, was presented with a cine projector and screen, and a nest of coffee tables and an occasional chair for Mrs. Blair, subscribed by the members of the Stirling Branch of the B.M.A. and practitioners on the executive council list in appreciation of the many services he had rendered to the profession, not only locally but throughout Scotland.

In making the presentation, Dr. W. L. Cuthbert, chairman of the local medical committee, referred to the active and leading part Dr. Blair had played on many B.M.A. committees in addition to his work on numerous other committees in connexion with the National Health Service. He particularly mentioned Dr. Blair's work as chairman of the subcommittee which produced an excellent pamphlet on partnerships under the National Health Service in Scotland which had been in great demand.

THE HOSPITAL TELE-TROLLEY

Visitors' hours at hospitals are necessarily limited, but a device inaugurated the other day at Acton Hospital by the Central Middlesex Group Management Committee will do much to bring the lonely and isolated in-patient into contact with the outside world. The Postmaster-General (Earl De La Warr) opened a coin-operated telephone service to be available for patients at their bedside. The instrument is brought into the ward on a trolley, plugged in, the necessary coins are inserted, button A is pressed—a thing which the Postmaster-General forgot to do when making the first call—and the patient is connected up with whomsoever he will. The obvious call is to the patient's home for a mutual "how-are-you?" but on occasion he may wish to connect himself with his place of work if business worries are on his mind, not to speak of the Postmaster-General's suggestion that he might wish to get in touch with his turf accountant; or he might ring up his private doctor, to tell him of his progress and when he expects to be discharged. The child patient, too, might get reassurance from the voice of his parents, sometimes perhaps more reassurance in that way than he would have got from the sight of them. Anyway, it is a good idea, and Acton (80 beds) is believed to be the first hospital in this country to adopt it—the idea originated in Canada.

The amenity offers possibilities of usefulness and happiness, perhaps also some of misuse, but the risk is worth

taking. The Postmaster-General could not promise that Acton's lead would be followed by hospitals generally, owing to the length of the waiting-list for private and business telephone connexions in some areas. He did, however, promise to extend it wherever possible. The first call was put through by the Postmaster-General to the Minister of Health, and from his room at the Ministry Mr. Macleod expressed his pleasure at this development, and said a few words of encouragement to the patient at whose bedside the installation stood. It was stated that a farthing profit is received on each call.

NATIONAL HEALTH SERVICE

REGIONAL HOSPITAL BOARD APPOINTMENTS

Appointments mainly to fill vacancies caused by the retirement in rotation of one-third of the members of the 14 regional hospital boards set up under the National Health Service Act in England and Wales have been made by the Minister of Health, Mr. Iain Macleod. Out of a total of 118 appointments, 88 are reappointments of retiring members; 9 appointments are still outstanding. Among those reappointed 11 are women, and of the new appointments 8 are women.

Tenure of office will be for three years—until March 31, 1957. Another one-third of the members will retire on March 31, 1955. Total membership of the boards, excluding chairmen, is 364.

Those reappointed or newly appointed for each board are as follows:

Newcastle.—Reappointed: Mr. R. C. Cherry; Mr. Jack Cohen; Mr. Peter Strong Hancock; Dr. RONALD EDWARD JOWETT; Professor FREDERICK JOHN NATTRASS; Mr. A. C. R. Punnett; Mr. R. S. VENTERS. New Members: Mr. R. A. Anderson (North Shields); Mr. Kenneth D'Alby (West Hartlepool); Mr. B. E. Cosslett (Northumberland), appointed to March 31, 1955. One appointment outstanding.

Leeds.—Reappointed: Mrs. Norah Fienburgh; Mr. Sydney Clayton Fryers; Mr. Joseph Charles Hunter; Dr. WILLIAM ANTHONY HYSLOP; The Rt. Rev. Arthur H. Morris; Mrs. Irene Barbara Shaw. New Members: Mrs. H. S. Brocklehurst (East Yorks); Dr. G. WHYTE WATSON (Shipley). One appointment outstanding.

Sheffield.—Reappointed: Mrs. Gladys Buxton; Mrs. Hilda M. Clark; Sir ERNEST FINCH; Dr. G. H. GIBSON; Mr. J. L. A. GROUT; Dr. C. S. O'FLYNN; Lieutenant-Colonel Noel Gervis Person; Mr. Walter Scholey. New Members: Mrs. D. M. Bates (Leicester); Mrs. R. M. Frears (Nottingham).

East Anglia.—Reappointed: Professor A. LESLIE BANKS; Mr. C. H. Chandler; Mr. G. M. Macfarlane-Grieve; Sir Cecil Oakes; Mr. A. L. Symonds. New Members: Mr. H. R. Buck (Newmarket, Suffolk); Mr. J. H. Threfall (Huntingdon). Two appointments outstanding.

North-west Metropolitan.—Reappointments: Mr. Frederick J. Ballard; Sir V. ZACHARY COPE; Miss K. G. LLOYD-WILLIAMS; Mr. Frederick Lawrence; Mr. Horace R. Neate; Mr. Kenneth Robinson; Mr. Anthony G. de Rothschild; Mr. A. E. Ward. New Members: Mrs. Henry Brooke (Hampstead); Dr. E. C. WARNER.

North-east Metropolitan.—Reappointed: Mr. Herbert W. Butler; Dr. GEORGE GRAHAM; Dr. J. ARTHUR MOODY; Mr. RONALD W. REID; Mr. William V. Wakefield. New Member: Dr. T. ROWLAND HILL (London). One appointment outstanding.

South-east Metropolitan.—Reappointed: Dr. CHARLES WORTHAM BROOK; the Hon. Ruth B. Buckley; Sir WILLIAM KELSEY FRY; Dr. V. F. HALL; Mr. Stanley C. Harris; Mr. James Cameron McLean; Dr. WILLIAM GORDON MASEFIELD; the Hon. Mrs. Sylvia Fletcher-Moulton. One appointment outstanding.

South-west Metropolitan.—Reappointed: Mr. H. E. HARDING; Mrs. V. F. King; Mr. Richard Sargood; Sir GEOFFREY S. TODD; Colonel C. Chieveley Williams. New Members: Mr. A. L. ABEL (London); Miss E. Balfour (Winchester); Mr. R. P. Chester (Warrford).

Oxford.—Reappointed: Mr. J. E. S. Clapp; Mr. W. C. GLEDHILL; Mr. H. A. Goddard; Sir David Lindsay Keir. New Members: Mrs. Enid Maud Lane-Fox (Aston); Mrs. Francis Agnes Tonge (Swindon).

South-western.—Reappointed: Professor ROBERT J. BROCKLEHURST; Mr. G. G. Gilmour-White; Dr. LESLIE C. HILL; Mrs.

D. E. King; Mrs. Jacquetta Marshall. New Members: Mr. P. D. Clarke (Gloucester); Mr. D. R. Llewellyn (Bath); Mr. J. R. Mackie (Crewkerne); Professor A. V. NEALE (Bristol); Dr. T. H. BUTLER (Bristol), appointed to March 31, 1956.

Wales.—Reappointed: Colonel R. D. Briercliffe; Mr. William James Canton; Mr. Thomas Evans; Mr. William Evans; Dr. EMYR WYN JONES; Provost R. M. F. PICKEN; Dr. JOHN H. O. ROBERTS; Mr. E. K. ROY THOMAS; Rev. W. Degwel Thomas. New Members: Mr. John Lloyd (Merioneth); Dr. J. P. J. JENKINS (Griffithstown); Mr. W. H. Mathias (Whitland), appointed to March 31, 1955; Mr. W. L. Davies (Boncath, Pembro), appointed to March 31, 1956.

Birmingham.—Reappointed: Mr. Albert Frederick Bradbeer; Mr. W. T. Bowen; Mr. Walter Leslie Dingley; Mr. G. O. Langley; Major Keith Needham; Dr. JOSEPH H. SHELDON; Professor ARTHUR PEREGRINE THOMSON. One appointment outstanding.

Manchester.—Reappointed: Mr. S. H. Hampson; Professor V. F. LAMBERT; Sir James Lythgoe; Dr. MILES PARKES; Sir HARRY PLATT; Mrs. Lilian A. Pratt; Mr. G. C. Sumner. New Members: Mrs. N. Beer (Didsbury, Manchester); Dr. D. W. LUXTON (Cheshire). One appointment outstanding.

Liverpool.—Reappointed: Mr. Nathaniel Birch; Mr. J. J. Cleary; Professor WILLIAM M. FRAZER; Professor H. L. SHIFFHAN. New Members: Mr. Edward Hill (Appleton, Warrington); Mr. David A. Solomon (Southport). One appointment outstanding.

NATIONAL OPHTHALMIC TREATMENT BOARD

At the annual general meeting of the N.O.T.B. Association on May 7, the chairman, Dr. J. N. Tennent, said that the amount of the present sight-testing fee would have to be re-examined in view of the recent increase in consultants' remuneration. The original sight-testing fee was directly related to the sessional remuneration of consultant staffs. The whole question would be taken up through the proper channels. Dr. Tennent gave a detailed survey of the association's activities during the year, pointing out that 21 new medical eye centres had been opened, and that the dispensing membership had increased, though there had been a slight decrease in the medical membership. He reminded members of the vast and complicated work carried out in connexion with N.O.T.B. medical eye centres. The Medical Appointments Subcommittee, under the able chairmanship of Mr. O. Gayer Morgan, had carried out its difficult task with complete impartiality and much skill. The meeting passed an amendment to Standing Orders by which the Medical Advisory Subcommittee will now have six medical members elected by the medical members of the association.

G.P.s AND HEALTH VISITORS MEET

A meeting of health visitors and general practitioners in St. Pancras Division was held at a member's house on May 18. The acting M.O.H. of the borough, the divisional medical officer for the area, and several other local authority medical officers were also present, and all welcomed the opportunity of getting to know one another. About 40 people came to the meeting, and afterwards discussed what steps were practicable to bring about greater co-operation between health visitors and general practitioners.

ANNUAL MEETING, GLASGOW, 1954

WELSH DINNER

The Welsh Dinner will be held at the Grosvenor Restaurant, Gordon Street, Glasgow, at 7.30 p.m. on Saturday, July 3. All Welsh representatives, Welsh graduates, and others with Welsh associations, accompanied by their ladies, will be welcome at this dinner. Tickets will be 30s. per head (exclusive of wines), and those wishing to attend are asked to apply with remittance to Dr. W. F. Anderson, 40, Newlands Road, Glasgow, S.3, before June 26.

G.P. REFRESHER COURSES

LOCAL AUTHORITY M.O.s ENCOURAGED TO ATTEND

The Minister of Health thinks that it would be advantageous for local authority medical officers to attend refresher courses for general practitioners arranged by the British Postgraduate Medical Federation. As well as enabling the medical officers to keep in touch with developments in clinical medicine, this would bring the authority's medical officers into closer contact with general practitioners and officers in hospital medical staff, and encourage co-operation in this way. A circular outlining the arrangements has accordingly been sent by the Ministry to all local health authorities in England (No. 12/54, dated May 10, 1954). Courses open to the medical officers would normally be intensive week-end courses, or extended courses spread over a number of weeks or months, and would be held in local hospitals.

ISLE OF MAN HEALTH SERVICE ESTIMATES REDUCED BY TYNWALD

On Tuesday, May 18, Tynwald, the Manx Parliament, passed an amendment reducing the Isle of Man Health Services Board's estimates of £552,377 by £25,000.

In proposing the amendment, Mr. H. H. Nicholls suggested that the cut could be made up for by charging patients subsistence at 3s. a day, a charge for physiotherapy and electro-medical treatment at 2s. per treatment, revising the rates of medical remuneration and making them include maternity attendances, and a charge of 50% of the cost of dental services. Mr. J. B. Molton, seconding, suggested an annual fee of £1 to be paid by everyone registered with a doctor. This would bring in £20,000 a year. He said that the Board had been asked to save £100,000, but on no point had the members agreed on how the economies could be made.

Wisdom After the Event

Deemster Sir Percy Cowley said that unless substantial cuts were made the day would soon come when the Island's health services would not be able to function because of lack of money. The Health Service Act had been passed without full realization of its implications. A means test for medical and other treatment might have to be considered. The chairman of the Board, Mr. T. C. Cowin, stated that a reduction of cost of £100,000 could be effected only by a fundamental alteration in the structure of the health services.

A resolution was approved requesting the Lieutenant-Governor, Sir Ambrose Dundas, to appoint a commission of inquiry into the whole scope of the Health Service Act.

Past History

Last year Tynwald set up a Commission to investigate the possibility of reducing the remuneration of Manx Government employees to take account of the lower rate of income tax on the Island (*Supplement*, 1953, 2, p. 83). This proposal would have affected the remuneration of members of the medical and other professions in the Island and was strenuously opposed by the British Medical Association and other professional organizations. As a result the Commission decided that it would not recommend a measure which would be resented by important sections of the community, and "possibly involving a serious administrative deadlock."

B.M.A. FILM LIBRARY

The following films have been added to the Association's film library and are now available.

The Surgery of Varicose Veins. Presented by T. J. Smith and Nephew Ltd. Colour, silent, 25 mins. 1952.
Inoculating a Plate. On permanent loan from St. Mary's Hospital Medical School. Colour, silent, 12 mins. 1951.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Good General Practice

SIR,—I was most interested in the letter from Dr. Edmond A. D. Boyd, of Vancouver, B.C. (*Supplement*, May 15, p. 244). It so happens I have an aged and widowed aunt who resides in Vancouver. Over the past 10 years or more she has been suffering from some form of arthritis which causes her much pain and has lately confined her to her home. Nearly all her friends have died, and, were it not for a small Estonian boy who calls every day to see what she needs, the lady would be very unhappily placed. If she is to have any medical attention she has to pay 25s. to the doctor and the cost of medicines. Hence she suffers alone, having been told there is no cure. From time to time I have sent her supplies of analgesics. However content the profession in Vancouver may be, there are a number of poor people who are not nearly so pleased.

In an industrial practice among patients one has known for years and sees every few weeks or months, with established diagnoses, it is quite possible to attend to 20 patients in two hours. Some are in and out of the consulting-room in the time it takes to ask for a final certificate, watch it being written, and saying, "Thank you, Doctor." Here in Bristol the general practitioner has frequent opportunities of postgraduate clinical, and other, sessions, constant contact with consultants, and the clinical material to keep himself fairly efficient in that prime necessity—diagnosis. With the advent of so many powerful chemical weapons the practitioner can now treat with confidence many conditions which were beyond him—early infected fingers, acute primary pneumonia, diabetes, anaemias, etc. He is not expected to fiddle with surgical procedures and is seldom called to deal with accidents. In these circumstances he should have ample time to examine fully the small number of doubtful cases that crop up in the average day. All branches of the profession are subject to the occasional overwhelming that occurs when four or five really serious and time-consuming cases happen to coincide.

Dr. Boyd's complacency with being paid "no more and no less" value in cash for what work he does savours more of the trade union attitude than of the traditional professional outlook that, as long as he earns enough, the doctor is not overly concerned with remuneration per item of service. The latter attitude has been more and more evident ever since 1913, when lay persons became involved in the administration of public moneys. Is this too big a price to have paid for the comforting thought that, in this country, no elderly, ailing, and impoverished person need want for medical aid and comfort?—I am, etc.,

Bristol, 6.

J. L. FAULL.

SIR,—I read with intense interest the letter written by Dr. Edmond A. D. Boyd (*Supplement*, May 15, p. 244). Dr. Boyd is a good doctor and practises medicine, which is a different thing from Dr. Stephen Taylor's idea of "good general practice" to-day. With a long experience of private practice behind me I would go further than Dr. Boyd, and, including midwifery, anaesthetics, etc., I consider 15 "services" as the optimum for the day's task of a conscientious doctor. Some three years or so ago I wrote in this journal in answer to a medical student's query: "If Mr. Watson has one spark of individualism and believes in the freedom of the individual and freedom in medicine, then avoid the N.H.S. of to-day." At that time I suggested Australia, for there the medical profession is tough and has consistently refused to be dictated to by politicians.

Latterly, I have read letters from young medical men who have settled happily in Canada, and there are great possi-

bilities for keen doctors in that country, now confirmed by Dr. Boyd. Until medicine is taken out of politics—and we have had a recent deplorable example of this association—I see no hope for general practice in this country, and the high standards set by men like Dr. Boyd, which are the only ones worth while if you practise medicine.—I am, etc.,

St. Austell.

REFERENCE

¹ *British Medical Journal Supplement*, 1951, 1, 139.

Service Recruitment

SIR,—Your correspondent "Harvey" (*Supplement*, April 17, p. 177) was scathing in his condemnation of the R.A.M.C. because the D.M.S. Middle East had dared to control the use of antibiotics. From his indignation one would infer that he thought the order had been given to frustrate the clinicians.

The supply of drugs in the Army is governed by the yearly grant of money from the Treasury, and it is not realized that, if a particular drug is prescribed for a patient in a military hospital, then in order to meet expected demands in distant theatres a year's supply of that drug has to be stored in the central medical equipment depot. I well remember the indignation expressed by a National Service Army doctor because a particular brand of antihistamine which he had been in the habit of prescribing in civil life was unavailable, although two other varieties were stocked. The medical officer said how scandalous it was. That was three years ago, and I wonder how much money has been wasted in the Army in stocking antihistamines whose popularity has now ended. One has only to visit the medical equipment depots throughout the world to see how much money has been wasted on discarded panaceas of the past. In my experience essential drugs for the treatment of disease have always been available, and measures to avoid excessive and wasteful prescribing have become a necessity in the National Health Service.

There may be valid reasons for not joining the R.A.M.C. at present, but this is not one of them.—I am, etc.,

East Cowes, I.O.W.

N. CANTLIE.

Grading of S.H.M.O.s

SIR,—I think Dr. S. F. Logan Dahne (*Supplement*, May 1, p. 215) would like my views on the titles that can be given to hospital posts held by S.H.M.O.s. Several years ago now the Ministry of Health issued an advisory circular on this matter to hospital boards, which was in fact published in the journals at the time,¹ informing them that a post held by a senior hospital medical officer need not be officially described as, for example, a senior hospital medical officer post in anaesthetics or pathology, but that the holder of such a post could be officially described as an assistant anaesthetist or an assistant pathologist. In many hospitals since this type of title has been used, and there is no official necessity to employ the title senior hospital medical officer in the name of any post held by an officer of such rank. The phrase "senior hospital medical officer" need apply only to his grading and remuneration.—I am, etc.,

London, W.1.

REFERENCE

¹ *British Medical Journal Supplement*, 1950, 2, 162.

Employment of Tuberculosis Visitors

SIR,—Some remarks by Dr. Robert Hardy on tuberculosis visitors and the chest clinic, quoted from your *Journal* of June 21, 1952 (p. 1355), in the *Nursing Mirror* of May 7, urge me to draw the attention of all members of the medical profession who are interested in tuberculosis work to certain anomalies which are current in the employment of tuberculosis visitors. Most employing authorities require one to possess the Health Visitors Certificate, and in the

few cases in which tuberculosis experience is acceptable without this the nurse must be prepared to accept a cut in salary of perhaps £20 per annum. In this way a newly qualified health visitor, without any previous experience of this highly specialized branch, may, indeed does, stand a better chance of obtaining a post in a chest clinic than a S.R.N. with B.T.A. certificate and perhaps many years' experience of the work.

There must be many nurses working in sanatoria who, for some reason, have been unable to take even a first part midwifery certificate, without which they cannot proceed with the health visitors course. The amount of midwifery knowledge required of tuberculosis visitors must be small indeed, as most pregnant women are hospitalized during the greater part of their pregnancy. I have long advocated the institution of a tuberculosis health visitor's certificate based on State registration plus the Certificate of B.T.A., with the year's experience of tuberculosis work necessary to gain that certificate, then the health visitors course as it stands at present. I shall be interested to know the opinions of tuberculosis officers and other interested people on this point. Would they accept tuberculosis visitors, trained for the job, in the way I have indicated?—I am, etc.,

Sonning Common, Oxon.

SHIELA D. ROBINSON.

Return of Goodwill

SIR,—At the Annual Representative Meeting at Cardiff in 1953 a resolution was passed instructing the Council of the Association to produce a scheme for the return of goodwill and to report to the Representative Body in 1954. Council referred this matter to the Amending Acts Committee of the Association, and as a member of that Committee I know what a great deal of time and thought has been given to the report which it presented to Council.

As stated in the *Supplement of the British Medical Journal* (March 20, p. 76), the Council of the Association considered the Amending Acts Committee's report at its meetings on March 9–10, and "decided to refer the scheme back for reconsideration of certain matters." Clearly, the report must have received favourable comment at that Council meeting. Now we read (*Supplement*, May 15, p. 236) that a resolution was passed at the Council meeting of May 5–6 that "the Council recommend to the Representative Body that no further action be taken." This resolution was apparently passed by Council when only 47 members (out of a total of 76) were present, by a majority of 26 votes to 16.

This matter is one of great moment to the profession, particularly at a time when the rumblings of a possible full-time salaried service are to be heard. As Dr. O. C. Carter pointed out in Council, the right to buy and sell goodwill was probably the last of the five principles of the Negotiating Committee to be abandoned. When a matter of this importance is before the Council of the Association it is usual to take a vote on a resolution before referring the matter for further consideration by one of its subcommittees. Will the Secretary of the Association please inform the profession through your columns whether such a resolution or resolutions were considered by Council on March 9–10; if so, what was the wording of the resolutions, what were the results of the voting, and how many members were present?—I am, etc.,

London, W.1.

E. C. WARNER.

* The Secretary of the B.M.A. writes: At the meeting of the Council in March there was no resolution from the Amending Acts Committee recommending approval of the goodwill scheme. What the Committee did, in accordance with the Council's instructions, was to "submit for discussion by the Council" what it believed to be the best possible scheme.

At this meeting the Council made no comment, favourable or unfavourable, on the scheme. Individual members of the Council made comments, favourable and unfavourable. A motion was adopted to consult the solicitors as

to whether such a scheme was legally practicable. A motion in the following terms was rejected:

"(1) That the scheme as presented by the Amending Acts Committee is the best that can be devised in present conditions; (2) that in view of (a) the practical difficulties of implementing the scheme, (b) the high capital outlay required by young practitioners to launch into practice, (c) the divided opinion in the profession as to the desire to introduce such a scheme, and (d) the known political resistance to such a scheme, the Council recommend to the Representative Body that no further action be taken."

An amendment to this motion was carried by a very large majority—a count was not taken—and adopted as the substantive motion. It reads as follows:

"That the scheme be presented to the Representative Body, together with a statement of the advantages and disadvantages appertaining to that scheme."

The Council then resolved to refer to the Amending Acts Committee, with the addition of co-opted members, the preparation of the statement of advantages and disadvantages, and to submit the report of the Amending Acts Committee to the G.M.S. and Private Practice Committees for their comments.

No other resolution on this subject was considered by the Council at the March meeting. The resolutions referred to above were considered on March 10. The number of members who attended the meeting on that day was 62.

Radiology on Points

SIR,—At the beginning of 1953, correspondence appeared in your columns concerning "Radiology on Points" (leading article, *Journal*, January 10, p. 86, Dr. J. W. D. Bull and Dr. Hugh W. Davies, *Supplement*, January 10, p. 11, and Dr. Henry W. Gillespie, Dr. Anthony A. Vickers, and Dr. G. Edwin Tilsley, *Supplement*, January 24, pp. 28 and 29). This correspondence expressed indignation towards the "unit" system and exposed it to some ridicule. These "unit" system and exposed it to some ridicule. These sentiments have not borne fruit. The "unit" system of recording the work of diagnostic x-ray department has been in use at many places for the whole of 1953. It is assumed that any recording system of this sort, to be of value, must be reliable, informative, and its value must be such as to justify the amount of labour involved in compiling the statistics.

The "unit" system is unreliable because at many points it has been shown that different people apply different interpretations. For instance: (a) It is known that in some departments a chest examination is counted as one "unit." If a lateral film is required it is counted as two "units." (b) An enema examination is counted as six "units." It could be argued reasonably that if the patient is screened and fully re-examined after the evacuation study this should count as a separate examination, making 12 "units" in all; and that if this is followed by an air insufflation study this should be counted as another six "units," making 18 in all. (c) It could be argued that a routine orthopaedic Smith-Petersen pin examination, which required four pairs of films and four visits by the radiographer to the theatre, should be counted as 32 "units" (eight for each visit). There is little hope of uniformity of interpretation in a system as complex as the "units" system.

The "units" system is uninformative in that it takes no account of the different types of work done in the department, in spite of the 52 listed examinations. For instance: (a) An in-patient normally requires far more attention than an out-patient, and the points value should be adjusted accordingly. (b) Patients referred from outside doctors require additional clinical and clerical work. They require more work than a hospital out-patient but less than a hospital in-patient, and should receive an intermediate correction factor. (c) Patients x-rayed on an Odelca or Watson camera unit require less film and less time in the department, but they require more radiographic and clerical staff to handle them than other out-patients. A correction factor to account for these diverse factors is necessary. (d) Children require much more attention and time than adults, and should receive an appropriate correction factor. (e) Mental patients also require more work and an appropriate correction factor. (f) Old people, particularly those coming from hospitals or homes for aged persons, require a great deal of individual attention and time,

and their "units" value also requires a suitable correction. (g) Special examinations such as those of maternity patients in labour also require special correction factors in any system such as that based on the present "units." If the "unit" system is to do what it set out to do it will become a statistician's paradise; and still a given number of "units" can have no possible means of expressing the type of work done. This is very relevant to the proportions of radiographic, clerical, and nursing staff, the number of rooms available, and the type of apparatus in them. Therefore, any "units" system requires just as much additional written information as any other conceivable recording system, and can have no intrinsic merit. The amount of time spent by staff in the calculating, sorting, and collecting of the "units" values in a department contrasts strangely with the appeals which we receive at intervals from the Ministry of Health for economy in the administration, staffing, and operation of the Health Service. Many departments have counted the number of examinations in their figures, but this is open to the same differences in interpretations which have been mentioned in paragraph 2 above.

Arguments on these lines passed through the usual channels—that is, the regional hospitals boards and boards of management of teaching hospitals—are barren, as the subject is out of their jurisdiction. May I through your columns once more appeal for the application of a little common sense, and express the hope and prayer (1) that the Ministry of Health takes note of the failure of the "units" system of recording work of diagnostic x-ray departments; (2) that the Ministry replaces the "units" system by a record of the number of patient attendances (an attendance being defined as a visit or visits of a patient to an x-ray department on any one day, made in response to one request from one clinical source of reference); and (3) that in each case this record of the number of attendances be qualified by a statement of the main types of work passing through the department, and the main sources of reference which are relevant to any additional attention which each patient may require?

The "units" figures for x-ray departments are available as a yardstick by which the administrative and technical requirements of these departments may be assessed, and it is tragically obvious that the more scrupulously honest department is being left behind in the race. As long as the "units" system is operated the only hope of progress for the local administrator is for him to sacrifice his morals on the altar of bureaucracy, to amass the largest possible "units" values on the lines which I have indicated, and then tell his conscience that this involves no cheating.—I am, etc.,

Worcester.

ANTHONY A. VICKERS.

Prescribing Costs

SIR,—Your correspondent Dr. W. Edwards (*Supplement*, May 15, p. 244) has apparently overlooked the fact that the payment of 1s. 11d. to the pharmaceutical chemist for 24 tab. codein. co. includes the dispensing fee. The purchase of these tablets—on ordinary sale—does not entail other than the selling price.—I am, etc.,

Northampton.

F. G. FLEMING.

Emergency Admissions

SIR,—Dr. H. Maitland Moir (*Supplement*, May 15, p. 246) is indeed fortunate in having no difficulty in having his seriously ill patients admitted to hospital in the Edinburgh and Midlothian area. In my area recently I have had great difficulty in getting the following cases admitted: a child with severe recurrent convulsions of acute onset and no temperature; a woman badly burned about the head, neck, and hand when she fell into a fire—she is hemiplegic; a young man almost comatose from an overdose of phenobarbitone with suicidal intent; a woman with delay in labour and maternal distress; a woman with severe hyperemesis; a young child with bronchopneumonia from an overcrowded home; and a man, in semi-coma, with bronchopneumonia.

The last case, incidentally, was a person, not on my list, who originally lived in a shack in a wood and moved to a

lodging-house when he took ill. I was on the 'phone for one and three-quarter hours before I got a hospital to admit this man. Seven hospitals refused him, the eighth took him in and cured him, and he is still combing the local golf course for lost balls, which he occasionally presents to me. I have also had the experience of having three hospitals refuse admission to a 50-year-old railway guard who collapsed and went into a coma, and whom I had diagnosed as coma due to cerebral thrombosis. A fourth hospital took him in when I stated I had a patient in a coma and I was unable to make a diagnosis.—I am, etc.,

Lanark.

THOMAS M. GLAISTER.

The Small-list Practitioner

SIR,—It might appear churlish to cavil at the excellent work done by the Working Party and the G.M.S. Committee; but one or two points require some further elucidation and amplification. In the Supplementary Report of the General Medical Services Committee (*Supplement*, May 1, p. 204) it is stated that the proposals will secure the principle of "no detriment." With the very greatest respect to the G.M.S. Committee and the Working Party, they have succeeded in securing the very greatest detriment of all—namely, insecurity of tenure. It seems now that at age 70 or over a man must learn to beg for his bread-and-butter with no absolute certainty that any will be vouchsafed him. I do not recollect that in the original Act any particular age limit is fixed for the general practitioner. Has not the Working Party somewhat overreached itself in arrogating to itself the right thus to penalize the 70's and over? It is true that "payment would not cease automatically," but who is going to do good work with the threat constantly before him? And what of those many 70's and over, single-handed or in partnership, with large lists; do not they come under the threatening review; or does the Working Party consider that a large list can be managed more easily than a small list?

Another point is this: a careful perusal of the G.M.S. Committee's report leaves me quite in the dark as to what are the Working Party's intentions regarding the inducement and hardship payments.—I am, etc.,

Ashbourne.

ROY CLAYTON.

Certificates for Temporary Residents

SIR,—Those of us practising in holiday resorts frequently see patients who have been sent for a change by their doctors while still drawing weekly certificates. They are told to see a doctor when the next certificate becomes due, but it is quite unusual for the patient to be given a letter to bring with him. May I appeal to doctors always to send a brief note? It makes things much easier, quite apart from preventing any possible laxity in certification.—I am, etc.,

St. Ives, Cornwall.

T. E. BARWELL.

Association Notices

NOTICE TO SHIP SURGEONS

MARITIME SUBCOMMITTEE

The Private Practice Committee of the British Medical Association has reappointed for the current session a Subcommittee to consider all questions affecting medical practitioners concerned with merchant shipping.

A meeting of the Subcommittee is to be held at B.M.A. House, Tavistock Square, London, W.C.1, on Wednesday, July 14, at 2 p.m., when conditions and terms of service of ship surgeons will be considered. Any doctors in active practice as ship surgeons who find it convenient to attend are invited and should, if possible, give notice by letter or telephone of their intention to be present.

A. MACRAE,
Secretary.

Diary of Central Meetings

MAY	
29 Sat.	Subcommittee on Hypnotism, Psychological Medicine Group Committee, 9.30 a.m.
JUNE	
2 Wed.	Film Committee, 11 a.m.
3 Thurs.	Annual Conference of Representatives of Local Medical Committees, 10 a.m.
4 Fri.	Accommodation Subcommittee, Estates Committee, 2 p.m.
9 Wed.	A.R.M. Agenda Committee, 11 a.m.
9 Wed.	Central Ethical Committee, 12 noon.
9 Wed.	Financial Advisory Committee, 3 p.m.
10 Thurs.	Central Consultants and Specialists Committee, 10.30 a.m.
10 Thurs.	Library Subcommittee, Science Committee, 2 p.m.
11 Fri.	Staff Side, Committee "C," 10 a.m.
15 Tues.	Evidence Committee on Divine Healing, 2 p.m.
15 Tues.	Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.
16 Wed.	Occupational Health Committee, 10.30 a.m.
18 Fri.	Public Relations Conference, 10.30 a.m.
23 Wed.	Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.1), 2 p.m.

Branch and Division Meetings to be Held

BARNSELY DIVISION.—At Queen's Hotel, Barnsley, Monday, May 31, 8.30 p.m., annual general meeting.

BOURNEMOUTH DIVISION.—At Criterion Restaurant, Old Christchurch Road, Bournemouth, Friday, May 28, 8.15 p.m., supper, followed by meeting. Address by Sir Daniel Davies, K.C.V.O.: "The Doctor and To-day."

CHELSEA AND FULHAM DIVISION.—At Fulham Town Hall, Walham Green, London, S.W., Tuesday, June 1, 8.45 p.m., general meeting.

DORSET DIVISION.—At the Clinic, Glyde Path Road, Dorchester, Tuesday, June 1, 8.30 p.m., meeting. B.M.A. Lecture by Dr. G. D. Kersley: "Recent Advances in the Treatment of Rheumatic Diseases."

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, (1) Saturday, May 29, 7 to 9 p.m., sherry party. Members' wives are invited. (2) Thursday, June 3, 8.30 p.m., special meeting. Address by Dr. S. F. Logan Dahne: "Goodwill."

LANCASTER DIVISION.—At King's Arms Hotel, Lancaster, Friday, May 28, 8 p.m., annual general meeting.

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Macclesfield Arms Hotel, Macclesfield, Monday, May 31, 8.45 p.m., A.G.M.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C.1, Wednesday, June 2, 3 p.m., annual general meeting. President's address by Dr. D. F. Hutchinson.

MONMOUTHSHIRE DIVISION.—At St. Mellons County Club, Monday, May 31, 8 p.m., summer dinner dance.

NORTH-EAST SUFFOLK DIVISION.—At Royal Norfolk and Suffolk Yacht Club, Royal Plain, Lowestoft, Thursday, June 3, 7.30 p.m., dinner; 8.45 p.m., annual general meeting.

SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Friday, June 4, 9 p.m., annual general meeting.

SOUTH LANCASHIRE AND EAST CHESHIRE BRANCH.—At Salford Masonic Hall, The Crescent, Salford, Wednesday, June 2, 12.15 p.m., reception; 12.30 p.m., luncheon; 2.15 p.m., 5th annual meeting.

SOUTH STAFFS DIVISION.—At Bell Library, Royal Hospital, Wolverhampton, Friday, May 28, 8.30 p.m., ordinary meeting.

SOUTHERN BRANCH.—At the Guildhall, Winchester, (1) Friday, June 4, 9.30 p.m. to 2.30 a.m., charities ball; (2) Saturday, June 5, 2.30 p.m., 78th annual meeting; 3.15 p.m., Winchester Address by Dr. C. B. S. Fuller: "The Antibiotics and their Effect on the Changing Form of Disease"; 4.45 p.m., visits have been arranged.

STRATFORD DIVISION.—Thursday, June 3, 3 p.m., joint visit with Ilford Medical Society to Messrs. Allen and Hanburys, Ltd., at Ware, Herts.

SWANSEA DIVISION.—Thursday, June 3, annual meeting.

TROWBRIDGE DIVISION.—At Roundway Hospital, Devizes, Wednesday, June 2, 8 p.m., annual general meeting.

WINCHESTER DIVISION.—At Guildhall, Winchester, Friday, June 4, 9.30 p.m. to 2.30 a.m., annual Divisional charity ball.

Meetings of Branches and Divisions

HAMPSTEAD DIVISION

A brains trust was held at the Hampstead Division's meeting on April 1, 1954, and was attended by about 80 members and guests. Dr. Lena Williams took the chair, and introduced Sir Walter Fergusson Hannay as question master of the team, which consisted of Miss Marghanita Laski, Dr. L. P. E. Laurent, Mr. R. S. Murley, Dr. Lindsey Batten, and Mr. Dickson Wright. A good selection of questions, some of a not too serious nature—such as, "Do fighter pilots make good mothers?"—ensured an entertaining, as well as an instructive, evening.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 5 1954

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THE ARCHBISHOPS' COMMISSION ON DIVINE HEALING

B.M.A.'S ASSISTANCE SOUGHT

In response to an invitation to assist the Commission on Divine Healing which has been set up by the Archbishops of Canterbury and York, the British Medical Association has appointed a committee to prepare evidence for the Commission. The Commission has the following terms of reference:

"To consider the theological, medical, psychological, and pastoral aspects of 'divine healing' with a view to providing, within two or three years, a report designed to guide the Church to clearer understanding of the subject; and in particular to help the clergy in the exercise of the ministry of healing and to encourage increasing understanding and co-operation between them and the medical profession."

The Commission, it is hoped, will afford a useful service to the community by ascertaining the value of what is referred to as "divine healing." It will seek evidence, among other things, on whether unexplained recovery from prolonged or incurable illnesses is due to suggestion, spontaneous remission, or divine intervention.

Co-operation with the Clergy

The Commission will also seek evidence about co-operation between doctors and clergy. In 1947 the Council of the Association issued a statement about co-operation with the clergy, and this was agreed by the Representative Body. The statement was as follows:

"It is considered that most useful work may be done by close personal contact between doctor and clergyman, with an interchange of views and active co-operation where possible. With regard to the co-operation which can be secured at a Divisional or parochial level, it is considered that arrangements can best be left to the B.M.A. Divisions' Council of Healing any branch organization of the Churches' Council of Healing, or similar body. Joint activities might include the appointment of and co-operation with hospital chaplains and their deputies, education of the public, and informal discussions between doctors and the clergy."

In addition to the above suggestions, which in some measure have already been the custom of doctors and clergy in different parts of the country, it would seem desirable that the whole field of medical practice in relation to the work of the Church should be explored. Moral aspects in the cause, treatment, and prevention of disease cannot be overlooked, and in this field also it is desirable that there should be fuller co-operation. Medicine and the Church working together should encourage a dynamic philosophy of health which would enable every citizen to find a way of life based on moral principle and on a sound knowledge of the factors which promote health and well-being. Health is more than a physical problem, and the patient's attitude both

to illness and to other problems is an important factor in his recovery and adjustment to life. Negative forces such as fear, resentment, jealousy, indulgence, and carelessness play no small part in the level of both personal and national health. For these reasons we welcome opportunities for discussion and co-operation in the future between qualified medical practitioners and all who have a concern for the religious needs of their patients."

Information Sought

The Association's Committee has drawn up a schema in the form of a questionnaire—printed below—to guide those willing to give information, and doctors who have experience of, or who have views on, the subject are invited to co-operate by answering the questions. Full details of diagnosis should be given, with special emphasis on the nature of the case—i.e., organic, with corroborative evidence (x-ray, histological, etc.), or mental or psychosomatic. It should also be stated how long the patients have been observed prior to their recovery, and subsequently. Although the word "recovery" is used, information with regard to remission, improvement, or restoration of function, even if not complete, should be given. The identity of patients should not be disclosed unless with their approval.

QUESTIONNAIRE

I. HEALING

1. Have you, in the course of your medical practice, had first-hand experience of illness in which there has been recovery from an apparently incurable disorder?
 - (a) where, to your knowledge, there has been no spiritual ministrations;
 - (b) through spiritual ministrations—for example,
 - (i) healing services;
 - (ii) the laying on of hands;
 - (iii) unction;
 - (iv) the influence of public or private prayer; and
 - (v) pilgrimages—for example, Lourdes;
 - (c) through a non-medical agency—for example, magic, faith cures, other than religious?
2. Are any of the above practices, in your opinion, of value or attended by possible harmful effects (including the risk of delay in seeking medical advice)?
3. Have you first-hand experience of cases in which you felt that the patients' attitude to some form of religion has played a part in their recovery?
4. Were the patients members of any religious body—Christian or non-Christian?

II. CO-OPERATION BETWEEN DOCTORS AND CLERGY

1. Should measures be promoted so that the clergy, ministers, or priests can give assistance to the medical profession in dealing with the spiritual needs of their patients, their attitude to illnesses, assistance over convalescence, rehabilitation, or resettlement? If so, state what kind of measures.

2. What experience have you of co-operation between doctors and the clergy and methods through which this has been achieved?

3. Should this be encouraged and extended in general by co-operation centrally between medical and church organizations, and locally between doctors and ministry, with particular reference to hospital and general practice? If so, by what methods? Details of any other relevant experiences or opinions would be welcomed.

Information should be submitted as soon as possible, and not later than September 15, to the Secretary of the Association, from whom separate copies of the questionnaire can be obtained if required.

GENERAL MEDICAL COUNCIL

SUMMER SESSION

The summer session of the General Medical Council opened on May 25, Sir DAVID CAMPBELL presiding. Notice was received of the reappointment to the Council of Sir Cecil Wakeley, Bart., P.R.C.S., as representative of the Royal College of Surgeons for one year, of Dr. J. M. O'Connor as representative of the National University of Ireland for three years, and of Mr. R. B. Green as representative of the University of Durham for five years.

President's Address

Sir DAVID CAMPBELL opened his address from the chair by recording with deep regret the death of a former member of the Council, Professor E. P. Cathcart, who had represented the University of Glasgow from 1933 to 1946. He went on to congratulate the Chairman of the Dental Board, Sir Wilfred Fish, on his recent knighthood, and Dr. George Clark on being made a C.B.

The President went on to say that a further stage in the implementation of the Medical Act, 1950, was reached early this year when applications for full registration began to reach the office of the Council in gradually increasing numbers. Up to the present time 110 practitioners holding qualifications granted in these islands have been fully registered. Eighty-eight of the applicants for full registration obtained their Certificates of Experience on the basis of six months spent in medicine and six months spent in surgery. The others combined surgery or medicine with midwifery.

Registration of Overseas Practitioners

Since the beginning of last year practitioners holding recognized overseas Commonwealth and other diplomas who wish to obtain full registration in this country have had to furnish the Council with evidence that they have had such house-officer experience as is required of applicants from the United Kingdom, or other experience not less extensive. The Council delegated to a small committee of four members the task of assessing the experience of every applicant. This task had not been light.

The President went on to say that 721 overseas Commonwealth applicants have been fully registered. Of these, 250 qualified in Australia, 213 in South Africa, 101 in India, 69 in New Zealand, 31 in Canada, 26 in Pakistan, 19 in Ceylon, and 22 in other parts of the Commonwealth. In addition, 2 practitioners holding recognized degrees granted in Burma have been fully registered in the Foreign List.

During the same period provisional registrations were granted to 74 Commonwealth practitioners, 20 of whom subsequently obtained full registration by service in the hospitals in this country; while temporary registration under Section 8 of the Medical Practitioners' and Pharmacists' Act, 1947, was granted to 456 practitioners from Commonwealth or foreign countries, not eligible for full or provisional registration, who were thus enabled to take up postgraduate employment in our hospitals. Most of the latter group qualified in foreign countries, including 144 in Europe, 42 in America, and 23 in Egypt. The great majority of overseas applicants for temporary, provisional, or full registration came for postgraduate study.

Visitation of Medical Schools

The President said that good progress had been made by those appointed within the past two years to visit or inspect examinations and to visit medical schools. Thirty examinations in various subjects in England and Wales, 10 in Scotland, and 7 in Ireland have now been visited or inspected, while 51 visits have been made to inquire about the teaching of different subjects—21 in England and Wales, 15 in Scotland, and 15 in Ireland. The reports of the Council's visitors and inspectors will be printed and forwarded as confidential documents to the licensing bodies concerned.

Recognition of Indian Degrees

The President reported that at its meeting the previous day the Executive Committee had resolved that the degrees of the University of Agra should be recognized in respect of the Agra Medical College, of the University of Delhi in respect of the Lady Hardinge Medical College, of the University of the Punjab, India, in respect of the Anritsar Medical College, and of the University of Gauhati in respect of the Assam Medical College.

A Wrong Interpretation

"In my address last November," said Sir David Campbell, "I expressed the concern of the Disciplinary Committee at the emergence of certain professional misdemeanours in connexion with the National Health Service which had kept recurring during the past few years, and on their advice issued a warning. I have since learned that this warning has been interpreted in some quarters as indicating that these misdemeanours are widespread and as a reflection on the high general ethical standard of the profession in Great Britain."

"This was neither intended nor implied. The Minister of Health, when asked in the House of Commons on January 21 as to what steps he had taken since my statement was made, said: 'I have taken no steps since the statement made by the President of the General Medical Council, but it is fair to say that perhaps the right interpretation has not been put on what was said. As I understand, it was a warning that the General Medical Council quite rightly take a grave view of laxity in these matters, and was not an allegation that fraudulent practices or conduct were at all widespread.'"

"That reply puts the matter in its proper perspective."

Omission from the Programme

Sir RUSSELL BRAIN reminded the President of his statement at the last session about the desirability of holding a debate on medical education and the entrance upon professional life, and he was sorry to see that there was no indication of this on the programme of the present session. There was no more important or urgent subject.

The President said that certain other matters, which he could not detail in open Council, had come forward, and it was evident that the work of the Medical Disciplinary Committee might extend over the week. He fully agreed about the importance of an early debate on the subject.

Elections

Sir SYDNEY SMITH was re-elected Chairman of Business. The Finance, Executive, Pharmacopoeia, and Medical Disciplinary Committees were elected. Dr. BROCKLEHURST, Sir SYDNEY SMITH, and Mr. STONEY were reappointed by the Council as members of the Dental Board, representing the Branch Councils for England, Scotland, and Ireland respectively.

Reports of Committees

Dr. H. G. DAIN presented a report from the Pharmacopoeia Committee, which embodied a report of the Pharmacopoeia Commission, 1953-8. The Commission recommended that new monographs on important drugs and preparations for which official standards were not provided, together with additions and amendments to existing

monographs, should be published towards the end of 1955. The report included a list of the committees of the Commission now working. They numbered 22.

The Council received the annual examination returns for 1953 and details of exemptions. The summary included, in addition to the usual particulars, the total number of students admitted by licensing bodies to premedical studies during 1953, the total number of students exempted from premedical courses and examinations, and the number commencing preclinical studies.

Professor R. M. F. PICKEN said that an interesting point was the contrast between medical schools regarding exemptions from the premedical course and examination. The premedical and preclinical teachers in his school were against such exemptions. Their point was that it was a good thing for students to have a year in the university before beginning the vocational side of their studies. This was a question which would have to be considered when the Council debated the general subject of medical education.

The President pointed out the smallness of the number exempted from the premedical course by the Scottish universities. He also drew attention to the percentages of passes in the final examination in the University of Cambridge in 1953: medicine, 74%; surgery, 64%; midwifery, 60%; and in the final examination as a whole, 39%.

Professor DEAN said that Cambridge students were now required to pass all parts at the same time.

The Diploma in Public Health

Sir ANDREW DAVIDSON presented the annual returns of examinations for certificates and diplomas in public health, also the report of a special committee appointed by the Council a year ago to report on the revision of the rules on the courses of study and examinations for the diplomas or degrees in sanitary science, public health, or State medicine. He said that the D.P.H. rules had been varied at intervals in 1930, 1938, and 1948. His committee felt that the policy should be to hasten slowly, and had decided as a first step towards further revision to invite the views of a number of bodies interested in the training of practitioners for the D.P.H.

The Council agreed, on the recommendation of the special committee, that the diploma in public health granted by the University of Malaya be recognized as registrable as an additional qualification.

It was reported that the following licensing bodies in public health, etc., might be granted held no examinations in 1953: the Universities of Birmingham, Cambridge, Oxford, Sheffield, and Dublin, and the Scottish and Irish Conjoint Boards.

Visitation of Schools and Examinations

Dr. BROCKLEHURST said that the visitation of schools and methods of examination had now been going on for some time. Up to date 51 visits had been made by visitors to medical schools and 47 visits to examinations. The special committee on visitation had now discharged the functions imposed on it by the Council and felt that it could be discharged, but it realized that as a result of the visits that were being made to schools and examinations there would be a considerable number of reports sent in, and it would be desirable for a smaller body than the Council as a whole to go over these reports when they came in and to study the observations of the licensing bodies on them. It recommended the setting up of a new committee which would deal with these reports.

The recommendation was seconded by Sir HENRY COHEN, and it was agreed that a committee be set up for this purpose.

The remainder of the business of the full Council was transacted in camera, and on its conclusion, on the following day, the Medical Disciplinary Committee met and continued its sittings throughout the week.

(To be continued)

REGISTRARS GROUP COUNCIL

A meeting of the Registrars Group Council was held at B.M.A. House on May 14, under the chairmanship of Dr. P. L. ROBINSON, of Liverpool. Twenty-six registrars, representing 16 of the 19 hospital regions in Great Britain, were present. The full membership of the Council is 38—two representatives from each region. The Council normally meets twice a year, and its executive committee quarterly.

Hospital Junior Staffing

The main discussion arose on the recommendations of the Hospital Junior Staffing Subcommittee of the Central Consultants and Specialists Committee. Dr. R. M. FORRESTER, who is a member of the Subcommittee, gave a full report of the Subcommittee's deliberations and conclusions.

There was some divergence of opinion on the Subcommittee's proposal to create a new permanent grade of hospital medical staff, with two broad salary ranges (corresponding to about £700-£1,000 and £1,100-£2,000 at the pre-April, 1954, level of remuneration), to replace the S.H.M.O. and J.H.M.O. grades, and, to a large extent, the registrar grades. Some members felt that such a measure would materially assist in solving the hospital junior staffing problem.

Other members expressed the view that the only way to attract greater numbers of doctors back to hospital work after National Service was to improve appreciably the remuneration and living conditions of house officers above the pre-registration level. It was pointed out that at the end of his National Service a married medical officer normally received about £820 per annum, whereas the newly agreed remuneration of a senior house officer was £745, less deductions for residential emoluments. This, in itself, deterred an intending general practitioner from returning to hospital appointments.

It was suggested that a new grade of hospital appointment would be undesirable, since there were many senior registrars of long standing who would be compelled to accept appointments in the new grade, even though they might not be attracted to them, because they had reached a point where it would be extremely difficult for them to start a career in any other branch of medical practice. It was considered that the Government should be pressed to recognize that many senior registrars were doing work of a consultant nature, and to create additional consultant posts accordingly and reduce the senior-registrar establishment. The hospital junior staffing problem could then be re-examined, and also the need for a new grade of permanent hospital medical officer.

Termination of Senior Registrar Posts

It was reported to the Group Council that a letter from the Chairman of the Group had been published in the medical press, in which he invited senior registrars whose appointments had been terminated without prospect of other suitable posts to notify him. As a result, particulars of a number of senior registrars in this difficult position had been forwarded to the Ministry of Health, with a request that it should consider as a matter of urgency what action could best be taken to assist these registrars.

The CHAIRMAN informed the Group Council that he had written to the Central Consultants and Specialists Committee urging that the Joint Committee should be recommended to press the Ministry to (1) draw the attention of regional boards again to the fact that senior registrars who have completed four years or more may, at the discretion of advisory appointments committees, be reappointed to the same or another post in the same specialty; (2) advise boards that in this way suitable senior registrars in non-teaching hospitals may be retained indefinitely, subject to periodic reappointment or review; (3) advise boards of governors that in general a senior registrar should not spend more than three, or at most four, years in a teaching hospital; and (4) advise that "transitional" posts be more

liberally created, and the time limit for their termination, at present set at December 31, 1955, be extended until a definite decision on future hospital staffing is agreed and implemented.

Remuneration

The new salary scales for hospital medical staffs agreed in Committee "B" of the Medical Whitley Council were fully discussed. Reference was again made to the relationship between the remuneration of hospital junior staff and the present junior staffing difficulties. The proposal to seek further improvement in the salary scales of S.H.M.O.s was noted, and a resolution was passed urging that consideration should at the same time be given to the following: (1) an appreciable increase in the remuneration of senior house officers, having regard to the disparity between the present remuneration of S.H.O.s and assistants in general practice; (2) a further increase for other grades of hospital junior staff; and (3) a narrowing of the gap between the remuneration at the top of the senior registrar scale and that at the bottom of the consultant scale.

The Group Council also decided to ask that when the Staff Side of Committee "B" considered the terms and conditions of service for hospital junior staff in future a representative of the Registrars Group should be co-opted to attend the Committee with Staff Side representatives.

Cremation Certificates

It was reported that the Executive Committee had recommended the withdrawal of the Home Office advice that, when Form B of the Cremation Certificates was given by a house officer in a hospital, Form C should not be accepted if signed by a registrar, even though he were of the requisite five years' standing. The Group Council decided to recommend also that a fee should be charged for Form B when it was completed by a hospital medical officer.

Other Matters Discussed

Among other matters discussed and referred to the Executive Committee for consideration were the possibility of interchange of appointments between registrars in the United Kingdom and registrars in other parts of the Commonwealth, and the issue of a periodic bulletin from the Group Council to all registrars.

Group Council Dinner

The meeting was followed in the evening by the Second Annual Dinner of the Group Council, which took place at the Connaught Rooms, and at which Dr. D. P. Stevenson, Deputy Secretary of the Association, was the principal guest.

CENTRAL HEALTH SERVICES COUNCIL AND STANDING ADVISORY COMMITTEES

The Minister of Health has made the following medical appointments and reappointments to the Central Health Services Council and Standing Advisory Committees for the period ending March 31, 1957 (new members are denoted by an asterisk):

Central Health Services Council.—*Mr. O. M. Duthie; Dr. W. G. Masefield; *Dr. F. M. Rose; Professor Sir Harry Platt; *Dr. J. G. Scadding.

Standing Medical Advisory Committee.—Dr. K. Cowan; Sir William Gilliatt; Dr. H. Joules; Dr. W. G. Masefield; Professor Sir Harry Platt.

Standing Ophthalmic Advisory Committee.—*Mr. J. H. Daggart; Mr. R. A. Greeves.

Standing Maternity and Midwifery Advisory Committee.—Mr. Arnold Walker.

Standing Mental Health Advisory Committee.—Dr. E. J. M. Bowby; Dr. W. G. Masefield.

Standing Tuberculosis Advisory Committee.—Professor Sir Harry Platt; *Dr. F. Ridehalgh; *Dr. G. W. H. Townsend.

Standing Cancer and Radiotherapy Advisory Committee.—Sir Harold Boldero; Sir Stanford Cade; Mr. C. E. Dukes; Mr. J. A. Stallworthy; Mr. C. J. L. Thurgar; Professor R. M. Walker.

ECONOMY IN PRESCRIBING

PRESCRIBING INVESTIGATION UNIT'S WORK

Some information about the work of the Ministry of Health's Prescribing Investigation Unit has already been published in the *Supplement* (May 15, p. 243). The secretary of the General Medical Services Committee has recently received a letter from the Ministry of Health which gives a more detailed account of the results of the investigation unit's activities. The letter is reproduced in full and is as follows:

"As you know the Minister of Health adopted, after consultation with the General Medical Services Committee of the British Medical Association, a procedure for examining cases where prescribing appears unnecessarily expensive. You may be interested to see the figures showing the work of the Ministry's Prescribing Investigation Unit, which give some idea how this procedure has been working since 1950.

"The Unit has reviewed the prescribing of no fewer than 4,400 doctors in England and Wales—that is, nearly 25% of the general practitioners in the two countries. As a result, the Unit prepared first reports on 883 doctors whose costs appeared unusually high. The reports compare the doctor's costs with those of his colleagues in the area, and also analyse the prescriptions to show where excessive cost appears to have been incurred.

"On the strength of these reports, the regional medical officer visits the doctor and discusses prescribing with him. In most cases the doctor is both willing and able to reduce his costs. In my letter to you of July 8 last I said that complete figures of comparative costs were not available, but that in approximately 100 cases examined the first report showed that the average excess cost of prescriptions dispensed, as compared with the average cost in the area, was £168 per month. A further check showed that most doctors had reduced costs, but some had not: the average excess cost had been reduced from £168 to £86 a month, a saving of the order of £10,000 a month (or about £100,000 a year) in respect of these doctors alone.

"I am now able to add that in the cases of the first 200 doctors whose prescribing was examined for the second time the average reduction in cost between the first and second examinations was £128 a month, totalling about £300,000 a year.

"Seventeen cases have been referred since 1950 to local medical committees for formal investigation under the appropriate regulations, and figures for the first eight of these cases are rather revealing. At the first investigation the prescribing costs in these eight cases were on the average £668 per month higher than the average for the area; after the full investigation procedure had been completed, this figure had been reduced to £154 per month. The saving over the year in these eight cases was thus approaching £50,000.

"Excess cost is largely accounted for by the following: (a) excessive frequency in prescribing; (b) prescribing of standard drugs and dressings in unnecessarily large quantities; (c) the prescribing of expensive proprietary preparations where a less costly standard preparation might have been equally effective. Of the 17 cases so far referred, remuneration has been withheld in nine cases (the sums ranging from £25 to £250). In one case it was found that no excess cost had been incurred. The remaining cases are not yet complete.

"On these results, it can, I think, fairly be claimed that this procedure is proving effective in practice: they also illustrate the ready co-operation accorded by most doctors when the matter is brought to their attention."

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.

Non-County Borough Councils.—Crewe.

Urban District Councils.—Houghton-le-Spring.

The County Medical Officer of Health for Northamptonshire, Dr. C. M. Smith, has issued a brochure giving details of the county's health services for the use of medical practitioners. Dr. Smith has recently been elected President of the local Branch of the B.M.A.

JOINT CONSULTANTS COMMITTEE

HOSPITAL JUNIOR STAFFING

A meeting of the Joint Consultants Committee was held at the Royal College of Surgeons on May 11, under the chairmanship of Sir Russell Brain. A large proportion of the time of the meeting was given to the problems of hospital junior staffing. The Committee received representation from the Hospital Junior Staffing Subcommittee of the B.M.A. Central Consultants and Specialists Committee of the B.M.A. which has studied a great deal of statistical information which has been furnished by the Ministry, and in bearing on the subject furnished by the Ministry, and in the light of which it had prepared a comprehensive report. The Subcommittee commented upon the weaknesses of the existing staffing structure, drawing particular attention to the fact that the development of the hospital services in recent years called for a demand upon medical manpower which could not easily be met solely by the system of short-term appointments. Other factors suggested by the Subcommittee as contributing towards the problem were compulsory national service, the widening gulf between hospital work and other forms of medical practice, the lack of security, and the deterioration of promotion prospects in the non-teaching hospitals.

Two New Grades

The proposals formulated by the Subcommittee to meet the situation included the abandonment of the present rigid registrar training ladder, and the appointment of all hospital staff below the consultant, according to the needs of the hospital, within two broad salary ranges rising to—or even overlapping—the lower end of the consultant scale. At the upper levels the Subcommittee envisaged that there would be scope for part-time appointments, which could be combined with other work—for example, general practice. The Subcommittee also stressed the need to provide greater security for hospital staff below the level of consultant, including the prospect of a permanent career, and an improvement of the prospects of promotion through the non-teaching hospitals. After a lengthy discussion the proposals were referred to a subcommittee of the Joint Committee for further examination.

S.H.M.O.s and Obstetrics

A report was also placed before the Committee on the use of the S.H.M.O. grade in obstetrics and gynaecology. In 1950 the Joint Committee had agreed with the Ministry that this grade might be appropriate for certain appointments where obstetrics was practised alone. In the light of experience, however, the Royal College of Obstetricians and Gynaecologists now felt that at this level of responsibility obstetrics and gynaecology should invariably be practised together, and accordingly it urged that the use of the grade should be discontinued in this specialty. The Committee endorsed this view and decided to make representations to the Ministry accordingly.

Medical Advisory Machinery

During the course of the meeting a number of points arose which again emphasized the need to improve the medical advisory machinery of regional hospital boards, and the Committee agreed to urge upon the Ministry more the desirability of giving advice to regional boards on this subject as it has done in the case of boards of governors and hospital management committees.

Other Matters

Consideration was again given to questions affecting the retiring age and superannuation rights of psychiatrists classified as mental health officers, and the Committee decided to seek further advice from the professional bodies representing these officers before discussing the matter with the Ministry. Other subjects dealt with in a lengthy agenda included matters relating to the interpretation of the pay-

bed regulations, study leave, the employment of hospital staff on pneumoconiosis panels, the loan of hospital records, and the investigation of complaints involving members of hospital medical staffs. At the conclusion of the meeting the members of the Committee were entertained to lunch by the Royal College of Surgeons.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Remuneration of Hospital Medical Staff

SIR,—The Council of the Scottish Branch of the Society of Medical Officers of Health has, by unanimous decision, instructed me to write in the strongest possible terms expressing the Branch's disgust and indignation at your leading article (*Journal*, May 15, p. 1139) on remuneration of hospital medical staff. The Branch is particularly horrified by your reference to consultants and general practitioners as "the two most important sections of the profession." It would be unfortunate in the extreme if any doctor in the public health service were misled by your leading article into the erroneous view that his work was any whit less important to the community than that of a consultant or a general practitioner. Any practitioner of preventive and social medicine who is in danger of being so misled might do well to study Sir Sheldon Dudley's recent book *Our National Ill Health Service*,¹ with its carefully reasoned comparison of the respective values to the public of the preventive and curative services.

The B.M.A. claims to represent members in the public health service equally with members in hospital and general practice, and it certainly never refuses annual subscriptions from health officers. Yet the Association and its *Journal* persistently ignore the interests of this section of the profession. Public health work is exacting and strenuous, and the medical officer of health is the only specialist who must by law possess a postgraduate qualification; but the Association and its *Journal* seem perfectly content with a situation in which most health officers reach retirement age with a salary maximum of £1,300 (or less than that of a trainee consultant) and in which less than 1% of doctors attain the salary maximum of a consultant without distinction award. I think I am correct in stating that, out of 260 doctors in the public health service in Scotland, there are only three whose salary maxima exceed £2,500, and only about 10 with salaries between £2,000 and £2,500.

It would appear that the B.M.A., while vigorously championing the cause of hospital doctors and general practitioners, is completely oblivious to the circumstances of medical officers in local government service, in the civil service, and in non-clinical university posts. It would also appear that, despite the inevitably close connexions between medicine and nursing, the B.M.A. is unwilling to draw public attention to the fact that nursing salaries—both in preventive and in curative nursing—have failed to advance like those of other professions, and in particular to the fact that a ward sister who takes one and a half years' further whole-time training in midwifery and health visiting receives as a health visitor a salary lower than she received as a ward sister.

Already one hears curious murmurs from the public: "Is a consultant with a second-class award really worth twice the pay of the medical officer of health of a moderate-sized borough? Is an average general practitioner worth the remuneration of 1½ departmental medical officers in local government service? Is a senior registrar as valuable as 2½ ward sisters? Is a general practitioner worth the money that would provide 3½ health visitors?" It is not possible to brush aside such queries by a lordly statement that preventive and curative work cannot be compared or by asserting that doctors and nurses cannot come into

comparison. Unless the B.M.A. alters its attitude it is plain that, sooner or later, the public will take steps to reduce considerably the remuneration of hospital and general practitioners.—I am, etc.,

I. A. G. MACQUEEN,
Honorary Secretary, Scottish Branch of
Society of Medical Officers of Health.

Aberdeen.

REFERENCE

Our National Ill Health Service, 1953. Watts and Co., London.

"We regret it if we have unwittingly caused offence to the Scottish Branch of the Society of Medical Officers of Health. The phrase to which strong exception is taken was not intended to diminish the importance of the public health service or to decry the value of the work done by medical officers of health.—ED., B.M.J.

SIR,—As junior members of the staff of one of London's oldest mental hospitals, may we make use of your columns to point out how rapidly the recent rise in salary awarded to us has been dissipated? The residential charges of this hospital have just risen, despite protests, from £156 to £208 per annum. This, allowing for tax, etc., leaves us all precisely where we were. The extraction of £208 per year from junior staff seems quite viciously excessive to us. We feel that this is a trend that should be stopped.—We are, etc.,

J. COLLINS.
W. O. HEFFERNAN.
S. MACENTEE.

RICHARD P. MICHAEL.
D. N. SELL.
L. ELAINE WOODVINE.

Southall.

SIR,—Mr. de Solderhoff states (*Supplement*, May 22, p. 281) that, while the report of the meeting of the Central Consultants and Specialists Committee described the resolution of confidence moved by Dr. Cochrane Shanks as having been carried *nemine contradicente*, it did not state that "there were at least five abstentions." When a resolution is reported as having been carried *nemine contradicente*, instead of unanimously, it is to be assumed that there were abstentions, but if the number of abstentions is not counted from the platform and announced, it is impossible for the reporter to say how many there were. Your correspondent also says that much matter, "contradictory matter in particular," is omitted from the reports of the meetings of the committee. Excisions are inevitable when a whole day's proceedings, covering perhaps forty separate items of business, have to be compressed into two or three columns of the *Supplement*, but no reporter worth his salt will fail to give as impartial and objective an account of the proceedings as he can.—I am, etc.,

YOUR REPORTER.

Remuneration in the Public Health Service

SIR,—May I support the plea made by Dr. E. D. Irvine (*Supplement*, April 3, p. 143) and subsequent correspondents for a fair deal for the whole-time medical officers in the public health service?

The level of remuneration received by all whole-time medical officers of health, whatever type of local authority they serve, should be so related to that received by general practitioners and consultants as to encourage rather than discourage entry into the public health service. This is the fundamental requirement for a just and satisfactory solution of the problem of the adequate remuneration of the medical officer of health. Neither the training he undergoes, the professional qualifications he must hold, the experience he must acquire before attaining the status of medical officer of health, nor the importance of his work warrants the deplorably low salary at present received by the majority of medical officers of health. It is to the decided advantage of preventive medicine, and therefore of the community, that the public health service should not be at a disadvantage, because of its relatively poor financial prospects, in obtaining suitable medical recruits. The relationship between the salaries of medical officers of health and other chief officers

of local authorities, and the placing of the county borough medical officer of health at the apex of a hierarchical system of remuneration, require careful consideration.

The medical officer of health should not be deprived of his just reward because of the difficulty created by the habit of relating his salary to that of other officers employed by local authorities. Has not rather too much regard been paid to population figures and the civic status of a town in computing the salaries of medical officers of health? The demands made on the professional skill of a medical officer of health serving a comparatively small area are not necessarily less than those made on his colleague serving a much larger one. The same salary scale applies to all who achieve consultant status irrespective of the minutiae of their differing duties and responsibilities. Surely those who attain the status of medical officer of health are entitled to a salary scale fixed at such a level as not to deter the best type of medical graduate from embarking on a career in the public health service. I am, etc.,

Stockton-on-Tees.

HENRY J. PETERS.

SIR,—I have noted with interest in Dr. J. B. Tilley's letter (*Supplement*, May 22, p. 281) a reference to a proposed meeting of the Staff Side of Committee "C" on June 11, to review the present situation in the public health service. Let us hope that immediate reconsideration will be given to the deputy M.O.H. of the smaller authority. Committee "C" has acknowledged, rather grudgingly, that a local authority with a population of less than 75,000 may need the services of a deputy M.O.H. and, with laudable intent, has stated that it would not be unreasonable for such a deputy to be paid a personal salary of not more than £50 above that of his assistant medical officer, if the assistant M.O.'s salary would otherwise have been equal to, or greater than, his own. The deputy M.O.H. who is fortunate enough to have an assistant with long service is well placed. The unfortunate deputy, however, whose assistant has short service with a local authority, is stranded on the recognized deputy scale—that is, two-thirds of the salary of the M.O.H.—possibly for several years until the assistant's salary approaches his own (1958 in my case). The maximum of the deputy salary scale may be appreciably less than the maximum of the assistant's scale (in my own case £67 less). Furthermore, a deputy at the present moment may find himself receiving a salary less than that which he would have received had he remained as an assistant M.O.H. (in my case £67 less).

Such glaring anomalies, which embarrass both employer and employee, could be largely eradicated by the addition of a rider to the Committee "C" recommendation to the effect that no deputy M.O.H. should receive less than he would have received had he remained as an assistant M.O.H. If this modest plea be shelved, and promises made for the future, then the least Committee "C" could do to remedy its error of omission would be to post-date any future salary increases for such deputy M.O.H.s to June 1, 1953 (the date of application of the most recent award to assistant M.O.H.s). As a member of a poorly paid branch of the medical profession I, for one, cannot afford to lose up to £117 per annum until 1958, and even then my assistant might have left and been replaced by another newcomer to local authority service. I am, etc.,

"DEPUTY M.O.H."

Hospital G.P. Liaison

SIR,—Dr. A. Lask's account (*Supplement*, May 15, p. 244) of the failure of a well and highly qualified general practitioner to secure a place on the staff of the local G.P. hospital fills me with both amazement and indignation. In my view, a G.P. hospital is one in which any G.P. in the area served by the hospital is afforded every facility for the investigation and treatment of his patients in hospital if he chooses to do so. Where any doctor is debarred from this inalienable right, that hospital is not justifying its title of "G.P. hospital." It seems to me that some investigation

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into the administration of this hospital of which Dr. Lask speaks, so far as the appointment of G.P. staff is concerned, is urgently necessary, for I cannot conceive any motive other than personal prejudice which would debar a G.P. holding the M.D., M.R.C.O.G. qualifications from the staff of the G.P. hospital of the area in which he works.—I am, etc.,

St. Helens, Lancs.

LOUIS CRAWFORD.

Doctor-Patient Relationship

SIR,—The recent findings of the Middlesex Executive Council that a doctor should have shown more tact and understanding and that he was casual and facetious should be the subject of a strong protest to the Minister of Health by the B.M.A. This case should never have reached the stage of an investigation. The patient should have been told that the remedy was in his own hands. Let him transfer to another doctor. The widespread publicity of such cases in the Press only reduces the doctor-patient relationship to a lower level and encourages further frivolous complaints and litigation. There was no question here of any negligence. Admittedly tact and understanding should be part of a doctor's equipment. But how can anyone who was not present at the particular consultation judge such a case? Therapeutically one gets good results in certain types by discarding both.

What other profession would put up with discipline from laymen? Would a trade unionist put up with discipline from a body consisting mostly of doctors? The whole system of executive councils needs drastic revision. Too much power is in their hands and many of them abuse it. If we must have disciplinary bodies in the N.H.S., let us at least have competent ones, and let them have power to discipline patients also. My opinions are not based solely on the case mentioned but also on recent experiences, not of a disciplinary nature, I and my local colleagues have had with our executive council. We found it dictatorial, unco-operative and completely lacking either tact or understanding. As the matters in question have not yet been settled, I prefer anonymity.—I am, etc.,

"G.P."

Peripatetic Practitioners

SIR,—The Council of the Medical Defence Union is seriously disturbed at the number of its members, mainly recently qualified or temporarily registered practitioners, who fail to furnish an address at which they can be reached by postal communications. This operates to their disadvantage in two ways: (1) they do not receive a copy of the Annual Report containing useful advice on procedure to be followed in threatened or actual litigation associated with allegations of negligence, and (2) they do not receive communications advising them that they are in arrear with their subscriptions, whereby they cease to be entitled to the benefits of membership until payment of the arrears is made good.

With the present tidal wave of medical litigation the profession is experiencing it behoves every practitioner to satisfy himself that he is not only a member of a reputable defence organization but a member "in benefit." That may be ensured by paying the annual subscription through a banker's order and checking by reference to his bank or bank statement that payment has in fact been made at the due date. There is nothing more unfortunate than for a member to seek advice and legal representation in a case only to find that he is not entitled to any assistance through failure to pay his subscription.

On a further matter which has, perhaps, a similar cause for its occurrence: The attention of the Council has been drawn to numerous members whose names have been deleted from the *Medical Register* owing to their failure to reply to communications addressed to them by the Registrar of the General Medical Council. The need for practitioners to give an appropriate address at or through which they can always be reached by telephone or letter is of para-

mount importance, and any who are in doubt about the matters mentioned above should take early steps to verify their position.—I am, etc.,

ROBERT FORBES,
Secretary, Medical Defence Union.

London, W.C.1.

POINTS FROM LETTERS

Remuneration of Hospital Medical Staff

Dr. H. V. DEAKIN (St. Austell) writes: Apropos of the recent correspondence on the remuneration of hospital staff, I write as a disinterested retired doctor with a somewhat shattered faith and pride in my profession and medicine to-day. Some time ago I wrote in this *Journal*: "To be a part-time consultant is to have the best of all worlds," and it is obviously much truer to-day. Surely this last ignominious surrender is just one of the natural consequences of another earlier surrender which led to the N.H.S. in its present deplorable form. Until medicine is taken completely out of politics the same sickening happenings will recur, and eventually it will sink to the same low level of the latter.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). The only charge made is for postage of books. A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Ackerknecht, E. H.: *Rudolf Virchow: Doctor, Statesman, Anthropologist*. 1953.
Association for Research in Nervous and Mental Disease Pub. Vol. XXXII. *Metabolic and Toxic Diseases of the Nervous System*. 1953.
Balneotherapy and Climatotherapy in Medical Science and Practice: 39 lectures. 1953.
Barnard, W. G.: *Elementary Pathological Histology*. Third edition. 1953.
Bayliss, R. I. S.: *Practical Procedures in Clinical Medicine*. Second edition. 1954.
Browning, E.: *Toxic Solvents*. 1953.
Burt, Sir C.: *Causes and Treatment of Backwardness*. Second edition. 1953.
Collins, W. S., and Wilensky, N. D.: *Peripheral Vascular Diseases*. Second edition. 1953.
Derner, G. F.: *Aspects of the Psychology of the Tuberculous*. 1953.
Dill, L. V.: *The Obstetrical Forceps*. 1953.
Donovan, G. E.: *Medical Electronics*. 1953.
Durán Sacristán, H.: *Valores Totales del Volumen Sanguíneo, Hemoglobina, Proteínas y Líquido Extracelular en Cirugía*. Tesis Doctoral. 1953.
Ellis, M. (Editor): *Modern Trends in Diseases of the Ear, Nose, and Throat*. 1954.
Evans, P. R., and MacKeith, R.: *Infant Feeding and Feeding Difficulties*. Second edition. 1954.
Fisher, Sir R. A., and Yates, F.: *Statistical Tables for Biological, Agricultural and Medical Research*. 1953.
Franklin, K. J.: *Joseph Barcroft, 1872-1947*. 1953.
Fry, J. (Editor): *Clinical Medicine in General Practice*. 1954.
Haldane, J. B. S.: *Biochemistry of Genetics*. 1954.
Hirst, L. F.: *The Conquest of Plague*. 1953.
Jaramillo-Arango, J.: *British Contribution to Medicine*. 1953.
Kunze, A.: *Autonomic Nervous System*. Fourth edition. 1953.
Lawrence, J. S., and Francis, J.: *The Sulphonamides and Antibiotics in Man and Animals*. Second edition. 1953.
Liddiard, M.: *The Mothercraft Manual*. Twelfth edition. 1954.
McBride, E. D.: *Disability Evaluation*. Fifth edition. 1953.
Modern Practice in Anaesthesia. Edited by Francis T. Evans. Second edition. 1954.
Noyes, A. P.: *Modern Clinical Psychiatry*. Fourth edition. 1953.
Passera, G., and Gazzera, G.: *Fisiopatologia della Anestesia Tiobarbiturica*. 1953.
Poli, M.: *Nefropatie Mediche Bilaterali Familiari*. 1953.
Pottenger, F. M.: *Symptoms of Visceral Disease*. Seventh edition. 1953.
Pratt, R., and Dufrenoy, J.: *Antibiotics*. Second edition. 1953.
Rand, W., et al.: *Growth and Development of the Young Child*. Fifth edition. 1953.
Robins, H. C.: *Guide to Spiritual Healing*. 1953.
Sava, G.: *A Surgeon Remembers*. 1953.
Schauffer, G. C.: *Pediatric Gynecology*. Third edition. 1953.
Spot Diagnosis with Notes on Therapy. Compiled by the Editors of "Medicine Illustrated." Volume I. 1954.
Te Linde, R. W.: *Operative Gynecology*. Second edition. 1953.
Thygesen, P.: *Course of Disseminated Sclerosis*. 1953.
Turner, D.: *Handbook of Diet Therapy*. Revised edition. 1952.
Valentine, C. W.: *Parents and Children: A First Book on the Psychology of Child Development and Training*. 1953.
Vogl, A.: *Diuretic Therapy*. 1953.
Wachsmann, F., and Barth, G.: *Die Bewegungsbestrahlung*. 1953.
Weil, A. J., and Saphra, I.: *Salmonellae and Shigellae: Laboratory Diagnosis Correlated with Clinical Manifestations and Epidemiology*. 1953.
Willcox, R. R.: *Progress in Venereology*. 1953.
Winbury-White, H. P.: *Stone in the Urinary Tract*. Second edition. 1954.
Wolf, H. J.: *Einführung in die innere Medizin*. 5 Auflage. 1953.
Yecudian, S., and Haich, E.: *Yoga and Health*. 1953.
Zijlstra, W. G.: *Fundamentals and Applications of Clinical Oximetry*. Second edition. 1953.
Zoethout, W. D., and Tuttle, W. W.: *Textbook of Physiology*. Eleventh edition. 1952.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Lieutenant T. S. Law, M.B.E., to be Surgeon Lieutenant-Commander.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel W. H. Carter has retired on retired pay on account of disability.

Lieutenant-Colonel T. G. McNie, having reached the age for retirement, has been retained on the Active List.

Majors J. S. F. Watson and A. B. Fountain to be Lieutenant-Colonels.

Major K. Greenwood has retired with a gratuity and has been granted the honorary rank of Lieutenant-Colonel.

Major W. M. Owen has retired with a gratuity.

Captain E. G. Hardy to be Major.

Short Service Commissions.—Captain O. F. Paise to be Major.

Captain E. J. Gammon has retired with a gratuity.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Colonel J. C. Hawksley, C.B.E., has been appointed Honorary Colonel of an A.E.R. unit.

Colonel D. P. Holmes, T.D., from T.A.R.O., to be Colonel.

Major (Acting Colonel) E. W. Ashworth, T.D., to be Colonel.

Major (Acting Lieutenant-Colonel) G. S. Adams, T.D., to be Lieutenant-Colonel.

Captain (Honorary Major) Marie D. Kelleher, from R.A.R.O., to be Captain, relinquishing the honorary rank of Major.

Captain H. C. Reid, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel C. J. Wells, M.B.E., has been granted the acting rank of Colonel.

Majors W. K. McCollum, T.D., C. W. Healey, M.C., T.D., R. West, J. P. Parkinson, and A. C. D. Parsons have been granted the acting rank of Lieutenant-Colonel.

Captain C. Weymes, formerly Short Service Commission, to be Captain, and has been granted the acting rank of Major.

Captain A. P. Grimby to be Major.

Captains R. M. Lang, J. G. Kennedy, N. B. Sprague, and P. J. L. Hunter have been granted the acting rank of Major.

Lieutenants (War Substantive Majors) C. Bainbridge, O.B.E., and H. A. Palmer, from Emergency Commissions, to be Majors.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel P. Howe, T.D., from Active List, to be Colonel.

Lieutenant-Colonel and Brevet Colonel H. D. Chalke, O.B.E., T.D., from Active List, to be Lieutenant-Colonel and Brevet Colonel.

Lieutenant-Colonel C. S. McKendrick, from Active List, to be Lieutenant-Colonel.

Major (Honorary Lieutenant-Colonel) R. Anderton, having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Major E. R. C. Walker, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.

Captains (Acting Majors) J. Telfer and D. N. Stewart, from Active List, to be Captains, relinquishing the acting rank of Major.

Captain (Honorary Major) H. R. Vernon, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O.

COLONIAL MEDICAL SERVICE

The following appointments have been announced: C. H. J. Baker, M.R.C.S., L.R.C.P., D.P.H., Health Officer, Federation of Malaya; J. A. Gallagher, M.B., B.Ch., B.A.O., and H. W. Wheate, M.B., B.S., D.T.M.&H., Medical Officers, Tanganyika; A. M. Baker, M.R.C.S., L.R.C.P., Medical Officer, Uganda; P. P. Clifford, M.B., B.Ch., B.A.O., D.L.O., Medical Officer, Kenya; T. Taylor, M.B., B.S., Medical Officer, Hong Kong; P. J. van den Brul, M.B., B.S., Medical Officer, British Somaliland Protectorate; R. M. Melville, M.B., Ch.B., Medical Officer, Federation of Malaya; Mrs. B. K. Perks, M.B., B.S., and W. A. St. John, M.R.C.S., L.R.C.P., Medical Officer, Leeward Islands; D. Tavarra, M.B., B.Ch., D.P.H., Medical Officer, Barbados; A. Simon, M.D., D.P.H., District Medical Officer, Seychelles.

The Coventry Division of the B.M.A. has arranged five cricket matches during June and July this year. Among their opponents will be the Birmingham doctors, on June 24.

Association Notices

ANNUAL GENERAL MEETING

Notice is hereby given that the Annual General Meeting of the Association will be held in the Bute Hall, The University, Glasgow, on Monday, July 5, 1954, at 12.30 p.m. Business: (1) Minutes of the last meeting, held on July 13, 1953. (2) Induction of President, 1954-5. (3) Balance sheet and income and expenditure account for the year ending December 31, 1953. (4) Appointment of auditors.

A. MACRAE,
Secretary.

Diary of Central Meetings

JUNE

- 9 Wed. A.R.M. Agenda Committee, 11 a.m.
9 Wed. Central Ethical Committee, 11 a.m.
9 Wed. Financial Advisory Committee, 3 p.m.
10 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
10 Thurs. Library Subcommittee, Science Committee, 2 p.m.
10 Thurs. W.M.A. Supporting Subcommittee, International Relations Committee, 2 p.m.
11 Fri. Staff Side, Committee "C", 10 a.m.
15 Tues. Evidence Committee on Divine Healing, 2 p.m.
15 Tues. Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.
16 Wed. Occupational Health Committee, 10.30 a.m.
18 Fri. Public Relations Conference, 10.30 a.m.
23 Wed. Accommodation Subcommittee, Estates Committee, 12 noon.
23 Wed. Estates Committee, 2 p.m.
23 Wed. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
24 Thurs. Constitution Committee, 2 p.m.
24 Thurs. Journal Committee, 2 p.m.

JULY

- 1 Thurs. Annual Representative Meeting (at Glasgow), 10 a.m.
2 Fri. Annual Representative Meeting (at Glasgow), 9.30 a.m.
3 Sat. Council (at Glasgow), 9 a.m.
3 Sat. Annual Representative Meeting (at Glasgow), 10 a.m.
5 Mon. Annual Representative Meeting (at Glasgow), 10 a.m.
5 Mon. Annual General Meeting (at Glasgow), 12.30 p.m.
5 Mon. Council (at Glasgow), at conclusion of A.R.M.
5 Mon. Adjourned Annual General Meeting and President's Address (at Glasgow), 8.15 p.m.
14 Wed. Maritime Subcommittee, Private Practice Committee, 2 p.m. (Date changed from July 21.)

Branch and Division Meetings to be Held

- EAST SUFFOLK DIVISION.—At White Lion Hotel, Aldeburgh, Wednesday, June 9, 9 p.m. to 1 a.m., annual summer dance.
GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, June 10, 8.30 p.m., annual general meeting.
HERTFORDSHIRE BRANCH.—At Clare Hall Hospital, South Mimms, Barnet, Wednesday, June 9, 3 p.m., A.G.M.
KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, W., Friday, June 11, 3.30 for 4 p.m., clinical meeting.
LINCOLNSHIRE BRANCH.—At Saracen's Head Hotel, Lincoln, Wednesday, June 9, 12 noon, annual meeting, to be followed by a Civic Reception. 1 p.m., lunch, to which members' wives are invited. Afternoon visits have been arranged.
REIGATE DIVISION.—At Reigate Hill Hotel, Tuesday, June 8, 8.30 p.m., discussion of Annual Report of Council, etc.
ROCHDALE DIVISION.—At Kingsway Hotel, Rochdale, Monday, June 7, 8.30 p.m., annual general meeting.
SOUTH ESSEX DIVISION.—At Railway Hotel, Hornchurch, Friday, June 4, 9 p.m., annual general meeting.
SOUTH WALES AND MONMOUTHSHIRE BRANCH.—At Cwm Taf Reservoirs, Brecon Beacons, Thursday, June 10, 3 p.m., annual social meeting.
SOUTH-WEST ESSEX DIVISION.—At St. Margaret's Hospital, Epping, Wednesday, June 9, 8.30 p.m., Dr. C. J. C. Britton: A Practical Approach to Allergy.
STRATFORD DIVISION.—Thursday, June 10, 3 p.m., joint visit with Ilford Medical Society to Messrs. Allen and Hanburys, Ltd., at Ware, Herts.
TOWER HAMLETS DIVISION.—At Poplar Hospital, East India Dock Road, E., Friday, June 11, 8 p.m., clinical meeting.
WEST SUSSEX DIVISION.—At 73, Richmond Road, Worthing, Sunday, June 13, 3 p.m., general meeting.

ANNUAL MEETING: GLASGOW, JULY 1-9

SUPPLEMENT TO THE
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ANNUAL CONFERENCE OF
REPRESENTATIVES OF LOCAL MEDICAL
COMMITTEES

DISCUSSIONS ON THE DISTRIBUTION SCHEME

The Annual Conference of Representatives of Local Medical Committees was held in the Great Hall of B.M.A. House, London, on Thursday, June 3. The chair was taken by Dr. W. M. KNOX (Glasgow), who was supported by Dr. A. TALBOT ROGERS, chairman of the General Medical Services Committee. Almost all the local medical committees in Great Britain and Northern Ireland were represented. The day's discussions were based principally on the Annual and Supplementary Reports of the Committee (Supplement, April 17 (p. 153) and May 1 (p. 204)).

CHAIRMAN'S REVIEW

Dr. TALBOT ROGERS, in moving approval of the Reports, said that when he addressed last year's Conference they were concerned chiefly with matters under discussion with the Ministry with a view to implementing the new scheme of distribution following the Danckwerts award. They had had a special inquiry into the number and types of doctors who had small lists; a full discussion took place in the Working Party, and the scheme, if the Conference ratified it that day, would be implemented as soon as possible. The scheme would ensure that no active practitioner would lose as a result of the new distribution of the Pool. This would be done without bringing in any form of means test. Another point was that this was the type of problem where varying conditions in different parts of the country had in the past led to differences of interpretation and administration in executive council areas. They thought it wise to ask for a central committee which would be the official arbiter.

Group Practice

On the question of group practice, this time last year they knew that there was £100,000 to be annually set aside from the Pool for the encouragement of such practice. The committee came to the conclusion that the best way to use the money was in the form of interest-free loans. Terms had been arranged by which such loans could be made and the money returned eventually to the Pool. They had set up two central committees, one for England and the other for Scotland, to administer the loans. The Scottish Com-

mittee had already met. The English Committee will be meeting very soon. These looked like being busy committees; their members might well have to visit the practices for which loans were asked, and it was believed that these members should be remunerated.

The report of the subcommittee on Medical Service Committee regulations, of which Dr. Dain had been chairman, was approved by the Conference last year. A number of amendments were suggested by that Conference. The Ministry had accepted the majority of these, and it was possible to make some modifications in the proposals. It was not possible to submit the amended regulations to the present Conference, because the Ministry felt that the Executive Councils Association should be given an opportunity to comment.

Another subcommittee, also headed by Dr. Dain, was that dealing with exchange of practices. They did not pretend to have brought forward any epoch-making change, but they did feel that if their suggestions were carried out by executive councils it would materially ease the situation for a small number of practitioners.

The committee had had the opportunity of pressing for the implementation of their policy in their written and oral evidence to the Cohen Committee. Through the Council of the Association evidence had also been presented to the Guillebaud Committee which would be followed by oral evidence in a few weeks' time.

Another report which was received with great satisfaction was the one drawn up by the Maternity Services Subcommittee, with Dr. Harrower in the chair.

During the year there had been useful liaison with other committees of the Association—the Central Consultants and Specialists Committee and the Public Health Committee. They had also set up a special committee with Dr. H. D. Chalke in the chair to look into the whole question of the care of the elderly. It was believed that the time had come to review the whole situation.

Dr. Talbot Rogers went on to describe the action taken on the Television Bill now before Parliament. Agreement had been secured whereby representatives of the Association would sit on the committee concerned with the watching of advertisement matter on commercial television. He also commented on the Amending Acts Committee, which was given the task of trying to find the best possible scheme for the return of the right to buy and sell goodwill. Members of the G.M.S. Committee had been co-opted on to the Amending Acts Committee for this purpose. The G.M.S.

Committee felt that a good attempt had been made at producing a practical scheme, but it did not feel that in the light of economic circumstances and other practical difficulties it would be possible to carry out this or any other scheme for the restoration of goodwill. His committee did not see in this scheme anything to justify them in asking the Conference to recede from the position that they took up a year ago, but they did appreciate the work put into the scheme and the opportunity given them to co-operate with the Amending Acts Committee.

With regard to the Ministry of Health, they had found during the year an increasing willingness on the part of the Ministry to hear the practitioners' point of view. There had not been the amount of direction which might have been feared when their practices became predominantly State practices. If they could establish that the Ministry could come to the committee with its problems and that the committee itself would take practical action which produced satisfactory results, he felt that they could go on as they were for many more years without feeling any tightening of the rein.

Prescribing of Expensive Drugs

On the question of prescribing of drugs, in the recent debate in the House of Commons the Minister said definitely that he proposed to ask doctors not to prescribe certain drugs. Immediately after the debate Dr. Stevenson and he sought an interview with the Ministry to see whether this meant any change in policy. It had been their policy that the general practitioner should be the sole arbiter as to what drugs he prescribed for his patients, and that was a position which would be maintained. But as responsible citizens and taxpayers and as doctors who wanted to give the best service to their patients, they should not look lightly at the idea of money being spent wastefully in any part of the Service when this would be at the cost of another part. The Ministry gave them an assurance that they did not mean any change of policy. General practitioners would still be free to prescribe whatever drugs they thought proper, though a practitioner would still be required to justify persistent over-prescribing.

Dr. Talbot Rogers concluded by saying that during the coming year there would be discussions with the Financial Secretary of the Ministry about the whole make-up of the Pool. They were not satisfied that the expense ratio as worked out for the previous year should stand. Another matter which they were taking up with the Ministry was as to the right and proper amount of money to be agreed as the earnings from private practice when calculating the Pool. That would be a matter of report to the Conference next year.

REMUNERATION

Back Debits and Back Credits

Dr. R. A. PAUL (Middlesex) moved that the Conference should recommend the abolition of back debits and back credits.

Dr. J. T. BALDWIN (G.M.S. Committee) said that at a meeting in Scotland this question had been discussed and the Department of Health would be quite happy to accept the suggestion for the abolition of back debits and back credits if there was a feeling in England and Wales to that effect.

Dr. TALBOT ROGERS said that if they wanted to abolish back debits and back credits entirely it would mean that they could not apply for back credits for Service men later. The Middlesex motion was lost by a large majority.

The Danckwerts Award and the Small-list Practitioner

Dr. G. N. GROSE (Middlesex) moved as an amendment to the report of the Working Party that those members eligible for supplementary payment as defined in paragraph 5 (ii) (a) of the Second Report of the Working Party should include doctors who would have been eligible to be in receipt of a fixed annual payment at March 31, 1953, if

they had applied. He said that a number of practitioners in Middlesex had refused to apply for fixed annual payments, which they felt was a form of charity and at the expense of their fellow-practitioners. It seemed unjust that this group should now be precluded from the supplementary payment.

Dr. A. B. DAVIES (G.M.S. Committee) said that judging from this and other amendments which were coming forward there was an idea that the Working Party could produce golden eggs on demand for anyone. Hard cases made bad law. There might be a few practitioners who felt that they were not benefiting as well as they should from this scheme, but if the door were opened to this and all the other claims he did not know from what source the money was to come. There was no pool for extra bonuses for anybody and everybody.

Dr. B. CARDEW (G.M.S. Committee) thought the Working Party scheme a generous one. The amendment would open the door too widely to all sorts of categories which were never intended to come under benefit. But there were borderline cases which should be sympathetically considered by the central committee. That committee should have the right to exercise some degree of latitude within well-specified limits. He thought an assurance should be obtained from the Ministry on this point.

Dr. TALBOT ROGERS, in reply to Dr. R. LAWRENCE (Assistants and Young Practitioners Subcommittee), said that when the estimate of 1,200 small-list single-handed practitioners was made it was not supposed that it covered the exact number suffering hardship. By and large, however, they had here a scheme which did cover the difficulty and had been accepted by the Government. It was possible they had tied it up too tightly, and that latitude should be exercised. He agreed with Dr. Cardew that the regulations should not be too rigid, and thought that the central committee when it began its work would produce a kind of case law for itself and find a way of helping really deserving cases.

The Middlesex amendment was withdrawn on the understanding that the matter would be looked into.

Dr. MADDOCK-JONES (Caernarvonshire) asked that a similar amendment in his name should be referred to the committee.

Dr. TALBOT ROGERS said that his committee would accept the reference, but he could not accept an implication in the Caernarvonshire amendment that rural practitioners had been ignored in this arrangement.

Dr. T. K. COOKE (North Riding) moved:

That it is unjust that the additional payment which is to be made to the single-handed small-list doctor should not also apply to the small-list doctors in partnership.

He said that these doctors were slightly worse off last year than in the final year before the scheme.

Dr. TALBOT ROGERS hoped that the Conference would not pass this amendment. They had had enough difficulty already in getting agreement about the small-list, single-handed practitioner.

The amendment was lost.

Dr. COOKE proceeded further to move:

That in all cases regard should be taken of the total professional income.

Surely it was axiomatic that payments should be for a full day's work. Were practitioners with 300 on their N.H.S. list doing a full day's work? Such practitioners would probably see only four or five patients a day. Doctors who had small N.H.S. lists had probably a large number of private patients. If they restricted their lists why should they be given £350 fixed annual payment? In his view it was ridiculous. Many of them also held public health appointments.

Dr. TALBOT ROGERS said that the proposal would involve a means test, which would not be liked. He thought it would be a retrograde step to pass this amendment in order to pick out one or two people to whom they had been over-generous.

This amendment also was lost.

Dr. J. E. DARLOW (Holland, Lincs) moved:

That this Conference congratulates the Working Party on their report, but regrets that no provision has been made for elderly practitioners with lists under 300, who have been in receipt of a fixed annual allowance, and recommends that provision should be made to help this gradually diminishing number of practitioners, subject to the approval of the local medical committee.

He said that the Working Party had done a good job of work but rather at the expense of one type of practitioner—namely, the elderly—who now would lose everything except his capitation fee.

Dr. TALBOT ROGERS said that this was an agreed scheme. The Ministry was looking upon this as a subsidy to small practices. It had been urged that there should be an age limit (70) for practitioners; this had been resisted, but the Ministry did not feel that they could ask the Treasury to go on subsidizing people who were over an age at which they might retire. They had to agree that such a doctor must be shown to be doing an appreciable amount of work, and that was the reason for laying down the size of list at 300 patients.

The Lincolnshire amendment was lost.

Dr. C. J. GROSCH (London) moved:

That no doctor shall receive both supplementary payments under the scheme for small-list practitioners and an initial practice allowance, but any doctor who is eligible for both shall have the option to choose either.

He said that this was brought forward to clarify the position. They thought in London that doctors should choose which method of payment they would prefer.

It was agreed that this motion be referred to the committee, Dr. Talbot Rogers saying that they did not visualize a doctor receiving both payments.

Monthly Payments to General Practitioners

Dr. N. NELSON (Dundee) moved:

That general practitioners should be paid monthly on first application, to be continued until further notice, and this without any plea of hardship.

He knew of no other people in the National Health Service who were paid quarterly. This concession could be made with very little trouble.

Dr. WATSON said that in Birkenhead any practitioner might receive his payments monthly without any formality whatever.

The motion was carried.

Machinery for Filling Practice Vacancies

Dr. J. C. MCMASTER (Somerset) moved:

That all necessary steps should be taken to reconstitute the Medical Practices Committee as an appellate committee only in respect of appointments to vacancies in general practice by executive councils in consultation with local medical committees.

He said that vacancies in the West Country were rather popular. They had one vacancy recently for which they had 128 applicants. A great deal of time was spent in preparing a short list and asking certain people to be interviewed. When the matter went forward to the Medical Practices Committee, however, the local body received the criticism that they should have interviewed at least 10% of the applicants. They had only to think what that would have meant in time and expense.

Dr. TALBOT ROGERS said that what Somerset proposed was in line with the present policy of the Conference. This was a matter which would come up again in the near future.

The Somerset motion was carried.

Allocation of Patients to General Practitioners

Dr. C. T. MILLS (Worcestershire) moved:

That the Committee be requested to press for the provision of whatever machinery may be necessary so that when a patient is being attended by a registered practitioner other than his or her National Health Service practitioner and without the latter's

consent the National Health Service practitioner should be permitted, if he so desires, to have the patient removed from his list immediately.

He said that in Worcester they had had two cases of serious difficulty arising from the fact that the practitioner had no legal right to withdraw from a case even when it would appear in the best interests of the patient to do so. In one case the N.H.S. doctor referred the patient to a specialist who, after investigation, wished to admit the patient to hospital. This the patient refused and called in another non-N.H.S. doctor, against the wishes of his practitioner, yet at the same time he refused to relieve the N.H.S. practitioner of his responsibility for him.

Dr. J. A. PRIDHAM (G.M.S. Committee) asked them to consider the position of a doctor away from his practice by reason of illness, the practice being run by a deputy, and of a patient who did not want to be treated by the deputy and went to another doctor whom he was willing to pay, but at the same time he wished to remain on the former doctor's list. There were many anomalies of a similar sort, and by such a motion as Worcester proposed they would lay themselves open to legislate for hard cases which would bring in difficulties best avoided.

Dr. TALBOT ROGERS said that there were considerable ethical implications about this motion.

Dr. MILLS said that he still thought that the position was one for which a solution must be found. He was willing, however, to have it referred to the committee.

The motion was referred to the committee.

Reinstatement of Ex-Service Men on Doctors' Lists

Dr. W. G. MURRAY-BROWNE (Gloucestershire) moved:

That, as a National Service man's name is automatically removed from his doctor's medical list when he is called up, it should be automatically returned to the same doctor's medical list when he is discharged from the Forces.

He did not think that the procedure set out in the Annual Report (paras. 103-5) was sufficiently strong.

Dr. A. J. JOHNSON (Norfolk) said that he took a census of 50 or 60 National Service men who handed in their cards in his own practice. Of this number 18 handed in their cards within 6 months, 17 within 6 months to 2 years, and 25 within 2 years to 5 years. In almost all cases they handed their cards in when they wanted some service.

Dr. KENNEDY (Isle of Wight) said that as a National Service man's name was automatically removed from his doctor's medical list when he was called up it should be automatically returned to the same doctor's list when he was discharged from the Forces, if he returned to live in the same area.

Dr. TALBOT ROGERS said that he wanted to sound a note of caution. He believed that there was an appreciable and growing danger of inflation of lists, and therefore he asked them to look carefully at anything which might suggest an automatic return of names to the list.

Dr. F. E. GOULD (Birmingham) said that there was a possibility here that they might be endangering private practice. There was nothing to suggest that these men who had been in National Service would wish to go back under the National Health Service. There was nothing in the resolution to tell them on whose list a man was to be put if his doctor was dead when he came out of the Service. Was he to go on to the list of his successor?

The Gloucestershire motion was carried.

Dr. J. C. ARTHUR (Gateshead) moved:

That the Service Departments should notify the central registry office of the names and intended domiciles of Service men and women who are leaving the Forces and that the office should thereupon transmit this information to the appropriate executive council.

He thought that if this was adopted they would avoid inflation and give them all they wanted in the way of getting the man back on the list.

Dr. TALBOT ROGERS pointed out that the Gateshead motion only made sense if a motion on the lines of the remarks of the Isle of Wight representative were adopted.

amended so that the fee paid was related to the work done—for example:

Antenatal examinations.—Half a guinea each up to maximum of four guineas.

Attendance at confinement.—Two guineas.

Medical care of mother and child for 14 days after the confinement.—Half a guinea per attendance, up to maximum of three guineas.

Medical and pelvic examination of the mother between six and twelve weeks after confinement.—One guinea.

What Middlesex proposed was that there should be a fee for each item of service. This was according to the best traditions of the medical profession.

Dr. CATHERINE HARROWER (G.M.S. Committee) said that it would be a very bad thing to have a maximum laid down and for doctors to be allowed to do less work; she thought it better to have a minimum laid down and doctors to be able to do more work than was specified in the minimum. If a doctor had to go to the actual confinement, well, he had to go, and there was no point in bribing him to go.

Dr. RIDGE pointed out that the fees set out in his motion were only examples. This was a genuine attempt to secure improvement in the overall standard of the maternity services.

The Middlesex amendment was lost.

Dr. K. S. MAURICE-SMITH (Isle of Ely) moved that the procedure in operation in England and Wales with regard to obstetric lists be abolished and that the procedure at present followed in Scotland and Northern Ireland be adopted in its place. He said that if the present basic training in midwifery was such that when they encountered any complications they were not found fit to practise midwifery it was quite time that something should be done about it. He added that there was only one place in which to learn domiciliary midwifery, and that was in the home.

Dr. HARROWER said that what was set out in the motion was the present policy of the Committee.

The motion was agreed to.

Dr. H. O. CHISHOLM (York) moved:

That for cases confined in a private nursing-home it should be within the power of the general practitioner in charge of the case to call upon the services of a specialist anaesthetist under the domiciliary arrangements of the National Health Service.

This was referred to the G.M.S. Committee.

Dr. D. VINCENT SUMMERS (Northamptonshire) moved:

That antenatal examinations for patients booked for hospital may be undertaken jointly by the hospital services and the general practitioner concerned and that the general practitioner be appropriately remunerated.

He said that his Committee felt that the choice as to where and by whom the antenatal examination should be undertaken should finally rest with the expectant mother. The hospital was responsible for the care and health of booked cases and it was essential that it should be kept accurately informed as to antenatal examinations. In many hospitals, again, there were training centres for midwives, and some material must be provided for them. But if the patient were given the choice as to where she should have her antenatal examinations and she chose her general practitioner, it should be explained to her that it would be an advantage to her and to the hospital to have the examination at the hospital. The hospital could be joined with the general practitioner to their mutual benefit.

Dr. HARROWER thought that this could be left to the G.M.S. Committee, who were very much alive to the problem.

The motion was referred to the Committee.

On a Derbyshire motion, calling for the abolition of the requirement for doctors' certificates for surgical corsets, Dr. TALBOT ROGERS said that he hoped the Conference would leave matters as they stood, as the number of certificates issued by doctors for surgical corsets was slowly declining.

The Derbyshire motion was carried, but a further motion by Gateshead that every effort be made to secure the abolition of purchase tax on corsets was lost.

Prescribing and Dispensing

Dr. NOY SCOTT (Devon and Exeter) moved:

That this Conference feels that it is time that a settlement was arranged in the matter of discount on drugs to dispensing doctors, as they continue to suffer a loss when supplying proprietary preparations.

He said that this was a hardy annual, but a lot of practitioners still did not realize how much their colleagues in rural areas suffered in this respect. Drugs like chloro-thyretin were sold to the dispensing doctor at the retail price, less 10%, but they were sold to the chemist at the wholesale price.

Dr. S. F. FOURACRE (East Riding) supported the motion.

Dr. J. O. McDONAGH (Perth) pointed out that the amount of drugs which doctors dispensed was really only a drop in the ocean from the manufacturers' point of view. Doctors could not get in touch with the wholesalers on this point, but they could bring it home to travellers who visited them on behalf of drug manufacturers.

Dr. C. F. R. KILLICK (Chairman of the Rural Practices Subcommittee) said that he would not like the Conference to think that the Committee had been doing nothing. They had met the manufacturing chemists and the pharmacists. So far as the former were concerned they had their full support, but the pharmacists were people who made their living by what they sold, and if doctors got the same rate of discount as they did they would be inclined to buy from the wholesalers instead of from the pharmacists, who would lose their trade.

The motion was referred to the Committee.

A motion by Derbyshire that the Ministry be approached with a view to simplifying the prescriptions for trusses and elastic hosiery so as to leave reasonable latitude to the fitter was lost.

Dr. J. E. ELLIOTT (Buckinghamshire) moved that high protein substances such as "casilan" and similar preparations be regarded as food in all cases.

Dr. FRANK GRAY (London) said that what Buckinghamshire was proposing was to give away their freedom in respect of prescribing. True, it related to only one substance—one to begin with—which they might not prescribe, and with regard to which, whatever they felt about it in a particular case, they had no discretion whatever. This motion was asking the Ministry to draw up lists of prohibited substances.

Dr. HOWIE WOOD (G.M.S. Committee) asked that the motion be turned down and that the question be referred to a scientific body.

The Buckinghamshire amendment, however, was carried.

A motion by Dr. H. W. DONOVAN (Birmingham) instructing the Committee to re-examine the problem of the use of E.C. 10A in an effort to find a method whereby the pharmacist would not lose financially by the institution of this type of prescription was agreed to.

Dr. D. SAKLATVALA (West Bromwich) asked that where local health authorities adopted schemes for immunization of children against diphtheria and whooping-cough the Ministry should supply the authorities with the antigen on the same terms as it supplied antigen for schemes of diphtheria immunization. It appeared that there was some difference in the way the antigen had been supplied in these cases.

The suggestion was accepted as a reference to the Committee.

Trainee General Practitioner Scheme

Dr. A. V. RUSSELL (Wolverhampton) moved that the present trainee assistant scheme should be discontinued because it offered no advantages over the training given to ordinary assistants by their principals. He said that assistants employed in the ordinary way by conscientious doctors received as good if not better training.

Dr. R. W. McCONNEL (G.M.S. Committee) opposed the motion. If the scheme was abused the remedy lay in their own hands. The local medical committee must see that a suitable individual was chosen as trainer.

After some discussion Dr. Russell withdrew his amendment and supported one which was in the name of Coventry and other committees:

That in view of the fact that the trainee general practitioner scheme appears to be working with diverse success in different areas of the country, the General Medical Services Committee be instructed to re-examine the scheme in order to

(a) establish some uniformity in the suitability and commitments of the trainer practitioners, and

(b) eliminate abuses.

Dr. TALBOT ROGERS accepted the reference to the Committee but suggested that local medical committees at an early meeting should consider the scheme and transmit any points on which they thought there might be improvement.

Dr. J. H. PORTER (London) said that the general public was inclined to think that the trainee assistant scheme was a very good one and that it was nice for the medical novice to be associated with an experienced general practitioner. They forgot that the novice had always had this training in the past.

Dr. HOWIE WOOD hoped that this amendment would be passed. He suggested that if any areas were dissatisfied with the working of the scheme it was because there was something at fault with their selection of trainers in the first place or, alternatively, in their scrutiny of the methods adopted by the trainer. From the point of view of the trainee it could be a most instructive and enjoyable year, and he could obtain an introduction to general practice under almost ideal conditions.

The Coventry amendment was carried.

This concluded the matters which arose under the Annual Report of the Committee, and the Report, as amended, was then approved.

MISCELLANEOUS MATTERS

Classification of Areas

The Conference then turned to various matters not referred to in the Annual Report. Dr. J. R. ROWELL (Middlesbrough) moved a resolution expressing dissatisfaction with the attitude of the Medical Practices Committee in regard to the method of reclassifying areas and asking that in future such reclassification should be decided on numbers only with no reference to outside commitments. The motion was supported by Dr. A. SHERLOCK (East Suffolk), who spoke of "fantastic" classifications. Dr. F. GRAY (London) said that they wanted the Medical Practices Committee to do their job properly, and they could not do it properly unless they knew something of the commitments of the doctors. He thought it was known that if in any area the Medical Practices Committee had not been correct in its dispositions it was always prepared on a detailed statement to look again at the facts of the case. The Middlesbrough motion was lost.

Dr. J. V. COPE (Surrey) moved to urge the Medical Practices Committee to have more regard to recommendations which concerned themselves with certain areas of practice, which concerned themselves with their local geography, and that the type of practice, and their local geography, and that the minimum figure should be higher than 1,500. Dr. J. A. PRIDHAM (G.M.S. Committee) pointed out that the Medical Practices Committee was not concerned with the question of whether or not a doctor could earn a proper income or a restricted income. Questions of that type must be argued between the G.M.S. and the Ministry. The Medical Practices Committee was being urged to do something which it ought not to do. Dr. H. C. BROWN (Northumberland) urged that any area (not being a rural area) where the average list did not exceed 1,800 should be classified by the Medical Practices Committee as a "restricted area." Dr. TALBOT ROGERS said that his Committee had had frequent meetings with the Medical Practices Committee, and if it was the wish of the Conference they would have another meeting on this subject.

The matter was referred to the Committee. A motion by Dorset, "That the rate of interest on compensation moneys be raised to 5%," was met by cries of

"Agreed," but Dr. A. N. MATHIAS (Compensation and Superannuation Committee) pointed out that this was completely unrealistic. The rate of interest on compensation moneys was fixed by Act of Parliament, and only by an Act of Parliament could it be changed. The motion was lost.

Temporary Residents

A motion that the special temporary resident fee of 5s. for inmates of convalescent homes and similar places should be increased was referred to the Committee. Another motion referred to the Committee was from Lincolnshire (Lindsey) calling for detailed consideration of the method of payment for temporary residents in holiday camps. The mover mentioned a holiday camp near Skegness which for two weeks in the year had a population of 7,200. Over 1,000 were seen by the doctor last year. The motion was supported by Denbigh and Flint.

Dr. S. E. FOURACRE (East Riding) asked for an assurance that the large numbers of dependants of American servicemen resident in this country for periods exceeding three months were taken into account when determining the size of the Central Pool. Dr. TALBOT ROGERS pointed out that the pool was not nowadays calculated on the number of people at risk. He thought it would be unwise to press for an alteration which would involve calculation of the numbers on lists. The motion was withdrawn.

The Charge for Prescriptions

Derbyshire requested the Committee to urge the alteration of the regulations relating to the monthly rendering of shillings by dispensing doctors paid on the drug tariff so as to align them with the regulations applied to dispensing chemists. Dr. KILLICK pointed out some disadvantages which might attend an alteration of the procedure, but the Conference indicated its assent to what Derbyshire had suggested.

A motion by Norfolk calling for the abolition of the collection of shilling charges by dispensing doctors on the ground that it was not only time-consuming but distasteful and undignified to professional men was lost.

Another Norfolk motion which was lost was that in cases where it was apparent from the outset that the patient would be unfit for work for a considerable time, doctors should be able to give certificates of incapacity for longer than a week from the beginning. Dr. TALBOT ROGERS said that this had been taken up before the Ministry of National Insurance, who thought it undesirable and might lead to lax certification.

It was agreed to take up with the Ministry the question of redrafting the hospital in-patient certificate form on dis-charge to state the fitness or unfitness for work of the patient.

A motion by Cumberland to instruct the Committee to investigate some method whereby a baby was registered with a doctor within four weeks of birth was lost. Dr. F. E. GOULD bade the Conference remember that the baby was a possible private patient. Dr. TALBOT ROGERS thought the matter should be left to the parents.

On a motion from West Bromwich it was agreed that the Committee should consider opening negotiations with a view to persuading local authorities to co-opt general-practitioner representation to their children's committees and to arrange for the attendance of one of the authority's medical officers at all meetings of the children's committee.

Dr. A. MADDOCK-JONES (Caernarvonshire) moved to make executive councils responsible for the administrative work involved in the recovery of fees for attendance in road accidents and their payment to the doctor. Dr. F. E. GOULD said that there was no reason why the doctor should not be paid by the insurance companies for his services under the Road Traffic Act. He had never failed to obtain the money from the insurance company for attendance at any accident. The Caernarvonshire motion was lost.

A final motion by Birkenhead called for the discontinuance of the use of National Health Service numbers on Form E.C. 1 and other documents. This was withdrawn.

Dr. Ross, who was represented by Mr. C. Leigh Taylor, of Messrs. Hempsons, said that he had a nervous breakdown while he was a student at Edinburgh University, but was able to pass his examinations and qualified in 1943. In his first appointment he held two posts concurrently at hospitals about 15 miles apart; in one of them he was in sole charge of the maternity department. After about six months he felt the strain of double work. Heroin was in daily use at both hospitals and some research was being done on it. The drug was constantly at hand, and about the end of 1943 he started to take it to relieve the strain. He subsequently put himself under medical treatment. He was rejected on medical grounds for the R.A.M.C. and held two posts in general practice. It was difficult at that time to get employment because of the men returning from the Forces. Ultimately he went as a registrar in psychiatry to a mental hospital in Carlisle, and, working in the depressing atmosphere of such an institution, he himself became depressed. He had access to the dispensary and presently became seriously addicted to heroin. He again underwent withdrawal of the drug. Afterwards he went as casualty officer to a general hospital. It became clear to him that the craving was very apt to recur in conditions of stress, or for no reason at all. He then determined to take up a form of medical work in which he would have no contact with drugs. He took a public health post. He found it necessary to take a part-time course for the D.P.H., and to obtain money

for this he took a locumtenent job in general practice at Southend. This brought on another period of pressure, and "with the stuff at hand" he relapsed. The relapse, however, was not severe, and he returned to his public health post and had not taken drugs since. He added that he had now been successful in Part I of the D.P.H. examination, and he felt confident that if he remained in public health work without drugs at hand he could remain free from addiction. The drugs mentioned in the charge, with the exception of 100 tablets of amidone hydrochloride, were consumed during his work as locumtenent in a busy general practice last summer. The amidone he had used a week or two after he left that job, in order to recover normality.

Mr. Taylor read testimonials, including one from a medical officer of health, and the Committee, in order to assist Dr. Ross to overcome his tendency to drugs, postponed judgment for one year.

Erasures

William Arthur Chanmugan Nason, registered as of Hornsey, F.R.C.S. Edin. 1925, L.M.S. Ceylon M. Coll., 1918, appeared on the charge of having been convicted at the Central Criminal Court in November, 1953, upon indictment that on four occasions during that year he had unlawfully used an instrument on four women with intent to procure miscarriage. He had been ordered to be imprisoned for three years.

Dr. Nason said that the cases were of inevitable abortion. He had had no money to appeal.

The Registrar was directed to erase his name from the Register.

Hugh Ley Puxon Peregrine, registered as of Twyford, Winchester, M.R.C.S. Eng., L.R.C.P. Lond., 1915, appeared on the charge that he had been convicted (after pleading guilty) at Winchester on July 21, 1953, of sending an indecent written communication through the post and had been fined £10. The Council's solicitors said that Dr. Peregrine had written seven letters, but proceedings had been taken in respect of only one, as there was a limit of six months in these cases when they were dealt with summarily.

Mr. Leigh Taylor, solicitor, asked for Dr. Peregrine's evidence to be taken *in camera*. He wished to call a doctor and to read the report of another psychiatrist, and both had said that part of the information on which their evidence was based was obtained from persons other than Dr. Peregrine under seal of professional confidence.

The public were excluded during the evidence, but were readmitted when Mr. Taylor addressed the Committee. He said that there was no connexion between the offence to which Dr. Peregrine had pleaded guilty and any of his had been seen by him professionally.

The Committee directed the Registrar to erase from the Medical Register the name of Hugh Ley Puxon Peregrine.

In both the above cases in which there were erasures the respondents have 28 days in which to lodge an appeal against the Committee's decision.

Other Convictions

The case of Archibald Luke Basham, registered as of Rayleigh, Essex, was mentioned. It was alleged that he had been convicted at Chelmsford Assizes in February, 1954, of conspiring to defraud the Essex Executive Council by falsely pretending that he had prescribed certain medical requisites for the use of his patients, and had been ordered to be imprisoned for twelve months. Dr. Basham, who was now serving his sentence, wrote that he did not know that he would have to ask the Prison Commissioners for permission to attend the hearing before the Committee. The Committee decided to postpone the case.

Graham George Robertson, registered as of Bedlington, Northumberland, appeared following a conviction in 1948

of driving a motor vehicle when under the influence of drink, and another in 1953 of being in charge of a motor-car when in a similar condition. The Council's solicitor said that Dr. Robertson had been before the Council in 1944 on similar charges, and after judgment had been twice postponed his name was erased from the Register in 1946 and restored in 1948.

Mr. E. B. McLellan, on behalf of the Medical Protection Society, addressed the Committee and read a number of testimonials from medical colleagues on Dr. Robertson's behalf. The Committee postponed judgment for one year.

The case was considered of Herbert Trevor Duke, registered as of Manchester Street, London, W., against whom it was stated that at the Central Criminal Court in March, 1954, he had been convicted on indictment that he had committed an act of gross indecency with another male person and had been ordered to be imprisoned for six months. Evidence was given on his behalf by a probation officer, who stated that Dr. Duke had done exceptionally well on probation. The Chairman said that the conviction was discreditable to a medical man, but after careful consideration the Committee had decided to postpone judgment for one year.

Patrick Stephen Gerrard Cameron, registered as of North Shields, appeared in respect of five convictions since 1929, three for driving a motor-car whilst under the influence of drink and two for dangerous or reckless driving. On the last conviction, at Newcastle, in November, 1953, he was ordered to be imprisoned for six months on each of two counts, the sentences to run concurrently, and was disqualified for holding a driving licence for ten years. A report by the Chief Constable of Tynemouth stated that from January, 1948, the date of his penultimate conviction, until November, 1953, he had conducted himself in an exemplary manner, with real sobriety. Testimonials were read by Mr. E. B. McLellan, instructed by the Medical Protection Society. The Committee postponed judgment for one year.

Cases Previously Heard

In the case of Patrick Aloysius Gallen, registered as of Garscube Road, Glasgow, in which judgment had been postponed for one year until the present session, following convictions of being in charge of a motor vehicle when under the influence of drink, Dr. Gallen appeared, and his solicitor, Mr. E. Gardiner, read certain testimonials which had been sent in in his favour. The Legal Assessor said that one or more of the persons whose names had been furnished by Dr. Gallen had sent letters to the Registrar, but had asked that their letters be confidential. He asked whether Dr. Gallen was willing for these letters to be read to the Committee *in camera*. Dr. Gallen acceded to the suggestion that the letters be read. The Committee decided to postpone judgment for a further period of one year.

Joseph Henry Bentley, registered as of Limpsfield, Surrey, in whose case judgment had been postponed following convictions in 1952 under the Dangerous Drugs Regulations, 1937, and the Dangerous Drugs Act, 1951, appeared and presented testimonials. The Committee did not see fit to direct the Registrar to erase Dr. Bentley's name, and this closed the case.

In the case of Patrick Kennedy, registered as of Gillingham, Kent, in which judgment had been more than once postponed following convictions in 1949 and 1951 of being drunk, the Committee postponed the case for a further six months to enable Dr. Kennedy to produce further names of medical practitioners or others who would be willing to testify in his favour.

Judgment was again postponed to a future session in the case of Jonathan Shutt, registered as of Lower Deptford, who had been found to have been convicted in 1951 of unlawfully driving away a motor-car. The practitioner was not present, and the Council's solicitor said that they had been unable to serve him with a notice of the hearing.

In the case of Patrick Laurence Lyons, registered as of Kilkelly, Co. Mayo, in which judgment had been postponed following three convictions in 1951 and 1952 involving drunkenness, the practitioner appeared and presented what were described by his counsel as excellent testimonials, and in the view of this testimony to his conduct the Committee resolved not to direct the Registrar to erase his name. This closed the case.

The same course was taken with Florence Joseph O'Driscoll, registered as of Orrell Park, Liverpool, against whom convictions for drunkenness in 1949 and 1953 had been found proved. Testimonials were read, and the Registrar was directed not to erase his name.

In two other cases arising out of convictions the practitioners concerned were unable to be present, and the Committee adjourned the hearing to a special session which, it is understood, is to be held in July.

MEDICAL ADMINISTRATION

PRESIDENTIAL ADDRESS TO METROPOLITAN COUNTIES BRANCH

At the 96th annual general meeting of the Metropolitan Counties Branch on June 2 Dr. D. F. HUTCHINSON was installed as the new President and delivered from the chair a short address on medical administration.

Certain administrative jobs, he said, necessitated a medical background. He had made some research into the history of medical administration but had found its origins vague. Probably it started in some progressive towns by the appointment of somebody to look after the health of the community rather than the health of the individual. These early that Liverpool led the way in this matter. These early administrators were the pioneers of the public health service. In Scotland 100 or more years ago a number of voluntary hospitals were brought into being and these had at their head a medical superintendent—a very familiar figure in Scottish hospitals.

When the National Health Insurance scheme came in in Great Britain the general medical services became for the first time subject to a certain amount of Government control, and bodies were formed—local medical and panel committees—to look after the interests of the medical profession in this new situation. Yet in the whole course of fession in this new situation. Yet in the whole course of National Health Insurance only one such committee—London—found it necessary to appoint a whole-time secretary. As the Welfare State grew, however, there was more and more scope for the medical administrator.

According to a recent survey, there were 690 doctors in this country who were in the Government service; a certain number of these were doing clinical work, but the majority were administrators. Looking at other categories, he was surprised to find that 144 doctors were doing administrative work in medical organizations (11 in the B.M.A. secretariat). In the hospital field there was a considerable difference between the clinical and the administrative outlook. In Scotland there was a general belief, which he shared, that a hospital should be administered by a doctor. He was sure there was a place for the medical administrator in the hospital field.

The Medical Administrator in the Services

Dr. Hutchinson went on to speak, from his experience of the Army during the war, of medical administration in the Services. There had been a good deal of talk of waste of medical manpower in the Services, particularly in the Army, which made far more use of doctors in an administrative capacity than did the Navy or the Air Force. There was a great deal to be said for the medical administrator in the Army. The medical officer of long service in the Army was an amazingly good administrator—so good in fact that

to counterbalance it his clinical knowledge was sometimes rather inadequate. The medical staff officer was an adviser, and if he knew his job the senior fighting officers did rely very largely on what their A.D.M.S. or D.D.M.S. advised them. But the Army doctor should not lose his clinical touch. One of Dr. Hutchinson's several Army stories was of being asked to see a general whom he found at the point of developing pneumonia. This was during the war and he had not used his stethoscope for months. It was a great refreshment to use it again and to carry out treatment. On the evening of that day he called a second time on the general to see how he was faring and to endeavour to make him comfortable for the night. Afterwards the general told him that he was the only Army doctor who had ever been to see him twice in one day, and he persisted ever afterwards, to Dr. Hutchinson's embarrassment, in calling him his "beloved physician."

In the general medical services of the country there was undoubtedly now much greater need for the medical administrator than in the past. The majority of the 20,000 doctors or so running the general medical services had neither the time nor the inclination to look after all the "paper work" or to learn the answers to all the curious questions that were raised. It had been found necessary in London and Middlesex to appoint whole-time secretaries to the local medical committees, Dr. Frank Gray and himself, whose primary job was to advise their colleagues, many of whom were most excellent physicians and yet showed sometimes astonishing ignorance of the regulations. Another important part of their work was to maintain liaison with local health authority and hospital services. In other fields, as apart from the clinical work of the doctor, were such officials as the secretaries of medical defence societies and members of the editorial staff of medical journals.

Words of Advice

In conclusion, Dr. Hutchinson gave some advice to those who contemplated entering the field of medical administration. It was absolutely essential that they should have a sound clinical background. Again, they must always be prepared with an answer to any question, even if it was only to refer the inquirer to some other source of information. Medical administrators must be careful to avoid any accent of superiority. And they must have absolutely first-class lay assistants. If a medical administrator tried to do all the donkey work himself he would be bogged down by detail.

Finally, there were many jobs that a medical administrator could do which could not be done by the most brilliant lay administrator. That, indeed, was the burden of his argument. Medical administrators might be a small class, but he hoped and believed that there was a niche for them and that they were doing useful work.

A hearty vote of thanks was accorded to Dr. Hutchinson on the motion of Dr. J. W. McCarthy, and another vote of thanks to Dr. J. A. Moody, the retiring Branch President. Dr. R. Hale-White was unanimously elected President for 1955-6.

A GALLANT WOMAN DOCTOR

During a short visit to this country, Captain (Dr.) Valérie André, of the French Air Force, attended a small luncheon party given by the Medical Women's Federation at B.M.A. House on June 2 to enable her to meet executive officers of the Federation. Dr. Macrae, Secretary of the B.M.A., and Dr. Grey-Turner were among those present.

Captain André served four years in Indo-China. Although primarily a doctor, she volunteered to learn to pilot a helicopter, and so became the only person, man or woman, to combine medical duties with those of a pilot. She flew her helicopter to rescue wounded from the battlefield, and made 120 flights on this mission.

Among other decorations Captain André has gained the Legion of Honour, the Croix de Guerre with Palms, the Order of Vietnam, and the American Legion of Merit.

THE EXHIBITION OF PHARMACEUTICAL PRODUCTS, INSTRUMENTS, APPLIANCES, AND MEDICAL PUBLICATIONS AT GLASGOW

AN ANTICIPATORY GLANCE

The famous Kelvin Hall at Glasgow will be a busy and attractive place during the week of the Annual Meeting, from Monday, July 5, when this Exhibition is opened by the President, until the following Friday. The Exhibition, which has been a feature of Annual Meetings without number, suffers from only one defect, that no short descriptive title can be given it. It ranges over pharmaceutical products, instruments, appliances, and medical publications, but, even when all that has been said, its miscellany has not been covered. There are also foods and drinks (for display and sometimes for "sampling") as well as domestic gadgets and surgery equipment, not to speak of intangibles like medical insurance and various advisory services.

A preliminary notice cannot possibly cover some 70 separate displays, nor even mention all the new introductions. Those who "do" the Exhibition, as every medical visitor to Glasgow should, will find the catalogue a complete though pedestrian guide. Here we can touch on only a few of the things to look for, and for reasons of space and to prevent this in turn becoming a dry catalogue we must not even pay pedantic respect to all the full official titles of the exhibiting firms.

Pharmaceutical Products

More than half the stands are devoted to pharmaceutical products, and as usual one is left admiring the artistry of presentation and packaging and the fertility with which new names are invented for slightly differentiated preparations. Penicillin and other antibiotics in various forms figure prominently at many of the stands. The pride of place at the Glaxo stand is taken by "crystapen"—pure crystalline sodium penicillin G—and here also is the penicillin ester, "estopen," and, a relatively newcomer to the Glaxo range, "benapen," mentioned as the only new derivative of penicillin to be evolved in this country. Imperial Chemical (Pharmaceuticals) Limited present tablets and oral suspensions combining in one convenient dosage form one of the sulphonamides—"sulphamezathine"—and a salt of penicillin. The tablets and suspensions are no more expensive than corresponding preparations of their individual constituents.

John Wyeth and Brother Limited are showing the new penicillin salt, benzathine penicillin, under the name of "penidural," in three different forms for administration. One of these is an "all purpose" penicillin salt compound in aqueous suspension containing potassium crystalline penicillin G, procaine penicillin, and benzathine penicillin.

One feature at the stand of Boots Pure Drug Company will be "tabillin" penicillin oral tablets, to be announced to the profession this month. They are said to be the first penicillin oral tablets available, individually sealed, in a foil-pack presentation. Another Boots feature is a laxative—"blandlax"—declared to be free from the disadvantages of liquid paraffin.

"Terramycin" in oral suspension and other forms is a feature at the Pfizer stand. The value of terramycin in tropical medicine, owing to its wide antibacterial range, its versatility, and its ease of administration, is stressed. Several other antibiotics are being shown by this firm, among them "viocin" sulphate, offered for selected cases of tuberculosis. "Ilotylin"—brand erythromycin is the outstanding product shown by Eli Lilly.

A wide range of preparations is to be displayed by May and Baker. One of these is the "largactil" brand chlorpromazine hydrochloride. Another preparation—

"nivembin"—is a simple association of chloroquine and diiodohydroxyquinoline in tablet form.

The stand of Burroughs Wellcome offers a new product with the trade name of "marzine" for the prevention and treatment of travel sickness and nausea and also the vomiting of pregnancy. It has been subjected to extensive clinical trials among airline and seagoing passengers, and among pregnant women, and is said to be noteworthy for its low incidence of side-effects. Several other interesting preparations at this stand invite notice.

British Drug Houses Limited exhibit two of their most recent products—"entacyl" (piperazine adipate) tablets for the treatment of threadworm infections, and "anorvit" tablets containing ferrous sulphate, ascorbic acid, and acetomenaphthone.

Organon Laboratories have the advantage of a factory situated near Glasgow, and, with transport arrangements available, are to invite visitors, instead of concentrating on a skeleton exhibit, to go out and see the factory in action. Sandoz Products are giving prominence to three preparations. "Cafergot" is a combination of ergotamine tartrate and caffeine for the oral treatment of migraine; "ferronicum," a preparation of ferrous gluconate, for the treatment of iron deficiency; and "pursennid," a laxative. A new topical analgesic, "quotane," for relieving the symptoms of itching, burning, and pain associated with lesions of the skin, is the principal exhibit of Menley and James. Duncan, Flockhart have a new surface analgesic, "xyloclase," which also acts on mucous membranes.

Parke, Davis are having their customary display, and are calling special attention to two complementary mercurial diuretics, "mercloran" and "mercordan," the latter for initiating treatment in severe cases of congestive cardiac failure, with a view to maintenance therapy with the former. Mercloran, which is given orally, is said by the makers to produce a response virtually equivalent to that obtained by parenteral therapy, and to eliminate the necessity for injection in many patients.

Special attention is called at the Ciba stand to a new oral antihypertensive named "serpasil." It contains a pure crystalline alkaloid derived from the root of *Rauwolfia serpentina*, a shrub growing in India, Java, and other tropical countries. The Ciba research laboratories, after extensive research, succeeded in isolating the alkaloid named reserpine, which is said to have the sedative action of the whole root.

The Crookes Laboratories are showing two completely new preparations. One of these is named "trillekanin," nitrogen mustard hydrochloride, offered for the treatment of leukaemia and similar conditions. The other is named "seconesin," a relaxant and sedative. Another preparation at this stand is "dermasulf," for the treatment of dermatological conditions in which sulphur is known to be of value.

An entirely new organic iron salt, ferrous succinate, is to be introduced by Calmic, Ltd., under the name of "ferromyn." One tablet three times a day provides 105 mg. of available iron.

A new soda lime, marketed under the name "calona," is shown by the British Oxygen Company for carbon dioxide absorption in closed circuit anaesthesia. It is offered also for other medical uses, in oxygen therapy, basal metabolism estimation, and respirators. It is said to contain a constituent ensuring a longer effective life than ordinary soda lime.

Particulars of a "complete allergy service" are given at the stand of C. L. Bencard Limited. Information is offered on the various aspects of allergy problems, and a comprehensive range of allergenic extracts for skin testing is available. Among the new preparations of Roche Products Limited which are being shown are "asterol," a new fungicidal substance, "marcoumar," an oral anticoagulant, "konakion," synthetic vitamin K₁, and "ronicol," the alcohol corresponding to nicotinic acid, in tablets and ampoules. A new product at the stand of Paines and Byrne is "cobalin" crystalline vitamin B₁₂ (cyanocobalamin B.P.) in a specially

prepared snuff base for administration by nasal insufflation, self-administered. It is stated that upwards of 40 cases of pernicious anaemia have been adequately treated for approximately 12 months by one or two weekly insufflations. The Distillers Company (Biochemicals) concentrated on a new vitamin product, "distivit," an injection of vitamin B₁₂, intended for the treatment of trigeminal neuralgia and allied neurological disorders. G. D. Searle and Company Limited will be showing their new "dramamine" and "probanthine" vials for parenteral administration and a probanthine with phenobarbitone tablet.

The derationing of sugar commodities during the last 12 months has enabled manufacturers of glucose products to "fortify" their confectionery. A. L. Simpkin announce that they have been able to revert to their pre-war standard by incorporating in their products a high percentage of dextrose monohydrate B.P. They are drawing attention to the range of glucose barley sugar varieties they have on display. One glucose barley sugar confection is offered as a vehicle for the administration of vitamin A in small doses. A vehicle for the administration of vitamin A in small doses, a vehicle for the administration of vitamin A in small doses, ensure that a patient on restricted fluid intake cannot drink too much. The usual exhibits associated with their respective names appear at the stands of Energen Foods, Lederle Laboratories Division of Cyanamid Products Limited, and Reckitt and Colman Limited.

Instruments and Apparatus

A new instrument to be shown for the first time at Glasgow is the Cambridge vectorcardiograph. It has been designed by the Cambridge Instrument Company to meet the need of research workers in the cardiographical field and embodies all the requirements of such equipment that have at present been made known. It consists of two 5-in. (12.5-cm.) cathode-ray tubes mounted side by side and a special camera for photographing on bromide paper the loops or records obtained on the cathode-ray-tube screens. It records simultaneously any two vector or scalar electrocardiograms from any combination of 12 electrode placements. The whole outfit is mounted in a console cabinet of convenient size and height. It is believed to be the first industrially made instrument of the kind in Europe.

A new electrocardiograph—"cardiolux"—will be shown by Philips Electrical Limited. The makers claim that it eliminates completely the effect of mains interference, and that even with the mains lead draped round the patient the resultant E.C.G. is entirely free from mains pick-up. The first refrigerated oxygen tents to be designed and manufactured in this country are expected to be exhibited at Glasgow by Oxygenaire. It is claimed for the tents that they mark a considerable advance in the technique of oxygen therapy. They have been undergoing tests for the last 12 months. A new anaesthetic trolley and drawer space by Airmed Limited; it has adequate table and drawer space and is more compact and easily manoeuvred than the conventional types.

The old firm of Edward Taylor is showing a new elastic bandage—"ventilo 6," so named because it has six ventilating grooves, enabling the skin of the part under treatment to "breathe" by the admission of air and by allowing a certain amount of vapour transmission. The London Hospital Ligation Department will be as usual in its place, this time showing by the use of photographs some of the processes which go to make London Hospital catgut a dependable suture.

Ethicon Suture Laboratories are showing a surgical linen thread available on 100-yard reels coloured black and ivory. It is said to be the first linen thread specially produced for surgical purposes gauged to U.S.P. requirements and of high knot tensile strength. Another presentation at this stand is "ethi-pack," pre-cut lengths of linen thread and other materials packed in an envelope ready for sterilization, and intended to save the time that the theatre personnel would normally spend in cutting the materials to the required length.

S. H. Camp and Company are exhibiting a special pelvic traction belt, an adjunct in the treatment of low back injuries; also abdominal supports for use in pneumoperitoneum treatment of pulmonary tuberculosis, and designed to maintain the rise of the diaphragm by the injection of air. Abdominal binders for use in the treatment of emphysema are also shown.

Three inhalers for anaesthesia, all working on the same principle, for ether, trichlorethylene, and chloroform, are on view at the stand of E. Hutchings and Company. The inhaler is entirely new, and its exhibition at Glasgow is its first appearance. The inhaler, the complete equipment of which is contained in two small 9-in. transit cases, appears to be a convenient portable anaesthetic device with a wide range of applications. A safety steam bronchitis kettle is shown at the stand of Charles F. Thackray. It is designed to avoid such accidents as have occurred in hospital when boiling water has been ejected from the spout of the bronchitis kettle. It is hoped also by the time of the Exhibition to have available at the Thackray stand some British-manufactured unbreakable nylon syringes made by the same process as used by the French.

Down Brothers and Mayer and Phelps have their usual good array of instruments. Special devices which will catch the eye include a kymographic tubal insufflation apparatus for the diagnosis and treatment of sterility; toughened stainless steel sutures; drainage appliances for ileostomy and colostomy, with opaque disposable bags, and Guy's model noiseless suction unit, an improved version of the original apparatus in that it is now fitted with a flameproof motor, non-sparking motor control, and mechanical automatic vacuum release, and is completely anti-static. The Scholl Manufacturing Company are again to the fore with their foot appliances, and are also showing a new elastic amputation sock.

Books

The book stands always make pleasant places in the Exhibition. Butterworth's display includes two new major works in three volumes, *Paediatrics for the Practitioner*, under the general editorship of Wilfrid Gaisford and Reginald Lightwood, said to be the first major paediatric textbook written for the general practitioner, and *Industrial Medicine and Hygiene*, edited by E. R. A. Merewether. At the stand of H. K. Lewis one is reminded of the loss which ophthalmology has sustained in the recent death of Eugene Wolff; a new edition (the fourth) of his *Anatomy of the Eye and Orbit* is shown. Here again is another work touching on occupational health, a publication from the Roffey Park Institute, edited by T. M. Ling, and entitled *Mental Health and Human Relations in Industry*. Oxford University Press and E. and S. Livingstone, the Edinburgh publishers, have their usual attractive covers. The National Association for the Prevention of Tuberculosis is also exhibiting some new publications, including *Tuberculosis and Adolescence*, by Bentley, Grzybowski, and Benjamin, together with a handy guide to statutory and voluntary welfare services. The B.M.A. publications also should not be neglected.

A dictation system for use in the operating theatre by which the surgeon can record the details of his findings as the operation is in progress is being exhibited by E.M.I. Sales and Service. Hitherto the noise factor has made such recordings impossible, but this has been overcome by a specially designed microphone, and the Emidicta system, as it is called, makes it possible for the recording of all the details as the surgeon speaks them. Doctors can also dictate reports from the nearest telephone to which the appliance in the typing room at the hospital is linked.

Finally, Rempoy Limited are showing a series of domestic work aids for disabled people and a range of orthopaedic appliances.

Altogether the Exhibition this year seems likely to have more new introductions than in any post-war year; yet it retains its character, it is the old Exhibition, and it can be

said of it as has been said of so many other things, *Plus ça change, plus c'est la même chose*.

(A full list of all exhibitors at this exhibition will be included in the final programme of the Annual Meeting, which will be published in the "Supplement" next week. This programme will refer to all parts of the meeting, including plenary sessions, scientific sessions, and scientific and other exhibitions in addition to the exhibition described here.)

GENERAL PRACTICE AND THE N.H.S. QUALITY AND COST

BY

CYRIL BEARE, M.B., F.R.C.S.

A. C. E. BREACH, M.R.C.S., L.R.C.P.

R. M. COURTNEY, M.A., M.B., Ch.B., D.P.H.

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D. B. HITCHINGS, M.R.C.S., L.R.C.P.

AND

A. V. RUSSELL, M.A., M.B., Ch.B.

The twofold problem of improving the National Health Service and at the same time reducing its cost within the economic capacity of the nation is of transcendent importance, not only to our own profession, but to the whole country. This problem is particularly topical now that the Guillebaud Committee is approaching the end of its important and difficult task.

It has been rightly contended that the best way to improve the quality of the Health Service and at the same time to limit its costs is to redirect the main emphasis away from the hospitals and toward the family doctor. If this contention be accepted, it follows that every effort must be made to maintain a high standard in general practice. The designers of the Health Service seem to have been unduly impressed with the glamour of modern technique as practised in the hospitals and to have paid but little regard to general practice. This is evidenced not only in the construction of the Acts themselves, but in the Government propaganda which preceded and followed the launching of the Service; and for this reason it will be necessary to use publicity methods in order to restore public confidence in the general practitioner and to reverse the new popular tendency to regard the hospital as the right and normal place for treatment. Conversely, if this publicity is to be justified it will be necessary to re-create in the general practitioner a sense of full personal responsibility, pride in his work and in maintaining his knowledge and his equipment at a high standard, and a willingness to reassume his old position as a trusted family friend and counsellor. It must be admitted that, since the introduction of the National Health Service, these qualities have become less common.

Standards of Practice

To restore standards of practice, it is necessary before all else to create such conditions as will attract to general practice men and women of the highest intellectual and ethical quality, and especially those with a sense of vocation. The present system, tending to a non-competitive State monopoly and providing a method of remuneration which takes no account of the quality of work done, fails to provide a stimulus to the highest standards of practice. Now that the Health Service is fully established there seems no valid reason for the deliberate discouragement of private practice outside the Service, and its restoration on a considerable scale would do much to stimulate a high standard of work by providing competition. It is true that the majority of the public have accepted the N.H.S.; but there remains a substantial minority who, if they could afford to do so, would much prefer to obtain their medical attention privately. For most of these the cost is prohibitive in

view of the enormous burden of taxation (necessitated in part by the Health Service itself); but it is not so much the professional fees that compel these patients to remain in the N.H.S. as the cost of modern life-saving drugs and of private rooms in hospitals and nursing-homes.

Drugs for Private Patients

The Conservative Party stated in *The Right Road for Britain* its intention to recognize the right of the private patient to receive drugs and appliances on the same terms as N.H.S. patients, but their policy has not been implemented. The Australian Government has wisely avoided the mistake of precipitate nationalization and has moved slowly, stage by stage, in the introduction of its Health Service. We believe that there is much to be learnt from this approach, in particular the careful building up by supplementing the efforts of existing institutions and the limiting of free drugs to a schedule of agreed essentials and specifics. This plan of excluding from the free list drugs which are not really essential deserves close attention and would certainly reduce the waste which is apparent in the mounting drug bills in our own N.H.S.; in any case private patients should be placed on the same footing as State patients for the provision of drugs and appliances.

Public Demand for Private Treatment

The enormous increase during the past five years in the number of private sickness insurance policies taken out clearly shows the strength of public demand for private medical treatment, and it would be sound policy to encourage this trend, both in the interests of public morale and for reasons of national economy. Indeed, the State would be amply repaid if it undertook to make some substantial contribution towards approved policies of sickness insurance. A further concession which would not only encourage practice outside the N.H.S. but would also reduce the capital expenditure needed for new hospitals and wings is the provision of grants-in-aid based upon part of the cost of a public bed and applied to reduce the present almost prohibitive cost of a private room in hospital or nursing-home.

The Central Remuneration Pool

It has been argued that the resuscitation of private practice would result in serious injustices and hardship to doctors practising in poor areas. This is probably true under the present system of a central remuneration pool, since receipts from private practice are taken into account itself only the aggregation of the recommended earnings of all general practitioners as outlined by the Spens Committee and interpreted by Mr. Justice Danckwerts. It has been found a convenient device, but it is in no way sacrosanct. The solution seems to be to abandon the present method of assessing the amount of the central pool and to stabilize the capitation fee, subject to certain agreed form-practitioner remuneration directly to the numbers of the population at risk instead of to the number of doctors in the Service. By adopting this course the State would stand to benefit financially in very large measure from a revival of private practice, which with suitable encouragement might well extend to seven or eight millions of the population.

The Capitation Fee System

While the method of remuneration by capitation fee has certain advantages and is administratively convenient, it has the number of patients for whom a doctor is at risk; that number will vary with such factors as the density of the population, the number of doctors available, and the individual doctor's popularity. The method tends to encourage unduly large practices in which an unnecessarily high

proportion of patients are referred to hospital for diagnosis and treatment in order to save time in the crowded surgeries. Conversely, the doctor who does his work with care and thoroughness, and who is prepared to give time to knowing his patients and listening to their troubles, is severely penalized under this system.

Recognition of Quality of Work

We believe that, even if it is not possible to relate remuneration under the capitation system to the actual quality of work done, it should at least be feasible to recognize such factual attributes as experience and higher qualifications acquired in practice. But we are convinced that the true solution is to allow an alternative system of assisted payments by the patient per item of service to grow up side by side with the present system. The two systems might remain distinct and competitive, or they might gradually fuse together so that a small capitation fee plus a small charge to the patient would become the usual method. Such a change would do much to revive the general practitioner's keenness and to counteract the present tendency towards "conveyor-belt" practice.

Clinical Interest and Opportunity

At the same time, if general practice is to maintain the highest standards and to prove attractive to the best doctors, it is necessary that clinical interest should be maintained, and this involves the provision of much greater facilities and than exist at present for study and refresher courses, together with adequate leisure and the means of obtaining relief from continuous petty responsibilities. It means, too, that the present tendency to narrow the scope of general practice must stop and the whole field of medicine be thrown open to the practitioner. He should be encouraged to take part in the work of specialized clinics, to do his own obstetrics, and to take responsible part in the work of hospitals. The bridge between general and consulting practice should be widened and inducements offered to the general practitioner to develop and practise a specialty in general practice. These suggestions will in themselves achieve economies and they will help to further the overall objective of re-establishing general practice in its rightful place as the main source of diagnosis and treatment. Above all, everything possible must be done to enable and encourage the general practitioner to take full control of his patients' health without reference to general hospitals except in complicated or surgical disease. This involves direct and greatly access to all kinds of ancillary diagnostic aids and greatly improved facilities for the nursing and domestic care of the sick in their homes, together with the care of their children and dependants where necessary. Such additional cost as this would involve would be negligible by comparison with the cost of a bed in hospital. Coupled with these provisions, the extended development and use of general-practitioner hospitals and G.P. wings of general hospitals, to which a patient can be admitted under the responsible care of his own doctor, will effect a further economy.

Goodwill of Practice

Finally, it is of outstanding importance in restoring to the general practitioner a proper pride in his work and a full sense of responsibility that he should be allowed to assume the full ownership and free disposal of the goodwill of his practice. The reasons which led to the confiscation of this ancient right were political, not economic. The decision was forced upon the profession against all advice; that it was a major error is now self-evident. To go back is difficult, but in this case not impossible; indeed there is good reason to hope that the scheme which will be presented to the Representative Meeting at Glasgow may secure general acceptance. This is the most obvious large economy open to the Guillebaud Committee; and upon its adoption depends the future status of the general practitioner.

CRICKET

B.M.A. v. LAW SOCIETY AT HURLINGHAM, MAY 30

LAW SOCIETY

T. M. Sutton-Mattocks, b. Percival	..	..	48
G. Williams, l.b.w., b. Clarke	..	..	36
D. Small, st. Dew, b. Clarke	..	..	3
W. F. Gould, l.b.w., b. Clarke	..	..	41
E. H. S. Singleton, c. Chew, b. Clarke	..	..	0
R. J. Clarke, c. Melhuish, b. Bonner	..	..	22
P. C. Dowson, c. Chew, b. Clarke	..	..	2
S. Munday, c. Melhuish, b. Chew	..	..	3
T. L. Outhwaite, b. Clarke	..	..	11
S. Sawell, not out	..	..	1
S. Feldman, b. Clarke	..	..	0
Extras	..	..	15

Total 182

BOWLING.—Chew 1-30; Clarke 7-58; Percival 1-31; Bonner 1-48.

B.M.A.

P. C. Rushton (London Hospital), c. Sutton-Mattocks, b. Small	..	..	1
C. Barwell (Guy's Hospital), c. Williams, b. Clarke	..	..	15
G. D. Bonner (Edinburgh), c. Williams, b. Gould	..	..	37
K. F. Dewhurst (Oxford), c. Munday, b. Gould	..	..	0
A. F. Melhuish (University College Hospital), c. Munday, b. Gould	..	..	20
J. Marks (London Hospital), c. Clarke, b. Gould	..	..	0
J. A. Dew (London Hospital), c. Clarke, b. Gould	..	..	27
G. R. Wilson (Glasgow), st. Singleton, b. Gould	..	..	0
C. B. Clarke (Guy's Hospital), st. Singleton, b. Feldman	..	..	18
H. E. R. Chew (London Hospital), l.b.w., b. Feldman	..	..	9
R. C. Percival (Sydney and London), not out	..	..	1

Total 128

BOWLING.—Clarke 1-17; Small 1-14; Gould 6-40; Feldman 2-57.

Questions Answered

Temporary Appointment in U.K.

Q.—I have had to employ a locumtenent since December, 1953, and intend to do so until June, 1954. The locumtenent worked in the U.S.A. for two years before coming to me, and is not due for tax for the last financial year. He will only be three more months in the U.K. Must I comply with the income tax inspector's demand that he should be taxed on this year's earnings?

A.—The inspector of taxes is apparently within his legal rights in requiring the locumtenent's remuneration to be brought into the P.A.Y.E. tax deduction scheme. It may well be that the tax so deducted will ultimately be repayable, but that may be affected by the locumtenent's future professional activities and his past and future residential status.

Expenses of Postgraduate Course

Q.—I am in general practice under the N.H.S. Can I claim for income-tax assessment examination fees, postgraduate tuition fees, and accommodation expenses in London for a 10-weeks postgraduate course for my final F.R.C.S.?

A.—The expense of a postgraduate course or of the acquisition of further professional qualifications falls under the head of capital outlay, and is not allowable for income-tax purposes as an expense.

MANCHESTER UNIVERSITY HEALTH CENTRE

OPENING BY MINISTER OF HEALTH

On Wednesday of this week Mr. Iain Macleod, Minister of Health, opened the new Darbishire House Health Centre in Manchester. This experimental centre has been started by Manchester University outside the framework of the National Health Service, and assisted by grants of £30,000 each from the Nuffield Trust and the Rockefeller Foundation. The Nuffield Trust has bought and adapted the premises and the Rockefeller Foundation has provided £10,000 for equipment and is reserving £20,000 to meet extraordinary expenditure during the first few years. The University will meet the research and teaching expenses of the centre and the Manchester City Corporation is providing £3,500 a year to begin with for three years to cover maintenance and the cost of non-medical staff. A preliminary notice of this venture was published in the *Journal* of August 30, 1952 (p. 490).

The Building

The centre is in a large, three-storied old-fashioned type of detached house in an industrial area and close to the Manchester Royal Infirmary. On the ground floor are four general-practitioner suites each consisting of a waiting-room, lobby, examination room, and consulting-room. There is a large office off the entrance hall. The first floor contains the maternity and child welfare clinic rooms and the rooms for the ancillary G.P. services, such as the district nurses' treatment and physiotherapy room, x-ray room, and clinical laboratory. On the second floor are the school health clinic rooms and the caretaker's flat. There is a lift to all floors. The illustrations give an idea of the fittings and tasteful decoration of some of the rooms.

Staffing

The aim is to provide a first-class, comprehensive family practitioner service in a working-class district. Four established general practitioners who used to practise single-handed in the neighbourhood are already at work as a group in the centre. There are three secretaries, and the x-ray and pathological facilities are staffed from the hospital. A unique feature of the scheme is that three local authority district nurses, in addition to doing their home nursing duties from the centre, will also run a treatment room for injections, minor injuries, and physiotherapy. Later on it is hoped that health visitors will also work from the centre under the supervision of the family doctors. Eventually each practitioner will run two sessions a week of the local authority school medical service and maternity and child welfare clinics. The midwives will in this way also come into the picture.

The Objects of the Centre

As an experimental centre planned on preconceived ideas of what a health centre should achieve it is hoped to give theory the advantage of practical test. The centre will be the basis for some operational studies which will provide data for answering some of the present-day questions on general-practitioner medical care. For instance, can a health centre, by giving the G.P. new tools such as x-ray and laboratory services, the

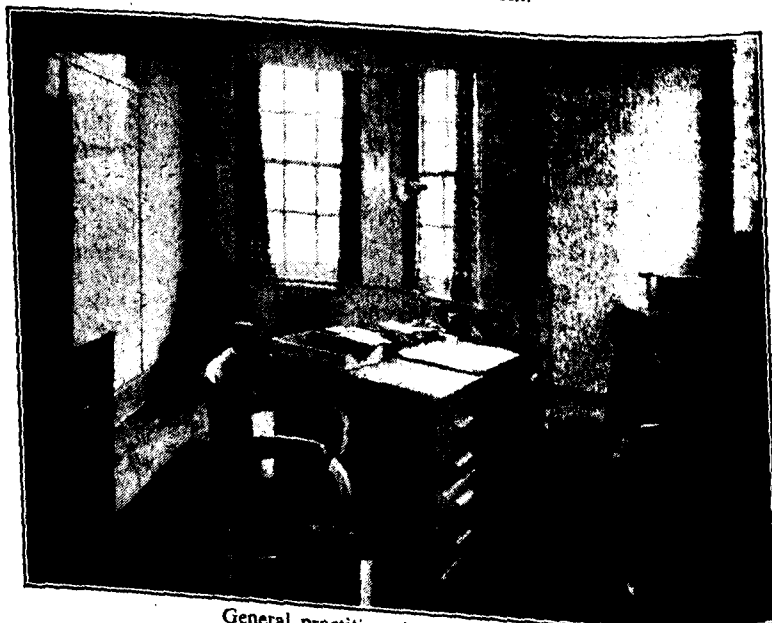
medical aid of district nurses, and health visitors and social workers under his own direction, relieve the burden on hospitals? Will the G.P. be able to devote more time to essential medical work and less to non-essentials, and will it increase the scope and interest of his work?

It is also expected that the centre will provide practical information about the best way to integrate the local authority preventive services, the G.P. services, and the hospital specialist services. After the centre has had time to get into its stride—perhaps two or three years—it is intended to use it as a part of undergraduate medical education. It is considered to be one of the most important functions of the centre that all medical students will be able to do a course of training in some of the ailments and problems which they are likely to meet in future. Each G.P. on the staff will become an approved teacher of the University Medical School and will, in addition, do two sessions a week as a clinical assistant at a local regional board hospital.

As a long-term policy it is intended to use the centre for socio-medical research into the causation of disease in the individual and the community.



District nurses' treatment-room.



General practitioner's consulting-room.



General practitioner's examination-room.

An Important Experiment

Manchester University, with the aid of the Nuffield Trust, Rockefeller Foundation, and Manchester Corporation, has set on foot an important experiment which will be watched with interest. It has been launched under auspices which will allow free reign for the research which is its primary object.

Plans for health centres of various types have now been described in current medical literature, and within the last two years a few centres have started work. It will be some years before a proper appraisal can be made of their value, and by that time professional opinion, which is at present conservative in its attitude towards this innovation, will have had time to crystallize.

OPHTHALMIC GROUP COMMITTEE

PROPOSED REVISION OF SIGHT-TESTING FEE

A meeting of the Ophthalmic Group Committee was held at B.M.A. House on May 21, with Mr. GAYE MORGAN in the chair.

The DEPUTY SECRETARY placed before the Committee a note on the question of seeking revision of the sight-testing fee.

The CHAIRMAN reminded the meeting that on the last occasion when the sight-testing fee was revised the Ministry had insisted that one of the principal factors to be taken into consideration was the remuneration received by consultants and specialists in the hospital eye service. The recent increases for members of hospital medical staffs (negotiated in Committee "B" of the Medical Whitley Council) now made it necessary for the sight-testing fee to be adjusted, and it was agreed to appoint a deputation to discuss the matter with the Ministry.

The Supplementary Ophthalmic Service

A group of ophthalmic medical practitioners practising in and around Birmingham had sent a protest against the

reported action of the Group Committee in pressing for the early abolition of the Supplementary Ophthalmic Service.

Mr. G. W. BLACK pointed out that the Act itself looked forward to a time when facilities would be established to justify the replacement of the Supplementary Ophthalmic Service by an augmented hospital service, but there were those who desired the perpetuation of the S.O.S.

The CHAIRMAN said that what the Group Committee pressed for was not the early abolition of the S.O.S. but its improvement coupled with some augmentation of the existing hospital service. People might be in favour of the augmentation of the hospital service and nevertheless be against any early abolition of the S.O.S. He thought the Birmingham signatories laboured under a misapprehension. The Minister had recognized that the S.O.S. had operated smoothly and well, and fully appreciated the desire of those taking part in the service that it should be established on a permanent basis. He considered, however, that it was very unlikely that a move to end the service would be made in any time which would be a matter of concern at present, and did not feel that he was justified at the moment in introducing legislation to rescind sect. 41 (4) of the Act.

It was agreed to reply in these terms to the Birmingham protesters.

Service Ophthalmologists

Some discussion took place about the difficulty experienced by Service ophthalmologists in satisfying the criteria of admission to the Central Ophthalmic List and in meeting the requirement of two years' experience in hospital ophthalmic appointments. The CHAIRMAN said that Service ophthalmologists were doing the same work as the civil practitioner outside, and they ought to have the same qualifications. He did not know whether the Qualifications Committee could do anything about it.

It was mentioned that this whole matter was to be discussed by the Council of the Faculty of Ophthalmologists, whose views would be reported to the Committee. A suggestion for some form of provisional registration was made.

It was agreed to obtain further data on the subject.

Referred Patients

A point which arose at the previous meeting was again brought forward concerning the provision of spectacles to patients referred back to their general practitioner following a Supplementary Ophthalmic Service sight test. The view of the Ministry was that glasses should not be supplied in such cases until it was known whether medical treatment would be necessary. The Ministry had not felt able to give instructions that in no such case should an optician supply glasses, but if there was evidence that glasses were supplied prematurely with the result that numbers of patients who had been referred from the Service to the general practitioner did not in fact go to him, or did not obtain hospital treatment where necessary, the Ministry would have to consider the question again.

It was suggested that members of the Committee should look into this matter and report any such cases they discovered.

Mr. P. Trevor-Roper was re-nominated for co-option to the London Local Medical Committee.

PRESENTATION TO DR. F. E. GOULD

At the Annual Dinner Dance of the Birmingham Division, held at Chadwick Manor Hotel on Friday, May 28, 1954, Dr. F. E. Gould, former Honorary Secretary of the Division for 19 years, was presented with a silver tray subscribed to by his colleagues in appreciation of his many services to the Division. The presentation was made by Dr. A. Beauchamp.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Remuneration of Hospital Medical Staff

SIR.—I hope it will not be supposed that the comparatively few letters concerning remuneration of consultants that have appeared in your columns is an indication of widespread satisfaction with the result of recent negotiations. Many consultants were under the impression that the report of the Spens Committee had been accepted by the Minister of Health and that the recent negotiations concerned the betterment factor. This factor, according to the Spens report, was to take into consideration the change in the value of money and also increases which have, in fact, taken place since 1939 in incomes in both the medical and other professions. There are, of course, various ways in which this factor may be estimated, but by any calculation the remuneration of a specialist should be considerably above the 1948 figures—figures which many of us thought were provisional.

The rather lengthy report which has now been published of the results of the recent negotiations reveals that the betterment factor is practically non-existent. There have been some relative readjustments within the hospital service by which some receive comparatively small increases of remuneration, while others have to be guaranteed against loss. This, it seems, has helped to restore the balance between hospital staffs and general practitioners; this is, indeed, a good thing, but many members of hospital staffs would like to adjust the balance of their own budget, too.

It is perhaps on the whole a good thing that doctors are not particularly politically minded, especially when it comes to their own remuneration—and perhaps some of us are labouring under a misapprehension. Was it not agreed by the 1948 Government that the terms of the Spens report should be implemented? And, if so, has the Minister now said that in regard to the betterment factor he refuses to implement it? If this is so the present situation is intolerable and negotiations towards a realistic betterment factor should be undertaken at once.—I am, etc.,

London, W.1.

F. RAY BETTLEY.

SIR.—I have been following with growing interest the many letters in the *Supplement* on the above subject. I have also noted the rising indignation expressed by consultants in these letters. It is becoming increasingly obvious to me, as it must be to the Management Side of Whitley "B," that the profession is hopelessly split into three distinct and almost separate parts. This fact is obviously worrying Sir Russell Brain, when he appeals for some sort of cohesion, and asks for an end to attempts to exploit this dissatisfaction which he says we all feel (*Supplement*, May 22, p. 280).

The time has now come, surely, to see what order can be restored out of the chaos, and get back to Spens, as surely we must if we are not to lose for ever our self-respect. The profession can only do this provided it speaks with one voice, and we do not have the ludicrous state of affairs existing at the moment, with the different sections represented by multifarious bodies who are neither democratically elected nor have proper contact with the rank and file of the profession. The only section better off in this matter is that of the general practitioners, who are represented by a democratically elected body; but they were wise enough to employ counsel to negotiate.

Surely the time has come for the leaders to realize that the present machinery is defunct and to advise the profession as a whole to set up a body with trade union status and a full-time staff, particularly a capable general secretary, whose only job would be the terms of service of all mem-

bers. Such a body is bound to come sooner or later, so in my opinion the sooner the better if we are not to lose our birthright, Spens. I do not wish to belittle the efforts of the Staff Side of Whitley "B"—they have done well to get the small crumbs handed out—but the "writing is on the wall" when one reads the letter of Sir John Hawton in reply to Dr. Macrae (*Supplement*, May 15, p. 240). The general practitioners must realize that the apparent discarding of Spens by the Government can only mean an eventual scaling down of their betterment to the level of the consultants. No, sir! Let us all get down to business together and form a trade union, behind which body we could rightly defend our principles, and behind which we could develop some semblance of security.—I am, etc.,

Parkstone, Dorset.

J. R. HINDMARSH.

SIR.—The Ayrshire Consultants' and Specialists' Association has for some months been considering the question of hospital medical staff representation. At a meeting on May 28, 1954, the following resolutions were unanimously approved:

(1) That this association deprecates the growing dissociation of the British Medical Association and the hospital staff representative bodies.

(2) That this association considers the time has come to review the method of hospital staff representation with a view to obtaining two main objects: first, to secure a single central representative body consisting entirely of elected representatives; second, to secure the position of this representative body as a sub-committee of the British Medical Association under whose aegis future negotiations with Government departments should be carried out.

The results of the recent Whitley negotiations on salaries of hospital medical staff were also discussed and the following resolutions were formulated and unanimously approved.

(1) That this association has no confidence in the present constitution of the Joint Consultants Committee and considers it unsuited to represent hospital staffs in future.

(2) That this association strongly condemns the Staff Side of Whitley Committee "B" for concluding the agreement on remuneration without reference to the general body of consultants and specialists.

(3) That this association considers the rates of remuneration of hospital staff as agreed in Whitley Committee "B" to be unsatisfactory.

(4) That this association considers the proposed new salary scales should be accepted as a strictly interim agreement and that, following reconstruction of the hospital staff representative system, a determined drive be opened, with the backing of the whole profession through the British Medical Association, to secure, first, the right of unilateral appeal to arbitration and, second, implementation of the Spens report.

(5) That this association considers that, in reopening discussion with the Management Side of Whitley Committee "B," well as to securing an overall increase in the global sum available for distribution as salaries. It is suggested that the contentious C grades, the award of which seems to be a lottery. The use of continued to provide recognition of really exceptional merit, and those already holding B and C awards could be protected by a "no detriment clause" in any new contracts agreed.

The latter should remove any doubt as to the reaction of at least one group of hospital medical staff (see Dr. Stevenson's comment in Central Consultants and Specialists Committee, reported in the *Supplement* (May 8, p. 228) indicating either contentment or apathy). Copies of these resolutions have been circulated as far as possible to all local staff associations in Scotland and to the regional and central consultants and specialists committees in Scotland. It is hoped that this lead will stimulate such movement of public opinion as to constrain all levels of consultants and specialists committees to initiate reorganization of the system of representation.—I am, etc.,

Kilmarnock.

W. L. MUNRO,

Hon. Secretary,
Ayrshire Consultants' and Specialists' Association.

Remuneration in the Public Health Service

SIR.—There is a growing feeling that the present basis of remuneration in the Public Health Service is illogical, and that in future reference to Whitley machinery must be based entirely on the principle that grading, salaries, and conditions of service in public health should be the same as for any of the specialties in the hospital service.

The suggestion that in public health there must be gradings and salaries similar to the specialists in the hospital service is logical, but so far no practical and definitive scheme has been suggested which would be fair not only in its application to practitioners in the Public Health Service but in its reference to general practitioners, hospital medical staff, and employers in those various services. If we examine the hospital service we find that a consultant is a person employed full-time in the practice of a specialty and who fills a post that requires special knowledge and experience. The number of consultants is limited not only by the needs of an area but by the public purse, as is shown by the fact that there are many senior medical officers who could to-day grace consultant posts, but are precluded because of "establishment standards."

Keeping in mind these definitions and restrictive factors, the position of staff in public health with regard to grading is exactly the same, since the number of medical officers of health is regulated by statute. However, it is obviously unacceptable to any negotiating body to say that every medical officer of health should be a consultant, since many are not entirely engaged in the full-time practice and application of public health. For example, some medical officers of health as part of their duties do clinical, school, or child welfare work for their own or other public health authorities, or tuberculosis or fevers for hospital boards. The following suggested basic scheme—which of necessity in a short letter must be skeletal—gives a reasonable compromise to professional and lay opinion. Higher consultant awards would require to be given either on the basis of individual merit or of some "weighting factor."

(1) A person occupying the statutory position of medical officer of health to the area of a local health authority, and engaged full-time in the practice of such a post, shall be classified as a consultant (present salary £2,100 by £125 to £3,100)—see example (i). (2) Where a person occupies the statutory post of medical officer of health to the area of a local health authority, but is engaged part-time in the clinical public health or hospital services, then each portion of all services shall be remunerated on the basis of $x/11$ ths of his status in each service—see examples (ii), (iii), and (iv). (3) A senior officer or deputy is a person statutorily qualified in public health and engaged full-time in assisting a consultant medical officer of health in the practice of his post (present salary £1,500 by £50 to £1,950). (4) A senior registrar is a person in a public health clinical post who has been a registrar in clinical public health for two years (present salary £1,100 by £100 to £1,400). (5) A registrar is a person in a public health clinical post obtained not less than two years after registration as a medical practitioner (present salary £850 by £115 to £965). (6) Where a person designated as a medical officer of health is not responsible for the area of a local health authority, he shall be classified partly as a senior officer and partly in respect of public health clinical duties as senior registrar and/or, if employed by a regional hospital board, on a status determined by that authority—see examples (v) and (vi). (7) Where a senior registrar holds the Diploma in Public Health then £100 will be added to his salary one year after his attaining his maximum point in his salary scale.

Examples

(i) Medical Officer of Health to Local Health Authority:			
Full-time practice of public health, £2,100 by £125 to £3,100.			
(ii) Medical Officer of Health to Local Health Authority:			
Practice of public health, 3/11ths of £3,100	£845	9s.	0d.
Clinical school work, 4/11ths of £1,400	£509	1s.	8d.
Clinical child welfare work, 4/11ths of £1,400	£509	1s.	8d.
Total ..	£1,863	12s.	4d.

(iii) Medical Officer of Health to Local Health Authority:			
Practice of public health, 8/11ths of £3,100	£2,254	10s.	8d.
Clinical tuberculosis (graded as senior medical officer) 3/11ths of £1,950	£531	16s.	3d.

Total .. £2,786 6s. 11d.

(iv) Medical Officer of Health to Local Health Authority (Formal Year in Post):			
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Practice of public health, 4/11ths of £2,475	£900	0s.	0d.
Clinical school or child welfare work, 4/11ths of £1,400	£509	1s.	8d.
Clinical tuberculosis as registrar, 3/11ths of £1,400	£381	16s.	3d.

Total .. £1,790 17s. 11d.

(v) Medical Officer of Health Not to a Local Health Authority:			
Full-time practice of public health, £1,500 by £50 to £1,950.			

(vi) Medical Officer of Health Not to a Local Health Authority:			
Practice of public health, 6/11ths of £1,950			
Clinical school or child welfare work, 5/11ths of £1,400	£636	7s.	1d.

Total .. £1,699 19s. 7d.

—I am, etc.,

Dumbarton.

SAMUEL HARVEY.

Radiology on Points

SIR.—I was very pleased to see that Dr. Anthony A. Vickers had again written to you on this subject (*Supplement*, May 29, p. 291). I fear that the "units" system of recording the work of diagnostic x-ray departments has come to stay, as there has been no indication that the comments made in your leading article (*Journal*, January 10, 1953, p. 86) and in the subsequent correspondence at the beginning of 1953 had any effect in inducing the Ministry of Health to have second thoughts. At the very least, a revision of the system is required and the values of the investigations reassessed to meet the criticisms which have been made.

As Dr. Vickers states, more scrupulously honest departments are being left behind in the race because the assessments are being left behind in the race because the assessment of units is widely open to misinterpretation. The "unit" system implies that the time and cost of materials involved in each type of investigation "averages out," but x-ray departments vary too much in their standard techniques for the system to be applied as a comparative yardstick of the work done and the staff and equipment required for this purpose. One department may expend two or three times more energy and films in a routine x-ray investigation than another and yet have the same number of "units" allotted. Some radiologists are content with one or two films while others require three or four for the same examination. The amount of film used would be a better indication of the work done. It is to be hoped that now the system has been given a fair trial the Ministry will listen to those who have to operate it.—I am, etc.,

Brighton.

JOSEPH RUBIN.

Return of Goodwill

SIR.—Having read Dr. E. C. Warner's letter on "Return of Goodwill" (*Supplement*, May 29, p. 290), it occurs to me that the report on the proceedings of Council for May 5 and 6 does not make clear what happened then with regard to the Amending Acts Committee's report on goodwill.

The report was not taken until late in the afternoon of May 5, when many members of Council had already left, and others were in process of leaving. Dr. Sutherland, chairman of the Amending Acts Committee, formally introduced the report, the lawyer's opinion on it, and the statement of advantages and disadvantages—and was about to propose its approval when the Chairman of Council intervened. He stated that he knew that we had at our March meeting turned down by a great majority a motion by Dr. Dawson which recommended that no further action be taken on the Amending Acts Committee's report—but since then he (the Chairman) had thought much about the matter

and had wondered whether we ought not to reverse our decision. He went on to say that lately he had been approached from an important and influential quarter with advice which he could not ignore, to the effect that it was imperative that Council should give a lead on the goodwill issue, and he made it clear that that lead ought to be a recommendation to reject the report. Dr. Sutherland pressed him to divulge the quarter from which this advice had come, pointing out that he had been at great pains to keep every committee of the Association in any way concerned with the goodwill issue informed of the A.A.C.'s work, and had had their representatives sitting with us to present their criticisms—but the Chairman of Council found himself unable to tell us what was the source of the advice he had been given, and once more urged upon Council the desirability of rescinding its March decision.

At this juncture Dr. Macrae rose to point out that, under Standing Orders, Council could not reverse any decision it had come to unless six months' previous notice had been given. Within twenty seconds suspension of Standing Orders was proposed, seconded, and carried, and Council found itself back where it had been in March. At once Dr. Dawson rose and again proposed word for word the motion which had been rejected "by a very large majority" in March, and he was seconded. I made a short speech in protest against this move and urged the Council not to go back on its former decision, and not to damn the A.A.C.'s report by sending it to the A.R.M. with a recommendation for rejection. As it became obvious, however, that my appeal was not carrying much weight, I begged leave to propose an amendment to the motion, but permission was refused. A vote was then taken and the motion was passed by 26 votes to 16, with five abstentions—a good many members of Council being absent.

It now remains for the Representative Body to decide what it shall do with this recommendation of Council, arrived at by a reversal of its previous decision, and I should like to point out that in the past the Representative Body has not always thought fit to accept Council's recommendations and especially not in cases where the R.B. has given Council specific instructions.—I am, etc.,

Wolverhampton.

A. VICTOR RUSSELL.

SIR,—Many will appreciate the strong line taken by Dr. E. C. Warner in his letter on this most important subject (*Supplement*, May 29, p. 290). The excellent scheme for the return of goodwill produced by the Amending Acts Committee was well received by the Council of the B.M.A. at the March meeting, subject to certain additions being made to the report before submission to the Divisions and Branches for consideration. At the May meeting of Council it was apparent that those who were opposed to the return of goodwill were determined to prejudice impartial consideration of the report of the Amending Acts Committee: for this purpose normal procedure was waived and the debate reopened, under the pretext of "giving the profession a lead." As a result it must now be concluded that the Council of the B.M.A. is opposed to the return of the ownership of goodwill: we should not hide our weakness behind such phrases as "in view of the practical difficulties of implementing the proposed scheme," etc.

It is to be hoped that the Representative Body will give a wiser and more courageous "lead" to Council than it has received from the latter; and that in the meantime the Divisions will give serious consideration to the report of the Amending Acts Committee. The importance is not one of finance, but of principle, for ownership of goodwill and encouragement of private practice constitute the main bulwark against a full-time salaried service. This probability in the fairly near future deserves a stronger description than Dr. Warner's "rumblings." Quite naturally, those who pursue a salaried mode of existence and are "salary-conditioned," which includes some of the Council members who were most strongly opposed to the return of goodwill, will not view the impending prospect with the same degree of dismay as those who prefer the traditional methods of

professional practice. But for members who look beyond the material satisfaction of the immediate moment the time has arrived for action to safeguard medicine from the uninspiring dead hand of nationalization; this may well be our last opportunity to do so, and the influence of lesser arguments must be put aside.—I am, etc.,

Guildford.

J. O. M. REES.

Association Notices

Diary of Central Meetings

JUNE

- 11 Fri. Rehabilitation Committee. Preliminary Meeting of Witnesses to give Evidence to Piercy Committee, 2.15 p.m.
- 15 Tues. Evidence Committee on Divine Healing, 2 p.m.
- 15 Tues. Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m.
- 16 Wed. Occupational Health Committee, 10.30 a.m.
- 17 Thurs. Working Party Subcommittee, Joint Consultants Committee, 2.30 p.m.
- 18 Fri. Conference of Honorary Public Relations Secretaries of Divisions, 10.30 a.m.
- 22 Tues. Psychological Medicine Group Committee, 2 p.m.
- 23 Wed. Accommodation Subcommittee, Estates Committee, 12 noon.
- 23 Wed. Estates Committee, 2 p.m.
- 23 Wed. Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m.
- 23 Wed. Geriatrics Joint Subcommittee, 2.15 p.m.
- 24 Thurs. Guillebaud Evidence Steering Committee, 10 a.m.
- 24 Thurs. Constitution Committee, 2 p.m.
- 24 Thurs. Journal Committee, 2 p.m.

JULY

- 1 Thurs. Annual Representative Meeting (at Glasgow), 10 a.m.
- 2 Fri. Annual Representative Meeting (at Glasgow), 9.30 a.m.
- 3 Sat. Council (at Glasgow), 9 a.m.
- 3 Sat. Annual Representative Meeting (at Glasgow), 10 a.m.
- 5 Mon. Annual Representative Meeting (at Glasgow), 10 a.m.
- 5 Mon. Annual General Meeting (at Glasgow), 12.30 p.m.
- 5 Mon. Council (at Glasgow), at conclusion of A.R.M.
- 5 Mon. Adjourned Annual General Meeting and President's Address (at Glasgow), 8.15 p.m.

Branch and Division Meetings to be Held

CAMBERWELL DIVISION.—Thursday, June 17, visit to Hatfield House, Herts.

DUDLEY DIVISION.—At Corbett Hospital, Amblecote, Stourbridge, Tuesday, June 15, 9 p.m., consideration of Annual Report of Council, etc.

EAST HERTS DIVISION.—Thursday, June 17, 2.30 p.m., tour of Roche Products Ltd., Welwyn Garden City.

HEREFORD DIVISION.—At Hereford General Hospital, Thursday, June 17, 3.30 p.m., annual general meeting.

KENT BRANCH.—At Winter Gardens, Margate, Thursday, June 17, 12 noon, annual general meeting; 12.30 for 12.45 p.m., lunch.

NORTH-EAST ESSEX DIVISION.—At Maternity Hospital, Lendwood, Colchester, Monday, June 14, 8.15 p.m., election of officers.

NORTH STAFFORDSHIRE DIVISION.—At Pathology Department, North Staffordshire Royal Infirmary, Stoke-on-Trent, Tuesday, June 15, 8 p.m., annual general meeting. Election of officers, etc.

NORTH WALES BRANCH.—At Waterloo Hotel, Bettws-y-Coed, etc. Presidential Address by Dr. Ifor H. Davies: "Looking through the Window of a Rural General Practitioner." Members' wives are invited.

NOTTINGHAMSHIRE BRANCH.—At Harlow Wood Hospital, near Mansfield, Thursday, June 17, 2.30 p.m., clinical meeting.

SUFFOLK BRANCH.—At Crown Hotel, Framlingham, Wednesday, June 16, 12.30 p.m., annual general meeting.

SURREY BRANCH.—At the Town Hall, Reigate, Surrey, Wednesday, June 16, 2.30 p.m., annual meeting. Presidential Address by Dr. Douglas A. Robertson: "Treating Blue Babies"—an appreciation of Modern Cardiac Surgery.

WEST HERTFORDSHIRE DIVISION.—At Stanborough's Hydro, Watford, Wednesday, June 16, 8.30 p.m., annual general meeting, election of officers, etc. Dr. H. Rhys Davies: "The Relief of Pain by Physical Means."

WILTSHIRE BRANCH.—At the Roundway Hospital, Devizes, Sunday, June 20, 2.45 p.m., meeting to discuss and decide upon the future of the Wiltshire Branch. Dr. L. S. Potter and Dr. S. J. the discussion.

SUPPLEMENT TO THE
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British Medical Association

ANNUAL MEETING—GLASGOW, JULY 1-9, 1954

President-Elect: Emeritus Professor Sir JOHN MCNEE, D.S.O., M.D., D.Sc., LL.D., F.R.C.P., F.R.F.P.S.

Joint General Secretaries: J. INGLIS CAMERON, M.B., Ch.B., F.R.F.P.S.; J. T. MCCUTCHEON, M.A., L.R.C.P., L.R.C.S., L.R.F.P.S.

Science Secretary: J. BASIL RENNIE, M.D., F.R.C.P., F.R.F.P.S.

Deputy Science Secretary: A. W. KAY, M.D., Ch.M., F.R.C.S.Ed.

Executive Officer: G. A. PECK, B.Sc., British Medical Association, Glasgow Regional Office, 234, St. Vincent Street, Glasgow, C.2.

PROGRAMME

The 122nd Annual Meeting of the British Medical Association will be held in Glasgow from Thursday, July 1, to Friday, July 9, 1954, inclusive.

On the evening of Wednesday, June 30, there will be a Cocktail Party for Representatives and their Ladies, arranged by the Glasgow Division.

The Annual Representative Meeting will begin on Thursday, July 1, and continue on Friday, Saturday, and Monday, July 2, 3, and 5.

The Representatives' Dinner and Ladies' Dinner will take place on Thursday, July 1, followed by a dance.

The Overseas Luncheon has been arranged for Friday, July 2.

On Sunday, July 4, an all-day cruise on the Firth of Clyde has been planned, and this will be followed in the evening by a concert, specially arranged by the B.B.C.

The Adjourned Annual General Meeting and President's Address will take place in the Kelvin Hall on the evening of Monday, July 5, and the President's Reception, which follows, will be held in the Bute Hall, at the University.

The Annual Scientific Meeting and associated functions occupy the period from Tuesday morning, July 6, to the evening of Friday, July 9.

The Official Religious Service will be held in Glasgow Cathedral on the afternoon of Tuesday, July 6, and the Roman Catholic Service will be held at St. Andrew's Cathedral at the same time.

The Annual Dinner of the Association will be held in the Central Hotel on Thursday, July 8.

A full social programme is being arranged, including a Civic Reception on Tuesday evening, July 6, and a University Reception on Wednesday evening, July 7. There will also be a dance on Friday evening, July 9.

Several special functions have been arranged for ladies accompanying members, including visits to Loch Lomond, Lake of Menteith and Stirling Castle, the Burns Country, and Edinburgh. Also included among these is an all-day excursion to Loch Katrine and the Trossachs.

The usual golf competitions will take place, and there will be an additional medal competition at Old Prestwick Golf Course on Thursday, July 8, for those not eligible for the Treasurer's Cup competition.

The Overseas Conference will be held on the afternoon of Wednesday, July 7, followed by a reception given by the Overseas League; there will also be an "At Home" for over-seas visitors given by the Empire Medical Advisory Bureau on Thursday, July 8.

The Reception Room for Registration will be open in the Kelvin Hall on Monday, July 5, at 9 a.m.

Three Plenary Scientific Sessions have been arranged as follows: Tuesday, July 6, at 9.30 a.m., subject "The Problem of Sleep"; Wednesday, July 7, at 3 p.m., subject "Food and Disease"; Thursday, July 8, at 9.15 a.m., subject "The Problem of Pulmonary Tuberculosis To-day."

Seventeen Scientific Sections have been arranged, the meetings to take place on Wednesday morning, July 7, Thursday afternoon, July 8, and Friday morning and afternoon, July 9 (details are given below).

The Scientific Exhibition will be held in the Kelvin Hall, and will be open daily from July 5 to 9. Demonstrations will be given at fixed advertised times and a wide field of medical interests will be covered. For details see page 326.

The Annual Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications will also be housed in the Kelvin Hall. The Exhibition will be open from 9 a.m. to 6 p.m. from July 5 to 9 inclusive. For details of exhibitors see page 326.

The Ladies' Club will be situated in the College Rooms, University, and will be open throughout the Meeting.

REGULATIONS REGARDING DRESS

Academic Dress is to be worn at the President's Address, the President's Reception, the Official Religious Service, the Roman Catholic Service, the Civic Reception, and the University Reception.

Robes may be hired from Messrs. Ede and Ravenscroft, Ltd., 93, Chancery Lane, London, W.C.2, or, in the case of Glasgow graduates, from Messrs. Thomson, Son and Wright, Ltd., 173, St. Vincent Street, Glasgow, C.2. Early application is advised, as the supply of gowns is limited, and it is suggested that the gowns be sent to the home address of the individual concerned.

Evening Dress (Tails or Dinner Jacket), with Decorations, is to be worn at the President's Reception, Civic Reception, University Reception, and Annual Dinner. Evening Dress without Decorations should be worn at the Representatives' Dinner, the Representatives' Dance, and the Dance in the Union on July 9.

REGISTRATION FEE

Members attending the Annual Meeting (other than members of the Representative Body and overseas visitors) are required to pay a fee of one guinea towards the expenses of the Meeting. The fee will be payable when members register at the Reception Office.

TICKETS

All tickets for functions up to Sunday, July 4, will be available for Representatives at the A.R.M. Inquiry Office at the Bute Hall, University, on June 30, July 1, 2, and 3, and for ladies at the Ladies' Club, the College Rooms, University.

Tickets for all other functions after Sunday, July 4, will be available from Monday, July 5, at the Reception Office, Kelvin Hall, or at the Ladies' Club.

BADGES

Members will not be admitted to Plenary Sessions, Scientific Sections, or Exhibitions unless wearing badges. They should therefore visit the Reception Office, Kelvin Hall, on the first day of the Annual Meeting to obtain their handbook, badge, registration card, and tickets.

Officers of Scientific Sections and other office-holders should inquire for special badges at the Reception Office.

CAR PARKING

Windscreen labels may be obtained at the Reception Offices, and members bringing their own cars are advised to use these labels to facilitate car parking.

Members staying in hotels in the centre of the city may find it difficult to leave their cars overnight. Adjacent to the Central Hotel there is limited parking accommodation within the Central Station at a charge of 2s. for each 12-hour period, night or day.

THE ALL-DAY CRUISE ON THE FIRTH OF CLYDE

An all-day trip down the Clyde on the largest and most luxurious of the Clyde Fleet, the turbine vessel *Queen Mary II*, has been arranged for Sunday, July 4, commencing at 10.15 a.m. The route to be followed is designed to show visitors the scenic beauties of the Firth of Clyde.

Leaving from the heart of Glasgow at Bridge Wharf, the first stretch of the river to the Tail of the Bank includes

the world-famous Clyde shipyards. Thereafter, in more open waters, the ship will sail through Largs Channel, between the two islands—the Cumbraes—and round the southernmost point of the Island of Bute. Turning north, it will go through the Kyles of Bute, and return to the mainland at Wemyss Bay, passing Toward Point on the way.

A special train will take visitors from Wemyss Bay back to the Central Station, Glasgow, for 6 p.m., in good time for the evening concert.

Lunch and afternoon tea will be provided on board ship. Inclusive ticket: 30s. Except for Representatives, for whom special arrangements are being made, early application is advisable.

HOTEL ACCOMMODATION

Hotel accommodation in and around Glasgow is now very fully booked up. Those who have difficulty in making arrangements are advised to write direct to the *Executive Officer, B.M.A. Glasgow Regional Office*, 234, St. Vincent Street, Glasgow, C.2, stating their exact requirements.

TRAVEL RESERVATIONS

Accommodation on trains and on aircraft between London and Glasgow during July is booked at a very early date. It is advisable to make reservations as soon as possible.

ABERDEEN GRADUATES' DINNER

A dinner arranged by the Glasgow Aberdeen University Association will be held in the North British Hotel, Glasgow, on Saturday, July 3, at 7.30 p.m. Tickets will be 25s. (excluding wines).

All Aberdeen graduates and their ladies attending the Annual Representative Meeting will be welcome. Those intending to be present should apply without any delay to Mr. W. E. S. Thomson, 23, Thorn Drive, Bearsden, Glasgow, for further information.

EDINBURGH GRADUATES' DINNER

The Edinburgh Graduates' Dinner will be held at the Grosvenor Restaurant, 74, Gordon Street, Glasgow, on Saturday, July 3, at 7.30 for 8 p.m. It is hoped that all Edinburgh graduates and their ladies attending the Annual Representative Meeting will be able to be present. Tickets, price 30s. each, inclusive of aperitifs, may be obtained from Dr. J. Cottrell, Flottergate House, Grimsby.

GLASGOW GRADUATES' DINNER

The Glasgow Graduates' Dinner will be held in the Royal Faculty of Physicians and Surgeons of Glasgow, 242, St. Vincent Street, Glasgow, C.2, on Saturday, July 3, at 7 for 7.30 p.m. The dinner is open to Glasgow graduates and their ladies who are attending the Annual Representative Meeting.

The cost is 30s. each, including aperitifs. Numbers are limited, and early application, with appropriate remittance, should be made to Dr. J. C. Macarthur, Roadmeetings House, Carlisle, Lanarkshire.

IRISH GRADUATES' LUNCHEON

The Irish Graduates' Luncheon will be held at the Students' Union, University Avenue, Glasgow, on Wednesday, July 7, at 1 p.m. at a cost of 7s. per person (excluding wine). This luncheon is open to all Irish graduates and their ladies attending the Annual Meeting, and those intending to be present are asked to notify in advance the manager of the Students' Union. No tickets will be issued, and payment will be made at the luncheon.

WELSH DINNER

The Welsh Dinner will be held at the Grosvenor Restaurant, Gordon Street, Glasgow, at 7.30 p.m. on Saturday, July 3. All Welsh representatives, Welsh graduates, and others with Welsh associations, accompanied by their ladies,

will be welcome at this dinner. Tickets will be 30s. per head (exclusive of wines), and those wishing to attend are asked to apply with remittance to Dr. W. F. Anderson, 40, Newlands Road, Glasgow, S.3, before June 26.

CHRISTIAN MEDICAL FELLOWSHIP ANNUAL BREAKFAST

The Annual Breakfast of the Christian Medical Fellowship will be held in the Students' Union, University Avenue, Glasgow, on Wednesday, July 7, at 8.15 a.m. The chairman will be Sir John McNee, and the speaker Mr. Howard Somervell. The proceedings will terminate at 9.15 a.m. Those intending to be present are asked to notify the local secretary, Dr. J. C. Eaton, 19, Boclair Road, Bearsden, Glasgow.

SCIENTIFIC MEETING

PLENARY SESSIONS

The Arena, The Kelvin Hall

Tuesday, July 6, 9.30 a.m.: "The Problem of Sleep"

Chairman: Professor Sir DAVID CAMPBELL (Aberdeen).
Speakers: Professor Sir GEOFFREY JEFFERSON (Manchester), Professor D. M. DUNLOP (Edinburgh), Dr. J. O. McDONAGH (Stanley), Dr. A. H. DOUTHWAITE (London), Dr. MACDONALD CRITCHLEY (London).

Wednesday, July 7, 3 p.m.: "Food and Disease"

Chairman: Dr. W. G. CLARK (Edinburgh).
Speakers: Dr. C. METCALFE BROWN (Manchester), Dr. JOAN TAYLOR (London), Dr. J. S. K. BOYD (London), Professor R. CRUICKSHANK (London), Mr. A. E. BURDETT (London); Professor B. S. PLATT (London).

Thursday, July 8, 9.15 a.m.: "The Problem of Pulmonary Tuberculosis To-day"

Chairman: Sir ANDREW DAVIDSON (Edinburgh).
Speakers: Dr. PETER MCKINLAY (Edinburgh), Dr. A. B. SEMPLE (Liverpool), Dr. J. R. LANGMUIR (Glasgow), Dr. W. D. W. BROOKS (London), Mr. T. HOLMES SELLORS (London), Dr. R. R. TRAIL (London).

SCIENTIFIC SECTIONS

All sessions will be held in the University and details are given of the lecture theatres where the sessions are to be held.

MEDICINE

President: G. E. BEAUMONT, D.M., F.R.C.P., D.P.H. (London).

Vice-Presidents: Professor S. ALSTEAD, M.D., F.R.C.P., F.R.F.P.S. (Glasgow); Professor L. J. DAVIS, M.D., F.R.C.P., F.R.C.P.Ed., F.R.F.P.S., F.R.S.Ed. (Glasgow); Professor S. J. HARTFALL, T.D., M.D., B.Sc., F.R.C.P. (Leeds); W. R. SNODGRASS, M.A., M.D., B.Sc., F.R.F.P.S. (Glasgow).

Hon. Secretaries: JOHN H. HUNT, D.M., M.R.C.P., 54, Sloane Street, London, S.W.1; E. G. OASTLER, T.D., M.A., M.B., Ch.B., F.R.C.P., F.R.F.P.S., 4, Woodside Terrace, Glasgow, C.3.

Official Reporter: Dr. T. PARKINSON.

Sessions

Physiology Lecture Theatre.
Wednesday, July 7.—9.30 a.m., Management of Old Age in General Practice, Dr. TREVOR HOWELL (London). Prevention and Treatment of Respiratory Infection in Old Age, Sir GEOFFREY MARSHALL (London), Dr. NEVILLE OSWALD (London), Dr. T. MCEWAN (Glasgow). Treatment of Parkinsonism, Dr. H. G. GARLAND (Leeds), Dr. H. G. MILLER (Newcastle-upon-Tyne). Treatment of Peripheral Vascular Disease in Old Age, Professor E. J. WAYNE (Glasgow), Pro-

fessor MICHAEL BOYD (Manchester), Dr. W. M. FERGUSON ANDERSON (Glasgow), Dr. O. T. BROWN (Dundee).

Thursday, July 8.—2.30 p.m., Medical Treatment of Hypertension, Dr. GEOFFREY BOURNE (London), Dr. J. GIBSON GRAHAM (Glasgow), Dr. GAVIN SHAW (Glasgow). Anticoagulants in Coronary Thrombosis, Dr. RAE GILCHRIST (Edinburgh), Professor R. B. HUNTER (Dundee), Dr. A. BROWN (Glasgow). Anticoagulants in Thrombophlebitis, Dr. BODLEY SCOTT (London), Mr. R. S. MURLEY (London), Mr. R. B. WRIGHT (Glasgow).

SURGERY

President: Sir HENEAGE OGILVIE, K.B.E., M.A., M.D., M.Ch., F.R.C.S. (London).

Vice-Presidents: JOHN DUNBAR, M.B., F.R.F.P.S. (Glasgow); Professor C. F. W. ILLINGWORTH, C.B.E., M.D., Ch.M., F.R.C.S.Ed., F.R.F.P.S. (Glasgow); T. MURRAY NEWTON, M.B., F.R.F.P.S. (Glasgow); Sir ARTHUR PORRITT, K.C.M.G., C.B.E., M.Ch., F.R.C.S., LL.D. (London).

Hon. Secretaries: A. B. KERR, O.B.E., T.D., M.B., F.R.F.P.S., F.R.C.S.Ed., 5, La Belle Place, Glasgow, C.3; IAN M. ORR, O.B.E., M.D., Ch.M., F.R.C.S.Ed., Brooklands, Garstang, Preston, Lancs.

Official Reporters: Mr. R. S. MURLEY (July 7); Dr. G. W. HAYWARD (July 8).

Sessions

Zoology Lecture Theatre.
Wednesday, July 7.—9.30 a.m., The Surgical Treatment of Peptic Ulcer. Panel discussion: Mr. JOHN BRUCE (Edinburgh), Mr. R. L. HOLT (Manchester), Professor C. F. W. ILLINGWORTH (Glasgow), Dr. F. AVERY JONES (London). *Short Papers:* The Effects of Pregnancy and the Menopause on the Course of Peptic Ulcer, Mr. DOUGLAS H. CLARK (Glasgow); Cartilage Implants in Surgical Repair, Mr. THOMAS GIBSON (Glasgow).

Thursday, July 8.—2.30 p.m. (Joint Meeting with the Section of Cardiology), Surgery in the Treatment of Mitral Stenosis, Professor W. A. MACKEY (Glasgow), Dr. MAURICE CAMPBELL (London), Dr. R. W. D. TURNER (Edinburgh), Mr. P. R. ALLISON (Leeds). Arterial Grafting, Mr. H. G. EASTCOTT (London), Mr. W. P. CLELAND (London).

OBSTETRICS AND GYNAECOLOGY

President: Professor R. A. LENNIE, T.D., M.D., F.R.F.P.S., F.R.C.O.G. (Glasgow).

Vice-Presidents: ROBERT M. CORBET, M.B., M.A.O., F.R.C.P.I., F.R.C.S.I., F.R.C.O.G. (Preston), DAVID W. CURRIE, M.D., Ch.M., F.R.C.S., F.R.C.O.G. (Leeds); W. F. T. HAULTAIN, O.B.E., M.C., B.A., M.B., F.R.C.P.Ed., F.R.C.S.Ed., F.R.C.O.G. (Edinburgh); JOHN HEWITT, M.B., F.R.F.P.S., F.R.C.O.G. (Glasgow); Professor G. GORDON LENNON, M.B., Ch.M., F.R.C.O.G., M.M.S.A. (Bristol).

Hon. Secretaries: R. MURDOCH, T.D., M.B., M.R.C.O.G., 16, Lilybank Gardens, Glasgow, W.2; R. B. K. RICKFORD, M.D., F.R.C.S., F.R.C.O.G., St. Thomas's Hospital, London, S.E.1.

Official Reporter: Mr. S. BENDER.

Sessions

Botany Lecture Theatre.
Wednesday, July 7.—9.30 a.m., Management of Labour in Contracted Pelvis, Dr. H. R. MACLENNAN (Glasgow), Professor W. I. C. MORRIS (Manchester), Dr. J. BRUCE DEWAR (Dumfries). Early Recognition of Cancer of the Uterus, Dr. R. M. CORBET (Preston), Professor G. GORDON LENNON (Bristol), Professor H. C. McLAREN (Birmingham), Miss M. E. ATTWOOD (Birmingham).

Thursday, July 8.—2.30 p.m., Indications for Induction of Labour, Dr. R. A. TENNENT (Glasgow), Mr. MASLEN-JONES (Wolverhampton), Mr. LESLIE PATRICK (Sheffield). Endometriosis, Mr. LESLIE WILLIAMS (London), Dr. JOHN STURROCK (Edinburgh), Mr. W. HAWKSWORTH (Oxford).

ANAESTHETICS

President: JOHN GILLIES, C.V.O., M.C., F.R.C.S.Ed., M.R.C.P.Ed., F.F.A.R.C.S., D.A. (Edinburgh).

Vice-Presidents: H. H. PINKERTON, M.B., F.R.F.P.S., F.F.A.R.C.S., D.A. (Glasgow); F. G. WOOD-SMITH, M.B., F.F.A.R.C.S., D.A. (London).

Hon. Secretaries: W. AUKIN, M.R.C.S., L.R.C.P., D.A., Wyncroft, 35, Gladhow Wood Road, Leeds, 8; I. M. CAMPBELL DEWAR, M.B., F.F.A.R.C.S., 57, Kelvinside Gardens, Glasgow, N.W.

Official Reporter: Dr. GEORGE ELLIS.

Session

Physiology Lecture Theatre.

Friday, July 9.—2 p.m., Medico-Legal Hazards in Anaesthesia, Professor W. W. MUSHIN (Cardiff), Mr. W. MAIR, B.L., LL.B. (Glasgow). *Occasional Papers:* Hand Blood Flow During Sleep, Dr. I. D. FERGUSON and Mr. A. PRINGLE, B.Sc. (Glasgow); Hand Blood Flow During Anaesthesia, Dr. A. C. FORRESTER (Glasgow); The Effects of Spontaneous and Artificial Pulmonary Ventilation on the Alveolar Carbon Dioxide Content in Man under Thiopentone Anaesthesia with Muscle Relaxant Drugs, Dr. R. P. HARBORD (Leeds); Second Thoughts on Neonatal Anaesthesia, Dr. G. JACKSON REES (Liverpool). *Film:* The Circulatory Effects of Artificial Respiration, Dr. E. TRIER MØRCH (Chicago, U.S.A.).

CARDIOLOGY

President: J. H. WRIGHT, J.P., M.D., F.R.C.P.Ed., F.R.F.P.S. (Glasgow).

Vice-Presidents: I. MACPHERSON, M.D., F.R.C.P. (Leeds); ALBERT A. F. PEEL, M.A., D.M., F.R.F.P.S. (Glasgow); K. SHIRLEY SMITH, M.D., B.Sc., F.R.C.P. (London).

Hon. Secretaries: G. J. AITKEN, M.B., B.Sc., F.R.F.P.S., 31, Kenmuir Avenue, North Mount Vernon, Glasgow, E.2; C. J. GAVEY, M.D., F.R.C.P., 106, Harley Street, London, W.1.

Official Reporter: Dr. G. W. HAYWARD.

Sessions

Zoology Lecture Theatre.

Thursday, July 8.—2.30 p.m. (Joint Meeting with the Section of Surgery), Surgery in the Treatment of Mitral Stenosis, Professor W. A. MACKAY (Glasgow), Dr. MAURICE CAMPBELL (London), Dr. R. W. D. TURNER (Edinburgh), Mr. P. R. ALLISON (Leeds). *Arterial Grafting*, Mr. H. G. EASTCOTT (London), Mr. W. P. CLELAND (London).

Physiology Lecture Theatre.

Friday, July 9.—9.30 a.m., Coronary Artery Disease: (1) The Aetiology of Coronary Artery Disease, Professor J. B. DUQUID (Newcastle-upon-Tyne); (2) The Significance of Cholesterol in the Causation of Atheroma and Coronary Artery Disease, Dr. T. D. V. LAWRIE (Glasgow); (3) Electrocardiography in Coronary Artery Disease, Dr. WILLIAM EVANS (London); (4) The Use of Oestrogens in the Treatment of Coronary Artery Disease, Dr. M. F. OLIVER (Edinburgh); (5) Treatment of Shock in Myocardial Infarction, Dr. K. SHIRLEY SMITH (London).

CHILD HEALTH

President: Professor STANLEY G. GRAHAM, M.D., F.R.C.P.Ed., F.R.F.P.S. (Glasgow).

Vice-Presidents: P. R. EVANS, M.D., M.Sc., F.R.C.P. (London); Professor J. L. HENDERSON, M.D., F.R.C.P.Ed. (Dundee); BERNARD E. SCHLESINGER, O.B.E., M.D., F.R.C.P. (London); MATTHEW WHITE, M.B., F.R.C.S.Ed., F.R.F.P.S. (Glasgow).

Hon. Secretaries: J. H. HUTCHISON, O.B.E., M.D., F.R.C.P., F.R.F.P.S., 21, Victoria Park Gardens North, Glasgow, W.1; A. P. NORMAN, M.B.E., M.D., M.R.C.P., D.C.H., Institute of Child Health, the Hospital for Sick Children, Great Ormond Street, London, W.C.1.

Official Reporter: Dr. P. R. EVANS.

Sessions

Natural Philosophy Lecture Theatre (new building).

Wednesday, July 7.—9.30 a.m., Recent Views on the Aetiology and Treatment of Marasmus: A General Survey of the Problem, Professor J. M. SMELLIE (Birmingham); The Social Aspects of Marasmus, Professor W. S. CRAIG (Leeds); Feeding Difficulties in Marasmus and their Correction, Professor R. W. B. ELLIS (Edinburgh); Renal Acidosis and Idiopathic Hypercalcaemia, Dr. REGINALD LIGHTWOOD (London); Fibrocystic Disease of the Pancreas, Dr. R. A. SHANKS (Glasgow). *Acute Haematogenous Osteitis: The Changing Picture*, Mr. MATTHEW WHITE (Glasgow); *The Diagnosis of Osteitis*, Dr. G. A. NELIGAN (Newcastle); *The Treatment of Osteitis*, Mr. J. S. MASON BROWN (Edinburgh); *Osteitis in the Newborn*, Mr. R. B. ZACHARY (Sheffield); *The Choice of Antibiotics in Osteitis*, Dr. I. A. B. CATHIE (London).

Thursday, July 8.—2.30 p.m., The Care and Management of the Epileptic Child: Epilepsy as a Social Problem, Dr. J. ROMANES DAVIDSON (Bridge of Weir); Disturbances of Behaviour in Epileptic Children, Dr. DESMOND A. POND (London); The Medical Treatment of Epilepsy, Dr. J. P. M. TIZARD (London); The Surgical Aspects of Epilepsy, Mr. F. J. GILLINGHAM (Edinburgh).

DERMATOLOGY

President: BRIAN F. RUSSELL, M.D., F.R.C.P., D.P.H. (London).

Vice-Presidents: F. F. HELLIER, O.B.E., M.A., M.D., F.R.C.P. (Leeds); J. FERGUSON SMITH, M.A., M.D., F.R.F.P.S. (Glasgow); JAMES SOMMERVILLE, M.B., F.R.F.P.S. (Glasgow); H. J. WALLACE, M.A., M.D., F.R.C.P. (London).

Hon. Secretaries: A. GIRDWOOD FERGUSSON, M.D., F.R.F.P.S., 3, Ashton Road, Glasgow, W.2; I. B. SNEDDON, M.B., M.R.C.P., 4, Claremont Place, Sheffield, 10.

Official Reporter: Dr. J. T. INGRAM.

Session

Dermatology Lecture Theatre.

Friday, July 9.—9.30 a.m., The Preventive Aspect of Dermatitis and Allied Disorders, Dr. F. F. HELLIER (Leeds), Dr. G. A. HODGSON (Cardiff), Dr. C. N. D. CRUICKSHANK (Birmingham), Dr. E. COLLIER (Glasgow). *Occasional Papers:* Otitis Externa, Mr. C. A. KEOGH (London); Treatment of Haemangiomas, Dr. W. L. LISTER (Plymouth). 2.30 p.m., Demonstration of Clinical Cases.

FORENSIC MEDICINE

President: Professor JOHN GLAISTER, M.D., D.Sc., F.R.F.P.S., F.R.S.Ed., Barrister-at-Law (Glasgow).

Vice-Presidents: FRANCIS E. CAMPS, M.D., D.T.M.&H. (London); Professor CYRIL J. POLSON, M.D., F.R.C.P., Barrister-at-Law (Leeds); R. DONALD TEARE, M.A., M.D., M.R.C.P. (London).

Hon. Secretaries: GILBERT FORBES, M.D., B.Sc., F.R.C.S.Ed., F.R.F.P.S., Department of Forensic Medicine, The University, Sheffield, 10; J. A. IMRIE, M.D., F.R.C.S.Ed., Police Headquarters, 21, St. Andrew's Street, Glasgow, C.1.

Official Reporter: Dr. GILBERT FORBES.

Session

Chemistry Lecture Theatre.

Friday, July 9.—2 p.m., Forensic Medicine in Relation to the General Public, Professor D. J. A. KERR (Edinburgh) and Mr. HECTOR MCKECHNIE, Q.C. (Edinburgh); Forensic Psychiatry, Dr. J. C. M. MATHESON (London); Forensic Pathology, Professor CYRIL J. POLSON (Leeds); Police Surgeons Dr. J. A. IMRIE (Glasgow) and Dr. RALPH SUMMERS (London); Forensic Chemistry, Mr. MAGNUS HERD (Glasgow).

MICROBIOLOGY AND PATHOLOGY

President: Professor D. F. CAPPELL, M.D., F.R.F.P.S., F.R.S.Ed. (Glasgow).

Vice-Presidents: Professor ROBERT CRUICKSHANK, M.D., F.R.C.P., D.P.H. (London); Professor J. W. HOWIE, M.D., (Glasgow); Professor G. L. MONTGOMERY, M.D., Ph.D., F.R.F.P.S. (Glasgow).

Hon. Secretaries: H. E. HUTCHISON, M.D., Department of Pathology, Western Infirmary, Glasgow, W.1; JOAN TAYLOR, M.B., D.P.H., Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Official Reporter: Dr. IAN TAYLOR.

Session

Chemistry Lecture Theatre.

Wednesday, July 7.—9.30 a.m. (Joint Session with Section of Preventive Medicine and Infectious Diseases), Poliomyelitis: Recent Advances in Knowledge of the Virus, Dr. ALLAN P. GOFFE (London); Epidemiology, Dr. W. H. BRADLEY (London); The Acute Case, with Special Reference to Respiratory Failure, Dr. A. B. CHRISTIE (Liverpool).

NEUROLOGY

President: MACDONALD CRITCHLEY, M.D., F.R.C.P. (London).

Vice-Presidents: WYLIE MCKISSOCK, O.B.E., M.S., F.R.C.S. (London); D. W. C. NORTHFIELD, M.S., F.R.C.S. (London); J. ERIC PATERSON, M.B., F.R.F.P.S. (Glasgow); JOHN D. SPILLANE, M.D., F.R.C.P. (Cardiff).

Hon. Secretaries: A. M. G. CAMPBELL, D.M., F.R.C.P., 79, Pembroke Road, Bristol; J. S. M. ROBERTSON, M.B., F.R.C.S., 23, Kingsborough Gardens, Glasgow, W.2.

Official Reporter: Dr. C. W. M. WHITTY.

Session

Botany Lecture Theatre.

Friday, July 9.—2 p.m., Symposium on Occupational Neurological Diseases. Pressure Neuropathy, Dr. H. G. GARLAND (Leeds); Metallic Poisons and the Nervous System, Dr. J. W. ALDREN TURNER (London); Damage to the Nervous System from Gas Poisoning, Dr. R. S. ALLISON (Belfast); The New Insecticides and the Nervous System, Dr. A. M. G. CAMPBELL (Bristol). *Cerebral Abscess*, Mr. J. E. PATERSON (Glasgow); Mr. W. S. LEWIN (Oxford).

OCCUPATIONAL HEALTH

President: Professor THOMAS FERGUSON, C.B.E., M.D., D.Sc., F.R.C.P.Ed., D.P.H., F.R.F.P.S. (Glasgow).

Vice-Presidents: H. ALEXANDER, M.B., D.P.H. (London); JOHN CRAW, M.B., F.R.F.P.S. (Whitehaven); J. J. O'DWYER, C.B.E., M.D., D.P.H. (London).

Hon. Secretaries: GEO. BUCHANAN, B.L., L.R.F.P.S., D.P.H., D.P.A., D.T.M.&H., D.I.H., 28, Langside Drive, Newlands, Glasgow, S.3; M. E. M. HERFORD, D.S.O., M.C., M.B.E., M.B., D.P.H., Ferneham, Farnham Royal, Bucks.

Official Reporter: Mr. S. J. H. MILLER.

Session

Ophthalmology Lecture Theatre.

Friday, July 9.—9.30 a.m. (Joint Session with the Section of Ophthalmology), The Employment of the Visually Handicapped, Dr. WILLIAM HUNTER (Glasgow), Visually Handicapped, Dr. WILLIAM HUNTER (Glasgow), Short papers related to the same subject will also be read by Dr. JAMES H. BELL (Glasgow), Dr. M. E. M. HERFORD (Slough)—Eye Defects of School-leavers, Dr. ARCHIBALD R. MILLER (Glasgow), and Mr. JOHN T. STEWART (Glasgow).

OPHTHALMOLOGY

President: Professor W. J. B. RIDDELL, M.D., F.R.F.P.S., F.R.S.Ed. (Glasgow).

Vice-Presidents: C. DEE SHAPLAND, M.B., M.R.C.P., F.R.C.S. (London); S. S. SUMNER, M.B., F.R.C.S.Ed. (Preston).

Hon. Secretaries: R. LEISHMAN, M.D., 11, Sandyford Place, Glasgow, C.3; S. J. H. MILLER, M.D., F.R.C.S., 21, Wimpole Street, London, W.1.

Official Reporter: Mr. S. J. H. MILLER.

Sessions

Ophthalmology Lecture Theatre.

Friday, July 9.—9.30 a.m. (Joint Session with the Section of Occupational Health), The Employment of the Visually Handicapped, Dr. WILLIAM HUNTER (Glasgow), Dr. EDWIN GORDON MACKIE (Sheffield). Short Papers related to the same subject will also be read by Dr. JAMES H. BELL (Glasgow), Dr. M. E. M. HERFORD (Slough)—Eye Defects of School-leavers, Dr. ARCHIBALD R. MILLER (Glasgow) and Mr. JOHN T. STEWART (Glasgow).

Friday, July 9.—2 p.m., Ocular Headache, Professor W. J. B. RIDDELL (Glasgow). *Occasional Papers:* Trachoma in Glasgow—Paper by the late Dr. S. SPENCE MEIGHAN to be read by Dr. D. CHRISTISON (Glasgow); Field Defects in Disseminated Sclerosis, Dr. R. J. MCWILLIAM (Glasgow).

ORTHOPAEDICS

President: Emeritus Professor Sir HARRY PLATT, M.D., M.S., F.R.C.S., F.A.C.S. (Manchester).

Vice-Presidents: ROLAND BARNES, F.R.C.S., F.R.F.P.S. (Glasgow); H. E. HARDING, F.R.C.S. (London); JAMES PATRICK, M.B., F.R.C.S. (Glasgow); Professor GEORGE PERKINS, M.C., M.Ch., F.R.C.S. (London).

Hon. Secretaries: J. G. BONNIN, M.B., F.R.C.S., Central Middlesex Hospital, Park Royal, London, N.W.10; ATHOL R. PARKES, M.B., F.R.C.S.Ed., Western Infirmary, Glasgow, W.1.

Official Reporter: Mr. J. G. BONNIN.

Session

Chemistry Lecture Theatre.

Friday, July 9.—9.30 a.m., Symposium on Poliomyelitis. The Management of the Infectious Phase of Poliomyelitis, Dr. T. ANDERSON (Glasgow); The Prevention of Deformity, Mr. J. M. P. CLARK (Leeds); The Flail and Shortened Limb, Mr. ROBERT ROAF (Liverpool). *Occasional Papers:* Treatment of Hallux Valgus by Arthrodesis, Mr. A. MACDOUGALL (Glasgow); Penicillin Nerve Lesions, Mr. A. R. PARKES (Glasgow).

PHYSICAL MEDICINE

President: W. S. TEGNER, B.M., B.Ch., F.R.C.P. (London).

Vice-Presidents: P. BAUWENS, M.R.C.S., L.R.C.P. (London); H. A. BURT, M.A., M.B., B.Ch., F.R.C.P. (London); DONALD WILSON, M.B., B.S., M.R.C.P. (Chichester).

Hon. Secretaries: A. C. BOYLE, M.D., M.R.C.P., D.Phys.Med., Department of Physical Medicine, the Middlesex Hospital, W.1; T. N. FRASER, M.D., F.R.C.P., F.R.F.P.S., 112, Southbrae Drive, Glasgow, W.3.

Official Reporter: Dr. A. C. BOYLE.

Session

Zoology Lecture Theatre.

Friday, July 9.—2 p.m., Recent Developments in Rehabilitation, Group Captain C. J. S. O'MALLEY (London), Dr. F. S. COOKSEY (London), Lieutenant-Colonel J. FRASER (Inverness). Management of Degenerative Joint Disease, Dr. H. A. BURT (London), Dr. LOGIE S. BAIN (Aberdeen), Dr. DONALD WILSON (Chichester). Electro-Diagnosis, Professor A. E. RITCHIE (St. Andrews), Dr. A. T. RICHARDSON (London), Squadron Leader C. B. WYNN PARRY (Farnham Common).

PREVENTIVE MEDICINE AND INFECTIOUS DISEASES

President: T. ANDERSON, M.D., F.R.C.P.Ed., F.R.F.P.S. (Glasgow).

Vice-Presidents: C. METCALFE BROWN, M.D., D.P.H., Barrister-at-Law (Manchester); S. C. GAWNE, M.D., B.S., M.R.C.S., L.R.C.P., D.C.H., D.P.H., Barrister-at-Law (Liverpool); STUART LAIDLAW, J.P., O.St.J., M.D., B.Sc., F.R.F.P.S., D.P.H., B.L., D.P.A. (Glasgow); LLYWELYN ROBERTS, M.D., M.R.C.P., D.P.H. (Sheffield).

Hon. Secretaries: JAMES H. LAWSON, M.D., D.P.H., Ruchill Fever Hospital, Glasgow, N.W.; J. B. S. MORGAN, M.B., B.Sc., M.R.C.S., D.P.H., County Health Department, County Offices, St. Mary's Gate, Derby.

Official Reporter: Dr. IAN TAYLOR.

Sessions

Chemistry Lecture Theatre.

Wednesday, July 7.—9.30 a.m. (Joint Session with Section of Microbiology and Pathology). Poliomyelitis: Recent Advances in Knowledge of the Virus, Dr. ALLAN P. GOFFE (London); Epidemiology, Dr. W. H. BRADLEY (London); The Acute Case, with Special Reference to Respiratory Failure, Dr. A. B. CHRISTIE (Liverpool).

Thursday, July 8.—2.30 p.m., The Epidemiology of Non-Infectious Diseases: The Epidemiological Method, Dr. J. N. MORRIS (London); The Epidemiology of Old Age, Dr. W. FERGUSON ANDERSON (Glasgow); The Epidemiological Approach to Obstetric Medicine, Dr. ANGUS M. THOMSON (Aberdeen); The Role of the Medical Officer of Health, Dr. JOHN RIDDELL (Edinburgh).

PSYCHIATRY

President: Professor T. FERGUSON RODGER, M.B., F.R.C.P.Ed. (Glasgow).

Vice-Presidents: MURIEL BARTON HALL, M.D., Ch.B. (Liverpool); Professor ALEXANDER KENNEDY, M.D., F.R.C.P. (Newcastle-upon-Tyne); DAVID YELLOWLEES, M.B., Ch.B. (Glasgow).

Hon. Secretaries: T. C. N. GIBBENS, M.D., D.P.M., Institute of Psychiatry, Maudsley Hospital, Denmark Hill, London, S.E.5; HUNTER GILLIES, M.D., F.R.C.P.Ed., D.P.M., Psychiatric Unit, Stobhill General Hospital, Glasgow, N.

Official Reporter: Professor A. KENNEDY.

Session

Natural Philosophy Lecture Theatre (new building).

Friday, July 9.—9.30 a.m., Depression: The Diagnosis of Depression, Dr. W. MAYER-GROSS (Dumfries); The Risks of Suicide in States of Depression, Dr. E. STENGEL (London); The Treatment of Depression, Dr. I. R. C. BATCHELOR (Edinburgh); The Rationale of Electrical Convulsion Treatment, Dr. D. A. POND (London); Failures with Electrical Convulsion Treatment, Dr. J. L. CAMERON (Glasgow); The Effects of Depression on Industrial Efficiency, Dr. M. MARKOWE (London); Depression in Relation to Crime, Dr. J. C. M. MATHESON (London).

RADIOLOGY

President: Professor B. W. WINDEYER, M.B., B.S., F.R.C.S., F.F.R., D.M.R.E. (London).

Vice-Presidents: Professor ROBERT MCWHIRTER, F.R.C.S.Ed., F.F.R., F.R.S.Ed. (Edinburgh); JOHN R. NUTTALL, M.D., F.F.R., D.M.R. (Leeds); S. D. SCOTT PARK, M.B., Ch.B., D.M.R.E. (Glasgow).

Hon. Secretaries: DAVID STENHOUSE, M.B., F.R.F.P.S., F.F.R., D.M.R., X-ray Department, McAlpin Nursing Home, 121, Hill Street, Glasgow, C.3; J. J. STEVENSON, M.D., D.M.R., The Royal Cancer Hospital, Fulham Road, London, S.W.3.

Official Reporter: Dr. A. E. JONES.

Session

Natural Philosophy Lecture Theatre (new building).

Friday, July 9.—2 p.m., Carcinoma of Bladder, Mr. A. H. JACOBS (Glasgow), Dr. G. W. BLOMFIELD (Sheffield). Leukaemia, Dr. R. BODLEY SCOTT (London), Dr. A. A. CHARTERIS (Glasgow), Dr. S. P. RAWSON (Glasgow).

SCIENTIFIC EXHIBITION

Kelvin Hall, July 5-9

The Exhibition will be open each day at 9 a.m. and will close on the first three days at 6 p.m. and on the last two at 5 p.m.

The following list gives brief details of the exhibit:

Royal Samaritan Hospital for Women and the Royal Infirmary, Glasgow. Diagnostic survey of the infertile marriage.

Department of Ophthalmology, University of Glasgow. Eye changes in vascular disease with examples of clinical retinal photographs.

Scottish National Blood Transfusion Association, Edinburgh. Economical production in the laboratory of useful plasma fractions and illustrations of their use.

Department of Pharmacology and Therapeutics, University of Sheffield; National Centre of Radiotherapy, Sheffield; Department of Medicine, University of Glasgow. Royal Infirmary; and Department of Therapeutics, University of Edinburgh. The role of radioactive iodine in modern medicine.

Departments of Pathology and Surgery, Glasgow Royal Infirmary. Phaeochromocytosis—clinical aspects, diagnosis by adrenergic blocking drugs, treatment, and pathology, with special reference to malignancy.

Department of Anaesthesia, Glasgow Royal Infirmary. Hand plethysmography unit for use during surgical anaesthesia, with charts illustrating results.

Department of Child Health, University of Glasgow, and Hospital for Sick Children, Glasgow. (1) Radioactive iodine studies in familial cretinism. (2) Chromatography, bio-assay, and electrophoresis in the hormone treatment of nephrosis. (3) Fibrocystic disease of the pancreas.

Department of Health for Scotland. Statistical presentation of certain topics within the interest of the department. Rowett Research Institute, Bucksburn, Aberdeenshire. The skeleton in lactation.

Department of Dermatology, Leeds General Infirmary. Some mycotic infections of the smooth skin and nails.

Department of Child Health, University of Sheffield. Tuberculous meningitis.

Nuffield Department of Clinical Medicine, Radcliffe Infirmary, Oxford. The stomach in anaemia: (1) histology; (2) studies on the intrinsic factor of Castle; and (3) estimation of pepsin and uropepsinogen.

Nuffield Orthopaedic Centre, Oxford. (1) The aetiology of osteoarthritis of the hip. (2) Research on the clinical characteristics of scoliosis.

Departments of Medical Art, Neuroradiology, and Neurosurgery, Manchester Royal Infirmary. The radiological diagnosis of brain tumour.

Crichton Royal Hospital, Dumfries. Demonstration of modern techniques in child psychiatry.

Department of Psychological Research, Crichton Royal Hospital, Dumfries. Demonstration of psychometric testing.

Department of Psychological Medicine, King's College Medical School, Newcastle-upon-Tyne, and Biophysics Unit, Crichton Royal Hospital, Dumfries. Portable E.E.G. equipment.

The National Maternity Hospital, Dublin. Medical conditions complicating pregnancy.

Cancer Research Department, Royal Beatson Memorial Hospital, Glasgow. (1) Atmospheric pollution tests for (a) arsenic, (b) benzpyrene, (c) radioactivity. (2) Analysis of tobacco smoke. (3) Liver cancer in animals.

Urological Units, Victoria Infirmary, Glasgow, and Hairmyres Hospital, Lanarkshire. (1) Prostatic obstruction.

(2) Carcinoma of bladder. (3) Cases of aberrant ureter in the female causing incontinence.

Department of Pathology, Glasgow Royal Infirmary. The effect of A.C.T.H. and cortisone on repair of lesions induced experimentally in animals—for example, in peptic ulceration, hepatic cirrhosis, and quartz granuloma.

Department of Pathology, Glasgow Royal Infirmary. Pituitary and adrenal changes in pathological conditions of man and animals.

Royal Infirmary, Glasgow. Mitral disease. Pre-operation investigation, especially cardiac catheterization and auricular puncture. Comparison of operation findings with pre-operation assessment. Post-operation assessment. Auricular biopsy findings. Pathological specimens showing complications of interest.

Department of Infectious Diseases, University of Glasgow, and Public Health Department, City of Glasgow. (1) Statistics of the City of Glasgow for acute respiratory diseases during the last 25 years. (2) Results of bacteriological examination. (3) Results of virological examination. logical examination. (3) Results of virological examination. Department of Pathology, Western Infirmary, Glasgow.

Studies on iron metabolism in man and experimental animals, illustrated by colour photography.

Royal Army Medical College. Mite-borne (scrub) typhus.

National Coal Board Medical Service. Research into the physiological and psychological effects of work in hot and humid atmospheres.

The Royal Cancer Hospital, London. Demonstration of cancer of the breast.

St. Bartholomew's Hospital, London, and the Royal Cancer Hospital. Portal hypertension; distribution, effect of different treatments on prognosis, liver function, blood counts.

Rehabilitation Committee of B.M.A.; Ministry of Labour. Scope and facilities for rehabilitation.

Food Hygiene Laboratory of the Central Public Health Laboratory, Colindale. Bacterial food-poisoning and other food-borne disease.

The Wright-Fleming Institute of Microbiology, St. Mary's Hospital, London. Demonstration of basic mechanisms of immediate (pollen) and delayed (tuberculin) reactions and their clinical significance.

British European Airways, with the Scottish Air Ambulance Scheme of the Department of Health for Scotland. Medical aspects of the Highlands and Islands Air Ambulance Service.

Royal Air Force, Directorate General of Medical Services. Recent advances in electrodiagnosis and electrotherapy.

Royal Navy (Royal Naval Personnel Research Committee). Naval Life Saving Committee, and Director of Victualling. Advances made since the 1939-45 war on survival at sea and cold- and foul-weather clothing.

SPECIAL EXHIBITIONS

Kelvin Hall, July 5-9

Royal Faculty of Physicians and Surgeons of Glasgow. Glasgow in the history of medicine.

Pharmaceutical Society of Great Britain. Recent advances in pharmaceutical science; objects of historical interest.

Royal Photographic Society, Medical Group. One hundred years of medical photography.

Ministry of Labour and National Service. The rehabilitation and resettlement of the disabled.

EXHIBITION OF PHARMACEUTICAL PRODUCTS, INSTRUMENTS, APPLIANCES, AND MEDICAL PUBLICATIONS

Kelvin Hall, July 5-9 (Open 9 a.m.-6 p.m. each day)

EXHIBITORS

- Stand No.
1.—Messrs. Down Bros. and Mayer and Phelps, Ltd., Chiron House, 32-34, New Cavendish Street, London, W.1.
2.—Genito Urinary Manufacturing Co. Ltd., 28, Devonshire Street, London, W.1.

- 3 and 4.—Messrs. H. K. Lewis and Co. Ltd., 136, Gower Street, W.C.1.
5.—Messrs. Paines and Byrne Ltd., Pabym Laboratories, Greenford, Middlesex.
6.—Messrs. A. L. Simpkin and Co. Ltd., Hunter Road, Sheffield, 6.
7.—The Camden Chemical Co. Ltd., 61, Gray's Inn Road, London, W.C.1.
8.—The British Medical Association.
10.—National Association for the Prevention of Tuberculosis, Tavistock House, Tavistock Square, London, W.C.1.
11.—Family Doctor, B.M.A. House, Tavistock Square, London, W.C.1.
12.—Wright, Layman and Umney, 42-50, Southwark Street, S.E.1.
13.—Messrs. Airmed Ltd., East Industrial Estate, Harlow, Essex.
14.—Oxford University Press, Press Road, Neasden, London, N.W.10.
15.—Cambridge Instrument Co. Ltd., 13, Grosvenor Place, London, S.W.1.
16.—Roche Products Ltd., 15, Manchester Square, London, W.1.
17.—Messrs. May and Baker, Ltd., Dagenham, Essex.
18.—Messrs. Glaxo Laboratories Ltd., 963, Greenford Road, Greenford, Middlesex.
19.—Messrs. S. H. Camp and Co. Ltd., 19, Hanover Square, London, W.1.
20.—Board of Registration of Medical Auxiliaries, Tavistock House North, Tavistock Square, London, W.C.1.
21.—Messrs. Eli Lilly and Co. Ltd., Basingstoke, Hants.
22.—Messrs. Menley and James, Ltd., Coldharbour Lane, S.E.5.
23 and 24.—Messrs. Pfizer Ltd., 137-139, Sandgate Road, Folkestone, Kent.
25.—Messrs. Chas. F. Thackray Ltd., 10, Park Street, Leeds, 1.
26.—Messrs. G. D. Searle and Co. Ltd., 17, Manchester Street, W.1.
27.—E.M.I. Sales Service Ltd., Hayes, Middlesex.
28.—The Ethicon Suture Laboratories Ltd., Bankhead Avenue, Sighthill, Edinburgh, 11.
29.—Messrs. Benger Laboratories Ltd., Holmes Chapel, Cheshire.
30.—British Oxygen Co. Ltd., Medical Division, Great West Road, Brentford, Middlesex.
31.—Messrs. Duncan, Flockhart and Co. Ltd., 104, Holyrood Road, Edinburgh, 8.
32.—Messrs. Boots Pure Drug Co. Ltd., Station Street, Nottingham.
33.—Messrs. Burroughs Wellcome and Co., 183-193, Euston Road, London, N.W.1.
34.—Distillers Company (Biochemicals) Ltd., Fleming Road, Speke, Liverpool, 19.
35.—The Crookes Laboratories Ltd., Gorset Road, Park Royal, N.W.10.
36.—British Drug Houses Ltd., Graham Street, City Road, London, N.1.
39.—Ciba Laboratories Ltd., Horsham, Sussex.
40.—Sandoz Products Ltd., 134, Wigmore Street, London, W.1.
41.—Calmic Ltd., Crewe Hall, Crewe.
42.—Messrs. Smith and Nephew Ltd., Tewin Road, Welwyn Garden City, Herts.
43.—Don S. Momand Ltd., 58, Albany Street, N.W.1.
44.—Lederle Laboratories Division, Cyanamid Products Ltd., Bush House, Aldwych, London, W.C.2.
45.—Messrs. Allen and Hanburys Ltd., Bethnal Green, London, E.2.
46.—Messrs. Parke, Davis and Co. Ltd., Staines Road, Hounslow, Middlesex.
47.—Imperial Chemical (Pharmaceuticals) Ltd., Fulshaw Hall, Wilmslow, Manchester.
48.—Messrs. Cow and Gate Ltd., Guildford, Surrey.
49.—Westminster Bank Ltd., 41, Lothbury, London, E.C.1.
50.—Messrs. Reckitt and Colman Ltd., Dansom Lane, Hull.
51.—London Hospital (Ligature Department) Ltd., London Hospital, Whitechapel Road, London, E.1.
52.—Messrs. Butterworth and Co. (Publishers) Ltd., 88, Kingsway, London, W.C.2.
53.—Phillips Electrical Ltd., Century House, Shaftesbury Avenue, London, W.C.2.
54.—Messrs. John Wyeth and Bro. Ltd., Clifton House, Euston Road, W.C.1.
55.—Energen Foods Co. Ltd., Willesden, London, N.W.10.
56.—The Scholl Manufacturing Co. Ltd., 182-204, St. John Street, London, E.C.1.
57.—Medical Insurance Agency Ltd., B.M.A. House, Tavistock Square, W.C.1.
58.—Messrs. Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.

- 59.—Lucocade Ltd., Great West Road, Brentford, Middlesex.
62.—Organon Laboratories Ltd., Brettenham House, Lancaster Place, W.C.2.
63.—Messrs. C. L. Bencard Ltd., Minerva Road, London, N.W.10.
64.—Messrs. Baillière, Tindall and Cox, Ltd., 7 and 8, Henrietta Street, Covent Garden, London, W.C.2.
66.—Messrs. John Smith and Son (Glasgow) Ltd., 26-30, Gibson Street, Hillhead, Glasgow, W.2.
67.—Messrs. E. Hutchings and Co., Ltd., 18, Charterhouse Square, E.C.1.
68.—Messrs. E. and S. Livingstone Ltd., 16-17, Teviot Place, Edinburgh, 1.
69.—Messrs. Edward Taylor Ltd., Monton, Eccles, Manchester.
76.—Messrs. Oxygeneire (London) Ltd., 8, Duke Street, Wigmore Street, W.1.
77.—Marburn, Ltd., 25, Red Lion Street, W.C.1.
78.—Remploy Ltd., Advertising Department, 25, Buckingham Gate, London, S.W.1.
79.—Ortho Pharmaceuticals Ltd., Lane End, High Wycombe, Bucks.

TIME-TABLE OF MEETINGS

- R.—Events available for members of Representative Body and Ladies accompanying them.
L.—Events primarily arranged for Ladies.
U.—Events for all Members and Ladies accompanying them.
*Academic Robes should be worn.

Wednesday, June 30

- 4.30 to 6.30 p.m.—Annual Representative Meeting Inquiry Office open at Bute Hall, University.
4.30 to 6.30 p.m.—Ladies' Club open, the College Rooms, University.
8.30 to 10.30 p.m.—R. Cocktail Party (by invitation of the Glasgow Division), Trades House, Glassford Street, Glasgow, C.1.

Thursday, July 1

- 9.00 a.m.—Annual Representative Meeting Inquiry Office open at Bute Hall, University.
9.00 a.m.—Ladies' Club open, the College Rooms, University.
10.00 a.m.—Annual Representative Meeting commences, Bute Hall, University.
11.00 a.m.—Welcome by the Right Honourable the Lord Provost of Glasgow to Annual Representative Meeting.
2.00 to 5.30 p.m.—L. Excursion to Loch Lomond (afternoon tea by kind invitation of Lady Colquhoun of Luss and Major-General A. P. D. Telfer-Smollet, Lord Lieutenant of Dunbartonshire). (For 100.) Inclusive ticket, 6s.
7.30 p.m.—R. Representatives' Dinner, Central Hotel, Gordon Street, Glasgow, C.1. Ticket 25s., excluding wines.
8.00 p.m.—L. Representatives' Ladies' Dinner, Central Hotel, Gordon Street, Glasgow, C.1. Ticket 25s., including aperitifs.
9.30 p.m.—R. Representatives' Dance, Central Hotel, Gordon Street, Glasgow, C.1. Ticket 10s., including buffet.

Friday, July 2

- 9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Annual Representative Meeting.
9.30 a.m. to 6.00 p.m.—L. All-day excursion to the Trossachs, returning via Duchray Valley, including State Forest (Sail on Loch Katrine and luncheon by kind invitation of Glasgow Corporation). (For 100.) Inclusive ticket, 12s. 6d.
1.00 p.m.—Overseas Luncheon, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.
2.00 to 6.00 p.m.—L. Visit to Livingstone Memorial, Blantyre; Clyde Valley and Lanark (afternoon tea at Clydesdale Hotel by kind invitation of the Lanarkshire Division). (For 40.) Inclusive ticket, 6s.
5.00 p.m.—Cocktail Party for Women Representatives and medical women accompanying Representatives, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2 (by invitation of the Medical Women's Federation, Scottish Western Association).
8.00 to 10.00 p.m.—Reception and Demonstration by Director and Staff at Glasgow Art Gallery, Kelvingrove. (For 600.)

Saturday, July 3

- 9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.00 a.m.—Council Meeting, Forehall, University.
9.30 a.m.—Ladies' Club open.
10.00 a.m.—Annual Representative Meeting.
10.30 a.m. to 5.30 p.m.—L. All-day excursion to the Lake of Menteith and visit to Stirling Castle. Luncheon at the Lake of Menteith Hotel or the Lion and the Unicorn, Thornhill. Tea at Stirling Castle (by kind invitation of the Stirling Branch and by kind permission of Major J. G. D. Fanshawe and the Officers of the Regimental Headquarters and Depot, the Argyll and Sutherland Highlanders). (For 100.) Ticket 12s. 6d.
7.30 p.m.—Aberdeen Graduates' Dinner, North British Hotel, George Square, Glasgow, C.2. Ticket 25s., excluding wines.
7.30 p.m.—Edinburgh Graduates' Dinner, Grosvenor Restaurant, Gordon Street, Glasgow, C.1. Ticket 30s., including aperitifs.
7.30 p.m.—Glasgow Graduates' Dinner, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2. Ticket 30s., including aperitifs.
7.30 p.m.—Welsh Dinner, Grosvenor Restaurant, Gordon Street, Glasgow, C.1. Ticket 30s., excluding wines.
8.30 p.m.—R. Block Booking, "Half-past Eight" (Summer Revue), Alhambra Theatre, Wellington Street, Glasgow, C.2. (For 150.) Ticket 7s. 6d.

Sunday, July 4

- 10.15 a.m. to 6.00 p.m.—All-day sail on the Firth of Clyde with luncheon, afternoon tea, and return by train. Inclusive ticket 30s.
8.30 to 10.15 p.m.—Concert, Kelvin Hall, Kelvingrove, specially arranged by the B.B.C. and to be broadcast on the Scottish Home Service from 9.15 to 10.15 p.m.

Monday, July 5

- 9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.00 a.m.—Scientific Exhibition opens at the Kelvin Hall, Kelvingrove.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications, opening by the President-Elect, Kelvin Hall, Kelvingrove.
9.00 a.m.—Reception Room for Registration opens at Kelvin Hall, Kelvingrove.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 5.00 p.m.—L. All-day excursion to the Kingdom of Fife and visit to Falkland Palace. Coffee at the Green Hotel, Kinross, Loch Leven, and luncheon at Auchtermuchty by kind invitation of Mrs. H. B. Muir and the Fife Branch. (For 60.) Inclusive ticket, 12s. 6d.
10.00 a.m.—Annual Representative Meeting.
11.00 a.m.—L. Notts Ladies' Challenge Cup Golf Competition at Buchanan Castle Golf Club (non-golfers also invited).
12.30 p.m.—Annual General Meeting, Bute Hall, University.
p.m.—Council Meeting, Forehall, University (at conclusion of Annual Representative Meeting).
5.00 p.m.—Medical Films, Kelvin Hall (first floor).
8.15 p.m.—U.* Adjourned Annual General Meeting and President's Address, Kelvin Hall, Kelvingrove. (For 1,100.)
9.30 p.m. to 12 midnight.—U.* President's Reception, Bute Hall, University. (For 1,100.)

Tuesday, July 6

- 9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 12 noon.—Scientific Plenary Session—"The Problem of Sleep," Arena, Kelvin Hall.
10.30 a.m. to 12.30 p.m.—L. Visit to the grounds of Eastwood Park, Renfrewshire, and coffee by kind invitation of Viscountess Weir. (For 60.) Transport ticket, 2s.
2.30 p.m.—Robing for Religious Service, Royal Infirmary.
3.00 p.m.—U.* Official Religious Service, Glasgow Cathedral.
3.00 p.m.—U.* Roman Catholic Service, St. Andrew's Cathedral, Glasgow, followed by reception at St. Enoch Hotel by the Archbishop of Glasgow.
5.00 p.m.—Reception by Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2. (Numbers limited.)

JUNE 19, 1954

ANNUAL MEETING: PROGRAMME

- 8.00 p.m. to 12 midnight.—U.* Reception and Dance by invitation of the Right Honourable the Lord Provost of Glasgow and Magistrates at the City Chambers, George Square, Glasgow, C.2. (For 750.)

Wednesday, July 7

- 8.15 a.m.—Annual Breakfast of the Christian Medical Fellowship, the Union, University Avenue, Glasgow.
9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 12.30 p.m.—Scientific Sections, University.
10.00 a.m.—Leinster and Childe Cup Golf Competition at Western Golf Club, Gales, Ayrshire.
10.00 a.m. to 5.00 p.m.—L. All-day excursion to Burns Country. Morning coffee at the Dutch House by kind invitation of the Ayrshire Division. Luncheon at the Burns Monument Hotel. Tea by kind invitation of Mrs. Kennedy, of Doonholm. (For 60.) Inclusive ticket, 12s. 6d.
1.00 p.m.—Irish Graduates' Luncheon, the Union, University Avenue. 7s., excluding wines.
2.00 to 3.00 p.m.—President and Party, Official Tour of Scientific Exhibition.
3.00 p.m.—Overseas Conference, Forehall, University. Annual Report by the Secretary of the Overseas Committee, followed by general discussion.
3.00 to 5.30 p.m.—Scientific Plenary Session—"Food and Disease," Arena, Kelvin Hall.
5.00 to 6.00 p.m.—Reception for Overseas visitors given by the Overseas League, 3, Claremont Terrace, Glasgow, C.3.
5.45 p.m.—Medical Films, Kelvin Hall (first floor).
8.00 to 11.30 p.m.—U.* Reception and Dance in the Bute Hall by invitation of the University of Glasgow. (For 800.)

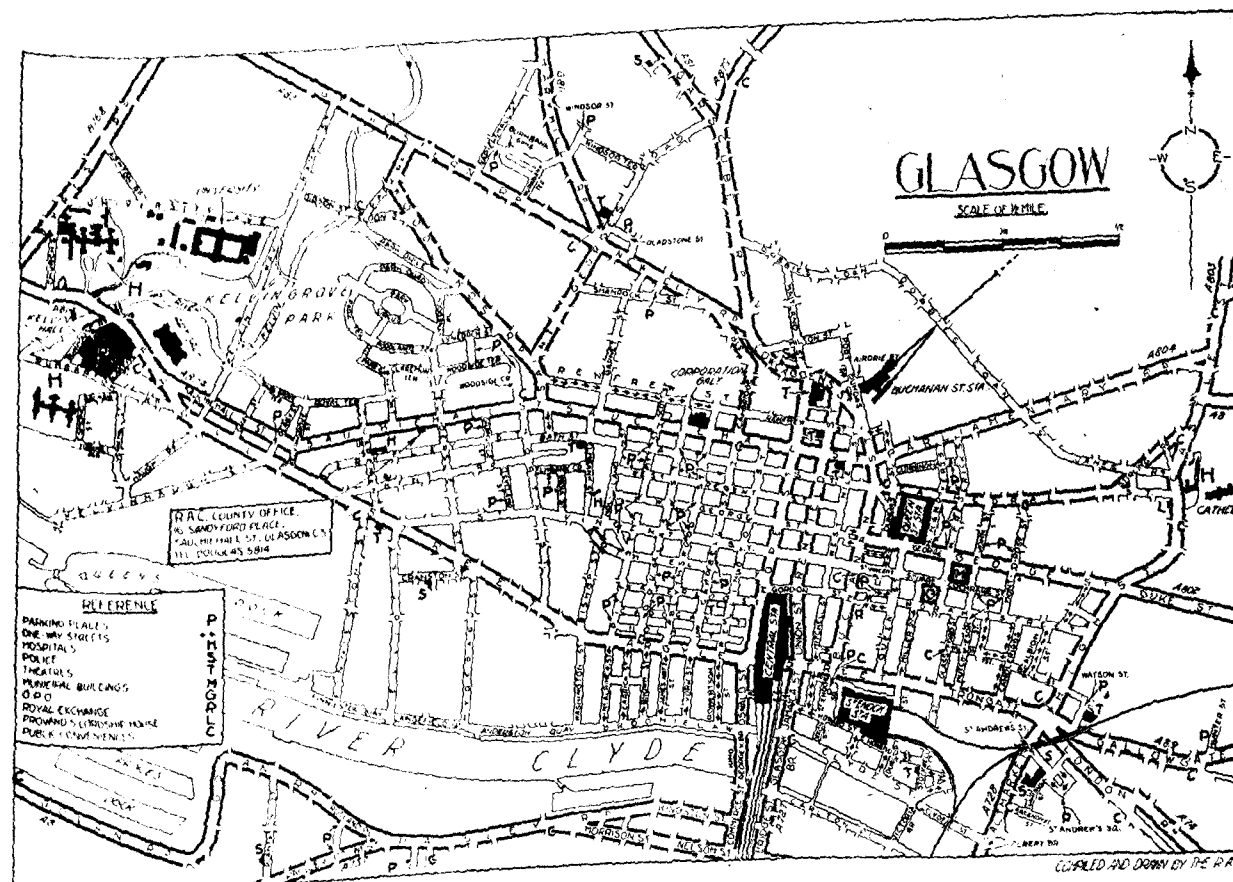
Thursday, July 8

- 9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.

- 9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.15 to 11.45 a.m.—Scientific Plenary Session—"The Problem of Pulmonary Tuberculosis To-day," Arena, Kelvin Hall.
9.30 a.m.—Ladies' Club open.
9.30 a.m. to 5.30 p.m.—L. All-day excursion to Edinburgh. Visit to Castle, St. Giles' Cathedral, John Knox's House, Holyrood Palace. Return via Forth Bridge and Linlithgow. (Luncheon by kind invitation of the Edinburgh Division. Tea by kind invitation of Mrs. David Band.) (For 60.) Inclusive ticket, 12s. 6d.
10.00 a.m.—Treasurer's Cup Golf Competition and Medal Competition at Old Prestwick Golf Club, Prestwick, Ayrshire.
12.15 p.m.—University Meeting in the Bute Hall for the conferring of honorary degrees.
2.30 to 5.30 p.m.—Scientific Sections, University.
3.00 to 5.30 p.m.—U. Garden Party in the grounds of the Glasgow Royal Mental Hospital, Gartnavel, 1055, Great Western Road, Glasgow, W.2, by invitation of the Medical Superintendent and the Board of Management. (For 200.)
5.00 p.m.—"At Home" for Overseas Visitors given by the Empire Medical Advisory Bureau, Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2.
7.30 p.m.—U. Annual Dinner, Central Hotel, Gordon Street, Glasgow, C.1. (For 350.) Ticket £2 10s., including wines.

Friday, July 9

- 9.00 a.m.—Reception Room for Registration open.
9.00 a.m.—Scientific Exhibition open.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open.
9.30 a.m.—Ladies' Club open (closes at 1 p.m.).
9.30 a.m. to 12.30 p.m.—Scientific Sections, University.
2.00 to 5.00 p.m.—Scientific Sections, University.
8.00 p.m. to 1.00 a.m.—U. Dance, the Union, University Avenue, Glasgow. (For 350.) Ticket 15s.



Street map of Glasgow.

British Medical Association

AGENDA OF ANNUAL REPRESENTATIVE MEETING, JULY 1, 2, 3, AND 5, 1954, IN THE BUTE HALL, UNIVERSITY, GLASGOW

CHAIRMAN: Dr. S. WAND, Birmingham

PRELIMINARY BUSINESS

Items 1 to 7 relate to preliminary business.

REPORT OF AGENDA COMMITTEE

Grouping of Motions and Amendments

8. The Committee has arranged certain Motions and Amendments which cover substantially the same ground in groups and has selected in each group one Motion or Amendment (marked with an asterisk ★) on which it proposes that discussion should take place. The Representatives of the Constituencies concerned have been informed of these proposals in accordance with Standing Order 21 (iii).

Order of Business

9. The Committee recommends:

Recommendation: (1) That the business under "Overseas" be taken at 11 a.m. on Saturday, July 3;

(2) That "Other Motions by Divisions and Branches," if not previously dealt with, be considered as the first business on Monday, July 5, after the Official Votes of Thanks;

(3) That, with these exceptions, the order of the business be as set out in the Agenda.

STANDING ORDERS

10. **Motion** by the Chairman: That the Standing Orders (Doc. A.R.M. 5) as circulated with this Agenda be adopted as the Standing Orders of the Meeting.

PRELIMINARY

11. **Motion** by the Chairman of Council on behalf of the Council: That the Annual and Supplementary Reports of Council under "Preliminary" (Docs. A.R.M. 2, paras. 1-17, and A.R.M. 3, paras. 190-3) be received.

Election of Vice-Presidents

12. **Motion** by the Chairman of Council: That, with effect from the conclusion of his term of office as President, Mr. J. W. Tudor Thomas, M.D., M.S., D.Sc., F.R.C.S., be elected a Vice-President of the Association in recognition of his valuable services to the Association.

13. **Motion** by the Chairman of Council: That Mr. A. M. A. Moore, F.R.C.S., be elected a Vice-President of the Association in recognition of his valuable services to the Association.

Service Representatives on Council

14. **Motion** by the Chairman of Council: That the following be elected as representatives of the R.A.M.C. and the Medical Branch of the Royal Air Force on the Council for the period 1954-7: Royal Army Medical Corps: Major-General J. C. A. Dowse, C.B., C.B.E., M.C.; Medical Branch of the Royal Air Force: Air Vice-Marshal W. E. Barnes, C.B.E.

Coat of Arms

15. **Motion** by the Chairman of Council: That the proposed coat of arms, as designed by the College of Arms, be accepted as a gift to the Association from the members of Council.

Remainder of Report under "Preliminary"

16. **Motion** by the Chairman of Council: That the remainder of the Annual and Supplementary Reports of Council under "Preliminary" be approved.

SCOTLAND

17. **Motion** by the Chairman of the Scottish Committee on behalf of the Council: That the Annual Report of Council under "Scotland" (Doc. A.R.M. 2, paras. 156-64) be received.

18. **Motion** by the Chairman of the Scottish Committee: That the Annual Report of Council under "Scotland" be approved.

PRIVATE PRACTICE

19. **Motion** by the Chairman of the Private Practice Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Private Practice" (Docs. A.R.M. 2, paras. 105-17, and A.R.M. 3, paras. 226-31) be received.

One-day Certificates to Miners: Bonus Shift Certificates

20. **Motion** by MORPETH: That the B.M.A. approach the Minister of Health concerning the issue of one-day certificates to miners and requests him to institute negotiations with the Ministry of Fuel and Power with a view to their complete abolition.

Life Assurance: Fee for Ordinary Form

21. **Motion** by the Chairman of the Private Practice Committee: That para. 106 of the Annual Report of Council be approved.

22. **Amendment** by SOUTH-EAST ESSEX: That the standard fee for medical examination and report for life assurance should be increased from one and a half guineas to a minimum of two guineas.

★23. **Amendment** by GREENWICH AND DEPTFORD: That this Annual Representative Meeting is of the opinion that the fee for life assurance examination should be increased to £2 2s.

24. **Amendment** by HARROW: That this Meeting reaffirms the resolution passed at the 1953 A.R.M.—namely, that the fee for the ordinary form of life assurance examination should be increased from £1 11s. 6d. to £2 2s.

25. **Amendment** by BOLTON: That the fees for medical examinations or reports for life assurance purposes should be a minimum of two guineas for a full examination and one guinea for a report without examination.

Life Assurance—Attendance Reports

26. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting is of opinion that there is no objection to the issue of attendance reports (that is, reports, without medical examination, regarding persons proposing to take out life assurance policies), provided that: (i) a suitable form of consent signed by the patient agreeing to such a report being issued is forwarded by the company to the practitioner for his retention; and (ii) a suitable fee is agreed upon, depending on the complexity of the report required.

Duration Certificates

27. **Motion** by the Chairman of the Private Practice Committee: That para. 108 of the Annual Report of Council be approved.

28. **Amendment** by OXFORD: That this Meeting supports the motion concerning duration certificates, referred to Council at the A.R.M., 1953, and affirms that it should supersede the resolution of the A.R.M., 1937, reaffirmed in 1949.

29. **Amendment** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting is of the opinion that (1) a "duration certificate" (that is, a medical report about the previous health and medical history of a person who has died shortly after having been accepted for life assurance, without prior medical examination) could jeopardize, but could never be essential to, the claim to the assurance. (2) A practitioner should not, therefore, issue such a certificate unless all the following conditions have been fulfilled:

(a) The proposer dies within three years of taking out the policy.

(b) The original proposal, read and signed by the proposer, contained a clause authorizing the company to apply for, and the doctor to issue, a "duration certificate" in the event of early death.

(c) The original proposal be produced for the practitioner's inspection.

(d) A certified photostat copy (or a duplicate actually signed by the proposer) be supplied to the practitioner for his retention.

(e) The policy has been taken out prior to December 31, 1954.

30. **Motion** by NEWCASTLE-UPON-TYNE: That all industrial insurance companies should require a medical certificate from clients to the effect that he/she has been in good health for two years prior to taking a policy.

Remainder of Report under "Private Practice"

31. **Motion** by the Chairman of the Private Practice Committee: That the remainder of the Annual and Supplementary Reports of Council under "Private Practice" be approved.

Medical Witnesses in Law Courts

32. **Motion** by SWANSEA: That this Meeting, having considered the case where a local single-handed general practitioner was compelled, under a subpoena, to spend four days at the Assize Court recently held at a town 45 miles distant, the action in which his evidence was required not commencing until the third day of his attendance, and his medical evidence not being taken until the fourth day, and realizing that similar occurrences are taking place all over the country, causing great hardship to doctors and patients alike, calls upon the Council of the British Medical Association to approach the Lord Chancellor's department seeking a drastic change for the better in the present methods of summoning and hearing medical witnesses.

Fees for Services of Medical Practitioners Called in by the Police

33. **Motion** by ISLE OF WIGHT: That in those areas where adequate remuneration is not being paid by the Police authorities for the services of medical practitioners, the Council be asked to take action with the Associations of Local Authorities to support local claims.

Remuneration of Members of Medical Boards

34. **Motion** by CITY OF EDINBURGH: That in the opinion of the Representative Body the time has come for an increase in the remuneration of members of medical boards under the various Ministries (for example, the Ministry of Labour and National Service, and the Ministry of National Insurance and Pensions).

Constitution of Private Practice Committee

35. **Motion** by MARYLEBONE: That this Meeting instructs the Council to form a plan whereby the Private Practice Committee shall be truly representative of private practice, both general and consultant.

CONSTITUTION OF THE ASSOCIATION

36. **Motion** by the Chairman of the Constitution Committee on behalf of the Council: That the Annual Report of Council under "Constitution of the Association" (Doc. A.R.M. 2, para. 155) be received.

37. **Motion** by the Chairman of the Constitution Committee: That the Annual Report of Council under "Constitution of the Association" be approved.

Access to Parliament and Ministry of Health

38. **Motion** by MARYLEBONE: That this Meeting draws attention to the fact that the Representative Body has no access to Parliament nor to the Minister of Health, either directly or through its Council, and requires that plans be presented at the next Annual Representative Meeting to correct this anomaly.

ARBITRATION MACHINERY

39. **Motion** by the Chairman of the Committee on Arbitration Machinery on behalf of the Council: That the Annual and Supplementary Reports of Council under "Arbitration Machinery" (Docs. A.R.M. 2, para. 83, and A.R.M. 3, para. 210) be received.

40. **Motion** by LIVERPOOL: That this Meeting also notes with satisfaction that the question of arbitration is to be raised again by the Staff Side in the near future.

★41. **Motion** by WORCESTER AND BROMSGROVE: That there should be the unilateral right to arbitration.

42. **Motion** by WINCHESTER: That in view of the unsatisfactory consultant award, Council be instructed to press urgently for the right of unilateral access to arbitration.

43. **Motion** by the Chairman of the Committee on Arbitration Machinery: That the Annual and Supplementary Reports of Council under "Arbitration Machinery" be approved.

HOSPITAL AND CONSULTANT SERVICES

44. **Motion** by the Chairman of the Central Consultants and Specialists Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Hospital and Consultant Services" (Docs. A.R.M. 2, paras. 53-81, and A.R.M. 3, paras. 206-8) be received.

Review of Consultant Organization

45. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That paras. 53 and 206 of the Annual and Supplementary Reports of Council be approved.

46. **Amendment** by WORCESTER AND BROMSGROVE: That in subparagraph (3) of para. 206, the last words should be amended to read "who are graded as consultants, senior hospital medical officers, and G.P. 10(b)'s."

Hospital Junior Staffing

47. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That paras. 54 and 207 of the Annual and Supplementary Reports of Council be approved.

48. **Amendment** by SWANSEA: That this Meeting deplores the implied merger of the senior hospital medical officers with senior registrars in the senior medical officer grade, and it believes that the S.H.M.O. grade should remain linked with the consultants and specialists group.

49. **Motion** by CLEVELAND: That this Meeting urges that the training of registrars in all specialties should be a continuous and progressive process, and that a period of not less than 12 months in a non-teaching hospital should be necessary to qualify for consultant status.

50. **Motion** by BRIGHTON AND MID-SUSSEX: That the Representative Body feels that the ratio of all grades of registrars to consultants' sessions should be equal in teaching and non-teaching hospitals, and that both grades of these registrars should interchange between these respective hospitals.

51. Motion by WORCESTER AND BROMSGROVE: That the Council be asked to investigate the possibility of arranging suitable liaison between regional hospital boards, hospital management committees, and executive councils so that registrars who have failed to become consultants may find those vacancies in general practice where there is an opportunity to continue in the local hospital the specialist work for which they have been trained.

Senior Registrars and Additional Consultant Posts

52. Motion by NORTH GLAMORGAN AND BRECKNOCK: That this Meeting is of opinion that the Minister should increase the number of part-time consultant posts in general medicine and surgery and in psychiatry.

Remuneration of Hospital Medical Staff

53. Motion by the Chairman of the Central Consultants and Specialists Committee: That paras. 58 and 208 of the Annual and Supplementary Reports of Council be approved.

***54. Amendment** by HEXHAM: That this Meeting is dissatisfied with the recent consultants' award, and the reasons given therefor.

55. Amendment by WORCESTER AND BROMSGROVE: That this Meeting is profoundly dissatisfied with the alteration in remuneration and the manner of the negotiations.

56. Amendment by DARTFORD: That this Meeting deplores the departure from Spens in the recently negotiated readjustment of salaries of hospital medical staff and demands that acceptance of this interim settlement shall not prejudice the claim that further adjustments should be made which are in keeping with the recommendations of the Spens Report.

57. Amendment by CONSETT: That the recent new agreement for remuneration of hospital medical and dental staff is not satisfactory.

***58. Amendment** by MANCHESTER: That this Meeting deplores the inadequacy of the recent agreement reached on the remuneration of hospital medical staffs, and urges that steps be taken to reopen this matter immediately, with a view to obtaining the implementation of the Spens Report as applied to consultants and specialists and obtaining adequate betterment. In the event of disagreement the matter should be referred to arbitration.

59. Amendment by WORCESTER AND BROMSGROVE: That further negotiations be opened immediately to obtain a figure which is consistent with the Spens recommendations.

60. Amendment by HEREFORD: That the Representative Body is dissatisfied with the award of Committee "B" of the Medical Whitley Council for the remuneration of hospital and consultant services, in that the recommendations of the Spens Report have not been implemented, and directs the Council to insist that negotiations be reopened.

61. Amendment by HOLLAND: That the recent increase in remuneration of hospital medical officers does not implement or safeguard the Spens Report, and the Council is requested to take such immediate action as is possible to secure an award in the terms of the Spens Report.

62. Amendment by SOUTHPORT: That this Meeting expresses dissatisfaction both with the method of negotiation and the result in relation to remuneration of hospital medical staff, and urges that negotiations be reopened.

63. Amendment by WORCESTER AND BROMSGROVE: That a further attempt be made to make the present settlement retrospective to the date of commencement of negotiations.

64. Amendment by CLEVELAND: That this Meeting, being dissatisfied with the outcome of the Whitley negotiations, wishes to take steps to review the whole of the negotiating machinery for consultants and specialists.

65. Amendment by SUNDERLAND: That this Meeting recommends that a negotiating committee be elected (representative of all sections of the profession) to conduct all future negotiations on the subject of terms of service or remuneration of any section of the profession.

***66. Amendment** by AYRSHIRE: That the Annual Representative Meeting insists that future negotiations on behalf of the consultants and specialists shall be conducted by B.M.A. machinery.

67. Amendment by SOUTHPORT: That this Meeting recommends that future negotiations for remuneration of the profession should be conducted under the auspices of the B.M.A., which should insist on the right to arbitration.

68. Amendment by SOUTHAMPTON: That this Meeting does not recognize the recent agreement on hospital medical staffs' salaries as either adequate or just, and it urges the Association to take over negotiations and take every possible step to refer the problem to arbitration and to obtain for any future occasion the right of unilateral access to arbitration.

69. Amendment by CONSETT: That as the B.M.A. is criticized for not taking sufficient interest in the welfare of hospital medical staff and for not retaining full control of its Consultants and Specialists Committee, so that the full negotiating power and machinery of the B.M.A. could be used, this Meeting considers that an attempt should be made to reunite the various sections of the profession so that in any future negotiations there is a backing from the B.M.A. in toto.

70. Amendment by CONSETT: That the B.M.A. take over all negotiations on remuneration, conditions of service, and the right to arbitration for the profession as a whole.

71. Amendment by NOTTINGHAMSHIRE: That the recent agreement on the remuneration of hospital medical staff has led to a loss of confidence in the negotiators and to dissatisfaction with the constitution of the Joint Committee, and therefore with the Staff Side of Whitley Council. It is therefore resolved that the British Medical Association should become the negotiating body for all branches of the profession.

72. Amendment by SOUTHAMPTON: That, bearing in mind the limitations imposed on the Royal Colleges by their charter, which restricts their medico-political activities, this Meeting feels that a reorganization of the Joint Committee is essential and that the Consultants and Specialists Committee of the Association should have a greater part in all future negotiations as representatives of the hospital medical staff, and instructs Council to take urgent action to implement this resolution.

73. Amendment by CONSETT: That the Central Consultants and Specialists Committee be renamed the Hospital Medical Staff Committee and be a normal committee without autonomy and be composed of elected representatives from the Branches.

74. Amendment by CONSETT: That the Regional Consultants and Specialists Committees be abolished and that all matters connected with hospital medical staff be dealt with through the normal channels—that is, Division and Branch to the Representative Body and Council.

75. Amendment by MARYLEBONE: That in view of the frustration experienced in the Whitley machinery, this Meeting advises the Central Consultants and Specialists Committee and the Joint Consultants Committee to withdraw from Whitley, and to arrange a direct approach to the Minister.

76. Amendment by WEST DENBIGH AND FLINT: That the S.H.M.O. remuneration should be raised forthwith to approximate more nearly to that of consultant.

77. Amendment by SOUTH ESSEX: That the value of the emoluments of house officers should remain at £100.

78. Amendment by WORCESTER AND BROMSGROVE: That practitioners on the staffs of hospitals at present remunerated on G.P. 10(b) rates should also receive an increase in remuneration.

79. Motion by LIVERPOOL: That this Meeting endorses the views expressed by the Council in its Supplementary Report and notes with satisfaction that the Council has reaffirmed its policy to adhere to the basis of remuneration as enunciated in the Spens Reports. It urges that negotiations be continued and that the best actuarial and

legal advice be given to the negotiators, all of whom should be members of the Central Consultants and Specialists Committee either by election or *ex officio*.

80. Motion by WORCESTER AND BROMSGROVE: That in view of the damaging restrictions which make it impossible to have present on the Staff Side at meetings of Whitley Committee "B" expert legal and actuarial advisers, in future it is essential that the Staff Side should have available all the facilities for special legal or other advice both prior to and during the conduct of negotiations.

81. Motion by SUNDERLAND: That this Meeting requests that Council seek the formation of a court of inquiry to determine the proper level of hospital staffs' remuneration.

82. Motion by CITY OF EDINBURGH: That this Meeting considers it to be prejudicial to the best interests of medical teaching in this country that there should be such a large discrepancy, accentuated by the recent agreement on hospital staff remuneration, between the salaries of consultants paid by hospital boards and those employed full-time by the universities, particularly since both may be carrying out similar duties in the same hospitals. It is urged that immediate steps be taken to improve the financial position of medical members of university teaching staffs.

Contributions of B.M.A. to Negotiating Bodies

83. Motion by TORQUAY: That the contributions of the B.M.A. to the expenses of the Joint Consultants Committee and the Staff Side of Committee "B" of the Medical Whitley Council should be directly proportional to the representation of the B.M.A. on those Committees.

Legal Actions Involving Hospital Authorities and Members of their Medical Staffs

84. Motion by READING: That this Meeting deplores the apparent change in the law by which a practitioner can no longer successfully plead reasonable care and skill in defence, where he has made an error of judgment.

Whole-time or Part-time Service

85. Motion by HARROW: That regional hospital boards should permit whole-time salaried consultants to become part-time when they so desire.

86. Motion by WORCESTER AND BROMSGROVE: That consultants, including medical superintendents in the Mental Health Service, should be given the option of being on a part-time or a whole-time basis.

Domiciliary Consultation Arrangements

87. Motion by RUGBY AND SOUTH WARWICKSHIRE: That this Meeting is of opinion that the diagnosis should not be disclosed on domiciliary consultation certificates.

***88. Motion** by RICHMOND: That facilities for domiciliary visits under the National Health Service be made available to National Health Service patients in private nursing-homes.

89. Motion by EAST YORKSHIRE: That where in view of the shortage of hospital beds for chronic illness, many patients have to be admitted to private nursing-homes for social or domestic reasons, this Representative Body urges that they should not be debarred by such admission from the benefits of consultant services under the National Health Service.

90. Motion by YORK: That it should be within the powers of the general practitioner in charge of a patient confined in a private nursing-home to call in the aid of a consultant anaesthetist under the domiciliary consultation arrangements of the National Health Service.

Geriatric Units

91. Motion by LINCOLN: That this Meeting reaffirms its previous decision to recommend to the Minister the establishment of geriatric units under the guidance of an experienced physician and expresses grave concern at the delay in dealing with this urgent problem.

92. Motion by MANCHESTER: That this Meeting agrees in general principle that ultimately a closely integrated national service should be planned; this is meanwhile not to prejudice the further development of any local approved geriatric service already established and such as exists in Manchester.

93. Motion by WESTMINSTER AND HOLBORN: That this Meeting is alarmed at the absence of any organization in some areas for ensuring prompt admission to hospital of aged persons in need of full-time attention, and suggests that the early appointment of a doctor, able to assess the needs of each and authorized to arrange admission, is essential.

Representation on Regional Boards and Hospital Management Committees

94. Motion by DARTFORD: That this Meeting is of the opinion that medical members of regional hospital boards and hospital management committees should be elected by their professional colleagues.

95. Motion by READING: That every endeavour should be made to ensure that all hospital management committees have general-practitioner representation.

96. Motion by READING: That each hospital in the area of a hospital management committee should be represented on that committee by one member of its medical staff.

Remainder of Report under "Hospital and Consultant Services"

97. Motion by the Chairman of the Central Consultants and Specialists Committee: That the remainder of the Annual and Supplementary Reports of Council under "Hospital and Consultant Services" be approved.

Facilities for Hospital Staff to Attend Meetings of Professional Body

98. Motion by MARYLEBONE: That this Meeting requests the Council to urge regional hospital boards and boards of governors of hospitals to grant every facility to hospital medical staff for the purpose of attending the Annual Representative Meeting.

Consultants and Specialists Defence Fund

99. Motion by GLASGOW: That this Representative Body requests Council to take steps to ensure that an adequate Defence Fund is established by the consultants and specialists.

S.H.M.O. Appointments

100. Motion by GATESHEAD: That no further S.H.M.O. posts be established and that existing posts should be subject to biennial review with a view to upgrading.

Grading of S.H.M.O.s

101. Motion by WOOLWICH: That this Meeting draws attention to the complete lack of uniformity in different regions, and sometimes within the same region, in the use of the grade of S.H.M.O., particularly in relation to and to the detriment of the Tuberculosis Service; and that Council be requested to treat the correction of this injustice as a matter of priority, and to employ every means in the power of the British Medical Association to ensure the grading as consultants of these S.H.M.O.s who are at present inappropriately and unfairly graded.

Junior Hospital Medical Staffs

102. Motion by DORSET: That this Meeting considers that the interests of the junior hospital medical staff do not have adequate expression in the B.M.A. and that a standing committee should be set up to watch over these interests.

Accommodation of Medical Superintendents outside the Hospital

103. Motion by WORCESTER AND BROMSGROVE: That the Council be asked to investigate the possibility of medical superintendents being given the opportunity to live outside the hospital if they so desire.

Machinery for Appointment of Consultants and Registrars

104. **Motion** by SOUTH ESSEX: That this Meeting considers that at the appointment of registrars and consultants, both the hospital management committee and the assessors should have equal voting power, while the chairman should retain a casting vote.

105. **Motion** by BRIGHTON AND MID-SUSSEX: That the Representative Body considers that local group medical and lay committee members should have more say in the appointment of consultant staff.

Administration of Hospital Groups

106. **Motion** by DORSET: That this Meeting considers that the administration of hospital groups could be improved by occasionally appointing experienced doctors as secretaries to hospital management committees.

Control of Hospital Management

107. **Motion** by MID-CHESHIRE: That this Meeting would deprecate the return of hospital management from independent to municipal control.

Post-mortem Examinations

108. **Motion** by DEWSBURY: That it should be possible for a practitioner to have a post-mortem performed by a consultant pathologist on any patient who was of particular clinical interest to the practitioner. The cost of such a service could be borne by the research grant of the National Health Service.

Rh Tests and Blood Grouping

109. **Motion** by BUCKINGHAMSHIRE: That when Rh tests and blood grouping are carried out, a card should be supplied suitable for preservation by the patient.

Visits to Patients in London Fever Hospitals

110. **Motion** by PADDINGTON: That the London fever hospitals should permit daily visits to patients in all suitable cases, except in special circumstances.

OCCUPATIONAL HEALTH

111. **Motion** by the Chairman of the Occupational Health Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Occupational Health" (Docs. A.R.M. 2, paras. 84-7, and A.R.M. 3, paras. 211-15), the Memorandum to the Ministry of Labour and National Service on the Future of the Occupational Health Services (Appendix III), the Memorandum on Medical Standards for Road, Rail, and Air Transport (Appendix IV), the Memorandum on the National Insurance (Industrial Injuries) Act (Appendix V), and the Revised Statement on the Remuneration of Whole-time Industrial Medical Officers (Appendix IX) be received.

Medical Standards for Road, Rail, and Air Transport

112. **Motion** by the Chairman of the Occupational Health Committee: That para. 85 of the Annual Report of Council and the Memorandum submitted to the Ministry of Transport (Appendix IV to the Annual Report) be approved.

113. **Amendment** by SOUTHAMPTON: That in the opinion of the Meeting further consideration should be given to the information which should be disclosed on Form P.S.V. 15A (application for licence to drive public service vehicles).

Duties of and Ethical Rules for Industrial Medical Officers

114. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting urges Council to take further active steps to try to compile a comprehensive list of industrial medical officers, or, failing this, to circulate among all non-members of the Association a copy of "The Duties and Ethical Rules for Industrial Medical Officers," and also to publish them at periodic (say three-yearly) intervals in the Supplement.

Remuneration of Whole-time Industrial Medical Officers

115. **Motion** by the Chairman of the Occupational Health Committee: That the following recommendation of the Council be adopted:

That the revised statement on remuneration of whole-time industrial medical officers, set out in Appendix IX to the Annual Report of Council, be approved.

Remainder of Report under "Occupational Health"

116. **Motion** by the Chairman of the Occupational Health Committee on behalf of the Council: That the remainder of the Annual and Supplementary Reports of Council under "Occupational Health" be approved.

ORGANIZATION

117. **Motion** by the Chairman of the Organization Committee on behalf of the Council: That the Annual Report of Council under "Organization" (Doc. A.R.M. 2, paras. 141-54) be received.

Autonomous Bodies

118. **Motion** by the Chairman of the Organization Committee: That the following recommendation of the Council be adopted:

That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1954-5.

That the Representative Body looks to these committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not delay the work of the Association.

Election of "Ten" Members of Council

119. **Motion** by the Chairman of the Organization Committee: That the following recommendation of the Council be adopted:

1. That By-law 49 be amended as follows:

(i) By inserting the following new subparagraph:

(2) For the purpose of electing the President, the Chairman, and the Deputy Chairman of the Representative Body, the Treasurer, and the members of the Council and of any Standing Committees required to be elected by the Representative Body votes shall be recorded at such time and in such manner as the Representative Meeting may decide.

(ii) By altering the numbering of the existing subparagraphs (2)-(5) to (3)-(6) respectively and by adding at the commencement of new subparagraph (3) the words "Except as aforesaid."

2. That By-law 53(c) be altered by the deletion of all words after "as to" in line 3 and the substitution thereof of the following:

"ten by Representatives of Constituencies and of Public Health Service Members and Members of Council representing the medical branches of the armed Forces, as to a further two by the elected Representatives of Constituencies comprised in the Branches and Divisions in Scotland, and as to a further one by the elected Representatives of Constituencies comprised in the Branches and Divisions in Wales, including Monmouthshire."

The By-laws as amended would read:

Voting

(2) For the purpose of electing the President, the Chairman, and the Deputy Chairman of the Representative Body, the Treasurer, and the members of the Council and of any Standing Committees required to be elected by the Representative Body votes shall be recorded at such time and in such manner as the Representative Meeting may decide.

(3) Except as aforesaid, voting shall be by show of hands, unless before the vote is taken fifteen Representatives present

request that the vote be taken by roll-call, in which event it shall (subject as hereinafter provided) be so taken. If, however, upon the Chairman proceeding to take the vote, a vote by card is demanded by a majority of the Representatives present the vote shall be taken by card. . . .

Council: Composition

53. . . .
(c) Thirteen (being persons who have been members of the Association for at least the period aforesaid), at the Representative Meeting being elected as to ten by Representatives of Constituencies and of Public Health Service Members and of Members of Council representing the medical branches of the armed Forces, as to a further two by the elected Representatives of Constituencies comprised in the Branches and Divisions in Scotland, and as to a further one by the elected Representatives of Constituencies comprised in the Branches and Divisions in Wales, including Monmouthshire. . . .

Membership of Divisions and Branches

120. **Motion** by the Chairman of the Organization Committee: That para. 150 of the Annual Report of Council be approved.

121. **Amendment** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting cannot accept Council's view that implementation of Minute 255 of the 1953 Annual Representative Meeting would cause any material administrative difficulties, or would lead to any insuperable complications or anomalies, and urges that the said Minute be implemented as soon as possible.

Remainder of Report under "Organization"

122. **Motion** by the Chairman of the Organization Committee: That the remainder of the Annual Report of Council under "Organization" be approved.

B.M.A. Year Book

123. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting considers that this publication is a very useful source of information on a variety of subjects, and urges that a free copy be issued to all members periodically (though not necessarily every year).

PUBLIC HEALTH

124. **Motion** by the Chairman of the Public Health Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Public Health" (Docs. A.R.M. 2, paras. 88-98, and A.R.M. 3, paras. 216-24), the Memorandum on the General Practitioner and the Health Visitor (Appendix VI), the Memorandum of Evidence submitted by the Council to the Health Visitors' Working Party (Appendix XI), the Memorandum of Evidence submitted by the Council to the Working Party on the Training of District Nurses (Appendix XI), and the Statement on the Memorandum submitted by the British Veterinary Association to the Ministry of Agriculture and Fisheries on the subject of Meat Production and Control (Appendix XII) be received.

125. **Motion** by the Chairman of the Public Health Committee: That the Annual and Supplementary Reports of Council under "Public Health" be approved.

Arbitration and the Public Health Service

126. **Motion** by DARLINGTON: That this Meeting considers that, the Council having failed to obtain a Whitley Court of Arbitration as mandated by the amended Mid-Herts resolution passed at the 1953 A.R.M. (Min. 83), the Council be instructed to withdraw all members from the Public Health Service if this court of arbitration has not been obtained by December 31, 1954.

(Min. 83 of the A.R.M., 1953, was as follows:

That this Meeting deplores the lack of a Whitley Court of Arbitration to which there should be a right of appeal by unilateral reference and where the ruling should be binding on both parties, and instructs Council to take immediate and urgent action.)

Salaries in the Public Health Service

*127. **Motion** by CITY OF ABERDEEN, BANFF, MORAY AND NAIRN, and DUNDEE: That the disparity between remuneration in the Public Health Service and that of the medical profession as a whole is a threat to the rest of the profession and contrary to public interest. It is therefore the declared policy of the Association that remuneration in the Public Health Service be brought into line with that of hospital and general practice, and the Council is instructed to take steps to implement this policy as a matter of urgency.

128. **Motion** by GATESHEAD: That the whole structure of public health remuneration be reviewed, as it is still out of line with that in other branches of the Service.

129. **Motion** by HARROW: That this Meeting considers that in view of the serious position developing with regard to recruitment in the Public Health Service, steps be taken to reopen the question of salaries in that service.

Constitution of Public Health Committee

130. **Motion** by LIVERPOOL: That this Meeting, while welcoming the Report of Council that the Industrial Court Awards have been accepted by all local authorities, is of the opinion that the organization of the Public Health Committee is not sufficiently representative of the junior grades of the Public Health Service; and that the matter be considered by the Constitution Committee.

Scales of Fees for Special Sessions

131. **Motion** by NORTH NORTHUMBERLAND: That in the opinion of this Meeting all scales of fees for special sessions—for example, dental anaesthetics, etc.—should be immediately revised.

REFORM OF THE NATIONAL HEALTH SERVICE

132. **Motion** by the Chairman of the Amending Acts Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Reform of the National Health Service" (Docs. A.R.M. 2, para. 82; and A.R.M. 3, para. 209) and the proposed scheme for the restoration of the right to buy and sell goodwill (Appendix VIII) be received.

Goodwill

133. **Motion** by the Chairman of Council: That the following recommendation of the Council be adopted:

That in view of (a) the practical difficulties of implementing the proposed scheme for the right to buy and sell goodwill, (b) the high capital outlay required by young practitioners to launch into practice, (c) the divided opinion in the profession as to the desire to introduce such a scheme, and (d) the known political resistance to any such proposal, no further action be taken.

134. **Amendment** by LINCOLN: That the recommendation of the Council be varied to read:

That no further action be taken regarding the scheme for the restoration of the right to buy and sell goodwill, contained in Appendix VIII of the Supplementary Report of Council.

135. **Amendment** by HARROW: That the principle of a general practitioner owning and being able to dispose of the goodwill of his practice in any way he likes is fundamentally sound and proper, but that this Meeting defers consideration of what action to take in regard to this principle until all Divisions have had an opportunity of studying Council's report on goodwill and of deciding what action should be taken.

136. **Amendment** by SOUTH-WEST ESSEX: That the scheme be referred back to the Council in order that it may consider arrangements whereby new entrants to practice will have an opportunity of entering the Service either (1) by purchase of the goodwill of the practice, or (2) by selection by the Medical Practices Committee.

137. **Amendment** by CHELSEA AND FULHAM: That the scheme for the reintroduction of buying and selling prac-

tices be referred back to Council for amendment and to devise regulations that will fully protect the financial position of new entrants.

138. **Amendment** by SOUTH STAFFORDSHIRE: That since the return of the right to buy and sell goodwill would appear to present no insuperable difficulties, Council be instructed as a matter of urgency to institute appropriate steps to try to regain this right.

139. **Amendment** by MARYLEBONE: That this Meeting commends the work of the Amending Acts Committee in its scheme for the restoration of the right to buy and sell the goodwill of practices and instructs the Council to implement the proposals.

140. **Amendment** by BRIGHTON AND MID-SUSSEX: That a referendum of the profession be taken as to the principle of the return of the right to buy and sell goodwill.

*141. **Amendment** by RICHMOND: That the return of the right to buy and sell goodwill being of such essential importance to the freedom of the profession, this Representative Meeting requests that the considered opinion of the profession should be ascertained by a plebiscite to be held before the next Annual Representative Meeting.

142. **Amendment** by MANCHESTER: That this Meeting requests Council to take a postal vote of all general practitioners on the question of the restoration of the sale of goodwill of practices.

143. **Motion** by AYRSHIRE and EAST KENT: That this Meeting considers that the restoration of the right to buy and sell the goodwill of medical practices in the National Health Service is impracticable.

MEDICAL FILMS

144. **Motion** by the Chairman of the Film Committee on behalf of the Council: That the Annual Report of Council under "Medical Films" (Doc. A.R.M. 2, para. 175) be received.

145. **Motion** by the Chairman of the Film Committee: That the Annual Report of Council under "Medical Films" be approved.

"BRITISH MEDICAL JOURNAL"

146. **Motion** by the Chairman of the Journal Committee on behalf of the Council: That the Annual Report of Council under "British Medical Journal" (Doc. A.R.M. 2, para. 118) be received.

147. **Motion** by the Chairman of the Journal Committee: That the Annual Report of Council under "British Medical Journal" be approved.

B.M.J. Advertisements and Nationality of Applicants for Appointments

148. **Motion** by CITY: That advertisements in the *British Medical Journal* shall not contain any inquiry as to the nationality of the applicant, except when the knowledge of certain languages is necessary for the treatment of patients.

"FAMILY DOCTOR"

149. **Motion** by the Chairman of the Family Doctor Committee on behalf of the Council: That the Annual Report of Council under "Family Doctor" (Doc. A.R.M. 2, para. 119) be received.

150. **Motion** by the Chairman of the Family Doctor Committee: That the Annual Report of Council under "Family Doctor" be approved.

151. **Motion** by ISLE OF WIGHT: That this Meeting congratulates the editorial staff of *Family Doctor* on the presentation of this publication.

GENERAL MEDICAL SERVICES

152. **Motion** by the Chairman of the General Medical Services Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "General Medical Services" (Docs. A.R.M. 2, paras. 18-49,

and A.R.M. 3, paras. 194-205) and the Second Report of the Working Party on the Danckwerts Award and the Small-list Practitioner (Appendix VII) be received.

The Danckwerts Award and the Small-list Practitioner

153. **Motion** by the Chairman of the General Medical Services Committee: That paras. 21 and 196 of the Annual and Supplementary Reports of Council and Appendix VII—Second Report of the Working Party on the Danckwerts Award and the Small-list Practitioner—be approved.

154. **Amendment** by CHELSEA AND FULHAM, KENSINGTON AND HAMMERSMITH, and PADDINGTON: That account should be taken of those practitioners who are under 60 years of age and also not in receipt of a fixed annual payment, who will now be worse off than they were under Danckwerts.

Admission of Students to Medical Schools

155. **Motion** by HEXHAM: That this Meeting considers that, in view of the saturation of certain branches of the medical profession, the Minister should be impressed with the extreme urgency of the situation, in setting up at the earliest possible moment the working party proposed in section 24 of the Annual Report of Council.

156. **Motion** by NEWCASTLE-UPON-TYNE: That in view of the serious consequences which would follow if the country became saturated with doctors, and pending the deliberations of the General Medical Services Committee on this problem, the Council should consider the advisability of taking immediate steps to reduce the intake of students into medical schools.

Change of Practice

157. **Motion** by KENSINGTON AND HAMMERSMITH: That this Meeting appreciates the efforts of the General Medical Services Committee to facilitate the exchange of practices, and urges it to continue to do all in its power to achieve this, since the inability to remove from some districts after years of hard work constitutes a grave hardship not only to the doctor but often even more so to his family, who suffer social and educational disabilities.

Machinery for Filling Practice Vacancies

158. **Motion** by WEST DENBIGH AND FLINT: That when vacancies in practices have to be filled, the appointment should be made by the local executive council.

159. **Motion** by HARROW: That advertised vacancies for practices on new estates or adjacent to existing built-up areas should not be advertised in the *British Medical Journal* until the matter has been referred to the local Division of the B.M.A. for its views.

Economy in Prescribing

*160. **Motion** by ST. PANCRAS: That the Council, through the General Medical Services Committee, urges once again the immediate introduction of stock orders for doctors' surgeries.

161. **Motion** by BUCKINGHAMSHIRE: That the Representative Body considers the introduction of Form E.C. 10A in England and Wales imperative within the next twelve months.

162. **Motion** by DARTFORD: That this Meeting deplores the present regulations regarding the supply of drugs and dressings for ready use in the surgery and recommends the stopping of payment for ready use dressings and the introduction of Form E.C. 10A.

163. **Motion** by BRIGHTON AND MID-SUSSEX: That to bring about a substantial saving in prescribing costs, the Council should continue to press for stock orders for doctors' surgeries in England and Wales.

164. **Motion** by WEST BROMWICH AND SMITHWICK: That it be referred to the Council to devise an alternative scheme whereby Form E.C. 10A or an effective equivalent may be operated for the ordering of stock drugs and surgical requisites.

165. **Motion** by GATESHEAD: That no prescriptions for cod-liver oil and malt be questioned by the Pricing Bureau unless in excess of 4 lb.

Dangerous Drugs Regulations

166. **Motion** by the Chairman of the General Medical Services Committee: That para. 31 of the Annual Report of Council be approved.

*167. **Amendment** by MANCHESTER: That this Meeting asks Council to press for the withdrawal of the circular issued by the Ministry dealing with the issue of pethidine to midwives.

168. **Amendment** by CAMBRIDGE AND HUNTINGDON: That representations be made to the Ministry of Health that midwifery practice will be made exceedingly difficult for general practitioners if midwives are not permitted to administer pethidine on the instruction of a general practitioner unless the latter is present.

169. **Amendment** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting is of opinion that pethidine should be administered only under the supervision of a doctor and only with his agreement, but not necessarily in his presence, and that the medical officer of health should not be allowed to issue or to authorize the administration of pethidine unless he personally accepts responsibility for the case.

170. **Amendment** by MID-CHESHIRE: That this Meeting protests at the wording of paragraph 31 of the Annual Report of Council, and recommends that this be clarified.

Supply of Medicines to Private Patients

171. **Motion** by MARYLEBONE: That this Meeting instructs the Council to continue to press the Minister to take immediate steps to allow the issue of medicine on Form E.C. 10 to private patients.

Accommodation in Surgeries and Waiting-rooms

172. **Motion** by CITY: That in order that single-handed practitioners may improve their surgery premises, a sum of money should be set aside from which a loan may be obtained on the same conditions as appertains to group practice.

Employment of General Practitioners in Hospitals

173. **Motion** by HEXHAM: That this Meeting views with great concern any possible reduction in the remuneration of general practitioners working in hospitals.

174. **Motion** by WEST DENBIGH AND FLINT: That general practitioners in hospital service should continue to receive not less than £175 per annum per session.

175. **Motion** by MID-CHESHIRE: That this Meeting urges the Council to expedite the payment to general practitioners in hospitals of the sum of £175 per annum.

Representation of General Practitioners in Hospital Administration

176. **Motion** by the Chairman of the General Medical Services Committee: That para. 39 of the Annual Report of Council be approved.

177. **Amendment** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting strongly supports the General Medical Services Committee's view that the general-practitioner representatives on regional hospital boards should always enjoy the confidence of their local colleagues, but views with deep dismay the Ministry's suggestion that the practitioner best suited, in his colleagues' opinion, for the post might be (and in fact very often is) excluded solely "to preserve the geographical balance of the other members of the Board," and this Meeting urges that the general practitioners' nominees should be accepted.

Maternity Medical Services: The Obstetric List

178. **Motion** by DARTFORD: That this Meeting reaffirms the opinion of the Representative Body of 1953 regarding the abolition of the Obstetric List and recommends that dis-

cussions with the Ministry with this in view should be reopened with the minimum of delay.

179. **Motion** by ISLE OF ELY: That this Annual Representative Meeting resolves that the procedure in operation in England and Wales with regard to Obstetric Lists under the National Health Service (Maternity Medical Services) be abolished, and that the procedure at present followed in Scotland and Northern Ireland be adopted in its place.

G.P. Maternity Beds in Hospitals

180. **Motion** by BATH: That this Meeting urges that regional hospital boards be instructed to refrain from reducing the number of general-practitioner maternity beds in hospitals.

Clinical Research Board

181. **Motion** by DORSET: That this Meeting considers that a general practitioner should sit on the Clinical Research Board as a right.

Certification for Surgical Corsets

182. **Motion** by the Chairman of the General Medical Services Committee: That para. 48 of the Annual Report of Council be approved.

183. **Amendment** by GATESHEAD: That every effort should be made to secure the abolition of the purchase tax on corsets.

184. **Amendment** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting is of opinion that general practitioners should not be required to issue certificates for surgical corsets solely for the purpose of obtaining exemption from purchase tax.

Elimination of Inflation

185. **Motion** by WORCESTER AND BROMSGROVE: That the Ministry be pressed again to have instructions printed on the Medical Card requesting the patient to notify to the executive council any change of address.

Remainder of Report under "General Medical Services"

186. **Motion** by the Chairman of the General Medical Services Committee: That the remainder of the Annual and Supplementary Reports of Council under "General Medical Services" be approved.

Disposal of Goodwill of Private Practice by N.H.S. Practitioner

187. **Motion** by BOURNEMOUTH: That any doctor who purchases the goodwill or a share of the goodwill of a private practice shall be entitled to sell the same even if he is engaged in National Health practice in the same area.

Employment of Assistants

188. **Motion** by GREENWICH AND DEPTFORD: That in the opinion of this Meeting any legislation regarding the taking or keeping of an assistant is a dangerous curtailment of liberty. The Representative Body therefore requests the Council to take active steps through the Medical Practices Advisory Bureau to protect the interests of applicants and inform them of the state of affairs in any particular case.

Single-handed Practitioners with Excessive Lists

189. **Motion** by LEWISHAM: That a principal with a list in excess of the maximum allowed for single-handed practice, having employed assistance for an aggregate period of two years, shall take a partner or have his list reduced to the maximum for a single-handed practitioner.

Practice Accommodation in Isolated Areas

190. **Motion** by WESTMORLAND: That the Representative Body invites the Council to review the difficulty experienced by practitioners in isolated areas in obtaining suitable practice accommodation, and that in appropriate cases the Ministry be asked to give powers to executive councils to provide such accommodation on payment of an appropriate rental.

Certification

191. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting considers that the present practice of requiring a full week's national insurance contribution for any portion of a week, for which a person (not otherwise exempt) is certified as fit for work, is unfair not only to the contributors but also to the doctors, since it at times jeopardizes the doctor-patient relationship. This Meeting therefore urges Council, in the interests of common justice, to raise this matter with the Ministry, notwithstanding the slight administrative problem which the adoption of the proposed alteration might involve.

Disclosure of Clinical Details to Local Medical Committees

192. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting is dissatisfied with the "suggested procedure" (B.M.J. Supplement, August 1, 1953, p. 68) for dealing with cases in which a practitioner who has been asked by an executive council for clinical details of a patient (so that it may be decided whether a preparation prescribed on Form E.C. 10 was a food or a drug) finds that the patient refuses to give consent to such disclosure. Objections are (a) that it would only be strictly ethical if the patient had consented to this specific arrangement, and (b) the onus of obtaining the patient's written consent should be on the executive council and not on the practitioner.

(The "suggested procedure" referred to is as follows:

"The practitioner sends the details of the case to the secretary of the local medical committee, who is, in most cases, himself a doctor, or to the chairman of the committee. The secretary or chairman, as the case may be, discloses to his committee the clinical details which he receives, but withholds the name of the patient. The committee, in informing the executive council of its findings, suppresses these clinical details, but the council will, of course, be in possession of the name of the patient through their clerk. Thus the secretary or chairman of the local medical committee is the only person who is in a position to connect the patient by name with the clinical details, and the objection to the disclosure of medical information to lay members and officials of the executive council is avoided.")

Valuation of Doctors' Houses

193. **Motion** by YORK: That the present system of valuation of the house of a doctor retiring from the National Health Service is unsatisfactory, inasmuch as no consideration is given by the valuer appointed for the purpose to the special accommodation for patients provided at the doctor's house.

London Local Medical Committee and Approval of Trainers

194. **Motion** by PADDINGTON: That this Meeting resents the persistent refusal of the Local Medical Committee for London to arrange for appeals against the decision of their subcommittee concerned with the approval of trainers, in spite of persistent representations made to it.

Postgraduate Instruction for General Practitioners

195. **Motion** by PADDINGTON: That the regional boards should be encouraged to provide postgraduate instruction to practitioners in all areas, to equip the practitioner to satisfy the requirements of the local medical committee.

COMPENSATION AND SUPERANNUATION

196. **Motion** by the Chairman of the Compensation and Superannuation Committee on behalf of the Council: That the Annual Report of Council under "Compensation and Superannuation" (Doc. A.R.M. 2, paras. 50-2), and the Memorandum on the Financial Position of Practitioners on Retirement (Appendix II), be received.

197. **Motion** by the Chairman of the Compensation and Superannuation Committee: That the Annual Report of Council under "Compensation and Superannuation" be approved.

Provision of Additional Voluntary Compensation Scheme

198. **Motion** by BUCKINGHAMSHIRE: That in view of the admitted inadequacies of the present superannuation scheme this Meeting suggests the provision of an additional voluntary scheme sponsored by the Ministry, equal payments being made by the practitioner and the Government.

MEDICAL ETHICS

199. **Motion** by the Chairman of the Central Ethical Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Medical Ethics" (Docs. A.R.M. 2, paras. 99-104, and A.R.M. 3, para. 225) be received.

Loan of Hospital Records to Government Departments

200. **Motion** by the Chairman of the Central Ethical Committee: That the following recommendation of the Council be adopted:

That the following statement on the loan of hospital records to Government departments be approved:

(a) That medical records should be lent to the medical officers employed by Government departments only when written consent has been given by or on behalf of the patient.

(b) That the form of consent signed by or on behalf of the patient should include a statement that the patient agrees to his hospital records being made available to the medical board in order to assist them in determining the degree of disablement and whether it is related to his industrial accident.

(c) That wherever practicable, and particularly where disclosure of information may have an adverse psychological effect upon the patient, the practitioner who compiled the record or, if he is not available, one nominated by the hospital authority for the purpose, should be consulted on the wisdom of disclosing to the patient all of the confidential information contained therein, at the same time taking the opportunity of reviewing the notes before they leave the hospital.

Remainder of Report under "Medical Ethics"

201. **Motion** by the Chairman of the Central Ethical Committee: That the remainder of the Annual and Supplementary Reports of Council under "Medical Ethics" be approved.

FINANCE

202. **Motion** by the Treasurer on behalf of the Council: That the Annual and Supplementary Reports of Council under "Finance" (Docs. A.R.M. 2, paras. 120-7, and A.R.M. 3, para. 232) and Appendix XIII and the Financial Statement for the year ending December 31, 1953 (Doc. A.R.M. 3A), be received.

203. **Motion** by the Treasurer: That the Annual and Supplementary Reports of Council under "Finance" be approved.

Association Membership Subscription

204. **Motion** by MARYLEBONE: That this Meeting notes with satisfaction the greatly improved financial position of the Association, which has resulted in part from the increase in subscription from four to six guineas in 1952, and instructs the Council to make plans for reducing the subscription to five guineas within two years.

205. **Motion** by GATESHEAD: That an assurance be given that, as soon as financial circumstances of the Association permit, the question of reducing all membership subscriptions will be seriously considered.

206. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting views with much concern the rather heavy fall in membership since the increased subscription rate, and asks for a clear statement from Council regarding the probable future trends of the Association's finances, membership, and subscription rates.

207. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That this Meeting urges the Council to investigate the desirability of having different subscription rates for "town" and "country" members.

208. **Motion** by RUGBY and SOUTH WARWICKSHIRE: That it be referred to the Council to consider the possibility of reducing the B.M.A. subscription to half a guinea or even less to members for the first 13 months after qualification.

Subscription Payable by Whole-time Salaried Members

209. **Motion** by the Treasurer: That para. 127 of the Annual Report of Council be approved.

*210. **Amendment** by HARROW: That this Meeting considers that the reduced subscription of four guineas should be granted to all whole-time salaried members of the Association.

211. **Amendment** by PERTH: That this Meeting reiterates its view that the reduced subscription of four guineas should be granted to all whole-time salaried members of the Association.

212. **Amendment** by MID-CHESHIRE: That this Meeting regrets that Council did not see fit to accept the resolution of the A.R.M., 1953, regarding subscriptions to be paid by members of the Association on full-time salaried service.

BUILDING

213. **Motion** by the Chairman of the Estates Committee on behalf of the Council: That the Annual Report of Council under "Building" (Doc. A.R.M. 2, para. 128) be received.

214. **Motion** by the Chairman of the Estates Committee: That the Annual Report of Council under "Building" be approved.

SCIENCE

215. **Motion** by the Chairman of the Science Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "Science" (Docs. A.R.M. 2, paras. 129-34, and A.R.M. 3, paras. 233-8) be received.

Postage on Library Books

216. **Motion** by HUDDERSFIELD: That in the interests of provincial practitioners, whose opportunities to enjoy the facilities of B.M.A. House are limited, the Association return to the former system of paying outgoing postage on library books and periodicals sent out on loan.

Remainder of Report under "Science"

217. **Motion** by the Chairman of the Science Committee: That the remainder of the Annual and Supplementary Reports of Council under "Science" be approved.

PUBLIC RELATIONS

218. **Motion** by the Chairman of the Public Relations Committee on behalf of the Council: That the Annual Report of Council under "Public Relations" (Doc. A.R.M. 2, paras. 135-9) be received.

219. **Motion** by the Chairman of the Public Relations Committee: That the Annual Report of Council under "Public Relations" be approved.

National Insurance Contribution and Health Service

220. **Motion** by PADDINGTON: That greater publicity should be given to the fact that the National Insurance Scheme ceased in July, 1948, and that the present National Insurance contribution is not used for financing the health service, the finances being provided out of the general revenue.

Public Relations Officer and Unfair Criticism of the Profession

221. **Motion** by GREENWICH AND DEPTFORD: That the Council be instructed to ensure that the Public Relations Officer should take all steps to prevent unfair criticism of the medical profession passing unanswered.

ARMED FORCES

222. **Motion** by the Chairman of the Armed Forces Committee on behalf of the Council: That the Annual Report of Council under "Armed Forces" (Doc. A.R.M. 2, para. 140) be received.

223. **Motion** by the Chairman of the Armed Forces Committee: That the Annual Report of Council under "Armed Forces" be approved.

WALES

224. **Motion** by the Chairman of the Welsh Committee on behalf of the Council: That the Annual Report of Council under "Wales" (Doc. A.R.M. 2, para. 165) be received.

225. **Motion** by the Chairman of the Welsh Committee: That the Annual Report of Council under "Wales" be approved.

OVERSEAS

226. **Motion** by the Chairman of the Overseas Committee on behalf of the Council: That the Annual Report of Council under "Overseas" (Doc. A.R.M. 2, paras. 166-72) be received.

227. **Motion** by the Chairman of the Overseas Committee: That the Annual Report of Council under "Overseas" be approved.

EMPIRE MEDICAL ADVISORY BUREAU

228. **Motion** by the Chairman of the Committee of Management of the Empire Medical Advisory Bureau on behalf of the Council: That the Annual Report of Council under "Empire Medical Advisory Bureau" (Doc. A.R.M. 2, para. 173) be received.

229. **Motion** by the Chairman of the Committee of Management of the Empire Medical Advisory Bureau: That the Annual Report of Council under "Empire Medical Advisory Bureau" be approved.

INTERNATIONAL MEDICAL VISITORS' BUREAU

230. **Motion** by the Chairman of the Committee of Management of the International Medical Visitors' Bureau on behalf of the Council: That the Annual Report of Council under "International Medical Visitors' Bureau" (Doc. A.R.M. 2, para. 174) be received.

231. **Motion** by the Chairman of the Committee of Management of the International Medical Visitors' Bureau: That the Annual Report of Council under "International Medical Visitors' Bureau" be approved.

MEDICAL BENEVOLENCE

232. **Motion** by the Chairman of the Charities Committee on behalf of the Council: That the Supplementary Report of Council under "Medical Benevolence" (Doc. A.R.M. 3, paras. 239-40) be received.

233. **Motion** by the Chairman of the Charities Committee: That the Supplementary Report of Council under "Medical Benevolence" be approved.

WORLD RELATIONS

234. **Motion** by the Chairman of the International Relations Committee on behalf of the Council: That the Annual and Supplementary Reports of Council under "World Relations" (Docs. A.R.M. 2, paras. 176-9, and A.R.M. 3, paras. 241-3) be received.

235. **Motion** by the Chairman of the International Relations Committee: That the Annual and Supplementary Reports of Council under "World Relations" be approved.

OTHER ASSOCIATION ACTIVITIES

236. **Motion** by the Chairman of Council: That the Annual and Supplementary Reports of Council under "Other Association Activities" (Docs. A.R.M. 2, paras. 180-9, and A.R.M. 3, paras. 244-51) be received.

vation of the Government's prerogatives. A code of conduct is unlikely to be arbitrable, but a simple proposal for a change in wage or salary rates almost certainly is" (my italics).

Commenting upon this situation, the leading article of the *B.M.J.* (1949, 2, 63) stated: "In May, 1948, the Minister agreed that after the inception of the Service it would be open to the profession to raise through Whitley machinery the question of betterment. It was because of this that the chairman of Council, Dr. H. Guy Dain, was able to persuade the medical profession to enter the National Health Service."

The Basis of Remuneration

Two committees were set up under the chairmanship of Sir William Spens, the general practice committee subsequently issuing a report upon the remuneration of general practitioners; and the specialist committee some time later providing a report on the remuneration of consultants and specialists. Both reports were publicly accepted by the Minister of Health, Mr. Aneurin Bevan, and the profession, as the basis of future remuneration. Unfortunately, owing to the instability of social and economic conditions at that time, the Spens Reports defined remuneration in terms of the 1939 values of money, and stated those now well-known words: "We leave to others the problem of the necessary adjustments to present-day values of money, but we desire to emphasize as strongly as possible that such adjustments should have direct regard not only to estimates of the change in the value of money but to the increases which have in fact taken place since 1939 in incomes both in the medical and other professions. In our judgment it is only if corresponding changes are made in the incomes of consultants and specialists that the recruitment and status of the various branches of specialist practice will be maintained."

It is important to realize that the betterment factor in the case of general practitioners had been determined by the Government as long ago as 1946, and that this figure was imposed by the Government but not agreed to by the profession when the Health Service began on the appointed day, July 5, 1948.

July, 1948–March, 1952

Although the imposition of the 20% betterment factor upon the general practitioners took place from the outset, hospital medical and dental staffs were left in ignorance of the betterment factor which the Government intended to impose upon them, and were obliged to exist upon rates of pay which were 25% to 40% below the accepted minimum of the Spens scale in terms of 1939 money values, whilst at the same time paying compulsory superannuation contributions.

It was therefore necessary for the Ministry of Health to invite specialists to participate in the National Health Service upon a temporary basis, interim contracts being issued for this purpose, and these, *inter alia*, stated:

"The invitation to take part in the service on the basis of the remuneration and conditions now proposed is made for a limited period only in order to allow of review and the substitution of firm contracts on a permanent basis as soon as possible. The rates of remuneration, travelling expenses, etc., proposed in the invitation are provisional payments until the rates evolved from the Spens Report are known."

Part-time specialists were more fortunate, since the Appendix contained provisional rates which in their case amounted to £200 per annum per half-day. Many of the whole-time specialists thought that this could be taken to infer that 11 half-days or £2,200 per annum, a betterment factor of 47%, might be taken as a starting-point for negotiations regarding the betterment factor to be applied to the Spens Report for Consultants and Specialists.

Some support to this impression was given by the increases which had in fact taken place in the medical and other professions since 1938. The professional earnings of doctors, dentists, lawyers, artists, and journalists were sum-

marized for purposes of assessment of income tax under Schedule D in Table V of the *National Income and Expenditure of the United Kingdom*, published by the Central Statistical Office as follows: 1938, £105m.; 1946, £180m.; 1947, £200m.; 1948, £212m.

From this it might be assumed that, allowing for some increase in total numbers within the professions concerned, there had been approximately a 100% increase in remuneration, and that this factor would be taken into account when the adjustments in "relation to the present value of money" were subsequently made.

A few specialists wrote for personal confirmation of the situation, a typical reply being:

"I am writing to confirm that the salary is provisional and subject to review before March 31, 1949, in the light of recommendations made in the Spens Report. All changes in rates of salaries occasioned by this review will have retrospective effect from July 5, 1948" (my italics).

Review of Hospital Medical Staff

During this period hospital staffs were "graded" by grading committees, and in the light of subsequent events there can be little doubt that grave injustices occurred as the result of the introduction by the Government of the grades of S.H.M.O. and S.H.D.O., which provided a ready means of obtaining consultant services, in many cases, at a rate of remuneration £1,000 below the equivalent maximum of the consultant scale. The view of the Council of the B.M.A. on this matter was expressed in their Supplementary Report (*Supplement*, 1949, 1, 287), when it was stated:

"The committee feels that the creation of this grade, necessary as it may be for the appropriate classification of certain transferred officers, is fraught with danger in that it might lead to the establishment of two grades of specialist, involving a process of dilution which would be most undesirable. It is therefore insistent that the grade shall not be applied to practitioners of consultant status, and had recommended to the Joint Committee that the grade should be used only as a temporary expedient, and that no future appointments should be made in this grade."

Advertisements for appointments involving specialist duties in this grade were no longer accepted for insertion in the *Journal*. Unfortunately, there are still to-day many very experienced physicians and surgeons graded as S.H.M.O.s but performing consultant duties, thus providing a pool of what must be considered as "cheap labour."

Internal strife was created at the registrar level by the creation of an excessive number of posts which bore no relationship to the ultimate consultant establishment, so that considerable uncertainty for the future existed.

Senior consultants were divided among themselves over the question of merit awards, which were allotted secretly to a total of 34% of specialists. The whole basis of the merit award system, and in particular the secrecy surrounding them, was the subject of much criticism.

Divided Within

Thus the Minister had been able to exploit the weaknesses of human character by allowing the profession to sit in judgment upon themselves. A correspondent in the *Supplement* (1949, 2, 192) aptly summarized the situation when he wrote: "We may well ask ourselves, 'How could this situation come about?' It has come about because doctors have been, since the National Health Service was first mooted, woefully disunited and disorganized, pursuing selfish aims and sectional interests and failing to come together for their own protection. Thus wedges are being driven between various sections of the profession. If doctors do not now at this late hour organize and unite, then the outlook for the doctor and his family is black indeed. And the time is short." There will be few of the medical profession to-day employed in hospitals who would be inclined to cast the first stone at the writer of this shrewd comment of almost five years ago, and, as he inferred, the time was "later than you think."

Compulsory Arbitration

In the meanwhile the General Medical Services Committee had obtained the opinion of an expert economist, who came to the conclusion that the increase in middle-class budgets in 1948 was 85% over the pre-war figure. A report on remuneration went to the Ministry on March 4, 1949, and a deputation of members of the General Medical Services Committee went to the Ministry on April 14 to discuss remuneration in the light of the report. An indication of the attitude to be adopted from that time henceforward was given when the Ministry was asked whether, in the event of a dispute on remuneration, the profession's claims should be submitted through Whitley machinery and finally, if necessary, to arbitration; the reply given was as follows: "It must not be assumed without further discussion that participation in the Whitley machinery necessarily involves, in the event of disagreement, the right to resort compulsorily to arbitration on all subjects."

Commenting upon this in a leading article entitled "Breach of Faith," the *Journal* (1949, 1, 762) observed that the profession would be disturbed at the negative caution in the Ministry's reply. It added: "Without the right to resort compulsorily to arbitration on a subject such as remuneration the Whitley machinery may well be reduced to mere trifling, the correction of minor administrative errors here and there and the removal of the occasional straw from the camel's back. It is difficult to see how any claims on which the two sides of the Whitley Council fail to agree can be justly decided if, on the Government's prerogative, resort to independent arbitration is denied. Indeed, not only the claim but justice itself would be denied."

It should also be recalled that the Chairman of Council said at the Special Representative Meeting on May 28, 1948: "The Minister has agreed that when the Service starts on July 5 we can immediately raise with the Whitley Council which will be set up to consider general practitioner remuneration, this matter of the betterment factor and the implementation of the Spens Report. Therefore we are not bound to the present conditions as set out in the remuneration offer if we can prove to the Whitley Council that the amount is not the proper one."

The Betterment Factor

In the meantime, the Joint Committee had been advising consultants not to sign any contract with the Ministry, which had issued its proposed terms and conditions of service in March, 1949. The leading article (*Journal*, 1949, 1, 486) concerning "Remuneration of Specialists" noted the Spens recommendations that increases in the medical and other professions were to be taken into account in calculating the betterment factor, and drew attention to the Churley Committee's proposals for remunerating higher civil servants, which had just been accepted by the Government. It was observed that: "The salaries of permanent secretaries and deputy secretaries in Government Departments have been increased by 50% above the salaries of these officers in 1939. It is not unfair to assume from this that the Government regards 50% as a reasonable betterment factor."

Contracts Signed

In view of the long delay and the financial hardship suffered by hospital medical staffs, and that the Ministry was unlikely immediately to give any further concessions by negotiation, the Committee and the Joint Committee decided to advise hospital staff to sign contracts. This was, however, done only after certain very important safeguards had been obtained from the Minister: (a) That no changes would be made in the terms and conditions of service without discussion in the appropriate part of the Whitley machinery, when established. (b) That remuneration was a subject suitable for arbitration. (c) That, save in exceptional circumstances, and after the conciliation

machinery of Whitley had been exhausted, issues of remuneration remaining in dispute would go either to arbitration or for inquiry and report by a committee. (d) That the model form of contract would be amended to make it clear that it was not subject to unilateral modification.

By signing a contract at this time a specialist was not necessarily committing himself to an acceptance of 20% as an adequate betterment factor, but acknowledging only that he was prepared to enter the scheme under the terms and conditions of service which had at that time been assured for him by the Joint Committee, his contract including the proviso that remuneration was subject to "the terms and conditions of service determined from time to time," knowing full well that further negotiations on the subject of remuneration were under consideration.

In view of recent events, it is of some interest to note the substance of a letter at this time (*B.M.J. Supplement*, 1949, 2, 185) from the members of the S.W. Metropolitan (Western) Regional Committee, one of the signatories to which is a member of the present Joint Committee. A paragraph from the letter reads: "It has been noted also that the Joint Committee has omitted to report regularly its proceedings to the Central Committee and finally acted without authority in agreeing with the Ministry to recommend the terms for the permanent contracts for hospital staffs, while discarding almost all the points of objection or modification which had been previously put forward by the Regional and Central Committees. Such behaviour does not inspire confidence in the Joint Committee for the future conduct by it of the affairs of hospital staffs, even if the staffs were prepared to waive their right to democratic representation."

The Danckwerts Award

A fundamental error of policy took place when it was agreed to allow the general practitioners to press their claim for betterment independently, since it was, as future events proved, yet one more crack in the unity of the profession. Every possible means to effect a peaceful settlement by negotiation having been tried, the attitude of the Minister (Mr. Aneurin Bevan) may be observed from an extract of his letter (*B.M.J. Supplement*, 1950, 1, 179) in reply to the previous request for application of a 70% betterment factor in the light of a carefully assessed 85% increase in the cost of living. The letter concluded: "The Minister is clear that in the light of these figures no reasonable case can be made for any increase in the total remuneration of general practitioners, nor any argument substantiated to show that general practitioners as a group are inadequately paid. Nor, in his view, could any claim be justified that any future alteration of remuneration at any later date should be made retrospective, either to July, 1948, or to the present day. This view rests upon the sheer merits of the case as revealed by the plain figures and facts as they stand."

After a threat of mass withdrawal from the Service the bluff contained in this letter was called, the dispute went to arbitration, and the "sheer merits of the case as revealed by the plain figures and facts as they stand" resulted in the adjudication of Mr. Justice Danckwerts. The outcome was that a betterment factor of 85% was applied to the years 1948–50, and 100% to 1951.

The statistics for this inquiry were prepared by Professor R. G. D. Allen, who occupied the Chair of Statistics at London University. After a most detailed investigation, he came to the conclusion that in 1952 the rise in the cost of living represented an increase of approximately 120% over the 1939 level.

This complete vindication of the claims of the general practitioners badly rocked the complacency of the Government, which hastened, through the medium of the Chancellor of the Exchequer, to make a statement to the following effect:

"I want to make it clear that the terms of reference of Mr. Justice Danckwerts's award were confined solely to

the question of the remuneration of general practitioners in the National Health Service, and his award has no wider application. In accepting the results of the adjudication, which was of an exceptional nature, the Government have by no means adopted the view that similar adjustments in other fields should follow. In their view there is no justification for any assumption that the appropriate standard of remuneration for the professional classes is a rate of 100% above that in force in 1939. They consider that remuneration should be determined in the light of all relevant circumstances."

Whilst the Minister is entitled to take this view, if he wishes, he is of course not infallible in law, and the proper course would seem to be to have pressed immediately for an adjudication concerning the betterment factor to be applied to hospital medical staffs upon the sheer merits of the case and not, under the circumstances, in relation to the Danckwerts award. Whatever the Minister's views, it would have been very difficult, having regard to the figures available from Professor Allen's calculations, to have awarded a betterment factor very much below that of the general practitioner, particularly when we look back to the Chorley report which the Government accepted in 1949 as justifying the application of a betterment factor of 50% to higher civil servants.

At this juncture it should be remembered that, although both the Danckwerts award and the scale for hospital staff imposed in 1949 but not put into effect until 1950 were retrospective to July, 1948, the Government had obtained four years' services to a considerable extent upon credit in the case of general practitioners, and two years' credit facilities of a similar nature in the case of hospital staff—and in both instances these were free of interest. In addition the money from superannuation contributions was not in circulation, or available to meet the day-to-day financial commitments of an impoverished hospital medical staff.

Why no Inquiry?

Another two years' delay was no doubt imperative if the Government was to recover from the situation brought about by the Danckwerts award, and subsequent events have shown that this has indeed been the policy carried out in relation to the recent negotiations. Sir Russell Brain, Chairman of the Staff Side of Committee "B" of the Medical Whitley Council, stated (*Supplement*, April 10, p. 145) that if negotiations at this stage had broken down in the Whitley Council the Minister could fulfil his undertaking by referring all aspects of consultant remuneration to a committee of inquiry. In view of the indisputable merits of the case and the sound precedent created by the Danckwerts adjudication it is difficult to understand why this was not done immediately. The excuse offered was that there was a danger that the findings could in effect replace the Spens Report as the basis of consultant remuneration for the future. One is not aware that this has in fact been the effect of the Danckwerts award so far as the general practitioners are concerned, and it is impossible to conceive that the basis upon which the profession entered the National Health Service would be jeopardized by a properly constituted legal body.

Referring to the possibility of such an inquiry into the remuneration of hospital medical staff, Sir Russell Brain stated (*Supplement*, May 8, p. 228) that this "would not have concerned itself with cost-of-living betterment but

would have looked into the earnings of part-time consultants." Sir Russell implied that this might have had unfortunate results, but in the *Supplement* (May 22, p. 280) concluded a letter with these words: "Can we not continue to put unity before sectional interest?"

Comparative Figures

The accompanying graph attempts to illustrate the past, present, and future position of a whole-time consultant as from the appointed day in July, 1948, and to compare this with the increase in the cost of living which has taken place from the inception of the Health Service.

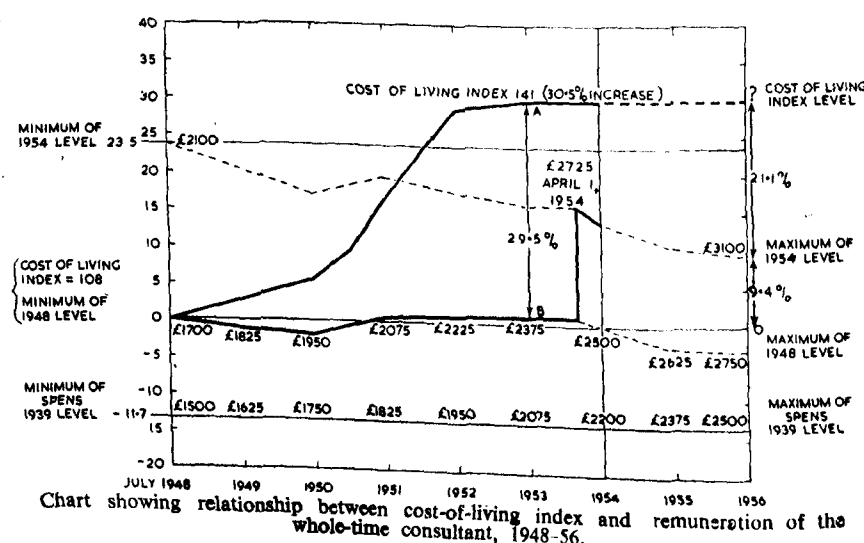


Chart showing relationship between cost-of-living index and remuneration of the whole-time consultant, 1948-56.

The graph is based upon percentage variations between the official cost-of-living index and the relationship of the 1948 scale to the 1939 Spens scale. The position at July, 1948, has been taken as the datum line of zero point in relation both to the salary minimum of £1,700 and to the cost-of-living index, which at that time stood at 108. The Spens minimum of £1,500 is £200 below this point, and is therefore shown as a decrease or minus factor of 11.7%, which is equivalent to saying that the minimum of the 1948 scale is 13.3% above the Spens minimum.

If the 1948 scale had been a true replica of the Spens scale with an even 13.3% increase throughout, the line depicting salary would of course be the same as the 1948 salary scale datum line; but it will be observed that this is not the case, and that, although declining slightly initially and then closely approximating to a 13.3% increase, subsequent increments are inadequate and the line declines sharply so that at the maximum of the scale the betterment factor is only 10% above the 1939 Spens level—this necessarily having to be shown as a 2.9% decrease from the corresponding point on the datum line representing a level 13.3% increase (£2,832) over the Spens maximum.

As from April 1, 1954, the 1948 scale is shown as a dotted line, the actual salary received rising abruptly in accordance with the recent increase. The next point or direction, expressed as a percentage increase above the equivalent point on the 1948 scale, and the percentage from the minimum to the maximum may be observed from the dotted line shown as a "back-projection" and continuation of the 1954 salary line.

The situation arising from the imposition of the 1948 scale may be seen by reference to Table I. The system of remuneration at the upper end of the scale is particularly reprehensible in view of the relatively greater burden of taxation which the higher-income groups are called upon

TABLE I

Grade	1948 Scale Plus Government 8% Superannuation Contribution	% Increase Over 1939 Spens Scale		1948 Scale Less 6% Compulsory Personal Superannuation Contribution and 8% Government Contribution	% Increase over 1939 Spens Scale of Taxable Income Remaining after Preceding Deductions	
		With Government 8% Contribution	Without Government 8% Contribution		Percentage	Amount
Consultant: Minimum, £1,700 Maximum, £2,750	£1,836 £2,970	18.8% 22.4%	13.3% 10.0%	£1,598 £2,585	6.5 3.4	£98 £85
Senior Registrar: Minimum, £1,000 Maximum, £1,300	£1,080 £1,404	20% 17%	11.1% 8.3%	£940 £1,222	4.4 1.9	£40 £22
Registrar: Minimum, £775 Maximum, £890	£837 £960	19.5% 20%	10.7% 11.25%	£728 £837	4 4.6	£28 £37
Senior House Officer, £670	£723	20.5%	11.66%	£630	5	£30

Example:—Consultant minimum, £1,836 (18.8%)—£136 (Government contribution)—£102 (personal contribution)=£1,598 (6.5% increase over Spens).

TABLE II.—Remuneration of Whole-time Consultant

Grade	Year	1939 Spens	% Increase of 1948 Scale Over 1939 Scale	1948 Scale	Adjustment of Salary to give 13.3% Level of Increase Above 1939 Spens Scale	% Variation of Actual Scale from 13.3% Adjusted Scale + = Above - = Below	Cost-of-living Index and % Increase since July, 1948 when Index = 108*	Total % Difference Between Actual Scale and Cost-of-living Index	Salary Required to Offset Increase in Cost of Living Each Year	Back Pay Due. Subject to Income Tax for Year Applicable and Superannuation
Minimum	1948	£1,500	13.3	£1,700	£1,700	Nil	108: Nil	Nil	£1,700	Nil
First increment	1949	£1,625	12.3	£1,825	£1,841	-0.9	111: +2.8	3.7	£1,893	£68
Second "	1950	£1,750	11.5	£1,950	£1,983	-1.6	114: +5.5	7.1	£2,088	£138
Third "	1951	£1,825	13.5	£2,075	£2,067	+0.4	126: +16.6	16.2	£2,411	£336
Fourth "	1952	£1,950	14.0	£2,225	£2,209	+0.7	138: +27.7	27.0	£2,848	£623
Fifth "	1953	£2,075	14.4	£2,375	£2,351	+1.0	141: +30.5	29.5	£3,075	£526† (of £701)
										Total, £1,691‡

* *Ministry of Labour Gazette*, February, 1954, p. 64. † Remuneration from July, 1953, to March 31, 1954. ‡ Approximately equal to £750 net. Note:—Increments are due in July each year.

TABLE III.—Remuneration of the S.H.M.O. and the J.H.M.O.

Grade	Year	1948 Scale*	Cost-of-living Index and % Increase Since July, 1948, when Index = 108	Salary which would have been Required to Offset Increase in Cost of Living	Back Pay Due. Subject to Tax for Year Applicable and Superannuation
S.H.M.O.:					
First year	1948	£1,300	108	Nil	Nil
Second "	1949	£1,350	111	2.8%	£38
Third "	1950	£1,400	114	5.5%	£77
Fourth "	1951	£1,450	126	16.6%	£241
Fifth "	1952	£1,500	138	27.7%	£415
Sixth year (9 12ths)	1953	£1,550	141	30.5%	£355 (of £473)
J.H.M.O.:					
First year	1948	£700	108	Nil	Nil
Second "	1949	£750	111	2.8%	£21
Third "	1950	£800	114	5.5%	£44
Fourth "	1951	£850	126	16.6%	£141
Fifth "	1952	£900	138	27.7%	£249
Sixth year (9 12ths)	1953	£950	141	30.5%	£217 (of £290)

* The grades of S.H.M.O. and J.H.M.O. were not provided for in the Spens Report. There are therefore no 1939 equivalents.

TABLE IV.—Remuneration of Senior Registrar, Registrar, and Senior House Officer

Grade	Year of Service	1939 Spens	1948 Scale	% Increase of 1948 Scale Over 1939 Scale	1948 Scale Adjusted to give 13.3% Increase	Cost-of-living Index and % Increase Since July, 1948, when Index = 108	Salary Required to Offset Increase in Cost of Living	Back Pay Due. Subject to Income Tax and Superannuation for Year Applicable
Senior Registrar:								
First year	Jan., 1951	£900	£1,000	11.1%	£1,020	118	9%	£112
Second "	Jan., 1952	£1,000	£1,100	10.0%	£1,133	133	23%	£282
Third "	Jan., 1953	£1,100	£1,200	9.0%	£1,246	139	28%	£395
Fourth "	Jan., 1954	£1,200	£1,300	8.3%	£1,360	141	30.5%	£119 (3/12ths of £475)
Registrar:								
First year	Jan., 1952	£700	£775	10.7%	£793	133	23%	£200
Second "	Jan., 1953	£800	£890	11.25%	£906	139	28%	£270
Senior house officer	Jan., 1953	£600	£670	11.66%	£689	139	28%	£470

The fourth year has been calculated by adding a further £100 to the third year of the Spens remuneration.

TABLE V.—Remuneration of House Officer

Grade	Year	1948 Scale*	Cost-of-living Index and % Increase Since July, 1948, when Index = 108	Salary which would have been Required to Offset Increase in Cost of Living, Less Appropriate Adjustment to Deduction for Residential Emoluments	Back Pay Due. Subject to Tax for Year Applicable and Superannuation. (6 12ths of Annual Amount in Each Period)
House officer:					
First six months ..	July, 1952	£350—£100=£250	138	£447—£128=£319	£34 10s.
Second " " ..	Jan., 1953	£400—£100=£300	141	£522—£130=£392	£46
Third " " ..	July, 1953	£450—£100=£350	141	£587—£130=£457	£53 10s.
					£134

* The grades of house officer were not provided for in the Spens Report. There are therefore no 1939 equivalents.

to bear to-day in comparison with 1939. This pattern of remuneration has been followed in an exaggerated form by the 1954 scale.

Bearing in mind the fact that the 1948 pay scale did not become effective until 1950, thus securing two years' services to a large extent on credit, and that no retrospective pay has been given with the recent award, the extent of cheap labour obtained by the Government may be readily envisaged. Add to this the underpayment of hospital staff, particularly in the registrar grades, and it becomes immediately apparent that the whole scheme has been floated to a considerable extent upon the finances not of the Government but of the hospital medical staffs themselves. The back pay to which we are morally entitled is set out comprehensively for all grades in Tables II, III, IV, and V.

The inadequacy of the 1954 scale in relation to the 1948 scale at all points beyond July, 1951, is very obvious, and it might be said that it is almost three years out of date. The net effective increase of the 1954 maximum is only 9.4% above the corrected maximum of the 1948 scale.

An attempt has been made to construct a scale, accepting a true increase in 1948 of 13.3% over the Spens scale throughout the salary range, and applying to the corrected salary figures thus obtained an increase of 30.5% to offset the increase in the cost of living since 1948. In applying a betterment factor of 30.5% to the 1948 scale (which was an imposed 13.3% increase above the 1939 Spens scale), thus making a total betterment of approximately 44% above pre-war levels, it is not intended to suggest either that this is necessarily an adequate figure or that an assumption has been made to the effect that every increase in the cost of living should result automatically in the application of a corresponding betterment factor. The intention is rather to indicate that this is the absolute minimum betterment which could be considered in the light of all the relevant circumstances. The results may be seen in Tables VI, VII, and VIII. In order to preserve the essential structure

TABLE VI.—1954 Salary Scale for Whole-time Consultant Adjusted to Compensate for 30.5% Increase in Cost of Living

Increments	1948 Scale Adjusted to give 13.3% Level of Increase Over All Points on 1939 Spens Scale	30.5% Increase Over Corrected 1948 Scale	Adjusted Figure to Provide Even and Smooth Progression of Proposed Scale
Minimum ..	£1,700	£2,218	£2,250
First ..	£1,841	£2,402	£2,400
Second ..	£1,983	£2,588	£2,550
Third ..	£2,067	£2,697	£2,700
Fourth ..	£2,209	£2,883	£2,850
Fifth ..	£2,351	£3,068	£3,000
Sixth ..	£2,493	£3,253	£3,250
Seventh ..	£2,691	£3,512	£3,500
Maximum ..	£2,832	£3,696	£3,750

This scale may therefore be expressed as £2,250×£150—£3,000×£250—£3,750.

TABLE VII.—Whole-time Consultant in Receipt of Merit Award. (All Merit Awards Plus 30% Increase)

"A" award ..	£3,750+£3,250=£7,000	4% of consultants
"B" " ..	£3,750+£1,950=£5,700	10% " "
"C" " ..	£3,750+£650=£4,400	20% " "

N.B.—Equivalent pre-war purchasing power of 1954 income of £5,000 p.a. for a married man with two children = £1,090. This is provided by a tax-free income of approximately £2,600. A consultant in receipt of the maximum merit award will therefore not have the equivalent 1939 purchasing power of the minimum of the 1939 Spens scale for consultants without a merit award.

TABLE VIII.—Proposed Rates of Remuneration for Other Grades of Hospital Medical Staff

Senior hospital medical officer ..	£1,700×£100=£2,200
Junior " " ..	£900×£75=£1,275
House Officer: First six months ..	£455—£130=£325
Second " " ..	£530—£130=£400
Third " " ..	£580—£130=£450

N.B.—No Spens equivalent exists for the above grades to which an approximate increase of 30% over the 1948 level has been applied. In the case of House Officers an increase to the rates for residential emoluments has been made so as to bring the charge up to a level commensurate with the increase in the cost of living.

Senior registrar ..	£1,350×£100=£1,650
Registrar ..	£1,050×£150=£1,200
Senior house officer ..	£900

N.B.—The salaries for the above grades have been obtained by calculating the ratio for the Spens minimum of the grade in relation to the Spens minimum of the Consultant grade—e.g., senior registrar, £900; consultant, £1,500 = ratio 9/15ths or 3/5ths of proposed consultant's minimum of £2,250; equivalent to £1,350 p.a.

and principles of the Spens scale it is necessary to ensure that the ratio of remuneration between the different grades is maintained, and every effort has been made to ensure that this basis is preserved. It is also necessary to provide an increase of the maximum over the minimum of the scale equivalent to that recommended by the Spens Report, and thus to avoid the tendency to "make up on the swings what has been lost on the roundabouts," a technique which has already been exposed. A comparison between the Spens scale, 1948 scale, 1954 scale, and the proposed scale is shown in Table IX.

TABLE IX

	1939 Spens Scale	1948 Scale	1954 Scale	Proposed Scale
Minimum ..	£1,500	£1,700	£2,100	£2,250
First increment ..	£1,625	£1,825	£2,225	£2,400
Second " ..	£1,750	£1,950	£2,350	£2,550
Third " ..	£1,825	£2,075	£2,475	£2,700
Fourth " ..	£1,950	£2,225	£2,600	£2,850
Fifth " ..	£2,075	£2,375	£2,725	£3,000
Sixth " ..	£2,200	£2,500	£2,850	£3,250
Seventh " ..	£2,375	£2,625	£2,975	£3,500
Maximum ..	£2,500	£2,750	£3,100	£3,750
% increase from minimum to maximum ..	66½	61.8	47.6	66½

The extent to which the 1954 scale has implemented the Spens recommendations and the real value of the recent increase in salary may be observed in the figures in Table X. These have been calculated in accordance with Mr. Butler's

TABLE X

	Gross Salary 1954	Tax	Net	Superannuation	True Net	1938 Equivalent Net Income
Senior Registrar:						
Minimum ..	£1,100	£136	£964	£66	£898	£395
Maximum ..	£1,400	£241	£1,159	£84	£1,075	£473
S.H.M.O.:						
Minimum ..	£1,500	£276	£1,224	£90	£1,134	£499
Maximum ..	£1,950	£434	£1,516	£117	£1,399	£615
Consultant:						
Minimum ..	£2,100	£504	£1,596	£126	£1,470	£647
Maximum ..	£3,100	£1,074	£2,026	£186	£1,840	£809
Plus "C" merit award ..	£3,600	£1,386	£2,214	£216	£1,998	£879

statement on February 6, 1953, that the pound was then worth 44% of its 1938 value, and on the assumption that the individual concerned is married, with two children.

Apart from the many anomalies of the merit award system, there is one feature which is not always fully appreciated. The Spens Report laid down that 4% of consultants were to receive an "A" award of £2,500, 10% a "B" award of £1,500, and 20% a "C" award of £500 per annum additional to the normal rate of remuneration. Since part-time consultants receive only a proportionate amount of the merit award dependent upon the number of sessions they perform, the percentage quota may be fulfilled at a much smaller cost to the Exchequer by giving awards to part-time rather than whole-time consultants. For example, of 100 consultants eligible for "C" awards of £500 per annum only 20%, or a fifth, may receive them. If, therefore, 20 whole-time consultants receive awards the amount involved is 20×£500 per annum=£10,000. If 20 part-time consultants receive the award, each performing 2/11ths, they each receive approximately £90 per annum as their proportion of the merit award at a total cost of £1,800. In both cases the 20% quota has been satisfied.

Allowances for Whole-time Staff

So much has been said concerning this subject that it will suffice to repeat the recommendations of the Spens Report, which in assuming that whole-time specialists would be paid "any sums which represent expenses reasonably incurred in the course of their work" which would not be liable to tax, specified such items as: "... car expenses; to tax, specified such items as: "... car expenses; the cost of renewal of instruments and other equipment; the cost of books and journals, preparation of scientific papers, and subscriptions to professional societies; printing, stationery, postage and telephone costs; expenses of attendance at national and international professional meetings; and the expenses of visiting hospitals and clinics at home and abroad, and entertaining visiting colleagues."

The Future

Hospital medical and dental staff must now decide for themselves whether they are content to aim at a salary which will give them at the maximum of the consultant per scale, aged about 45, a spendable income of £1,840 per annum with an equivalent purchasing power of £809 in 1938, and whether in the light of all the facts this can be regarded as a proper implementation of the Spens Report in virtue of which the profession was induced to enter the Service. The Whitley machinery at the present time has broken down completely, and in view of the often-repeated assurances that the Minister would certainly agree to it, an inquiry, based upon the Spens recommendations and the merits of the case and not the Dankwerts award, should be instituted forthwith. It should also be made quite clear that an increase in pay is not being demanded, but that a rectification of the unjust rates of remuneration imposed by the Government in 1950 (retrospective to 1948) is being sought, together with full back pay as compensation for the severe personal financial hardship endured for six years by the hospital full-time staffs of this country. This is not to say that the correct proportion of back pay should not be given to part-time consultants, but rather to emphasize that, since they have been able to offset the increase in living by increased fees to private patients, and to obtain preferential allowances, the financial draught has not been so severe.

One point above all stands out in the clearest possible manner—unity is strength in the medical profession as it is elsewhere. As the B.M.J. has repeatedly pointed out, if we abandon Spens we abandon our birthright. The time has come to close our ranks, demand as a united body an impartial inquiry, and fight to the last ditch to ensure that we get it.

MAJOR ACCIDENTS

MOBILE HOSPITAL TEAMS

Arrangements are being made for certain hospitals in all areas to be ready to send mobile medical teams to the scene of major civil accidents involving large numbers of casualties. It will be the function of the ambulance service to call on the most appropriate hospital. The ambulance service will be kept informed by hospitals of the number of beds remaining available for casualties. If it is necessary to call upon more distant "support" hospitals, the hospital medical officer in charge of a mobile team will keep the ambulance service informed as to which of the hospitals should receive casualties. Mobile teams from hospitals will bring their own surgical and medical equipment.

The Ministry of Health has notified all local health authorities of these arrangements (circular 13/54).

MEDICAL CERTIFICATES FOR SERVICE MEN

Medical certificates submitted by civilian medical practitioners for Service men on leave who are prevented by illness from reporting to their units on the date specified do not always provide the information required by the Service authorities, and a certain amount of trouble is caused by this omission. The Service departments concerned expect certificates made out under these circumstances to state specifically that the patient is unfit to travel: a statement that the patient is unfit for duty is insufficient for Service requirements.

PATIENTS REFERRED BY DENTISTS FOR PENICILLIN INJECTIONS

The Secretary of the British Dental Association has sent the following letter to his association's branches and sections and to local dental committees:

"The British Medical Association has told us that difficulties have arisen in parts of the country where some dental practitioners have referred patients to doctors for penicillin injections. The doctor is sometimes placed in an awkward position in dental cases of this kind if he decides that risks of sensitization and bacteriological resistance preclude the use of penicillin on a particular patient. The British Medical Association has accordingly asked that any dentist referring a patient to a doctor for this treatment should make his request to the doctor in writing and should not give any details to the patient.

"The General Dental Services Committee agrees entirely with the suggestion of the British Medical Association on this point, and it would appreciate it if you could take steps to give the matter all possible publicity in your area."

A COMPREHENSIVE SERVICE

The following letter has been sent to us by the recipient.

"Dear Dr.,

"Please be as kind as give me cream for my leg also gauze and lint. And I would like if you will come down and see it when you are coming this way. And please do me a favour, Dr., by telling me the names of the three horses you think will come in on the Derby.

"Yours sincerely,
"Alice.

"Please write the names of the horses down to my husband as he might not remember."

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

A PLEA FOR REVIEW OF JUNIOR HOSPITAL STAFF

An all-day meeting of the Central Consultants and Specialists Committee was held on June 10, with Dr. T. ROWLAND HILL in the chair. A report on a number of detailed matters was presented by the Executive. One of these concerned the method to be adopted in reviewing part-time contracts, and in particular to the introduction of attendance registers and to the opposition already voiced by the Central and Joint Committees to the requirement to "clock in." The point was that the reassessment of part-time contracts on the evidence of an attendance register would tend to reduce consultant remuneration to a time basis. There were, however, allegations that some part-time men were not putting in the expected amount of time.

Mr. NORTHFIELD pointed out that, if some men were not putting in their full time, this might be due not to any lack of conscientiousness on their part but to the fact that there was not enough work presenting itself to enable the contract to be fulfilled. Mr. LAWRENCE ABEL suggested that any difficulties could be dealt with on the spot in a perfectly friendly manner, or, if necessary, by the local consultants committee; it was a domestic problem.

The CHAIRMAN said that with highly qualified professional men measurement by time could never be more than a broad criterion.

The Committee reaffirmed its opposition to the principle of "clocking in" and emphasized the importance of establishing a closer and more understanding relationship between a board's administrative officers and the consultants in the region. Professor CLOAKE undertook to bring forward a reasoned resolution on the subject at the next meeting of the Executive. It was also agreed that the correspondence on the subject should be referred to the Joint Committee.

The Expense Levy

The CHAIRMAN, in reporting on the work of the Joint Committee, said that a small subcommittee had been appointed to work out the details of a scheme for the introduction of an expense levy. The principle had been mooted of having one levy to cover the expense of the whole of the consultants' organization. The Ministry had so far consistently refused to entertain a proposal for deduction of contributions to an expense levy at source, but if necessary a personal interview with the Minister would be sought. It appeared from a rough calculation that no unreasonable demand would be made upon the individual.

Representation on Regional Hospital Boards

Attention was called to a recent resolution of the Council agreeing in principle that names of suitable members of the public health service should be included in the list of doctors nominated by the Association for membership of regional hospital boards, and the Liaison Committee had suggested that the attention of Branches and Divisions be drawn to the desirability of such an inclusion.

Some members of the Central Committee, however, pointed out the inadequacy of hospital medical staff representation on the boards and the likelihood that this would be further reduced if seats were allocated for the representation of other outside interests. It was agreed to refer the matter back to the Liaison Committee for further consideration.

Grading of S.H.M.O.s

The Tuberculosis and Diseases of the Chest Group Committee brought forward a resolution that the Staff Side of Committee "B" be urged to continue to press for a solution of the problem of securing for upgraded S.H.M.O.s a starting salary at an appropriate point above the minimum of the consultant scale as permitted by the terms and conditions of service. It was agreed that this should go forward to the Staff Side of Committee "B." The same Group drew

attention to previous resolutions that all S.H.M.O.s doing consultant work or who were in full charge of chest units should be given consultant status. Mr. STAVELEY GOUGH pointed out that, so far as beds were concerned, it could not be decided from the fact that if a man had charge of 10 beds or of 100 beds that he was a consultant or an S.H.M.O.

After some discussion the resolution of the Group was referred to the Joint Committee.

Employment of Locumtenents During Annual Leave

It was reported that the South-western Regional Committee had expressed concern regarding the non-provision of consultant locumtenent cover during holiday periods.

Dr. L. S. POTTER, for the Medical Practices Advisory Bureau, said that, although the demand was likely to exceed the supply, there were quite a number of locumtenents available for this purpose. One of the metropolitan regional boards kept a panel of locumtenents, and he did not see why this idea should not be carried out in other regions. He himself would do his best to provide names for the panels.

It was agreed to inform other regional boards of the panel system.

Remuneration of Hospital Medical Staff

The Committee had before it a number of communications from regional committees concerning the recent revision in remuneration. Mr. NICHOLSON-LAILEY, speaking for the South-western Region, said that it was their view that as an urgent matter the Joint Committee should obtain calculations regarding the betterment factor. These calculations should be made by economic experts of the highest authority, and if they proved to be materially in excess of the recent awards a further claim in exact and definite terms should be made forthwith.

The CHAIRMAN pointed out that in the latest *Bulletin* (Bulletin No. 3) all the considerations were set out. He felt confident that this was the first time the actual facts had been assembled in this manner.

The representative of the South-eastern Metropolitan Regional Committee urged that the Staff Side of Committee "B" should press for the implementation of the Spens report in respect of the payment of adequate allowances to cover professional expenses reasonably incurred by hospital medical staff in the performance of their duties, and that in view of recent changes in income-tax assessment such allowances should be obtained both for whole-time and for part-time consultants.

It was agreed to forward the proposals to the Staff Side of Committee "B."

Accessibility of Hospital Records

Dr. COCHRANE SHANKS submitted the minutes of the Medico-Legal Subcommittee. These included a statement by the Law Society concerning the furnishing of medical reports on hospital patients to solicitors or other interested third parties. He said that the statement contained nothing to which exception could be taken, and it made it abundantly clear that it rested solely within the discretion of the member of the medical staff concerned to furnish a report or not. There was no reference, however, in the statement to the furnishing of copies of hospital records, and his subcommittee thought that attention should be drawn to the Minister's assurance that copies of hospital notes should not be allowed to leave the hospital without reference to the practitioner concerned.

The Registrar Position

Resolutions from the Registrars Group Council were before the Committee calling attention to the need, when the remuneration of S.H.M.O.s was considered, for an appreciable increase in the remuneration of senior house officers and a further increase for other grades of hospital junior staff. The Group Council also submitted a report of a discussion which they had held on the general position

SOUTHERN BRANCH ANNUAL MEETING SUCCESSFUL GATHERING AT WINCHESTER

The Southern Branch of the B.M.A. held a successful and interesting annual meeting on June 4 and 5. The hosts this year were the Winchester Division, who arranged their annual charities ball for the night of June 4 to coincide with the meeting. About 250 members and their ladies attended the ball, which was held in the beautiful Old Guildhall, the proceeds going to the Council for the Care of Cripples.

The following day the 78th annual meeting of the Branch was held in the Guildhall. Dr. A. Orley, of Guernsey, the retiring president, invested the incoming president, Dr. C. B. S. Fuller (Winchester), with the presidential badge. Dr. R. H. Balfour Barrow was reappointed honorary secretary; Dr. J. C. Harland (Isle of Wight) was made president-elect. After a graciously expressed civic welcome by the Mayor of Winchester, Mrs. H. M. Charles, Dr. C. B. S. Fuller delivered the Winchester address on "The Antibiotics and Their Effect on the Changing Form of Disease."

Demonstration of Physical Medicine

Before ending the meeting with a visit to the library of Winchester College, members and their ladies saw a most interesting demonstration in the Physical Medicine Department of the Royal Hampshire County Hospital by Dr. Russell Grant. Dr. Grant pointed out how most of the apparatus and installations, from wax baths and light and heat apparatus to a hot pool, had been constructed at a fraction of the usual cost by careful improvisation and planning. The demonstrations showed how function could be restored by special training and surgical appliances, and by installing modifications and gadgets to enable disabled patients to cook and to run their homes. A well-knit organization has been built up through various agencies in each parish to ensure visiting, reading, and shopping for the homebound, infirm, and blind.

REDUCING WAITING-TIME OF OUT-PATIENTS

MINISTER URGES APPOINTMENTS SYSTEM

Hospital authorities throughout England and Wales have been asked by the Minister of Health, Mr. Iain Macleod, to review the working of out-patient departments so as to remove all reasonable causes of complaint. Matters which he thinks call for special attention are appointments systems, punctuality of staff, and reception of patients. While much public criticism may well arise from lack of an adequate appreciation of the difficulties involved, the complaints made have been so widespread as to suggest to Mr. Macleod that at a number of hospitals the suggestions previously made on this subject have either not been put into effect or are not being successfully applied. The main points of criticism he cites are: (a) that patients called for an appointment at a particular time frequently have to wait for an hour (and often much longer) before they are seen by the doctor; (b) that the consultants in charge of clinics are responsible for some of these delays by arriving late; (c) that appointments systems are badly organized; and (d) that little attempt is made to explain to patients the reason for delays, to win their confidence, or to consider their comfort or needs.

Suggestions for Improvement

The Minister suggests that regional boards and management committees should pay special attention to certain points. Appointments systems, he thinks, should not only be universal but designed to ensure, as far as possible, that each patient is called for the time that he is expected to see the doctor. The old practice of "multiple" or "block" bookings should be discontinued. The needs of parents

of hospital junior staff with a request that it be forwarded to the Joint Committee and submitted for publication in the medical press.

Dr. R. M. FORRESTER said that the Registrars Group was far more concerned with future prospects than with present remuneration, but there were also some points on remuneration which they had specially in mind. They had hoped that, when the Joint Committee and the Whitley Council were pressing for an improvement for seniors, consideration would also be given to the house officer, especially the house officer after his pre-registration term. If hospitals wanted junior staff they must be prepared to pay a remuneration which would compare favourably with what a young man could earn in general practice as an assistant and junior partner. Particularly now that senior registrars were allowed to re-apply and continue for more than four years, there should be a continuing increase of their remuneration up to a figure more closely approximating to that of the consultant service. They were very disappointed that the gap between the remuneration at the top of the senior registrar scale and that at the bottom of the consultant scale had not been narrowed.

Dr. Forrester went on to speak of the general position. He mentioned that recently for one consultant post in Bournemouth there were 128 applicants, and 108 of these were of less than consultant status. During recent years the Royal Colleges had turned out a large number of people with higher qualifications, and he thought the situation had got out of hand. When it was proposed to cut down the number of senior registrars from 1,400 to about 500 there was an outcry, and the final establishment was agreed at 960 senior registrars. This was based partly on the idea that there must be competition for senior registrar posts. He agreed that competition was necessary, but not to the extent of that shown by Bournemouth. The Ministry said that there were about 150 consultant posts coming up each year. But there were 240 senior registrars coming up each year and only 150 consultant jobs for them, and the following year the same thing would be repeated and worsened because of the numbers from the previous year who had perhaps taken research fellowships or lecturer posts, and the hung on in the hope of a consultant appointment. The whole idea of the competition was wrongly worked out. There were far too many senior registrars for too few prospective jobs. The Ministry had stated to the Joint Committee that as from 1956 the numbers of consultants reaching retiring age each year would be higher than in the past few years, and that this would allow for an increase in the number of men in training for the Ministry to be completely out of touch with the position. He believed that a perfectly honest mistake had been made. A great many senior registrars were, in fact, doing consultant work for which they were not being paid. He hoped that the statement on the subject which the Registrars Group Council had formulated would be sent for the information of the Joint Committee.

Professor G. I. STRACHAN, chairman of the subcommittee which has this matter in hand, said that clearly this and other cognate matters on the agenda relating to hospital junior staffing could not be adequately discussed at that late stage of the Committee's meeting, and he proposed that these very important and complicated considerations should be referred to his subcommittee, from which they would again come forward to the main committee with recommendations.

This was seconded and agreed to.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.
Urban District Councils.—Houghton-le-Spring.

with small children at home and of patients coming from a distance by infrequent buses or train also clearly call for separate consideration. It should be impressed upon consultants that the success of the appointments system depends on their being present on time, and an administrative officer of adequate seniority should be made responsible for the efficient running of the appointments system.

The Minister urges that special care should be taken in selecting the staff responsible for receiving patients, and they should remember that patients are often anxious, bewildered, or even frightened, and it is essential to attend to their needs and comfort. Much ill-informed criticism could be avoided by the development of better relations with patients and with the public at large. A helpful and kindly approach to out-patients by receptionists and other staff is only one example of this. Much more could be done to interest the public in the work of the hospitals and the difficulties with which they have to contend, and in the steps being taken to overcome them.

The Minister says that later he will call for a report showing the extent to which waiting-time has been eliminated.

The Consultants and Specialists Committee has asked its Executive Committee to examine the question of waiting-time in hospital out-patient departments, and to report.

Correspondence

Return of Goodwill

SIR.—I have read with interest the letters by Drs. E. C. Warner (*Supplement*, May 29, p. 290), A. V. Russell, and J. O. M. Rees (*Supplement*, June 12, p. 319) regarding the goodwill issue and the action taken by Council at its March and May meetings. I have re-read the minutes of the March meeting and find that the motion read as follows: "That the scheme be presented to the Representative Body together with a statement of the advantages and disadvantages appertaining to that scheme." It was decided that this statement should be drawn up by the Amending Acts Committee with the addition of co-opted members. There does not appear from the letters to be any dispute about or disagreement with this course. There is, however, something else which happened at the March meeting which they seemed to have ignored. The Chairman asked if it was the wish of the Council that the report of the Amending Acts Committee should be submitted to the G.M.S. Committee and Private Practice Committee for their comments, and the Council agreed to this being done. Surely it is clear from this that it was in the mind of the chairman, in common with many other members of Council, that when at the May meeting the report was again placed on the Council agenda it would be open for Council to take any action it might think fit.

Many of us thought that it was the duty of Council, having considered the full report, to give a lead to the Representative Body. Indeed, to fail to do so would, I think, have amounted to a failure to carry out our proper functions. We had been instructed to prepare a scheme for the return of the right to buy and sell goodwill and present it to the Representative Body. We have done the first part, and the second will be fulfilled at Glasgow. But I venture to assert that, if the Council, having examined the scheme in its totality, had failed to pass its opinion upon its merits and feasibility, it would rightly have been accused of cowardice and shirking its duty. I think the scheme is the best that can be prepared, and tribute should be paid to the ingenuity of those who devoted so much time and energy to its preparation; but this does not make it a wise, feasible, or by any means acceptable one. This, however, will be argued out at Glasgow.

Dr. Rees draws the red herring of the full-time salaried service across the trail. Quite unjustifiably he asserts that there are members of Council who are in favour of such

a service. This, in my opinion, is quite inaccurate and unjustified by anything said in Council during these debates.—I am, etc.,

Cambridge.

ALEXR. BROWN.

History of the W.M.A.

SIR.—I was interested to read in the Supplementary Report of Council (*Supplement*, May 22, p. 247) a short history of the World Medical Association, to which, however, in the interests of historical accuracy, I should like to add a couple of footnotes. In 1939 the B.M.A. Council had decided to dissociate itself entirely from the Association Professionnelle Internationale des Médecins, and a resolution to that effect was on the agenda of the Representative Body at Aberdeen in 1939. The Marylebone Division, at a meeting before the Annual Meeting, took serious exception to this and put forward a counter-resolution. I have not the reference by me here, but it was the first resolution discussed by the Representative Body in 1939, and a full report appears, I know, in the *Supplement*. I had the honour (and the temerity) of moving the Marylebone Division's resolution and had to reply at the end of the discussion to the then Chairman of Council, Sir Kaye Le Fleming, who denounced the Marylebone Division's views in the strongest terms. The Representative Body supported me, however, with a very large majority, and the B.M.A.'s association with the A.P.I.M. was thus continued—in spite of the Council—throughout and after the last war.

I well remember the conference at B.M.A. House in September, 1946, under the chairmanship of Sir Hugh Lett. Lord Horder and I were asked by the American Medical Association to attend it on their behalf as "observers," for they were hesitant and sent no official representatives. The French, Belgian, and Spanish delegates in particular wanted to retain the old A.P.I.M., but during the conference—thanks in the main to the tact of Dr. Routley, of Canada, and Dr. Charles Hill—the atmosphere changed from early suspicions to friendliness and co-operation. Lord Horder and I were therefore able to send a persuasive report to the American Medical Association, telling them (as was true) that without their co-operation the new W.M.A. would be as ineffective as the late lamented League of Nations, but that with them it might well become something worth the world, but to humanity at large—as, indeed, it is proving.—I am, etc.,

Gibraltar.

R. SCOTT STEVENSON.

** An account of the discussion Mr. Scott Stevenson refers to was published in the *Supplement* of July 29, 1939. The Marylebone amendment, carried by a "considerable majority," was as follows:

"That in view of the long association of the B.M.A. with the A.P.I.M., of the recognition by the Health Committee of the League of Nations of the A.P.I.M. as responsibly concerned with medico-social questions of high importance, and of the desirability, more especially in existing circumstances, of maintaining international contacts at the present juncture, the Association should continue to be represented as a constituent member at the Annual Conference of the A.P.I.M."—Ed., B.M.J.

Employment of Tuberculosis Visitors

SIR.—As in the first sentence of Miss Shiela D. Robinson's letter (*Supplement*, May 29, p. 290) my name is invoked, and the last paragraph invites the opinions of tuberculosis officers on certain modifications in training and qualifications of tuberculosis visitors advocated by her, I beg to reply, although I believe the views of individuals cannot influence future policy at all. My original letter (*Journal*, June 21, 1952, p. 1355) did not deal with training, but was written at a time when we in the chest clinic service locally were engaged in a "rearguard action" against a serious threat to withdraw tuberculosis visitors from the chest clinics, to base them in a distant guildhall, and to transform them—women

who had spent most of their professional life in tuberculosis—into the "all purpose" health visitor.

Miss Robinson will know—her letter gives little clue—that the future training and utilization of visitors is now being reviewed by a Working Party to which memoranda and oral evidence have been submitted by bodies such as the Society of Medical Officers of Health, B.M.A., etc., and that a report expressing its considered views will be issued in due course. Her attempt to reopen the subject in your columns seems, therefore, belated if not futile. I hope I am right in assuming that the Working Party will have listened to evidence from the British Tuberculosis Association or Joint Tuberculosis Council before its conclusions are reached on the future of tuberculosis visitors.

Responsible, with three colleagues, for the chest clinic and ancillary work in an area of 375,000 (approximately) population size, I am more concerned that we should keep tuberculosis visitors as essential members of the clinic's "team," co-operating to that degree only obtainable by daily personal contact with the others and working under a common roof, than with splitting hairs about their professional training requirements. The qualifications of visitors were laid down by Local Government Regulations (1930); these are changeable by legislation, and the Working Party's report may be the precursor of change.

In reply to Miss Robinson's specific question, my view is that a trained visitor (her certificate is equivalent to a D.P.H.) will usually fit into the chest clinic's team more smoothly than a nurse qualified S.R.N. and with the British Tuberculosis Association's certificate, who may never before have set foot in a tuberculous household, and will not as a rule know much of, or have any bias towards, preventive and social medicine. The late Sir R. Philip said that it was the chief job of a tuberculosis officer to prevent, not to treat, tuberculosis; were it translated into terms of the job of a visitor, his aphorism would still hold some truth. I disagree that a newly qualified visitor may be "without previous experience" of tuberculosis. Here, each student visitor spends about eight of her 50 weeks' training as a full-time member of the chest clinic's staff. As well, she receives the benefit, perhaps doubtful, of four one-hour lectures (based on the official syllabus) on tuberculosis, and tutorials on special subjects—for example, the rationale of Mantoux testing, B.C.G. vaccination, mass miniature radiography, etc. It has been my happy experience to work occasionally with visitors who had not the health visitor certificate, but were otherwise well trained in general and tuberculosis nursing. They accustomed themselves quickly to the new climate and conditions of the clinic, and proved of equal merit to their health visitor certificate sisters.

In conclusion, I would voice an appeal that, whatever change may be effected in the syllabus of training, it should be on the side of simplification and pruning of what has become an exotic growth, much of the theoretical instruction and "cramming" involved being of little practical use after qualification.—I am, etc.,

Hull.

R. HARDY.

Radiology on Points

SIR.—Dr. Anthony A. Vickers (*Supplement*, May 29, p. 291) and your previous correspondents have only touched the fringe of the anomalies arising through assessing various totals have little meaning because of the marked variations in many factors: the type of patient; the routine of individual radiologists; the demands of various specialists; the general facilities and stress of work in each department; and, probably most of all, in the interpretation of the "units" themselves. In the past each department has had a rough estimate of its own increasing work in the yearly totals of "investigations" or "examinations." To judge any further increase one must still use the older method. If a comparison between different departments is necessary, the numbers of the major investigations—barium meal, barium enema, I.V.P., etc.—give added information and can make some allowance for specialized work. Even this

method only gives an approximate comparison between departments doing the same type of work. If, in addition, the total number of films of each size used (calculated easily from stocks consumed) is divided by the number of investigations, a general indication is given as to whether techniques are extensive or "economical." In the excellent memorandum on diagnostic radiology drawn up by the Faculty of Radiologists, staffing of departments is assessed according to the number of "investigations" per annum. This rough guide has been of some limited value in the past. What advantage is there in changing to a mathematical system which superficially appears to be "scientific" but which actually neglects variation in factors sufficient to make a 100% error more probable than possible?

Most x-ray departments have difficulty, owing to shortage of staff, in coping with routine clerical duties. The bureaucratic tendencies of the National Health Service add further difficulties. Is this "unit" system a foretaste of the "costing" of each department which will shortly plague us? If so, we shall need far more clerks than radiographers, unless slot machines and comptometers are provided.—I am, etc.,

Port Talbot, Glam.

R. A. ROBERTS.

Remuneration of Hospital Medical Staff

SIR.—At the special meeting of the Central Consultants and Specialists Committee on April 28, 1954, to discuss the statement by Sir Russell Brain on remuneration of hospital medical staff (*Supplement*, May 8, p. 228), Dr. D. P. Stevenson stated that since the publication of the new increases there had been remarkably little correspondence on the subject, a fact which might argue contentment or apathy. I have heard these words—"contentment or apathy"—quoted on several occasions since then. This is a most irresponsible statement to make at this time.

The negotiations have been conducted in secrecy. The full facts are only now being revealed to us. Most of us here have received our first real information in the form of a bulletin only five days ago. These facts require considerable digestion. Surely correspondence, without some knowledge of the facts, such as has now been given to us, would have been premature. I would suggest that a more guarded phraseology would be more appropriate and that potential boomerangs should be avoided.—I am, etc.,

Kirkcaldy.

WILLIAM DRUMMOND.

Emergency Admissions

SIR.—Perhaps I am a little late regarding the question of Bed Bureau, which was discussed by Dr. S. Stowe (*Supplement*, May 1, p. 214) and Dr. R. S. V. Marshall (p. 215), following your medico-legal article (*Journal*, April 17, p. 940), and later by Dr. H. Maitland Moir (*Supplement*, May 15, p. 246) and Dr. Thomas M. Glaister (*Supplement*, May 29, p. 291). I can only say that in my area, the Plymouth Group, the Bureau is efficiency itself, twenty-four-hour service, kind, and helpful.—I am, etc.,

Kingsbridge.

T. H. STEELE-PERKINS.

A Doctor Looks at Crime

SIR.—Dr. Oliver Gray's short monograph as he himself describes it (*Supplement*, April 24, p. 179) deserves close and careful study by all. With Dr. R. W. Cockshut (*Supplement*, May 8, p. 232) I agree that the subject-matter is of great interest "not only for what it says but for what it leaves unsaid," especially for those who are concerned with the moral and social welfare of our juvenile and adolescent population. The whole problem of the young offender requires thorough discussion. The probable underlying causes and appropriate treatment must be studied seriously and from all aspects, but above all we must study likely methods of prevention. Wise action taken at this stage of their lives will often, in my view, act as a deterrent to adult crime.

In my opinion, as a family medical practitioner of many years' standing and practising in an area with a large

juvenile population, the present attitude to authority, the lack of honesty, truthfulness, and especially responsibility among certain sections of the juvenile population of to-day, can be remedied in the first place by the teaching of good moral principles from the home. The average adolescent of to-day is a self-centred individual lacking in good manners and with a definite lowering of moral standards. The reasons for this decline have resulted, in my opinion, from the upheavals of war, housing difficulties, the present-day speed of living, and the parents' willingness, almost eagerness, for the responsibility of the children to be passed on to the State.

A very important factor in the limited outlook of the young adolescent of to-day is the lack of true religion and moral principles that are so sadly lacking in their homes. The teaching of these matters must commence in the home. The groundings given by the parents can then be expanded during school years, but the first responsibility in this direction is the parents. The study of juvenile delinquency and of kindred subjects, as raised by Dr. Oliver Gray, is, I consider, one of the most fascinating, interesting, and vital subjects within the sphere of social welfare.—I am, etc.,

Leeds. HARRY SUGARÉ.

Prescribing Costs

SIR.—Mr. F. G. Fleming (*Supplement*, May 29, p. 291) suggests that I have overlooked the fact that the 1s. 11d. paid to chemists for 24 tab. codein. co. includes 1s. dispensing fee. Indeed, I have not. What puzzles me is why putting 24 tablets in a cardboard box should be dignified by the name of dispensing or attract a fee at all. When the pharmacist really does dispense, by all means let him be paid the rate for the job, but a vast number of prescriptions involve no dispensing at all, and are nothing more than retail sales, with the sole difference that, instead of the medicament being asked for verbally, the name is written on a piece of paper called a prescription form.

The retail price of 24 tab. codein. co., in a cardboard box, is 1s. 4d. Any doctor will, I am sure, find his chemist delighted to give him 10% discount on this. Presumably the Ministry could negotiate even better terms and get 15% or even 20%; thereby paying about 1s. 1d. instead of 1s. 11d. Why don't they?—I am, etc.,

Ashted, Surrey.

W. EDWARDS.

Keeping Clear of the Zebra

SIR.—From July 1, 1954, it will be an offence to stop a vehicle within 45 ft. of the approach side of a zebra crossing for setting down, picking up, loading, and unloading. There seem to be no exceptions, and if any hospital has a zebra crossing within this distance of its entrance it will be necessary for them to take local action to get the crossing moved. Ambulances will, apparently, no longer be permitted to take up patients from places within these zones, and, of course, the regulation also applies to doctors' cars. The Order does not seem to have received much publicity, and I am therefore writing to ask you to draw attention to the matter.—I am, etc.,

London, S.W.10.

R. KELSON FORD.

Association Notices

Diary of Central Meetings

JUNE

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|----|--------|--|
| 22 | Tues. | Psychological Medicine Group Committee, 2 p.m. |
| 23 | Wed. | Accommodation Subcommittee, Estates Committee, 12 noon. |
| 23 | Wed. | Estates Committee, 2 p.m. |
| 23 | Wed. | Executive Subcommittee, Joint Formulary Committee (at Pharmaceutical Society, 17, Bloomsbury Square, London, W.C.), 2 p.m. |
| 23 | Wed. | Geriatrics Joint Subcommittee, 2.15 p.m. |
| 24 | Thurs. | Guillebaud Evidence Steering Committee, 10 a.m. |
| 24 | Thurs. | Constitution Committee, 2 p.m. |
| 24 | Thurs. | Journal Committee, 2 p.m. |

JULY

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|----|--------|---|
| 1 | Thurs. | Annual Representative Meeting (at Glasgow), 10 a.m. |
| 2 | Fri. | Annual Representative Meeting (at Glasgow), 9.30 a.m. |
| 3 | Sat. | Council (at Glasgow), 9 a.m. |
| 3 | Sat. | Annual Representative Meeting (at Glasgow), 10 a.m. |
| 5 | Mon. | Annual Representative Meeting (at Glasgow), 10 a.m. |
| 5 | Mon. | Annual General Meeting (at Glasgow), 12.30 p.m. |
| 5 | Mon. | Council (at Glasgow), at conclusion of A.R.M. |
| 5 | Mon. | Adjourned Annual General Meeting and President's Address (at Glasgow), 8.15 p.m. |
| 14 | Wed. | Maritime Subcommittee, Private Practice Committee, 2 p.m. (Date changed from July 21.) |
| 15 | Thurs. | Working Party Subcommittee, Joint Consultants Committee. Meeting with Ministry of Health at 23, Savile Row, London, W., 2.30 p.m. |
| 22 | Thurs. | General Medical Services Committee, 10.30 a.m. |
| 22 | Thurs. | Central Ethical Committee, 2 p.m. |

Branch and Division Meetings to be Held

CITY DIVISION.—(1) At B.M.A. House, Tavistock Square, W.C., Tuesday, June 22, 8.30 p.m., consideration of Agenda of A.R.M. (2) At Institute of Laryngology and Otology, Gray's Inn Road, W.C., Friday, June 25, 3.30 p.m., clinical meeting. Mr. K. G. Rotter: "Otitis Media in Children and Infants."

COVENTRY DIVISION.—Wednesday, June 23, 2.30 p.m. Visit to Cadbury Brothers Ltd., Bournville.

DORSET DIVISION.—At Antelope Hotel, Dorchester, Friday, June 25, 7.45 for 8 p.m., dinner; 9 p.m., annual general meeting.

DUDLEY DIVISION.—At Prestwood Sanatorium, Stourbridge, Tuesday, June 22, 8.30 p.m., clinical meeting arranged by Dr. J. Stevenson and staff and Dr. A. W. B. MacDonald.

EAST SOMERSET DIVISION.—At the Small Hall, Wells, Sunday, June 20, 3 p.m., annual general meeting. Consideration of Annual Report of Council, etc.

EAST SUFFOLK DIVISION.—At East Suffolk and Ipswich Hospital, Tuesday, June 22, 8.30 p.m., annual general meeting; election of officers; consideration of Annual Report of Council, etc.

ENFIELD AND POTTERS BAR DIVISION.—Thursday, June 24, summer social meeting. Members to meet at Blomfield Road, Paddington, at 3.15 p.m., for trip by motor barge on Regent's Canal.

GLASGOW DIVISION.—At Institution of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow, Wednesday, June 23, 8.30 p.m.

KENSINGTON AND HAMMERSMITH DIVISION.—At St. Charles's Hospital, Ladbroke Grove, W., Friday, June 25, 3.30 for 4 p.m., clinical meeting.

NORTH MIDDLESEX DIVISION.—Sunday, June 27, annual outing. Members to meet in the Lion House, Zoological Gardens, Regent's Park, N.W., at 10.30 a.m. Members wishing to join the party are asked to communicate immediately with the honorary secretary of the Division, Dr. Joan Chappell, 1, Winsford Terrace, London, N.18.

NORWICH DIVISION.—At Norfolk and Norwich Hospital, Tuesday, June 22, 8.30 p.m., annual meeting; election of officers; consideration of Annual Report of Council, etc.

OXFORD DIVISION.—At Radcliffe Infirmary, Oxford, Wednesday, June 23, 8.15 p.m., clinical meeting.

SALISBURY DIVISION.—At Salisbury Infirmary, Monday, June 21, 8.15 p.m., annual general meeting; election of officers, etc.

SHEFFIELD DIVISION.—(1) At Sheffield University Medical Library, Friday, June 18, 8.30 p.m., consideration of Annual Report of Council, etc. (2) At Royal Victoria Hotel, Sheffield, Friday, June 25, 12.30 p.m., annual luncheon to new medical graduates of Sheffield University.

SOUTH MIDDLESEX DIVISION.—At Anchor Hotel, Shepperton, Monday, June 21, 9 p.m., consideration of Agenda of A.R.M., etc.

STRATFORD DIVISION.—At the Clinic, Katherine Road, Forest Gate, E., Thursday, June 24, 2.45 p.m., lecture by Dr. Philip Ellman, followed by clinical demonstrations, on the Diagnosis, Differential Diagnosis, and Treatment of Pulmonary Tuberculosis in Clinical Practice.

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, E., Friday, June 25, 3 p.m., clinical meeting. Miss Gladys H. Dodds and Dr. S. D. Perchard: "Gynaecology."

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Wednesday, June 23, 8.30 p.m. Consideration of Supplementary Annual Report of Council and Agenda of A.R.M., etc.

WESTMINSTER AND HOLBORN DIVISION.—At Westminster City Chambers, Thursday, June 24, 8 p.m., annual general meeting. Consideration of A.R.M. Agenda; election of officers, etc.

ANNUAL MEETING: GLASGOW, JULY 1-9

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 26 1954

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A VISIT TO THE MIDDLE EAST AND FAR EASTERN BRANCHES

BY

J. W. TUDOR THOMAS, D.Sc., M.D., M.S., F.R.C.S.
President of the British Medical Association

It has been to me a great privilege and a pleasure to have had the opportunity of visiting B.M.A. Branches in the Middle and the Far East on behalf of the Association. My wife and I received everywhere the warmest welcome, and met nothing but kindness and hospitality wherever we went. In the course of the tour it was good to meet our members and members of the profession generally, and to discuss with them their difficulties and problems, as well as to see much of the medical work which is being carried on in those parts.

I was invited to give many lectures and addresses, and visited a large number of hospitals and saw much of the clinical work and the general arrangements. We also met many of those who occupied prominent positions in the various countries which we visited, and our personal contacts were extended by the many dinners, lunches, and receptions that were arranged on our behalf. We visited scenes of great beauty and places of historic interest, and with all the wealth and charm of unaccustomed surroundings the limited time at our disposal seemed all too short.

The details of the tour were arranged by Dr. Grey-Turner, Assistant Secretary to the Association, and I would like to acknowledge my indebtedness to him for all his careful preparation and interest. The object of the tour was to carry greetings and good wishes from the Association, its Council, and the Overseas Committee to our members overseas, and to express an interest in their welfare and to try to help them in any way possible. We left London Airport on March 9, and returned to the same airport on April 24, having travelled by air some 22,500 miles and visited many countries. The following is a brief summary of the tour, which, however, cannot include much of the detail, which was all of great interest.

THE TOUR

Lebanon

We left London Airport by B.O.A.C. Argonaut, arriving at Beirut in Lebanon at lunch-time on March 10, and were met by representatives of the B.M.A. and others. Our hosts in Beirut were Dr. and Mrs. Ford-Robertson, and we stayed with them at their house at the Hospital for Nervous and Mental Diseases at Asfuriyeh, of which he is the Director. The hospital is on a hill near Beirut, overlooking the Mediterranean.

I gave several lectures during my stay in Lebanon, and visited the American University of Beirut and the hospital, where I spent some time in the Department of Ophthal-

mology with Professor Diab. A visit was also made to Tripoli to meet and address members of the North Lebanon Medical Association. While in Lebanon we attended several pleasant functions arranged on our behalf by H.E. the Ambassador, B.M.A. members, the British Council, and others.

On Saturday, March 13, we left for Bagdad, some 500 miles away, across the Lebanese mountains and the desert, flying over Damascus.

Bagdad

On arrival at Bagdad we were met at the airport by Dr. Altounyan, of Aleppo (Syria), President of the Middle East Branch, and Professor M. Critchley, the Honorary Secretary, and others. We stayed at the Embassy, on the right bank of the Tigris between two main river bridges. The Government of Iraq had given their support to our visit to Bagdad, and a car and driver were put at my disposal by the Minister of Health for the duration of my stay.

The Branch B.M.A. Dinner was held in the Alwiyah Club. The guests included H.E. the Ambassador and Lady Troutbeck, and the Minister of Health. It was a well-attended and very pleasant function. I attended a special meeting of the Branch, at which I gave an address, and visited the Royal Medical College of Iraq and addressed the body of students and the profession. The Royal Medical College of Iraq was founded in 1927, and the medical course now takes six years. In 1953 there were 147 new students. A visit was also made to the hospital, where I spent some time in the eye department. We were entertained to a sumptuous lunch by the Iraqi Medical Society, and I had the pleasure of addressing the Society that evening.

We visited the Abdul Illah Tuberculosis Sanatorium some miles out of Bagdad and also the hospital at Hilla, and viewed the ruins of Babylon.

On Wednesday, March 17, we left Bagdad for Beirut, and attended a lunch there given by the Minister for Health and Agriculture. During our time in Beirut we had met Dr. Hitti, chairman of the B.M.A. members in the Lebanon, and in both Lebanon and in Iraq we had been received most kindly.

Ceylon

On March 18 we left Beirut for Colombo. We travelled overnight, and, passing over the brown landscape of India, reached the green vegetation of Ceylon with its beautiful coastline on March 19. Within three hours of our arrival

I was sitting alongside Dr. Abeyaratne at a meeting of the Ceylon Medical Association, which comprises the Ceylon Branch, while he gave his presidential address.

During our time in Ceylon I visited hospitals in various parts, and we saw many places of beauty and of historic interest. At Kandy I visited the new university centre, which is rapidly developing, and the Kandy Hospital, and was entertained to lunch by the Clinical Society of Kandy Hospital. I visited certain isolated hospitals, where one doctor has to cope with most of the work, and I admired the way he did his best to overcome his difficulties.

There were many hospitals to visit in Colombo, and much interesting medical work to be seen. Among them was the Ridgeway Hospital for women and children, with 350 beds and dealing with 1,000 out-patients a day. There was also the Colombo General Hospital of 1,364 beds, which is the main teaching hospital of the Medical School of Ceylon. About 150 medical students now qualify each year from the Medical School. I also visited the Eye Hospital and met the ophthalmic surgeons, and was their guest at a reception, and the guest of the Ceylon Medical Association to dinner.

Hong Kong

On March 26 we left Ceylon for Singapore, where we spent the night *en route* for Hong Kong. We arrived at Hong Kong on March 27, and landed at Kai Tak Airport after some delay due to considerable cloud.

We stayed with the president of the Branch, Surgeon Captain Panckridge, R.N., and Mrs. Panckridge, at the Royal Naval Hospital, some 1,400 feet up on the Peak in a most delightful position overlooking Hong Kong with its seacoast and islands. That night we were entertained to Chinese dinner by the Hong Kong Chinese Medical Association. There were about 130 present, including their genial president, Dr. Lee Hai Leong.

During the week we spent in Hong Kong we had much hospitality, including that of H.E. the Governor and Lady Grantham, and attended many functions, among them a B.M.A. Reception. Visits were made to several excellent hospitals, including the Government Hospital, the Queen Mary Hospital, and the Matilda Hospital, the Royal Naval Hospital, and the Hong Kong Sanatorium. At the invitation of the University I gave a public lecture, attended mostly by doctors, students, and nurses, and, as in other centres, I was given every opportunity to meet members of our profession and to address them on various occasions.

I had the pleasure of being entertained by Dr. Ride, the Vice-Chancellor of the University, and Mr. Black, the Colonial Secretary, and of meeting the Deputy Director of Medical Services, Dr. Liston, in the absence of Dr. Lee. The ophthalmic surgeons of Hong Kong also entertained us to dinner, and I spent some time with them at the Kowloon Eye Clinic. We were indeed made very welcome during our stay and were sorry to leave.

North Borneo

On Friday, April 2, we left by air for Jesselton in North Borneo, passing over glorious scenery with the vivid colours of the sea, the islands, and the submerged islands and colourings of coral and sand.

At Jesselton we were the guests of H.E. the Governor and Mrs. Turnbull, and in the small medical community of this centre we were received with a great warmth of welcome. The Jesselton Hospital has devoted medical officers doing splendid work, and it is fitting that a new hospital is now being built to serve the area with better facilities. In Jesselton I attended a Branch meeting with Dr. Christianson, the president, and was entertained to dinner by the B.M.A. members of Jesselton (chairman, Dr. Pan) and was pleased to make close personal contact with all the doctors in the area, including the Director of Medical Services, Dr. Clapham.

From Jesselton we left by air on April 6 for Kuching.

Kuching, Sarawak

At Kuching we were the guests of H.E. the Governor, whose residence, The Astana, was reached by sampan over the Kuching river, a most picturesque position. We were entertained to dinner by the B.M.A. Sarawak members (chairman, Dr. Philpott). I found much interest in seeing the work of the hospital and in visiting a leper settlement. Excellent work is being done by the Anti-tuberculosis Association of Sarawak, and there, as in some of the other countries we visited, tuberculosis constitutes a grave problem.

We had a most pleasant tea with the sisters and nurses of the General Hospital in the nurses home, which is a first-rate home and beautifully kept. We met the Director of Medical Services, Dr. Glyn Evans, and, as in other centres, we found nothing but kindness and hospitality during our stay in Sarawak.

Singapore and Malaya

On April 8 we left Kuching for Singapore and were the guests there of Professor Eric Mekié. I visited the hospital, where they have built a new nurses home, in which each bedroom is shared by two nurses but each nurse has her own bathroom.

While in Singapore I was shown around the hospital, which is the teaching hospital for their medical school. I also inspected several departments in the Faculty of Medicine, and addressed the students of the College. There were many opportunities for meeting members of the Division and for discussions with them, and we received much kindness at their hands. I also spent some time in the eye department at the General Hospital with Dr. Williamson (ophthalmologist).

Following Singapore, we went to Penang, to Ipoh, and to Kuala Lumpur. In each place there were lectures to give, hospitals to visit, and B.M.A. Divisional or Branch dinners. In Penang we stayed with Dr. and Mrs. Pallister, in Ipoh with Dr. and Mrs. Dickson, and in Kuala Lumpur with the Hon. James Whyte and Mrs. Whyte (who is a doctor).

During our stay in Malaya we made personal contact with many of the doctors, and we received great hospitality everywhere. In Kuala Lumpur I attended meetings of the Branch Council and the annual general meeting of the Branch, where I listened to Dr. Sodhy deliver his presidential address. I also inspected with much admiration the Institute for Medical Research at Kuala Lumpur under the direction of Dr. Field. In this beautiful and well-equipped building excellent work is being done on the subject of viruses and the nature and spread of disease under tropical conditions, as well as investigations on the practical control of those diseases.

We were privileged to meet H.E. the High Commissioner and Lady Templer as well as the Deputy High Commissioner and Lady MacGillivray. There is a great deal of tuberculosis in Malaya, and a new hospital is now being built for research in tuberculosis and for the treatment of patients. It will bear the name of Lady Templer, who has been actively interested in its establishment. We also visited the Leper Settlement at Sungei Bulloh, the Military Hospital at Kinrara, and the Royal Naval Base at Johore.

In Malaya, as in the other countries we visited, our members referred to the value of the *British Medical Journal*, which they are so glad to receive.

We left Singapore for home on Friday, April 23, arriving at London Airport on the 24th, where we were met by Dr. Grey-Turner and Dr. Bergin, the medical officer to the airport.

I would like to acknowledge my thanks to the B.O.A.C. for the excellence of their arrangements and for many personal kindnesses shown to us.

Retrospect

Looking back on the tour, I feel that it may serve a good purpose in directing attention to the fact that many of

our members live overseas and that they should never be forgotten. There are many very loyal members overseas and very many who deserve our warmest appreciation both for the excellence of their work and for the way that they keep up the best of British tradition in far-off lands.

It has been a great pleasure to make this official visit on behalf of the Association, and to do anything I could in every way to assist them and to carry that message of good will which I undertook to do. The greetings were warmly received, and there was an evident desire to know more about the British Medical Association and to learn about its standing, its traditions, and its functions. Many of the doctors whom I met had never been in England and had never seen the workings of the Association in this country. I felt that they were pleased to realize that they formed part of our organization, and that by my visit they were perhaps making a closer contact with the Association than they had done before. They were all interested to know of the Empire Medical Advisory Bureau, and of its interest in the visits of our members from overseas and in their welfare.

I have carried back with me many matters from our colleagues in the countries which I visited which will be considered by the Overseas Committee, and I was able to assure them of sympathetic and careful attention to their problems and difficulties. My wife and I look back on this tour with very pleasant memories, and, although at times it was strenuous, it was throughout most enjoyable and we are grateful for all the kindness shown to us.

CONDITIONS OF SERVICE IN THE ARMED FORCES

In September, 1953, the Government, in announcing the setting up of the Waverley Committee to review the arrangements for providing medical and dental services for the Armed Forces, at home and abroad, in peace and war, published details of increased remuneration and amendments of lished details of increased remuneration and amendments of certain conditions of service for officers in the medical branches of H.M. Forces. The improvements were intended to attract more practitioners to make the Services their career.

The changes were briefly: (1) increased rates of pay for the middle ranks in the medical branch of each Service; (2) increased specialist pay; (3) permanent commission grant of £1,500 (taxable) payable to all officers granted permanent commissions, subject to the completion of one year's satisfactory service as a medical officer on any type of compulsory mission; (4) more posts for retired officers to release young medical officers for more active appointments; (5) direct acceptance for a regular commission without first having held a short-service commission; (6) antedating of commissions granted to late entrants to the medical branches of the Services according to civilian experience, up to a maximum of seven years; and (7) extension to National Service medical officers in the R.A.M.C. of a scheme granting three-year short-service commissions.

Association Seeks Further Information

These revised conditions of service have been considered by the Association, and further information, together with certain assurances, has been sought from the Ministry of Defence and the Service Departments. Particularly has the Association been concerned to safeguard the prestige and promotion prospects of the medical officers already in the Services when these new arrangements became operative on October 1, 1953.

Information was sought on the method of payment of the new permanent commission grant, and it was learned that this is to be paid in one lump sum to the medical officer concerned, which means that his total remuneration for that year is considerably higher than normal. Thus a large pro-

portion of the grant will be paid back to the Government in the form of income tax. It is appreciated that, under income-tax law, this method of payment is necessary, but intending applicants should appreciate in advance what follows from the reference to a grant of £1,500 (taxable). The acceptance of a permanent commission implies an undertaking to serve until the normal retiring age, unless Service requirements permit premature retirement or there are compassionate grounds which are allowed to override Service requirements. The Service Departments have not, therefore, laid down any minimum period for which a medical officer must serve in order to be exempt from repayment of the whole or a part of the new permanent commission grant.

Concern About Antedated Commissions

The Association has expressed particular concern about the proposal to antedate commissions of all new entrants, for it is believed that this would affect the promotion prospects of medical officers commissioned prior to October 1, 1953, especially in relation to promotion to lieutenant-colonel and colonel in the R.A.M.C., after 17 and 23 years' service respectively. Thus it is hoped that this kind of manoeuvre is purely a temporary expedient in order to breach a dangerous gap in recruitment. On these points a statement has been made by the Ministry of Defence that relatively few medical officers have been appointed since the end of the war to permanent commissions. Ample opportunities for promotion are, it is stated, anticipated for medical officers appointed to the Services both before and after October 1, 1953. As, however, the provision of an adequate career up to retiring age is the aim of the Services, the Ministry stated that as recruiting improves appointments to permanent commissions would be limited in order to prevent blocks in promotion at later stages. It also stated that particular attention is being given, in a review of the R.A.M.C., to the authorized complement of posts in the ranks of lieutenant-colonel and colonel to ensure a fair opportunity of reaching these ranks for all officers suitable for such promotion.

No Firm Assurance

A communication has also been received from the War Office that the interest of all officers in the armed medical services is constantly kept under review, and it is not anticipated that any R.A.M.C. officer will be prevented, as a result of the new arrangements to antedate commissions, from attaining the rank which his abilities justify. The Association has, however, been unable to obtain any firm assurance from the Ministry of Defence that promotion to lieutenant-colonel and colonel in the R.A.M.C., after 17 and 23 years' service respectively, will—if necessary by increasing the establishment of these ranks—be sustained.

Representations that the possibility of retrospective application of the new arrangements to antedate all commissions might be considered in regard to medical officers granted permanent commissions since April 1, 1953, or whose previous applications had been rejected or only partially granted, have been made to the Service Departments, but have not been successful.

Approval Reserved

The Association does not consider that the additional information it has received enables it to give whole-hearted support to the interim proposals, particularly in view of the possible long-term effect these may have on medical officers who entered the Service before October 1, 1953, and those who enter under the new arrangements. For this reason it is anxious that medical practitioners contemplating making a career in one of the three Services should be fully aware of the above facts.

In addition, the Association awaits with interest the outcome of the deliberations of the Waverley Committee which it is hoped will result in the introduction of more acceptable terms and conditions of service.

MEDICAL PRACTICES COMMITTEE

The following amendments to the classification of areas (April 2 to June 4, 1954) have been issued by the Medical Practices Committee:

ENGLAND: COUNTIES

Buckinghamshire.—Long Crendon, Intermediate; Slough and Cippinham, Intermediate.
Cheshire.—Partington, Restricted.
Derbyshire.—Borough of Ilkeston, *Designated.
Durham.—Urban District of Hetton, Intermediate.
Gloucester County and City.—Dursley, Uley, and Wootton-under-Edge, Intermediate.
Hertfordshire.—Urban District of Cheshunt and Goff's Oak, Intermediate; District of Waltham Cross, *Designated.
Isle of Ely.—March, Intermediate.
Lincolnshire (Lindsey).—Rural District of Welton (except Bardney, Dunholme, and Ingham), Intermediate; Districts of Dunholme and Ingham, Restricted; Urban District of Barton-upon-Humber, Intermediate; Borough of Scunthorpe, *Designated.
London.—Borough of Lambeth: Herne Hill Ward, Restricted. Borough of Lewisham: Culverley and St. Andrew's Wards, *Designated. Borough of Paddington: South of Harrow Road, Restricted.
Middlesex.—Borough of Southall, Intermediate.
Northamptonshire.—Corby, Intermediate.
Northumberland.—Glendale, Intermediate.
Wiltshire.—Downton, Restricted.
Worcestershire.—Oldbury, Intermediate.
Yorkshire (W.R.).—Urban and Rural District of Penistone, Intermediate; Urban District of Earby, Restricted.

COUNTY BOROUGHES

Birmingham.—Washwood Heath, Intermediate; Stechford, *Designated.
Leeds.—Hyde Park, Roundhay Headingley, Harrogate Road and Cookridge Districts, Intermediate; Remainder of County Borough, Designated.
Stoke-on-Trent.—Burslem and Longport, *Designated.

WALES

Monmouthshire and Newport.—Urban and Rural Districts of Pontypool, Intermediate.

THE GENERAL PRACTITIONER AND THE HEALTH VISITOR

HERTFORDSHIRE MEETING

Following the joint circular issued by the British Medical Association and the Society of Medical Officers of Health (*Supplement*, March 27, p. 125), representatives of the Hertfordshire Branch of the B.M.A. and of the Hertfordshire Local Medical Committee and the county medical officer and senior members of his medical staff held a meeting at St. Albans on May 26 to discuss the question of co-operation between general practitioners and health visitors. Dr. D. G. Wilson was elected to the chair.

In opening the discussion the county medical officer, Dr. J. L. Dunlop, reviewed the circumstances which had militated against co-operation between the curative and health services in the past, and showed how some of the worst obstacles had been removed by the National Health Service. He welcomed the circular as likely to strengthen the efforts already being made. He put forward suggestions of ways in which the health visitor and general practitioner could work together, and invited criticisms and improvements from practitioners present.

Practical Suggestions

The following points emerged from the general discussion which followed. It was stated that the health visitor was at a disadvantage, compared with the nurse and the midwife,

in that her work seldom brought her into close contact with the general practitioner—who was not always aware of her exact function. Contact was made more difficult because health visitors were seldom on the telephone, and in any case were out at work at times when general practitioners found it most convenient to get in touch with them. Many practitioners, therefore, did not know how many, where, or what were the names of health visitors working in their areas.

To overcome these difficulties it was suggested that (a) the county medical officer should write to all general practitioners outlining the uses which could be made of the health visitor service, and telling them of his intention to instruct health visitors to call on all general practitioners with whose patients they might be concerned; (b) the health visitors should make this call in order to establish the personal contact so advantageous to the general practitioner and the district nurse; (c) where it was mutually agreed, the health visitor should follow up the first call with others either on the doctor or on his secretary, who might form a good connecting link for the exchange of information and messages.

It was felt that the improved liaison resulting from these measures would benefit patients, visitors, and doctors. It was recognized that the final achievement would depend on personalities, and that it would be better therefore to leave general practitioners and health visitors to develop their individual schemes.

WAITING FOR A LETTER

That there is more than one side to every problem is shown by the following letter in the current issue of *Family Doctor* from an out-patient's secretary in a general hospital. She tells her side of some of the difficulties in sending out prompt reports on patients. She writes as follows:

"Sometimes a report is delayed, or not sent at all, because we do not know the name and address of the doctor. The registration clerks who record this on the case sheets are not allowed to open the doctors' letters to find it for themselves. But when the patients are asked for this information: 25% give it incorrectly; 20% say they don't know the doctor's name but it is just past the Red Lion; 10% are too old, anxious or intimidated to be able to remember; 5% are too deaf to hear the question; 5% are of foreign origin and unable to speak English; 20% don't know. Of these, 2% have letters written on very small pieces of thin paper, which disintegrate or vanish during the session, leaving the consultant and me without a clue.

"Family doctors could, therefore, help us to help them by using envelopes with 'From Dr. So-and-So' printed on the outside. This could then be copied by the clerks in the first place."

PRESENTATIONS TO DRs. C. J. G. BOURHILL AND G. A. SINCLAIR

After an informal supper party on May 27 Dr. C. J. G. Bourhill, former chairman of the Warrington Local Medical Committee for 17 years, and Dr. G. A. Sinclair, former secretary for 27 years, were presented with a gold watch, and a silver tea service and tray, respectively. The gifts were subscribed by practitioners on the executive council list, of the public health department and attached to local hospitals, and others connected with the executive council, in appreciation of the services Drs. Bourhill and Sinclair had given to the profession, in particular in furthering mutual help and trust among practitioners in the area.

The presentations were made by Mr. W. A. Boulting, chairman of the Warrington Executive Council, Dr. L. S. B. Tasker, and Mr. G. E. Archer.

STATUS OF SENIOR HOSPITAL MEDICAL OFFICERS

NATIONAL SPECIALISTS' GROUP FORMED

A meeting of senior hospital medical officers from 13 of the 14 regions in England and Wales and including a representative from Scotland was held at B.M.A. House, London, on Saturday afternoon, May 29, 1954. Letters of support were received from the remaining region in England. The Convenor and Chairman was Mr. G. Waring Robinson, of Leicester, chairman of S.H.M.O. groups in the Sheffield Region. There was an unexpectedly large attendance, about 200 being present.

The CHAIRMAN said that it had been suggested to him that this occasion should be used to form a national Group of S.H.M.O.s. He wished to see the eventual abolition of the grade, and therefore hoped that this would prove to be the shortest-lived group of any.

Mr. GEORGE LOWE (Tiverton) proposed that an Official Group of S.H.M.O.s be formed, with Chairman, Secretary, and Committee, to represent all 14 regions. This proposition was unanimously adopted, and Mr. Waring Robinson was elected Chairman, Mr. G. Lowe Vice-chairman, and Dr. W. J. Wilson (Sheffield) Honorary Secretary. Members from each region then conferred to choose one of their number to serve on the Committee.

The Present Standing of the S.H.M.O.

The CHAIRMAN said that S.H.M.O.s had much more support from other branches of the profession than was generally realized. In his correspondence he had been surprised at the response, for example, from members of Council of the B.M.A. and from the Royal Colleges. With regard to the Regional Consultants and Specialists Association, he was reminded that the policy of the Association, as laid down at the Special Representative Meeting in December, 1949, was to seek the abolition of the grade altogether. The members of this grade, he said, felt a sense of injustice, but the airing of personal grievances was not the best way to advance a cause. The important thing was to get the whole profession and the Ministry of Health to realize that here was a large and important body of medical men—specialists—who could speak with a united voice.

There appeared to be a very hazy idea of the standing of the S.H.M.O., and he hoped that that meeting would express its opinion in no uncertain terms on that point. The S.H.M.O. was appointed only when it was known that he had a wide experience in his specialty; generally he possessed a higher qualification. He was expected to be able to take complete clinical control, differing in no way in this respect from his consultant colleagues. The relationship between consultants and S.H.M.O.s was not that of commanding officers to lower ranks. The senior area consultant was responsible for the smooth running of his department, and with his colleagues, whether consultants or S.H.M.O.s. On this question of status he felt that the S.H.M.O. was slowly being pushed down to a lower level. After all, the S.H.M.O. was a recognized specialist who at the time of his appointment was considered competent to be in complete clinical control of patients and beds. His professional standing, therefore, was similar to that of his consultant colleagues, and he should have equal representation on all appropriate committees.

At this point several of those present gave their experiences of difficulties in the several regions. Mr. Lowe said that there was not only a good deal of individual injustice but much variation between regions. He also protested against the assumption "Once an S.H.M.O., always an S.H.M.O." One speaker said that if it was proposed to abolish the grade of S.H.M.O. this should carry with it the implication that all in that grade immediately became consultants. The differential between the consultant and the

S.H.M.O., said this speaker, was under the present arrangement made to appear quite excessive.

The CHAIRMAN pointed out that the question of abolishing the grade was a separate one and would be considered under long-term policy. The meeting was at present discussing the professional standing of S.H.M.O.s on the assumption that the grade was retained. In some further discussion the difficulty was pointed out that S.H.M.O.s were not a homogeneous body, and that not all had come into the grade by the same route. One speaker expressed the view that a great injustice was done by not creating a rank of "Specialist." The term "Consultant," he said, should have been reserved for those in receipt of the Merit Award. "We shall never get anywhere until we create a specialist grade." Another speaker urged that no distinction be made between consultants and specialists.

The following resolution was carried unanimously:

That a Senior Hospital Medical Officer is a recognized specialist who at the time of his appointment was considered to be competent to have complete clinical control, and where applicable control of beds. His professional standing, therefore, is similar to that of his consultant colleagues, and he should have equal representation on all relevant committees.

It was further agreed unanimously, Dr. PUGH proposing and Dr. GOLDSTEIN seconding:

That, pending the abolition of the grade, a fully constituted Group of S.H.M.O.s should be recognized by the British Medical Association, with adequate representation on the Central and Regional Consultants and Specialists Committees.

The Recent Awards

The CHAIRMAN next drew attention to the recent revision of scales, which, he said, had accentuated the difference between the salaries of S.H.M.O.s and of consultants. The S.H.M.O.s had had an increase of 15.4% and the consultants an increase of 23.5% at the minimum of the scales. This also, he pointed out, affected status, because a man's status was largely judged by his remuneration. Dr. PUGH proposed and Dr. HARRISON seconded:

That this meeting considers the recent awards to S.H.M.O.s imply a lowering of their professional standing as compared with that of their consultant colleagues, and requests the immediate righting of this humiliating injustice.

This resolution also was carried unanimously.

Promotion by Regular Review

The CHAIRMAN said that in the grade at present the prospects of promotion were practically nil, except perhaps in certain specialties. Speaking broadly, the S.H.M.O., when applying for a post, was in competition with senior registrars from teaching hospitals. A senior registrar should attain consultant status by passing through an intermediate grade as long as such a grade is retained. A review committee should be appointed, meeting perhaps three or four times a year, to which S.H.M.O.s could apply, and on that committee S.H.M.O.s themselves should be represented. Mr. Lowe said that if the grade was retained promotion by merit should be an essential feature of the Service. The method of obtaining that promotion should be determined later, but it was essential that anybody worthy of the rank of consultant should have the chance to compete.

From further debate it was evident that there were those in the meeting who thought that the first thing to ask for was the abolition of the grade, but an amendment that no alternative proposal to the abolition of the grade be put forward to the Ministry was lost. The following motions were carried unanimously:

That if the grade be retained promotion on merit to consultant rank should be an essential feature of the Service and that age should be no obstacle.

That the meeting expresses its complete lack of confidence in the work of the earlier Review Committees, believing that in many instances the reviews were grossly unfair. It further requests that S.H.M.O.s have adequate representation on the Committees concerned with the proposed review of selected cases.

Revision of Salary Scales

The CHAIRMAN suggested that they should press for a revision of the salary scale to a minimum of £1,500 rising to a maximum of £2,500, the annual increments probably being £100. In the case of a man in the fullness of his professional career £2,500 was in no way excessive.

Considerable discussion followed on this matter. The Chairman pointed out that the salary scale he had suggested was only an interim measure pending the abolition of the grade, and he considered that a minimum of not less than 80% throughout the consultant's scale would be more in keeping with the professional standing of S.H.M.O.s.

Eventually the following resolution was passed unanimously:

That this meeting considers that pending the abolition of the grade the remuneration of Senior Hospital Medical Officers should be not less than 80% of the consultant scale.

Another proposal agreed to was that S.H.M.O.s should be represented—or at any rate called in to give their views—on any committee appointed to consider injustices pertaining to the grade.

Further Action

In reply to questions, the CHAIRMAN said that a succinct report of the present meeting would be sent to the Minister of Health, the Royal Colleges, the British Medical Association, the Central Consultants and Specialists Committee, and other appropriate bodies, and to the medical journals. It was suggested from the meeting that it be brought to the attention of all members of Parliament and to all S.H.M.O.s in the country. In reply to a question the Chairman said that he believed there were about 2,500 S.H.M.O.s in the country.

Discussion then took place on the question of title, and the resolution eventually adopted was:

That the title S.H.M.O. cease to exist, and that under the generic term "Specialist" the title "Physician," "Surgeon," "Pathologist," "Radiologist," etc., be used.

Finally Dr. SAUNDERS-JACOBS proposed and Dr. HARRISON seconded the proposal:

That the Council of the B.M.A. be requested to take urgent and vigorous action to further the resolutions adopted by this meeting.

This resolution was carried unanimously.

The meeting accorded an enthusiastic vote of thanks to Mr. Waring Robinson for his initiative in summoning the meeting, and his conduct of it, and an appeal was made, and quickly responded to, for contributing to defray the initial organizational expenses.

MINISTER OF HEALTH ON FUTURE OF GENERAL PRACTICE

HEALTH CENTRES NOT A UNIVERSAL ANSWER

The Minister of Health (Rt. Hon. Iain Macleod, M.P.), in opening extensions to the East Ham Chest Clinic on June 21, took occasion to address some remarks specially to general practitioners about the future of general practice.

The subject of general practice, he said, was particularly dear to him because he was the son and grandson of general practitioners, and if he had been clever enough at school he would have been a general practitioner himself. There were many in general practice who had feared the coming of the National Health Service, and he was much concerned when he became Minister in 1952 to be quite certain that all that old feeling had gone. He came to office at rather a fortunate time for himself: the Danckwerts award had just been announced, and the arguments about charges in the National Health Service had at any rate simmered down. One of the first things he decided was not to make his period as Minister of Health, whether long or short, memorable for new legislation in the field of health, and indeed during his two years of office he had not introduced a single Bill. It was not more legislation that was needed, but to make work

the legislation already in being. With that idea in mind he started—and it was still his guiding principle as a Minister—to try to bring his Ministry nearer to those who worked in the Service and to make the people working in the Service understand some of the problems that administration had to face.

New Horizons

A great deal had disappeared, Mr. Macleod continued, from the old conception of general practice, but there were new horizons ahead. Little more in this particular field could be done from Whitehall. One could not help noticing, he said, how areas differed one from another.

"You can find in a good area almost at once the reason why it is good. The leaders of general practice in that area are on friendly terms with the hospital and the local health authority, and that sort of co-operation is something you cannot order by circular or regulation. What I want to see is the spirit of team-work in general practice devoted to the service of the patient such as we have already in hospital."

It was easy enough to bring it about in hospital, with its discipline and its teams of physicians and surgeons and specialists, and behind them the nurses and other staff, not forgetting those who ought to provide the link between the hospital and the general practitioner—namely, the almoner and the health visitor. To get that team-work into general practice there were those who advocated health centres, or group practice, or some development of the ordinary partnership system.

"One thing I am certain is right, that the same pattern will not do for every area. Areas differ socially and medically. Medicine is a very individual profession, and it does not seem to make sense for the Minister to lay down that all general practice in this country be channelled into health centres. I have no doubt that in many areas health centres do provide a very good example, particularly where there is a new housing estate and, so to speak, a medical vacuum in which services must be provided. In such an area it may well be that the health centre is the answer if the doctors want to work together in that sort of way. But these principles I would lay down: that it cannot be the same everywhere, and that it must remain as the doctor's right to practise or not in these health centres as he chooses. It would be disastrous to attempt to force the medical profession into giving their services in a way that many of them would regard as unsatisfactory. I have no doubt that health centres are going to provide part of the answer in this field, but not the whole answer."

Nor, for the same reason, was the answer to be found in group practice or developments of it, though group practice was bound to develop in many areas as doctors came more closely to study their problems together and as, one by one, doctors in a certain area began to specialize in some particular subject.

Liaison Between G.P. and Hospital

What was most important was the soundness of the links between general practitioner and hospital. It was of first importance that the general practitioners should be welcome and know that they were welcome in all their local hospitals, and that the ordinary facilities of the hospital, like the x-ray department, should be available for them. It was of first importance also that when the patient left hospital the general practitioner should have a report on him—and not just a routine report, but a considered statement from a senior member of the hospital staff. If that linkage was continued through the work of the health visitor, then they ought to have got somewhere near the ideal of the general practitioner as the head of a clinical team as diverse in its own way as the team which looked after the patient in hospital.

As to whether the general practitioner should himself practise surgery in the hospital there might be different opinions, but he recalled that his own father, who was the head of a partnership at Skipton, in Yorkshire, did a good deal of surgery in his time at the local hospital, and on a recent visit there he was delighted to find that the practice continued. Along with the link between the general practitioner and the hospital he wanted to see as close a link as possible between the general practitioner and the medical officer of

health and thereby to assist the progress of preventive medicine. It was difficult at present to concentrate as much as one would desire on the preventive side when the demands on the resources of curative medicine were so great, but the National Health Service ought to be designed to promote health.

Mr. Macleod concluded by asking general practitioners in the audience to talk to him privately afterwards. He said that it was not possible for him to meet as he would like to that the general practitioners of the country. "What one usually does is to meet the representatives, admirable though they be, of those practitioners in session in the B.M.A."

The ceremony at the East Ham Chest Clinic was presided over by Dr. L. Comyns, chairman of the Hospital Management Committee, and among those who spoke were Dr. J. S. Coleman, medical officer of health for East Ham, and Dr. Philip Ellman, consultant physician to the clinic. The vote of thanks to the Minister was proposed by Dr. Stanley Thomas, secretary of the East Ham Local Medical Committee, and seconded by Dr. M. J. McCormack, chairman of the West Ham Local Medical Committee.

Correspondence**Merit Awards**

SIR.—The Council of the Regional Hospitals' Consultants and Specialists Association is aware that throughout the country there is considerable disquiet at the manner in which merit awards are distributed. This disquiet is no doubt due in the main to the overt secrecy which enshrouds the subject. Since the early days of the National Hospital Service there have in many regions been no local consultations and little or nothing is known of how recommendations are made or considered. In many areas local advisory committees have not been further consulted and, indeed, committees have not been further consulted and, indeed, committees have not been further consulted and, indeed, committees have not been further consulted.

At its meeting on June 3, the Council of this Association accepted the following resolution put forward by one of its constituent bodies:

"That the Council of the Regional Hospitals' Consultants and Specialists Association is of opinion that in the granting of Distinction Awards the Awards Committee should consult local medical opinion, and that this could best be done through small regional advisory panels of consultants elected by the consultants in each region."

—I am, etc.,

London, W.C.2.

JOHN SIMONS,
President, Regional Hospitals'
Consultants and Specialists Association.

Remuneration of Hospital Medical Staff

SIR.—I am writing this letter in the hope that it may appear in print before representatives gather at the A.R.M. A number of amendments appear in the *Supplement* of June 19 (p. 332) urging that future negotiations on behalf of hospital medical staffs should be undertaken exclusively by the B.M.A. Doubtless this agitation stems from your leading article of April 10 (p. 860), which at a recent meeting of the Central Consultants and Specialists Committee I described as reprehensible and irresponsible. In that article the attempt was made to dissociate the B.M.A. from all responsibility in the recent negotiations. I wish to point out that I owe my position on the Joint Committee (and thereby on Whitley "B" Staff Side) to my membership of the B.M.A., of the N.E. Metropolitan Region Consultants Committee, and of the Central Consultants and Specialists Committee. This is likewise true of the other members of the Central Consultants and Specialists Committee who sit on the Joint Committee. And though the Central Consultants and Specialists Committee is an autonomous body, nevertheless it is paradoxically a standing committee of the B.M.A. Consequently, through us the B.M.A. is represented on the Joint Committee and is responsible for the results of the recent negotiations to the precise degree that we—of

the Central Consultants and Specialists sitting on the Joint Committee—were responsible. The B.M.A. may wish not to recognize that responsibility, but it is nevertheless factual. I was disgusted by what, Sir, should have been a soberly worded commentary, but which served instead as a stab in the back.

Those who bring forward the amendments in question, and those who may have a burning desire to speak to them, should think carefully and be cautious. The consultants and specialists of this country already possess an organization through which they can criticize their representatives. I for one—and I am sure that here I speak for my colleagues—am very willing to be criticized, but only through our machinery and only by my fellow members of hospital staffs. Any criticisms of the negotiating machinery should be made by the members of hospital staffs, and the overhaul should be carried out by them. We are glad to have the good wishes of our general-practitioner colleagues, and we co-operate with them through our Liaison Committee. But I for one would strongly resent their interference. However well meant—in our affairs. I imagine that at the A.R.M. there will be a large majority of general practitioners, and I trust they will take no part in the discussions and in the voting on matters concerning our negotiating machinery.

I issue a solemn warning to those who may wish to destroy the present machinery that an endeavour to replace it by one entirely under the aegis of the B.M.A., to the exclusion of the other constituent bodies of the Joint Committee, at this stage in the development of the N.H.S., would with fair certainty completely destroy the influence of hospital staffs on the organization of the Service. This influence—now very considerable—has been built up slowly and with great difficulty in the last six years. Further, it is a conceit that all consultants would naturally and automatically support a "pure" B.M.A. negotiating committee. Any attempt by the A.R.M. or the Council to "push around" the consultants might easily lead to a split between general practitioners and consultants, and spell ruin for the B.M.A.

Finally, I hope it is crystal clear that I have no objection to criticisms of the outcome of the recent negotiations. Informed criticism of that nature by those to whom I owe a responsibility is right and proper; and the answers to such criticisms have been given particularly clearly in Bulletin No. 3 of the Central Consultants and Specialists Committee. But I write this letter because I am horrified by the thought of the chasm which might yawn before the profession in a few weeks' time as a result of the irresponsible actions of ill-informed persons.—I am, etc.,

London, N.6.

D. W. C. NORTHFIELD.

**The leading article in the *Journal* of April 10 described the constitution of the Staff Side of Whitley Committee "B" thus: "... the Staff Side negotiators on behalf of consultants and hospital medical staff are chosen by the Joint Consultants Committee, which has on it representatives from the Royal Colleges and Corporations of England and Scotland, and from the Central Consultants and Specialists Committee of the B.M.A., the distinguished President of the Royal College of Physicians acting as chairman. The British Medical Association has not in fact conducted the negotiations (as it did for the general practitioners)." These are the facts, and it is the recording of them which, it appears, Mr. Northfield describes as "reprehensible and irresponsible."—Ed., B.M.J.

Doctor-Patient Relationship

SIR.—I think that many of us in the profession will find ourselves in agreement with the opinions expressed by "G.P." in his letter (*Supplement*, June 5, p. 299) under the above heading. At the same time I must say that I am obviously more fortunate than him and his colleagues in that my local executive council has always treated me with much consideration and co-operation.

The point I wish to make, however, is concerned with the power of executive councils to discipline patients, and

here I do agree most heartily with your correspondent. I think there is a great injustice here. Apart from a mild injunction to patients on their medical cards (which, incidentally, I am certain are never perused) to try to send in their calls before 10 a.m., I know of no regulations attaching to the public whatever. On the other hand, vigorous disciplinary measures can be, and are, taken against doctors who may be delayed in responding to calls and for other reasons such as are mentioned in your correspondent's letter. This unilateral and unfair dissemination of "justice" can do no other than wreck completely what fragments remain of anything resembling a doctor-patient relationship, which is pretty well doomed already. Most of us realized its death knell was struck when the N.H.S. was launched, but were severely criticized for this opinion by the then Minister of Health. It is up to executive councils to try to preserve the remaining fragments of this relationship by every means possible and not the least by being much more careful in arriving at their conclusions regarding the conduct of those who, let them remember, are keeping the Service going. Laymen on councils are not conversant with the problems of the profession. They should realize this and try to understand the doctors' difficulties more sympathetically. Indeed, I consider they are fortunate to have such a docile and co-operative body of men and women under their jurisdiction. Bias in favour of the public will not, however, necessarily secure for them a continuation of such co-operation, and they would do well to contemplate this. Also, a bit more discipline directed towards the patients would not be out of place and would create infinitely better circumstances for the welfare of the Health Service.

One last point, which may at first sight seem irrelevant but which does in fact have a bearing on the subject: when are we going to have this iniquity wiped out of private patients having to pay for their medicines? They are just as entitled to free medicine as are the N.H.S. group, and the continuation of this wretched piece of political bias can in fact be very detrimental to the doctor-patient relationship. There can be no possible excuse for it, and it would be a much more worthy subject for press publicity than the alleged misdemeanours of a hard-worked and frequently distracted medical profession.—I am, etc.,

Great Haywood, Stafford.

A. D. MACDONALD.

Patients of Vacant Practices

SIR,—So Dr. A. Talbot Rogers "regretted the terms" in which the Devon and Exeter Local Medical Committee's motion at the Conference of Local Medical Committees regarding the patients of vacant practices was worded (*Supplement*, June 12, p. 304). Shades of Lord Acton, his regret was not greater than is mine at his apparent petulance. Had Dr. Talbot Rogers taken the trouble to try to explain in just what way the acceptance of such patients can become an ethical matter, using the word "ethical" in its ordinarily accepted sense as relating to morals, he would have interested many. The mere fact that the G.M.S. Committee, or a majority of its members, took this view proves nothing of the kind.

May I take my own case as a specific example? I am a singlehanded practitioner in a small town. If I die in harness a duty will devolve on my colleagues under their "terms of service" to render all necessary treatment to the patients of the practice until a successor shall have been appointed. It may well be that even now many of my patients would like an opportunity to transfer if they could do so without embarrassment. Why should my *exitus* debar them from transferring? What moral obligation would rest upon my colleagues to refuse to accept them and others? To whom do they stand under moral obligation in the matter? It would certainly not be to me, certainly not to my wife, whose only interest would be to remove herself and two dependent children from this vast, aesthetically pleasing, but back-breaking and impoverishing Georgian house with the least possible delay. I submit that apart from the con-

tractual obligation already mentioned they would be under no obligation of any kind and would be perfectly free to accept any patient who wished to transfer. This is the clear and obvious corollary of the fact that the goodwill of the practice belongs neither to me nor to my heirs.

If the matter is without objectively ethical content, if it is, in the language of theologians, "indifferent," then it cannot be the concern of a committee which, if its name means what it appears to mean, is concerned solely with ethics. This proposition is as simple as that two and two do not make five, and there is no very obvious reason why anyone should doff his cap to the chairman for the time being of the G.M.S. Committee before putting it forward. Dr. Talbot Rogers must have had some sound reason for his round declaration in a slightly different connexion that "freezing" of a death vacancy would not recommend itself to the Ministry, although one would have thought that on administrative grounds the suggestion might have much to commend it and should certainly be possible by regulation. To seek to "freeze" such a practice by an illogical, illusory appeal to our moral sense seems to be merely another example of the present frightening trend to direct other people in the conduct of their affairs.—I am, etc.,

Launceston, Cornwall.

DONALD M. O'CONNOR.

Waiting in Out-patients

SIR,—There has been much publicity in the lay press on the question of the long waits which out-patients have when attending hospital, and the Minister of Health has issued a rebuke to the hospitals. Many suggestions are offered, such as the establishment of more appointments officers of higher skill, etc., but the real cause of the waiting is perhaps so very simple that it has escaped the notice of the authorities. It is just this, that too many patients are being attended to by too few consultants. If a train is habitually overcrowded and late, the remedy is not to put an extra clerk in the booking-office but to put on another train. For every consultant appointment which is advertised there are usually some 40 to 50 applicants, and there is much unemployment amongst highly qualified men and women who have been registrars for far too long. If the number of consultants were doubled, the patients would no longer have to wait, and the cost to the State would be less in the end than the appointment of further lay staff which would do nothing to remedy this evil.

Finally, if registrars who had completed their training could get appointments as consultants, there would be more incentive to the newly qualified to take up registrar appointments. Many of these posts are unfilled at the moment, particularly in the provinces, because they are regarded as a blind alley.—I am, etc.,

Camberley.

LESLIE HARTLEY.

The Small-list Practitioner

SIR,—I should like to associate myself with the views expressed by Dr. W. J. Grant (*Supplement*, May 15, p. 244) and by Dr. Roy Clayton (*Supplement*, May 29, p. 292). As regards those of the latter, I, too, see no reason or justification for penalizing the over 70's on account of their age. The Working Party would seem to be still obsessed with the idea that three score years and ten are still the be-all and end-all of man's existence, and with a wish to retire or get rid of them (though we are not yet a salaried Civil Service) despite Government propaganda in the Press and over the radio in favour of encouraging old men to keep going and work as long as they feel fit to do so; and of life figures; and despite the fact that the Ministry categorically stated before the appointed day that it had no intention of introducing a retiring age. As to their efficiency, my impression is that there is quite as high a percentage of inefficients under 70 as over, yet the efficiency will it be judged? As regards "no detriment," surely the proposed scheme is definitely detrimental to the "under

300's," for they are not only not to get any additional help but are not even to be allowed the capitation fee judged equitable by Mr. Danckwerts—namely, about £1 a head—but which the Working Party apparently do not concede. In their view "it is not proper" to make comparison between the new scheme and the effect of the Danckwerts award. The amount necessary to provide that extra 3s. a head for the few remaining under 300's would, I should think, hurt nobody.—I am, etc.,

Thame.

C. H. BARBER.

SIR,—May I respectfully point out to Dr. W. J. Grant (*Supplement*, May 15, p. 244), and others who have hastily welcomed the second report of the Working Party, that its recommendations are designed to benefit only two groups of practitioners: (1) those who were in receipt of a fixed annual payment on March 31, 1953, and (2) doctors aged 60 and over, subject to certain conditions? The Working Party were asked, in making their second report, to amend their original distribution scheme where "those least favourably placed" who might have expected to have benefited from the new distribution had, in fact, not done so (resolution of Special Conference of Local Medical Committees—see *Supplement*, July 5, 1952, p. 1). That this was taken to mean the small-list practitioner is evident from the proposed scheme.

The capitation fee under the Danckwerts award, which, it must be remembered, was a first settlement and was made retrospective to July, 1948, was about 20s. It can be shown by simple arithmetic that the average capitation fee for lists up to 714 under the Working Party's original distribution scheme is less than 20s., and for lists up to 500 it is, of course, only 17s. These doctors are manifestly worse off, instead of having benefited, than under the Danckwerts system, and, except where they come into the categories shown above, will so remain if this report is adopted. Only a small proportion outside (1) and (2) will be eligible under the sickly "hardship scheme." At a combined meeting of the Kensington and Fulham, Hammer-smith, and Paddington B.M.A. Divisions on May 28, 1954, a motion was carried underlining the fact that the Working Party have failed to do what they were asked to do. I trust that the Annual Conference also rejects a scheme which further divides our profession into smaller groups, and continues discrimination against those who can least afford it.—I am, etc.,

London, W.6.

ROBERT JOHN.

Return of Goodwill

SIR,—Having read Dr. Alexander Brown's letter (*Supplement*, June 19, p. 350) there are one or two comments I should like to make, but first I should like to say that I have the greatest respect for Dr. Brown's integrity and I have always admired his sincerity. I hope he will concede that I too am sincere, and that my letter in the *Supplement* of June 12 (p. 319) was a simple statement of fact.

At the March meeting of Council it was certainly not decided that the Amending Acts Committee's scheme for the return of goodwill should be presented to the A.R.M. with Council's condemnation. Indeed, a move in that direction was defeated by a very large majority. As far as submission of the Amending Acts Committee's report to the G.M.S. Committee and the Private Practice Committee is concerned, I would point out again that, ever since the beginning of our session last autumn, representatives of these committees have been invited to our meetings, and have enjoyed, and used, the fullest liberty to make their criticisms known. It has become increasingly obvious as time has passed that there were those in Council, who, whilst paying lip-service to the feeling that it was a most unfortunate thing that we had ever relinquished the ownership of our goodwill, nevertheless were bitterly opposed to the idea of any attempt being made to regain it. Obviously, they are perfectly entitled to hold and express any opinions about the matter that they wish—but so, too, are those of us who support the idea of the restoration of goodwill.

Many of our opponents have been generous enough to compliment the Amending Acts Committee on its ingenuity, and on the time and energy it has expended on its work—and then they have gone on to say that its goodwill scheme is the best one possible, that no better one can be devised, but that it is just not feasible. Now there I would join issue with them, for I think that Dr. H. H. D. Sutherland has shown the scheme to be a perfectly practical one even as it stands, but I say again, as I said in Council on May 5, that our scheme in its present form is not necessarily the final one, that there were, perhaps, loose ends to be tidied up, omissions to be rectified, and new criticisms to be considered, and at Glasgow I hope we shall be able to prove that we have adequately met most of the objections levelled against us.

As to the "red herring" of a whole-time salaried general medical service, it is as well to remember that consideration of this subject was not excluded from the Guillebaud Committee's remit, and that therefore (in spite of views expressed by the Minister of Health) the thought is already in the minds of the politicians.

At the same time, I must agree with Dr. Brown that I have never heard any member of Council express, in debate, support for a whole-time salaried medical service, and I take this to be a most cheering indication that complete opposition to any such development continues to be—as it always has been—the official policy of the B.M.A.

In conclusion, I trust that representatives will keep an open mind on the goodwill issue till after the debate at Glasgow, when I hope, and expect, that Dr. Sutherland will be able to meet all fair criticism and will be able to persuade the Representative Body that our scheme is not only feasible but desirable.—I am, etc.,

Wolverhampton.

A. VICTOR RUSSELL.

Remuneration in the Public Health Service

SIR,—It occurs to me that in the correspondence I have read an important point has been overlooked. Under Section 17 of the Industrial Court on the Public Health Service Award (*Supplement*, December 30, 1950, p. 255) the following statement occurs on the part of the management: "... And it was submitted that for the purpose of fixing the appropriate scales of salary attaching to posts in the public health service regard should be had to the scales prevailing in the local authority hierarchy. This was the basis of the offer made by the management side." Yet since this award they have increased assistant dental officers' salaries to above that of assistant medical officers. This, in my view, completely destroys the grounds upon which the management side refused to grant the salaries asked for, as the dental officers concerned were previously on a lower-salaried scale compared with medical officers. It is interesting to note that our colleagues the chest physicians have enhanced their salaries by a change of nomenclature from tuberculosis medical officers.

I am wondering if a fresh appeal is not only justified but should be regarded as a matter of urgency.—I am, etc.,

Brighton.

LEWIS B. PETERS.

Information from National Service Medical Boards

SIR,—The Ministry of Pensions recently wrote to me about a patient who had been examined by a medical board and found to have a non-pensionable condition; they were "therefore unable to provide any treatment for it, but the information is passed to you for any action you may wish to take."

How different is the attitude of the National Service medical boards to the passing on of information. When I wrote to the B.M.A. on this subject in September, 1952, I was advised that the matter had been previously taken up with the Ministry of Labour, who had made the following points: (1) General practitioners could "readily" obtain the requisite information about a patient from the chairman of the medical board. (2) "It would be impractic-

able" to pass on any material information which might come to light at a medical board. (3) "The great majority" of recruits and/or their doctors know "the nature of the disability which causes rejection," but "in any case, however, where a man has been placed in Grade III or Grade IV and some serious condition has been found at the examination, of which the man has hitherto been ignorant, and for which, in the chairman's opinion, the man needs medical advice in his own interest, he is advised to consult his own doctor." I was told that the General Medical Services Committee "expressed itself satisfied with these arrangements."

But are these arrangements satisfactory? Indeed, are they implemented?

It is time-consuming for the general practitioner to have to communicate with boards, the addresses of which patients are frequently unable to supply (only three out of eleven sample patients who were graded III or IV by medical boards were able to supply me with the necessary addresses). Why should the onus be on the general practitioner? Why should it be "impracticable" for Ministry of Labour Boards to pass on information when the Ministry of Pensions can clearly (and courteously) do so? Is it not a waste of medical manpower when the general practitioner is not informed of the various special investigations carried out by hospitals at the request of medical boards? Why cannot the general practitioner receive copies of these investigation findings? Indeed, why should he not be allowed to refer these patients himself in the first instance, instead of having everything done for him above his head by medical boards?

Out of the eleven sample patients referred to above, the following cases stand out: One man was graded IV because he stated "part of his left lower lung was not functioning." He was x-rayed at the medical board, but not referred either to hospital or to me. Two men were graded III and another two graded IV, but were not told why. To this day neither they nor I know why—again they were not referred either to hospital or to me. According to his statement a patient was graded IV because of his eyes, and sent to my local hospital, where he was seen four times by the ophthalmologist, who could find nothing abnormal, but I have never received any official report from board or consultant. Another was graded III solely because he had six toes on his right foot, as far I can gather. Yet another was graded IV because of "stomach trouble" and was sent to hospital for a barium meal, but he was certainly not told to get in touch with me. It is nine years since the war ended, and six since July, 1948. Surely by now there should be more co-operation between National Service and the National Health Service.—I am, etc.,

London, E.9

D. G. BERRY.

Radiology on Points

SIR.—Within twenty-four hours of reading in your columns my letter (*Supplement*, May 29, p. 291) I heard of the supreme ludicrous (to date) of the "unit system." Finance officers have been, since January, 1953, relating their costing returns to the "unit" figures for pathological and radiological departments. H.M. (54) 37, section 16, reads as follows:

"In order to secure that the out-patient figures for these two departments for the 1953-4 costing returns are reasonably comparable with those for previous years it has been decided that where the actual numbers of specimens or examinations are not known the numbers of 'units' of work for each department will be converted on a notional basis, for the purpose of the costing return, into numbers of specimens or examinations. The factors to be used for this purpose will be determined by the department when forms SH3 for 1953 have been collated, and hospital authorities will be notified as soon as possible."

There are simple little arithmetical games which start off. "Think of a number, multiply by so and so, and take away the number you first thought of." It seems that we now pay Government departments to play these games.—I am, etc.,

Worcester.

ANTHONY A. VICKERS.

Peripatetic Practitioners

SIR.—May I strongly endorse Dr. Robert Forbes's advice (*Supplement*, June 5, p. 299) about the importance of doctors keeping their defence societies and the General Medical Council informed of a change of permanent address? There is another disadvantage in failing to do so which he does not mention. The Medical Protection Society sometimes hears of impending litigation which may involve a member whose present whereabouts are unknown to us, and delay in establishing contact with him at an early stage may later seriously prejudice his legal position or that of his colleagues as the action matures. The difficulty in tracing a woman practitioner may be further increased when she does not inform her defence society or the Registrar of the G.M.C. that she has changed her surname as well as her permanent address.—I am, etc.,

London, W.C.2.

ALISTAIR FRENCH,
Secretary, Medical Protection Society.

Christian Medical Fellowship

SIR.—As already announced in the Annual Meeting Programme (*Supplement*, June 19, p. 323), the annual breakfast of the Christian Medical Fellowship will be held during the B.M.A. Annual Meeting at Glasgow. This year's speaker will be Mr. T. Howard Somervell, until recently Professor of Surgery in the Vellore Christian Medical College, Madras. The address of the Christian Medical Fellowship is 39, Bedford Square, London, W.C.1, and not at Liverpool, as inadvertently given by Dr. J. H. Thompson in a letter to the *Journal* (June 5, p. 1323).—I am, etc.,

DOUGLAS JOHNSON,
Secretary, Christian Medical Fellowship.

Association Notices

Diary of Central Meetings

JULY

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|----|--------|---|
| 1 | Thurs. | Annual Representative Meeting (at Glasgow), 10 a.m. |
| 2 | Fri. | Annual Representative Meeting (at Glasgow), 9.30 a.m. |
| 3 | Sat. | Council (at Glasgow), 9 a.m. |
| 3 | Sat. | Annual Representative Meeting (at Glasgow), 10 a.m. |
| 5 | Mon. | Annual Representative Meeting (at Glasgow), 10 a.m. |
| 5 | Mon. | Annual General Meeting (at Glasgow), 12.30 p.m. |
| 5 | Mon. | Council (at Glasgow), at conclusion of A.R.M. |
| 5 | Mon. | British Medical Guild Trustees (at Glasgow), at conclusion of Council. |
| 5 | Mon. | Adjourned Annual General Meeting and President's Address (at Glasgow), 8.15 p.m. |
| 12 | Mon. | Evidence Committee on Divine Healing, 2 p.m. |
| 14 | Wed. | Staff Side, Committee "C," 10.30 a.m. |
| 14 | Wed. | Maritime Subcommittee, Private Practice Committee, 2 p.m. (Date changed from July 21.) |
| 15 | Thurs. | Working Party Subcommittee, Joint Consultants Committee. Meeting with Ministry of Health at 23, Savile Row, London, W., 2.30 p.m. |
| 22 | Thurs. | General Medical Services Committee, 10.30 a.m. |
| 22 | Thurs. | Central Ethical Committee, 2 p.m. |

Branch and Division Meetings to be Held

CAMBRIDGE AND HUNTINGDON BRANCH.—At Pembroke College, Cambridge, Wednesday, June 30, 12.30 p.m., annual general meeting, election of officers, etc. Address by president: "Surgery 40 Years On."

CITY DIVISION.—At Hackney Hospital, Homerton High Street, E., Wednesday, June 30, 2 p.m., films: "Functions of the Carotid Sinus and Aortic Nerve" (Part I and Part II).

WEMBLEY DIVISION.—At Wembley Hospital, Tuesday, June 29, 8.30 p.m., clinical meeting.

Meetings of Branches and Divisions

MIDLANDS BRANCH, SOUTHERN RHODESIA

The annual general meeting was held at Que Que on April 2, 1954, at which 15 members were present. Dr. R. B. Saunders gave an address on the treatment of bilharzia. The following officials were elected:

President.—Mr. J. C. Comline.
Immediate Past-president.—Dr. R. B. Saunders.
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